# 100th Annual Research Report
# Rice Research Station


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Crowey, Louisiana

2008

# 100th Annual Research Report

# RICE RESEARCH STATION

# Crowley, Louisiana

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**Louisiana Agricultural Experiment Station**
**David J. Boethel, Vice Chancellor and Director**

**Louisiana Cooperative Extension Service**
**Paul D. Coreil, Vice Chancellor and Director**

**Southwest Region/Rice Research Station**
**Steve D. Linscombe, Regional Director/Resident Coordinator**

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# INTRODUCTION

Research at the Rice Research Station, Crowley, Louisiana, is conducted by scientists with the LSU AgCenter's Louisiana Agricultural Experiment Station. The 2008 rice research program included breeding/variety development, biotechnology, variety testing, fertilization, soil and water management, cultural practices, weed control, insect control, and disease investigations. Crops grown in rotation with rice were evaluated relative to increasing the efficiency of land use. The aquaculture research program places emphasis upon production practices, forages, and multi-cropping of crawfish with agronomic crops. Another important area of work is the production and distribution of foundation seed. The Rice Research Station also conducts research studies in improving species for coastal restoration. In addition, the statewide rice extension agronomist conducts numerous educational programs from the Rice Research Station. Although most research work was performed by members of the Rice Station faculty, several faculty members from the Baton Rouge campus conducted research at this station.

The research activities of this station include both fundamental and applied research, although the latter predominates because of the mission of the Rice Research Station. Research accomplishments and general progress of the Rice Research Station during 2008 are presented in this report representing the 100th Annual Research Report of the Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center. It is significant that this research facility has been providing new technology to the Louisiana rice industry for 100 years.

In addition to research responsibilities of the Rice Research Station faculty and cooperators, a large number of farmers, extension personnel, and others were trained and otherwise contacted during 2008. Approximately 500 people attended the annual Rice Research Station field day to view plots and participate in discussions of research findings. Field days also were conducted in Acadia, Evangeline, Jeff Davis, Richland, and Vermilion parishes. In addition, the faculty participated in industry meetings, both on and off the station, and worked individually with farmers and others in solving immediate problems. Several thousand people received services from the Rice Research Station during 2008.

Projects at this station are conducted under the supervision of research scientists from the Rice Research Station and also by cooperating personnel from certain departments of the Louisiana Agricultural Experiment Station. Following the reports, station personnel and cooperators in 2008 are listed.

**MONTHLY RAINFALL DATA**
**RICE RESEARCH STATION - CROWLEY, LA**
**2008**

| DATE | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC | YEAR TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 1.59 | | | | | | .91 | (Gustav) .16 | | | .01 | |
| 2 | | | | | | | | | 2.55 | | | | |
| 3 | | | | .09 | .78 | | | .35 | .23 | | | | |
| 4 | | | 1.55 | | | | | | 3.23 | | | 1.00 | |
| 5 | | | | .23 | | | | .45 | | | | | |
| 6 | | .17 | | | .12 | .01 | | .14 | | | | | |
| 7 | | | .72 | | | | | | | | .29 | | |
| 8 | | | | | | | .67 | | | .59 | | | |
| 9 | .08 | | | | | | .25 | | | | | | |
| 10 | | | | | | 1.50 | .18 | | | | | .57 | |
| 11 | .57 | | 2.19 | | | | | | | | | (snow).45 | |
| 12 | | | | | | | | .08 | .16 | | 1.01 | .13 | |
| 13 | .08 | .89 | | | | | | 2.12 | | | .65 | | |
| 14 | | | .02 | | | | | | (Ike) .63 | | | | |
| 15 | | .01 | | | 4.23 | | | | 1.71 | | | | |
| 16 | 1.24 | .34 | | | .04 | | | .20 | | | | .02 | |
| 17 | .29 | .75 | | | | .32 | | .20 | | | | | |
| 18 | | | | | | .05 | | .56 | | | | | |
| 19 | 1.98 | | 1.00 | .26 | | .05 | | | | | | | |
| 20 | .13 | | | .01 | | | | .05 | | | | | |
| 21 | | .18 | | | | | | .23 | | | | .02 | |
| 22 | | .24 | | | | .19 | | .01 | | | | | |
| 23 | | | | | .54 | | | | | .05 | | | |
| 24 | .71 | | | .75 | | | .31 | .27 | | | | | |
| 25 | .15 | | | | | | .12 | .18 | | | .15 | .15 | |
| 26 | .90 | .02 | | | | 1.72 | | | | | | | |
| 27 | | | | | | .09 | | | | | | | |
| 28 | | | | .70 | | .03 | | | | | | .60 | |
| 29 | | | | .06 | | .94 | | | | | .60 | 1.20 | |
| 30 | .17 | | .02 | | | .06 | | | | | .01 | .01 | |
| 31 | | | .16 | | | | .11 | | | | | | |
| MONTH TOTAL | 6.30 | 4.19 | 5.66 | 2.10 | 5.71 | 4.96 | 1.64 | 5.75 | 8.67 | 0.64 | 2.71 | 4.16 | 52.49 |
| 2007 | 9.78 | 1.12 | 1.29 | 4.63 | 6.80 | 7.42 | 7.86 | 5.90 | 9.19 | 1.95 | 9.27 | 3.27 | 68.48 |

# RICE BREEDING

## GENETIC IMPROVEMENT OF RICE FOR LOUISIANA PRODUCTION[1]

S.D. Linscombe, X.Y. Sha, S.B. Blanche, K.F. Bearb, C.A. Conner, R.R. Dilly, Jr., B.W. Theunissen,
S.J. Theunissen, B.J. Henry, H.L. Hoffpauir, and L.E. Leonards

### INTRODUCTION

The primary objective of the Rice Breeding Project is the development of superior varieties for the Louisiana rice industry. The Breeding Project is developing improved genotypes of both long- and medium-grain types, which are both important in the state and region. A major area of emphasis is the development of Clearfield varieties of both long- and medium-grain types. The project is also placing major emphasis on the development of special purpose types.

In addition to the primary objective of varietal development, the Breeding Project also conducts other research that may have direct and/or indirect contributions on varietal development. Included here are studies on milling quality, mutation breeding, date of planting, and herbicide tolerance of new varieties and experimental lines.

The 2008 rice breeding nursery included more than 100,000 breeding rows, 750 $F_1$ transplant populations, and 600 space planted $F_2$ populations. About 600 new crosses were made. On- and off-station testing included over 5,000 yield plots. Yield testing included the Cooperative Uniform Regional Rice Nursery, which contained 200 experimental lines and checks (50 Louisiana entries). The commercial-advanced test was conducted at the Rice Research Station and six off-station locations.

The preliminary yield testing program evaluated more than 1,000 lines (mainly of $F_5$ and $F_6$ generations), most for the first time.  In addition to yield testing, these lines were also evaluated for seedling vigor, milling characteristics, quality parameters, and numerous other agronomic characteristics.

[1] This research is supported in part by funding provided by rice producers through the Louisiana Rice Research Board.

## COOPERATIVE UNIFORM REGIONAL RICE NURSERY

The Uniform Regional Rice Nursery (URRN) is a multi-state yield nursery conducted by public rice breeders at research locations in Arkansas, Louisiana, Mississippi, Texas, California, and Missouri to evaluate experimental lines and commercial varieties. Entries are exposed to different environments over a wide, diverse growing region and allow researchers to evaluate their adaptation in a single row.

The 2008 URRN test included 200 experimental lines and varieties planted in six states. The randomized complete block design was applied, with three replications for Groups 1 to 4 and two replications for Groups 5 to 7. Seeding rates were 90 lb for varieties and 38 lb for hybrids.

The 2008 URRN results from the Rice Research Station will be reported. All plots were drill seeded on March 24. Groups 1 to 4 were harvested on August 7 and Groups 5 to 7 were harvested on August 8. Tests were conducted using standard agronomic practices (except that no fungicides were applied). Tables 1 to 7 show grain and milling yield and agronomic performance (seedling vigor, days to 50% heading, plant height, and lodging percentage) of entries in the 2008 URRN at the Rice Research Station.

**Table 1.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 1, Rice Research Station, Crowley, LA.

| | | | | Days to 50% | Plant Height | | Grain Yield (lb/A @ 12%) | | | Milling Yield (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entry | Source | Pedigree | Vigor† | Heading | (in) | LDG | Main | 2nd | Total | WHL | TOT | SB‡ | PB‡ | RNB‡ |
| 007 | RU0601108 | LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS | 4 | 87 | 43 | | 10989 | 744 | 11734 | 62.5 | 69.9 | 6.5 | 5.5 | 5.0 |
| 020 | CTHL | CATAHOULA | 5 | 81 | 40 | | 10637 | 524 | 11161 | 66.5 | 72.7 | 7.8 | 4.8 | 3.8 |
| 001 | RU0701087 | GP13416/KATY//PI 312777 | 4 | 82 | 43 | 23 | 10636 | 272 | 10908 | 58.3 | 65.6 | 7.0 | 5.3 | 6.5 |
| 013 | RU0601013 | LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/WLLS | 3 | 80 | 42 | 10 | 10538 | 1035 | 11573 | 64.3 | 72.0 | 7.3 | 4.5 | 5.0 |
| 011 | RU 0502002 | CPRS/KBNT//9502008-A | 4 | 79 | 41 | | 10241 | 422 | 10662 | 63.2 | 69.8 | 7.0 | 4.0 | 2.3 |
| 008 | RU 0802008 | CCDR/CLR 11 | 5 | 79 | 38 | | 10213 | 314 | 10527 | 64.6 | 70.1 | 8.5 | 5.3 | 5.5 |
| 019 | RU9903092 | PRESIDIO (PRSD) | 4 | 80 | 41 | | 9503 | 1256 | 10759 | 65.8 | 71.0 | 6.5 | 4.0 | 4.5 |
| 009 | RU0803009 | CPRS/LGRU | 5 | 84 | 40 | | 9415 | 587 | 10002 | 62.2 | 68.4 | 8.0 | 5.3 | 4.3 |
| 004 | RU0701102 | 91642//KATY/NWBT/5/…/4/KATY/NWBT/3/… | 4 | 83 | 40 | 27 | 9317 | 791 | 10108 | 55.8 | 70.2 | 6.5 | 5.5 | 2.5 |
| 012 | RU0503012 | ((NWBT/RU8303181)/RSMT))TX7129/CCDR | 5 | 84 | 43 | | 8830 | 1065 | 9895 | 57.7 | 68.0 | 7.5 | 3.5 | 4.0 |
| 014 | RU0604122 | TBNT/LA110//LMNT/3/TBNT | 4 | 81 | 42 | 50 | 8503 | 653 | 9156 | 58.8 | 69.2 | 7.0 | 4.3 | 8.0 |
| 010 | RU0701124 | DREW/UA99-167 | 3 | 76 | 39 | 57 | 8479 | 625 | 9104 | 61.9 | 69.4 | 7.5 | 3.8 | 2.0 |
| 005 | RU 0702192 | CFX-26/9702128 | 5 | 79 | 41 | 57 | 8434 | 553 | 8987 | 66.5 | 71.8 | 8.0 | 5.3 | 5.3 |
| 006 | RU0803006 | CPRS/LGRU | 6 | 83 | 40 | 20 | 7991 | 410 | 8401 | 61.0 | 66.0 | 7.3 | 4.5 | 3.3 |
| 002 | RU 0802002 | CFX-18//CCDR/9770532 DH2 | 4 | 83 | 42 | 87 | 7773 | 170 | 7943 | 64.7 | 70.1 | 8.0 | 4.5 | 4.8 |
| 016 | RU0704191 | GFMT/TBNT/LA110 | 5 | 88 | 35 | | 7770 | 867 | 8638 | 68.5 | 72.5 | 8.3 | 3.8 | 3.8 |
| 003 | RU0803003 | (LGRU/LCSN).../(RU8803072/(KATY//GFMT/PCOS))… | 6 | 85 | 42 | 23 | 7626 | 742 | 8368 | 53.4 | 65.6 | 6.3 | 3.5 | 1.3 |
| 017 | SPNG | SPRING | 4 | 75 | 43 | | 7623 | 799 | 8422 | 64.3 | 72.5 | 7.5 | 4.8 | 4.3 |
| 015 | RU0704157 | DLMT/KATY | 5 | 87 | 37 | | 7615 | 878 | 8494 | 65.8 | 70.9 | 7.5 | 4.0 | 5.0 |
| 018 | TRNS | TRENASSE | 5 | 76 | 40 | 87 | 6751 | 387 | 7138 | 58.7 | 67.6 | 8.5 | 6.3 | 2.8 |
| c.v. % | | | 15.1 | 1.6 | 3.6 | 115 | 8.0 | 18.0 | 7.8 | 2.3 | 1.3 | 6.6 | 10.8 | 20.2 |
| $LSD_{0.05}$ | | | 1.1 | 2.1 | 2.4 | 41.9 | 1173 | 195 | 1202 | 3.0 | 1.9 | 0.7 | 0.7 | 1.2 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

**Table 2.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 2, Rice Research Station, Crowley, LA.

| Entry | Source | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | LDG | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) WHL | TOT | SB‡ | PB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 038 | NPTN | NEPTUNE | 4 | 87 | 36 | | 10613 | 1318 | 11931 | 68.5 | 70.9 | 6.5 | 3.8 | 2.5 |
| 022 | RU 0802022 | AC 1398 | 4 | 81 | 40 | | 10585 | 636 | 11221 | 63.1 | 68.9 | 5.8 | 3.5 | 4.8 |
| 039 | RU0404191 | BOWMAN | 4 | 82 | 41 | | 10293 | 878 | 11171 | 63.2 | 70.6 | 7.3 | 3.8 | 4 |
| 040 | FRNS | FRANCIS | 4 | 83 | 43 | | 10252 | 417 | 10669 | 59.1 | 67.5 | 6.8 | 4.5 | 7.5 |
| 024 | RU0801024 | VSNTLM1/L201/PNRZ/3/MARS/TBNT… | 5 | 85 | 37 | | 9923 | 323 | 10246 | 66.5 | 70.4 | 4.5 | 4.8 | 3.8 |
| 031 | RU 0802031 | CCDR/0502085 | 5 | 80 | 40 | | 9858 | 302 | 10160 | 62.5 | 68.8 | 7.5 | 2.8 | 5 |
| 037 | JPTR | JUPITER | 6 | 87 | 39 | | 9799 | 738 | 10537 | 65.3 | 69.1 | 5.8 | 2.8 | 2.3 |
| 035 | RU0604186 | MBLE//82CAY21/LMNT | 4 | 83 | 38 | | 9778 | 581 | 10359 | 63.8 | 69.9 | 6.8 | 4 | 5 |
| 023 | RU0803023 | (LGRU/LCSN)RU9801111/(RU8803072/(KATY//… | 6 | 85 | 43 | 87 | 9128 | 737 | 9864 | 54.8 | 67.3 | 5.8 | 3.3 | 1 |
| 033 | RU0704122 | IR36/8603006 | 3 | 86 | 47 | 73 | 9013 | 846 | 9859 | 65.9 | 72.0 | 6.5 | 3.5 | 6 |
| 028 | RU 0802028 | AC1055 | 5 | 81 | 41 | 80 | 8657 | 391 | 9048 | 62.2 | 70.0 | 7.5 | 4.3 | 3.5 |
| 027 | RU0601027 | DREW/UA99-52 | 5 | 82 | 42 | 57 | 8575 | 521 | 9096 | 56.5 | 67.4 | 7.5 | 2.8 | 3 |
| 029 | RU0803029 | CPRS/LGRU | 5 | 85 | 40 | 80 | 8396 | 256 | 8652 | 65.3 | 70.8 | 7.8 | 3.3 | 2.5 |
| 030 | RU0801030 | CBT/LM1 | 5 | 81 | 38 | 87 | 8181 | 116 | 8297 | 59.8 | 67.8 | 6.5 | 3.5 | 3.8 |
| 036 | RU0704100 | IR36/8603006 | 4 | 86 | 46 | 60 | 8139 | 716 | 8855 | 63.4 | 70.2 | 6.8 | 3.8 | 5.8 |
| 034 | RU 0802034 | CCDR//9502008//AR 1188/CCDR | 5 | 78 | 41 | 90 | 8112 | 268 | 8379 | 64.4 | 71.1 | 8.3 | 3.5 | 4.8 |
| 021 | RU0601121 | RU9901127/GP-2 | 6 | 83 | 37 | 57 | 7892 | 284 | 8176 | 65.0 | 69.0 | 7.3 | 3 | 2.8 |
| 026 | RU0803026 | CPRS/LGRU | 4 | 84 | 40 | 77 | 7744 | 532 | 8276 | 63.6 | 67.5 | 7.3 | 4.5 | 4 |
| 032 | RU0703190 | CCDR/L202 | 7 | 81 | 39 | 50 | 6318 | 243 | 6561 | 59.2 | 70.2 | 7 | 3.3 | 5 |
| 025 | RU 0402125 | 96 INT/AHNT | 3 | 88 | 43 | 47 | 5696 | 410 | 6106 | 68.5 | 72.3 | 5.3 | 5.5 | 1.8 |
| c.v. % | | | 16.4 | 1.7 | 3.7 | 58.3 | 13.0 | 32.2 | 12.4 | 2.9 | 2.1 | 7.9 | 19.3 | 24.7 |
| $LSD_{0.05}$ | | | 1.3 | 2.4 | 2.5 | 40.6 | 1889 | 280 | 1921 | 3.9 | 3.1 | 2.2 | 0.3 | 1.4 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

**Table 3.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Uniform Regional Rice Nursery, Group 3, Rice Research Station, Crowley, LA.

| Entry | Source | Pedigree | Vigor[†] | Days to 50% Heading | Plant Height (in) | LDG | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) WHL | TOT | SB[‡] | PB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 050 | RU0601170 | LBNT/9902/3/DAWN/...//STBN/4/LGRU/5/LGRU/MILL | 4 | 85 | 42 | 20 | 11039 | 549 | 11588 | 64.2 | 71.1 | 6 | 5.5 | 2.5 |
| 041 | RU0601188 | LGRU//KATY/STBN/5/...//LMNT/RA73/3/…/4/LGRU | 4 | 90 | 49 | 7 | 10967 | 1133 | 12100 | 57.3 | 70.0 | 6 | 3.8 | 3.3 |
| 051 | RU 0802051 | TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18 | 4 | 83 | 43 | 70 | 10148 | 668 | 10817 | 61.6 | 67.4 | 8 | 3.3 | 4.5 |
| 045 | RU 0702189 | DREW/CFX-18 | 6 | 89 | 42 | | 10093 | 704 | 10797 | 62.3 | 68.6 | 7 | 4 | 3.3 |
| 047 | RU0601130 | WLLS/INIAP-12//ZHE 733 | 5 | 88 | 44 | 50 | 10088 | 749 | 10836 | 58.8 | 68.1 | 5 | 4 | 1.8 |
| 042 | RU 0602189 | 9502008/CPRS | 5 | 81 | 41 | 67 | 10019 | 922 | 10941 | 63.3 | 69.1 | 7 | 4 | 5.8 |
| 053 | RU0604035 | RSMT/KATY | 4 | 80 | 39 | | 9895 | 955 | 10850 | 59.5 | 68.9 | 8 | 3.3 | 5 |
| 058 | CHNR | CHENIERE | 5 | 84 | 40 | 17 | 9774 | 497 | 10271 | 58.3 | 69.6 | 7 | 2.8 | 5.8 |
| 060 | CL 171 AR | CL 171 AR | 5 | 86 | 42 | | 9758 | 672 | 10430 | 62.3 | 68.5 | 8 | 4.3 | 4 |
| 059 | CCDR | COCODRIE | 4 | 80 | 40 | 20 | 9740 | 641 | 10381 | 62.3 | 69.8 | 8 | 3.5 | 5.5 |
| 048 | RU 0702097 | CPRS/97T1280 DH1/3/CPRS/NWBT//KATY | 6 | 88 | 44 | | 9661 | 333 | 9994 | 65.2 | 72.2 | 7 | 3 | 1.5 |
| 057 | RU9404036 | PRISCILLA | 4 | 80 | 43 | 20 | 9539 | 1089 | 10628 | 57.3 | 66.1 | 6 | 4.3 | 5.5 |
| 055 | RU0504198 | RSMT/KATY | 4 | 82 | 42 | | 9302 | 853 | 10155 | 64.5 | 70.5 | 7 | 3 | 7.3 |
| 054 | RU0504193 | CPRS/3/L201//TBNT/BLMT | 4 | 84 | 40 | 23 | 9064 | 795 | 9859 | 66.1 | 71.2 | 7 | 5.3 | 6.5 |
| 049 | RU0703144 | CPRS/CCDR | 5 | 83 | 39 | 7 | 8913 | 408 | 9321 | 61.0 | 68.3 | 7 | 3.5 | 3.5 |
| 043 | RU0703098 | (92:13768(VSTA/LBNT//RSMT)/CPRS)RU9803150/… | 6 | 84 | 38 | | 8283 | 789 | 9072 | 61.9 | 68.9 | 7 | 3.3 | 2.3 |
| 044 | RU0601044 | DREW/UA99-52 | 5 | 82 | 40 | 20 | 8021 | 906 | 8927 | 58.4 | 68.4 | 6 | 4.5 | 3 |
| 046 | RU0703147 | CPRS/CCDR | 6 | 84 | 42 | 80 | 7758 | 158 | 7916 | 60.6 | 67.6 | 7 | 4 | 2.8 |
| 052 | RU0703181 | CPRS/CCDR | 5 | 84 | 41 | 83 | 6640 | 170 | 6811 | 61.6 | 67.9 | 7 | 3.8 | 4 |
| 056 | SIERRA | SIERRA | 6 | 79 | 41 | 53 | 6341 | 1053 | 7393 | 59.5 | 70.9 | 7 | 3.3 | 5.3 |
| c.v. % | | | 14.0 | 1.3 | 3.2 | 90 | 11.1 | 18.3 | 10.4 | 3.5 | 2.3 | 9.2 | 17.0 | 22.6 |
| $LSD_{0.05}$ | | | 1.1 | 1.8 | 2.2 | 40 | 1694 | 212 | 1709 | 4.4 | 3.3 | 0.9 | 0.9 | 1.2 |

[†]Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡]Abbreviations: LDG=lodging %, SB=sheath blight, PB[‡]=bacterial panicle blight, RNB=rotten neck blast.

**Table 4.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 4, Rice Research Station, Crowley, LA.

| Entry | Source | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | LDG | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) WHL | TOT | SB‡ | PB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 080 | WLLS | WELLS | 3 | 85 | 44 | 17 | 11180 | 579 | 11759 | 57.2 | 68.1 | 6.3 | 3.8 | 5.3 |
| 065 | RU 0702162 | BNGL//MERC/RICO/3/MERC/RICO//BNGL | 4 | 84 | 39 | 7 | 10801 | 964 | 11766 | 68.0 | 71.2 | 6.3 | 3 | 3 |
| 076 | RU0801076 | LGRU//KATY/STBN/5/NWBT/…//RA73/LMNT/4/… | 4 | 88 | 44 | | 10687 | 1326 | 12014 | 57.2 | 70.2 | 5.3 | 2.8 | 2.5 |
| 075 | RU0603075 | 4483-1693 | 7 | 92 | 43 | | 9939 | 1066 | 11006 | 55.9 | 68.2 | 3.3 | 3 | 2.5 |
| 073 | RU0704197 | IR36/8603006 | 4 | 87 | 43 | | 9687 | 1134 | 10820 | 61.9 | 68.9 | 6.8 | 2.8 | 5 |
| 062 | RU 0702068 | 9502065/3/MERC//MERC/… | 5 | 82 | 42 | 47 | 9683 | 96 | 9779 | 66.6 | 70.6 | 6.3 | 4.8 | 3.5 |
| 071 | RU 0802071 | BNGL/SHORT RICO/4/ORIN//… | 5 | 81 | 39 | | 9528 | 936 | 10465 | 64.6 | 68.7 | 6 | 2.8 | 5 |
| 063 | RU0803063 | CPRS/LGRU | 6 | 88 | 42 | | 9243 | 646 | 9889 | 62.1 | 67.6 | 7.3 | 4.8 | 3.5 |
| 079 | CBNT | CYBONNET | 4 | 82 | 42 | 43 | 9240 | 844 | 10084 | 65.7 | 71.8 | 7.8 | 3.8 | 4.5 |
| 070 | RU0701070 | LGRU//KATY/STBN/5/NWBT/KATY//RA73/… | 5 | 88 | 45 | | 8905 | 1733 | 10638 | 66.6 | 72.4 | 5.5 | 4.3 | 3.3 |
| 068 | RU 0702165 | EARL/9902028 | 4 | 80 | 42 | 60 | 8749 | 272 | 9020 | 70.0 | 73.0 | 6.3 | 2.5 | 6.8 |
| 061 | RU0601061 | RU9201176/3/NWBT/KATY//RA73/LMNT | 3 | 83 | 46 | 50 | 8708 | 787 | 9495 | 59.9 | 70.1 | 6 | 3.5 | 1.5 |
| 074 | RU0704154 | GFMT/TBNT/LA110 | 5 | 85 | 38 | | 8572 | 1345 | 9917 | 64.2 | 69.8 | 8 | 3.8 | 4 |
| 064 | RU0401182 | DREW/5/NWBT/3/DAWN/9695//STBN/4/KATY/STBN | 3 | 84 | 44 | 83 | 8340 | 1117 | 9458 | 61.1 | 68.9 | 6 | 5 | 2.8 |
| 066 | RU0803066 | PNTL/(JCTO/PNTL)0028A4 | 6 | 83 | 41 | 43 | 8339 | 1172 | 9512 | 60.0 | 66.6 | 6 | 3 | 6.8 |
| 072 | RU0503126 | ((NWBT/RU8303181)/RSMT))TX7144/MDSN | 4 | 90 | 40 | | 8264 | 638 | 8902 | 64.0 | 70.0 | 6.3 | 5.3 | 1.3 |
| 077 | RU0804077 | CPRS//NWBT/KATY | 6 | 86 | 37 | | 7864 | 586 | 8450 | 60.8 | 65.9 | 7 | 4.5 | 2 |
| 067 | RU0801067 | P97Y228/PI 560265//STG97F5-01-004 | 6 | 81 | 34 | 30 | 7337 | 26 | 7363 | 65.8 | 69.1 | 7.3 | 3.5 | 4.3 |
| 069 | RU0703123 | ((NWBT/RU8303181)/GFMT)/MDSN | 6 | 86 | 41 | | 6903 | 1426 | 8329 | 63.2 | 67.0 | 6.8 | 3.3 | 3 |
| 078 | RU0103104 | TEXMONT/TEQING | 7 | 90 | 37 | | 5946 | 1121 | 7067 | 61.3 | 68.5 | 7.5 | 5.5 | 4.5 |
| c.v. % | | | 12.6 | 1.5 | 4.5 | 131 | 11.1 | 19.8 | 10.2 | 3.7 | 2.9 | 9.8 | 14.0 | 19.7 |
| $LSD_{0.05}$ | | | 1.0 | 2.1 | 3.0 | 41 | 1625 | 292 | 1643 | 4.9 | 4.3 | 0.9 | 0.7 | 1.0 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

**Table 5.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 5, Rice Research Station, Crowley, LA.

| Entry | Source | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | LDG | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) WHL | TOT | SB‡ | PB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 085 | RU 0702085 | AR 1188/CCDR//9502008/LGRU | 4 | 84 | 42 | | 10731 | 1012 | 11743 | 63.3 | 70.3 | 7.5 | 4 | 3 |
| 088 | RU 0802088 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 5 | 83 | 38 | | 10608 | 844 | 11451 | 62.8 | 68.8 | 7.5 | 6 | 2 |
| 093 | RU0801093 | LBNT/9902/3/DAWN/…//STBN/4/LGRU/5/WLLS/6/… | 4 | 80 | 42 | | 10498 | 975 | 11473 | 59.8 | 71.3 | 6.5 | 3.5 | 6 |
| 092 | RU0803092 | CCDR/LQ275a | 5 | 89 | 42 | | 10373 | 317 | 10690 | 60.9 | 69.4 | 8 | 4.5 | 1.5 |
| 100 | RU0804100 | RSMT//8203035/GCHW | 5 | 82 | 43 | 20 | 10010 | 722 | 10732 | 61.6 | 69.5 | 8.5 | 4.5 | 4 |
| 111 | RU0701111 | FRNS/6/LBNT/…/3/DAWN/...//STBN/4/LGRU/5/DREW | 4 | 86 | 43 | 25 | 9972 | 355 | 10326 | 66.2 | 71.8 | 6 | 6.5 | 5 |
| 117 | CCDR | COCODRIE | 4 | 81 | 41 | 60 | 9839 | 447 | 10286 | 64.3 | 72.2 | 8 | 4.5 | 5.5 |
| 091 | RU 0802091 | CFX-18//CCDR/9770532 DH2 | 5 | 80 | 44 | 85 | 9789 | 826 | 10615 | 60.8 | 67.3 | 7.5 | 5 | 5.5 |
| 103 | RU 0802103 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | 4 | 79 | 42 | | 9770 | 404 | 10174 | 59.5 | 66.6 | 7.5 | 4.5 | 5 |
| 115 | RU 0802115 | WELLS/DXBL | 4 | 85 | 44 | 30 | 9671 | 705 | 10377 | 59.2 | 69.3 | 6 | 4 | 4 |
| 083 | RU0804083 | RSMT//RXMT/IR36 | 4 | 80 | 42 | | 9667 | 1045 | 10713 | 61.3 | 70.5 | 7 | 3.5 | 5 |
| 094 | RU 0802094 | NWBT/KATY//9902207x2/3/9502008-A/DREW | 5 | 77 | 42 | 80 | 9574 | 476 | 10050 | 64.5 | 71.5 | 7.5 | 4 | 2.5 |
| 102 | RU0801102 | FRNS/6/LBNT/…/3/DAWN/...//STBN/4/LGRU/5/DREW | 4 | 88 | 42 | | 9494 | 658 | 10152 | 57.0 | 68.1 | 7 | 5.5 | 4.5 |
| 116 | RU0803116 | SABR/CCDR | 4 | 82 | 46 | 25 | 9478 | 1149 | 10627 | 67.0 | 71.5 | 5 | 5 | 1 |
| 107 | RU0803107 | LGRU/LCSN/CF4-85 | 5 | 86 | 40 | | 9473 | 866 | 10339 | 66.3 | 70.0 | 6 | 3.5 | 3 |
| 082 | RU 0702082 | AR 1142/JODN/4/NWBT/KATY/3/82CAY21/... | 4 | 88 | 39 | | 9320 | 954 | 10274 | 65.1 | 70.3 | 5.5 | 4.5 | 4 |
| 099 | RU0801099 | CYBT/UA99-94//UA99-126 | 6 | 84 | 40 | | 9315 | 890 | 10205 | 63.7 | 71.1 | 6.5 | 5.5 | 3.5 |
| 096 | RU0801096 | FRNS/5/LBNT/9902//NWBT/3/KATY/NWBT/4/LGRU | 4 | 89 | 44 | | 9314 | 674 | 9988 | 63.7 | 70.3 | 7.5 | 4.5 | 3 |
| 086 | RU0803086 | CCDR/L202 | 4 | 82 | 42 | 80 | 9148 | 518 | 9666 | 51.4 | 63.5 | 7 | 3 | 7 |
| 106 | RU 0802106 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | 5 | 80 | 43 | 45 | 9131 | 435 | 9567 | 61.8 | 68.6 | 7.5 | 5 | 4.5 |
| 090 | RU0801090 | 91642//KATY/NWBT/5/…/4/KATY/NWBT/3/… | 5 | 81 | 42 | 50 | 9105 | 403 | 9508 | 59.1 | 68.9 | 7.5 | 4.5 | 3.5 |
| 104 | RU0803104 | LGRU/LCSN/CF4-85 | 5 | 86 | 43 | | 9067 | 1250 | 10317 | 64.4 | 68.2 | 6.5 | 3 | 3.5 |
| 101 | RU0803101 | LGRU/LCSN/CF4-85 | 4 | 87 | 44 | | 9040 | 1297 | 10337 | 66.7 | 70.5 | 7 | 3 | 4 |
| 108 | RU0801108 | KATY/NWBT//L201/7402003/3/WLLS/4/FRNS | 4 | 83 | 38 | | 9012 | 834 | 9846 | 58.4 | 70.1 | 6.5 | 5.5 | 3 |
| 105 | RU0801105 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 4 | 84 | 43 | 40 | 8808 | 168 | 8976 | 58.9 | 66.8 | 5.5 | 5.5 | 5.5 |
| 084 | RU0801084 | RU9901133/PI 560239//CYBT | 5 | 81 | 41 | | 8701 | 1189 | 9891 | 62.5 | 70.2 | 5 | 4.5 | 1.5 |
| 097 | RU 0802097 | NWBT/KATY//9902207x2/3/CPRS | 5 | 80 | 43 | 40 | 8430 | 728 | 9158 | 63.8 | 69.5 | 7.5 | 5 | 4 |
| 087 | RU0801087 | 19991516/6/BASMATI-370/KATY/4/VSNTLM//L201/… | 6 | 83 | 40 | | 8423 | 800 | 9224 | 56.8 | 68.6 | 7.5 | 5.5 | 3 |
| 089 | RU0803089 | CCDR/LQ275a | 6 | 90 | 40 | | 8225 | 801 | 9026 | 61.1 | 69.4 | 7 | 4.5 | 1 |
| 112 | RU 0802112 | CCDR/3/KATY/CPRS//JKSN | 5 | 80 | 43 | 80 | 8032 | 517 | 8549 | 65.7 | 72.2 | 7.5 | 4.5 | 5 |
| 081 | RU0801081 | LGRU//KATY/STBN/3/LGRU | 4 | 80 | 43 | | 7797 | 912 | 8709 | 57.4 | 70.1 | 6 | 4 | 5 |
| 114 | RU0804114 | RSMT//RXMT/IR36 | 3 | 77 | 42 | | 7693 | 688 | 8381 | 58.5 | 69.7 | 7 | 5.5 | 6 |
| 095 | RU0803095 | PNTL/(JCTO/PNTL)0028A4 | 5 | 83 | 44 | 90 | 7473 | 1159 | 8633 | 62.4 | 67.9 | 7.5 | 3.5 | 7 |
| 109 | RU 0802109 | CPRS/3/NWBT/KATY//9902207x2 | 5 | 82 | 40 | 65 | 7021 | 359 | 7380 | 64.8 | 70.2 | 8 | 5 | 3.5 |
| 120 | PI595900 | DIXIEBELLE (DXBL) | 6 | 82 | 37 | 45 | 6862 | 922 | 7784 | 63.2 | 69.3 | 6.5 | 4.5 | 5.5 |
| 113 | RU0803113 | SABR/CCDR | 6 | 81 | 41 | | 6810 | 856 | 7666 | 62.1 | 68.7 | 7.5 | 4 | 4.5 |
| 119 | M206 | M206 | 6 | 75 | 40 | 90 | 6531 | 369 | 6899 | 66.0 | 69.7 | 7 | 4 | 8 |
| 110 | RU0703110 | (DF5-68)/TX8946 | 4 | 80 | 42 | 40 | 6314 | 30 | 6344 | 65.9 | 70.1 | 4.5 | 4 | 2.5 |
| 098 | RU0803098 | SABR/CCDR | 7 | 84 | 42 | | 6295 | 955 | 7250 | 60.5 | 69.4 | 6.5 | 3.5 | 4 |
| 118 | RU0003009 | HIDALGO | 7 | 79 | 41 | 90 | 6079 | 136 | 6216 | 63.1 | 70.8 | 6 | 4 | 5 |
| c.v. % | | | 13.0 | 1.4 | 2.8 | 91 | 16.2 | 22.3 | 15.4 | 4.1 | 2.5 | 10.3 | 13.1 | 24.9 |
| $LSD_{0.05}$ | | | 1.2 | 2.3 | 2.3 | 50 | 2870 | 332 | 2952 | 5.2 | 3.5 | 1.4 | 1.2 | 2.1 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor. ‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

**Table 6.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 6, Rice Research Station, Crowley, LA.

| | | | | Days to 50% | Plant Height | | Grain Yield (lb/A @ 12%) | | | Milling Yield (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entry | Source | Pedigree | Vigor† | Heading | (in) | LDG | Main | 2nd | Total | WHL | TOT | SB‡ | PB‡ | RNB‡ |
| 126 | RU0803126 | LGRU/LCSN/CF4-85 | 5 | 90 | 45 | | 10786 | 1043 | 11830 | 65.5 | 69.2 | 5.5 | 3 | 2.5 |
| 142 | RU0801142 | KBNT/Q36194 | 4 | 88 | 45 | | 10696 | 437 | 11133 | 64.6 | 71.4 | 6 | 6 | 6.5 |
| 153 | RU0803153 | CPRS/CCDR | 5 | 81 | 42 | | 10655 | 881 | 11536 | 63.5 | 69.9 | 7.5 | 4.5 | 4.5 |
| 124 | RU0801124 | MDRK/PI 312777//JING 185-7 | 6 | 86 | 39 | | 10465 | 788 | 11254 | 64.6 | 69.5 | 5 | 5 | 4 |
| 160 | FRNS | FRANCIS | 4 | 84 | 43 | 45 | 10448 | 445 | 10893 | 60.3 | 68.2 | 7 | 6 | 7.5 |
| 121 | RU0801121 | LGRU/3/LMNT/KATY//LMNT/RA73 | 4 | 91 | 48 | | 10374 | 685 | 11059 | 63.2 | 69.5 | 5 | 3 | 1.5 |
| 134 | RU 0802134 | CCDR//CCDR/JEFF | 5 | 82 | 42 | | 10252 | 453 | 10705 | 57.8 | 66.9 | 8 | 4.5 | 4 |
| 143 | RU 0802143 | 9502008/CPRS/4/CPRS//82CAY21/TBNT/3/AR 1121 | 5 | 77 | 41 | 15 | 10169 | 990 | 11159 | 63.0 | 69.0 | 8 | 4 | 3.5 |
| 147 | RU0803147 | LCSN/LGRU | 5 | 83 | 42 | | 9867 | 1008 | 10875 | 58.0 | 67.1 | 9 | 4.5 | 3 |
| 122 | RU0804122 | L202//TBNT/BLMT | 4 | 83 | 40 | | 9790 | 1159 | 10949 | 55.3 | 66.5 | 6 | 5 | 5.5 |
| 135 | RU0803135 | MILL/JSMN | 5 | 81 | 45 | 45 | 9483 | 361 | 9844 | 66.3 | 70.8 | 6.5 | 3 | 2.5 |
| 127 | RU0801127 | 91642//KATY/NWBT/5/…/4/KATY/NWBT/3/… | 5 | 82 | 41 | | 9464 | 934 | 10398 | 61.1 | 69.9 | 6.5 | 6 | 2.5 |
| 129 | RU0803129 | LGRU/LCSN/CF4-85 | 5 | 90 | 46 | | 9395 | 1289 | 10684 | 65.1 | 69.1 | 6.5 | 3 | 3.5 |
| 123 | RU0803123 | LGRU/LCSN/CF4-85 | 6 | 91 | 44 | | 9375 | 1121 | 10495 | 67.0 | 70.2 | 6.5 | 3.5 | 2 |
| 145 | RU0801145 | CCDR/ZHE 733//WC 285 | 5 | 88 | 39 | | 9301 | 1355 | 10655 | 49.9 | 68.0 | 6.5 | 4.5 | 4.5 |
| 140 | RU 0802140 | CPRS//L-205/DLLA | 4 | 86 | 43 | | 9099 | 931 | 10030 | 65.4 | 69.6 | 6.5 | 4.5 | 3 |
| 132 | RU0703132 | (DLMT/(LMNT*3/JSMN))/((CPRS/PELDE)/JEFF) | 6 | 91 | 44 | | 9086 | 949 | 10035 | 64.5 | 69.3 | 6.5 | 4.5 | 1.5 |
| 159 | RU0103123 | Sabine (SABN) | 6 | 86 | 39 | | 9080 | 1000 | 10080 | 60.0 | 65.9 | 8 | 4.5 | 4 |
| 141 | RU0703141 | LCSN/LGRU | 6 | 89 | 44 | 80 | 9080 | 57 | 9138 | 63.1 | 68.9 | 7.5 | 4 | 3.5 |
| 131 | RU 0802131 | AC1073 | 5 | 78 | 40 | 35 | 9043 | 539 | 9582 | 64.7 | 71.2 | 7.5 | 3.5 | 5 |
| 128 | RU 0802128 | AC1019 | 4 | 80 | 41 | 45 | 8833 | 262 | 9095 | 60.9 | 71.0 | 8 | 5 | 4 |
| 130 | RU0801130 | YACU 9/ZHE 733//WC 292 | 6 | 83 | 41 | | 8831 | 1096 | 9926 | 57.7 | 68.9 | 6 | 4 | 2 |
| 125 | RU 0802125 | AC1055 | 4 | 81 | 41 | 45 | 8827 | 484 | 9311 | 62.5 | 70.2 | 7.5 | 4 | 3.5 |
| 144 | RU0803144 | CCDR/L202 | 6 | 84 | 38 | 15 | 8819 | 708 | 9528 | 60.0 | 66.3 | 6 | 3.5 | 3 |
| 157 | RU0804157 | CPRS//NWBT/KATY | 5 | 81 | 38 | | 8685 | 684 | 9369 | 66.0 | 71.3 | 7.5 | 5 | 4 |
| 149 | RU 0802149 | 9502008//KATY/9902207X2/3/JSMN/… | 3 | 80 | 42 | 45 | 8683 | 1168 | 9851 | 61.7 | 68.2 | 8 | 5 | 3 |
| 148 | RU0701148 | IRGA409/RXMT/5/BRAZ/TBNT/3/164986-4/NV66//… | 4 | 85 | 44 | 40 | 8611 | 954 | 9565 | 50.0 | 71.2 | 6.5 | 5.5 | 1.5 |
| 155 | RU 0802155 | MILL//9502008/LGRU | 4 | 77 | 40 | | 8562 | 888 | 9450 | 63.6 | 70.9 | 7.5 | 4 | 7 |
| 156 | RU0804156 | IR36/8603006 | 3 | 87 | 46 | 85 | 8525 | 595 | 9119 | 63.3 | 69.7 | 6.5 | 4 | 5.5 |
| 152 | RU 0802152 | LGRU/WELLS | 5 | 86 | 45 | | 8420 | 1444 | 9864 | 59.2 | 70.2 | 5.5 | 4 | 3 |
| 137 | RU 0802137 | AC1106 | 5 | 84 | 41 | | 8273 | 807 | 9081 | 65.6 | 71.5 | 8.5 | 4.5 | 3 |
| 154 | RU0804154 | RSMT/KATY | 3 | 84 | 38 | 15 | 8106 | 1263 | 9368 | 63.4 | 72.0 | 8.5 | 4 | 5 |
| 158 | DLRS | DELLROSE | 6 | 85 | 44 | 40 | 7658 | 1576 | 9234 | 66.2 | 71.4 | 6.5 | 4 | 2.5 |
| 151 | RU0801151 | STG97F5-01-004/UA99-128//97Y228 | 6 | 89 | 39 | 45 | 7318 | 1249 | 8567 | 66.3 | 69.9 | 5.5 | 4 | 2.5 |
| 133 | RU0801133 | FRNS/6/LBNT/.../3/DAWN/...//STBN/4/LGRU/5/DREW | 4 | 84 | 44 | 25 | 7295 | 480 | 7775 | 62.9 | 68.7 | 7 | 6 | 5.5 |
| 139 | RU0501139 | SHUFENG 121-1655 | 6 | 93 | 47 | 45 | 6995 | 691 | 7686 | 59.8 | 69.7 | 4 | 2.5 | 0.5 |
| 150 | RU0803150 | AR 1188/CCDR/JEFF/CPRS | 4 | 84 | 46 | 45 | 6382 | 496 | 6878 | 61.7 | 67.2 | 8 | 3.5 | 3.5 |
| 136 | RU0801136 | MDRK/LM 1 | 6 | 90 | 36 | | 6373 | 627 | 7000 | 64.0 | 69.1 | 5.5 | 6 | 3 |
| 146 | RU 0802146 | NWBT/KATY//9902207X2/3/JSMN/DLLA//… | 4 | 81 | 44 | 45 | 5804 | 549 | 6353 | 58.5 | 64.7 | 7.5 | 5 | 3.5 |
| 138 | RU0703138 | CPRS/3/CPRS/NWBT/KATY | 6 | 84 | 47 | 90 | 5593 | 428 | 6022 | 61.7 | 69.4 | 6.5 | 3.5 | 4 |
| c.v. % | | | 13.8 | 1.7 | 3.5 | 166 | 13.0 | 15.9 | 12.1 | 6.0 | 2.7 | 10.9 | 15.7 | 23.2 |
| $LSD_{0.05}$ | | | 1.3 | 3.0 | 3.0 | 71 | 2318 | 264 | 2352 | 7.6 | 3.7 | 1.5 | 1.4 | 1.7 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor. ‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

**Table 7.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Uniform Regional Rice Nursery, Group 7, Rice Research Station, Crowley, LA.

| Entry | Source | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | LDG | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) WHL | TOT | SB‡ | PB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 187 | RU0603187 | Tesanai 2 | 6 | 93 | 50 | 80 | 11792 | 1685 | 13477 | 58.7 | 67.2 | 4.5 | 2.5 | 2 |
| 185 | RU0801185 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 4 | 87 | 42 | 15 | 11279 | 333 | 11612 | 65.4 | 70.6 | 6.5 | 6.5 | 7 |
| 176 | RU0801176 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 4 | 88 | 44 | | 11279 | 588 | 11867 | 62.1 | 69.1 | 6 | 6 | 5 |
| 161 | RU0801161 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 4 | 88 | 45 | | 10717 | 904 | 11621 | 62.2 | 69.1 | 7 | 4.5 | 4.5 |
| 192 | RU 0802192 | 9502008//KATY/9902207x2/3/9502008/CPRS | 5 | 82 | 40 | | 10655 | 856 | 11511 | 63.3 | 69.3 | 8.5 | 6 | 6.5 |
| 166 | RU0603166 | 4484-1665 | 7 | 94 | 44 | | 10409 | 802 | 11211 | 28.6 | 69.1 | 4 | 2.5 | 0 |
| 200 | XL 723 | XL 723 | 5 | 81 | 46 | 85 | 10362 | 1177 | 11540 | 62.6 | 71.6 | 7 | 3 | 0.5 |
| 190 | RU0803190 | CPRS/CCDR | 5 | 86 | 40 | | 10152 | 599 | 10751 | 62.5 | 67.3 | 7 | 5 | 4.5 |
| 184 | RU0703184 | L201/SABR | 5 | 85 | 44 | | 10081 | 1148 | 11229 | 60.6 | 66.1 | 5.5 | 6 | 0 |
| 168 | RU 0802168 | BNGL/SHORT RICO/4/ORIN//… | 5 | 82 | 43 | 65 | 9801 | 591 | 10393 | 66.8 | 69.7 | 5 | 3.5 | 6 |
| 167 | RU0801167 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 4 | 86 | 42 | 30 | 9694 | 657 | 10352 | 64.9 | 70.5 | 7 | 6 | 7.5 |
| 199 | BNGL | BENGAL | 5 | 87 | 40 | 45 | 9671 | 90 | 9761 | 67.8 | 71.2 | 5.5 | 3.5 | 4 |
| 172 | RU0803172 | CPRS/CCDR | 5 | 87 | 40 | | 9593 | 803 | 10396 | 62.5 | 68.5 | 8 | 5 | 6 |
| 182 | RU0801182 | FRNS/6/LBNT/.../3/DAWN/…//STBN/4/LGRU/5/DREW | 5 | 86 | 42 | 15 | 9592 | 387 | 9979 | 61.6 | 68.2 | 6.5 | 7 | 6 |
| 169 | RU0803169 | LGRU/LCSN/CF4-85 | 5 | 89 | 43 | | 9510 | 1123 | 10633 | 62.2 | 66.7 | 7 | 4 | 5.5 |
| 178 | RU0803178 | LGRU/LCSN/CF4-85 | 5 | 93 | 44 | | 9402 | 1428 | 10830 | 64.6 | 68.9 | 6 | 3.5 | 4 |
| 195 | RU 0802195 | CCDR/3/CPRS/NWBT//KATY | 5 | 83 | 38 | | 9264 | 683 | 9947 | 62.4 | 67.2 | 9 | 5.5 | 5 |
| 164 | RU0801164 | RU9201127/5/LBNT/9902//NWBT/3/MILL/4/DREW | 4 | 89 | 47 | 30 | 9216 | 177 | 9392 | 64.0 | 70.6 | 6 | 6 | 6.5 |
| 183 | RU 0802183 | CPRS/KBNT//DREW | 5 | 88 | 43 | 70 | 9181 | 1326 | 10507 | 65.3 | 69.0 | 8 | 5.5 | 5.5 |
| 180 | RU 0802180 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | 4 | 82 | 42 | | 9133 | 789 | 9921 | 65.5 | 71.5 | 8.5 | 4 | 4.5 |
| 171 | RU 0802171 | BNGL/SHORT RICO//LFTE | 5 | 84 | 42 | | 9079 | 508 | 9587 | 67.0 | 70.8 | 7 | 3.5 | 7 |
| 191 | RU0804191 | CPRS//NWBT/KATY | 5 | 81 | 35 | 35 | 8992 | 687 | 9679 | 62.5 | 68.3 | 8 | 5 | 4 |
| 196 | RU0804196 | LMNT//TBNT/LA110… | 5 | 84 | 39 | 35 | 8991 | 594 | 9585 | 66.3 | 73.2 | 7.5 | 3.5 | 4 |
| 189 | RU 0802189 | LM-1//CPRS/KBNT | 4 | 80 | 39 | 70 | 8948 | 1086 | 10033 | 53.8 | 67.6 | 6.5 | 4.5 | 4.5 |
| 181 | RU0803181 | CPRS/CCDR | 5 | 83 | 39 | 70 | 8841 | 354 | 9195 | 62.0 | 67.8 | 6.5 | 5 | 2 |
| 165 | RU 0802165 | BNGL/SHORT RICO/4/ORIN//… | 6 | 79 | 41 | 45 | 8709 | 949 | 9659 | 65.8 | 72.0 | 7 | 4.5 | 6 |
| 163 | RU0803163 | JEFF/CPRS/CPRS | 5 | 86 | 45 | 75 | 8558 | 359 | 8917 | 63.8 | 68.8 | 6.5 | 5.5 | 4.5 |
| 173 | RU0801173 | RU9901127/GP-2 | 6 | 83 | 39 | 80 | 8407 | 167 | 8574 | 64.3 | 67.8 | 7.5 | 4 | 1 |
| 179 | RU0701179 | LBNT/9902/3/DAWN/9695//STBN/4/LGRU/5/DREW | 4 | 90 | 47 | | 8393 | 940 | 9333 | 60.8 | 69.7 | 6 | 6.5 | 4.5 |
| 174 | RU 0802174 | NWBT/KATY//9902207x2/3/CCDR | 5 | 81 | 40 | 30 | 8319 | 737 | 9057 | 64.1 | 70.9 | 7.5 | 4.5 | 4 |
| 197 | RU0804197 | CPRS//NWBT/KATY | 6 | 79 | 37 | 75 | 8069 | 323 | 8392 | 64.7 | 69.8 | 9 | 5.5 | 7 |
| 188 | RU0801188 | …/9NRZ/3/MARS/TBNT//9827/4/VSNTLM//L201 | 6 | 90 | 37 | | 7999 | 1151 | 9151 | 60.6 | 67.0 | 6.5 | 5.5 | 6.5 |
| 198 | RU0804198 | CPRS//NWBT/KATY | 5 | 85 | 33 | | 7971 | 790 | 8761 | 65.5 | 69.9 | 8.5 | 7 | 4 |
| 177 | RU 0802177 | WELLS/MBLE | 4 | 83 | 43 | 45 | 7964 | 908 | 8872 | 58.2 | 70.9 | 7 | 4.5 | 5 |
| 194 | RU0804194 | CPRS//NWBT/KATY | 5 | 85 | 33 | | 7684 | 450 | 8134 | 63.4 | 68.8 | 8 | 5.5 | 3 |
| 175 | RU0803175 | CCDR/L202 | 5 | 80 | 41 | 90 | 7458 | 500 | 7958 | 59.3 | 68.6 | 8 | 3.5 | 6 |
| 193 | RU0804193 | LMNT//8203035/GCHW | 5 | 84 | 40 | 80 | 7192 | 961 | 8154 | 64.2 | 70.4 | 6 | 4.5 | 4.5 |
| 170 | RU0801170 | 97Y228/PI 560265//STG97F5-01-004 | 5 | 83 | 38 | 90 | 7114 | 190 | 7304 | 61.8 | 67.0 | 7 | 5 | 0.5 |
| 162 | RU 0802162 | BNGL/SHORT RICO/4/ORIN//… | 5 | 80 | 40 | 90 | 6468 | 242 | 6710 | 65.1 | 70.1 | 5 | 4.5 | 4 |
| 186 | RU0804186 | CPRS//NWBT/KATY | 3 | 77 | 42 | 80 | 6145 | 565 | 6710 | 63.5 | 70.5 | 7.5 | 5.5 | 5 |
| c.v. % | | | 10.9 | 1.6 | 2.9 | 73 | 10.2 | 25.1 | 10.1 | 9.5 | 2.8 | 9.7 | 13.9 | 19.7 |
| LSD$_{0.05}$ | | | 1.0 | 2.8 | 2.4 | 53 | 1863 | 364 | 2000 | 11.9 | 3.9 | 1.3 | 1.4 | 1.8 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor. ‡Abbreviations: LDG=lodging %, SB=sheath blight, PB‡=bacterial panicle blight, RNB=rotten neck blast.

## COMMERCIAL-ADVANCED YIELD TRIALS

The Commercial-Advanced yield trial (CA) is a multi-location test conducted by the Rice Breeding Project in the major rice-growing regions in Louisiana. The objective of this study is to evaluate the adaptation and stability of entries for several important characteristics. Data evaluated includes grain yield, whole and total milling percentages, seedling vigor, maturity, plant height, lodging resistance, ratoon crop potential, and resistance to sheath blight, bacterial panicle blight, rotten neck blast, and narrow brown leaf spot diseases. Entries include commercial varieties and advanced experimental lines.

Test locations in 2008 included the Rice Research Station at Crowley (RRS) and five on-farm test sites in Acadia, Evangeline, Vermilion, Jefferson Davis, and Richland parishes. Each location represents a different environment and allows researchers to evaluate entries with different planting dates, soil types, climatic conditions, management systems, disease pressure, and numerous other variables.

Standard agronomic procedures (except that no fungicides were applied) were used at each individual location. Sixty entries were tested in a randomized complete block design with three replications at all locations and plots were 4.66 x 16 ft. Varieties were drill seeded at 90 lb/A. Dr. Don Groth and the Rice Pathology Project provided the sheath blight, rotten neck blast, bacterial panicle blight, and narrow brown leaf spot disease ratings.

Planting dates were: RRS, March 24; Acadia, March 31; Evangeline, March 24; Vermilion, March 19; Jefferson Davis, March 17; and Richland, March 24. Harvest dates were: RRS, August 7; Acadia, August 7; Evangeline, August 1; Vermilion, August 4; Jefferson Davis, July 30; and Richland, September 9. Results from these tests are shown in Tables 2 to 6.

**Table 1.** Entry number, pedigree, grain type, and source information for entries in the Commercial-Advanced Trial, 2008.

| Entry | Pedigree | Grain Type† | Source‡ |
|---|---|---|---|
| 201 | CL131 | L | LAES |
| 202 | CL161 | L | LAES |
| 203 | CL151 | L | LAES |
| 204 | CL171 | L | AAES |
| 205 | TRENASSE | L | LAES |
| 206 | BOWMAN | L | MAFES |
| 207 | COCODRIE | L | LAES |
| 208 | CHENIERE | L | LAES |
| 209 | CYPRESS | L | LAES |
| 210 | WELLS | L | AAES |
| 244 | AC1055 | L | LAES |
| 212 | CYBONNET | L | AAES |
| 213 | JUPITER | M | LAES |
| 214 | BENGAL | M | LAES |
| 215 | PIROGUE | S | LAES |
| 216 | PRESIDIO | L | TAES, USDA |
| 217 | DELLROSE | L(A) | LAES |
| 218 | CATAHOULA | L | LAES |
| 219 | NEPTUNE | M | LAES |
| 220 | ORIN//MERC/RICO/3/MARS//M201/MARS/4/CL161 | M | LAES |
| 221 | DREW/IRGA417 | L | AAES |
| 222 | DREW/5/NWBT/3/DAWN/9695//STBN/4/KATY/STBN | L | AAES |
| 223 | 4483-1693 | L | USDA |

Continued.

**Table 1.** Continued.

| Entry | Pedigree | Grain Type† | Source‡ |
|---|---|---|---|
| 224 | CFX-18//CCDR/9770532 DH2 | L | LAES |
| 225 | CCDR/CLR 11 | L | LAES |
| 226 | TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18 | L | LAES |
| 227 | CPRS/KBNT//9502008-A | L | LAES |
| 228 | 9502008/CPRS | L | LAES |
| 229 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | L | LAES |
| 230 | CFX-18//CCDR/9770532 DH2 | L | LAES |
| 231 | AR 1142/JODN/4/NWBT/KATY/3/82CAY21/... | L | LAES |
| 232 | AR 1188/CCDR//9502008/LGRU | L | LAES |
| 233 | NWBT/KATY//9902207x2/3/9502008-A/DREW | L | LAES |
| 234 | NWBT/KATY//9902207x2/3/CPRS | L | LAES |
| 235 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | L | LAES |
| 236 | CPRS/97T1280 DH1/3/CPRS/NWBT//KATY | L | LAES |
| 237 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | L | LAES |
| 238 | DREW/CFX-18 | L | LAES |
| 239 | CFX-26/9702128 | L | LAES |
| 240 | CPRS/3/NWBT/KATY//9902207x2 | L | LAES |
| 241 | CCDR/3/KATY/CPRS//JKSN | L | LAES |
| 242 | AC 1398 | L | LAES |
| 243 | 96 INT/AHNT | L | LAES |
| 244 | JAZZMAN | L(A) | LAES |
| 245 | CCDR/0502085 | L | LAES |
| 246 | CCDR//9502008//AR 1188/CCDR | L | LAES |
| 247 | AC1055 | L | LAES |
| 248 | AC1019 | L | LAES |
| 249 | CCDR//CCDR/JEFF | L | LAES |
| 250 | NWBT/KATY//9902207X2/3/JSMN/DLLA//… | L(A) | LAES |
| 251 | 9502008//KATY/9902207X2/3/JSMN/… | L(A) | LAES |
| 252 | 9502065/3/MERC//MERC/… | M | LAES |
| 253 | EARL/9902028 | M | LAES |
| 254 | BNGL//MERC/RICO/3/MERC/RICO//BNGL | M | LAES |
| 255 | BNGL/SHORT RICO/4/ORIN//… | M | LAES |
| 256 | BNGL/SHORT RICO/4/ORIN//… | M | LAES |
| 257 | CTHL x WELLS | L | LAES/AAES |
| 258 | CL151 x CL161 | L | LAES |
| 259 | CTHL x CPRS | L | LAES |
| 260 | CTHL x FRNS | L | LAES/AAES |

† L = Long grain, M = Medium grain, and S = Short grain, (A = Aromatic, E = Elongating).
‡ AAES, Rice Research and Extension Center, Arkansas Agricultural Experiment Station, Stuttgart, AR; LAES, Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Crowley, LA; MAFES, Delta Research and Extension Center, Mississippi Agricultural and Forestry Experiment Station; TAES, USDA, Texas A&M Research and Education Center, Texas Agricultural Experiment Station, U.S. Department of Agriculture, Beaumont, TX.

**Table 2.** Grain and milling yield and agronomic performance of entries in the 2008 Commercial-Advanced Yield Trial, Rice Research Station, Crowley, LA.

| | | | Days to 50% | Plant Height | | Grain Yield (lb/A @ 12%) | | | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Entry** | **Source** | **Vigor†** | **Heading** | **(in)** | **Lodging** | **Main** | **2nd** | **Total** | **Whole** | **Total** |
| 254 | RU0702162 | 4 | 85 | 38 | | 10810 | 726 | 11536 | 65.5 | 70.1 |
| 232 | RU0702085 | 5 | 84 | 39 | | 10803 | 515 | 11318 | 61.4 | 69.5 |
| 260 | CTHLxFRNS | 4 | 83 | 42 | 20 | 10688 | 333 | 11021 | 62.6 | 69.7 |
| 257 | CTHLxWELLS | 3 | 84 | 43 | 24 | 10626 | 657 | 11283 | 59.8 | 69.8 |
| 219 | NPTN | 5 | 90 | 37 | | 10527 | 1179 | 11707 | 67.9 | 73.0 |
| 223 | RU0603075 | 7 | 91 | 44 | | 10381 | 815 | 11196 | 50.5 | 66.3 |
| 210 | WELLS | 4 | 86 | 43 | 23 | 10361 | 370 | 10731 | 57.0 | 67.4 |
| 229 | RU0802088 | 4 | 84 | 39 | | 10347 | 641 | 10989 | 59.8 | 66.2 |
| 242 | RU0802022 | 4 | 82 | 41 | 7 | 10333 | 624 | 10957 | 62.0 | 68.2 |
| 204 | CL171 | 4 | 86 | 42 | | 10248 | 742 | 10990 | 64.3 | 69.9 |
| 245 | RU0802031 | 5 | 81 | 39 | | 10142 | 321 | 10463 | 61.1 | 67.7 |
| 212 | CBNT | 4 | 84 | 40 | | 10076 | 705 | 10782 | 58.5 | 70.6 |
| 235 | RU0802103 | 5 | 81 | 39 | 10 | 10070 | 277 | 10348 | 62.1 | 68.1 |
| 255 | RU0802071 | 4 | 80 | 39 | 27 | 10010 | 620 | 10631 | 64.9 | 70.8 |
| 214 | BNGL | 4 | 86 | 39 | 17 | 9992 | 303 | 10295 | 66.6 | 71.2 |
| 252 | RU0702068 | 5 | 84 | 40 | 23 | 9985 | 242 | 10228 | 39.7 | 71.8 |
| 227 | RU0502002 | 6 | 80 | 38 | | 9937 | 517 | 10454 | 63.4 | 69.2 |
| 213 | JPTR | 5 | 87 | 41 | 17 | 9875 | 464 | 10339 | 59.4 | 70.1 |
| 238 | RU0702189 | 5 | 88 | 41 | | 9864 | 733 | 10596 | 60.6 | 67.3 |
| 249 | RU0802134 | 5 | 81 | 39 | | 9862 | 288 | 10150 | 59.3 | 68.5 |
| 208 | CHNR | 4 | 86 | 39 | | 9806 | 422 | 10228 | 60.7 | 67.4 |
| 211 | BANKS | 4 | 87 | 47 | 30 | 9801 | 473 | 10274 | 57.4 | 65.8 |
| 206 | BWMN | 5 | 85 | 39 | | 9764 | 748 | 10512 | 62.9 | 69.9 |
| 216 | PSDO | 4 | 82 | 39 | | 9761 | 1195 | 10956 | 60.9 | 67.6 |
| 236 | RU0702097 | 5 | 84 | 42 | 30 | 9758 | 232 | 9990 | 64.0 | 70.9 |
| 222 | RU0401182 | 4 | 87 | 43 | 23 | 9713 | 1168 | 10881 | 60.5 | 68.7 |
| 231 | RU0702082 | 4 | 87 | 37 | | 9711 | 749 | 10460 | 63.7 | 68.9 |
| 241 | RU0802112 | 5 | 83 | 40 | 13 | 9687 | 518 | 10206 | 62.7 | 68.9 |
| 230 | RU0802091 | 4 | 79 | 41 | 30 | 9676 | 642 | 10317 | 63.7 | 70.0 |
| 218 | CTHL | 5 | 82 | 38 | | 9624 | 479 | 10103 | 63.5 | 70.5 |
| 205 | TRNS | 4 | 75 | 39 | 40 | 9566 | 469 | 10036 | 59.9 | 67.2 |
| 220 | CY005 | 4 | 81 | 44 | 53 | 9460 | 817 | 10277 | 64.4 | 68.2 |
| 207 | CCDR | 4 | 81 | 39 | 20 | 9404 | 323 | 9727 | 60.9 | 68.5 |
| 228 | RU0602189 | 5 | 83 | 39 | 17 | 9331 | 964 | 10295 | 61.3 | 67.4 |
| 201 | CL131 | 4 | 84 | 36 | | 9256 | 340 | 9596 | 62.8 | 69.8 |
| 225 | RU0802008 | 5 | 80 | 37 | 30 | 9254 | 278 | 9532 | 63.5 | 69.8 |
| 243 | JAZZMAN | 4 | 87 | 43 | 23 | 9188 | 367 | 9555 | 64.1 | 69.1 |
| 226 | RU0802051 | 5 | 82 | 42 | 33 | 9123 | 788 | 9911 | 62.5 | 67.9 |
| 209 | CPRS | 4 | 87 | 40 | 17 | 9119 | 396 | 9516 | 63.5 | 68.1 |
| 233 | RU0802094 | 5 | 78 | 39 | | 9064 | 238 | 9302 | 64.4 | 71.4 |
| 246 | RU0802034 | 5 | 80 | 41 | 57 | 8955 | 135 | 9089 | 59.0 | 67.1 |
| 234 | RU0802097 | 5 | 84 | 38 | | 8942 | 583 | 9525 | 63.2 | 68.4 |
| 259 | CTHLxCPRS | 5 | 85 | 40 | 20 | 8918 | 364 | 9282 | 62.8 | 69.2 |
| 203 | CL151 | 4 | 82 | 42 | 90 | 8917 | 33 | 8950 | 64.0 | 70.3 |
| 240 | RU0802109 | 4 | 83 | 38 | 10 | 8692 | 435 | 9127 | 65.3 | 70.1 |
| 215 | PIRO | 6 | 87 | 41 | | 8583 | 412 | 8995 | 56.5 | 69.8 |
| 237 | RU0802106 | 4 | 79 | 39 | 20 | 8550 | 439 | 8989 | 63.8 | 70.4 |
| 256 | RU0802162 | 5 | 78 | 41 | 57 | 8488 | 240 | 8728 | 60.6 | 68.1 |
| 251 | RU0802149 | 4 | 83 | 41 | 40 | 8389 | 735 | 9124 | 59.7 | 67.0 |
| 247 | RU0802125 | 4 | 82 | 40 | 53 | 8359 | 533 | 8892 | 61.5 | 69.7 |
| 202 | CL161 | 4 | 86 | 42 | 63 | 8230 | 275 | 8505 | 62.2 | 68.6 |
| 253 | RU0702165 | 3 | 81 | 41 | 90 | 8193 | 179 | 8372 | 65.0 | 70.7 |
| 224 | RU0802002 | 4 | 81 | 41 | 83 | 8116 | 205 | 8322 | 63.8 | 69.5 |
| 239 | RU0702192 | 5 | 80 | 38 | 63 | 8091 | 737 | 8828 | 65.2 | 70.7 |

Continued.

**Table 2.** Continued.

| Entry | Source | Vigor[†] | Days to 50% Heading | Plant Height (in) | Lodging | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) Whole | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 258 | CL151xCL161 | 4 | 85 | 42 | 50 | 7876 | 246 | 8122 | 64.0 | 68.8 |
| 244 | RU0802028 | 5 | 83 | 39 | 63 | 7841 | 390 | 8231 | 62.2 | 69.3 |
| 221 | RU0701124 | 3 | 76 | 40 | 30 | 7802 | 549 | 8352 | 62.4 | 70.3 |
| 217 | DLRS | 6 | 84 | 42 | 7 | 7658 | 1255 | 8913 | 66.4 | 70.4 |
| 248 | RU0802128 | 5 | 80 | 38 | 47 | 7172 | 106 | 7278 | 62.9 | 70.8 |
| 250 | RU0802146 | 4 | 80 | 43 | 90 | 6541 | 387 | 6928 | 64.9 | 70.2 |
| c.v. % | | 14.8 | 1.9 | 3.5 | 118 | 10.8 | 28.5 | 10.5 | 8.6 | 2.5 |
| $LSD_{0.05}$ | | 1.1 | 2.5 | 2.3 | 46.3 | 1622 | 237 | 1673 | 10.7 | 3.5 |

[†]Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 3.** Grain and milling yield and agronomic performance of entries in the 2008 Commercial-Advanced Yield Trial, Evangeline Parish, LA.

| Entry | Source | Vigor | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) |
|---|---|---|---|---|---|
| 224 | RU0802002 | 5 | 79 | 37 | 6745 |
| 225 | RU0802008 | 5 | 77 | 34 | 6578 |
| 226 | RU0802051 | 5 | 82 | 37 | 6353 |
| 203 | CL151 | 5 | 80 | 38 | 6335 |
| 249 | RU0802134 | 6 | 77 | 34 | 5960 |
| 247 | RU0802125 | 5 | 82 | 34 | 5957 |
| 220 | CY005 | 4 | 80 | 38 | 5879 |
| 227 | RU0502002 | 5 | 75 | 33 | 5869 |
| 260 | CTHLxFRNS | 4 | 80 | 36 | 5835 |
| 242 | RU0802022 | 5 | 81 | 37 | 5794 |
| 230 | RU0802091 | 6 | 78 | 36 | 5776 |
| 245 | RU0802031 | 6 | 76 | 33 | 5749 |
| 232 | RU0702085 | 6 | 76 | 36 | 5736 |
| 252 | RU0702068 | 5 | 85 | 36 | 5629 |
| 235 | RU0802103 | 5 | 76 | 35 | 5573 |
| 229 | RU0802088 | 5 | 80 | 33 | 5509 |
| 243 | JAZZMAN | 5 | 88 | 36 | 5474 |
| 207 | CCDR | 4 | 76 | 32 | 5447 |
| 256 | RU0802162 | 6 | 83 | 36 | 5432 |
| 239 | RU0702192 | 6 | 79 | 35 | 5412 |
| 202 | CL161 | 4 | 82 | 37 | 5366 |
| 238 | RU0702189 | 5 | 86 | 38 | 5357 |
| 204 | CL171 | 4 | 81 | 37 | 5325 |
| 248 | RU0802128 | 5 | 79 | 33 | 5318 |
| 259 | CTHLxCPRS | 5 | 77 | 34 | 5303 |
| 237 | RU0802106 | 6 | 76 | 34 | 5294 |
| 201 | CL131 | 4 | 81 | 32 | 5287 |
| 214 | BNGL | 4 | 86 | 35 | 5281 |
| 205 | TRNS | 6 | 74 | 34 | 5269 |
| 258 | CL151xCL161 | 5 | 80 | 36 | 5263 |
| 246 | RU0802034 | 5 | 76 | 34 | 5260 |
| 257 | CTHLxWELLS | 4 | 78 | 36 | 5203 |
| 255 | RU0802071 | 5 | 83 | 36 | 5142 |
| 236 | RU0702097 | 6 | 86 | 37 | 5129 |
| 223 | RU0603075 | 7 | 88 | 40 | 5112 |
| 219 | NPTN | 5 | 88 | 33 | 5092 |
| 210 | WELLS | 3 | 82 | 37 | 5089 |
| 212 | CBNT | 5 | 76 | 34 | 5044 |
| 253 | RU0702165 | 5 | 84 | 37 | 5023 |
| 241 | RU0802112 | 5 | 76 | 36 | 5014 |

Continued.

**Table 3.** Continued.

| Entry | Source | Vigor | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) |
|---|---|---|---|---|---|
| 221 | RU0701124 | 5 | 74 | 37 | 4997 |
| 234 | RU0802097 | 5 | 78 | 34 | 4982 |
| 209 | CPRS | 4 | 80 | 35 | 4962 |
| 208 | CHNR | 5 | 80 | 34 | 4859 |
| 218 | CTHL | 5 | 76 | 35 | 4846 |
| 211 | BANKS | 4 | 84 | 39 | 4823 |
| 228 | RU0602189 | 5 | 76 | 32 | 4790 |
| 222 | RU0401182 | 4 | 83 | 37 | 4660 |
| 216 | PSDO | 4 | 80 | 34 | 4618 |
| 213 | JPTR | 6 | 88 | 36 | 4584 |
| 233 | RU0802094 | 5 | 75 | 33 | 4552 |
| 231 | RU0702082 | 5 | 85 | 33 | 4530 |
| 250 | RU0802146 | 5 | 77 | 35 | 4470 |
| 240 | RU0802109 | 6 | 79 | 32 | 4412 |
| 244 | RU0802028 | 6 | 83 | 35 | 4310 |
| 251 | RU0802149 | 6 | 82 | 34 | 4297 |
| 254 | RU0702162 | 6 | 87 | 33 | 3980 |
| 217 | DLRS | 6 | 84 | 36 | 3925 |
| 206 | BWMN | 5 | 82 | 35 | 3923 |
| 215 | PIRO | 7 | 88 | 35 | 3707 |
| c.v. % | | 13.0 | 2.1 | 3.5 | 10.5 |
| $LSD_{0.05}$ | | 1.1 | 2.7 | 2.0 | 879 |

Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 4.** Grain and milling yield, agronomic performance, and disease resistance of entries in the 2008 Commercial-Advanced Yield Trial, Vermilion Parish, LA.

| | | | | | Grain Yield (lb/A @ 12%) | | | Milling Yield (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Entry | Source | Vigor† | Days to 50% Heading | Plant Height (in) | Main | 2nd | Total | Whole | Total | SB†‡ | BS†‡ | NB†‡ |
| 227 | RU0502002 | 5 | 82 | 39 | 8511 | 709 | 9221 | 63.5 | 70.2 | 5 | 5 | 2 |
| 237 | RU0802106 | 4 | 79 | 36 | 8497 | 868 | 9365 | 61.2 | 67.9 | 6 | 4 | 2 |
| 253 | RU0702165 | 3 | 82 | 41 | 8393 | 494 | 8887 | 67.4 | 72.9 | 5 | 4 | 0 |
| 203 | CL151 | 4 | 81 | 38 | 8299 | 1072 | 9371 | 62.7 | 70.3 | 5 | 4 | 3 |
| 233 | RU0802094 | 4 | 78 | 36 | 8215 | 536 | 8751 | 64.5 | 71.7 | 6 | 4 | 2 |
| 225 | RU0802008 | 5 | 79 | 35 | 8127 | 976 | 9103 | 64.9 | 72.6 | 6 | 3 | 3 |
| 230 | RU0802091 | 4 | 79 | 38 | 8003 | 866 | 8869 | 64.7 | 71.0 | 6 | 3 | 3 |
| 245 | RU0802031 | 4 | 81 | 37 | 7990 | 661 | 8651 | 60.9 | 68.4 | 5 | 4 | 3 |
| 246 | RU0802034 | 4 | 80 | 37 | 7989 | 582 | 8571 | 61.5 | 69.9 | 5 | 3 | 3 |
| 235 | RU0802103 | 4 | 47 | 38 | 7908 | 766 | 8674 | 62.7 | 69.5 | 6 | 4 | 2 |
| 241 | RU0802112 | 5 | 81 | 38 | 7879 | 687 | 8566 | 58.8 | 67.5 | 5 | 3 | 2 |
| 218 | CTHL | 4 | 81 | 37 | 7759 | 531 | 8289 | 65.5 | 71.7 | 5 | 4 | 2 |
| 226 | RU0802051 | 4 | 82 | 39 | 7740 | 1137 | 8877 | 64.3 | 70.3 | 5 | 3 | 3 |
| 213 | JPTR | 5 | 88 | 39 | 7726 | 1516 | 9241 | 65.9 | 69.3 | 4 | 3 | 1 |
| 234 | RU0802097 | 4 | 79 | 37 | 7683 | 887 | 8570 | 63.7 | 69.6 | 6 | 3 | 3 |
| 207 | CCDR | 3 | 81 | 36 | 7636 | 679 | 8315 | 62.4 | 70.3 | 6 | 3 | 3 |
| 211 | BANKS | 4 | 88 | 43 | 7620 | 747 | 8367 | 58.8 | 69.0 | 5 | 3 | 2 |
| 208 | CHNR | 4 | 85 | 37 | 7587 | 845 | 8432 | 60.7 | 69.7 | 5 | 4 | 3 |
| 239 | RU0702192 | 5 | 79 | 36 | 7529 | 1398 | 8927 | 66.9 | 71.6 | 5 | 4 | 1 |
| 244 | RU0802028 | 5 | 83 | 37 | 7469 | 1001 | 8469 | 61.6 | 70.2 | 6 | 3 | 4 |
| 249 | RU0802134 | 5 | 81 | 36 | 7428 | 543 | 7971 | 61.9 | 71.6 | 6 | 4 | 2 |
| 257 | CTHLxWELLS | 3 | 83 | 40 | 7424 | 1334 | 8758 | 60.8 | 70.1 | 4 | 1 | 1 |
| 224 | RU0802002 | 4 | 81 | 38 | 7407 | 884 | 8291 | 64.9 | 69.6 | 7 | 4 | 4 |
| 247 | RU0802125 | 4 | 81 | 37 | 7405 | 1397 | 8802 | 60.7 | 69.1 | 6 | 3 | 3 |
| 250 | RU0802146 | 4 | 82 | 39 | 7359 | 890 | 8249 | 64.2 | 69.8 | 6 | 3 | 3 |

Continued.

**Table 4.** Continued.

| Entry | Source | Vigor[†] | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) Main | 2nd | Total | Milling Yield (%) Whole | Total | SB[†‡] | BS[†‡] | NB[†‡] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 232 | RU0702085 | 4 | 82 | 37 | 7354 | 932 | 8286 | 63.9 | 71.9 | 5 | 3 | 2 |
| 229 | RU0802088 | 4 | 84 | 36 | 7352 | 741 | 8093 | 63.4 | 69.8 | 5 | 4 | 3 |
| 260 | CTHLxFRNS | 4 | 81 | 39 | 7348 | 1023 | 8372 | 61.4 | 69.3 | 6 | 2 | 1 |
| 252 | RU0702068 | 4 | 83 | 37 | 7275 | 1426 | 8701 | 63.7 | 68.5 | 5 | 3 | 0 |
| 240 | RU0802109 | 4 | 83 | 36 | 7198 | 980 | 8178 | 64.0 | 69.6 | 5 | 3 | 2 |
| 219 | NPTN | 4 | 88 | 35 | 7168 | 1832 | 9000 | 67.5 | 71.2 | 4 | 2 | 0 |
| 254 | RU0702162 | 3 | 86 | 37 | 7146 | 1495 | 8642 | 62.2 | 70.3 | 5 | 2 | 1 |
| 242 | RU0802022 | 4 | 83 | 38 | 7095 | 931 | 8026 | 60.5 | 69.0 | 6 | 2 | 4 |
| 228 | RU0602189 | 4 | 81 | 37 | 7093 | 868 | 7962 | 62.8 | 70.5 | 5 | 3 | 2 |
| 212 | CBNT | 4 | 82 | 37 | 7002 | 1473 | 8475 | 64.9 | 70.4 | 5 | 3 | 1 |
| 258 | CL151xCL161 | 4 | 84 | 38 | 6976 | 1200 | 8176 | 63.7 | 69.0 | 5 | 3 | 2 |
| 255 | RU0802071 | 3 | 82 | 38 | 6953 | 1056 | 8010 | 69.3 | 74.9 | 4 | 4 | 0 |
| 214 | BNGL | 4 | 87 | 38 | 6939 | 979 | 7918 | 63.5 | 69.9 | 5 | 3 | 1 |
| 259 | CTHLxCPRS | 5 | 82 | 36 | 6931 | 927 | 7858 | 65.7 | 72.3 | 5 | 4 | 1 |
| 220 | CY005 | 4 | 80 | 40 | 6884 | 1307 | 8191 | 65.5 | 69.2 | 5 | 4 | 1 |
| 256 | RU0802162 | 4 | 81 | 40 | 6849 | 797 | 7646 | 60.3 | 71.3 | 4 | 4 | 0 |
| 201 | CL131 | 4 | 82 | 33 | 6741 | 1003 | 7744 | 66.7 | 72.3 | 6 | 4 | 4 |
| 243 | JAZZMAN | 4 | 87 | 38 | 6723 | 760 | 7482 | 61.4 | 68.7 | 5 | 2 | 3 |
| 248 | RU0802128 | 4 | 84 | 37 | 6684 | 1083 | 7767 | 60.2 | 68.1 | 6 | 4 | 3 |
| 222 | RU0401182 | 3 | 87 | 38 | 6680 | 2058 | 8738 | 61.6 | 68.9 | 4 | 1 | 1 |
| 238 | RU0702189 | 5 | 87 | 39 | 6680 | 1201 | 7881 | 59.6 | 68.1 | 4 | 3 | 1 |
| 231 | RU0702082 | 4 | 86 | 36 | 6651 | 1128 | 7780 | 63.6 | 69.1 | 5 | 3 | 2 |
| 209 | CPRS | 4 | 85 | 38 | 6569 | 1079 | 7649 | 64.7 | 70.8 | 5 | 3 | 3 |
| 210 | WELLS | 3 | 85 | 40 | 6493 | 1445 | 7939 | 59.1 | 69.8 | 4 | 1 | 1 |
| 215 | PIRO | 5 | 87 | 40 | 6491 | 1100 | 7590 | 57.8 | 68.8 | 3 | 2 | 1 |
| 202 | CL161 | 3 | 85 | 37 | 6399 | 912 | 7311 | 67.7 | 73.2 | 6 | 3 | 3 |
| 223 | RU0603075 | 6 | 89 | 43 | 6303 | 1339 | 7642 | 48.2 | 67.8 | 3 | 1 | 0 |
| 236 | RU0702097 | 5 | 87 | 40 | 6248 | 1257 | 7505 | 59.1 | 68.5 | 4 | 4 | 0 |
| 205 | TRNS | 4 | 75 | 37 | 6096 | 1020 | 7116 | 62.6 | 69.3 | 6 | 4 | 2 |
| 216 | PSDO | 3 | 81 | 38 | 6084 | 1684 | 7768 | 62.8 | 68.5 | 5 | 2 | 0 |
| 221 | RU0701124 | 3 | 73 | 38 | 5978 | 697 | 6675 | 62.6 | 69.9 | 6 | 7 | 0 |
| 251 | RU0802149 | 4 | 83 | 37 | 5863 | 1189 | 7052 | 62.2 | 68.2 | 5 | 2 | 3 |
| 204 | CL171 | 3 | 85 | 39 | 5722 | 1617 | 7339 | 64.3 | 70.4 | 5 | 2 | 4 |
| 217 | DLRS | 5 | 84 | 40 | 5675 | 2089 | 7764 | 66.6 | 71.0 | 4 | 4 | 1 |
| 206 | BWMN | 5 | 85 | 40 | 5465 | 1167 | 6632 | 62.3 | 70.5 | 5 | 4 | 1 |
| c.v. % | | 16.4 | 9.2 | 2.9 | 6.9 | 21.8 | 6.8 | 3.8 | 2.5 | 12.1 | 43.8 | 20.0 |
| $LSD_{0.05}$ | | 1.1 | 12.2 | 1.8 | 804 | 374 | 897 | 4.8 | 3.6 | 1.0 | 1.4 | 1.1 |

[†]Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

[‡] Abbreviations: SB=sheath blight, BS=brown spot, NB= neck blast.

**Table 5.** Grain and milling yield and agronomic performance of entries in the 2008 Commercial- Yield Trial, Jefferson Davis Parish, LA.

| Entry | Source | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB†‡ |
|---|---|---|---|---|---|---|---|---|
| 203 | CL151 | 4 | 83 | 35 | 7170 | 68.9 | 73.2 | 8 |
| 254 | RU0702162 | 4 | 83 | 31 | 6706 | 65.4 | 71.0 | 6 |
| 253 | RU0702165 | 4 | 81 | 31 | 6270 | 62.5 | 70.5 | 6 |
| 210 | WELLS | 3 | 84 | 34 | 6226 | 61.8 | 74.1 | 6 |
| 252 | RU0702068 | 4 | 81 | 30 | 6209 | 64.4 | 73.3 | 7 |
| 256 | RU0802162 | 4 | 81 | 33 | 6152 | 66.0 | 71.6 | 6 |
| 218 | CTHL | 5 | 83 | 31 | 6093 | 68.5 | 74.0 | 7 |
| 232 | RU0702085 | 4 | 82 | 32 | 6029 | 67.1 | 72.0 | 7 |
| 241 | RU0802112 | 4 | 82 | 32 | 6023 | 66.1 | 72.9 | 7 |
| 219 | NPTN | 5 | 87 | 31 | 6016 | 69.9 | 74.0 | 6 |
| 226 | RU0802051 | 4 | 83 | 32 | 5983 | 71.0 | 71.7 | 7 |
| 201 | CL131 | 4 | 83 | 29 | 5982 | 65.8 | 71.9 | 8 |
| 208 | CHNR | 4 | 83 | 31 | 5979 | 63.7 | 72.4 | 7 |
| 243 | JAZZMAN | 3 | 85 | 34 | 5903 | 67.3 | 72.4 | 7 |
| 225 | RU0802008 | 5 | 81 | 30 | 5886 | 66.7 | 72.2 | 8 |
| 255 | RU0802071 | 4 | 81 | 33 | 5785 | 62.8 | 71.5 | 6 |
| 233 | RU0802094 | 4 | 79 | 30 | 5781 | 66.8 | 72.0 | 7 |
| 260 | CTHLxFRNS | 4 | 84 | 33 | 5776 | 64.1 | 71.9 | 7 |
| 214 | BNGL | 4 | 84 | 31 | 5772 | 64.7 | 71.7 | 7 |
| 247 | RU0802125 | 5 | 83 | 31 | 5768 | 64.3 | 72.8 | 8 |
| 258 | CL151xCL161 | 4 | 84 | 33 | 5768 | 66.8 | 71.9 | 8 |
| 213 | JPTR | 5 | 87 | 32 | 5762 | 62.9 | 69.9 | 5 |
| 215 | PIRO | 5 | 87 | 33 | 5739 | 60.6 | 72.9 | 6 |
| 259 | CTHLxCPRS | 5 | 84 | 32 | 5716 | 70.7 | 74.4 | 8 |
| 223 | RU0603075 | 6 | 92 | 36 | 5681 | 31.7 | 67.6 | 5 |
| 202 | CL161 | 4 | 86 | 34 | 5670 | 69.3 | 71.7 | 8 |
| 242 | RU0802022 | 4 | 82 | 33 | 5670 | 63.4 | 70.9 | 8 |
| 207 | CCDR | 3 | 82 | 31 | 5665 | 62.0 | 71.3 | 8 |
| 229 | RU0802088 | 4 | 81 | 29 | 5578 | 66.1 | 71.5 | 8 |
| 206 | BWMN | 5 | 85 | 34 | 5546 | 55.6 | 71.7 | 7 |
| 238 | RU0702189 | 4 | 86 | 33 | 5519 | 68.0 | 73.0 | 8 |
| 245 | RU0802031 | 4 | 83 | 31 | 5501 | 65.5 | 71.4 | 8 |
| 239 | RU0702192 | 4 | 81 | 31 | 5495 | 67.8 | 72.4 | 8 |
| 224 | RU0802002 | 4 | 82 | 33 | 5472 | 66.8 | 71.3 | 9 |
| 236 | RU0702097 | 5 | 88 | 33 | 5461 | 65.6 | 70.8 | 6 |
| 257 | CTHLxWELLS | 4 | 84 | 35 | 5455 | 65.7 | 74.0 | 7 |
| 230 | RU0802091 | 4 | 82 | 32 | 5401 | 68.2 | 72.4 | 8 |
| 220 | CY005 | 4 | 79 | 31 | 5391 | 67.6 | 70.0 | 7 |
| 251 | RU0802149 | 4 | 81 | 31 | 5367 | 65.3 | 71.0 | 8 |
| 244 | RU0802028 | 5 | 83 | 30 | 5366 | 63.4 | 72.3 | 8 |
| 205 | TRNS | 4 | 78 | 32 | 5348 | 63.7 | 69.5 | 8 |
| 237 | RU0802106 | 4 | 80 | 32 | 5314 | 68.7 | 72.7 | 8 |
| 204 | CL171 | 3 | 86 | 33 | 5293 | 67.6 | 72.5 | 8 |
| 216 | PSDO | 4 | 83 | 30 | 5252 | 66.9 | 72.2 | 7 |
| 222 | RU0401182 | 4 | 85 | 34 | 5212 | 60.6 | 70.4 | 6 |
| 249 | RU0802134 | 4 | 81 | 30 | 5198 | 66.7 | 72.7 | 8 |
| 240 | RU0802109 | 4 | 82 | 30 | 5156 | 67.4 | 71.4 | 7 |
| 211 | BANKS | 4 | 84 | 36 | 5098 | 64.4 | 70.9 | 6 |
| 248 | RU0802128 | 5 | 81 | 29 | 5094 | 66.6 | 72.7 | 8 |
| 209 | CPRS | 4 | 86 | 30 | 5086 | 62.9 | 70.0 | 8 |
| 250 | RU0802146 | 4 | 81 | 34 | 5023 | 68.4 | 72.0 | 9 |
| 228 | RU0602189 | 4 | 82 | 30 | 5019 | 70.4 | 73.9 | 7 |
| 227 | RU0502002 | 4 | 82 | 29 | 4933 | 68.1 | 72.4 | 7 |

Continued.

**Table 5.** Continued.

| Entry | Source | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Total | SB†‡ |
|---|---|---|---|---|---|---|---|---|
| 231 | RU0702082 | 5 | 86 | 30 | 4818 | 68.9 | 72.8 | 7 |
| 212 | CBNT | 4 | 82 | 32 | 4810 | 69.4 | 73.0 | 7 |
| 235 | RU0802103 | 4 | 82 | 31 | 4740 | 67.5 | 71.6 | 7 |
| 246 | RU0802034 | 4 | 81 | 30 | 4714 | 69.5 | 74.5 | 8 |
| 217 | DLRS | 6 | 84 | 35 | 4458 | 68.4 | 71.8 | 6 |
| 234 | RU0802097 | 5 | 82 | 32 | 4361 | 68.5 | 72.0 | 8 |
| 221 | RU0701124 | 4 | 77 | 29 | 3809 | 63.6 | 70.3 | 7 |
| c.v. % | | 12.4 | 1.2 | 4.3 | 9.8 | 3.9 | 1.9 | 7.6 |
| $LSD_{0.05}$ | | 0.9 | 1.7 | 2.2 | 874 | 5.1 | 2.8 | 0.9 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight.

**Table 6.** Grain and milling yield, agronomic performance, and disease resistance of entries in the 2008 Commercial-Advanced Yield Trial, Acadia Parish, LA.

| Entry | Source | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Total |
|---|---|---|---|---|---|---|---|
| 242 | RU0802022 | 4 | 86 | 38 | 8389 | 63.3 | 69.5 |
| 230 | RU0802091 | 5 | 81 | 37 | 8342 | 62.1 | 68.7 |
| 244 | RU0802028 | 5 | 84 | 36 | 8145 | 62.6 | 70.0 |
| 226 | RU0802051 | 4 | 86 | 38 | 8095 | 61.9 | 68.8 |
| 203 | CL151 | 4 | 82 | 36 | 7953 | 62.0 | 69.9 |
| 247 | RU0802125 | 4 | 85 | 35 | 7900 | 61.8 | 70.1 |
| 220 | CY005 | 4 | 80 | 36 | 7794 | 66.0 | 68.6 |
| 239 | RU0702192 | 4 | 81 | 34 | 7673 | 64.5 | 71.0 |
| 205 | TRNS | 5 | 77 | 36 | 7639 | 57.7 | 65.8 |
| 208 | CHNR | 4 | 83 | 35 | 7591 | 62.0 | 71.2 |
| 238 | RU0702189 | 5 | 86 | 38 | 7585 | 63.5 | 70.7 |
| 225 | RU0802008 | 5 | 80 | 34 | 7508 | 64.1 | 71.4 |
| 252 | RU0702068 | 4 | 82 | 36 | 7493 | 65.5 | 70.2 |
| 254 | RU0702162 | 5 | 83 | 34 | 7414 | 65.8 | 70.3 |
| 222 | RU0401182 | 4 | 86 | 38 | 7391 | 61.6 | 69.8 |
| 235 | RU0802103 | 5 | 80 | 35 | 7384 | 62.8 | 70.1 |
| 232 | RU0702085 | 5 | 82 | 36 | 7275 | 59.2 | 68.7 |
| 218 | CTHL | 5 | 83 | 35 | 7206 | 62.3 | 72.2 |
| 260 | CTHLxFRNS | 6 | 85 | 36 | 7198 | 59.5 | 70.6 |
| 229 | RU0802088 | 4 | 88 | 35 | 7198 | 64.2 | 71.2 |
| 213 | JPTR | 6 | 88 | 35 | 7169 | 63.3 | 67.6 |
| 258 | CL151xCL161 | 5 | 85 | 38 | 7158 | 63.7 | 69.4 |
| 207 | CCDR | 5 | 81 | 34 | 7066 | 62.7 | 71.6 |
| 209 | CPRS | 4 | 84 | 36 | 7066 | 63.2 | 68.8 |
| 211 | BANKS | 4 | 87 | 41 | 7010 | 51.2 | 66.7 |
| 249 | RU0802134 | 4 | 82 | 34 | 6968 | 60.9 | 69.9 |
| 228 | RU0602189 | 5 | 81 | 35 | 6934 | 64.0 | 70.7 |
| 240 | RU0802109 | 5 | 83 | 33 | 6925 | 64.0 | 71.4 |
| 253 | RU0702165 | 4 | 83 | 36 | 6868 | 67.3 | 71.9 |
| 243 | JAZZMAN | 4 | 88 | 37 | 6857 | 65.3 | 69.3 |
| 227 | RU0502002 | 6 | 80 | 34 | 6784 | 59.8 | 69.1 |
| 255 | RU0802071 | 6 | 82 | 33 | 6763 | 64.9 | 70.7 |
| 236 | RU0702097 | 6 | 88 | 36 | 6721 | 61.6 | 70.4 |
| 224 | RU0802002 | 4 | 81 | 36 | 6674 | 64.9 | 70.7 |
| 212 | CBNT | 4 | 85 | 35 | 6669 | 65.2 | 70.2 |

Continued.

**Table 6.** Continued.

| Entry | Source | Vigor[†] | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Total |
|---|---|---|---|---|---|---|---|
| 223 | RU0603075 | 6 | 91 | 39 | 6618 | 38.1 | 65.4 |
| 246 | RU0802034 | 4 | 81 | 34 | 6602 | 59.9 | 68.6 |
| 241 | RU0802112 | 4 | 81 | 35 | 6600 | 62.2 | 70.0 |
| 234 | RU0802097 | 5 | 81 | 35 | 6451 | 64.0 | 70.8 |
| 202 | CL161 | 6 | 87 | 37 | 6372 | 64.5 | 69.8 |
| 210 | WELLS | 5 | 86 | 37 | 6334 | 53.8 | 70.3 |
| 201 | CL131 | 5 | 83 | 33 | 6329 | 65.0 | 70.3 |
| 219 | NPTN | 6 | 86 | 32 | 6287 | 67.9 | 70.7 |
| 257 | CTHLxWELLS | 5 | 84 | 36 | 6287 | 55.5 | 71.5 |
| 216 | PSDO | 4 | 82 | 36 | 6271 | 64.2 | 70.1 |
| 245 | RU0802031 | 5 | 82 | 34 | 6252 | 62.7 | 69.7 |
| 204 | CL171 | 5 | 87 | 36 | 6170 | 66.9 | 72.4 |
| 237 | RU0802106 | 5 | 81 | 35 | 6146 | 60.4 | 68.4 |
| 221 | RU0701124 | 3 | 75 | 36 | 6145 | 58.9 | 67.3 |
| 259 | CTHLxCPRS | 6 | 85 | 35 | 6144 | 63.4 | 71.5 |
| 250 | RU0802146 | 4 | 84 | 35 | 5959 | 63.9 | 68.7 |
| 231 | RU0702082 | 5 | 86 | 34 | 5957 | 64.2 | 69.4 |
| 206 | BWMN | 5 | 88 | 37 | 5868 | 59.6 | 68.9 |
| 217 | DLRS | 5 | 85 | 37 | 5842 | 67.1 | 72.0 |
| 214 | BNGL | 5 | 85 | 34 | 5579 | 66.6 | 70.1 |
| 248 | RU0802128 | 5 | 82 | 33 | 5578 | 58.4 | 69.0 |
| 233 | RU0802094 | 5 | 79 | 35 | 5517 | 63.2 | 72.0 |
| 256 | RU0802162 | 6 | 81 | 34 | 5505 | 64.8 | 69.2 |
| 251 | RU0802149 | 5 | 84 | 34 | 4787 | 61.1 | 68.7 |
| 215 | PIRO | 6 | 87 | 34 | 4324 | 57.8 | 67.5 |
| c.v. % | | 17.9 | 1.5 | 3.4 | 13.1 | 3.6 | 1.3 |
| $LSD_{0.05}$ | | 1.4 | 2.0 | 1.9 | 1437 | 4.4 | 1.8 |

[†]Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 7.** Grain and milling yield and agronomic performance of entries in the 2008 Commercial-Advanced Yield Trial, Richland Parish, LA.

| Entry | Source | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) |
|---|---|---|---|---|---|
| 214 | BNGL | 87 | 37 | 53 | 10327 |
| 252 | RU0702068 | 87 | 38 | 73 | 10209 |
| 253 | RU0702165 | 82 | 40 | 90 | 9998 |
| 213 | JPTR | 88 | 40 | 80 | 9978 |
| 254 | RU0702162 | 86 | 38 | 7 | 9959 |
| 215 | PIRO | 86 | 39 | 0 | 9848 |
| 255 | RU0802071 | 84 | 40 | 10 | 9807 |
| 256 | RU0802162 | 82 | 41 | 80 | 9756 |
| 208 | CHNR | 87 | 36 | 67 | 9464 |
| 203 | CL151 | 86 | 37 | 83 | 9394 |
| 220 | CY005 | 83 | 40 | 43 | 9356 |
| 260 | CTHLxFRNS | 89 | 41 | 73 | 9318 |
| 226 | RU0802051 | 89 | 39 | 53 | 9307 |
| 232 | RU0702085 | 89 | 40 | 20 | 9200 |
| 210 | WELLS | 89 | 42 | 53 | 9175 |
| 243 | JAZZMAN | 87 | 44 | 77 | 9164 |
| 257 | CTHLxWELLS | 88 | 41 | 20 | 9134 |
| 206 | BWMN | 90 | 38 | 20 | 9099 |
| 236 | RU0702097 | 91 | 40 | 73 | 8967 |

Continued.

**Table 7.** Continued.

| Entry | Source | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) |
|---|---|---|---|---|---|
| 219 | NPTN | 89 | 35 | 0 | 8967 |
| 237 | RU0802106 | 86 | 38 | 80 | 8923 |
| 235 | RU0802103 | 86 | 36 | 87 | 8899 |
| 205 | TRNS | 80 | 37 | 80 | 8884 |
| 245 | RU0802031 | 85 | 37 | 87 | 8877 |
| 258 | CL151xCL161 | 86 | 38 | 47 | 8855 |
| 242 | RU0802022 | 88 | 39 | 80 | 8826 |
| 209 | CPRS | 88 | 37 | 27 | 8795 |
| 222 | RU0401182 | 92 | 42 | 63 | 8790 |
| 204 | CL171 | 89 | 40 | 13 | 8692 |
| 216 | PSDO | 86 | 38 | 40 | 8669 |
| 223 | RU0603075 | 94 | 39 | 17 | 8624 |
| 249 | RU0802134 | 87 | 37 | 87 | 8549 |
| 246 | RU0802034 | 86 | 39 | 77 | 8504 |
| 241 | RU0802112 | 85 | 38 | 90 | 8369 |
| 202 | CL161 | 88 | 37 | 30 | 8353 |
| 211 | BANKS | 89 | 44 | 57 | 8339 |
| 238 | RU0702189 | 89 | 39 | 0 | 8332 |
| 224 | RU0802002 | 85 | 37 | 53 | 8313 |
| 259 | CTHLxCPRS | 88 | 37 | 7 | 8286 |
| 227 | RU0502002 | 86 | 35 | 23 | 8188 |
| 240 | RU0802109 | 86 | 36 | 50 | 8168 |
| 230 | RU0802091 | 86 | 38 | 27 | 8136 |
| 229 | RU0802088 | 86 | 35 | 0 | 8101 |
| 244 | RU0802028 | 87 | 37 | 57 | 8100 |
| 225 | RU0802008 | 86 | 34 | 60 | 8095 |
| 231 | RU0702082 | 90 | 36 | 0 | 8089 |
| 234 | RU0802097 | 84 | 37 | 27 | 8052 |
| 239 | RU0702192 | 86 | 37 | 73 | 8038 |
| 212 | CBNT | 90 | 38 | 43 | 7999 |
| 201 | CL131 | 84 | 34 | 3 | 7919 |
| 248 | RU0802128 | 88 | 37 | 67 | 7800 |
| 251 | RU0802149 | 85 | 38 | 63 | 7771 |
| 250 | RU0802146 | 86 | 39 | 90 | 7738 |
| 233 | RU0802094 | 86 | 36 | 57 | 7654 |
| 218 | CTHL | 88 | 37 | 17 | 7612 |
| 247 | RU0802125 | 87 | 37 | 63 | 7576 |
| 207 | CCDR | 87 | 37 | 60 | 7547 |
| 228 | RU0602189 | 89 | 37 | 43 | 7518 |
| 217 | DLRS | 89 | 41 | 17 | 7313 |
| 221 | RU0701124 | 78 | 37 | 0 | 6408 |
| c.v. % | | 1.7 | 3.5 | 46 | 7.6 |
| $LSD_{0.05}$ | | 2.5 | 2.0 | 35.4 | 1065 |

†Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

## PRELIMINARY YIELD TRIALS

The preliminary yield trials consist primarily of promising breeding nursery material that is ready to be tested in replicated (PY) or non-replicated (SP) yield trials. The material in these trials was screened for agronomic and grain characteristics in nurseries prior to this phase of testing. Promising experimental lines were evaluated for seedling vigor, maturity, plant height, lodging resistance, grain yield of main and ratoon crops, whole and total milling percentages, and disease resistance.

These tests were conducted using standard agronomic practices (except that no fungicide was applied) at the Rice Research Station in Crowley, Louisiana. A randomized complete block design was used for the replicated PY trials, and a completely randomized design was used for the non-replicated SP trials to arrange the test entries. Plots were 4.66 x 16 ft and two replications were used in the PY trials only. Varieties were drill seeded at 90 lb/A on March 17 and harvested on August 12 and 13. Dr. Don Groth and the Rice Pathology Project provided the disease ratings for sheath blight, bacterial panicle blight, and rotten neck blast.

| Trial | Group | Entry No. | Type |
|---|---|---|---|
| PY | 1 | 501-525 | Long grain |
| PY | 2 | 526-550 | Long grain |
| PY | 3 | 551-575 | Long grain |
| PY | 4 | 576-600 | Long grain |
| PY | 5 | 601-625 | Long grain |
| PY | 6 | 626-650 | Long grain |
| PY | 7 | 651-675 | Long grain |
| PY | 8 | 676-700 | Long grain |
| PY | 9 | 701-725 | Long grain |
| PY | 10 | 726-750 | Long grain |
| PY | 11 | 751-775 | Long grain |
| PY | 12 | 776-800 | Long grain |
| PY | 13 | 801-825 | Specialty |
| PY | 14 | 826-850 | Medium grain |
| PY | 15 | 851-875 | Medium grain |
| SP | 1 | 1-50 | Long grain |
| SP | 2 | 51-250 | Long grain and Specialty |
| SP | 3 | 251-325 | Medium grain |

PY Groups 1 to 8 and SP Group 1 will be presented in Tables 1 to 9 in this section. In the “Development of Improved Long-Grain and Special Purpose Rice Varieties for Louisiana” section, PY Groups 9 to 13 are presented. In the “Medium-Grain Rice Breeding” section, PY Groups 14 to 15 and SP Group 3 are presented.

**Table 1.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Preliminary Yield Trial, Group 1, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 525 | TRENASSE | 84 | 6599 | 61.7 | 67.6 | 8 | 6 | 2.5 |
| 523 | 9502008/KBNT//CPRS/LGRU | 93 | 6146 | 69.1 | 73.5 | 6 | 3 | 3 |
| 520 | 9502008/3/CPRS//82CAY21/…/4/CPRS | 96 | 5239 | 66.8 | 71.2 | 7 | 4 | 4 |
| 521 | 9502008/3/CPRS//82CAY21/…/4/LM-1 | 96 | 5108 | 59.4 | 67.7 | 6.5 | 2.5 | 3 |
| 518 | KATY/CPRS//NWBT/KATY | 94 | 4901 | 54.9 | 69.0 | 7 | 4 | 3.5 |
| 506 | CCDR/9901081 | 92 | 4896 | 62.6 | 69.7 | 6.5 | 4 | 5 |
| 517 | CPRS/LGRU//AR 1142/JODN | 93 | 4827 | 56.1 | 69.2 | 6.5 | 3.5 | 3.5 |
| 507 | LMNT/WELLS | 94 | 4664 | 64.5 | 71.8 | 8 | 4.5 | 3 |
| 522 | 9502008/KBNT//CPRS/LGRU | 91 | 4582 | 68.1 | 72.2 | 7.5 | 4 | 3 |
| 508 | CPRS/9901081 | 92 | 4571 | 67.1 | 72.8 | 7.5 | 6 | 4.5 |
| 503 | CCDR/4/CPRS/3/MBLE//LMNT/… | 90 | 4481 | 64.8 | 71.0 | 7.5 | 4.5 | 4.5 |
| 511 | NWBT/KATY/3/82CAY21/../4/DREW | 93 | 4440 | 68.6 | 73.1 | 7.5 | 3 | 4 |
| 501 | MILL/4/AR 1179/3/CPRS/… | 94 | 4341 | 60.9 | 70.6 | 6 | 3.5 | 2 |
| 524 | CCDR/JKSN | 91 | 4314 | 66.2 | 71.4 | 7.5 | 4 | 4 |
| 512 | WELLS//LGRU/JODN | 93 | 4197 | 61.4 | 69.6 | 6 | 3.5 | 5.5 |
| 513 | KATY/CPRS//NWBT/3/CCDR | 96 | 4122 | 67.5 | 71.9 | 6.5 | 3.5 | 5 |
| 516 | KATY/CPRS//NWBT/KATY | 95 | 4016 | 53.2 | 73.7 | 7.5 | 4.5 | 4 |
| 502 | 9302065/CPRS | 96 | 3952 | 66.6 | 71.8 | 7 | 6 | 2.5 |
| 515 | FRAN//9502008/KBNT | 94 | 3791 | 63.4 | 71.0 | 6.5 | 4 | 3 |
| 510 | AR 1188/CCDR//9502008/LGRU | 91 | 3679 | 64.2 | 71.2 | 7 | 3.5 | 5.5 |
| 519 | 9002207X2/LGRU//CCDR | 91 | 3651 | 67.4 | 72.2 | 8 | 2.5 | 3.5 |
| 504 | CCDR//AR 1188/CCDR | 92 | 3586 | 64.6 | 71.0 | 7.5 | 4.5 | 4.5 |
| 514 | CCDR/3/NWBT/KATY//CPRS | 93 | 3408 | 66.8 | 71.1 | 7.5 | 5 | 4.5 |
| 509 | AR 1188/CCDR//9502008/LGRU | 92 | 3404 | 61.3 | 69.9 | 8 | 4 | 6 |
| 505 | CCDR/9901081 | 94 | 2997 | 60.7 | 68.2 | 6.5 | 5 | 3 |
| c.v. % | | 2.5 | 14.6 | 4.2 | 1.6 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 4.7 | 1327 | 6.5 | 2.8 | 1.2 | 1.5 | 1.7 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 2.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Preliminary Yield Trial, Group 2, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| 549 | KATY/CPRS//NWBT/KATY/3/CPRS | 93 | 5172 | 68.4 | 72.4 | 7.5 | 3.5 | 4 |
| 548 | KATY/CPRS//NWBT/KATY/3/CPRS | 93 | 5101 | 62.4 | 69.1 | 6.5 | 4 | 2.5 |
| 542 | FRAN//9502008/KBNT | 95 | 4973 | 61.7 | 70.7 | 6.5 | 6 | 5.5 |
| 546 | FRAN/TACAURI | 93 | 4619 | 61.3 | 70.1 | 6.5 | 3 | 6 |
| 547 | JODN/LMNT | 93 | 4570 | 67.5 | 71.8 | 7 | 3.5 | 4.5 |
| 545 | FRAN//CPRS/LGRU | 93 | 4493 | 65.4 | 71.6 | 6.5 | 3 | 5 |
| 534 | CPRS/KBNT//902207X2/LGRU | 97 | 4411 | 63.1 | 69.5 | 7 | 4 | 2 |
| 540 | DREW/3/KBNT//KATY/CPRS/4/WELLS | 97 | 4411 | 55.0 | 69.4 | 5.5 | 3 | 6.5 |
| 544 | FRAN//9502008/LGRU | 93 | 4262 | 67.3 | 72.6 | 7.5 | 4 | 4.5 |
| 529 | CCDR/9770532DH3 | 88 | 4171 | 63.0 | 69.8 | 7.5 | 4.5 | 5 |
| 532 | CPRS/CH1 | 96 | 4014 | 62.6 | 69.5 | 8 | 4.5 | 3.5 |
| 536 | CPRS/KBNT/4/9502008/3/CPRS//… | 93 | 3969 | 50.4 | 68.0 | 7.5 | 2.5 | 3.5 |
| 530 | CPRS/CH1 | 93 | 3865 | 66.8 | 71.3 | 7.5 | 4 | 5.5 |
| 535 | CPRS/KBNT//DREW | 96 | 3834 | 66.1 | 71.3 | 7 | 3 | 4.5 |
| 531 | CPRS/CH1 | 94 | 3801 | 62.1 | 69.7 | 7 | 4 | 6 |
| 528 | CCDR/9770532DH3 | 91 | 3793 | 66.5 | 71.5 | 6.5 | 4.5 | 4.5 |
| 541 | FRAN/DREW | 93 | 3612 | 58.1 | 68.7 | 7 | 4 | 5 |
| 539 | CPRS/LGRU//CPRS | 96 | 3451 | 67.2 | 72.4 | 7.5 | 3.5 | 4.5 |
| 538 | CPRS/LGRU//CPRS | 95 | 3403 | | | 6.5 | 4.5 | 5 |
| 533 | CPRS/CH1 | 95 | 3299 | 55.1 | 68.9 | 7 | 4.5 | 3.5 |
| 543 | FRAN//9502008/KBNT | 94 | 3204 | | | 7 | 3 | 5.5 |
| 537 | CPRS/KBNT//9502008-A/DREW | 96 | 3036 | 64.5 | 71.4 | 7 | 2.5 | 4.5 |
| 527 | CCDR/9770532DH2//EP 227 | 93 | 2881 | 64.3 | 71.4 | 8 | 4 | 3 |
| 550 | CATAHOULA | 92 | 2313 | | | 7 | 3.5 | 3.5 |
| 526 | CCDR//9502008-A/DREW | 95 | 1986 | 61.9 | 71.3 | 7 | 3.5 | 5 |
| c.v. % | | 2.1 | 23.7 | 12.4 | 3.2 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 4.1 | 1942 | 20.1 | 5.7 | 1.2 | 1.5 | 1.7 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 3.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Preliminary Yield Trial, Group 3, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 571 | CCDR//9502008-A/TACAURI | 93 | 6826 | 54.1 | 74.5 | 7 | 4 | 4.5 |
| 567 | NWBT/KATY//LCSN/3/TORO-2 | 95 | 6223 | 69.3 | 73.2 | 7 | 2.5 | 3.5 |
| 557 | LM-1//CPRS/KBNT | 95 | 5393 | 65.7 | 70.2 | 6.5 | 3.5 | 4 |
| 575 | CHENIERE | 94 | 4958 | 57.9 | 70.8 | 7.5 | 3.5 | 5 |
| 568 | WELLS/EP 144 | 95 | 4914 | 48.7 | 69.4 | 7 | 3.5 | 3 |
| 574 | CCDR/4/CPRS/3/KBNT//AR 1188 | 93 | 4784 | 65.8 | 70.7 | 7.5 | 3.5 | 6 |
| 573 | CCDR//9502008-A/TACAURI | 90 | 4763 | 66.4 | 73.0 | 8 | 4 | 4.5 |
| 560 | LM-1/4/DREW/3/9602103/CPRS//… | 97 | 4538 | 65.3 | 71.6 | 6.5 | 5 | 5 |
| 569 | MBLE/CCDR | 94 | 4355 | 64.2 | 71.2 | 7.5 | 4 | 3.5 |
| 570 | CCDR//9502008-A/TACAURI | 90 | 4198 | 64.9 | 72.1 | 8 | 3.5 | 5.5 |
| 552 | KATY/CPRS//NWBT/KATY | 96 | 4112 | 63.4 | 70.5 | 7 | 4.5 | 2.5 |
| 572 | CCDR//9502008-A/TACAURI | 90 | 4102 | 66.2 | 72.0 | 7 | 3 | 5 |
| 565 | MILL//9502008/MILL | 95 | 4027 | 56.4 | 73.2 | 6.5 | 3 | 6 |
| 566 | MILL/CCDR | 95 | 3950 | 68.0 | 72.4 | 7 | 3 | 4 |
| 553 | KATY/CPRS//NWBT/KATY | 97 | 3949 | | | 6.5 | 4 | 4 |
| 554 | KATY/CPRS//NWBT/KATY | 96 | 3905 | 62.8 | 71.0 | 6.5 | 3 | 2.5 |
| 559 | LM-1/4/DREW/3/9602103/CPRS//… | 95 | 3730 | 64.9 | 71.9 | 7.5 | 2.5 | 5.5 |
| 561 | MBLE/CCDR | 96 | 3705 | 57.6 | 68.7 | 7 | 3 | 5 |
| 556 | LGRU/ARNT | 97 | 3384 | 52.2 | 69.0 | 7 | 4.5 | 4.5 |
| 562 | MBLE/CCDR | 96 | 3279 | 68.5 | 72.9 | 8 | 3.5 | 6 |
| 551 | KATY/CPRS//NWBT/KATY/3/CPRS | 98 | 3182 | 60.1 | 69.6 | 6.5 | 4.5 | 3.5 |
| 558 | LM-1//CPRS/KBNT | 96 | 3134 | 58.0 | 68.5 | 6 | 3.5 | 4 |
| 564 | MILL//9502008/MILL | 94 | 3106 | 67.3 | 70.9 | 6.5 | 3 | 6.5 |
| 563 | MBLE/CCDR | 95 | 2872 | | | 7 | 3 | 5 |
| 555 | LGRU/WELLS | 98 | 2752 | | | 6.5 | 3 | 4.5 |
| c.v. % | | 1.6 | 14.3 | 11.7 | 1.6 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 3.2 | 1228 | 18.7 | 2.9 | 1.2 | 1.5 | 1.7 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 4.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Preliminary Yield Trial, Group 4, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 588 | TACAURI//CPRS/82CAY21/TBNT/3/CPRS//… | 92 | 5853 | 64.1 | 72.1 | 7 | 4.5 | 3 |
| 580 | TACAURI/3/CPRS//82CAY21/TBNT/4/CPRS//… | 98 | 5053 | 61.3 | 67.6 | 6 | 3 | 4 |
| 590 | TACAURI//CPRS/82CAY21/TBNT/3/CHENIERE | 97 | 4812 | 63.1 | 71.4 | 6 | 3.5 | 4 |
| 591 | KATY/CPRS//NWBT/…/3/9502008/4/CCDR | 88 | 4640 | 57.9 | 67.2 | 7.5 | 4 | 5.5 |
| 584 | TACAURI/3/CPRS//82CAY21/TBNT/4/CCDR | 96 | 4523 | 63.2 | 70.8 | 6 | 4.5 | 6 |
| 594 | 9502008/KBNT//CPRS/LGRU | 98 | 4126 | 64.0 | 71.2 | 7.5 | 4 | 4 |
| 585 | TACAURI//CPRS/82CAY21/TBNT/3/CCDR | 88 | 4042 | 63.0 | 70.6 | 7 | 4 | 6 |
| 600 | COCODRIE | 93 | 3928 | 67.6 | 73.0 | 7 | 4.5 | 5 |
| 581 | NWBT/KATY//9902207x2/3/CPRS | 97 | 3858 | 66.3 | 71.2 | 7 | 4.5 | 3.5 |
| 583 | TACAURI/3/CPRS//82CAY21/TBNT/4/CCDR | 98 | 3857 | 58.8 | 69.9 | 6.5 | 3 | 4.5 |
| 589 | TACAURI//CPRS/82CAY21/TBNT/3/CHENIERE | 97 | 3659 | 67.8 | 72.7 | 5.5 | 5 | 5 |
| 579 | TACAURI/3/CPRS//82CAY21/TBNT/4/CPRS//… | 96 | 3655 | 64.3 | 70.6 | 7.5 | 2.5 | 5 |
| 576 | 95020083CPRS//82CAY21/TBNT/3/9502008/LGRU | 93 | 3647 | 58.8 | 70.8 | 7 | 4 | 5.5 |
| 593 | 9502008//KATY/9902207x2/4/TACAURI/3/… | 95 | 3635 | 65.5 | 71.9 | 8.5 | 3 | 6.5 |
| 587 | TACAURI//CPRS/82CAY21/TBNT/4/… | 94 | 3605 | 65.2 | 71.5 | 7 | 3.5 | 5.5 |
| 592 | KATY/CPRS//NWBT/…/3/9502008/4/CCDR | 94 | 3528 | 62.5 | 70.7 | 7.5 | 4.5 | 4.5 |
| 598 | TACAURI//CPRS/82CAY21/TBNT/3/CCDR | 93 | 3422 | 68.3 | 73.1 | 6 | 4 | 6.5 |
| 597 | CPRS//CPRS/DREW | 95 | 3292 | 66.6 | 71.6 | 7.5 | 3.5 | 4.5 |
| 596 | CCDR//9502008-A/TACAURI | 96 | 3139 | | | 8 | 4.5 | 6 |
| 599 | JEFF/3/9502008//KATY/902207x2 | 94 | 3132 | 55.8 | 67.5 | 7 | 4 | 5 |
| 578 | CPRS/3/NWBT/KATY//9902207x2 | 93 | 2962 | 60.5 | 70.0 | 7.5 | 3.5 | 4.5 |
| 582 | CHENIERE/4/RXCL//LSBR33/3/RSMT/KATY | 98 | 2819 | 60.1 | 70.8 | 5.5 | 3.5 | 5 |
| 586 | TACAURI//CPRS/82CAY21/TBNT/3/CCDR | 95 | 2804 | 64.5 | 70.6 | 7 | 3 | 5 |
| 595 | 9502008/KBNT//CPRS/LGRU | 98 | 2700 | 60.7 | 69.5 | 6.5 | 2.5 | 3.5 |
| 577 | CPRS/3/NWBT/KATY//9902207x2 | 92 | 2218 | 63.2 | 71.3 | 7 | 4 | 4.5 |
| c.v. % | | 2.3 | 24 | 4.4 | 1.7 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 4.4 | 1840 | 6.6 | 2.8 | 1.2 | 1.5 | 1.7 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 5.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Preliminary Yield Trial, Group 5, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| 625 | CL 151 | 93 | 8118 | 61.7 | 68.9 | 8 | 4.5 | 5.5 |
| 621 | 9502008/LGRU/3/CPRS//82CAY21/TBNT | 94 | 7103 | 61.9 | 69.3 | 8 | 5.5 | 5 |
| 622 | 9502008/LGRU/3/CPRS//82CAY21/TBNT | 91 | 7066 | 32.1 | 69.3 | 7.5 | 4.5 | 5 |
| 610 | NWBT/KATY//9902207x2/3/CPRS | 94 | 4036 | 63.2 | 70.7 | 7.5 | 5 | 5.5 |
| 607 | FRANCIS/9302065 | 97 | 4006 | 54.0 | 72.8 | 7 | 4.5 | 4 |
| 623 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | 91 | 3905 | 36.7 | 75.0 | 7 | 3 | 4 |
| 609 | CPRS//9502008/LGRU | 97 | 3845 | | | 7.5 | 3.5 | 7 |
| 606 | CCDR/4/AR 1121/3/CPRS//82CAY21/TBNT | 95 | 3701 | 68.4 | 72.9 | 7 | 4.5 | 4.5 |
| 617 | CHENIERE/4/TACAURI/3/CPRS//82CAY21/TBNT | 96 | 3614 | 61.4 | 70.1 | 7.5 | 4 | 5 |
| 602 | CCDR/4/CPRS/3/KBNT//AR 1188 | 93 | 3556 | 67.5 | 72.6 | 7.5 | 3.5 | 5.5 |
| 615 | CHENIERE/4/CPRS/3/KBNT//AR 1188 | 98 | 3281 | 64.5 | 70.0 | 7.5 | 3.5 | 5 |
| 603 | CCDR/4/CPRS/3/KBNT//AR 1188 | 96 | 3217 | 68.8 | 72.4 | 7.5 | 4.5 | 5.5 |
| 601 | CCDR/4/CPRS//82CAY21/TBNT/3/AR 1121 | 96 | 3117 | 63.2 | 71.3 | 7.5 | 3.5 | 5 |
| 614 | CHENIERE/4/CPRS/3/KBNT//AR 1188 | 98 | 2792 | | | 7.5 | 4 | 4.5 |
| 611 | CHENIERE/4/RXCL//LSBR33/3/RSMT/KATY | 95 | 2715 | 64.5 | 72.9 | 6.5 | 4 | 2 |
| 620 | 9502008/LGRU//CCDR | 95 | 2688 | 61.0 | 68.6 | 8 | 3 | 6 |
| 604 | CCDR//CPRS//82CAY21//TBNT/3/MBLE | 94 | 2667 | 65.3 | 71.8 | 7 | 4 | 5 |
| 608 | 95020083CPRS//82CAY21/TBNT/3/L201//TBNT/… | 95 | 2512 | 62.4 | 70.0 | 7 | 4.5 | 5.5 |
| 605 | CCDR//9502008-A/TACAURI | 95 | 2501 | | | 8 | 3 | 5 |
| 618 | CPRS/DREW/4/CPRS//82CAY21/TBNT/3/AR 1121 | 96 | 2274 | | | 6 | 4 | 5.5 |
| 619 | 9502008/LGRU//CCDR | 97 | 2247 | | | 8.5 | 4 | 5.5 |
| 624 | 9502008-A/DREW//CCDR | 94 | 2190 | | | 7 | 3 | 4.5 |
| 612 | CHENIERE/4/TACAURI/3/CPRS//82CAY21/TBNT | 98 | 2083 | 63.2 | 71.8 | 7.5 | 3 | 3.5 |
| 616 | CHENIERE/CPRS | 96 | 1775 | | | 7.5 | 4 | 5.5 |
| 613 | CHENIERE/4/9502008/3/CPRS//82CAY21/TBNT | 98 | 1554 | | | 7 | 4 | 4.5 |
| c.v. % | | 1.9 | 19.8 | 5.4 | 3.9 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 3.7 | 1415 | 19.4 | 11.6 | 1.2 | 1.5 | 1.7 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 6.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Preliminary Yield Trial, Group 6, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| 644 | 902207x2/LGRU//CHENIERE | 96 | 6622 | 65.2 | 71.3 | 7 | 4 | 4 |
| 638 | TACAURI//CPRS/82CAY21/TBNT/3/NWBT/.. | 95 | 5302 | 65.0 | 70.5 | 7.5 | 4 | 4 |
| 643 | 902207x2/LGRU//JKSN | 97 | 4811 | 56.3 | 71.6 | 7.5 | 3.5 | 4.5 |
| 646 | 9502008//KATY/9902207x2/3/JEFF | 96 | 4771 | 67.2 | 70.2 | 5.5 | 3 | 1.5 |
| 635 | TACAURI//CPRS/82CAY21/TBNT/3/MBLE//TQNG/… | 92 | 4708 | 65.5 | 71.3 | 8 | 3 | 4 |
| 642 | 902207x2/LGRU//JKSN | 98 | 4704 | 62.8 | 72.0 | 6.5 | 3.5 | 3.5 |
| 639 | CPRS/3/KBNT//AR 1188/4/JEFF | 96 | 4330 | 63.9 | 68.9 | 6.5 | 4.5 | 4.5 |
| 634 | AR 1121/3/CPRS//82CAY21/TBNT/4/TACAURI//… | 89 | 4195 | 66.6 | 71.0 | 6 | 3.5 | 5 |
| 647 | 9502008//KATY/9902207x2/3MBLE//TQNG/MBLE | 91 | 4174 | 42.4 | 64.6 | 7.5 | 4 | 4 |
| 636 | TACAURI//CPRS/82CAY21/TBNT/3/FRANCIS | 94 | 4134 | 66.3 | 72.3 | 6.5 | 2.5 | 5 |
| 648 | 9502008//KATY/9902207x2/3/9502008/AR 1121 | 95 | 4040 | 57.1 | 69.9 | 6.5 | 3.5 | 4 |
| 641 | CPRS/3/KBNT//AR 1188/4/CPAR//82CAY21//… | 95 | 3876 | 64.2 | 70.6 | 7 | 4 | 5 |
| 649 | KATY/CPRS//NWBT/…/3/9502008/4/CCDR | 88 | 3664 | 60.8 | 68.6 | 7.5 | 3 | 6 |
| 631 | AR 1121/3/CPRS//82CAY21/TBNT/4/CCDR | 95 | 3591 | 67.0 | 73.6 | 5.5 | 3 | 5 |
| 637 | TACAURI//CPRS/82CAY21/TBNT/4/TACAURI/3/… | 98 | 3565 | 64.9 | 70.1 | 7.5 | 2 | 4.5 |
| 626 | 9502008-A/TACAURI//CHENIERE | 96 | 3350 | 24.9 | 72.8 | 7 | 3.5 | 4.5 |
| 628 | TACAURI/3/CPRS//82CAY21/TBNT/4/CCDR | 95 | 3333 | 62.7 | 71.9 | 7.5 | 4 | 4.5 |
| 629 | 9502008/AR 1121//CCDR | 92 | 3251 | 65.5 | 72.1 | 7 | 3.5 | 4.5 |
| 640 | CPRS/3/KBNT//AR 1188/4/JKSN | 95 | 3134 | 66.6 | 72.0 | 5.5 | 3.5 | 3 |
| 632 | AR 1121/3/CPRS//82CAY21/TBNT/4/CPRS | 97 | 3133 | 59.2 | 69.7 | 8 | 3 | 4.5 |
| 645 | 9502008//KATY/9902207x2/3/JEFF | 97 | 2999 | 62.3 | 69.0 | 5.5 | 3.5 | 2.5 |
| 627 | TACAURI/3/CPRS//82CAY21/TBNT/4/MBLE | 97 | 2993 | 62.6 | 69.6 | 7 | 3.5 | 5 |
| 630 | AR 1121/3/CPRS//82CAY21/TBNT/4/TACAURI | 96 | 2705 | 67.7 | 72.7 | 6.5 | 3 | 4.5 |
| 633 | AR 1121/3/CPRS//82CAY21/TBNT/4/9502008-A/… | 98 | 2618 | 63.0 | 72.2 | 8 | 3 | 4 |
| 650 | CYPRESS | 95 | 2291 | | | 8 | 5.5 | 4 |
| c.v. % | | 2.7 | 22.2 | 7.6 | 1.7 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 5.3 | 1766 | 12.4 | 3.2 | 1.2 | 1.5 | 1.7 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 7.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Preliminary Yield Trial, Group 7, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| 665 | CHENIERE/LMNT | 92 | 6758 | 65.0 | 71.2 | 6.5 | 4.5 | 4 |
| 669 | 9502008//KATY/902207X2/3/LMNT | 94 | 5386 | 58.2 | 68.3 | 6 | 4 | 4 |
| 658 | CPRS//82CAY21/TBNT/3/… | 94 | 5310 | 65.7 | 72.2 | 7 | 5 | 3.5 |
| 673 | 9502008-A/DREW//FRANCIS | 86 | 4751 | 62.7 | 70.9 | 8 | 3 | 5 |
| 671 | 9502008//KATY/902207X2/3/SABER | 92 | 4245 | 64.8 | 69.4 | 8 | 3 | 2.5 |
| 670 | 9502008//KATY/902207X2/3/CPRS/KBNT | 95 | 4166 | 63.1 | 68.9 | 6.5 | 4 | 2.5 |
| 667 | CHENIERE//9502008-A/R 1121 | 93 | 4109 | 65.5 | 71.6 | 8 | 4 | 5 |
| 668 | 9502008//KATY/902207X2/3/LMNT | 93 | 3991 | 65.9 | 71.4 | 7.5 | 3.5 | 4 |
| 657 | CPRS//82CAY21/TBNT/3/… | 96 | 3907 | 65.6 | 70.4 | 8 | 4 | 4 |
| 672 | 9502008//KATY/902207X2/3/SABER | 92 | 3683 | 63.8 | 69.3 | 7 | 3 | 4 |
| 666 | CHENIERE//9502008-A/R 1121 | 93 | 3673 | 65.4 | 72.6 | 7 | 3.5 | 5 |
| 661 | 9502008//KATY/902207X2/3/… | 96 | 3406 | 58.4 | 69.2 | 6.5 | 4 | 5.5 |
| 663 | 9502008//KATY/902207X2/3/… | 98 | 3353 | 66.3 | 70.6 | 7 | 3.5 | 4 |
| 662 | 9502008//KATY/902207X2/3/… | 99 | 3176 | 62.8 | 70.3 | 5.5 | 4.5 | 2 |
| 652 | KATY/CPRS//NWBT/…/3/9502008/4/9602082/… | 95 | 3115 | 66.1 | 71.7 | 6.5 | 4.5 | 2.5 |
| 675 | WELLS | 96 | 3100 | | | 6.5 | 5 | 5.5 |
| 674 | LGRU/WELLS//LGRU | 96 | 3098 | 56.7 | 69.8 | 5.5 | 4 | 4.5 |
| 659 | CPRS//82CAY21/TBNT/3/… | 95 | 2944 | | | 6.5 | 4 | 4 |
| 651 | KATY/CPRS//NWBT/…/3/9502008/4/9602082/… | 93 | 2872 | 58.3 | 69.4 | 8 | 4 | 5.5 |
| 654 | 9502008//KATY/9902207x2/4/TACAURI/3/… | 98 | 2774 | | | 7.5 | 4.5 | 6.5 |
| 656 | CCDR/4/KATY/CPRA//NWBT/… | 93 | 2707 | 67.8 | 72.1 | 7 | 3.5 | 3 |
| 655 | CCDR/4/KATY/CPRA//NWBT/… | 94 | 2685 | 63.9 | 70.4 | 8 | 3.5 | 4.5 |
| 664 | 9502008//KATY/9902207x2/3/MBLE//… | 97 | 2513 | 61.2 | 68.2 | 7 | 4 | 4 |
| 660 | CHENIERE/3/CCDR//AR 1142/… | 98 | 2493 | | | 6.5 | 3.5 | 5.5 |
| 653 | KATY/CPRS//NWBT/…/3/9502008/4/NWBT/… | 99 | 2363 | 59.2 | 69.2 | 7 | 3.5 | 5 |
| c.v. % | | 2.5 | 21.3 | 5.7 | 2.6 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 4.9 | 1590 | 11.4 | 5.7 | 1.2 | 1.5 | 1.7 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 8.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Preliminary Yield Trial, Group 8, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| 695 | CH1/3/CPRS//82CAY21/TBNT/4/CCDR | 83 | 4723 | 63.5 | 70.4 | 7.5 | 3.5 | 6.5 |
| 683 | 9502008/AR1121//9502008/3/MBLE//LMNT/… | 94 | 4686 | 65.2 | 71.5 | 8 | 3.5 | 4.5 |
| 682 | 9502008/AR1121//CPRS/KBNT | 92 | 4647 | 65.3 | 71.5 | 6 | 4 | 3 |
| 680 | 9502008/AR1121//CPRS//82CAY21/TBNT | 92 | 4605 | 66.7 | 72.2 | 8 | 4 | 5 |
| 697 | CPRS/9502008-A//9502008-A/DREW | 85 | 4535 | 64.8 | 71.0 | 8 | 3.5 | 4.5 |
| 681 | 9502008/AR1121//CPRS/KBNT | 92 | 4268 | 60.9 | 71.3 | 6.5 | 4 | 5.5 |
| 688 | 9502008/AR1121//CH1/3/CPRS//82CAY21/TBNT | 93 | 4218 | 65.0 | 70.4 | 7 | 4 | 5 |
| 689 | 9502008/AR1121//CPRS/KBNT | 93 | 4109 | 63.8 | 68.8 | 7 | 4 | 5.5 |
| 684 | 9502008/AR1121//9502008/3/MBLE//LMNT/… | 90 | 4096 | 61.1 | 69.0 | 8 | 3.5 | 5 |
| 698 | CPRS/9502008-A//9502008-A/DREW | 88 | 4093 | 62.5 | 70.0 | 6.5 | 4 | 5 |
| 687 | 9502008/AR1121//CPRS//82CAY21/TBNT/3/… | 96 | 4070 | 65.8 | 70.6 | 7 | 3.5 | 4 |
| 691 | 9502008/AR1121//DREW/3/CPRS//82CAY21/TBNT | 93 | 4030 | 66.1 | 72.2 | 7.5 | 3.5 | 4.5 |
| 678 | LGRU/WELLS//CPRS//82CAY21/TBNT/3/AR 1179 | 93 | 3882 | 64.6 | 71.6 | 7 | 4.5 | 5.5 |
| 694 | CH1/3/CPRS//82CAY21/TBNT/4/CCDR | 91 | 3870 | 63.7 | 71.1 | 7 | 4 | 5.5 |
| 676 | LGRU/WELLS//CHENIERE | 93 | 3808 | 48.9 | 67.0 | 6.5 | 3.5 | 5 |
| 692 | 9502008/AR1121//DREW/3/CPRS//82CAY21/TBNT | 91 | 3730 | 63.6 | 71.8 | 8 | 3.5 | 5 |
| 690 | 9502008/AR1121//DREW/3/CPRS//82CAY21/TBNT | 94 | 3690 | 59.9 | 70.2 | 7 | 3.5 | 3 |
| 679 | 9502008/AR1121//KATY/CPRS//NWBT/…/3/… | 94 | 3615 | 64.1 | 71.2 | 8.5 | 5.5 | 4.5 |
| 693 | 9502008/AR1121//MILL | 92 | 3480 | 60.6 | 70.9 | 6.5 | 4.5 | 4.5 |
| 677 | LGRU/WELLS//CHENIERE | 93 | 3386 | 46.0 | 69.7 | 7 | 4.5 | 6 |
| 700 | BOWMAN | 98 | 3353 | 55.7 | 67.3 | 5.5 | 4 | 5.5 |
| 696 | CPRS/9502008-A//FRANCIS | 91 | 3320 | 57.4 | 69.9 | 7.5 | 3.5 | 4.5 |
| 686 | 9502008/AR1121//CPRS//82CAY21/TBNT/3/… | 93 | 3158 | 66.3 | 71.3 | 7.5 | 3.5 | 5 |
| 685 | 9502008/AR1121//CPRS//82CAY21/TBNT/3/… | 94 | 2852 | 63.2 | 69.9 | 8.5 | 3 | 5.5 |
| 699 | 902207X2//NWBT/KATY/3/CPRS/KBNT/4/… | 91 | 2843 | 64.0 | 72.0 | 6 | 4 | 3 |
| c.v. % | | 3.8 | 27.0 | 5.6 | 1.9 | 8.8 | 20.0 | 19.1 |
| $LSD_{0.05}$ | | 7.1 | 2160 | 7.5 | 3.0 | 1.2 | 1.5 | 1.7 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 9.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Single-Plot Grain Yield Trial, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 08SP 050 | TRENASSE | 84 | 8865 | 62.0 | 70.6 | 8.5 | 5 | 2.5 |
| 08SP 008 | CPRS/KBNT//CPRS | 88 | 5931 | 69.0 | 72.5 | 6 | 4 | 3.5 |
| 08SP 003 | KATY/CPRS//NWBT/3/CCDR | 93 | 5533 | 62.5 | 70.1 | 4 | 3 | 3.5 |
| 08SP 001 | SABER//AR 1188/CCDR | 92 | 5200 | 60.7 | 67.4 | 6.5 | 4.5 | 1.5 |
| 08SP 009 | CPRS/KBNT/4/9502008/3/CPRS//… | 93 | 5078 | 67.2 | 72.9 | 8.5 | 5 | 3 |
| 08SP 002 | AR 1179/3/CPRS//…/4/WELLS | 96 | 5046 | 58.4 | 71.3 | 5.5 | 4 | 2 |
| 08SP 012 | SABER/4/KATY/NWBT/3/LBNT/9902///… | 94 | 5031 | 63.1 | 69.4 | 6.5 | 5 | 3.5 |
| 08SP 006 | CCDR/JEFF | 83 | 5014 | 65.6 | 70.4 | 8 | 2 | 5 |
| 08SP 007 | CCDR/9770532DH2/3/LGRU//KATY/STBN | 82 | 4989 | 65.8 | 70.4 | 8.5 | 5 | 3 |
| 08SP 040 | TACAURI//CPRS/82CAY21/TBNT/4/TACAURI/3/… | 93 | 4865 | 60.7 | 70.9 | 7 | 4 | 3.5 |
| 08SP 049 | 9502008//KATY/902207X2/3/… | 94 | 4863 | 65.0 | 70.9 | 7 | 4 | 3 |
| 08SP 023 | 9502008-A/DREW/3/NWBT/KATY//9902207x2 | 84 | 4790 | 64.2 | 73.4 | 6 | 5.5 | 3.5 |
| 08SP 042 | KATY/CPRS//NWBT/…/3/9502008/4/CCDR | 93 | 4598 | 59.7 | 70.3 | 8 | 4 | 4 |
| 08SP 020 | CPRS//9502008-A/DREW | 85 | 4404 | 65.6 | 72.8 | 7.5 | 5 | 5 |
| 08SP 045 | 9502008//KATY/9902207x2/3/AHRENT | 94 | 4348 | 61.5 | 69.6 | 8 | 2.5 | 4.5 |
| 08SP 005 | CCDR/ARNT | 91 | 4346 | 64.4 | 71.5 | 7 | 3.5 | 4 |
| 08SP 044 | 9502008//KATY/9902207x2/3/JEFF | 94 | 4334 | 66.0 | 71.9 | 8 | 4 | 4 |
| 08SP 043 | 9502008//KATY/9902207x2/3/JKSN | 93 | 4103 | 63.2 | 70.0 | 5.5 | 4.5 | 2.5 |
| 08SP 018 | CPRS/3/NWBT/KATY//9902207x2 | 93 | 4092 | 70.6 | 72.9 | 7 | 4 | 4 |
| 08SP 011 | MILL/4/DREW/3/9602103/CPRS//… | 88 | 4006 | 66.3 | 71.3 | 7 | 4 | 4.5 |
| 08SP 047 | 9502008//KATY/9902207x2/3/AC105DH2/… | 92 | 3865 | 63.9 | 71.5 | 8.5 | 3.5 | 4 |
| 08SP 010 | LGRU//CPRS/KBNT | 93 | 3825 | 24.6 | 69.3 | 7.5 | 5 | 3.5 |
| 08SP 048 | CPRS//9502008-A/DREW | 93 | 3800 | 63.9 | 69.9 | 8.5 | 3.5 | 4.5 |
| 08SP 022 | NWBT/KATY//9902207x2/3/9502008-A/DREW | 85 | 3758 | 63.3 | 71.8 | 8 | 3.5 | 5 |
| 08SP 034 | KATY/CPRS//NWBT/…/3/9502008/4/CCDR | 95 | 3594 | 64.1 | 70.9 | 7.5 | 6 | 5 |
| 08SP 019 | CPRS//9502008-A/DREW | 89 | 3592 | 64.5 | 69.7 | 8 | 3.5 | 5 |
| 08SP 004 | 9502008/3/CPRS//82CAY21/…/4/LM-1 | 82 | 3586 | 63.8 | 69.5 | 7.5 | 5 | 4.5 |
| 08SP 025 | CATAHOULA | 88 | 3583 | 55.9 | 70.4 | 8 | 3.5 | 3 |
| 08SP 017 | CPRS/3/NWBT/KATY//9902207x2 | 89 | 3437 | 52.6 | 64.4 | 6.5 | 5.5 | 6 |
| 08SP 021 | NWBT/KATY//9902207x2/3/CCDR | 86 | 3434 | 60.6 | 69.5 | 7 | 3 | 3.5 |
| 08SP 032 | TACAURI//CPRS/82CAY21/TBNT/3/CHENIERE | 95 | 3141 | 63.1 | 70.8 | 8 | 3 | 4 |
| 08SP 041 | 902207x2/LGRU/4/TACAURI/3/CPRS//82CAY21/… | 92 | 3051 | 57.6 | 71.7 | 6.5 | 5 | 5 |
| 08SP 016 | FRANCIS/9302065 | 96 | 2984 | 62.0 | 69.9 | 6.5 | 3 | 2.5 |
| 08SP 014 | CCDR/4/CPRS/3/KBNT//AR 1188 | 90 | 2941 | . | . | 6.5 | 5.5 | 5 |
| 08SP 038 | CHENIERE/4/TACAURI/3/CPRS//82CAY21/TBNT | 95 | 2927 | . | . | 6.5 | 2.5 | 3.5 |
| 08SP 031 | AR 1121/3/CPRS//82CAY21/TBNT/4/… | 93 | 2924 | 64.0 | 71.1 | 5.5 | 4 | 4.5 |
| 08SP 028 | AR 1121/3/CPRS//82CAY21/TBNT/4/TACAURI | 94 | 2890 | 58.4 | 69.9 | 8 | 3 | 4.5 |

Continued.

**Table 9.** Continued.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Total | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| 08SP 033 | 9502008//KATY/9902207x2/3MBLE//TQNG/MBLE | 93 | 2849 | 59.1 | 66.3 | 7 | 5 | 3 |
| 08SP 024 | TACAURI/3/CPRS//82CAY21/TBNT/4/CCDR | 94 | 2835 | 65.4 | 72.6 | 7 | 3.5 | 2.5 |
| 08SP 046 | 9502008//KATY/9902207x2/4/TACAURI/3/… | 93 | 2822 | 59.6 | 70.8 | 6 | 4.5 | 5 |
| 08SP 013 | 9302065/LGRU | 96 | 2765 | 60.2 | 71.0 | 7 | 5.5 | 3 |
| 08SP 030 | AR 1121/3/CPRS//82CAY21/TBNT/4/… | 96 | 2675 | 63.7 | 71.9 | 6 | 2.5 | 3 |
| 08SP 015 | CCDR/4/AR 1121/3/CPRS//82CAY21/TBNT | 90 | 2663 | 63.3 | 73.4 | 7.5 | 2.5 | 5 |
| 08SP 035 | 9502008//KATY/9902207x2/3/MBLE | 96 | 2555 | . | . | 8 | 3.5 | 4 |
| 08SP 027 | AR 1121/3/CPRS//82CAY21/TBNT/4/TACAURI | 96 | 2341 | 55.3 | 70.4 | 6 | 3.5 | 5.5 |
| 08SP 026 | TACAURI/3/CPRS//82CAY21/TBNT/4/CCDR | 94 | 2328 | 59.9 | 70.7 | 7 | 5 | 4 |
| 08SP 039 | 9502008/AR 1121//CPRS/(KATY//GFMT/PCOS) | 92 | 2039 | . | . | 7 | 4.5 | 3 |
| 08SP 036 | CCDR//9502008-A/TACAURI | 94 | 2017 | . | . | 7 | 2.5 | 4.5 |
| 08SP 029 | AR 1121/3/CPRS//82CAY21/TBNT/4/CCDR | 95 | 1641 | . | . | 6 | 4.5 | 5 |
| 08SP 037 | CCDR/4/CPRS/3/KBNT//AR 1188 | 96 | 1501 | . | . | 8.5 | 5 | 3.5 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

## DATE OF PLANTING STUDIES

The purpose of these trials is to determine the grain yield, milling quality, and other agronomic characteristics of major rice varieties, experimental lines, and hybrids planted at various times. The choice of planting date can significantly impact rice growth, development, and yield, and the information generated from these trials is important for understanding the impact on important economic and production characteristics associated with rice production.

**Experiment**: Date of Planting

**Location**: Rice Research Station, Crowley, Louisiana

**Planting Method**: Water seeded

**Plot size**: 4.66 x 16 ft

**Planting Dates**: March 14, April 1, May 1, May 15, May 30, July 3

**Entries**: Catahoula, Cheniere, CL131, CL151, CL161, CL171, Cocodrie, LA0802002 (URN002), 08CY005 (CY005), Jupiter, Neptune, and Jazzman

**Experimental Design**: Randomized complete block design with three replications

**Results**: Results can be found in Tables 1 to 5, which are arranged across planting dates.

**Table 1.** Grain yields† of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| | Planting Date | | | | | | |
|---|---|---|---|---|---|---|---|
| **Entry** | **Mar 14** | **Apr 1** | **May 1** | **May 15** | **May 30** | **July 3** | **Mean** |
| 08URN 002 | 1998 | 6190 | 8132 | 5501 | 4131 | 3488 | 4907 |
| CATAHOULA | 901 | 3209 | 8048 | 5347 | 4226 | 2564 | 4049 |
| CHENIERE | 3112 | 3894 | 8025 | 5065 | 4656 | 3256 | 4668 |
| CL131 | 2346 | 5808 | 7572 | 5762 | 4064 | 2656 | 4701 |
| CL151 | 4001 | 7285 | 8367 | 5598 | 4842 | 3885 | 5663 |
| CL161 | 2854 | 7924 | 7783 | 5548 | 4013 | 3326 | 5241 |
| CL171 | 4826 | 6291 | 6953 | 4848 | 3472 | 3318 | 4951 |
| COCODRIE | 1360 | 2898 | 8175 | 5110 | 4414 | 3101 | 4176 |
| CY 005 | 2494 | 5953 | 7740 | 6387 | 4325 | 3196 | 5016 |
| JUPITER | 2015 | 3830 | 8648 | 5284 | 4856 | 3984 | 4770 |
| JAZZMAN | 610 | 2804 | 5634 | 4589 | 3507 | 2811 | 3326 |
| NEPTUNE | 165 | 1014 | 8840 | 6096 | 4259 | 3249 | 3937 |
| Mean | 2224 | 4758 | 7826 | 5428 | 4230 | 3236 | 4591 |
| c.v. % | 42.7 | 19.5 | 9.4 | 9.8 | 9.0 | 8.7 | - |
| $LSD_{0.05}$ | 1613 | 1648 | 1250 | 900 | 642 | 510 | - |

† Yield is in pounds of rough rice per acre at 12% moisture.

**Table 2.** Seedling vigor† of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| | Planting Date | | | | | | |
|---|---|---|---|---|---|---|---|
| **Entry** | **Mar 14** | **Apr 1** | **May 1** | **May 15** | **May 30** | **July 3** | **Mean** |
| 08URN 002 | 6 | 3 | 3 | 3 | 5 | 4 | 4 |
| CATAHOULA | 7 | 6 | 4 | 5 | 7 | 5 | 6 |
| CHENIERE | 5 | 5 | 4 | 5 | 7 | 5 | 5 |
| CL131 | 6 | 4 | 3 | 4 | 4 | 5 | 4 |
| CL151 | 5 | 3 | 3 | 4 | 5 | 4 | 4 |
| CL161 | 5 | 3 | 3 | 4 | 5 | 4 | 4 |
| CL171 | 4 | 3 | 3 | 4 | 4 | 4 | 4 |
| COCODRIE | 5 | 6 | 4 | 4 | 6 | 4 | 5 |
| CY 005 | 5 | 3 | 3 | 3 | 4 | 5 | 4 |
| JUPITER | 6 | 6 | 4 | 6 | 6 | 7 | 6 |
| JAZZMAN | 7 | 6 | 5 | 5 | 5 | 5 | 6 |
| NEPTUNE | 7 | 7 | 4 | 5 | 7 | 6 | 6 |
| Mean | 6 | 5 | 4 | 4 | 5 | 5 | 5 |
| c.v. % | 12.4 | 13.5 | 12.5 | 17.4 | 14.1 | 18.3 | - |
| $LSD_{0.05}$ | 1.2 | 1.1 | 0.8 | 1.3 | 1.3 | 1.5 | - |

† Subjective rating of 1 to 9 where 1 is the highest seedling vigor and 9 is the lowest seedling vigor.

**Table 3.** Days to 50% heading of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| | Planting Date | | | | | | |
|---|---|---|---|---|---|---|---|
| **Entry** | **Mar 14** | **Apr 1** | **May 1** | **May 15** | **May 30** | **July 3** | **Mean** |
| 08URN 002 | 90 | 89 | 80 | 71 | 69 | 64 | 77 |
| CATAHOULA | 98 | 92 | 80 | 71 | 66 | 63 | 78 |
| CHENIERE | 90 | 90 | 82 | 72 | 67 | 66 | 78 |
| CL131 | 90 | 93 | 77 | 71 | 69 | 65 | 78 |
| CL151 | 88 | 90 | 79 | 71 | 67 | 68 | 77 |
| CL161 | 92 | 92 | 81 | 75 | 70 | 67 | 80 |
| CL171 | 89 | 95 | 81 | 74 | 67 | 67 | 79 |
| COCODRIE | 92 | 93 | 77 | 69 | 64 | 63 | 76 |
| CY 005 | 82 | 88 | 76 | 68 | 67 | 64 | 74 |
| JUPITER | 98 | 94 | 81 | 72 | 74 | 69 | 81 |
| JAZZMAN | 107 | 104 | 82 | 72 | 73 | 69 | 85 |
| NEPTUNE | 102 | 101 | 79 | 73 | 73 | 69 | 83 |
| Mean | 93 | 93 | 80 | 72 | 69 | 66 | 79 |
| c.v. % | 3.6 | 1.7 | 3.0 | 1.3 | 2.4 | 1.5 | - |
| $LSD_{0.05}$ | 5.7 | 2.8 | 4.0 | 1.6 | 2.8 | 1.7 | - |

**Table 4.** Plant height† of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| Entry | Planting Date Mar 14 | Apr 1 | May 1 | May 15 | May 30 | July 3 | Mean |
|---|---|---|---|---|---|---|---|
| 08URN 002 | 31 | 35 | 39 | 36 | 36 | 30 | 35 |
| CATAHOULA | 28 | 32 | 38 | 35 | 33 | 28 | 32 |
| CHENIERE | 30 | 31 | 37 | 34 | 34 | 29 | 33 |
| CL131 | 27 | 33 | 34 | 32 | 31 | 26 | 31 |
| CL151 | 32 | 36 | 37 | 37 | 33 | 29 | 34 |
| CL161 | 32 | 37 | 39 | 36 | 36 | 31 | 35 |
| CL171 | 33 | 36 | 39 | 38 | 35 | 30 | 35 |
| COCODRIE | 30 | 31 | 37 | 35 | 34 | 27 | 32 |
| CY 005 | 30 | 34 | 38 | 38 | 35 | 28 | 34 |
| JUPITER | 32 | 34 | 37 | 35 | 35 | 31 | 34 |
| JAZZMAN | 32 | 37 | 40 | 39 | 39 | 32 | 37 |
| NEPTUNE | 24 | 31 | 34 | 34 | 33 | 26 | 30 |
| Mean | 30 | 34 | 37 | 36 | 35 | 29 | 33 |
| c.v. % | 6.9 | 5.1 | 2.7 | 4.0 | 4.7 | 3.4 | - |
| $LSD_{0.05}$ | 3.5 | 2.9 | 1.7 | 2.4 | 2.8 | 1.6 | - |

† Plant height in inches from the soil surface to the tip of the main panicle.

**Table 5.** Whole milling percentage† of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| Entry | Planting Date Mar 14 | Apr 1 | May 1 | May 15 | May 30 | July 3 | Mean |
|---|---|---|---|---|---|---|---|
| 08URN 002 | 59.0 | 64.3 | 62.9 | 60.8 | 51.5 | 65.1 | 61 |
| CATAHOULA | 60.3 | 57.5 | 60.5 | 61.4 | 53.9 | 61.5 | 59 |
| CHENIERE | 58.6 | 60.7 | 59.1 | 62.8 | 55.6 | 66.7 | 61 |
| CL131 | 61.9 | 65.8 | 63.9 | 66.6 | 44.3 | 67.4 | 62 |
| CL151 | 58.1 | 61.0 | 61.6 | 58.9 | 50.4 | 62.3 | 59 |
| CL161 | 59.0 | 66.4 | 60.9 | 62.6 | 54.5 | 63.9 | 61 |
| CL171 | 59.5 | 65.8 | 62.1 | 56.9 | 45.2 | 57.7 | 58 |
| COCODRIE | 61.4 | 63.2 | 61.6 | 62.8 | 54.1 | 62.8 | 61 |
| CY 005 | 65.1 | 60.7 | 64.2 | 63.3 | 60.8 | 65.9 | 63 |
| JUPITER | 66.6 | 60.8 | 57.6 | 62.6 | 53.7 | 63.6 | 61 |
| JAZZMAN | 63.8 | 62.7 | 48.9 | 51.6 | 36.4 | 61.1 | 54 |
| NEPTUNE | 67.6 | 61.2 | 59.5 | 67.3 | 44.0 | 68.0 | 61 |
| Mean | 62 | 63 | 60 | 61 | 50 | 64 | 60 |
| c.v. % | 4.3 | 4.6 | 5.0 | 5.7 | 14.9 | 4.1 | - |
| $LSD_{0.05}$ | 5.8 | 6.3 | 6.7 | 7.8 | 16.5 | 5.8 | - |

† The percentage of unbroken grains after removal of the hulls and broken grains.

**Table 6.** Total milling percentage† of 12 rice varieties and experimental lines planted over six planting dates, 2008. Rice Research Station, Crowley, LA.

| | Planting Date | | | | | | |
|---|---|---|---|---|---|---|---|
| **Entry** | **Mar 14** | **Apr 1** | **May 1** | **May 15** | **May 30** | **July 3** | **Mean** |
| 08URN 002 | 69.6 | 71.0 | 69.0 | 68.6 | 65.6 | 71.9 | 69 |
| CATAHOULA | 72.3 | 71.9 | 69.6 | 71.7 | 67.0 | 72.7 | 71 |
| CHENIERE | 71.4 | 70.8 | 66.4 | 71.0 | 67.9 | 72.0 | 70 |
| CL131 | 70.2 | 71.1 | 69.8 | 71.7 | 66.2 | 72.8 | 70 |
| CL151 | 67.9 | 67.8 | 68.9 | 69.3 | 67.2 | 69.9 | 69 |
| CL161 | 69.5 | 70.3 | 68.1 | 68.8 | 63.7 | 70.6 | 69 |
| CL171 | 69.4 | 70.6 | 68.4 | 69.0 | 58.9 | 69.9 | 68 |
| COCODRIE | 71.8 | 70.5 | 68.7 | 71.5 | 64.5 | 71.9 | 70 |
| CY 005 | 70.0 | 68.3 | 69.0 | 68.7 | 67.0 | 70.7 | 69 |
| JUPITER | 70.7 | 64.3 | 62.5 | 66.1 | 67.3 | 70.4 | 67 |
| JAZZMAN | 70.2 | 67.3 | 61.3 | 64.7 | 56.2 | 68.2 | 65 |
| NEPTUNE | 72.8 | 71.3 | 64.5 | 71.1 | 63.3 | 74.3 | 70 |
| Mean | 70 | 70 | 67 | 69 | 65 | 71 | 69 |
| c.v. % | 1.4 | 1.7 | 3.1 | 2.3 | 2.1 | 1.2 | - |
| $LSD_{0.05}$ | 2.1 | 2.5 | 4.5 | 3.6 | 3.0 | 1.8 | - |

† The cumulative percentage of broken and unbroken grains after removal of the hulls.

## CLEARFIELD EXPERIMENTAL LINES

S.D. Linscombe, S.B. Blanche, X.Y. Sha, K.F. Bearb, C.A. Conner, B.W. Theunissen,
S.J. Theunissen, R. Dilly Jr., B.J. Henry, and H.L. Hoffpauir

The Clearfield technology allows for a broad-spectrum application of NewPath (*imazethapyr*) herbicide to be used in a program to selectively eliminate red rice in a commercial rice field. Since the majority of the current Clearfield rice acreage was planted with CL161 (a Cypress mutant), there is a great potential to improve Clearfield rice production by the development of improved Clearfield varieties.

The Rice Breeding Project at the LSU AgCenter's Rice Research Station (RRS) has been actively involved in the development of new Clearfield lines that combine the high level of herbicide resistance, high yield potential, and good agronomic characteristics. Because of the limitations of both mutation and backcross breeding, conventional pedigree breeding has continued to be the primary method for the development of new Clearfield rice varieties. Crosses are continuously made to combine the high level of *imazethapyr* resistance of CL161 and its derived experimental lines with high yield potential of conventional long-grain varieties or lines. On- and off-station (in-farm) trials were conducted to evaluate these lines in a typical breeding trial for yield, milling, and agronomic performance. These trials were also treated with the herbicide Newpath to evaluate resistance levels. In each of the trials, *imazethapyr* was applied at a rate of 0.126 lb ai/A at emergence after drill seeding, then again at the 3- to 4-leaf stage.

In 2008, advanced yield trials, including 22 experimental Clearfield lines, along with check varieties CL131, CL161, CL151, and CL171, were tested at the RRS and four off-station locations. All on- and off-station tests were planted as companion tests to the commercial-advanced (CA) tests. Standard agronomic practices were used for all trials. The experimental design was a randomized complete block with two to three replications for each location. Plot size was 4.67 x 16 ft. Yield and agronomic performance of advanced tests are listed in Tables 1 to 5. Clearfield preliminary yield trials are listed in Tables 6 to 11.

**Table 1.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Multi-Location Yield Trial, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor[†] | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total |
|---|---|---|---|---|---|---|---|
| 019 | CL151 | 4 | 80 | 38 | 10198 | 60.9 | 68.3 |
| 017 | 9502008-A/DREW//CFX 29//… | 4 | 77 | 36 | 9910 | 64.9 | 70.2 |
| 018 | CL131 | 4 | 81 | 37 | 9869 | 64.3 | 70.5 |
| 014 | CFX-18//CCDR/9770532 DH2 | 4 | 79 | 40 | 9778 | 63.2 | 69.4 |
| 015 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 4 | 78 | 39 | 9668 | 64.3 | 70.4 |
| 009 | 9502008-A/DREW//CFX 26/WELLS | 3 | 77 | 38 | 9587 | 63.6 | 70.6 |
| 012 | CCDR/CFX-18 | 5 | 80 | 40 | 9370 | 58.8 | 67.5 |
| 021 | CL171 | 3 | 85 | 41 | 9319 | 62.8 | 68.5 |
| 006 | 9502008-A/DREW//CLR 20 | 5 | 77 | 39 | 9254 | 65.3 | 71.6 |
| 011 | 9502008-A//AR1188/CCDR/3/… | 4 | 80 | 37 | 8980 | 63.5 | 69.6 |
| 002 | CCDR/CFX-18 | 4 | 78 | 38 | 8962 | 63.8 | 69.7 |
| 003 | DREW/JEFF//CFX-18 | 4 | 80 | 40 | 8580 | 65.6 | 70.7 |
| 010 | CFX18/LM-1 | 4 | 80 | 38 | 8551 | 69.0 | 72.5 |
| 005 | WELLS/CFX-18 | 4 | 78 | 39 | 8498 | 62.7 | 68.7 |
| 022 | ORIN//MERC/RICO/3/…//M201/…/4/CL161 | 4 | 77 | 40 | 8361 | 66.3 | 70.1 |
| 020 | CL161 | 4 | 84 | 40 | 8346 | 63.5 | 69.1 |
| 008 | 9502008-A/DREW//CFX 29/CCDR | 4 | 84 | 36 | 8241 | 67.2 | 71.7 |
| 004 | 9502008-A/DREW//CLR 20 | 4 | 77 | 41 | 7869 | 65.0 | 70.9 |
| 007 | PY 678/CL161 | 6 | 80 | 42 | 7119 | 66.7 | 70.8 |
| 001 | DREW/CLR 13 | 5 | 78 | 39 | 6888 | 64.0 | 70.8 |
| 013 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 80 | 36 | 6791 | 64.2 | 71.1 |
| 016 | 9502008/3/CPRS//82CAY21/…/4/CFX18 | 3 | 79 | 39 | 5788 | 63.7 | 69.6 |
| c.v. % | | 11.3 | 2.1 | 4.3 | 8.8 | 4.0 | 2.5 |
| $LSD_{0.05}$ | | 0.8 | 2.7 | 2.7 | 1258 | 5.3 | 3.6 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 2.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Multi-Location Yield Trial, Acadia Parish, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total |
|---|---|---|---|---|---|---|---|
| 012 | CCDR/CFX-18 | 4 | 85 | 38 | 8948 | 59.6 | 67.9 |
| 005 | WELLS/CFX-18 | 4 | 84 | 38 | 8929 | 61.9 | 69.2 |
| 004 | 9502008-A/DREW//CLR 20 | 4 | 82 | 39 | 8875 | 62.9 | 70.1 |
| 017 | 9502008-A/DREW//CFX 29//… | 4 | 83 | 37 | 8822 | 62.8 | 68.9 |
| 019 | CL151 | 4 | 83 | 38 | 8679 | 61.9 | 69.6 |
| 009 | 9502008-A/DREW//CFX 26/WELLS | 4 | 85 | 37 | 8640 | 64.7 | 71.7 |
| 018 | CL 131 | 4 | 82 | 34 | 8568 | 64.0 | 70.3 |
| 006 | 9502008-A/DREW//CLR 20 | 4 | 82 | 37 | 8516 | 64.2 | 70.7 |
| 010 | CFX18/LM-1 | 4 | 85 | 38 | 8467 | 65.9 | 70.2 |
| 015 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 4 | 84 | 37 | 8455 | 60.6 | 70.7 |
| 003 | DREW/JEFF//CFX-18 | 4 | 85 | 37 | 8402 | 65.3 | 70.8 |
| 022 | ORIN//MERC/RICO/3/…//M201/…/4/CL161 | 4 | 80 | 39 | 8341 | 62.4 | 67.1 |
| 014 | CFX-18//CCDR/9770532 DH2 | 4 | 83 | 38 | 8260 | 62.9 | 68.5 |
| 020 | CL161 | 3 | 86 | 38 | 8115 | 64.1 | 70.0 |
| 013 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 85 | 38 | 8080 | 63.2 | 70.5 |
| 011 | 9502008-A//AR1188/CCDR/3/… | 4 | 83 | 39 | 8025 | 61.5 | 68.1 |
| 016 | 9502008/3/CPRS//82CAY21/…/4/CFX18 | 4 | 81 | 37 | 7870 | 64.7 | 70.3 |
| 021 | CL171 | 4 | 86 | 39 | 7538 | 66.1 | 71.5 |
| 008 | 9502008-A/DREW//CFX 29/CCDR | 4 | 87 | 34 | 7500 | 68.4 | 71.9 |
| 002 | CCDR/CFX-18 | 4 | 80 | 36 | 7271 | 63.1 | 69.5 |
| 007 | PY 678/CL161 | 5 | 83 | 36 | 7215 | 66.6 | 71.0 |
| 001 | DREW/CLR 13 | 4 | 81 | 35 | 6906 | 63.0 | 70.2 |
| c.v. % | | 9.2 | 1.2 | 3.0 | 7.1 | 1.5 | 1.0 |
| $LSD_{0.05}$ | | 0.6 | 1.7 | 1.8 | 954 | 1.9 | 1.4 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 3.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Multi-Location Yield Trial, Evangeline Parish, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total |
|---|---|---|---|---|---|---|---|
| 014 | CFX-18//CCDR/9770532 DH2 | 4 | 77 | 39 | 7226 | 67.1 | 72.7 |
| 019 | CL151 | 4 | 80 | 39 | 6959 | 64.4 | 70.5 |
| 002 | CCDR/CFX-18 | 5 | 78 | 35 | 6939 | 66.2 | 72.8 |
| 022 | ORIN//MERC/RICO/3/…//M201/…/4/CL161 | 4 | 79 | 39 | 6859 | 67.8 | 71.4 |
| 015 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 4 | 80 | 37 | 6741 | 61.4 | 70.0 |
| 006 | 9502008-A/DREW//CLR 20 | 5 | 76 | 37 | 6693 | 67.4 | 72.3 |
| 004 | 9502008-A/DREW//CLR 20 | 5 | 76 | 38 | 6665 | 67.4 | 72.4 |
| 012 | CCDR/CFX-18 | 5 | 80 | 37 | 6353 | 63.4 | 71.3 |
| 017 | 9502008-A/DREW//CFX 29//… | 5 | 77 | 35 | 6272 | 66.6 | 72.2 |
| 013 | 9502008/3/MBLE//LMNT/20001-5/… | 5 | 77 | 36 | 6271 | 65.1 | 74.0 |
| 016 | 9502008/3/CPRS//82CAY21/…/4/CFX18 | 5 | 77 | 37 | 6239 | 68.4 | 72.8 |
| 005 | WELLS/CFX-18 | 4 | 76 | 37 | 6027 | 67.0 | 71.9 |
| 020 | CL161 | 4 | 83 | 38 | 5957 | 69.2 | 72.4 |
| 021 | CL171 | 4 | 81 | 37 | 5939 | 65.7 | 72.7 |
| 009 | 9502008-A/DREW//CFX 26/WELLS | 4 | 78 | 36 | 5895 | 67.4 | 73.4 |
| 001 | DREW/CLR 13 | 6 | 78 | 35 | 5855 | 64.5 | 72.2 |
| 011 | 9502008-A//AR1188/CCDR/3/… | 5 | 80 | 37 | 5835 | 66.7 | 71.8 |
| 010 | CFX18/LM-1 | 5 | 80 | 37 | 5553 | 67.5 | 73.4 |
| 003 | DREW/JEFF//CFX-18 | 5 | 78 | 36 | 5511 | 68.7 | 73.0 |
| 018 | CL131 | 6 | 84 | 32 | 5269 | 69.7 | 74.0 |
| 008 | 9502008-A/DREW//CFX 29/CCDR | 5 | 85 | 33 | 4792 | 69.1 | 73.6 |
| 007 | PY 678/CL161 | 7 | 84 | 38 | 4333 | 66.2 | 73.0 |
| c.v. % | | 10.4 | 1.4 | 2.7 | 5.8 | 3.1 | 1.3 |
| $LSD_{0.05}$ | | 0.8 | 1.9 | 1.6 | 519 | 4.4 | 2.1 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 4.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Multi-Location Yield Trial, Lake Arthur, Vermilion Parish, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Total | SB†‡ | BS†‡ | RNB†‡ |
|---|---|---|---|---|---|---|---|---|---|---|
| 019 | CL151 | 4 | 81 | 40 | 8487 | 62.8 | 70.7 | 5 | 3 | 2 |
| 004 | 9502008-A/DREW//CLR 20 | 4 | 78 | 39 | 8328 | 65.9 | 70.9 | 6 | 3 | 3 |
| 014 | CFX-18//CCDR/9770532 DH2 | 5 | 80 | 39 | 8164 | 64.3 | 69.7 | 5 | 3 | 3 |
| 015 | KATY/CPRS//NWBT/…/3/…/4/CLR 9 | 4 | 79 | 39 | 8123 | 64.6 | 70.9 | 5 | 3 | 3 |
| 002 | CCDR/CFX-18 | 4 | 79 | 37 | 8020 | 62.5 | 70.5 | 6 | 3 | 4 |
| 006 | 9502008-A/DREW//CLR 20 | 4 | 80 | 38 | 8016 | 61.1 | 67.1 | 6 | 3 | 5 |
| 003 | DREW/JEFF//CFX-18 | 4 | 81 | 38 | 7719 | 63.8 | 70.6 | 5 | 2 | 3 |
| 005 | WELLS/CFX-18 | 4 | 81 | 38 | 7641 | 64.5 | 70.4 | 5 | 2 | 4 |
| 001 | DREW/CLR 13 | 6 | 80 | 38 | 7602 | 61.6 | 69.0 | 6 | 6 | 3 |
| 016 | …/3/CPRS//82CAY21/…/4/CFX18 | 4 | 80 | 38 | 7548 | 63.6 | 69.1 | 6 | 3 | 3 |
| 012 | CCDR/CFX-18 | 5 | 81 | 38 | 7538 | 58.7 | 67.6 | 5 | 2 | 3 |
| 017 | 9502008-A/DREW//CFX 29//… | 4 | 77 | 35 | 7391 | 65.1 | 70.0 | 5 | 3 | 2 |
| 022 | ORIN//MERC/…/3/…//M201/…/4/CL161 | 4 | 81 | 41 | 7370 | 63.5 | 68.4 | 5 | 4 | 2 |
| 011 | 9502008-A//AR1188/CCDR/3/… | 5 | 81 | 39 | 7366 | 63.1 | 69.2 | 5 | 4 | 3 |
| 018 | CL131 | 5 | 81 | 35 | 6983 | 63.5 | 70.3 | 5 | 3 | 5 |
| 009 | 9502008-A/DREW//CFX 26/WELLS | 5 | 80 | 37 | 6860 | 65.3 | 72.2 | 5 | 3 | 2 |
| 013 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 80 | 37 | 6760 | 64.6 | 71.0 | 6 | 3 | 3 |
| 020 | CL161 | 4 | 84 | 38 | 6606 | 64.1 | 70.3 | 6 | 3 | 3 |
| 010 | CFX18/LM-1 | 5 | 82 | 38 | 6366 | 66.9 | 71.1 | 5 | 3 | 2 |
| 021 | CL171 | 3 | 86 | 40 | 6206 | 64.2 | 70.4 | 4 | 2 | 3 |
| 007 | PY 678/CL161 | 6 | 82 | 42 | 5511 | 59.3 | 71.7 | 4 | 3 | 2 |
| 008 | 9502008-A/DREW//CFX 29/CCDR | 5 | 85 | 35 | 5137 | 69.1 | 73.3 | 5 | 2 | 4 |
| c.v. % | | 10.6 | 1.1 | 2.4 | 5.4 | 3.1 | 1.8 | 10.7 | 24.1 | 32.3 |
| $LSD_{0.05}$ | | 0.8 | 1.5 | 1.5 | 643 | 4.2 | 2.6 | 0.9 | 1.2 | 1.5 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 5.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Multi-Location Yield Trial, Richland Parish, LA.

| Entry | Pedigree | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) |
|---|---|---|---|---|---|
| 009 | 9502008-A/DREW//CFX 26/WELLS | 88 | 38 | 10 | 8509 |
| 019 | CL151 | 88 | 38 | 90 | 8502 |
| 010 | CFX18/LM-1 | 88 | 39 | 67 | 8303 |
| 007 | PY 678/CL161 | 88 | 39 | 90 | 8138 |
| 006 | 9502008-A/DREW//CLR 20 | 85 | 36 | 77 | 8040 |
| 004 | 9502008-A/DREW//CLR 20 | 85 | 38 | 63 | 7993 |
| 022 | ORIN//MERC/RICO/3/MARS//M201/MARS/4/CL161 | 83 | 39 | 83 | 7936 |
| 005 | WELLS/CFX-18 | 87 | 37 | 67 | 7904 |
| 020 | CL161 | 90 | 37 | 83 | 7791 |
| 012 | CCDR/CFX-18 | 90 | 38 | 87 | 7774 |
| 008 | 9502008-A/DREW//CFX 29/CCDR | 92 | 34 | | 7454 |
| 015 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 87 | 36 | | 7411 |
| 016 | 9502008/3/CPRS//82CAY21/…/4/CFX18 | 84 | 36 | 83 | 7409 |
| 003 | DREW/JEFF//CFX-18 | 89 | 36 | 50 | 7394 |
| 021 | CL171 | 89 | 38 | 7 | 7309 |
| 013 | 9502008/3/MBLE//LMNT/20001-5/… | 88 | 36 | | 7151 |
| 002 | CCDR/CFX-18 | 84 | 35 | 80 | 7075 |
| 018 | CL131 | 86 | 31 | 23 | 6889 |
| 011 | 9502008-A//AR1188/CCDR/3/… | 88 | 38 | 87 | 6832 |
| 017 | 9502008-A/DREW//CFX 29//… | 88 | 35 | 53 | 6825 |
| 014 | CFX-18//CCDR/9770532 DH2 | 86 | 36 | 67 | 6650 |
| 001 | DREW/CLR 13 | 86 | 35 | 53 | 6480 |
| c.v. % | | 1.8 | 4.7 | 46 | 9.8 |
| $LSD_{0.05}$ | | 2.6 | 2.8 | 35.4 | 1214 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 6.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 1, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Whole | Total |
| 001 | FRANCIS/CLR 13 | 4 | 84 | 38 | | 10145 | 63.6 | 70.7 |
| 017 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 5 | 84 | 38 | 15 | 10025 | 57.3 | 65.8 |
| 014 | TACAURI/3/CPRS//82CAY21/TBNT/4/CLR 6 | 5 | 84 | 36 | | 9762 | 59.7 | 68.7 |
| 015 | TACAURI/3/CPRS//82CAY21/TBNT/4/CLR 6 | 5 | 83 | 37 | | 9707 | 60.6 | 67.8 |
| 023 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 84 | 38 | | 9676 | 62.3 | 68.1 |
| 013 | 9502008-A/TACAURI//CLR 5 | 5 | 84 | 38 | | 9567 | 66.1 | 69.9 |
| 006 | CCDR/98PIM0151//CLR 7 | 4 | 83 | 35 | 35 | 9545 | 64.8 | 69.2 |
| 002 | FRANCIS/CLR 21 | 3 | 82 | 41 | | 9533 | 61.6 | 70.6 |
| 004 | CCDR/98PIM0151//CLR 7 | 4 | 82 | 40 | 60 | 9475 | 65.5 | 70.3 |
| 022 | 9502008/3/CPRS//82CAY21/… | 3 | 79 | 36 | | 9436 | 66.9 | 71.6 |
| 003 | CPRS/CLR 11 | 5 | 83 | 38 | 40 | 9402 | 65.0 | 68.7 |
| 020 | 9302065/3/CFX-29/AR 1142/LA 2031 | 4 | 84 | 38 | | 8973 | 66.0 | 70.3 |
| 008 | CCDR/98PIM0151//CLR 7 | 4 | 84 | 35 | 15 | 8885 | 65.6 | 70.9 |
| 016 | TACAURI/3/CPRS//82CAY21/TBNT/4/CLR 6 | 4 | 78 | 40 | 30 | 8884 | 64.6 | 70.1 |
| 018 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 6 | 5 | 84 | 40 | | 8844 | 57.4 | 65.9 |
| 021 | 0043676/AC105DH3/3/CFX 29//… | 5 | 83 | 37 | | 8813 | 61.3 | 68.6 |
| 025 | CL131 | 5 | 82 | 36 | | 8715 | 65.6 | 71.2 |
| 012 | 9502008-A/TACAURI//CFX-18 | 5 | 79 | 36 | | 8505 | 67.1 | 72.4 |
| 019 | CFX-189502008-A/TACAURI | 4 | 78 | 37 | 25 | 8369 | 61.9 | 69.8 |
| 009 | CCDR/98PIM0151//LGRU | 4 | 85 | 36 | | 8322 | 64.5 | 68.8 |
| 011 | 9502008-A/TACAURI//CFX-18 | 5 | 79 | 38 | 10 | 8238 | 65.4 | 71.2 |
| 007 | CCDR/98PIM0151//CLR 7 | 3 | 83 | 37 | 40 | 8137 | 64.5 | 70.1 |
| 024 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 83 | 37 | | 8107 | 63.7 | 69.1 |
| 005 | CCDR/98PIM0151//CLR 7 | 4 | 82 | 39 | 60 | 7762 | 64.3 | 69.5 |
| 010 | CCDR/98PIM0151/4/AR 1121/3/CPRS//82CAY21/TBNT | 4 | 85 | 34 | 10 | 7585 | 63.6 | 72.8 |
| $LSD_{0.05}$ | | 0.8 | 2.4 | 3.9 | 50.6 | 1313 | 4.2 | 3.9 |
| c.v. % | | 10.0 | 1.4 | 5.0 | 180.4 | 7.1 | 3.2 | 2.7 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 7.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 2, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Whole | Total |
| 046 | CHENIERE//CFX 29/CCDR | 4 | 86 | 38 | | 10856 | 64.3 | 71.2 |
| 030 | 9502008-A//AR1188/CCDR/3/… | 4 | 83 | 39 | 15 | 10455 | 66.6 | 71.1 |
| 050 | CL151 | 4 | 82 | 39 | | 10330 | 59.7 | 66.3 |
| 048 | CPRS/3/CFX 29//AR 1142/LA 2031 | 4 | 82 | 39 | | 10095 | 66.5 | 71.3 |
| 026 | 9502008/3/MBLE//LMNT/20001-5/… | 4 | 85 | 37 | 25 | 10025 | 65.2 | 70.2 |
| 033 | 9502008-A/DREW//CFX 26/WELLS | 4 | 76 | 37 | 10 | 9851 | 64.2 | 69.8 |
| 043 | CCDR/CFX 18 | 4 | 81 | 38 | 15 | 9792 | 65.6 | 70.0 |
| 040 | CCDR//CFX 26/WELLS | 5 | 80 | 33 | | 9687 | 63.1 | 68.8 |
| 049 | CPRS//CFX 26/WELLS | 5 | 86 | 38 | | 9671 | 64.5 | 68.6 |
| 038 | CCDR/3/CFX 29/AR 1142/LA 2031 | 4 | 79 | 37 | | 9513 | 64.9 | 70.1 |
| 044 | CH1/3/CPRS//82CAY21/TBNT/4/… | 4 | 81 | 39 | | 9376 | 63.5 | 69.4 |
| 036 | 9502008-A/DREW//CFX 26/WELLS | 5 | 79 | 33 | | 9324 | 68.6 | 72.5 |
| 047 | CHENIERE//CFX 29/CCDR | 4 | 81 | 37 | | 9286 | 68.3 | 73.3 |
| 045 | CHENIERE/CFX 18 | 5 | 83 | 38 | | 9168 | 65.6 | 72.8 |
| 029 | 9502008-A//AR1188/CCDR/3/… | 5 | 81 | 34 | | 9127 | 67.0 | 72.3 |
| 042 | CCDR//CFX 26/WELLS | 5 | 80 | 34 | 30 | 9093 | 66.1 | 71.0 |
| 039 | CCDR/3/CFX 29/AR 1142/LA 2031 | 5 | 78 | 35 | 10 | 8959 | 67.7 | 72.2 |
| 035 | 9502008-A/DREW//CFX 18 | 4 | 79 | 40 | 10 | 8852 | 66.5 | 71.5 |
| 031 | 9502008-A/DREW//CFX 26/WELLS | 4 | 79 | 40 | 60 | 8778 | 62.5 | 69.0 |
| 041 | CCDR//CFX 26/WELLS | 4 | 79 | 33 | 35 | 8597 | 64.6 | 70.6 |
| 037 | AHRENT//CFX 26/WELLS | 4 | 78 | 37 | | 8537 | 66.5 | 71.0 |
| 027 | 9502008/AR1121//CFX 29//… | 4 | 79 | 35 | 65 | 8490 | 65.4 | 72.0 |
| 028 | 9502008-A//AR1188/CCDR/3/CFX 18 | 4 | 81 | 38 | 20 | 8423 | 66.0 | 71.3 |
| 034 | 9502008-A/DREW//CFX 18 | 5 | 77 | 38 | 30 | 8412 | 63.1 | 69.7 |
| 032 | 9502008-A/DREW//CFX 26/WELLS | 4 | 79 | 40 | 70 | 8387 | 64.2 | 70.1 |
| c.v. % | | 10.9 | 1.6 | 4.3 | 114.2 | 6.5 | 2.4 | 1.8 |
| $LSD_{0.05}$ | | 0.9 | 2.6 | 3.3 | 37.2 | 1253 | 3.2 | 2.6 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 8.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 3, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor[†] | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Whole | Total |
| 067 | 9302065/3/CFX-29/AR 1142/LA 2031 | 4 | 84 | 39 | 25 | 10314 | 67.1 | 71.7 |
| 057 | CPRS/KBNT//WELLS CFX 18 | 5 | 84 | 38 | | 10275 | 64.4 | 69.5 |
| 071 | 9302065/3/CFX-29/AR 1142/LA 2031 | 4 | 81 | 38 | 15 | 10024 | 67.0 | 68.9 |
| 069 | 9302065/CFX 18 | 4 | 85 | 38 | | 9724 | 64.4 | 68.4 |
| 058 | KATY/CPRS//NWBT/…/3/CPRS/… | 3 | 80 | 36 | | 9587 | 70.0 | 73.7 |
| 051 | CPRS//82CAY21/TBNT/3/CFX 18 | 4 | 83 | 40 | 40 | 9539 | 63.4 | 68.5 |
| 052 | CPRS//82CAY21/TBNT/3/CFX 18 | 4 | 83 | 36 | 25 | 9425 | 68.3 | 72.2 |
| 055 | CPRS/9502008-A//CFX 26/WELLS | 5 | 84 | 36 | | 9408 | 65.2 | 69.8 |
| 061 | 902207X2/NWBT/KATY/3/CPRS/KBNT/4/CFX 18 | 4 | 77 | 37 | | 9394 | 67.3 | 72.2 |
| 070 | 9302065/3/CFX-29/AR 1142/LA 2031 | 4 | 83 | 38 | | 9262 | 65.1 | 68.7 |
| 062 | 9502008/AR1121//CFX 29//AR 1142/LA 2031 | 4 | 77 | 35 | 30 | 9159 | 71.1 | 74.3 |
| 066 | CPRS/KBNT//CFX 18 | 5 | 83 | 37 | | 9045 | 66.1 | 70.6 |
| 056 | CPRS/KBNT//WELLS CFX 18 | 4 | 83 | 39 | 50 | 8968 | 65.4 | 70.2 |
| 065 | CCDR//CFX 26/WELLS | 5 | 79 | 36 | | 8952 | 66.3 | 71.4 |
| 064 | CCDR//WELLS/CFX 18 | 4 | 78 | 36 | 55 | 8799 | 65.3 | 71.7 |
| 060 | TACAURI/3/CPRS//82CAY21/TBNT/… | 4 | 75 | 35 | 55 | 8764 | 66.6 | 71.7 |
| 068 | 9302065/3/CFX-29/AR 1142/LA 2031 | 3 | 82 | 38 | | 8597 | 69.9 | 73.2 |
| 073 | 9302065/3/DREW/JEFF//CFX 18 | 4 | 86 | 37 | | 8448 | 64.8 | 68.8 |
| 072 | 9302065/3/CFX-29/AR 1142/LA 2031 | 4 | 82 | 37 | 40 | 8329 | 68.5 | 72.2 |
| 059 | MBLE//CFX 26/WELLS | 5 | 77 | 34 | | 8297 | 67.6 | 71.7 |
| 054 | CPRS/9502008-A//CFX 26/WELLS | 5 | 81 | 38 | 10 | 8293 | 65.1 | 68.9 |
| 075 | CL161 | 4 | 86 | 40 | 80 | 8250 | 63.1 | 67.2 |
| 063 | CCDR//CFX 26/WELLS | 4 | 81 | 37 | 70 | 8243 | 63.9 | 68.3 |
| 053 | CPRS//82CAY21/TBNT/3/AR1179/… | 5 | 83 | 39 | | 8216 | 64.4 | 68.9 |
| 074 | 0043676/AC105DH3//CFX 18 | 5 | 79 | 32 | | 7838 | 64.5 | 69.8 |
| c.v. % | | 11.8 | 1.5 | 3.7 | 123.4 | 10.1 | 2.5 | 2.1 |
| $LSD_{0.05}$ | | 1.0 | 2.5 | 2.8 | 50.4 | 1870 | 3.4 | 3.1 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 9.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 4, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Whole | Total |
| 098 | KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR | 4 | 84 | 41 | 35 | 10396 | 64.2 | 69.0 |
| 096 | KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 18 | 5 | 82 | 37 | | 10225 | 67.4 | 71.9 |
| 094 | CPRS/KBNT//CFX 29//AR 1142/LA 2031 | 4 | 83 | 40 | 40 | 10064 | 64.2 | 69.2 |
| 095 | CPRS/KBNT//CFX 29 | 5 | 82 | 38 | | 9835 | 65.5 | 70.4 |
| 083 | CCDR//CFX 26/WELLS | 5 | 80 | 34 | 10 | 9680 | 66.5 | 70.5 |
| 089 | CPRS//82CAY21/TBNT/3/CFX 26/WELLS | 4 | 80 | 41 | 30 | 9623 | 66.2 | 70.0 |
| 099 | KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/… | 4 | 85 | 40 | 10 | 9563 | 66.2 | 70.5 |
| 085 | CH1/3/CPRS//82CAY21/TBNT/4/CFX 29//… | 4 | 79 | 38 | 50 | 9524 | 66.5 | 72.9 |
| 092 | CPRS/9502008-A//CFX 26/WELLS | 5 | 84 | 40 | 15 | 9482 | 64.6 | 69.5 |
| 086 | CHENIERE//CFX 29/CCDR | 4 | 81 | 38 | 55 | 9477 | 63.7 | 70.1 |
| 087 | CPRS//CFX 29/CCDR | 5 | 85 | 40 | 80 | 9425 | 66.5 | 70.4 |
| 100 | CL171 | 4 | 86 | 42 | | 9346 | 64.9 | 69.3 |
| 084 | CH1/3/CPRS//82CAY21/TBNT/4/CFX 29 | 5 | 79 | 38 | | 9226 | 63.0 | 70.0 |
| 090 | CPRS//82CAY21/TBNT/3/CFX 29/CCDR | 5 | 79 | 40 | 80 | 9091 | 62.1 | 67.6 |
| 082 | 9502008-A/DREW//CFX 26/WELLS | 5 | 82 | 39 | 80 | 8926 | 66.6 | 71.9 |
| 091 | CPRS/9502008-A/3/CFX 29//AR 1142/LA 2031 | 4 | 82 | 37 | 80 | 8647 | 68.9 | 72.9 |
| 077 | 9502008-A//AR1188/CCDR/3/CFX 29//… | 4 | 79 | 38 | 40 | 8628 | 66.1 | 71.4 |
| 088 | CPRS/3/CFX 29//AR 1142/LA 2031 | 5 | 83 | 40 | 80 | 8605 | 67.8 | 72.1 |
| 078 | 9502008-A/DREW//CFX 29 | 4 | 82 | 39 | 70 | 8584 | 65.9 | 70.7 |
| 093 | CPRS/KBNT//CFX 29//AR 1142/LA 2031 | 4 | 80 | 40 | 25 | 7786 | 65.1 | 70.8 |
| 079 | 9502008-A/DREW//CFX 26/WELLS | 3 | 77 | 40 | 80 | 7685 | 64.1 | 69.3 |
| 080 | 9502008-A/DREW//CFX 26/WELLS | 4 | 83 | 42 | 90 | 7503 | 65.1 | 69.4 |
| 081 | 9502008-A/DREW//CFX 26/WELLS | 4 | 78 | 39 | 85 | 7502 | 64.2 | 68.7 |
| 097 | KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR | 4 | 85 | 39 | 35 | 6800 | 65.2 | 68.9 |
| 076 | 0043676/AC105DH3//CFX 29 | 4 | 81 | 42 | 85 | 6439 | 62.9 | 68.7 |
| c.v. % | | 12.2 | 1.9 | 4.2 | 47.5 | 10.0 | 2.4 | 2.0 |
| $LSD_{0.05}$ | | 1.0 | 3.2 | 3.4 | 45.3 | 1837 | 3.3 | 2.9 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 10.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 5, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Whole | Total |
| 103 | TACAURI/3/CPRS//82CAY21/TBNT/4/… | 4 | 78 | 36 | 30 | 10357 | 66.7 | 71.1 |
| 101 | KATY/CPRS//NWBT/…/3/CPRS/KBNT/4/CFX 29/CCDR | 4 | 81 | 38 | | 10165 | 65.2 | 69.3 |
| 123 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 9 | 4 | 83 | 40 | | 9962 | 63.2 | 70.1 |
| 120 | CFX18//CPRS/KBNT | 4 | 84 | 37 | | 9683 | 66.6 | 71.0 |
| 117 | CCDR//LGRU/LCSN/3/CFX-29 | 4 | 83 | 39 | | 9506 | 64.9 | 69.4 |
| 107 | CCDR/JEFF/3/CFX-18//CCDR/9770532 DH2 | 4 | 79 | 36 | 20 | 9388 | 66.8 | 72.2 |
| 109 | CHNR/3/CFX-18//CCDR/970532 DH2 | 4 | 84 | 37 | | 9295 | 68.0 | 72.2 |
| 102 | LMNT/3/CFX 29//AR 1142/LA 2031 | 4 | 84 | 39 | 55 | 9274 | 64.6 | 69.8 |
| 111 | DREW/CCDR//CL131 | 5 | 79 | 38 | 15 | 9124 | 67.0 | 71.8 |
| 113 | DREW/CCDR/5/AR 1179/3/CPRS//…/4/CFX-18 | 4 | 79 | 37 | 40 | 9061 | 67.0 | 72.7 |
| 105 | CCDR/3/CFX-18//CCDR/9770532 DH2 | 4 | 79 | 34 | | 9045 | 68.0 | 73.6 |
| 119 | CFX-29//AR 1142/LA 2031/3/CL131 | 5 | 78 | 37 | | 8917 | 67.7 | 71.5 |
| 118 | CCDR/JEFF//CL131 | 4 | 77 | 39 | 80 | 8857 | 63.5 | 69.2 |
| 108 | CHNR/3/CFX-29//AR 1142/LA 2031 | 5 | 85 | 35 | | 8772 | 66.5 | 70.9 |
| 112 | DREW/CCDR/3/CFX-18//CCDR/9770532 DH2 | 5 | 78 | 39 | 35 | 8730 | 65.5 | 71.2 |
| 106 | 9502008/3/MBLE//LMNT/20001-5/4/CFX-26/… | 5 | 78 | 38 | 30 | 8451 | 66.1 | 71.0 |
| 110 | 9502008-A/DREW//CL131 | 4 | 77 | 38 | 10 | 8450 | 69.4 | 74.5 |
| 122 | CCDR/CFX-18 | 5 | 84 | 41 | 60 | 8349 | 63.3 | 69.3 |
| 116 | CCDR/9770532DH2//DREW/CFX-18 | 5 | 80 | 39 | 90 | 8063 | 67.2 | 72.0 |
| 125 | ORIN//MERC/RICO/3/MARS//M201/MARS/4/CL161 | 4 | 78 | 42 | 40 | 8013 | 66.5 | 69.9 |
| 114 | DREW/CCDR/5/AR 1179/3/CPRS//…/4/CFX-18 | 4 | 82 | 37 | 35 | 7877 | 67.2 | 72.1 |
| 115 | CCDR/9770532DH2/3/CFX-18//CCDR/9770532 DH2 | 5 | 79 | 38 | 80 | 7803 | 66.8 | 72.3 |
| 124 | CCDR/CLR 11 | 5 | 79 | 36 | 15 | 7378 | 69.7 | 74.6 |
| 121 | CFX18/LCSN | 5 | 84 | 39 | 15 | 7060 | 63.6 | 68.7 |
| 104 | CCDR/5/AR 1179/3/CPRS//…/4/CFX-18 | 5 | 87 | 36 | | 6950 | 67.1 | 70.2 |
| c.v. % | | 12.7 | 1.2 | 3.6 | 95 | 11.1 | 2.1 | 1.7 |
| $LSD_{0.05}$ | | 1.1 | 1.9 | 2.8 | 51 | 2003 | 2.9 | 2.5 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

**Table 11.** Grain and milling yield and agronomic performance of entries in the 2008 Clearfield Preliminary Yield Trial, Group 6, Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor† | Days to 50% Heading | Plant Height (in) | Lodging (%) | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total |
|---|---|---|---|---|---|---|---|---|
| 126 | LGRU/CLR 11 | 5 | 83 | 36 | 15 | 9883 | 66.6 | 72.1 |
| 134 | CPRS/9502008-A//CFX 18 | 5 | 84 | 39 | | 9492 | 67.6 | 71.6 |
| 146 | CCDR/98PIM0151//CLR 7 | 5 | 83 | 38 | 70 | 9450 | 65.5 | 70.3 |
| 143 | KATY/CPRS//NWBT/…/3/9502008/4/CLR 6 | 5 | 83 | 40 | | 9351 | 64.8 | 69.3 |
| 148 | CCDR/98PIM0151/4/CPRS//82CAY21/TBNT/3/AR 1121 | 4 | 84 | 38 | | 9193 | 68.7 | 72.4 |
| 128 | CCDR/CLR 11 | 4 | 84 | 41 | 35 | 9175 | 63.2 | 68.6 |
| 127 | LGRU/CLR 11 | 4 | 81 | 37 | 45 | 9134 | 63.9 | 70.0 |
| 141 | BNGL/SRICO/CFX18 | 5 | 87 | 40 | | 9103 | 62.2 | 70.1 |
| 129 | 9502008/3/MBLE//LMNT/20001-5/4/CL131 | 4 | 84 | 39 | 45 | 9086 | 65.3 | 70.7 |
| 149 | CHENIERE//WELLS/CFX 18 | 5 | 82 | 39 | 85 | 9011 | 61.8 | 71.0 |
| 139 | GFMT/CFX-29 | 4 | 85 | 39 | | 8462 | 65.8 | 70.1 |
| 130 | CCDR//LGRU/LCSN/3/WELLS/CFX-18 | 4 | 79 | 37 | 45 | 8207 | 68.2 | 72.0 |
| 145 | TACAURI/3/CPRS//82CAY21/TBNT/4/CFX-18 | 5 | 79 | 39 | 85 | 8186 | 59.7 | 67.3 |
| 142 | BNGL/CL161 | 4 | 85 | 40 | 30 | 8135 | 68.7 | 70.7 |
| 144 | CCDR/CFX-18 | 5 | 81 | 39 | 80 | 8105 | 65.9 | 71.2 |
| 133 | CPRS//82CAY21/TBNT/3/CFX 18 | 5 | 78 | 38 | 30 | 7797 | 63.6 | 70.6 |
| 131 | CCDR/JEFF//CL131 | 5 | 78 | 36 | 75 | 7611 | 62.3 | 68.6 |
| 140 | CPRS/97T1280 DH1//CFX-18 | 4 | 83 | 39 | 80 | 7307 | 67.0 | 71.3 |
| 135 | CPRS/KBNT//CFX 18 | 4 | 85 | 41 | 80 | 7167 | 66.7 | 72.8 |
| 138 | SABER//CFX 26/WELLS | 4 | 78 | 37 | 15 | 6923 | 66.5 | 71.9 |
| 136 | JEFF//CFX 26/WELLS | 4 | 78 | 37 | 90 | 6767 | 71.3 | 74.5 |
| 150 | CFX-18//CCDR/9770532 DH2 | 4 | 80 | 40 | 90 | 6124 | 64.4 | 69.9 |
| 147 | CCDR/98PIM0151//CLR 12 | 4 | 83 | 41 | 90 | 6075 | 63.5 | 67.8 |
| 132 | CPRS//82CAY21/TBNT/3/CFX 18 | 4 | 75 | 37 | 90 | 5945 | 62.0 | 68.7 |
| 137 | JEFF/3/CFX 29//AR 1142/LA 2031 | 4 | 78 | 39 | 90 | 4135 | 63.8 | 70.3 |
| c.v. % | | 16.5 | 1.5 | 4.0 | 53.8 | 12.1 | 2.4 | 1.8 |
| $LSD_{0.05}$ | | 1.4 | 2.6 | 3.1 | 56.2 | 1989 | 3.2 | 2.6 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

## MEDIUM-GRAIN RICE BREEDING

S.B. Blanche, S.D. Linscombe, R.R. Dilly, Jr., K.F. Bearb, C.A. Conner,
B.T. Theunissen, S.J. Theunissen, and H.L. Hoffpauir

The objectives of the medium-grain rice breeding project are to develop improved medium-grain rice varieties using traditional and modern breeding techniques. Key goals of the program are to increase yield potential, disease resistance, and milling quality and to select for large, bold grain types with good cooking characteristics. Other traits of interest include short plant stature, lodging resistance, earliness, and stable grain and milling yields.

The medium-grain breeding project made 70 unique cross combinations to accomplish the goals of the program. Other activities in 2008 included 65 transplanted $F_1$ populations and 60 space-planted $F_2$ populations. The 2008 medium-grain rice breeding nursery included over 10,000 progeny rows from $F_3$ (early) to $F_8$ (advanced) generations.

Eight advanced medium-grain experimental lines (entries 062, 065, 068, 071, 162, 165, 168, and 171) were tested in the 2008 Uniform Regional Rice Nursery (URN). The yield, milling, and agronomic performance of these lines are presented in the URN tables (Groups 4 and 7). Five of these lines were tested in the Commercial-Advanced Yield Trial (CA) at six locations throughout the Louisiana rice-growing regions, and these data are presented in the CA tables.

There were 125 advanced medium-grain lines tested in the preliminary yield testing program in 2008. The preliminary yield trials consist primarily of outstanding breeding nursery material that is ready for testing in replicated (PY) or non-replicated (SP) yield trials. The material in these trials was screened for agronomic and grain characteristics in nurseries prior to this phase of testing. Promising experimental lines were evaluated for seedling vigor, maturity, plant height, lodging resistance, grain yield of main and ratoon crops, whole and total milling percentages, and disease resistance.

Standard agronomic practices were used for the preliminary yield tests except that no fungicide was applied. Tests were conducted at the Rice Research Station at Crowley, LA, and plot size was 4.66 x 16 ft. Plots were seeded at a rate of 90 lb/A. This test was drill seeded on March 17 and harvested on August 12 and 13. Milling samples were taken from each plot at harvest maturity (18 to 20% moisture). Tables 1 to 3 presented in this section report only on the medium-grain entries in the replicated and single-plot preliminary yield test. Dr. Don Groth and the Rice Pathology Project provided the disease ratings for sheath blight, rotten neck blast, and bacterial panicle blight.

**Table 1.** Grain and milling yield, agronomic performance, and disease ratings† of entries in the 2008 Preliminary Yield Trial, Group 14, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB‡ | BPB‡ | RNB‡ |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 08PY842 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/6/… | 78 | 8334 | 68.3 | 70.2 | 7 | 6 | 5 |
| 08PY838 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 84 | 7461 | 67.5 | 69.8 | 6 | 3 | 4 |
| 08PY846 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 83 | 7335 | 64.6 | 67.4 | 5 | 4 | 3.5 |
| 08PY840 | ORIN//MERC/RICO//…/3/BNGL/RICO | 83 | 7167 | 65.3 | 68.4 | 6 | 3.5 | 3.5 |
| 08PY844 | BNGL/SHORT RICO//MERC | 79 | 6866 | 66.0 | 69.3 | 5 | 5 | 4 |
| 08PY831 | BNGL/SHORT RICO/4/9502065/3/… | 84 | 6690 | 67.1 | 70.8 | 7 | 2.5 | 1 |
| 08PY850 | JPTR | 89 | 6688 | 67.2 | 69.6 | 5.5 | 3 | 2.5 |
| 08PY843 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 84 | 6412 | 66.2 | 68.9 | 6 | 3.5 | 3.5 |
| 08PY847 | MARS/4/9502065/3/MERC//MERC | 85 | 6342 | 64.5 | 68.3 | 6 | 4 | 4 |
| 08PY834 | LFTE/BNGL | 83 | 6266 | 65.7 | 69.2 | 5.5 | 2.5 | 3.5 |
| 08PY832 | EARL/4/ORIN//MERC/RICO/3/… | 88 | 6159 | 64.6 | 66.9 | 5 | 6.5 | 3 |
| 08PY827 | BNGL/SHORT RICO/4/9502065/3/… | 86 | 6076 | 67.4 | 70.4 | 5 | 3 | 4 |
| 08PY845 | BNGL//MERC/RICO/4/EARL/3/CPRS/… | 89 | 5416 | 66.4 | 69.9 | 4.5 | 5.5 | 4.5 |
| 08PY835 | EARL/9902028 | 89 | 5250 | 64.0 | 67.8 | 6 | 4 | 2.5 |
| 08PY829 | BNGL//MERC/RICO/3/EARL | 89 | 5233 | 66.6 | 69.0 | 6 | 5.5 | 4 |
| 08PY826 | BNGL//MERC/RICO/3/MERC/RICO//BNGL | 86 | 5183 | 68.4 | 71.0 | 4.5 | 5 | 4.5 |
| 08PY833 | 9865216DH2//BNGL/SHORT RICO | 85 | 5159 | 68.5 | 70.0 | 6.5 | 3.5 | 4.5 |
| 08PY839 | BNGL//MERC/RICO/3/EARL | 87 | 4986 | 62.5 | 68.3 | 5.5 | 4 | 5 |
| 08PY836 | MARS//M201/MARS/5/STRN//MERC/… | 85 | 4854 | 65.6 | 69.7 | 6 | 4 | 3.5 |
| 08PY830 | BNGL//MERC/RICO/3/EARL | 87 | 4629 | 64.2 | 69.7 | 5.5 | 3.5 | 6 |
| 08PY828 | BNGL/3/BNGL//MERC/RICO | 88 | 4332 | 68.9 | 71.3 | 4 | 3.5 | 2.5 |
| 08PY849 | MDRK/EARL | 90 | 4280 | 66.5 | 69.5 | 5.5 | 6 | 3 |
| 08PY848 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 82 | 4213 | 66.3 | 69.0 | 6 | 3 | 5 |
| 08PY837 | EARL/4/ORIN//MERC/RICO/3/… | 90 | 3739 | 64.9 | 67.4 | 5 | 3.5 | 2.5 |
| 08PY841 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 83 | 3689 | 67.5 | 70.5 | 6.5 | 2.5 | 2.5 |
| c.v. % | | 2.8 | 18.0 | 2.4 | 1.5 | 10.7 | 22.6 | 22.2 |
| $LSD_{0.05}$ | | 5.0 | 2110 | 3.3 | 2.1 | 1.5 | 1.9 | 1.8 |

† Subjective rating 0 to 9, where 0 = excellent, 9 = poor.

‡ Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 2.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Preliminary Yield Trial, Group 15, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| 08PY851 | BNGL//MERC/RICO/4/EARL/3/CPRS/… | 86 | 5661 | 66.3 | 70.1 | 5 | 5 | 5 |
| 08PY852 | EARL/9902028 | 86 | 5993 | 66.0 | 68.8 | 4.5 | 6 | 5.5 |
| 08PY853 | BNGL//MERC/RICO/3/EARL | 87 | 3913 | 67.6 | 70.1 | 5.5 | 7 | 5 |
| 08PY854 | BNGL//MERC/RICO/3/EARL | 87 | 5449 | 67.5 | 69.8 | 6.5 | 4.5 | 5 |
| 08PY855 | BNGL//MERC/RICO/3/STRN | 90 | 3186 | . | . | 5.5 | 5.5 | 3.5 |
| 08PY856 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/… | 87 | 9108 | 68.1 | 70.2 | 6.5 | 6 | 4 |
| 08PY857 | BNGL//MERC/RICO/3/EARL | 87 | 5339 | 67.4 | 70.5 | 5 | 7 | 4 |
| 08PY858 | SP 361/BNGL | 85 | 3673 | 63.8 | 70.0 | 4.5 | 4.5 | 4 |
| 08PY859 | BNGL//MERC/RICO/3/EARL | 87 | 3768 | 65.2 | 70.1 | 5 | 4 | 4.5 |
| 08PY860 | 9902028/3/BNGL//MERC/RICO | 86 | 3481 | 65.2 | 69.6 | 7 | 2.5 | 4.5 |
| 08PY861 | BNGL//MERC/RICO/3/EARL | 82 | 5194 | 66.5 | 70.0 | 7 | 4 | 4.5 |
| 08PY862 | BNGL//MERC/RICO/3/EARL | 90 | 5064 | 66.7 | 69.3 | 5 | 5.5 | 3.5 |
| 08PY863 | BNGL/3/ORIN//MERC/RICO//… | 83 | 5977 | 67.3 | 69.6 | 6 | 3.5 | 4.5 |
| 08PY864 | BNGL/4/9502065/3/MERC//MERC | 83 | 4155 | 65.0 | 70.7 | 5 | 3 | 2.5 |
| 08PY865 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 85 | 5423 | 65.5 | 69.6 | 5.5 | 5.5 | 5 |
| 08PY866 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 85 | 3905 | 70.1 | 72.6 | 6 | 4.5 | 5 |
| 08PY867 | M-401/LFTE | 78 | 5567 | 66.6 | 70.0 | 7 | 3.5 | 4 |
| 08PY868 | BNGL/RICO | 85 | 4019 | 69.0 | 71.6 | 5.5 | 3 | 4 |
| 08PY869 | BNGL/RICO//EARL | 83 | 5863 | 68.0 | 70.5 | 5 | 5 | 4 |
| 08PY870 | ORIN//MERC/RICO//…/3/BNGL/RICO | 85 | 7588 | 66.0 | 68.6 | 6 | 3.5 | 5.5 |
| 08PY871 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 85 | 6662 | 66.8 | 69.1 | 5 | 4.5 | 5.5 |
| 08PY872 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 83 | 6731 | 66.7 | 69.5 | 5 | 4.5 | 3.5 |
| 08PY873 | BNGL//MERC/RICO/3/EARL | 84 | 4295 | 66.7 | 69.1 | 6 | 5 | 6 |
| 08PY874 | ORIN/BNGL//EARL | 88 | 5433 | 66.3 | 68.7 | 5.5 | 3.5 | 4 |
| 08PY875 | NPTN | 88 | 5852 | 67.9 | 70.2 | 5 | 3.5 | 2.5 |
| c.v. % | | 4.3 | 20.7 | 2.8 | 1.2 | 10.7 | 22.6 | 22.2 |
| $LSD_{0.05}$ | | 7.8 | 2221 | 4.0 | 1.8 | 1.5 | 1.9 | 1.8 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

**Table 3.** Grain and milling yield, agronomic performance, and disease ratings[†] of entries in the 2008 Single-Plot Medium Grain Yield Trial, Crowley, LA.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) | | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| | | | | Whole | Total | | | |
| 08SP281 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/MARS | 88 | 9774 | 66.8 | 69.9 | 6.5 | 3.5 | 4 |
| 08SP288 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/… | 81 | 8489 | 68.1 | 70.3 | 7 | 3.5 | 3 |
| 08SP290 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/… | 87 | 8442 | 65.7 | 69.1 | 7 | 3 | 2 |
| 08SP289 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/5/… | 84 | 8060 | 65.8 | 68.9 | 6.5 | 3.5 | 1.5 |
| 08SP274 | RICO/5/LFTE/4/KATY/CPRS/3/LMNT | 87 | 7734 | 67.9 | 71.6 | 7 | 4 | 2 |
| 08SP296 | MEDARK/LFTE | 79 | 6827 | 62.0 | 67.6 | 6 | 4 | 2 |
| 08SP287 | LFTE/4/KATY/CPRS/3/CPRS/LMNT/6/… | 94 | 6749 | 66.6 | 69.4 | 6 | 4 | 4 |
| 08SP252 | BNGL//MERC/RICO/3/EARL | 90 | 6711 | 63.9 | 67.6 | 6 | 5.5 | 4 |
| 08SP292 | ORIN//MERC/RICO/3/MARS//M201/… | 81 | 6437 | 67.2 | 70.2 | 6 | 3.5 | 4 |
| 08SP291 | ORIN//MERC/RICO/3/MARS//M201/… | 81 | 6274 | 66.2 | 68.9 | 6.5 | 4.5 | 5 |
| 08SP299 | MEDARK/EARL | 90 | 6213 | 64.4 | 68.3 | 5 | 4 | 5 |
| 08SP305 | EARL/4/ORIN//MERC/RICO/3/9502065 | 90 | 6163 | 65.7 | 69.5 | 4.5 | 6.5 | 2.5 |
| 08SP269 | BNGL/KOKOHUROSE | 90 | 5800 | 64.2 | 69.7 | 5 | 2.5 | 4 |
| 08SP257 | BNGL/4/9502065/3/MERC//MERC | 87 | 5638 | 63.1 | 69.0 | 5.5 | 3 | 2 |
| 08SP259 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 84 | 5611 | 66.7 | 69.9 | 6 | 3.5 | 5 |
| 08SP275 | JPTR | 90 | 5480 | 63.1 | 67.5 | 5 | 2.5 | 3 |
| 08SP286 | BNGL//MERC/RICO/4/EARL/3/CPRS/… | 89 | 5338 | 63.2 | 66.8 | 6.5 | 5 | 5 |
| 08SP315 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 91 | 5299 | 65.6 | 68.3 | 6 | 3.5 | 3 |
| 08SP265 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 84 | 5116 | 63.8 | 67.2 | 5 | 3.5 | 3 |
| 08SP313 | BNGL/9502065//EARL | 87 | 5069 | 64.9 | 68.2 | 6.5 | 3.5 | 5 |
| 08SP300 | NPTN | 92 | 5045 | 65.6 | 68.8 | 5.5 | 3.5 | 4 |
| 08SP307 | EARL/4/ORIN//MERC/RICO/3/9502065 | 87 | 5031 | 70.2 | 72.1 | 6 | 5.5 | 4 |
| 08SP317 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 89 | 4960 | 66.3 | 70.5 | 5 | 6 | 3 |
| 08SP309 | EARL/4/ORIN//MERC/RICO/3/9502065 | 88 | 4853 | 59.6 | 70.4 | 5.5 | 6 | 4 |
| 08SP266 | 9865216DH2/EARL | 88 | 4796 | 66.4 | 70.2 | 5.5 | 4 | 3.5 |
| 08SP323 | MERC/RICO//MERC/3/MERC/LMNT//…/4/BNGL//TDCN/LMNT | 85 | 4760 | 65.8 | 70.0 | 6 | 3 | 2.5 |
| 08SP298 | MEDARK/LFTE | 90 | 4759 | 60.3 | 69.2 | 5.5 | 5 | 5 |
| 08SP319 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 91 | 4722 | 59.5 | 68.4 | 6 | 3.5 | 5 |
| 08SP310 | EARL/4/ORIN//MERC/RICO/3/9502065 | 87 | 4722 | 65.9 | 69.2 | 5.5 | 6 | 5 |
| 08SP263 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 82 | 4593 | 63.1 | 68.8 | 5.5 | 3.5 | 3.5 |
| 08SP306 | EARL/4/ORIN//MERC/RICO/3/9502065 | 87 | 4414 | 63.4 | 67.4 | 5.5 | 5.5 | 4 |
| 08SP321 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 90 | 4367 | 57.6 | 68.4 | 6.5 | 3.5 | 3 |
| 08SP308 | EARL/4/ORIN//MERC/RICO/3/9502065 | 85 | 4363 | 65.8 | 69.3 | 7 | 5.5 | 6 |
| 08SP322 | MERC/RICO//MERC/3/MERC/LMNT//…/4/BNGL//TDCN/LMNT | 89 | 4335 | 63.1 | 68.7 | 7 | 6 | 2 |
| 08SP302 | BNGL/MARS | 90 | 4279 | 65.8 | 68.4 | 5.5 | 5.5 | 3.5 |
| 08SP311 | EARL/4/9502065/3/MERC/RICO//BNGL | 86 | 4266 | 64.0 | 68.2 | 6.5 | 3.5 | 4.5 |
| 08SP273 | MERC/6/MARS//M201/MARS/5/… | 89 | 4261 | 60.7 | 68.7 | 5 | 4 | 5.5 |
| 08SP283 | RICO/BNGL | 91 | 4246 | 64.3 | 70.8 | 5 | 3 | 4 |

Continued.

**Table 3.** Continued.

| Entry | Pedigree | Days to 50% Heading | Grain Yield (lb/A @ 12%) | Milling Yield (%) Whole | Milling Yield (%) Total | SB[‡] | BPB[‡] | RNB[‡] |
|---|---|---|---|---|---|---|---|---|
| 08SP293 | EARL/4/ORIN//MERC/RICO/3/9602134 | 87 | 4210 | 65.5 | 69.3 | 6.5 | 5 | 3.5 |
| 08SP282 | MARS/4/ORIN//MERC/RICO/3/MARS//… | 89 | 4185 | 63.0 | 66.7 | 6.5 | 4 | 6 |
| 08SP297 | MEDARK/LFTE | 82 | 4169 | 67.7 | 70.0 | 6 | 4.5 | 5 |
| 08SP270 | BNGL/SHORT RICO//MERC | 93 | 4061 | 63.5 | 68.2 | 5.5 | 6 | 3.5 |
| 08SP262 | 9502065/3/MERC//MERC/4/BNGL | 88 | 4053 | 51.0 | 67.5 | 6.5 | 4.5 | 3.5 |
| 08SP284 | RICO/BNGL | 90 | 3986 | 62.2 | 69.3 | 5 | 6 | 4.5 |
| 08SP316 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 91 | 3961 | 64.9 | 68.1 | 6 | 4.5 | 3 |
| 08SP256 | BNGL/4/9502065/3/MERC//MERC | 85 | 3925 | 67.3 | 71.0 | 5.5 | 3 | 3 |
| 08SP260 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 83 | 3909 | 66.2 | 69.3 | 6 | 4 | 4 |
| 08SP304 | BNGL/4/ORIN//MERC/RICO/3/9502065 | 90 | 3853 | 64.3 | 68.1 | 6 | 6 | 5.5 |
| 08SP303 | BNGL/MARS | 90 | 3823 | 62.2 | 68.0 | 5 | 4.5 | 4.5 |
| 08SP314 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 90 | 3749 | 63.8 | 67.9 | 5.5 | 3 | 2.5 |
| 08SP294 | EARL/4/ORIN//MERC/RICO/3/9602134 | 87 | 3719 | 67.1 | 70.1 | 6 | 5 | 4 |
| 08SP320 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 91 | 3680 | 63.8 | 69.1 | 6.5 | 4.5 | 4 |
| 08SP318 | MERC/LMNT//MERC/3/BNGL/4/LFTE/5/BNGL/M-202 | 91 | 3674 | 68.1 | 71.2 | 6.5 | 5 | 4 |
| 08SP285 | 9865216DH2//BNGL/SHORT RICO | 90 | 3657 | 63.6 | 68.3 | 5 | 5 | 4 |
| 08SP258 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 84 | 3575 | 66.6 | 69.6 | 6.5 | 4 | 5 |
| 08SP255 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 85 | 3406 | 64.6 | 68.8 | 6 | 4 | 3 |
| 08SP254 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 85 | 3344 | 66.9 | 69.4 | 4.5 | 3 | 2 |
| 08SP271 | LFTE/KOKOHUROSE | 91 | 3339 | 65.7 | 69.1 | 5.5 | 3.5 | 2.5 |
| 08SP312 | EARL/4/9502065/3/MERC/RICO//BNGL | 88 | 3314 | 61.8 | 69.4 | 6.5 | 4 | 4.5 |
| 08SP264 | ORIN/3/MERC/CAM9/MARS/4/BNGL | 83 | 3269 | 54.9 | 68.3 | 6 | 3.5 | 2.5 |
| 08SP267 | MDRK/LFTE | 86 | 3245 | 62.7 | 67.5 | 7.5 | 4 | 5.5 |
| 08SP261 | 9502065/3/MERC//MERC/4/BNGL | 88 | 3200 | 67.0 | 70.6 | 5.5 | 5 | 3 |
| 08SP278 | 9865216DH2/BNGL | 91 | 3056 | 66.0 | 68.9 | 5.5 | 6 | 3 |
| 08SP295 | LFTE//MERC/SABER | 83 | 2939 | 66.0 | 69.5 | 6 | 3 | 6 |
| 08SP277 | 9502065/3/BNGL//MERC/RICO/5/LFTE/4/… | 91 | 2892 | 66.3 | 69.5 | 7 | 4 | 4.5 |
| 08SP268 | BNGL/FRAN | 89 | 2871 | 58.6 | 68.5 | 7.5 | 3 | 4.5 |
| 08SP253 | ORIN//MERC/RICO//…/3/BNGL/RICO | 88 | 2851 | 64.5 | 67.7 | 4 | 4 | 3 |
| 08SP301 | BNGL/MEDARK | 91 | 2732 | 65.8 | 70.0 | 5.5 | 6 | 5 |
| 08SP251 | SP 361/BNGL | 91 | 2723 | 70.0 | 71.7 | 5.5 | 6.5 | 5 |
| 08SP279 | BNGL/5/LFTE/4/KATY/CPRS/3/… | 93 | 2703 | 57.0 | 66.0 | 6.5 | 5 | 5 |
| 08SP280 | BNGL/SHORT RICO//BNGL | 93 | 2589 | 60.5 | 68.9 | 6.5 | 3.5 | 3 |
| 08SP325 | BNGL | 93 | 2565 | 64.2 | 67.8 | 4.5 | 4 | 6 |
| 08SP272 | LFTE/KOKOHUROSE | 91 | 2103 | 67.2 | 69.6 | 6.5 | 3 | 4 |
| 08SP276 | 9502065/3/BNGL//MERC/RICO/4/MERC | 95 | 1120 | . | . | 6 | 5.5 | 4.5 |
| 08SP324 | LFTE//GP-2/LFTE/3/EARL | 95 | 1068 | . | . | 5 | 5.5 | 2.5 |

[†] Subjective rating 0 to 9, where 0 = excellent, 9 = poor.
[‡] Abbreviations: SB=sheath blight, BPB=bacterial panicle blight, RNB=rotten neck blast.

## DEVELOPMENT OF IMPROVED LONG-GRAIN AND SPECIAL PURPOSE RICE VARIETIES FOR LOUISIANA

X.Y. Sha, S.D. Linscombe, S.B. Blanche, S.J. Theunissen, and B.J. Henry

This state project is aimed to develop superior conventional long-grain rice varieties with emphasis on yield potential, quality (milling, cooking, and processing), disease resistance, lodging resistance, seedling vigor, and early maturity. The other objective is to develop specialty rice varieties adapted to Louisiana and southern U.S. environmental conditions with superior cooking, agronomic, milling, and specific qualities, such as aroma and kernel elongation. The emphasis is being placed on breeding for Jasmine-, Basmati-, and Della-type long-grain rice.

The 2008 field tests included 241 transplanted $F_1$s (166 long-grain and 75 specialty), 21 transplanted $BC_1F_1$s, 220 space-planted $F_2$ populations (151 long-grain and 69 specialty), and 34,000 progeny rows (28,000 long-grain and 6,000 specialty) ranging from $F_3$ to $F_8$. Out of these rows, 730 rows were bulk-harvested for the further evaluation (547 long-grain and 183 specialty). A total of 284 new crosses were made in 2008, which included 196 long-grain, 81 specialty, and 7 other crosses for Dr. Jong Ham of the Department of Plant Pathology and Crop Physiology, LSU. The preliminary yield test included 432 breeding lines (385 long-grain and 47 specialty). Of these, 240 (216 long-grain and 24 specialty) in replicated test (PY) and 192 (169 long-grain and 23 specialty) in the single plot test (SP). Unfortunately, most of PY and SP plots were severely damaged by the NewPath drift. Yield, milling, and agronomic performance of lightly affected lines are listed in Tables 1-7. Eight advanced long-grain (entries 022, 028, 031, 034, 125, 128, 131, and 134) and five specialty (entries 025, 137, 140, 146, and 149) were tested in the uniform regional rice nursery (URN). Test results of these lines are presented in Table 8. Most of these lines also were tested in statewide multi-location commercial advanced (CA) yield trials. CA data are listed in Table 9. The agronomic performance of these advanced lines compared with other conventional lines can be found in tables listed the earlier reports entitled “Cooperative Uniform Regional Rice Nursery” and the “Commercial-Advanced Yield Trials.” A separate advanced yield (AY) trial of 19 long-grain, 9 specialty experimental lines, and 2 check varieties was carried out at the Rice Research Station, while the latter also was tested at Jeff Davis Parish. Test results of the AY trial are listed in Tables 10 and 11.

The 2008 Puerto Rico winter nursery included 4,400 progeny rows of both long-grain and specialty types. Most of these were $F_3$s for the generation advancement purpose.

In collaboration with Dr. Jim Oard of the School of Plants, Environmental and Soil Sciences of LSU, DNA marker-assisted selection was conducted on about 300 specialty lines and over 200 $BC_1F_1$ plants for aroma, amylose content, and gelatinization temperature.

The Jasmine-type line LA0402125 continuously showed competitive grain and milling yields with specialty attributes (aroma, flavor, amylose content, alkaline spread value, and cooking quality) similar to the imported Thai Jasmine. It was named “Jazzman” and approved for release for 2009 by LSU AgCenter. A Della-type aromatic long-grain line RU0802140, which appears to have great yield potential and milling and grain quality, as well as the strong aroma similar to Della, will be increased for detailed evaluation in 2009. The two most promising long-grain lines, LA0802022 and LA0802031, will be extensively tested also.

Table 1. Agronomic and milling performance of 2008 Preliminary Yield Test, long-grain entries. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 703 | AC1400 | 5.0 | 91 | 85 | 7250 | 54.4 | 67.4 |
| 710 | AC1218 | 4.0 | 91 | 87 | 9230 | 65.5 | 70.6 |
| 713 | AC1365 | 5.0 | 90 | 89 | 7759 | 57.5 | 67.0 |
| 714 | AC1172 | 4.5 | 88 | 85 | 7153 | 58.8 | 65.9 |
| 715 | AC1081 | 4.0 | 89 | 84 | 8538 | 61.2 | 68.7 |
| 716 | AC1415 | 5.0 | 90 | 82 | 7294 | 61.4 | 68.2 |
| 717 | AC1406 | 4.0 | 91 | 83 | 7986 | 54.7 | 66.4 |
| 719 | AC1336 | 4.0 | 92 | 89 | 8507 | 60.7 | 68.6 |
| 722 | 9502008//AR 1188/CCDR/3/0402097 | 4.0 | 88 | 87 | 3979 | 63.3 | 69.1 |
| 728 | AC1395 | 4.5 | 92 | 100 | 9252 | 64.9 | 68.3 |
| 729 | NWBT/KATY//9902207x2/3/0302005 | 4.0 | 90 | 89 | 6001 | 54.6 | 67.0 |
| 731 | CCDR/JEFF/3/9502008//AR1142/MBLE | 4.0 | 88 | 86 | 4860 | 61.9 | 68.8 |
| 737 | AC1172 | 4.5 | 89 | 91 | 7661 | 60.1 | 66.5 |
| 740 | AC1075 | 4.0 | 88 | 83 | 8830 | 60.6 | 67.0 |
| 741 | CCDR//CCDR/JEFF | 4.0 | 90 | 87 | 4726 | 61.8 | 69.4 |
| 742 | DREW/CCDR//CCDR/JEFF | 4.0 | 90 | 85 | 6110 | 61.7 | 68.4 |
| 743 | AC1075 | 5.5 | 91 | 95 | 9132 | 53.5 | 66.1 |
| 745 | 0402022/0502094 | 4.0 | 89 | 85 | 4718 | 57.9 | 65.6 |
| 746 | AC110/AC638 | 4.5 | 90 | 90 | 4394 | 63.0 | 68.7 |
| 747 | 9502008//AR 1188/CCDR/3/CCDR | 4.5 | 90 | 88 | 4390 | 55.7 | 65.4 |
| 748 | AC625/PRESIDO | 3.0 | 86 | 89 | 6418 | 65.8 | 72.2 |
| 749 | AC1402 | 4.0 | 86 | 75 | 8530 | 62.1 | 69.3 |
| 752 | NWBT/KATY//9902207x2/3/0302005 | 5.0 | 90 | 88 | 4807 | 59.8 | 68.8 |
| 753 | CCDR/0502085 | 4.5 | 88 | 86 | 4708 | 57.1 | 65.1 |
| 756 | DREW/CCDR//CCDR/JEFF | 4.0 | 89 | 83 | 5432 | 59.3 | 68.2 |
| 761 | AC1012/AC110 | 5.0 | 90 | 89 | 8782 | 62.3 | 67.8 |
| 762 | AC1399 | 5.0 | 91 | 90 | 8756 | 57.3 | 68.6 |
| 765 | 9502008//AR 1188/CCDR/3/0502165 | 5.0 | 92 | 86 | 4742 | 63.7 | 68.6 |
| 766 | CCDR//9502008//AR1188/CCDR | 4.5 | 90 | 85 | 3987 | 63.3 | 69.2 |
| 768 | CCDR/JEFF/3/9502008//AR1142/MBLE | 4.0 | 88 | 91 | 4305 | 61.7 | 68.2 |
| 771 | CPRS/3/NWBT/KATY//9902207X2 | 5.0 | 92 | 85 | 5330 | 63.6 | 69.7 |
| 772 | 0402022/3/9502008//AR1142/MBLE | 5.0 | 89 | 84 | 4378 | 59.0 | 67.6 |
| 773 | NWBT/KATY//9902207x2/3/0302005 | 4.5 | 87 | 87 | 5941 | 59.8 | 68.1 |
| 775 | Trenasse | 4.5 | 85 | 82 | 6694 | 55.9 | 66.0 |
| 776 | AC1094 | 4.5 | 91 | 91 | 8871 | 62.7 | 68.3 |
| 783 | AC1400 | 5.0 | 90 | 82 | 6535 | 60.3 | 68.0 |
| 784 | AC1403 | 5.0 | 91 | 87 | 7689 | 64.7 | 68.8 |
| 786 | 9502008//AR 1188/CCDR/3/0302005 | 5.0 | 90 | 85 | 5500 | 55.6 | 66.2 |
| 790 | DREW/CCDR//9502008/DREW | 4.5 | 92 | 88 | 4144 | 54.1 | 65.2 |
| 796 | TACAURI//KBNT/LCSN/3/0502022 | 6.0 | 87 | 81 | 4818 | 57.6 | 66.8 |
| 798 | 0402022/3/9502008//AR1142/MBLE | 4.5 | 90 | 80 | 4924 | 62.7 | 69.4 |
| 800 | Cheniere | 4.5 | 93 | 84 | 5708 | 59.2 | 68.7 |
| c.v.% | | 9.7 | 2.5 | 4.0 | 11.4 | 5.2 | 2.5 |
| $LSD_{0.05}$ | | 0.9 | 4 | 7 | 1472 | 2.3 | 3.4 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 2. Agronomic and milling performance of 2008 Preliminary Yield Test, specialty entries. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 801 | CPRS//L-205/DLLA | 4.5 | 91 | 78 | 3641 | 56.7 | 68.4 |
| 802 | 00HB126/PI 457917//CCDR | 4.5 | 99 | 88 | 3613 | 51.5 | 66.9 |
| 803 | LBLE/L201//MBLE/3/BSMT PAK372A/4/… | 4.0 | 96 | 82 | 5792 | 65.5 | 72.1 |
| 804 | CPRS/DREW/3/JSMN/DLLA//LEAH/DLLA | 5.0 | 90 | 98 | 4082 | 58.9 | 66.7 |
| 805 | CCDR/3/JSMN/DLLA//LEAH/DLLA | 5.0 | 95 | 84 | 3074 | 66.1 | 71.2 |
| 807 | DLRS//AR1142/LA2031/3/JSMN/DLLA | 5.0 | 94 | 78 | 6503 | 52.2 | 67.1 |
| 808 | 00HB126/PI 457917//CCDR | 5.0 | 99 | 90 | 5579 | 57.2 | 68.4 |
| 809 | AC107DH1/AC167DH1/4/DMSI/… | 5.0 | 90 | 86 | 6630 | 64.7 | 71.1 |
| 813 | DLRS//AR1142/LA2031/3/JSMN/DLLA | 5.0 | 97 | 78 | 5374 | 52.8 | 65.1 |
| 815 | DLMT/5/DLMT 8462…./4/DMSI | 4.5 | 92 | 94 | 6165 | 52.5 | 67.0 |
| 818 | AC107DH1/AC167DH1//A-201 | 5.0 | 83 | 89 | 6925 | 56.2 | 66.5 |
| 820 | JSMN/DLLA//96SP287/4/DLLAx2/LMNT*2/3/DMSI/… | 5.0 | 96 | 85 | 4001 | 52.1 | 68.1 |
| 821 | JSMN/DLLA//96SP287/3/CPRS/DREW | 5.0 | 88 | 87 | 4075 | 55.7 | 67.3 |
| 822 | DLMT/CALMATI | 5.0 | 87 | 76 | 4564 | 53.1 | 66.6 |
| 823 | NCHS//JSMN/DLLA | 4.5 | 90 | 73 | 4694 | 58.3 | 63.2 |
| 824 | DLLAx2/LMNT*2/3/DMSI/DLLAx2//…/4/JSMN/DLLA//… | 5.0 | 97 | 81 | 4085 | 60.8 | 67.8 |
| 825 | Cocodrie | 4.5 | 90 | 83 | 4960 | 60.6 | 69.2 |
| c.v.% | | 8.2 | 3.0 | 4.6 | 10.8 | 4.1 | 2.6 |
| $LSD_{0.05}$ | | 0.8 | 6 | 8 | 1131 | 5.0 | 3.7 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 3. Agronomic and milling performance of 2008 Preliminary Yield Test, long-grain entries, Group PR01. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 08P2501 | CCDR//CCDR/JEFF | 3.5 | 70 | 98 | 8311 | 62.9 | 69.5 |
| 08P2505 | CCDR//CCDR/JEFF | 3.0 | 69 | 97 | 8454 | 66.5 | 73.9 |
| 08P2509 | CCDR//CCDR/JEFF | 3.0 | 69 | 103 | 8940 | 62.2 | 69.2 |
| 08P2512 | CCDR//CCDR/JEFF | 4.0 | 71 | 91 | 6638 | 62.8 | 70.6 |
| 08P2517 | CCDR//CCDR/JEFF | 3.5 | 70 | 97 | 8042 | 61.8 | 68.0 |
| 08P2519 | CCDR//CCDR/JEFF | 3.0 | 69 | 102 | 8789 | 61.8 | 68.5 |
| 08P2521 | CCDR//CCDR/JEFF | 3.5 | 68 | 97 | 8210 | 64.1 | 71.2 |
| 08P2525 | CCDR//CCDR/JEFF | 4.0 | 68 | 91 | 7366 | 66.6 | 72.7 |
| 08P2527 | CCDR//CCDR/JEFF | 3.0 | 70 | 104 | 7940 | 62.1 | 68.6 |
| 08P2530 | CCDR//CCDR/JEFF | 3.0 | 68 | 98 | 8202 | 53.8 | 69.4 |
| 08P2536 | CCDR//CCDR/JEFF | 3.0 | 69 | 96 | 7432 | 65.4 | 73.1 |
| 08P2544 | CCDR//CCDR/JEFF | 3.5 | 67 | 97 | 8457 | 63.0 | 69.6 |
| 08P2549 | CCDR//CCDR/JEFF | 3.0 | 67 | 97 | 8635 | 61.6 | 73.6 |
| 08P2551 | CCDR//CCDR/JEFF | 3.5 | 68 | 104 | 8127 | 67.1 | 74.2 |
| 08P2557 | CCDR//CCDR/JEFF | 3.0 | 67 | 102 | 6858 | 63.7 | 71.8 |
| 08P2561 | CCDR//CCDR/JEFF | 3.5 | 66 | 97 | 7650 | 65.2 | 70.9 |
| 08P2564 | CCDR//CCDR/JEFF | 3.0 | 67 | 99 | 8017 | 62.9 | 67.6 |
| 08P2626 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 67 | 104 | 8191 | 61.8 | 71.2 |
| 08P2629 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 68 | 100 | 8326 | 63.7 | 72.2 |
| 08P2632 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 66 | 97 | 8479 | 62.2 | 69.8 |
| 08P2635 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 69 | 96 | 8624 | 63.4 | 71.1 |
| 08P2645 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 69 | 100 | 8682 | 66.2 | 72.9 |
| 08P2648 | CCDR/3/9502008-A//AR1188/CCDR | 3.0 | 70 | 100 | 8907 | 64.1 | 70.7 |
| RU0802022 | AC1398 | 3.5 | 73 | 104 | 9028 | 65.6 | 71.3 |
| Cocodrie | Cocodrie | 3.0 | 69 | 106 | 9089 | 65.0 | 71.8 |
| | | | | | | | |
| c.v.% | | 15.0 | 1.9 | 4.8 | 7.8 | 5.5 | 3.8 |
| $LSD_{0.05}$ | | 1.0 | 3 | 10 | 1328 | 7.2 | 5.6 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 4. Agronomic and milling performance of 2008 Preliminary Yield Test, long-grain entries, Group PR02. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 08P2651 | CCDR//9901081/CCDR | 4.0 | 70 | 97 | 8222 | 62.8 | 71.1 |
| 08P2654 | CCDR//9901081/CCDR | 4.0 | 68 | 96 | 8001 | 63.4 | 73.5 |
| 08P2679 | CCDR//9901081/CCDR | 4.0 | 73 | 90 | 6867 | 64.2 | 71.9 |
| 08P2704 | CCDR/3/CPRS/KBNT//9502008-A | 3.5 | 69 | 98 | 8420 | 65.3 | 72.5 |
| 08P2709 | CCDR/3/CPRS/KBNT//9502008-A | 3.0 | 70 | 102 | 8884 | 65.5 | 72.8 |
| 08P2713 | CCDR/3/CPRS/KBNT//9502008-A | 4.0 | 68 | 103 | 9123 | 62.2 | 68.5 |
| 08P2724 | CCDR/3/CPRS/KBNT//9502008-A | 3.5 | 70 | 98 | 8623 | 60.3 | 70.8 |
| 08P2728 | CCDR/3/CPRS/KBNT//9502008-A | 3.5 | 70 | 101 | 9101 | 64.7 | 72.6 |
| 08P2743 | CCDR/3/CPRS/KBNT//9502008-A | 3.0 | 70 | 102 | 9328 | 65.7 | 73.8 |
| 08P2753 | CCDR/3/9502008-A//AR1188/CCDR | 3.0 | 69 | 102 | 9131 | 60.3 | 66.8 |
| 08P2757 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 69 | 103 | 8321 | 63.4 | 69.9 |
| 08P2761 | CCDR/3/9502008-A//AR1188/CCDR | 3.0 | 69 | 99 | 9582 | 65.0 | 73.5 |
| 08P2773 | CCDR/3/9502008-A//AR1188/CCDR | 4.0 | 70 | 102 | 8311 | 62.8 | 69.5 |
| 08P2777 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 70 | 100 | 8505 | 63.2 | 73.3 |
| 08P2781 | CCDR/3/9502008-A//AR1188/CCDR | 3.5 | 70 | 97 | 8497 | 64.6 | 72.1 |
| 08P2785 | CCDR/3/9502008-A//AR1188/CCDR | 3.0 | 71 | 105 | 8825 | 65.1 | 71.9 |
| 08P2791 | CCDR/3/9502008-A//AR1188/CCDR | 3.0 | 69 | 104 | 8556 | 65.0 | 72.7 |
| 08P2794 | CCDR/3/9502008-A//AR1188/CCDR | 4.0 | 70 | 103 | 7989 | 61.0 | 69.5 |
| 08P2807 | CCDR/RU0602128 | 3.5 | 69 | 97 | 7182 | 63.7 | 72.4 |
| 08P2816 | CCDR/RU0602128 | 3.5 | 69 | 103 | 8733 | 63.0 | 70.3 |
| 08P2827 | CCDR/RU0602128 | 3.5 | 70 | 100 | 8205 | 64.4 | 71.2 |
| 08P2834 | CCDR/RU0602128 | 3.5 | 69 | 100 | 8949 | 62.5 | 69.5 |
| 08P2842 | CCDR/RU0602128 | 3.5 | 69 | 102 | 7065 | 62.3 | 68.6 |
| RU0802028 | AC1055 | 3.0 | 74 | 102 | 9275 | 62.7 | 71.5 |
| Catahoula | Catahoula | 4.0 | 72 | 102 | 9061 | 58.4 | 71.2 |
| c.v.% | | 13.7 | 0.9 | 3.1 | 9.1 | 4.3 | 4.2 |
| $LSD_{0.05}$ | | 1.0 | 1 | 6 | 1591 | 5.6 | 6.2 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 5. Agronomic and milling performance of 2008 Preliminary Yield Test, long-grain entries, Group PR03. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 08P2852 | CCDR/RU0602137 | 4.0 | 68 | 99 | 8465 | 62.0 | 68.7 |
| 08P2857 | CCDR/RU0602137 | 3.5 | 69 | 96 | 8551 | 63.4 | 70.0 |
| 08P2873 | CCDR/RU0602137 | 3.5 | 70 | 96 | 8266 | 62.9 | 70.0 |
| 08P2881 | CCDR/RU0602137 | 3.5 | 68 | 95 | 7414 | 64.3 | 68.9 |
| 08P2896 | CCDR/RU0602137 | 3.5 | 69 | 105 | 8181 | 61.6 | 67.8 |
| 08P2934 | CCDR/JAF4DH3 | 4.0 | 72 | 101 | 7348 | 62.2 | 69.0 |
| 08P2946 | CCDR/JAF4DH3 | 4.0 | 70 | 104 | 8985 | 62.6 | 69.1 |
| 08P2956 | CCDR/AC1094 | 4.0 | 70 | 100 | 6768 | 61.8 | 68.9 |
| 08P2961 | CCDR/AC1094 | 4.0 | 72 | 103 | 9179 | 62.4 | 69.1 |
| 08P3168 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 3.5 | 70 | 97 | 9443 | 65.0 | 70.6 |
| 08P3170 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 4.0 | 72 | 99 | 8143 | 63.9 | 69.3 |
| 08P3173 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 3.5 | 72 | 93 | 8607 | 64.1 | 69.5 |
| 08P3176 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 4.0 | 73 | 99 | 6159 | 58.3 | 68.6 |
| 08P3182 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 4.0 | 73 | 102 | 7579 | 66.3 | 71.5 |
| 08P3185 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 3.5 | 72 | 96 | 8413 | 64.8 | 71.5 |
| 08P3194 | CPRS/KBNT//9502008-A/3/9901081/CCDR | 4.0 | 74 | 89 | 6731 | 63.6 | 70.4 |
| 08P3207 | CPRS/KBNT//9502008-A | 3.5 | 71 | 100 | 9623 | 63.5 | 72.2 |
| 08P3228 | CPRS/KBNT//9502008-A | 3.5 | 71 | 98 | 8897 | 63.1 | 69.1 |
| 08P3231 | CPRS/KBNT//9502008-A | 3.0 | 71 | 97 | 8814 | 63.6 | 69.4 |
| 08P3250 | CPRS/KBNT//9502008-A | 4.0 | 71 | 100 | 7620 | 61.6 | 67.3 |
| 08P3252 | CPRS/KBNT//9502008-A/3/AC1021 | 4.0 | 71 | 101 | 7730 | 62.5 | 67.2 |
| 08P3325 | CPRS//9502008-A/DREW | 4.0 | 71 | 98 | 7233 | 67.1 | 71.9 |
| 08P3328 | CPRS//9502008-A/DREW | 4.0 | 74 | 107 | 4244 | 57.2 | 67.1 |
| RU0802031 | CCDR/0502085 | 3.0 | 69 | 99 | 8851 | 68.1 | 72.6 |
| Trenasse | Trenasse | 3.0 | 65 | 100 | 8561 | 59.2 | 65.9 |
| | | | | | | | |
| c.v.% | | 11.0 | 1.2 | 2.9 | 11.7 | 4.0 | 3.1 |
| $LSD_{0.05}$ | | 0.8 | 2 | 6 | 1929 | 5.2 | 4.4 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 6. Agronomic and milling performance of 2008 Preliminary Yield Test, long-grain entries, Group PR04. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|
| | | | | | | Head | Total |
| 08P3333 | CPRS//9502008-A/DREW | 4.0 | 72 | 102 | 6055 | 63.3 | 68.5 |
| 08P3346 | CPRS//9502008-A/DREW | 3.5 | 74 | 95 | 4968 | 63.9 | 69.5 |
| 08P3350 | CPRS//9502008-A/DREW | 3.5 | 70 | 96 | 7596 | 65.8 | 71.0 |
| 08P3363 | CCDR/JEFF//AC1021 | 3.5 | 68 | 93 | 5915 | 66.2 | 69.9 |
| 08P3393 | CCDR/JEFF//AC1021 | 4.5 | 69 | 89 | 5163 | 66.0 | 70.4 |
| 08P3402 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 3.5 | 67 | 101 | 7844 | 62.6 | 69.5 |
| 08P3434 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 3.0 | 67 | 100 | 8156 | 61.9 | 67.5 |
| 08P3438 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 3.5 | 69 | 100 | 7889 | 62.3 | 68.6 |
| 08P3444 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 4.0 | 68 | 98 | 7882 | 60.8 | 65.8 |
| 08P3446 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 3.5 | 68 | 96 | 8270 | 64.2 | 69.5 |
| 08P3449 | CCDR/JEFF/3/9502008-A//AR1188/CCDR | 3.0 | 69 | 102 | 8072 | 61.5 | 67.1 |
| 08P3453 | 9502008A//AR1188/CCDR/3/WELLS/ZHE733 | 3.5 | 63 | 100 | 7551 | 61.4 | 69.0 |
| 08P3488 | 9502008A//AR1188/CCDR/3/WELLS/ZHE733 | 3.5 | 59 | 101 | 7279 | 65.8 | 70.8 |
| 08P3519 | 9502008-A//AR1188/CCDR/3/AC746 | 4.0 | 70 | 99 | 6517 | 59.8 | 67.0 |
| 08P3539 | 9502008-A//AR1188/CCDR/3/AC746 | 3.5 | 67 | 97 | 7884 | 63.5 | 68.3 |
| 08P3582 | 9502008-A/DREW//WELLS/ZHE733 | 3.0 | 70 | 104 | 8781 | 64.4 | 68.8 |
| 08P3626 | 9502008-A/DREW//AC627 | 3.5 | 72 | 97 | 7224 | 66.0 | 70.8 |
| 08P3629 | 9502008-A/DREW//AC627 | 4.0 | 73 | 99 | 7560 | 58.8 | 66.5 |
| 08P3631 | 9502008-A/DREW//AC627 | 3.5 | 66 | 98 | 7669 | 63.7 | 69.1 |
| 08P3656 | 9502008-A/DREW//AC101/DREW | 3.5 | 69 | 96 | 7258 | 66.2 | 70.5 |
| 08P3663 | 9502008-A/DREW//AC101/DREW | 3.5 | 70 | 103 | 8754 | 63.3 | 68.6 |
| 08P3673 | 9502008-A/DREW//AC101/DREW | 3.5 | 69 | 104 | 7453 | 63.3 | 70.2 |
| 08P2896-2 | CCDR/RU0602137 | 3.5 | 69 | 107 | 8039 | 63.5 | 69.2 |
| RU0802034 | CCDR//9502008//AR 1188/CCDR | 3.0 | 67 | 104 | 7958 | 62.9 | 69.3 |
| Wells | Wells | 3.0 | 75 | 108 | 8252 | 64.4 | 73.1 |
| c.v.% | | 16.3 | 1.0 | 3.6 | 5.2 | 4.4 | 3.9 |
| $LSD_{0.05}$ | | 1.2 | 1 | 7 | 805 | 5.7 | 5.6 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 7. Agronomic and milling performance of 2008 Single Plot Test. Long-grain and specialty lines. Rice Research Station, Crowley, LA.

| Entry | Pedigree | Type† | Vigor‡ | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Head | Total |
| SP054 | AC1290 | L | 4 | 92 | 85 | 4564 | 68.1 | 72.7 |
| SP058 | AC1073 | L | 5 | 88 | 82 | 7715 | 65.2 | 67.7 |
| SP080 | AC1401 | L | 4 | 92 | 90 | 7888 | 60.2 | 67.2 |
| SP095 | AC1405 | L | 5 | 92 | 83 | 8419 | 63.7 | 69.1 |
| SP100 | CL151 | L | 7 | 95 | 88 | 7787 | 61.0 | 68.3 |
| SP102 | AC1075 | L | 5 | 91 | 82 | 9108 | 48.3 | 64.2 |
| SP107 | AC690 | L | 5 | 85 | 79 | 6848 | 62.9 | 66.7 |
| SP117 | AC1381 | L | 5 | 96 | 86 | 8940 | 58.0 | 69.3 |
| SP120 | AC1081 | L | 5 | 91 | 86 | 7846 | 57.3 | 66.8 |
| SP131 | AC1081 | L | 5 | 94 | 88 | 8178 | 58.3 | 69.5 |
| SP136 | 9502008//AR 1188/CCDR/3/CCDR | L | 5 | 93 | 79 | 4034 | 64.0 | 70.4 |
| SP138 | AC 1415 | L | 6 | 96 | 83 | 8072 | 61.9 | 68.0 |
| SP140 | AC1073 | L | 5 | 89 | 91 | 9228 | 47.6 | 62.2 |
| SP146 | AC627 | L | 5 | 92 | 82 | 8295 | 56.8 | 68.3 |
| SP147 | AC 1415 | L | 6 | 91 | 81 | 7993 | 58.0 | 67.9 |
| SP159 | NWBT/KATY//9902207x2/3/0302005 | L | 5 | 89 | 83 | 4707 | 64.1 | 69.3 |
| SP162 | AC 1398 | L | 5 | 92 | 84 | 8568 | 50.0 | 66.3 |
| SP167 | DREW/CCDR//CCDR | L | 5 | 98 | 79 | 4011 | 66.8 | 71.9 |
| SP175 | CL131 | L | 3 | 92 | 82 | 9674 | 63.0 | 70.8 |
| SP176 | AC 1415 | L | 5 | 94 | 83 | 9031 | 65.9 | 69.6 |
| SP193 | AC1081 | L | 5 | 87 | 89 | 8930 | 55.3 | 65.9 |
| SP195 | CCDR/0502094 | L | 5 | 91 | 84 | 4224 | 60.5 | 66.6 |
| SP204 | AC1073 | L | 4 | 91 | 90 | 7254 | 49.7 | 61.9 |
| SP208 | AC1405 | L | 5 | 91 | 76 | 8477 | 55.1 | 67.5 |
| SP212 | AC1073 | L | 5 | 84 | 81 | 6773 | 65.2 | 70.6 |
| SP214 | AC1406 | L | 5 | 91 | 81 | 8135 | 64.0 | 70.9 |
| SP217 | AC1365 | L | 5 | 92 | 86 | 9785 | 63.7 | 69.3 |
| SP225 | Trenasse | L | 4 | 89 | 92 | 7745 | 49.7 | 65.3 |
| SP231 | 9502008A/DREW/3/JSMN/DLLA//LEAH/DLLA | SP | 5 | 91 | 85 | 4030 | 49.6 | 66.2 |
| SP234 | DLRS//AR1142/LA2031/3/JSMN/DLLA | SP | 5 | 101 | 72 | 5542 | 41.5 | 61.1 |
| SP238 | DLMT/5/DLMT 8462…./4/DMSI | SP | 4 | 92 | 88 | 5893 | 50.1 | 63.8 |
| SP239 | ALAN//JKSN/KDM 105 | SP | 4 | 96 | 85 | 7603 | 54.3 | 64.0 |
| SP247 | A-301/KATY/5/DLMT 8462…/4/DMSI | SP | 5 | 97 | 89 | 6089 | 55.2 | 66.1 |
| SP250 | Dellrose | SP | 6 | 98 | 83 | 4718 | 64.8 | 72.8 |

† L = Long grain and SP = Specialty type.

‡ Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 8. Yield, milling, and agronomic performance of 13 experimental long-grain, specialty lines, and check varieties in the Uniform Regional Rice Nursery (URN), Crowley, LA. 2008.

| Entry | Pedigree | Grain Type | Vigor* | Days to 50% Heading | Plant Height (inch) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Head | Total |
| RU0802022 | AC1398 | Long | 4.0 | 81 | 40 | 10585 | 63.1 | 68.9 |
| RU0402125 | Jazzman | Jasmine | 3.3 | 88 | 43 | 5696 | 68.5 | 72.3 |
| RU0802028 | AC1055 | Long | 4.7 | 81 | 41 | 8657 | 62.2 | 70.0 |
| RU0802031 | CCDR/0502085 | Long | 4.7 | 80 | 40 | 9858 | 62.5 | 68.8 |
| RU0802034 | CCDR//9502008//AR 1188/CCDR | Long | 5.0 | 78 | 41 | 8112 | 64.4 | 71.1 |
| RU0802125 | AC1055 | Long | 4.0 | 81 | 41 | 8827 | 62.5 | 70.2 |
| RU0802128 | AC1019 | Long | 4.0 | 80 | 41 | 8833 | 60.9 | 71.0 |
| RU0802131 | AC1073 | Long | 4.5 | 78 | 40 | 9043 | 64.7 | 71.2 |
| RU0802134 | CCDR//CCDR/JEFF | Long | 5.0 | 82 | 42 | 10252 | 57.8 | 66.9 |
| RU0802137 | AC1106 | Toro | 4.5 | 84 | 41 | 8273 | 65.6 | 71.5 |
| RU0802140 | CPRS//L-205/DLLA | Della | 3.5 | 86 | 43 | 9099 | 65.4 | 69.6 |
| RU0802146 | NWBT/KATY//9902207X2/3/JSMN/DLLA//… | Jasmine | 4.0 | 81 | 44 | 5804 | 58.5 | 64.7 |
| RU0802149 | 9502008//KATY/9902207X2/3/JSMN/… | Jasmine | 3.0 | 80 | 42 | 8683 | 61.7 | 68.2 |
| Catahoula | | Long | 4.7 | 81 | 40 | 10637 | 66.5 | 72.7 |
| Cheniere | | Long | 4.7 | 84 | 40 | 9774 | 58.3 | 69.6 |
| Cocodrie | | Long | 3.7 | 80 | 40 | 9740 | 62.3 | 69.8 |
| Dellrose | | Della | 5.5 | 85 | 44 | 7658 | 66.2 | 71.4 |
| Francis | | Long | 3.7 | 83 | 43 | 10252 | 59.1 | 67.5 |
| Trenasse | | Long | 5.0 | 76 | 40 | 6751 | 58.7 | 67.6 |
| Wells | | Long | 3.3 | 85 | 44 | 11180 | 57.2 | 68.1 |
| XL723 | | Long | 4.5 | 81 | 46 | 10362 | 62.6 | 71.6 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 9. Average yield, milling, and agronomic performance of 10 experimental long-grain, specialty lines, and eight check varieties in the Commercial Advanced (CA) trial at four Louisiana locations (Crowley, Mowata, Fenton, and Lake Arthur), 2008.

| Entry | Source | Grain Type | Vigor* | Days to 50% Heading | Plant Height (inch) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Head | Total |
| 242 | RU0802022 | Long | 4.1 | 83 | 37 | 7456 | 62.3 | 69.4 |
| 243 | RU0402125 | Jasmine | 4.0 | 87 | 38 | 6829 | 64.5 | 69.9 |
| 244 | RU0802028 | Long | 5.1 | 83 | 36 | 6626 | 62.5 | 70.5 |
| 245 | RU0802031 | Long | 4.9 | 81 | 35 | 7127 | 62.6 | 69.3 |
| 246 | RU0802034 | Long | 4.6 | 80 | 35 | 6704 | 62.5 | 70.0 |
| 247 | RU0802125 | Long | 4.7 | 83 | 36 | 7078 | 62.1 | 70.4 |
| 248 | RU0802128 | Long | 4.8 | 81 | 34 | 5969 | 62.0 | 70.2 |
| 249 | RU0802134 | Long | 4.5 | 81 | 35 | 7083 | 62.2 | 70.7 |
| 250 | RU0802146 | Jasmine | 4.1 | 81 | 37 | 5870 | 65.3 | 70.2 |
| 251 | RU0802149 | Jasmine | 4.6 | 83 | 35 | 5741 | 62.1 | 68.7 |
| 203 | CL151 | CL-long | 4.1 | 82 | 38 | 7735 | 64.4 | 71.0 |
| 205 | Trenasse | Long | 4.5 | 76 | 36 | 6784 | 61.0 | 68.0 |
| 207 | Cocodrie | Long | 4.0 | 80 | 34 | 7044 | 62.0 | 70.4 |
| 208 | Cheniere | Long | 4.1 | 84 | 35 | 7164 | 61.8 | 70.2 |
| 209 | Cypress | Long | 4.2 | 84 | 36 | 6560 | 63.6 | 69.4 |
| 210 | Wells | Long | 3.5 | 85 | 38 | 6901 | 58.0 | 70.4 |
| 217 | Dellrose | Della | 5.7 | 84 | 38 | 5512 | 67.1 | 71.3 |
| 218 | Catahoula | Long | 4.9 | 81 | 35 | 7106 | 65.0 | 72.1 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 10. Yield, milling, and agronomic performance of all entries of Advanced Yield trial (AY) tested at the Rice Research Station, Crowley, LA. 2008.

| Entry | Pedigree | Grain Type | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Head | Total |
| 001 | NWBT/KATY//9902207x2/3/JSMN/DLLA//LEAH/DLLA | Jasmine | 3.7 | 60 | 90 | 6800 | 61.3 | 70.7 |
| 002 | 9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA | Jasmine | 4.0 | 75 | 104 | 8048 | 61.3 | 66.9 |
| 003 | CPRS/DLRS | Della | 3.0 | 71 | 103 | 7502 | 60.3 | 67.9 |
| 004 | A-201/SADRI TYPE//DLRS | Della | 4.0 | 68 | 94 | 8135 | 63.6 | 70.5 |
| 005 | DLMT 8462…/4/DMSI/5/RSMT | Basmati | 4.0 | 73 | 104 | 6728 | 61.4 | 68.7 |
| 006 | L202/LEAH//TORO/3/IR67016 | Basmati | 4.3 | 73 | 106 | 6519 | 63.0 | 70.8 |
| 007 | DLRS//KBNT/JODN | Della | 3.3 | 73 | 109 | 7287 | 66.2 | 68.9 |
| 008 | AC1106 | Toro | 4.0 | 76 | 96 | 6802 | 61.6 | 68.5 |
| 009 | Jazzman | Jasmine | 4.0 | 75 | 104 | 8149 | 57.9 | 67.3 |
| 010 | Cheniere | Long | 3.0 | 72 | 97 | 8716 | 65.0 | 71.3 |
| 011 | AC1349 | Long | 3.7 | 71 | 101 | 8245 | 58.6 | 65.4 |
| 012 | AC1330 | Long | 3.7 | 69 | 97 | 6946 | 53.6 | 65.4 |
| 013 | AC1072 | Long | 4.3 | 73 | 94 | 7968 | 61.9 | 68.2 |
| 014 | AC1070 | Long | 4.0 | 69 | 104 | 7655 | 61.9 | 66.8 |
| 015 | AC1070 | Long | 4.0 | 71 | 105 | 8962 | 63.1 | 71.5 |
| 016 | AC1406 | Long | 4.0 | 74 | 101 | 8020 | 60.5 | 69.1 |
| 017 | AC1398 | Long | 3.3 | 73 | 109 | 7762 | 58.9 | 66.0 |
| 018 | AC638 | Long | 3.7 | 69 | 103 | 9011 | 62.2 | 67.5 |
| 019 | AC1403 | Long | 3.3 | 73 | 106 | 7947 | 64.4 | 69.0 |
| 020 | AC1019 | Long | 3.7 | 72 | 99 | 8660 | 60.7 | 67.5 |
| 021 | AC105 | Long | 3.3 | 71 | 103 | 8859 | 63.2 | 68.8 |
| 022 | AC1349 | Long | 4.0 | 71 | 99 | 6345 | 52.3 | 67.0 |
| 023 | AC1402 | Long | 4.0 | 75 | 99 | 8053 | 64.9 | 71.2 |
| 024 | CCDR/0502094 | Long | 4.0 | 70 | 102 | 6555 | 62.9 | 69.6 |
| 025 | 0402022/0502094 | Long | 3.7 | 69 | 103 | 8118 | 63.8 | 70.4 |
| 026 | 9502008//KATY/902207x2/3/0402068 | Long | 4.0 | 71 | 104 | 9430 | 64.0 | 71.8 |
| 027 | AC110/AC638 | Long | 4.0 | 71 | 99 | 9029 | 63.1 | 71.5 |
| 028 | AC1019 | Long | 3.3 | 66 | 100 | 7281 | 58.2 | 66.0 |
| 029 | AC1076 | Long | 4.0 | 73 | 106 | 8473 | 61.0 | 67.9 |
| 030 | Wells | Long | 3.3 | 75 | 106 | 6595 | 53.9 | 65.2 |
| | | | | | | | | |
| c.v.% | | | 10.5 | 1.6 | 3.6 | 12.8 | 6.6 | 4.2 |
| $LSD_{0.05}$ | | | 0.6 | 2 | 6 | 1630 | 8.3 | 5.9 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

Table 11. Yield, milling, and agronomic performance of specialty entries of the Advanced Yield trial (AY) tested at Fenton, Jeff Davis Parish, 2008.

| Entry | Pedigree | Grain Type | Vigor* | Days to 50% Heading | Plant Height (cm) | Yield (lb/A) | Milling (%) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Head | Total |
| 001 | NWBT/KATY//9902207x2/3/JSMN/DLLA//LEAH/DLLA | Jasmine | 4.3 | 80 | 73 | 4383 | 61.9 | 70.4 |
| 002 | 9502008-A/DREW/3/JSMN/DLLA//LEAH/DLLA | Jasmine | 4.0 | 83 | 81 | 5259 | 64.1 | 72.6 |
| 003 | CPRS/DLRS | Della | 4.0 | 82 | 82 | 5908 | 67.0 | 71.9 |
| 004 | A-201/SADRI TYPE//DLRS | Della | 4.7 | 79 | 67 | 3961 | 68.7 | 73.5 |
| 005 | DLMT 8462…/4/DMSI/5/RSMT | Basmati | 4.7 | 84 | 78 | 3929 | 65.7 | 73.1 |
| 006 | L202/LEAH//TORO/3/IR67016 | Basmati | 4.0 | 84 | 79 | 4146 | 62.9 | 71.3 |
| 007 | DLRS//KBNT/JODN | Della | 4.0 | 83 | 77 | 5184 | 72.4 | 75.6 |
| 008 | AC1106 | Toro | 4.3 | 83 | 70 | 6120 | 69.1 | 74.4 |
| 009 | Jazzman | Jasmine | 3.3 | 86 | 90 | 5618 | 67.1 | 73.8 |
| 010 | Cheniere | Long | 4.0 | 85 | 77 | 5044 | 63.8 | 72.6 |
| | | | | | | | | |
| c.v.% | | | 8.2 | 1.1 | 4.1 | 12.4 | 5.6 | 1.6 |
| $LSD_{0.05}$ | | | 0.6 | 2 | 5 | 1056 | 8.3 | 2.6 |

* Subjective rating 1 to 7, where 1 = excellent, 7 = no stand.

# RICE GENETICS AND GERMPLASM DEVELOPMENT

J.H. Oard, D. Groth, S.D. Linscombe, X. Sha, S. Ordonez, and J. Silva

## Summary

1) Specific DNA markers were used to assist Dr. Sha in the development of elite lines for special purpose rice. Three markers associated with aroma, amylose content, and gelatinization temperature were used, along with plant type, to select 300 elite medium-grain lines. Some 100 $F_1$ hybrids were also genotyped with markers for selection and generation advance in 2009. 2) DNA markers potentially associated with sheath blight resistance and high grain milling yields were identified by the RiceCAP Project. Access to the markers will be made available to the public via the RiceCAP website. 3) Several sheath blight-tolerant lines were identified, including one selection that produced high yields under high disease pressure. 4) Initial crossing and selection for adapted inbred lines for hybrid rice development were carried out in the field and greenhouse. 5) Collection and initial evaluation of yield-related traits and molecular data from a selected population of elite lines were completed.

## Marker-Assisted Development of Elite Medium-Grain Lines for Cooking and Grain Quality

In cooperation with Dr. Sha, we have completed the second year of evaluating certain molecular markers to speed up development of new Louisiana medium-grain varieties. These markers have produced some success by other U.S. public breeding programs to enhance elite line development. We evaluated some 300 breeding lines of different generations from Dr. Sha's breeding program in 2008. In addition, we screened ~100 $F_1$ hybrid plants from Dr. Sha to identify the best plant type combined with the most desirable combination of the three markers for aroma, amylose content, and gelatinization temperature. The selected $F_1$'s were advanced in the 2008 greenhouse and $F_2$ populations will be evaluated in 2009 by Dr. Sha. The major advantage of these markers to date has been the identification of homozygous or pure-breeding advanced lines for cooking and quality traits that otherwise would require an extra generation or more to select. Moreover, these markers have assisted in the identification of seed mixtures and, in some cases, the identification and/or differentiation of commercial varieties.

## Identification of DNA Markers for Sheath Blight Resistance and High Grain Milling Yields

The RiceCAP Project has identified DNA markers associated with sheath blight resistance and head rice. RiceCAP developed and evaluated four mapping populations for sheath blight under field and greenhouse conditions over four years, including the SB5 mapping population in 2008. The two most important parental sources of Cocodrie and MRC10277 were developed by Drs. Linscombe and Rush, respectively. Without these two parents, this project would not be successfully completed. The field locations included two years of inoculated field plots at Crowley and Stuttgart, AR. Dr. Don Groth was a key contributor to maintain field plots at Crowley and collected quality disease ratings for this research. The inoculated lines consisted of 325 doubled-haploid lines (designated SB2) that were previously developed by the Rice Station. Analysis of data for all trials, including those from separate greenhouse experiments, showed that a region at the bottom of chromosome 9 was associated with sheath blight resistance. The gene(s) responsible for resistance on chromosome 9 are unknown at this time, but molecular markers in this region have been identified during the RiceCAP Project. A second marker on chromosome 2 was also found to be associated with sheath blight resistance. Details about this research and markers for resistance can be found at the website: http://www.uark.edu/ua/ricecap.

DNA markers for high head rice yields were also identified by the RiceCAP project. The MY2 population was derived from a cross of Cypress, a Louisiana variety known for high head rice yields across different harvest moistures, and LaGrue, an Arkansas variety with inconsistent head rice yields in different environments. MY2 was evaluated at Crowley and Stuttgart in 2006 and 2007.

The results showed that environment, particularly high nighttime temperatures during grain filling, had a strong impact on head rice in Louisiana vs. Arkansas. The genetic analysis suggested that a gene(s) from Cypress promoted early heading that helped avoid high night temperatures during grain filling, resulting in high head rice yields. The results also suggested that the beneficial effects of this Cypress gene(s) observed in Louisiana did not have the same impact in Arkansas, presumably due to lower night temperatures during grain filling. More detailed results from this MY2 research can be accessed through the RiceCAP website listed above. Finally, Dr. Ernest Girouard served as Chairman of the Stakeholders Advisory Board for RiceCAP. The Board made several important suggestions during the four years that substantially improved the quality of RiceCAP research, and we thank Dr. Girouard for his efforts.

**Development of Sheath Blight Resistant Germplasm by Traditional Genetic Approaches**

During 2008, a total of 149 $F_1$ crosses from multiple resistance sources were completed. More than 400 $F_2$ to $F_6$ families were screened in inoculated plots. A total of 103 lines with sheath blight ratings ≤ 5 and good agronomic traits were identified. From this material, 24 lines were selected for crossing in the greenhouse, generation advance, and 2009 field evaluations. In 2006, 30 sheath blight lines were submitted to the Rice Breeding Project. After a 2007 seed increase in Puerto Rice, 11 sheath blight lines were evaluated in inoculated trials along with several check varieties. Results for six lines/varieties are shown in Table 1. The data show that sheath blight lines SB1 and SB2 produced good sheath blight tolerance compared with CL151, Catahoula, Cocodrie, and the KATY/CPRS breeding line. Days to heading for SB1 and SB2 are comparable with the commercial varieties. Height of SB1 and SB2 is taller by 1 to 4 inches than the commercial varieties. Grain yield of SB1 was the highest in this trial with inoculation, which is encouraging, but additional trials without disease pressure need to be conducted. Head rice yields for SB1 and SB2 are lower than the varieties and the KATY/CPRS breeding line by 1 to 4%. Crosses will be made in 2009 with SB1 and SB2 to improve head rice yields and reduce height.

**Development of Adapted Inbred Lines for Hybrid Rice in Louisiana**

In September 2008, Drs. Oard and McKenzie (RES, Biggs, CA) visited three Chinese institutes involved in hybrid rice breeding (LAAS, Shenyang; GAAS, Nanning; YAU, Kunming). In October 2008, Dr. Linscombe visited Dr. Mao of the Guangxie Academy of Agricultural Sciences in Nanning. Dr. Li, from Dr. Mao's program, will spend one year at the Rice Station to conduct hybrid rice research. Hybrid rice germplasm obtained from Dr. Li will be grown and evaluated at Crowley under 2009 field plot conditions.

During 2008, Dr. Oard initiated the evaluation and development of adapted inbred lines for hybrid rice grown in Louisiana. Sources of male sterile (cms), maintainer, and restorer lines were obtained from Asian origins. Initial evaluations in the greenhouse were completed, resulting in ~100 hybrid and testcrosses evaluated in the greenhouse and field. An additional 60 hybrid combinations were completed and evaluated in the latter part of 2008. One cross resulted in the development of a homozygous male sterile line maintained by a Louisiana source that improved adaption and overall plant type. It is important to emphasize that this research is at the initial stages and that much work needs to be done before the goal of adapted inbred lines for hybrid rice can be reached. With that said, good progress has been made with additional crosses and selections to be made in 2009.

Table 1. Sheath blight rating (SBR), grain yield, and % head rice for SB1 and SB2 sheath blight lines, KATY/CPRS breeding line, CL151, Catahoula, and Cocodrie, Crowley, 2008.

| Line /Variety | SBR | Vigor | Days to Heading | Height (in) | % Lodge | Yield (lb/A) | % Head Rice | % Total Rice |
|---|---|---|---|---|---|---|---|---|
| SB1 | 5 | 6 | 80 | 40 | 0 | 6807 | 59 | 69 |
| KATY/CPRS//NWBT/… | 7 | 5 | 81 | 36 | 0 | 6372 | 61 | 70 |
| SB2 | 5 | 7 | 81 | 39 | 0 | 6311 | 60 | 69 |
| CL151 | 7 | 4 | 79 | 39 | 90 | 5962 | 61 | 67 |
| Catahoula | 7 | 5 | 81 | 36 | 13 | 5961 | 63 | 72 |
| Cocodrie | 8 | 6 | 78 | 37 | 17 | 5345 | 62 | 69 |

### Trait and Molecular Characterization of Selected Inbred Lines

The RiceCAP Project initiated a research effort in 2008 to identify DNA markers associated with yield component traits in adapted U.S. inbred lines. The selected population (AMP) consisted of 474 entries primarily from U.S. sources. AMP was evaluated in 2008 in Louisiana, Mississippi, and Arkansas using a randomized complete block design field layout. Data for the following yield component traits were collected: height, maturity, days to heading, panicle number, panicle length, panicle weight, and seeds/panicle. Initial analysis shows considerable phenotypic variation for most traits that is crucial for identifying important marker-trait associations. A total of 1,300 DNA markers were identified across the 12 chromosome. Cluster analyses based on allele frequency showed that the 474 lines could be assigned into six main groups. Members of each group generally reflected their origin (state) where first developed. Each cluster group will be used in future research to identify DNA markers associated with the yield component traits.

## MARKER-ASSISTED BREEDING AND GENETIC IMPROVEMENT OF SOUTHERN U.S. RICE

H.S. Utomo and S.D. Linscombe

Marker-assisted breeding (MAB) at the Rice Research Station focuses on important traits such as disease resistance, protein content, and other quality traits. Promising breeding lines developed will have to exhibit high yielding potential with acceptable grain quality, disease resistance, optimum plant maturity and height, and are very adaptable to target growing regions. To produce these promising breeding lines, MAB is conducted along with with conventional breeding methodology for the production traits that are currently beyond the scope of marker-assisted selections (MAS). Understanding molecular properties of the yield potential and critical quality traits, however, requires tremendous investment. They obviously represent the current bottleneck to limited successful exploitation of available mapped QTLs in cultivar development. Development of combined methodology that allows breeders to merge their germplasm knowledge and breeding population objectives with molecular phenotypic trait association is needed to develop genetic modeling for multiple MAS and obtain rapid increase in the frequency of favorable alleles associated with target traits within the breeding populations.

The objectives of the marker-assisted breeding project were to: (1) develop blast pyramided lines from (a) tandem crosses followed by pedigree selection, (b) tandem crosses followed by double haploidization, and (c) marker-assisted backcrosses; (2) evaluate their performance in the field and establish introgression models for subsequently widening the genetic base of U.S. germplasm; and (3) initiate genome wide selection.

Widening the genetic base of U.S. rice germplasm through interspecific crosses may provide various advantages including improving yield potential, disease resistance, and resistance to environmental stress such as drought, salinity, and low temperature. Interspecific crosses, however, can disrupt favorable gene complexes important for maintaining high yield potential and quality advantages of the adapted lines. DNA markers provide a needed tool to work to direct potential genes from the unadapted materials while maintaining the balance of the favorable gene complexes. With a proper introgression design, the effect of these few foreign genes can be analyzed extensively. Once target alleles have been introgressed into the adapted lines, forward crossing and MAB can be applied during cultivar development.

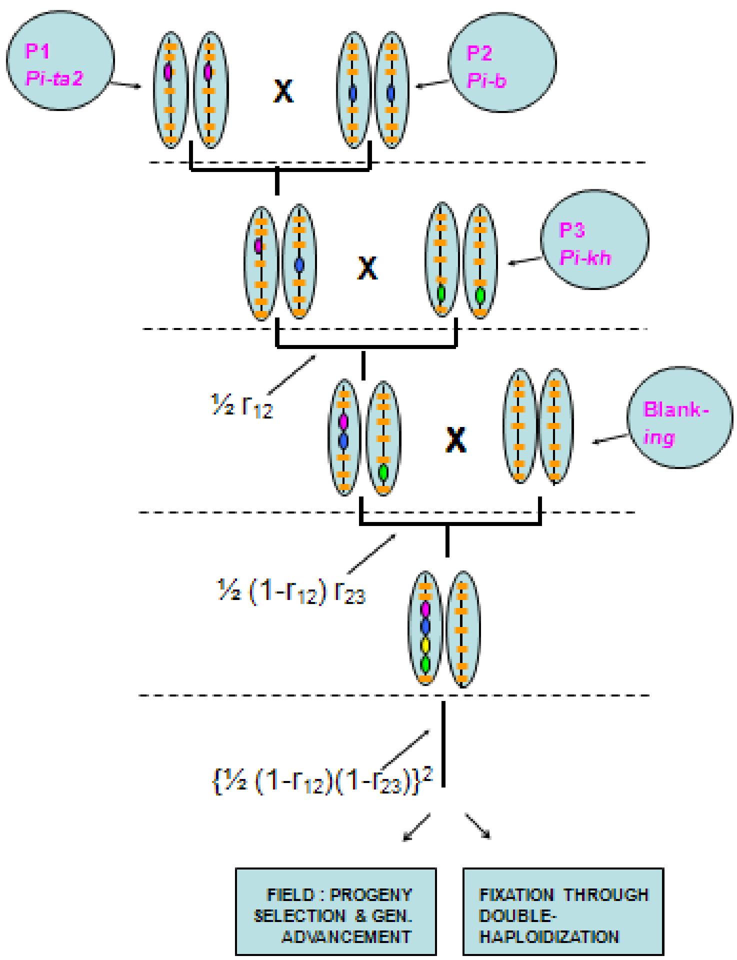
### Gene Introgression

Gene introgression and pyramiding are considered one of the most successful practical uses of molecular markers to date. Publicly available information on gene-marker association for a number of important agronomic traits can readily be used to introgress and pyramid these genes into elite breeding lines used in cultivar development. Marker-assisted backcrossing (MABC) is a straight-forward method to introgress or move target gene(s) from parental donors to parental recipients through successive backcrossing to remove the genetic background of the donor while recovering genetic properties of recurrent parents as much as possible. Statistical methods and schedule of backcrosses to create effective MABC can be created. MABC with marker-based genome scanning has allowed a speedy recovery of most recurrent genome as demonstrated in the last year of study. MABC can also be used to develop cleaner near isogenic lines by minimizing carried over donor segments flanking the target locus, providing precise introgression of individual genes for detailed characterization of the QTLs. In the hybrid rice production, marker-assisted gene pyramiding has been successfully utilized to combine multiple genes of male sterility and to provide a broader-spectrum of resistance against major diseases, such as rice blast and bacterial blight. Individual genes have unique reactions against pathogenic races and some of them have overlapping spectra that make selection based on disease reactions or symptoms more challenging. This problem can easily be overcome using molecular markers linked to individual disease-resistant genes allowing effective selection to be carried out to stack the genes. Figure 1 provides an example of a cross schedule for pyramiding three blast-resistant genes. Similar cross schedules are being used to introgress and accumulate target genes, including salt, drought, and cold tolerance.

**Blast-Resistant Genes**

Historically, blast-resistant genes are one of the first to be studied in the United States. Considered as one of the most important rice diseases, development of more durable blast-resistant cultivars will help achieve potential yield by minimizing yield loss due to blast outbreaks. While *Pi-ta*$^2$ provides the widest protection spectrums against rice blast races, it does not provide protection against 10 major U.S. blast races (eight out of 10 major races). Derived from Vietnamese cultivar Tetep, the gene was incorporated during the development of cultivar Katy that was released in 1981. Similarly, the *Pi-b* gene was originally not present in the U.S. germplasm. It was obtained from Chinese cultivar TeQing and incorporated into the development of U.S. cultivar Saber. Molecular markers closely associated with *Pi-ta*$^2$, *Pi-b, Pi-z*, *Pi-k*$^h$, and *Pi-k*$^s$ are available to identify these genes in the background of U.S. cultivars. Increasing durability against blast disease among commercial cultivars will help maintain steady yield under various disease pressures.

Figure 1. Schedule of crosses used to pyramid three blast resistance genes.




Parental source:

- Pi-ta$^2$ – Katy
- Pi-b – Saber
- Pi-k$^H$ – Lemont

Recipient parental lines: Cocodrie and Cypress (used in a blanking).

Field performance of pyramided Pi-ta$^2$/Pi-b lines evaluated based on average value of five replicated rows presented in Table 1. Selected lines with good yield potential will be further advanced.

Table 1. Field performance of pyramided Pi-ta$^2$/Pi-b lines.

| No. | Plant ID | Blast genes | Grain type§ | Vigor¶ | Plant height (cm) | Heading date | Panicle length (cm) | Panicle weight (g) | Row yield (g) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 08F3973 | Pi-ta$^2$,Pi-b | L | 2 | 71 | 84 | 26.7 | 7.25 | 502 |
| 2 | 08F3722 | Pi-ta$^2$,Pi-b | L | 3 | 73 | 84 | 28.5 | 6.94 | 503 |
| 3 | 08F4791 | Pi-ta$^2$,Pi-b | L | 2 | 78 | 83 | 28.1 | 7.02 | 579 |
| 4 | 08F4912 | Pi-ta$^2$,Pi-b | L | 4 | 81 | 83 | 25.4 | 6.30 | 477 |
| 5 | 08F5134 | Pi-ta$^2$,Pi-b | L | 2 | 80 | 84 | 27.1 | 6.42 | 490 |
| 6 | 08F5403 | Pi-ta$^2$,Pi-b | L | 3 | 85 | 82 | 26.8 | 7.39 | 532 |
| 7 | 08F4754 | Pi-ta$^2$,Pi-b | L | 3 | 77 | 83 | 32.4 | 6.74 | 504 |
| 8 | 08F4376 | Pi-ta$^2$,Pi-b | L | 3 | 75 | 81 | 28.2 | 6.18 | 510 |
| 9 | 08F3455 | Pi-ta$^2$,Pi-b | L | 3 | 74 | 86 | 29.5 | 6.91 | 522 |
| 10 | 08F4411 | Pi-ta$^2$,Pi-b | L | 2 | 85 | 82 | 26.4 | 6.09 | 534 |
| 11 | 08F7622 | Pi-ta$^2$,Pi-b | L | 2 | 77 | 80 | 25.3 | 5.92 | 487 |
| 12 | 08F5711 | Pi-ta$^2$,Pi-b | L | 2 | 76 | 78 | 26.6 | 5.88 | 499 |
| 13 | 08F7722 | Pi-ta$^2$,Pi-b | L | 3 | 75 | 86 | 28.5 | 5.95 | 569 |
| 14 | 08F4672 | Pi-ta$^2$,Pi-b | L | 3 | 76 | 81 | 27.9 | 6.86 | 596 |
| 15 | 08F5384 | Pi-ta$^2$,Pi-b | L | 2 | 84 | 80 | 28.8 | 5.85 | 565 |
| 16 | 08F7175 | Pi-ta$^2$,Pi-b | L | 2 | 83 | 81 | 23.4 | 5.99 | 486 |
| 17 | 08F5825 | Pi-ta$^2$,Pi-b | L | 3 | 87 | 80 | 27.8 | 5.88 | 477 |
| 18 | 08F1245 | Pi-ta$^2$,Pi-b | L | 2 | 82 | 83 | 26.4 | 5.88 | 505 |
| 19 | 08F7754 | Pi-ta$^2$,Pi-b | L | 3 | 82 | 84 | 23.9 | 5.92 | 489 |
| 20 | 08F7199 | Pi-ta$^2$,Pi-b | L | 2 | 81 | 82 | 28.4 | 5.96 | 498 |
| 21 | CCDR | | L | 3 | 93 | 82 | 27.2 | 5.70 | 460 |

¶Subjective rating (1= excellent, 9=poor); §L= long grain.

Field performance of pyramided Pi-ta$^2$/Pi-kh lines evaluated based on average value of five replicated rows (Table 2). Selected lines with good yield potential will be further advanced.

Table 2. Field performance of pyramided Pi-ta$^2$/Pi-kh rice lines.

| Plant ID | Blast genes | Grain type§ | Vigor¶ | Plant height (cm) | Heading date§ | Panicle length (cm) | Panicle weight (g) | Row yield (g) |
|---|---|---|---|---|---|---|---|---|
| 08F5112 | Pi-ta$^2$, Pi-kh | L | 3.1 | 94 | 86 | 29.4 | 5.65 | 466 |
| 08F5151 | Pi-ta$^2$, Pi-kh | L | 3.2 | 88 | 83 | 27.5 | 5.64 | 478 |
| 08F5333 | Pi-ta$^2$, Pi-kh | L | 4.2 | 89 | 81 | 26.7 | 5.60 | 532 |
| 08F2822 | Pi-ta$^2$, Pi-kh | L | 5.1 | 93 | 83 | 27 | 5.60 | 443 |
| 08F3851 | Pi-ta$^2$, Pi-kh | L | 3.3 | 92 | 84 | 24.9 | 5.60 | 556 |
| 08F5483 | Pi-ta$^2$, Pi-kh | L | 3.2 | 92 | 85 | 28.9 | 5.59 | 564 |
| 08F5842 | Pi-ta$^2$, Pi-kh | L | 4.5 | 92 | 87 | 27.1 | 5.59 | 454 |
| 08F4812 | Pi-ta$^2$, Pi-kh | L | 3.9 | 91 | 85 | 27.8 | 5.58 | 445 |
| 08F3672 | Pi-ta$^2$, Pi-kh | L | 3.5 | 99 | 85 | 30.8 | 5.57 | 440 |
| 08F4803 | Pi-ta$^2$, Pi-kh | L | 3.6 | 87 | 82 | 25.9 | 5.56 | 504 |
| 08F5392 | Pi-ta$^2$, Pi-kh | L | 3.0 | 81 | 83 | 25.6 | 5.50 | 505 |
| 08F4783 | Pi-ta$^2$, Pi-kh | L | 4.2 | 94 | 83 | 28.3 | 5.50 | 546 |
| CCDR | | L | 3.1 | 93 | 82 | 27.2 | 5.70 | 460 |

¶Subjective rating (1= excellent, 9=poor); §L= long grain.

Field performance of pyramided Pi-ta$^2$, Pi-b, and Pi-kh lines that were obtained following the introgression schedule (Fig. 1) evaluated based on average value of five replicated rows (Table 3). Selected lines with good yield potential will be further advanced.

Table 3. Marker-assisted backcrossing to pyramid Pi-ta², Pi-b, and Pi-kh genes into the recurrent parental lines Cocodrie and Cypress.

| | Allele Compost. (%) | Grain Type[§] | Vigor[¶] | Days to 50% Heading | Plant Height (cm) | Row Yield (g) |
|---|---|---|---|---|---|---|
| mbCCDR-1 | 44(C);28(L);10(S);13(K) | L | 3.1 | 82 | 95 | 419 |
| mbCPRS-1 | 49(C);22(L);11(S);18(K) | L | 3.7 | 84 | 94 | 360 |
| CCDR ck | | L | 3.0 | 81 | 93 | 432 |
| CPRS ck | | L | 3.1 | 85 | 94 | 385 |
| C.V. (%) | | | 6.7 | 1.9 | 4.1 | 11.4 |
| LSD (0.05) | | | 0.7 | 4.0 | 3.2 | 24.8 |

[¶]Subjective rating (1= excellent, 9=poor); [§]L= long grain.

Field performance of pyramided Pi-ta², Pi-b, and Pi-kh lines that were obtained through the introgression schedule (Fig. 1) followed by anther culture is presented in Table 4. The performance was based on the average value of five replicated rows. Selected lines with good yield potential will be further advanced.

Table 4. Field performance of double haploid lines carrying Pi-ta², Pi-b, and Pi-kh genes.

| | Allele Compt. (%)[†] | Grain Type[§] | Vigor[¶] | Days to 50% Heading | Plant Height (cm) | Row Yield (g) |
|---|---|---|---|---|---|---|
| mbCCDRdh | 38(C);28(L);25(S);9(K) | L | 3.7 | 82 | 95 | 405 |
| mbCPRSdh | 46(CP);26(L);16(S);12(K) | L | 4.3 | 84 | 94 | 388 |
| CCDR ck | | L | 3.2 | 81 | 93 | 445 |
| CPRS ck | | L | 3.5 | 85 | 94 | 376 |
| C.V. (%) | | | 6.7 | 1.9 | 4.1 | 11.4 |
| LSD (0.05) | | | 0.7 | 4.0 | 3.2 | 21.3 |

[¶]Subjective rating (1= excellent, 9=poor); [§]L= long grain. [†]C=Cocodrie, L=Lemont, S=Saber, K=Katy, and CP=Cypress.

Field performance of introgression of Pi-ta² through rapid backcrosses is presented in Table 4. The performance was based on average value of five replicated rows. Selected lines with good yield potential will be further advanced.

Table 4. Field performance backcrossed lines carrying Pi-ta[2] gene.

| | Grain Type[§] | Vigor[¶] | Days to 50% Heading | Plant Height (cm) | Row Yield (g) |
|---|---|---|---|---|---|
| mbCCDbc-1 | L | 4.0 | 82 | 95 | 444 |
| mbCPRSbc-2 | L | 3.1 | 84 | 94 | 366 |
| CCDR ck | L | 3.2 | 81 | 93 | 445 |
| CPRS ck | L | 3.0 | 85 | 94 | 376 |
| C.V. (%) | | 6.7 | 1.9 | 4.1 | 10.1 |
| LSD (0.05) | | 0.7 | 4.0 | 3.2 | 19.4 |

[¶]Subjective rating (1= excellent, 9=poor); [§]L= long grain.

Performance of some of the marker-assisted-derived lines on preliminary yield (2008 PY) trials is presented in Table 5. Selected lines with good yield potential will be further advanced.

Table 5. Field performance of marker-assisted-derived lines in preliminary yield trials.

| ENTRY | LINE ID | VIG | DAYS | HTE | YIELD |
|---|---|---|---|---|---|
| 003 | 2649-1 | 4 | 72 | 38 | 8829 |
| 002 | 2639-2 | 4 | 70 | 38 | 8514 |
| 015 | CHENIERE | 5 | 73 | 39 | 8477 |
| 006 | 2956-2 | 4 | 72 | 40 | 8415 |
| 005 | 2956-1 | 5 | 71 | 41 | 8194 |
| 011 | 4798-2 | 4 | 71 | 40 | 8139 |
| 014 | COCODRIE | 4 | 71 | 39 | 8042 |
| 016 | CATAHOULA | 4 | 72 | 40 | 7273 |
| 004 | 2649-2 | 4 | 70 | 39 | 7240 |
| 007 | 2987-1 | 4 | 71 | 39 | 7197 |
| 010 | 4761-2 | 4 | 77 | 40 | 7143 |
| 013 | PURPLE RICE | 4 | 78 | 42 | 6766 |
| 012 | 5601-2 | 5 | 72 | 38 | 6665 |
| 001 | 1541-1 | 5 | 71 | 28 | 6420 |
| 008 | 3275-1 | 5 | 75 | 36 | 5693 |
| 009 | 4171-2 | 4 | 78 | 44 | 4855 |

**Pyramiding Drought, Salt, Cold Tolerance, and Other Traits**

Introgression is being conducted to incorporate foreign genes as a part of systematic broadening U.S. germplasm. They include gene coding for Fe content, drought tolerance, salt tolerance (*salT*; *qST1*, *qST3*), cold tolerance at seedling stage (RM561-RM341, Chr. 2), and grain weight (*qgw3.1*; Chr.3). Introgressed lines will be advanced and evaluated for their performance in the coming years.

**Genome-Wide Selection**

A majority of QTL mapping reported in the literature is derived from bi-parental mapping populations to identify QTLs that co-segregate with phenotypic traits within a biparental family. Bi-parental-based QTL mapping, therefore, has an inference limitation to particular parents used in the mapping population, i.e., the gene and gene combinations of these parental lines. Extrapolation beyond the original mapping population will likely be invalid because of the lack of knowledge of identity by descent at a specific genomic region. To be able to exploit the QTLs from a broad set of germplasm, including elite lines and wild ancestors, the mapping has to be expanded beyond a bi-parental base. Association studies identify QTLs by identifying particular allelic variants that are associated with the phenotypic trait in a population (not necessarily a bi-parental family). Since a greater number of alleles is analyzed from all meiosis events that occur throughout the breeding history of genetic materials used in the study, association mapping provides higher resolution in identifying the QTLs than bi-parental based mapping.

The marker-based genome wide selection can be used to directly utilize molecular markers for predicting performance without QTL mapping at all. Understanding the difficulties in estimating the joint effects of many QTLs based on finite data sets and knowing the number and genomic locations of the QTLs themselves are not crucial for selection of qualitative traits. The genome-wide selection ignores the number of QTLs and their locations but focuses on genetic improvement of qualitative traits rather than understanding their genetic basis. All markers used in the analysis are fitted as random effects in a linear model. Trait values are predicted from a weighted index. Genome-wide selection can be most useful for complex traits controlled by many QTLs with low heritability. Similar to MARS, genome-wide selection can be applied in any growing conditions by genotyping with all markers. To maximize the power of molecular markers in predicting performance, a class of procedures such as machine learning methods that focus on finding rules or patterns in a large set of phenotypic and marker data can be integrated into the analyses to produce a better prediction. This particularly is very helpful in accounting for epistatic interactions that are very important for long-term selections to improve yield potential. For the purpose of the marker-based genome-wide selection, two populations were created last year. Both phenotyping and genotyping of these populations will be applied as they are advanced through selections. Data collected will be continuously incorporated to optimize selection indexes and improve predictive values of the markers in cultivar development.

# INDUCED MUTATIONAL BREEDING AND ENHANCEMENT OF NUTRITIONAL QUALITY IN RICE

I. Wenefrida, S.D. Linscombe, and H.S. Utomo

## Introduction and Methodologies

Rice added-value has been a subject of increasing interest in the rice industry looking for a number of ways to improve the utilization of this crop beyond its current function as a major source of human food and calories. A specific content of fibers, vitamins, minerals, and disease-fighting phytonutrients found in the rice grain offers some health benefit potential to rice consumers. Improved protein content in the grain will further enhance the nutritional quality potential by complementing the existing natural health functional constituents. For the rice industry, the production of high protein rice cultivar(s) will help stabilize market and secure the price of U.S. premium rice.

Replicated field tests were conducted to evaluate the stability of grain protein content. Since grain protein content can be affected by the availability of nitrogen in the soil, different nitrogen fertilization rates were studied. Four nitrogen application rates (100, 125, 150, and 175 lb/A) were evaluated for their effect on total crude grain protein content. The test was conducted on 33 protein lines, along with three check cultivars, using a randomized complete block design with a factorial treatment arrangement in three replicates. Total protein content from each line tested was determined using a combustion method using the Leco TrueSpec® CN Combustion Analyzer. Nine elite high protein lines were evaluated in replicated preliminary yield (PY) tests. Yield potential of these lines were evaluated in addition to other important agronomic traits, including plant vigor, plant height, percent lodging, and percent whole grain.

New lines were developed using parental lines adaptable to Louisiana growing conditions. The newly mutated lines developed in the Rice Research Station Biotech Lab were grown in replicated tests in the field in the 2008 growing season. These new lines were planted in three replicated rows in March 2008 and harvested in July 2008. The field was fertilized using 110 lb/A urea in a split application. The plots were maintained flooded, with occasional draining for weed control purposes. Glyphosate herbicide was used to control weed. Seed was hand harvested, threshed, dried to 12% moisture content, and stored. A finely ground sample of seed weighing approximately 200 mg was used to determine a total crude protein content for each line evaluated. The Leco TrueSpec® CN Combustion Analyzer was used in the analyses.

## Results

### Total Crude Protein Content of Newly Developed Lines

A. Group 1

A total of 215 new lines were developed in Group 1 from major rice varieties Cocodrie (CCDR), Wells, Francis (FRNC), and Cypress (CPRS) and three breeding lines NN07, NR07, and 07672. Based on replicated data, the total crude protein content of 215 newly developed lines are as follows: four lines showed a total crude protein content of <5%, 14 lines with a total crude protein content of 5.1 to 6.0%, 40 lines of 6.1-7.0%, 63 lines of 7.1-8.0%, 55 lines of 8.1-9.0%, 24 lines of 9.1-10.0%, 6 lines of 10.1-11.0%, one line of 11.1-12.0%, two lines of 12.1-13.0%, four lines of 13.1-14.0%, and one line of 14.1-15.0%. Lines with higher than 9% protein content will be advanced in the 2009 field tests.

Table 1. Protein content of newly developed lines. Total crude protein content was determined using the Leco TrueSpec® CN Combustion Analyzer. Values are based on three replicates using brown rice harvested from the field.

| Entry | ID[¶] | % N | % C | % Protein |
|---|---|---|---|---|
| 1 | CCDR1 | 1.1959985 | 45.24860 | 7.474991 |
| 2 | CCDR2 | 1.4645423 | 45.54661 | 9.153389 |
| 3 | CCDR3 | 1.4000154 | 45.29779 | 8.750096 |
| 4 | CCDR4 | 1.5583254 | 45.85504 | 9.739534 |
| 5 | CCDR5 | 1.3459063 | 45.51480 | 8.411914 |
| 6 | CCDR12 | 1.4178845 | 45.16464 | 8.861778 |
| 7 | CCDR22 | 1.1346592 | 45.11044 | 7.09162 |
| 8 | CCDR23 | 1.1975341 | 45.54905 | 7.484588 |
| 9 | CCDR24 | 1.2639522 | 45.65540 | 7.8997 |
| 10 | CCDR25 | 1.1213814 | 49.64631 | 7.008634 |
| 11 | CCDR26 | 0.9983631 | 45.67504 | 6.239769 |
| 12 | CCDR27 | 1.3246243 | 45.46225 | 8.278902 |
| 13 | CCDR35 | 1.2810249 | 45.79479 | 8.006406 |
| 14 | CCDR37 | 1.3412052 | 45.84932 | 8.38253 |
| 15 | CCDR39 | 1.2826422 | 46.30705 | 8.01658 |
| 16 | CCDR44 | 1.2780822 | 45.95803 | 7.98890 |
| 17 | CCDR45 | 1.5295188 | 46.14431 | 9.55949 |
| 18 | CCDR46 | 1.3486055 | 45.84625 | 8.42878 |
| 19 | CCDR47 | 1.1787215 | 45.98791 | 7.36701 |
| 20 | CCDR49 | 1.1959841 | 45.95732 | 7.47490 |
| 21 | CCDR51 | 1.1850022 | 46.14691 | 7.40626 |
| 22 | CCDR52 | 1.2066708 | 46.06201 | 7.54169 |
| 23 | CCDR53 | 0.9820092 | 45.91875 | 6.13755 |
| 24 | CCDR53 | 1.1377937 | 44.42350 | 7.11121 |
| 25 | CCDR54 | 1.1443826 | 44.67404 | 7.15239 |
| 26 | CCDR56 | 1.3141487 | 44.68713 | 8.21342 |
| 27 | CCDR57 | 1.1235864 | 44.80848 | 7.02241 |
| 28 | CCDR59 | 1.0862546 | 44.29382 | 6.78909 |
| 29 | CCDR61 | 1.2068792 | 44.65668 | 7.54299 |
| 30 | CCDR62 | 1.3160865 | 44.79633 | 8.22554 |
| 31 | CCDR65 | 1.1683251 | 44.57766 | 7.30203 |
| 32 | CCDR69 | 1.0353469 | 44.44270 | 6.47091 |
| 33 | CCDR70 | 1.4237801 | 44.83734 | 8.89862 |
| 34 | CCDR72 | 1.1156856 | 44.51966 | 6.97303 |
| 35 | CCDR73 | 1.2396849 | 44.61452 | 7.74803 |
| 36 | CCDR76 | 0.9569587 | 44.41284 | 5.98099 |
| 37 | CCDR77 | 1.0641183 | 44.68545 | 6.65073 |
| 38 | CCDR79 | 1.1644746 | 44.84957 | 7.27796 |
| 39 | CCDR81 | 1.2096827 | 45.37791 | 7.56051 |
| 40 | CCDR82 | 1.1653556 | 46.89254 | 7.28347 |
| 41 | CCDR83 | 0.9695634 | 44.72203 | 6.05977 |
| 42 | CCDR85 | 1.1067654 | 44.74856 | 6.91728 |
| 43 | CCDR86 | 1.3916365 | 44.88137 | 8.69772 |
| 44 | CCDR87 | 1.4035571 | 45.09455 | 8.77223 |
| 45 | CCDR88 | 1.2808615 | 44.65911 | 8.00538 |

Continued.

Table 1. Continued.

| Entry | ID¶ | % N | % C | % Protein |
|---|---|---|---|---|
| 46 | CCDR89 | 1.0285765 | 44.66610 | 6.42860 |
| 47 | CCDR90 | 1.4471453 | 45.94747 | 9.04465 |
| 48 | CCDR91 | 1.6484472 | 46.26438 | 10.3027 |
| 49 | CCDR92 | 1.3251145 | 45.66772 | 8.28196 |
| 50 | CCDR93 | 1.2273172 | 45.52421 | 7.67073 |
| 51 | CCDR94 | 1.2900465 | 45.46909 | 8.06279 |
| 52 | CCDR95 | 1.3880316 | 45.74539 | 8.67519 |
| 53 | CCDR96 | 1.4059299 | 45.58454 | 8.78706 |
| 54 | CCDR97 | 1.4954412 | 46.00586 | 9.34650 |
| 55 | CCDR98 | 1.2397543 | 44.14225 | 7.74846 |
| 56 | CCDR99 | 1.432181 | 44.16340 | 8.95113 |
| 57 | CCDR100 | 1.303876 | 44.06426 | 8.14922 |
| 58 | CCDR101 | 1.221964 | 44.04301 | 7.63727 |
| 59 | CCDR102 | 1.275495 | 44.03105 | 7.97184 |
| 60 | CCDR103 | 1.291356 | 44.06020 | 8.07097 |
| 61 | CCDR104 | 1.182141 | 44.00849 | 7.38838 |
| 62 | CCDR105 | 1.273056 | 44.17385 | 7.95660 |
| 63 | CCDR106 | 1.458358 | 44.75605 | 9.11473 |
| 64 | CCDR107 | 1.026658 | 43.98613 | 6.41661 |
| 65 | CCDR108 | 1.043752 | 44.16072 | 6.52345 |
| 66 | CCDR109 | 1.199503 | 44.26475 | 7.49689 |
| 67 | CCDR116 | 1.333213 | 44.45968 | 8.33258 |
| 68 | CCDR117 | 0.935130 | 44.25130 | 5.84456 |
| 69 | CCDR118 | 1.241497 | 44.57898 | 7.75935 |
| 70 | CCDR121 | 0.937078 | 45.24550 | 5.85674 |
| 71 | CCDR122 | 1.233737 | 45.21625 | 7.71085 |
| 72 | CCDR123 | 1.383504 | 45.27371 | 8.64690 |
| 73 | CCDR125 | 1.279504 | 45.31838 | 7.99690 |
| 74 | CCDR126 | 1.013351 | 44.95201 | 6.33344 |
| 75 | CCDR127 | 1.107924 | 44.94387 | 6.92452 |
| 76 | CCDR128 | 1.216185 | 45.09133 | 7.60115 |
| 77 | CCDR129 | 1.348682 | 45.56311 | 8.42926 |
| 78 | CCDR130 | 1.187636 | 45.16401 | 7.42272 |
| 79 | CCDR131 | 1.233248 | 45.50218 | 7.70780 |
| 80 | CCDR132 | 1.457671 | 45.71792 | 9.11044 |
| 81 | CCDR133 | 1.433114 | 45.98322 | 8.95696 |
| 82 | CCDR134 | 1.001116 | 45.31320 | 6.25697 |
| 83 | CCDR135 | 1.015749 | 45.45857 | 6.34843 |
| 84 | CCDR136 | 0.753097 | 44.85091 | 4.70685 |
| 85 | CCDR137 | 0.982545 | 45.73178 | 6.14090 |
| 86 | CCDR138 | 0.842296 | 45.25215 | 5.26435 |
| 87 | CCDR139 | 1.098962 | 45.70090 | 6.86851 |
| 88 | CCDR143 | 0.842075 | 45.27539 | 5.26297 |
| 89 | CCDR144 | 0.785004 | 45.09382 | 4.90627 |
| 90 | CCDR145 | 0.820869 | 45.31926 | 5.13043 |
| 91 | CCDR146 | 0.906715 | 45.20464 | 5.66696 |
| 92 | CCDR147 | 1.082512 | 45.40373 | 6.76570 |

Continued.

Table 1. Continued.

| Entry | ID¶ | % N | % C | % Protein |
|---|---|---|---|---|
| 93 | CCDR148 | 0.877599 | 46.16188 | 5.48499 |
| 94 | CCDR149 | 0.099849 | 4.213126 | 0.62406 |
| 95 | CCDR150 | 0.989677 | 45.50716 | 6.18548 |
| 96 | CCDR151 | 1.123671 | 45.94062 | 7.02294 |
| 97 | CCDR152 | 1.074546 | 45.65367 | 6.71591 |
| 98 | CCDR153 | 1.072220 | 45.37463 | 6.70138 |
| 99 | CCDR154 | 0.906425 | 45.47641 | 5.66515 |
| 100 | CCDR155 | 1.018079 | 45.64172 | 6.36299 |
| 101 | CCDR156 | 1.017906 | 55.93611 | 6.36191 |
| 102 | CCDR157 | 0.887556 | 44.72143 | 5.54723 |
| 103 | CCDR158 | 0.953503 | 44.60110 | 5.95939 |
| 104 | CCDR159 | 1.100645 | 44.32447 | 6.87903 |
| 105 | CCDR161 | 1.401117 | 45.21540 | 8.75698 |
| 106 | CCDR162 | 1.200925 | 44.55482 | 7.50578 |
| 107 | CCDR163 | 0.992701 | 45.31955 | 6.20438 |
| 108 | CCDR164 | 0.757912 | 44.17062 | 4.73695 |
| 109 | CCDR166 | 0.747141 | 44.30763 | 4.66963 |
| 110 | CCDR167 | 1.139337 | 43.31509 | 7.12085 |
| 111 | CCDR165 | 0.982387 | 44.08752 | 6.13992 |
| 112 | CCDR218 | 1.340493 | 44.38898 | 8.37808 |
| 113 | CCDR219 | 1.043433 | 44.45547 | 6.52145 |
| 114 | CCDR221 | 1.123955 | 44.12285 | 7.02472 |
| 115 | CCDR222 | 1.288017 | 43.82000 | 8.05010 |
| 116 | CCDR274 | 1.219056 | 42.90631 | 7.61915 |
| 117 | CCDR275 | 0.919164 | 42.57523 | 5.74477 |
| 118 | CCDR276 | 1.483004 | 43.16670 | 9.26877 |
| 119 | CCDR277 | 1.465483 | 42.55063 | 9.15927 |
| 120 | FRNC401 | 1.385678 | 42.46260 | 8.66049 |
| 121 | FRNC408 | 1.367020 | 42.55019 | 8.54387 |
| 122 | FRNC413 | 1.447360 | 42.66336 | 9.04600 |
| 123 | FRNC415 | 1.426158 | 42.66057 | 8.91348 |
| 124 | FRNC435 | 1.447953 | 45.99496 | 9.04970 |
| 125 | FRNC456 | 1.507281 | 45.90961 | 9.42051 |
| 126 | FRNC482 | 1.316118 | 45.70752 | 8.22573 |
| 127 | NR489 | 1.611939 | 45.49262 | 10.07462 |
| 128 | NR490 | 1.690645 | 45.71180 | 10.56653 |
| 129 | NR491 | 1.747613 | 45.78377 | 10.92258 |
| 130 | NR492 | 1.776745 | 45.65062 | 11.10466 |
| 131 | NR493 | 1.742297 | 45.51989 | 10.88936 |
| 132 | NR494 | 2.226437 | 45.98384 | 13.91523 |
| 133 | NR495 | 2.142964 | 46.25540 | 13.39353 |
| 134 | NR496 | 2.227723 | 45.36434 | 13.92327 |
| 135 | NR497 | 2.079747 | 45.16107 | 12.99842 |
| 136 | NR498 | 2.089062 | 45.19240 | 13.05664 |
| 137 | NR499 | 2.055276 | 45.46835 | 12.84545 |
| 138 | NR500 | 2.372947 | 46.10596 | 14.83091 |
| 139 | 07672-176 | 1.351953 | 43.14806 | 8.44972 |

Continued.

Table 1. Continued.

| Entry | ID¶ | % N | % C | % Protein |
|---|---|---|---|---|
| 140 | 07672-177 | 1.096322 | 43.18341 | 6.85202 |
| 141 | 07672-178 | 1.494483 | 43.46365 | 9.34059 |
| 142 | 07672-179 | 1.328218 | 43.67295 | 8.30131 |
| 143 | 07672-181 | 1.434275 | 43.84915 | 8.96422 |
| 144 | 07672-182 | 1.332749 | 43.42355 | 8.32961 |
| 145 | 07672-183 | 1.488163 | 43.80299 | 9.30105 |
| 146 | 07672-184 | 1.537371 | 43.64315 | 9.60855 |
| 147 | 07672-185 | 1.457602 | 45.22302 | 9.11002 |
| 148 | 07672-186 | 1.313072 | 45.11945 | 8.20671 |
| 149 | 07672-187 | 1.253502 | 45.11628 | 7.83432 |
| 150 | 07672-188 | 1.245217 | 45.42415 | 7.78262 |
| 151 | 07672-189 | 1.080614 | 45.12153 | 6.75382 |
| 152 | 07672-190 | 1.104981 | 44.88623 | 6.90611 |
| 153 | 07672-191 | 1.187701 | 45.25685 | 7.42312 |
| 154 | 07672-193 | 1.196028 | 45.26966 | 7.47511 |
| 155 | 07672-194 | 1.087043 | 45.06629 | 6.79400 |
| 156 | 07672-195 | 1.126033 | 45.02839 | 7.03771 |
| 157 | 07672-196 | 1.589504 | 45.91596 | 9.93440 |
| 158 | 07672-198 | 1.309543 | 45.20486 | 8.18464 |
| 159 | 07672-200 | 1.423399 | 45.62279 | 8.89625 |
| 160 | WELLS209 | 1.143066 | 45.64438 | 7.14416 |
| 161 | WELLS210 | 1.161477 | 45.55368 | 7.25923 |
| 162 | WELLS211 | 1.003113 | 43.60858 | 6.26946 |
| 163 | WELLS212 | 1.117869 | 43.64925 | 6.98668 |
| 164 | WELLS213 | 1.174272 | 44.14937 | 7.33920 |
| 165 | WELSS214 | 1.219973 | 44.07281 | 7.62483 |
| 166 | WELLS215 | 0.875514 | 43.91866 | 5.47196 |
| 167 | WELLS216 | 1.075406 | 44.22254 | 6.72128 |
| 168 | WELLS217 | 1.097857 | 44.07456 | 6.86161 |
| 169 | 07672-175 | 1.447172 | 44.26015 | 9.04482 |
| 170 | NN392 | 1.163746 | 44.32487 | 7.27341 |
| 171 | NN397 | 1.377843 | 44.10638 | 8.61152 |
| 172 | NN403 | 1.457103 | 44.48035 | 9.10689 |
| 173 | NN409 | 1.700646 | 44.61478 | 10.62904 |
| 174 | NN416 | 1.261643 | 44.71033 | 7.88526 |
| 175 | NN417 | 1.307586 | 44.49644 | 8.17241 |
| 176 | NN419 | 1.191779 | 44.28971 | 7.44862 |
| 177 | NN420 | 1.427612 | 44.39249 | 8.92257 |
| 178 | NN424 | 1.410691 | 44.60131 | 8.81684 |
| 179 | NN425 | 1.267393 | 44.53512 | 7.92121 |
| 180 | NN430 | 1.293561 | 44.41641 | 8.08475 |
| 181 | NN432 | 1.126698 | 44.16637 | 7.04186 |
| 182 | NN436 | 1.467322 | 44.61415 | 9.17076 |
| 183 | NN437 | 1.461567 | 44.89860 | 9.13479 |
| 184 | NN442 | 1.231961 | 43.75335 | 7.69975 |
| 185 | NN465 | 1.515892 | 44.97619 | 9.47432 |
| 186 | NN466 | 1.189359 | 46.34486 | 7.43349 |

Continued.

Table 1. Continued.

| Entry | ID¶ | % N | % C | % Protein |
|---|---|---|---|---|
| 187 | NN471 | 1.338488 | 44.40951 | 8.36555 |
| 188 | NN477 | 1.268403 | 44.81362 | 7.92752 |
| 189 | NN481 | 1.193320 | 44.66947 | 7.45825 |
| 190 | NN485 | 1.253056 | 44.93322 | 7.83160 |
| 191 | CPRS201 | 1.357117 | 44.88720 | 8.48198 |
| 192 | CPRS202 | 0.992008 | 45.10253 | 6.20005 |
| 193 | CPRS203 | 1.217030 | 44.00706 | 7.60644 |
| 194 | CPRS204 | 1.279789 | 43.91919 | 7.99868 |
| 195 | CPRS205 | 1.278027 | 44.08635 | 7.98767 |
| 196 | CPRS206 | 0.982122 | 43.79387 | 6.13826 |
| 197 | CPRS207 | 1.140104 | 44.08017 | 7.12565 |
| 198 | CPRS208 | 1.125661 | 44.00583 | 7.03538 |
| 199 | CPRS282 | 1.045232 | 44.34543 | 6.53270 |
| 200 | CPRS286 | 1.091174 | 44.90225 | 6.81984 |
| 201 | CPRS310 | 1.309062 | 44.75937 | 8.18164 |
| 202 | CPRS315 | 0.947258 | 44.03503 | 5.92036 |
| 203 | CPRS316 | 1.118374 | 42.57821 | 6.98984 |
| 204 | CPRS317 | 1.216215 | 42.82315 | 7.60134 |
| 205 | CPRS327 | 1.377138 | 43.08279 | 8.60711 |
| 206 | CPRS330 | 1.364105 | 43.08245 | 8.52566 |
| 207 | CPRS332 | 1.352613 | 42.99062 | 8.45383 |
| 208 | CPRS433 | 1.330966 | 41.86574 | 8.31854 |
| 209 | CPRS438 | 1.366112 | 41.92442 | 8.53821 |
| 210 | 07672-168 | 1.433150 | 42.64108 | 8.95718 |
| 211 | 07672-169 | 1.425924 | 41.98717 | 8.91202 |
| 212 | 07672-170 | 1.459258 | 43.16216 | 9.12036 |
| 213 | 07672-171 | 1.458863 | 42.56355 | 9.11789 |
| 214 | 07672-172 | 1.290005 | 42.15195 | 8.06253 |
| 215 | 07672-173 | 1.136997 | 42.33447 | 7.10623 |

¶CCDR=Cocodrie derived; CPRS=Cypress derived; WELLS=Wells derived; NN, NR, and 07672 = breeding lines from the marker-assisted breeding project.

**Total Crude Protein Content of Newly Developed Lines (Group 2)**

A total of 140 new lines were developed from Cypress (CPRS). The total crude protein contents of these newly developed lines based on replicated data are as follows. Two lines showed a total crude protein content of <5%, 16 lines with a total crude protein content of < 6%, 35 lines of 6.1-7.0%, 53 lines of 7.1-8.0%, 21 lines of 8.1-9.0%, 9 lines of 9.1-10.0%, 3 lines of 10.1-11.0%, and 1 line of 11.1-12.0%. Lines with higher than 9% protein content will be advanced in the 2009 field tests.

Table 2. Protein content of newly developed lines from Group 2. Total crude protein content was determined using the Leco TrueSpec® CN Combustion Analyzer. Values are based on three replicates using brown rice harvested from the field.

| No | Lab ID¶ | % N | % C | C:N | % Protein |
|---|---|---|---|---|---|
| 1 | CPRS-075-P1-1-1 IW-TP06-BRN | 1.30896 | 43.9484 | 33.5751 | 8.18100 |
| 2 | CPRS-075-P1-1-2 IW-TP06-BRN | 1.13409 | 44.1623 | 38.9407 | 7.08807 |
| 3 | CPRS-075-P1-1-3-1 IW-TP06-BRN | 0.95343 | 43.9702 | 46.1179 | 5.95894 |
| 4 | CPRS-075-P1-1-3-2 IW-TP06-BRN | 1.26034 | 44.0134 | 34.9218 | 7.87714 |
| 5 | CPRS-075-P1-1-3-2 IW-TP06-BRN | 1.45831 | 44.2263 | 30.3270 | 9.11446 |
| 6 | CPRS-075-P1-1-4 IW-TP06-BRN | 1.10005 | 44.3386 | 40.3060 | 6.87531 |
| 7 | CPRS-075-P1-1-4-1 IW-TP06-BRN | 1.44140 | 44.1363 | 30.6204 | 9.00877 |
| 8 | CPRS-075-P1-1-5 IW-TP06-BRN | 1.30507 | 44.3011 | 33.9453 | 8.15671 |
| 9 | CPRS-075-P1-1-6 IW-TP06-BRN | 1.30552 | 44.3985 | 34.0080 | 8.15955 |
| 10 | CPRS-075-P1-1-7 IW-TP06-BRN | 1.01710 | 44.1377 | 43.3954 | 6.35690 |
| 11 | CPRS-075-P1-2-1 IW-TP06-BRN | 1.23628 | 44.3084 | 35.8399 | 7.72678 |
| 12 | CPRS-075-P1-1-8 IW-TP06-BRN | 1.22935 | 44.3418 | 36.0692 | 7.68345 |
| 13 | CPRS-075-P1-2-2 IW-TP06-BRN | 1.13845 | 44.4165 | 39.0149 | 7.11531 |
| 14 | CPRS-075-P1-2-3 IW-TP06-BRN | 1.26830 | 44.3964 | 35.0044 | 7.92693 |
| 15 | CPRS-075-P1-2-4 IW-TP06-BRN | 1.05287 | 44.3256 | 42.0997 | 6.58044 |
| 16 | CPRS-075-P1-2-5 IW-TP06-BRN | 1.08994 | 44.0602 | 40.4243 | 6.81215 |
| 17 | CPRS-075-P1-2-6 IW-TP06-BRN | 0.89873 | 43.9957 | 48.9529 | 5.61708 |
| 18 | CPRS-075-P1-2-7 IW-TP06-BRN | 1.17806 | 44.1956 | 37.5155 | 7.36289 |
| 19 | CPRS-075-P1-2-8 IW-TP06-BRN | 1.21893 | 44.2408 | 36.2947 | 7.61834 |
| 20 | CPRS-075-P1-2-9 IW-TP06-BRN | 1.04189 | 43.9816 | 42.2130 | 6.51185 |
| 21 | CPRS-075-P1-2-10 IW-TP06-BRN | 0.96673 | 43.8679 | 45.3772 | 6.04211 |
| 22 | CPRS-075-P1-2-10-1 IW-TP06-BRN | 0.97695 | 44.0611 | 45.1006 | 6.10595 |
| 23 | CPRS-075-P1-2-11 IW-TP06-BRN | 1.11583 | 44.8205 | 40.1678 | 6.97393 |
| 24 | CPRS-075-P1-2-12 IW-TP06-BRN | 1.25611 | 44.7876 | 35.6557 | 7.85071 |
| 25 | CPRS-075-P1-2-13 IW-TP06-BRN | 1.17952 | 44.9128 | 38.0771 | 7.37201 |
| 26 | CPRS-075-P1-2-13-1 IW-TP06-BRN | 1.39551 | 44.7940 | 32.0984 | 8.72199 |
| 27 | CPRS-075-P1-2-13-2 IW-TP06-BRN | 1.38203 | 44.8783 | 32.4726 | 8.63772 |
| 28 | CPRS-075-P1-2-13-3 IW-TP06-BRN | 1.20114 | 45.0955 | 37.5437 | 7.50715 |
| 29 | CPRS-075-P1-2-13-4 IW-TP06-BRN | 1.25202 | 44.6600 | 35.6701 | 7.82517 |
| 30 | CPRS-075-P1-2-14 IW-TP06-BRN | 1.37064 | 44.8934 | 32.7535 | 8.56651 |
| 31 | CPRS-075-P1-2-14-1 IW-TP06-BRN | 1.29663 | 44.5995 | 34.3962 | 8.10398 |
| 32 | CPRS-075-P1-2-14-2 IW-TP06-BRN | 1.23942 | 44.5210 | 35.9206 | 7.74641 |
| 33 | CPRS-075-P1-2-14-3 IW-TP06-BRN | 1.68291 | 45.1016 | 26.7997 | 10.51822 |
| 34 | CPRS-075-P1-2-15 IW-TP06-BRN | 1.26460 | 44.8128 | 35.4361 | 7.90371 |
| 35 | CPRS-075-P1-2-16 IW-TP06-BRN | 1.28170 | 44.9116 | 35.0406 | 8.01063 |
| 36 | CPRS-075-P1-2-17 IW-TP06-BRN | 1.02829 | 44.6946 | 43.4649 | 6.42682 |
| 37 | CPRS-075-P1-2-17-1 IW-TP06-BRN | 1.18701 | 45.0521 | 37.954 | 7.41886 |

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Table 2. Continued.

| No | Lab ID[¶] | % N | % C | C:N | % Protein |
|---|---|---|---|---|---|
| 38 | CPRS-075-P1-2-17-2 IW-TP06-BRN | 1.20288 | 45.0603 | 37.4603 | 7.51801 |
| 39 | CPRS-075-P1-2-18 IW-TP06-BRN | 1.25445 | 44.9173 | 35.8062 | 7.84033 |
| 40 | CPRS-075-P1-2-19 IW-TP06-BRN | 1.13079 | 44.8086 | 39.6256 | 7.06748 |
| 41 | CPRS-075-P1-2-21 IW-TP06-BRN | 1.19235 | 44.6696 | 37.4635 | 7.45218 |
| 42 | CPRS-075-P1-2-21-1 IW-TP06-BRN | 1.49982 | 45.3606 | 30.2439 | 9.37390 |
| 43 | CPRS-075-P1-2-22 IW-TP06-BRN | 1.44202 | 45.4764 | 31.5364 | 9.01267 |
| 44 | CPRS-075-P1-2-22-1 IW-TP06-BRN | 1.04880 | 45.0120 | 42.9174 | 6.55502 |
| 45 | CPRS-075-P1-2-22-1 IW-TP06-BRN | 1.13188 | 45.2098 | 39.942 | 7.07430 |
| 46 | CPRS-075-P1-2-22-2 IW-TP06-BRN | 1.32261 | 45.3731 | 34.3056 | 8.26635 |
| 47 | CPRS-075-P1-2-23 IW-TP06-BRN | 1.19336 | 45.1042 | 37.7957 | 7.45854 |
| 48 | CPRS-075-P1-2-23-1 IW-TP06-BRN | 1.36254 | 44.4288 | 32.6072 | 8.51589 |
| 49 | CPRS-075-P1-2-24 IW-TP06-BRN | 0.96140 | 45.1802 | 46.9942 | 6.00876 |
| 50 | CPRS-075-P1-3-1 IW-TP06-BRN | 1.25775 | 45.1639 | 35.9084 | 7.86095 |
| 51 | CPRS-075-P1-3-1-1 IW-TP06-BRN | 1.21198 | 45.3292 | 37.4007 | 7.57492 |
| 52 | CPRS-075-P1-3-2 IW-TP06-BRN | 1.23387 | 45.0793 | 36.5349 | 7.71169 |
| 53 | CPRS-075-P1-3-2-1 IW-TP06-BRN | 1.20544 | 44.6677 | 37.0548 | 7.53405 |
| 54 | CPRS-075-P1-3-2-1 IW-TP06-BRN | 1.52212 | 45.1173 | 29.6410 | 9.51328 |
| 55 | CPRS-075-P1-3-3 IW-TP06-BRN | 1.23225 | 45.1819 | 36.6661 | 7.70156 |
| 56 | CPRS-075-P1-3-4 IW-TP06-BRN | 1.34331 | 45.0755 | 33.5554 | 8.39571 |
| 57 | CPRS-075-P1-3-5 IW-TP06-BRN | 1.31590 | 44.9859 | 34.1863 | 8.22440 |
| 58 | CPRS-075-P1-4-1 IW-TP06-BRN | 1.71910 | 44.9111 | 26.1248 | 10.74439 |
| 59 | CPRS-075-P1-4-1 IW-TP06-BRN | 1.20226 | 44.9251 | 37.3670 | 7.51415 |
| 60 | CPRS-075-P1-4-2 IW-TP06-BRN | 1.17165 | 44.8768 | 38.3020 | 7.32286 |
| 61 | CPRS-075-P1-4-3 IW-TP06-BRN | 1.09036 | 44.7964 | 41.0837 | 6.81480 |
| 62 | CPRS-075-P1-4-3-1 IW-TP06-BRN | 1.06249 | 44.9291 | 42.2866 | 6.64056 |
| 63 | CPRS-075-P1-4-3-2 IW-TP06-BRN | 1.06921 | 44.7473 | 41.8508 | 6.68256 |
| 64 | CPRS-075-P1-4-3-4 IW-TP06-BRN | 1.26749 | 45.5212 | 35.9144 | 7.92181 |
| 65 | CPRS-075-P1-4-3-4 IW-TP06-BRN | 1.04893 | 45.2038 | 43.0951 | 6.55582 |
| 66 | CPRS-075-P1-4-3-5 IW-TP06-BRN | 1.26200 | 45.4644 | 36.0255 | 7.88754 |
| 67 | CPRS-075-P1-4-5 IW-TP06-BRN | 1.00853 | 45.0209 | 44.6398 | 6.30335 |
| 68 | CPRS-075-P1-4-6 IW-TP06-BRN | 0.99927 | 45.1907 | 45.2234 | 6.24547 |
| 69 | CPRS-075-P1-4-6-1 IW-TP06-BRN | 1.12778 | 45.2538 | 40.1263 | 7.04864 |
| 70 | CPRS-075-P1-4-6-1 IW-TP06-BRN | 1.15281 | 45.8023 | 39.7309 | 7.20507 |
| 71 | CPRS-075-P1-4-7 IW-TP06-BRN | 1.17473 | 45.7882 | 38.9776 | 7.34207 |
| 72 | CPRS-075-P1-4-8 IW-TP06-BRN | 1.27278 | 45.6924 | 35.8995 | 7.95491 |
| 73 | CPRS-075-P1-4-9 IW-TP06-BRN | 1.38481 | 46.0529 | 33.2557 | 8.65507 |
| 74 | CPRS-075-P1-4-10 IW-TP06-BRN | 1.18166 | 46.0202 | 38.9452 | 7.38541 |
| 75 | CPRS-075-P1-4-11 IW-TP06-BRN | 1.24191 | 45.883 | 36.9453 | 7.76196 |

Continued.

Table 2.  Continued.

| No | Lab ID[¶] | % N | % C | C:N | % Protein |
|---|---|---|---|---|---|
| 76 | 08-264-1-1-PAN8 IW-RRS | 0.95631 | 46.5153 | 48.6404 | 5.97694 |
| 77 | 08-264-1-2-PAN1 IW-RRS | 0.88154 | 46.2266 | 52.4380 | 5.50967 |
| 78 | 08-264-1-2-PAN1 IW-RRS | 1.23484 | 46.7270 | 37.8404 | 7.71778 |
| 79 | 08-264-1-2-PAN2 IW-RRS | 0.97882 | 46.7340 | 47.7452 | 6.11763 |
| 80 | 08-264-1-2-PAN2 IW-RRS | 0.89299 | 46.4042 | 51.9649 | 5.58119 |
| 81 | 08-264-1-2-PAN3 IW-RRS | 1.17356 | 46.6709 | 39.7686 | 7.33475 |
| 82 | 08-264-1-5-PAN3 IW-RRS | 1.01991 | 46.6324 | 45.7219 | 6.37446 |
| 83 | 08-264-1-6-PAN1 IW-RRS | 1.21926 | 46.6778 | 38.2834 | 7.62043 |
| 84 | 08-264-1-6-PAN2 IW-RRS | 1.08912 | 46.5188 | 42.7121 | 6.80702 |
| 85 | 08-264-1-6-PAN3 IW-RRS | 1.11410 | 46.6476 | 41.8698 | 6.96318 |
| 86 | 08-264-1-8-PAN1 IW-RRS | 0.99238 | 46.8413 | 47.2007 | 6.20240 |
| 87 | 08-264-1-8-PAN1 IW-RRS | 0.78168 | 46.3481 | 59.2927 | 4.88552 |
| 88 | 08-264-1-8-PAN2 IW-RRS | 0.93163 | 46.8101 | 50.2451 | 5.82271 |
| 89 | 08-264-1-8-MIX IW-RRS | 0.90374 | 46.5044 | 51.4573 | 5.64841 |
| 90 | 08-264-4-1-PAN1 IW-RRS | 1.22633 | 46.6812 | 38.0656 | 7.66464 |
| 91 | 08-264-4-2-PAN1 IW-RRS | 1.39593 | 46.6712 | 33.4335 | 8.72461 |
| 92 | 08-264-4-2-PAN1 IW-RRS | 1.52162 | 47.1387 | 30.9792 | 9.51014 |
| 93 | 08-264-4-3-PAN1 IW-RRS | 1.04026 | 45.4197 | 43.6617 | 6.50164 |
| 94 | 08-264-4-3-PAN2 IW-RRS | 1.13313 | 45.7617 | 40.3851 | 7.08207 |
| 95 | 08-264-4-3-PAN3 IW-RRS | 0.95083 | 45.9684 | 48.3452 | 5.94272 |
| 96 | 08-264-4-3-PAN4 IW-RRS | 1.19798 | 45.9210 | 38.3317 | 7.48743 |
| 97 | 08-264-4-3-MIX IW-RRS | 1.27097 | 45.2897 | 35.6338 | 7.94360 |
| 98 | 08-264-6-1-PAN1 IW-RRS | 1.42957 | 45.6348 | 31.9220 | 8.93483 |
| 99 | 08-264-6-1-PAN1 IW-RRS | 0.98785 | 45.9475 | 46.5126 | 6.17406 |
| 100 | 08-264-6-1-PAN3 IW-RRS | 1.24851 | 45.4307 | 36.3879 | 7.80320 |
| 101 | 08-264-6-1-PAN6 IW-RRS | 1.72185 | 45.9252 | 26.6720 | 10.76157 |
| 102 | 08-264-6-1-MIX IW-RRS | 1.30109 | 45.5852 | 35.0360 | 8.13186 |
| 103 | 08-264-9-3-MIX IW-RRS | 1.39992 | 45.6610 | 32.6168 | 8.74952 |
| 104 | 08-264-9-3-PAN2 IW-RRS | 1.36427 | 45.5719 | 33.4037 | 8.52672 |
| 105 | 08-264-12-2-PAN2 IW-RRS | 0.81774 | 45.5502 | 55.7019 | 5.11092 |
| 106 | 08-264-13-2-PAN1 IW-RRS | 0.99553 | 46.0582 | 46.2648 | 6.22208 |
| 107 | 08-264-13-2-PAN1 IW-RRS | 1.07588 | 45.3927 | 42.1910 | 6.72429 |
| 108 | 08-264-13-2-PAN2 IW-RRS | 0.80980 | 45.2129 | 55.8322 | 5.06125 |
| 109 | 08-264-13-2-PAN5 IW-RRS | 1.11811 | 46.0072 | 41.1471 | 6.98821 |
| 110 | 08-264-14-1-PAN1 IW-RRS | 1.11899 | 45.4009 | 40.5730 | 6.99369 |
| 111 | 08-264-22-3-PAN2 IW-RRS | 1.34468 | 46.2671 | 34.4074 | 8.40426 |
| 112 | 08-264-22-3-MIX IW-RRS | 1.51013 | 45.4852 | 30.1199 | 9.43835 |
| 113 | 08-264-22-3-PAN4 IW-RRS | 1.48842 | 45.0746 | 30.2835 | 9.30263 |

Continued.

Table 2. Continued.

| No | Lab ID[¶] | % N | % C | C:N | % Protein |
|---|---|---|---|---|---|
| 114 | 08-264-23-2-PAN2 IW-RRS | 0.92445 | 45.6572 | 49.3883 | 5.77783 |
| 115 | 08-264-24-2-PAN1 IW-RRS | 1.14119 | 45.6058 | 39.9631 | 7.13248 |
| 116 | 08-264-24-2-PAN2 IW-RRS | 1.16842 | 44.0816 | 37.7272 | 7.30268 |
| 117 | 08-264-24-2-PAN6 IW-RRS | 1.13858 | 44.2301 | 38.8466 | 7.11615 |
| 118 | 08-264-24-2-MIX IW-RRS | 1.59159 | 44.5633 | 27.9991 | 9.94749 |
| 119 | 08-264-24-2-MIX IW-RRS | 1.30829 | 44.6901 | 34.1591 | 8.17683 |
| 120 | 08-264-31-2-PAN3 IW-RRS | 1.27254 | 44.6442 | 35.0827 | 7.95338 |
| 121 | 08-264-31-2-MIX IW-RRS | 1.83669 | 44.8744 | 24.4321 | 11.47937 |
| 122 | 08-264-31-6-MIX IW-RRS | 1.18354 | 44.6551 | 37.7300 | 7.39713 |
| 123 | 08-264-31-6-PAN2 IW-RRS | 1.10251 | 44.7379 | 40.5782 | 6.89069 |
| 124 | 08-264-31-10-PAN4 IW-RRS | 0.87817 | 44.5441 | 50.7236 | 5.48858 |
| 125 | 07500CY0151 FIELD 08 | 1.12632 | 45.2697 | 40.1926 | 7.03950 |
| 126 | 07500CY0151 FIELD 08 | 0.81957 | 44.6925 | 54.5313 | 5.12235 |
| 127 | 07500CY0153 FIELD 08 | 0.88349 | 45.2961 | 51.2690 | 5.52186 |
| 128 | 07500CY0153 FIELD 08 | 1.08834 | 45.4485 | 41.7593 | 6.80216 |
| 129 | 07500CY0157 FIELD 08 | 1.14845 | 45.2788 | 39.4259 | 7.17782 |
| 130 | 07500CY0157 FIELD 08 | 1.20387 | 45.5027 | 37.7969 | 7.52420 |
| 131 | 07NCCDR427 FIELD 08 | 1.19727 | 45.6279 | 38.1097 | 7.48298 |
| 132 | 07NCCDR427 FIELD 08 | 1.08307 | 45.4385 | 41.9532 | 6.76921 |
| 133 | 07NCCDR4212 FIELD 08 | 1.09487 | 45.3845 | 41.4519 | 6.84295 |
| 134 | 07NCCDR4212 FIELD 08 | 1.07013 | 45.2073 | 42.2445 | 6.68834 |
| 135 | 0527067231 FIELD 08 | 1.35488 | 45.4273 | 33.5286 | 8.46800 |
| 136 | 0527067231 FIELD 08 | 0.98435 | 44.9328 | 45.6469 | 6.15222 |
| 137 | 0527067241 FIELD 08 | 0.89507 | 44.8821 | 50.1435 | 5.59421 |
| 138 | 0527067241 FIELD 08 | 1.06874 | 44.7541 | 41.8754 | 6.67966 |
| 139 | 0527067244 FIELD 08 | 0.74706 | 44.6085 | 59.7119 | 4.66913 |
| 140 | 0527067244 FIELD 08 | 0.94480 | 46.5729 | 49.2936 | 5.90504 |

[¶]CPRS=Cypress derived.

**Total Crude Protein Content of Newly Developed Lines (Group 3)**

A total of 23 new lines were developed from Group 3 (IW entries). The total crude protein contents of these newly developed lines based on replicated data are as follows. One line showed a total crude protein content of <8%, 10 lines with a total crude protein content of <9%, eight lines of 9.1-10.0%, three lines of 10.1-11.0%, and one line of 11.1-12.0%. Lines with protein content of more than 9.0% will be advanced in the 2009 field tests.

Table 3. Protein content of newly developed lines. Total crude protein content was determined using the Leco TrueSpec® CN Combustion Analyzer. Values are based on three replicates using brown rice harvested from the field.

| ID | Wt. (mg) | % N | % C | C/N | % Protein |
|---|---|---|---|---|---|
| IW220 | 26.61 | 1.334475 | 41.13291 | 30.82328 | 8.340472 |
| IW280 | 28.12 | 1.366094 | 40.94962 | 29.97568 | 8.53809 |
| IW282 | 24.62 | 1.576135 | 41.32178 | 26.21716 | 9.85084 |
| IW284 | 35.81 | 1.447223 | 40.92242 | 28.27651 | 9.04514 |
| IW287 | 36.89 | 1.385289 | 40.63491 | 29.33315 | 8.65806 |
| IW291 | 36.63 | 1.383073 | 40.80876 | 29.50587 | 8.64420 |
| IW311 | 36.60 | 1.468758 | 40.64453 | 27.67272 | 9.17973 |
| IW320 | 32.49 | 1.422520 | 41.13833 | 28.91933 | 8.89075 |
| IW341 | 32.03 | 1.432519 | 40.94697 | 28.58388 | 8.95324 |
| IW345 | 21.31 | 1.789885 | 42.53937 | 23.76653 | 11.18679 |
| IW346 | 29.03 | 1.428030 | 40.71912 | 28.51418 | 8.92519 |
| IW347 | 36.74 | 1.365544 | 41.15486 | 30.13807 | 8.53465 |
| IW350 | 34.52 | 1.467674 | 40.74460 | 27.76134 | 9.17296 |
| IW353 | 29.49 | 1.497525 | 41.11653 | 27.45632 | 9.35953 |
| IW360 | 24.40 | 1.402676 | 41.69379 | 29.72447 | 8.76672 |
| IW380 | 26.28 | 1.606635 | 44.65773 | 27.79581 | 10.04147 |
| IW406 | 35.90 | 1.189939 | 41.67497 | 35.02276 | 7.43712 |
| IW444 | 29.87 | 1.598044 | 41.45124 | 25.93873 | 9.98777 |
| IW448 | 30.53 | 1.431742 | 41.42544 | 28.93359 | 8.94839 |
| IW449 | 22.62 | 1.600574 | 42.10108 | 26.30374 | 10.00359 |
| IW450 | 36.18 | 1.508950 | 41.25291 | 27.33881 | 9.43094 |
| IW460 | 26.53 | 1.542109 | 41.55396 | 26.94619 | 9.63818 |
| IW463 | 22.56 | 1.712348 | 42.14735 | 24.61377 | 10.70218 |

**Total Protein Content of Elite High Protein Lines under Different Nitrogen Applications**

Table 4 is partial data on N-tests. The remaining entries are currently being analyzed and will be reported in the next annual report.

Table 4. Protein content of elite lines in replicated N-tests.

| **Field ID** | **Lab ID** | % Nitrogen | Crude Protein (%) |
|---|---|---|---|
| NN82NR-Row | Wells 31-0800152 | 2.164 | 13.524 |
| NN86NR-Row | Wells 31-0800153 | 2.344 | 14.647 |
| NN91NR-Row | Wells 31-0800154 | 2.117 | 13.230 |
| NN99-Row | Wells 31-0800155 | 2.034 | 12.712 |
| NN241-Row | Wells 32-0800156 | 2.000 | 12.500 |
| NN236NR-Row | Wells 32-0800157 | 2.186 | 13.661 |
| NN230NR-Row | Wells 32-0800158 | 1.964 | 12.273 |
| NN211NR-Row | Wells 32-0800159 | 1.882 | 11.759 |
| NN408NR-Row | Wells 33-0800160 | 1.865 | 11.656 |
| NN401NR-Row | Wells 33-0800161 | 2.192 | 13.697 |
| NN434NR-Row | Wells 33-0800162 | 1.926 | 12.038 |
| NN402NR-Row | Wells 33-0800163 | 2.186 | 13.659 |
| NN441-Row | Wells-0800164 | 1.524 | 9.523 |
| NN546-Row | CPRS 462-126-0800165 | 1.971 | 12.320 |
| NN561-Row | CPRS 462-126-0800167 | 1.976 | 12.348 |
| NN564-Row | CPRS 462-126-0800168 | 1.961 | 12.254 |
| NN556-126 Row | CPRS 462-126-0800169 | 1.841 | 11.508 |
| NN563-Row | CPRS 462-126-0800170 | 1.213 | 7.584 |
| N500R-552 | Francis931-0800171 | 1.937 | 12.104 |
| NN500R-426 | Francis931-0800172 | 1.418 | 8.864 |
| NN500R-221 | Francis931-0800173 | 2.032 | 12.700 |
| NN500R-108 | Francis931-0800174 | 1.354 | 8.461 |
| NN500R-118 | Francis-0800175 | 1.372 | 8.576 |

**Preliminary Yield Trials of Nine High Protein Lines**

Yield potential, plant vigor, days to 50% heading, plant height, and lodging characteristics for nine elite high protein lines evaluated in the preliminary yield trials last year were presented in Table 5. Days to 50% heading among elite high protein lines ranged from 82 to 89, while days to heading of cultivar checks was 81 for Cocodrie, 86 for Cypress, and 88 for Wells. They have acceptable plant height, ranging from 48 to 41 inches. The majority of high protein lines showed good lodging resistance. Line 07NCCDR421, a Cocodrie-derived line, has the second highest yield potential, which is very close to the Cocodrie check.

Table 5. Field performance of nine elite high protein lines and three conventional cultivars from which the lines were derived in preliminary yield trials at the Rice Research Station in 2008.

| PLOT | ENTRY | ID | VIG | DAYS | HTE | LDG | YIELD | WHOLE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| 08HP009 | 009 | Wells | 3 | 88 | 42 | | 11218 | 60.6 | 68.9 |
| 08IHP008 | 008 | Cocodrie | 4 | 81 | 41 | 23 | 9649 | 60.8 | 68.0 |
| 08HP002 | 002 | 52709629 | 4 | 86 | 41 | | 9626 | 63.9 | 69.0 |
| 08HP007 | 007 | 07NCCDR4212 | 5 | 82 | 40 | | 9411 | 60.9 | 69.1 |
| 08HP012 | 012 | 07500CY0153 | 6 | 89 | 40 | 7 | 9353 | 62.5 | 68.4 |
| 08HP011 | 011 | Cypress | 4 | 86 | 38 | 23 | 9225 | 58.9 | 68.7 |
| 08HP006 | 006 | 07NCCDR427 | 5 | 83 | 39 | | 9089 | 60.1 | 68.6 |
| 08HP010 | 010 | 07500CY0151 | 5 | 87 | 41 | | 8921 | 59.1 | 67.2 |
| 08HP005 | 005 | 527067244 | 5 | 86 | 41 | | 8653 | 67.6 | 73.0 |
| 08HP003 | 003 | 07500CY0157 | 5 | 87 | 40 | 10 | 8454 | 67.7 | 72.0 |
| 08HP004 | 004 | 527067241 | 4 | 86 | 41 | | 8402 | 59.0 | 67.7 |
| 08HP001 | 001 | 527067231 | 4 | 87 | 41 | | 5050 | 62.2 | 67.1 |

# RICE AGRONOMY[1]

D.L. Harrell, J.P. Leonards, R.P. Regan, and D.M. Walker

## INRODUCTION

The following three sections of the report document research conducted in rice plant nutrition, cultural management and rice rotational crops. Rice plant nutrition studies were conducted at the LSU AgCenter Rice Research Station, as well as multiple off-station locations in an effort to generate agronomic production information representative of all Louisiana rice production areas. Rice nutrition studies were conducted in Acadia Parish at the Rice Research Station, as well as on cooperator farms located in Acadia, Vermilion, Evangeline, and Richland parishes. Cultural management studies were conducted at the Rice Research Station north and south units.

We would like to express our sincere appreciation to the following off-station cooperators for their assistance in conducting this research. Our efforts would not be successful without their support:

Dennis and Bubba Leonards – Acadia Parish
Larry and Kody Bieber – Evangeline Parish
Elliot Colvin – Richland Parish
Lounsberry Farms – Vermilion Parish

Throughout the following sections, multiple abbreviations are used to represent common units of measure and agricultural chemicals, these abbreviations are explained below in Tables 1 and 2, respectively.

[1] This research was supported in part by funds provided by rice producers through the Louisiana Rice Research Board.

Table 1. Common abbreviations used in agronomic research at the Rice Research Station.

| Abbreviation | Explanation |
|---|---|
| A | Acre |
| AS | Ammonium sulfate |
| bushel/A | Bushels per acre |
| Ca | Calcium |
| COC | Crop oil concentrate |
| DAT | Days after treatment |
| DPP | Days prior to planting |
| Fe | Iron |
| ft | Feet |
| $ft^2$ | Square feet |
| gal/A | Gallons product per acre |
| Head Rice | Percent unbroken kernels left after milling |
| in | Inches |
| lb | Pounds |
| lb/A | Pounds product per acre |
| lb ai/A | Pounds active ingredient per acre |
| Ldg-Rate | Lodging rate in percent |
| Ldg-Type | Lodging type on a scale from 0 to 5 where 0 = no lodging, 1 = slightly lodged (approximately 1 - 23$^o$ angle) and 5 = lodged to ground (90$^o$ angle) |
| K | Potassium |
| Main | First rice crop; crop growth stage prior to first harvest |
| Mg | Magnesium |
| N | Nitrogen |
| Na | Sodium |
| NA | Information not available/applicable |
| oz/A | Ounces product per acre |
| P | Phosphorus |
| PD | Panicle differentiation |
| PI | Panicle initiation |
| pl/$m^2$ | Plant densities measures 14 days after seeding emergence by counting the main-stem numbers in a randomly selected area of 1 $m^2$ in each plot |
| Postharvest | Application applied immediately following main crop harvest |
| ppm | parts per million |
| PRE | Application prior to crop emergence |
| Preflood | Preflood application applied 1 to 2 days prior to permanent flood establishment |
| Preplant | Preplanting application prior to flooding and seeding |
| pt/A | Pints product per acre |
| Ratoon | Second rice crop growth after harvest of first (main) crop |
| RRS | Rice Research Station, Crowley, LA |
| SB Severity | Sheath blight infestation on a scale from 1 to 9; where 1 = no sheath blight and 9 = severe sheath blight infestation |
| Total Mill | Percent of rice kernels left after milling |
| Zn | Zinc |
| 10% Heading(HD) | Crop growth stage where 10% of plants within a plot have visible panicles |
| 50% Heading(HD) | Number of days from effective seeding date to 50% panicle exertion |

Table 2. Common crop protection chemicals and formulations used in agronomic research at the Rice Research Station.

| | Trade Name | Common Name | Formulation | Company |
|---|---|---|---|---|
| Herbicides | | | | |
| | Aim | Carfentrazone | EC2 | FMC Corp. |
| | Arrosolo | Propanil + molinate | 3 lb + 3 lb | RiceCo |
| | Basagran | Bentazon | 4 lb | BASF |
| | Clincher | Cyhalofop | 2.38 lb | Dow Agro Science LLC |
| | Command | Clomazone | 3ME | FMC Corp. |
| | Duet | Propanil + bensulfuron | 4 lb + 0.48 oz | Rice Co. |
| | Grandstand R | Triclopyr | 3 lb | Dow Agro Science LLC |
| | Grasp | Penoxsulam | SC2 | Dow Agro Science LLC |
| | Honcho Plus | Glyphosate | 4 lb | Monsanto |
| | Liberty | Glufosinate ammonium | 18.19% | Bayer CropScience |
| | Londax | Bensulfuron | 60% DF | DuPont |
| | Newpath | Imazethapyr | 2 lb | BASF |
| | Permit | Halosulfuron | 75% WSG | Monsanto |
| | Prowl | Pendimethalin | EL 3.3 | BASF |
| | Regiment | Bispyribac-sodium | 80% DF | Valent USA |
| | Rice Beaux | Propanil + Thiobencarb | | Riceco LLC |
| | Roundup Weatherman | Glyphosate | 4 lb | Monsanto |
| | Stam M4 | Propanil | 4 lb | Dow Agro Science LLC |
| | Weedar 64 | 2,4-D | 3.8 lb | Aventis |
| Insecticides | | | | |
| | Dermacor | Rynaxypyr | | DuPont |
| | Karate Z | Cyhalothrin | 2.08 lb | Syngenta |
| | Mustang Max | Zeta-cypermethrin | 0.8 | FMC Corp. |
| | Methyl Parathion | Methyl Parathion | 4 lb | Cheminova |
| Fungicides | | | | |
| | Dithane DF | Mancozeb | 75% DF | Dow Agro Science LLC |
| | Stratego | Propiconazole + Trifloxystrobin | 1.04 lb + 1.04 lb | Bayer Crop Science LLC |
| | Quadris | Azoxystrobin | 2.08 lb | Syngenta |
| | Quilt | Azoxystrobin + Propiconazole | 1.04 lb + 0.62 lb | Syngenta |

## RICE NUTRITION RESEARCH

D.L. Harrell, J.P. Leonards, R.P. Regan, and D.M. Walker

### Variety by Nitrogen Rate and Application Timing Experiments

Variety by nitrogen (N) experiments are conducted yearly throughout Louisiana to establish N requirements for new commercial varieties and advanced experimental line. Rice varieties vary in their response to N rates and timing of application. These varietal N response differences can be attributed to several factors, including such traits as lodging, disease susceptibility, and N uptake efficiency. Environmental influences also impact the N rate needed to produce optimum yields. Theses include such factors as soil type, weather, disease, and insect pressure. For this reason, trials are conducted not only at the Rice Research Station in Crowley but also at cooperator sites in Vermilion and Richland parishes. Rates of N range from 0 to 210 lb/A utilizing both the single preflood and split applications. The N requirement, days to 50% heading, lodging susceptibility, and plant height are all determined. Ratoon data are also determined for trials in southwest Louisiana. A minimum of 3 years of data for each variety are needed before final recommendations are established. These recommendations can be found in Rice Varieties and Management Tips 2009, LAES publication number 2270. Electronic copies of this publication can be accessed from the LSU AgCenter Website: (http://www.lsuagcenter.com). Eight rice varieties (Catahoula, Jazzman, Neptune, CL131, CL151, CL171, Bowman, and Trenasse), and one advanced experimental line (0401182AR) were evaluated in 2008.

At the Rice Research Station location, all variety by N trials were drill seeded on March 25 and harvested on August 13. The soil at this location is classified as a Crowley silt loam. No lodging occurred in any trial at this location. Grain yields at the Rice Research Station were generally greater than those observed at both Vermilion and Richland parish sites. Optimum N rates for Bowman and Trenasse were 120 lb/A. Rice varieties Jazzman, Neptune, CL131, CL151, and CL171 and the experimental line 0401182AR were all optimized at 150 lb/A. Catahoula was optimized at 210 lb N/A. After main crop harvest, 90 lb N/A was applied to a dry soil surface to all test plots to evaluate the effect of first crop N fertility on ratoon growth and yield. A significant ratoon yield response was only seen for the varieties CL151 and Bowman and the experimental line 0401182. Generally, a first crop N rate of less than 30 lb/A reduced ratoon yields for CL151 and 0401182 while first crop N rates less than 90 lb/A reduced ratoon yields in Bowman.

At the Vermilion Parish site, all variety by N trials were drill seeded into a conventionally tilled seedbed on March 26 and were harvested on August 4. The soil at this site is classified as a Kaplan silt loam. This site traditionally has a higher disease pressure and generally is less responsive to N fertilization as compared with other sites. The optimum N rate for Jazzman was 150 lb/A, while optimum rates for Neptune and CL131 were 120 lb/A. A N rate of 90 lb/A was sufficient to optimize grain yields of CL151, Bowman, and Trenasse. Ratoon yields were evaluated on all trials. All trials received 90 lb N/A applied immediately after first crop harvest. A ratoon yield response to first crop N nutrition was not seen for any cultivar.

At the Richland Parish site, all variety by N trials were drill seeded on April 15 and were harvested on September 9. The soil is classified as a Perry clay. The Catahoula and Jazzman trials, which were planted on the south edge of the field near the riser, were affected by an unidentified malady. The random stand decline in these two trials compromised the data obtained from these two trials. In addition, many of the plots at this location were severely lodged prior to harvest due to the winds and heavy rainfall associated with Hurricane Gustav. The decreased harvest efficiency and grain loss due to lodging most likely contributed to the higher coefficients of variation seen for trials at this location. An N rate of 90 lb/A was found to be optimum for Trenasse, Bowman, CL171, and CL151. The optimum N rate for both Neptune and 0401182 was 150 lb/A, while the optimum N rate for CL131 was 120 lb/A.

**Ratoon Rice Fertility Experiments**

A trial was conducted to evaluate the response of Cocodrie and Trenasse ratoon yields to various N sources and rates. Nitrogen sources included urea, ammonium sulfate (AS) and a 1:1 N based blend of urea and AS. Rates of N were 45, 90, and 135 lb/A. Analysis of variance results (data not shown) indicated that a significant ratoon yield response to N source and variety were not observed. However, a significant ratoon yield response ($P$ = 0.041) was seen for N rate. Ratoon grain yield means for the 45, 90, and 135 lb/A N rates were 789, 967, and 1089 lb/A, respectively (LSD = 219 lb/A). Yields were optimized at an N rate of 90 lb/A.

A trial was initiated in 2008 to evaluate the ratoon yield response of Catahoula and Neptune to various rates of N. Six post harvest rates of N (0, 30, 60, 90, 120, and 150 lb/A) were evaluated. All plots received 150 lb/A prior to permanent flood establishment in the first crop. Analysis of variance indicated that ratoon yields of Neptune (1989 lb/A) were significantly greater than Cheniere (1272 lb/A; data not shown). A variety by N rate interaction was also significant ($P$ = 0.0065). Optimal ratoon yields for Catahoula were achieved at a ratoon N rate of 60 lb/A, while ratoon yields of Neptune were optimized at a ratoon N rate of 120 lb/A.

Nitrogen application timing for ratoon rice production was evaluated for two rice varieties, Cocodrie and Trenasse. Nitrogen was applied at 90 lb/A at one of six different application timings: 1) main crop heading, 2) 7 days prior to draining, 3) main crop harvest, 4) a 60/30 split between heading and harvest, 5) a 60/30 split between 7 days prior to draining and harvest, or 6) 60/30 split between harvest and 21 days after harvest. Nitrogen applied at main crop harvest provided the highest grain yield for both Cocodrie and Trenasse.

A trial was conducted to evaluate the influence of main crop straw placement or removal on ratoon crop N efficiency. Straw remaining after first crop harvest was either 1) applied evenly across the top of the plot and urea fertilizer applied over the top, 2) removed from the plot and urea applied on bare ground, followed by replacing the straw over the top, or 3) straw removed permanently from the plot and urea applied on bare ground. Three post harvest N rates (45, 90, and 135 lb/A) were evaluated. Ratoon yields were not affected by either straw placement or a straw placement by N rate interaction.

A trial was initiated in 2008 to evaluate the effectiveness of Agrotain-treated urea as compared with untreated urea in ratoon rice production. Two N sources (Agrotain-treated urea and urea) and five N rates (0, 30, 60, 90, 120, and 150 lb/A) were evaluated in the trial. First crop rice was fertilized with urea at rate of 150 lb N/A after harvest. Main crop yields were not significantly different from each other. Analysis of variance data (not shown) indicated that a ratoon yield response was not seen between the N sources. This may be due to rainfall events that occurred the next 3 days, which provided a very quick permanent flood establishment after N application. A significant ratoon yield response to N rate ($P$ = 0.0012) was observed. Ratoon yields for both N sources were optimized at 30 lb/A.

**Other Fertility Experiments**

A trial was conducted to evaluate the agronomic response of rice to preplant incorporated starter N applications. Two rates of N (10 and 20 lb/A) and two N sources (Agrotain-treated urea and urea). Neither N rate nor N source significantly increased grain yields.

A trial was conducted to evaluate the agronomic response and N uptake of Cheniere rice when two different N sources (Agrotain-treated urea and urea) were applied at various timings prior to permanent flood establishment and after flood establishment. Five preflood N application timings were evaluated (10dpf, 8dpf, 6dpf, 4dpf, and 2dpf) and 3 post flood N applications (0dpost, 1dpost, and 4dpost) were evaluated. A yield advantage of 1294 lb/A was observed for Agrotain-treated urea over urea at the 10dpf timing. A yield advantage for Agrotain-treated urea over urea was not seen at fertilizer application timings closer to flood establishment. Both urea and Agrotain-treated urea grain yields for applications applied into flood water were approximately one-half of those realized at preflood timings. Similarly, N uptake was greatly reduced when both N sources were applied into flood water.

A similar N source (Agrotain-treated urea and urea) and application timing experiment was conducted at Evangeline Parish location. Application timings for this trial were 6dpf, 3dpf, 0dpost, and 2dpost. A yield advantage was not seen for either N source at all timings. However, preflood N applications out yielded all post flood applications.

Multiple Zn fertility trials were conducted at the Leonards Farm in Acadia Parish in 2008. Initial soil test results indicated a Zn concentration between 1 and 1.7 ppm at the location. Average pH was 7.9. The objective of the first trial was to help in the calibration of the Melich3 soil test for Zn. This trial consisted of five Zn rates (0, 5, 10, 15 and 20 lb/A). The Zn source was zinc sulfate that was applied at planting. Additional sulfur (S), as elemental S, was also applied to plots to balance the S application at 10 lb/A. A true check plot that did not receive either Zn or S was also included. All N fertilization was done with AS. This was done to saturate the system with S. Leaf samples were then taken 6 weeks after planting, approximately 6 days prior to green ring, both the 0 Zn (with 10 lb S/A), and the true check had tissue Zn concentrations <15 ppm, confirming the presence of Zn deficiency. After harvest, yields also indicated Zn fertilizer response. Generally, 5 lb Zn/A was found to alleviate the Zn deficiency and increase yields over the check plots by approximately 1,500 lb/A.

A second Zn trial at the Leonards Farm evaluated the response of Zn oxide-coated 0-24-24 fertilizer as compared with Zn sulfate. Three rates of Zn sulfate were evaluated (5, 10, 15, and 30 lb/A) and three rates (16, 24, and 32 oz/A) of the Zn oxide source (HM9863) coated on the surface of 0-24-24. An untreated control was also included. Both Zn sources were surface applied after planting. P and K were balanced in all trials. A significant yield advantage for both Zn sources over the untreated control was observed at all rates.

A third Zn trial at the Leonards Farm was conducted to evaluate the yield response of rice after the onset of Zn deficiency symptoms (bronzing) to several commercially available liquid Zn sources applied at labeled rates. Liquid Zn products evaluated in the trial included TraFix, Brexil, Zinc Plus, and Super Zinc FL. Granular Zn sulfate was also evaluated at a rate of 10 lb Zn/A. All products were applied approximately 5 days prior to the green ring physiological growth stage. A statistically significant yield advantage over the untreated control was not seen for any Zn product. However, a numerical yield advantage over the untreated control was seen for all applied Zn products. The granular Zn sulfate produced numerically higher yields as compared with the liquid Zn products.

**Rice Variety by Nitrogen Experiments at the Rice Research Station**

**Experiment number** ..........................: 08-CM-01 to CM-09

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (Crowley Main)
- **Tillage type** .................................: Conventional
- **Experimental design** ..................: Randomized complete block
- **Number of reps** ..........................: 4
- **Plot size** .......................................: 7 x 20 ft
- **Row width/rows per plot** ...........: 7 in / 12

**Soil type** ..............................................: Crowley silt loam
- **% organic matter** .......................: 1.252
- **pH** ................................................: 7.0
- **Extractable nutrients** ppm..........: Ca-1077, Cu-2.2, Mg-250, P-7.7, K-62.0, Na-80.7, S-11.0, Zn-4.6

**Crop/Variety** ......................................: Rice / See Data Sheet
- **Planting method/date** .................: Drill seeded / March 25, 2008
- **Seeding rate/depth** ......................: 40 seeds/ $ft^2$ / .5 in
- **Emergence date** ..........................: April 5
- **Harvest date** ................................: August 13

**Seed treatment/cwt** ............................: Maxim® 4FS + Apron XL® LS at Manufacturer's rate
Release ® LC at 1.0 to 2.0 g/100 lb of seed
Flokote Zn at 8 oz/100 lb of seed

**Fertilization** ........................................: 195 lb/A 0-24-24-2.5, March 25
1 qt/A Zinc Plus, April 25
Ratoon, 90 lb N/A 46-0-0, August 15

**Water management** ...........................:
- **Flush** ............................................: April 2, April 14
- **Flood** ............................................: May 15
- **Drain** ............................................: July 28
- **Ratoon Flood** ..............................: August 20
- **Ratoon Drain** ..............................: October 28

**Pest management** ...............................:
- **Herbicides** ....................................: 15 oz/A Clincher + 1 qt/A Crop oil, April 23
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, April 25
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 14
.6 oz/A Londax, June 21

- **Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides**………………………..: 21 oz/A Quilt + 6 oz/A Quadris, June 2

Table 1. Determine the agronomic response of drill-seeded Catahoula (302082) to nitrogen fertilizer rate and time of application (3.1) + Green seeker N rate (1.1) (Rice Research Station).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | 8/8/08 | 6/13/08 | 7/9/08 | 8/11/08 | | 10/8/08 | 11/10/08 | |
| Rating Type | | | | | 50% HD | Height | Biomass | Biomass | Yield | 50% Head | Grn-Biomass | Yield | Yield |
| Rating Unit | | | | | days | in | lb/A | lb/A | lb/A | days | lb/A | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Crop Stage Scale | | | | | | | PD | 50% Head | | | 50% Head | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 100 gh | 28 d | 1293 b | 3536 e | 2552 f | 42 b | 3273 a | 1210 a | 3762 h |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 99 h | 33 c | 2035 a | 7234 d | 5205 e | 48 a | 2900 a | 1289 a | 6494 g |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 100 fgh | 34 bc | 2677 a | 8265 cd | 7256 d | 49 a | 3163 a | 1316 a | 8572 f |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 101 c-g | 37 ab | 2837 a | 10983 abc | 8798 c | 49 a | 4414 a | 1451 a | 10249 e |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 101 cde | 37 ab | 2947 a | 10750 abc | 9738 c | 49 a | 4085 a | 1578 a | 11316 cd |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 102 bc | 37 ab | 2555 a | 12008 ab | 11113 b | 49 a | 4984 a | 1566 a | 12679 a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 103 b | 39 a | 2463 a | 13554 a | 10885 b | 49 a | 4381 a | 1585 a | 12469 ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 104 a | 39 a | 3063 a | 11609 abc | 11877 a | 50 a | 4161 a | 1266 a | 13143 a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 99 h | 34 bc | | 8950 bcd | 7377 d | 49 a | 3476 a | 1258 a | 8635 f |
| | UREA | 45 | lb ai/A | Midseason | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | PD | 101 d-h | 36 abc | | 10905 abc | 9291 c | 49 a | 3547 a | 1303 a | 10594 de |
| | UREA | 45 | lb ai/A | Midseason | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | PD | 101 d-h | 37 ab | | 12691 a | 9620 c | 49 a | 4830 a | 1391 a | 11011 cde |
| | UREA | 45 | lb ai/A | Midseason | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | PD | 102 bcd | 36 abc | | 12407 a | 10507 b | 50 a | 4167 a | 1291 a | 11799 bc |
| | UREA | 45 | lb ai/A | Midseason | | | | | | | | | |
| 13 | UREA | 75 | lb ai/A | PD | 100 e-h | 36 abc | | 10410 abc | 8987 c | 49 a | | 1441 a | 10428 de |
| | SBNR-UREA | 0 | lb ai/A | Midseason | | | | | | | | | |
| 14 | UREA | 105 | lb ai/A | PD | 101 c-f | 36 ab | | 10936 abc | 9551 c | 48 a | | 1341 a | 10892 cde |
| | SBNR-UREA | 0 | lb ai/A | Midseason | | | | | | | | | |
| LSD (P=.05) | | | | | 0.9 | 2.25 | 692.2 | 2111 | 643.9 | 3.7 | 1763.3 | 260.6 | 702.5 |
| Standard Deviation | | | | | 0.7 | 1.34 | 470.6 | 1477.2 | 450.6 | 2.6 | 1041.3 | 182.3 | 491.6 |
| CV | | | | | 0.65 | 3.77 | 18.95 | 14.34 | 5.14 | 5.37 | 26.37 | 13.24 | 4.85 |
| Replicate F | | | | | 0.611 | 1.043 | 3.444 | 0.877 | 0.963 | 1.053 | 0.109 | 3.753 | 1.63 |
| Replicate Prob(F) | | | | | 0.6119 | 0.3668 | 0.0352 | 0.4614 | 0.42 | 0.38 | 0.8969 | 0.0185 | 0.1982 |
| Treatment F | | | | | 15.923 | 12.257 | 6.033 | 12.4 | 122.493 | 2.1 | 1.237 | 1.936 | 108.672 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0006 | 0.0001 | 0.0001 | 0.0371 | 0.3212 | 0.0559 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Determine the agronomic response of drill-seeded Jazzman (LA2125) to nitrogen fertilizer rate and time of application (1.1) (Rice Research Station).

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | 8/8/08 | 8/15/08 | 11/17/08 | |
| Rating Type | | | | | 50% Head | Height | Yield | Yield | Yield |
| Rating Unit | | | | | days | in | lb/A | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Total |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 111 a | 26.7 g | 2394 g | 1043 ab | 3437 e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 105 c | 32.3 f | 4072 f | 1308 a | 5379 d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 104 c | 36 e | 6459 e | 1422 a | 7881 c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 104 c | 38.7 b-e | 8605 cd | 1319 a | 9925 ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 104 c | 39.7 a-d | 8856 bcd | 1081 ab | 9938 ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 106 b | 40.7 abc | 9762 ab | 1167 a | 10929 a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 106 b | 41.3 ab | 9745 ab | 1245 a | 10990 a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 106 b | 42.3 a | 9868 a | 837 b | 10705 a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 104 c | 36.7 de | 6995 e | 1287 a | 8281 c |
| | UREA | 45 | lb ai/A | PD | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 104 c | 37.7 cde | 8167 d | 1356 a | 9524 b |
| | UREA | 45 | lb ai/A | PD | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 105 c | 39 b-e | 9306 abc | 1192 a | 10498 ab |
| | UREA | 45 | lb ai/A | PD | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 105 c | 41 ab | 9810 ab | 1036 ab | 10847 a |
| | UREA | 45 | lb ai/A | PD | | | | | |
| LSD (P=.05) | | | | | 0.7 | 2.16 | 676.2 | 229.2 | 739.8 |
| Standard Deviation | | | | | 0.5 | 1.28 | 468.3 | 158.8 | 512.4 |
| CV | | | | | 0.48 | 3.39 | 5.98 | 13.33 | 5.68 |
| Replicate F | | | | | 5.13 | 0.665 | 0.696 | 0.269 | 0.432 |
| Replicate Prob(F) | | | | | 0.0051 | 0.5243 | 0.5613 | 0.8473 | 0.7316 |
| Treatment F | | | | | 64.003 | 36.056 | 108.881 | 4.427 | 88.744 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0004 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 3. Determine the agronomic response of drill-seeded Neptune (LA2028) to nitrogen fertilizer rate and time of application (3.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | 8/8/08 | | | | 8/15/08 | | 11/11/08 | | | |
| Rating Type | | | | | Height | | 50% Head | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | In | | days | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 24 | f | 108 | a | 1194 | h | 2079 | a | 3274 | f |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 29 | e | 104 | c | 4141 | g | 2785 | a | 6926 | e |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 31 | d | 104 | c | 6033 | f | 2481 | a | 8514 | d |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 33 | bcd | 104 | c | 7739 | e | 2853 | a | 10592 | c |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 34 | abc | 104 | c | 9251 | cd | 2726 | a | 11977 | b |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 35 | ab | 105 | bc | 10583 | ab | 2847 | a | 13429 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 36 | ab | 105 | bc | 11087 | ab | 2882 | a | 13969 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 36 | a | 106 | b | 11255 | a | 2649 | a | 13904 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 32 | cd | 104 | c | 6311 | f | 2615 | a | 8927 | d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 34 | a-d | 104 | c | 8751 | d | 2766 | a | 11517 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 34 | a-d | 104 | c | 9960 | bc | 2692 | a | 12651 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 35 | ab | 105 | bc | 10809 | ab | 2607 | a | 13416 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.71 | | 0.8 | | 901 | | 470.2 | | 1080.4 | |
| Standard Deviation | | | | | 1.01 | | 0.6 | | 624 | | 325.7 | | 748.2 | |
| CV | | | | | 3.09 | | 0.54 | | 7.71 | | 12.22 | | 6.96 | |
| Replicate F | | | | | 4.03 | | 1.808 | | 3.299 | | 2.945 | | 2.612 | |
| Replicate Prob(F) | | | | | 0.0323 | | 0.1649 | | 0.0323 | | 0.0472 | | 0.0678 | |
| Treatment F | | | | | 34.624 | | 16.556 | | 101.362 | | 1.808 | | 77.398 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0928 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 4. Determine the agronomic response of drill-seeded CL131 to nitrogen fertilizer rate and time of application (3.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/8/08 | | 8/13/08 | | 11/10/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 98 | d | 25 | e | 2996 | f | 1951 | a | 4947 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 97 | d | 28 | d | 5072 | e | 2222 | a | 7294 | d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 97 | d | 30 | cd | 6971 | d | 2274 | a | 9245 | c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 98 | d | 32 | abc | 8106 | bc | 2701 | a | 10806 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 100 | bc | 33 | abc | 8424 | b | 2256 | a | 10680 | b |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 102 | ab | 34 | ab | 10024 | a | 2265 | a | 12289 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 101 | ab | 35 | a | 9495 | a | 2282 | a | 11778 | ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 103 | a | 33 | abc | 9887 | a | 2409 | a | 12296 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 97 | d | 30 | cd | 7359 | cd | 2181 | a | 9540 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 99 | cd | 31 | bc | 8556 | b | 2490 | a | 11047 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 100 | bc | 32 | abc | 9419 | a | 2567 | a | 11985 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 101 | ab | 32 | abc | 9870 | a | 2345 | a | 12215 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.4 | | 2.01 | | 754.9 | | 485.5 | | 989.5 | |
| Standard Deviation | | | | | 0.9 | | 1.19 | | 522.8 | | 336.2 | | 685.3 | |
| CV | | | | | 0.94 | | 3.8 | | 6.52 | | 14.44 | | 6.63 | |
| Replicate F | | | | | 1.793 | | 2.2 | | 1.15 | | 3.187 | | 1.715 | |
| Replicate Prob(F) | | | | | 0.1678 | | 0.1346 | | 0.3434 | | 0.0364 | | 0.183 | |
| Treatment F | | | | | 18.459 | | 16.22 | | 67.829 | | 1.345 | | 44.099 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.2447 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 5. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (2.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/8/08 | | 8/13/08 | | 11/10/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 100 | cde | 29 | e | 3376 | f | 1902 | b | 5286 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 98 | e | 33 | d | 6214 | e | 2138 | ab | 8353 | d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 99 | cde | 36 | c | 8999 | d | 2255 | ab | 11254 | c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 100 | c | 38 | bc | 10964 | abc | 2234 | ab | 13199 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 101 | c | 39 | ab | 10443 | c | 2608 | a | 13051 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 102 | b | 40 | a | 11936 | a | 2362 | ab | 14298 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 104 | a | 40 | a | 11666 | ab | 1998 | ab | 13663 | ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 104 | a | 39 | ab | 11520 | abc | 2119 | ab | 13638 | ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 99 | de | 35 | d | 8736 | d | 2050 | ab | 10785 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 100 | cd | 38 | abc | 10757 | bc | 2155 | ab | 12911 | b |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 101 | c | 38 | abc | 11336 | abc | 2576 | a | 13913 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 103 | b | 39 | ab | 11522 | abc | 2159 | ab | 13681 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.1 | | 1.63 | | 765.8 | | 388.9 | | 854.8 | |
| Standard Deviation | | | | | 0.8 | | 0.97 | | 530.3 | | 269.3 | | 592 | |
| CV | | | | | 0.79 | | 2.6 | | 5.42 | | 12.17 | | 4.93 | |
| Replicate F | | | | | 4.576 | | 1.163 | | 0.679 | | 5.37 | | 2.225 | |
| Replicate Prob(F) | | | | | 0.0087 | | 0.3312 | | 0.5716 | | 0.004 | | 0.1043 | |
| Treatment F | | | | | 26.088 | | 34.569 | | 96.846 | | 2.523 | | 84.032 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0197 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 6. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (2.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/8/08 | | 8/13/08 | | 11/10/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | Days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 92 | f | 27 | d | 2258 | f | 2067 | a | 4325 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 92 | f | 31 | c | 5200 | e | 2296 | a | 7496 | d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 95 | e | 34 | b | 6213 | d | 2374 | a | 8587 | c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 97 | cd | 35 | ab | 7636 | c | 2744 | a | 10380 | b |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 97 | cd | 36 | ab | 8150 | bc | 2587 | a | 10737 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 98 | bc | 36 | ab | 9312 | a | 2789 | a | 12101 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 99 | ab | 38 | a | 8665 | ab | 2634 | a | 11299 | ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 100 | a | 38 | a | 8834 | ab | 2429 | a | 11264 | ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 94 | e | 34 | b | 6225 | d | 2548 | a | 8773 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 96 | d | 36 | ab | 8166 | bc | 2565 | a | 10730 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 97 | cd | 36 | ab | 8592 | ab | 2949 | a | 11540 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 98 | ab | 37 | ab | 8596 | ab | 2465 | a | 11061 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.19 | | 1.98 | | 642.1 | | 472 | | 924.9 | |
| Standard Deviation | | | | | 0.82 | | 1.17 | | 444.7 | | 326.9 | | 640.6 | |
| CV | | | | | 0.86 | | 3.34 | | 6.07 | | 12.88 | | 6.5 | |
| Replicate F | | | | | 0.195 | | 4.918 | | 3.434 | | 0.969 | | 2.889 | |
| Replicate Prob(F) | | | | | 0.8992 | | 0.0172 | | 0.028 | | 0.4192 | | 0.0502 | |
| Treatment F | | | | | 35.393 | | 21.544 | | 83.422 | | 2.076 | | 47.989 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0519 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 7. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (1.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/8/08 | | 8/13/08 | | 11/10/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 108 | a | 29 | e | 3049 | e | 1198 | c | 4247 | f |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 106 | d | 33 | d | 5471 | d | 1258 | bc | 6729 | e |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 106 | d | 35 | bcd | 7324 | c | 1210 | c | 8534 | d |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 106 | d | 35 | a-d | 8894 | b | 1718 | ab | 10612 | c |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 106 | cd | 37 | ab | 9369 | ab | 1574 | abc | 10943 | bc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 107 | bc | 37 | abc | 10278 | a | 1664 | abc | 11942 | ab |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 107 | ab | 39 | a | 10475 | a | 1987 | a | 12461 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 108 | ab | 37 | abc | 9725 | ab | 1828 | a | 11553 | abc |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 105 | e | 34 | cd | 7368 | c | 1175 | c | 8543 | d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 106 | d | 36 | a-d | 8958 | b | 1347 | bc | 10305 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 106 | cd | 36 | a-d | 9524 | ab | 1709 | ab | 11234 | abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 107 | bc | 36 | abc | 10275 | a | 1874 | a | 12149 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 0.64 | | 2.12 | | 872 | | 324.5 | | 936.8 | |
| Standard Deviation | | | | | 0.44 | | 1.25 | | 603.9 | | 224.7 | | 648.8 | |
| CV | | | | | 0.42 | | 3.55 | | 7.2 | | 14.54 | | 6.53 | |
| Replicate F | | | | | 2.538 | | 0.478 | | 0.221 | | 0.756 | | 0.065 | |
| Replicate Prob(F) | | | | | 0.0734 | | 0.6262 | | 0.8809 | | 0.5271 | | 0.9781 | |
| Treatment F | | | | | 17.846 | | 12.333 | | 55.136 | | 6.813 | | 58.537 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 8. Determine the agronomic response of drill-seeded 0401182 AR to nitrogen fertilizer rate and time of application (1.1) (Rice Research Station).

| Crop Name | | | | Rice | | Rice | | Rice | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | 8/8/08 | | 8/13/08 | | 11/10/08 | | | |
| Rating Type | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 100 f | 29 | d | 2392 | g | 1852 | b | 4244 | f |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 100 f | 32 | c | 5060 | f | 2659 | a | 7719 | e |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 102 e | 36 | b | 7222 | e | 2699 | a | 9922 | d |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 104 cd | 38 | ab | 8817 | d | 2798 | a | 11615 | c |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 104 cd | 40 | a | 9356 | cd | 2538 | a | 11895 | bc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 105 bc | 40 | a | 10165 | abc | 2677 | a | 12843 | abc |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 106 ab | 40 | a | 10218 | abc | 2699 | a | 12916 | abc |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 106 a | 41 | a | 10986 | a | 2423 | a | 13409 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 100 f | 36 | b | 7285 | e | 2652 | a | 9938 | d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 103 d | 38 | ab | 9065 | d | 2950 | a | 12015 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 103 cd | 40 | a | 9969 | bc | 2958 | a | 12927 | abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 105 bc | 39 | a | 10599 | ab | 2586 | a | 13185 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| LSD (P=.05) | | | | 1 | | 2.15 | | 652.1 | | 474 | | 887.5 | |
| Standard Deviation | | | | 0.7 | | 1.27 | | 451.6 | | 328.3 | | 614.6 | |
| CV | | | | 0.65 | | 3.39 | | 5.36 | | 12.51 | | 5.56 | |
| Replicate F | | | | 0.559 | | 0.12 | | 6.701 | | 5.186 | | 7.177 | |
| Replicate Prob(F) | | | | 0.6456 | | 0.8874 | | 0.0012 | | 0.0048 | | 0.0008 | |
| Treatment F | | | | 40.356 | | 24.878 | | 128.003 | | 3.071 | | 79.158 | |
| Treatment Prob(F) | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0061 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 9. Determine the agronomic response of drill-seeded Trenasse to nitrogen fertilizer rate and time of application (5.1) + Multistate soil test N study (Rice Research Station).

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | | 8/11/08 | 8/11/08 | 8/11/08 | 8/14/08 | 11/17/08 | |
| Rating Type | | | | | 50% Head | Biomass | Height | Lodge | Lodge | Yield | Yield | Yield |
| Rating Unit | | | | | days | lb/A | in | % plot | rate 1-5 | lb/A | lb/A | lb/A |
| Crop Stage Majority | | | | | | 50% head | | | | | | |
| Crop Stage Scale | | | | | Main | Main | Main | Main | Main | Main | Ratoon | Total |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 90 e | 3170 b | 27 e | | | 3433 f | 1007 a | 4439 e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 90 e | | 31 d | | | 6138 e | 1283 a | 7422 d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 92 cd | | 35 c | | | 8355 d | 1403 a | 9758 c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 93 bc | | 38 ab | | | 9809 c | 1141 a | 10949 b |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 94 ab | 10125 a | 38 ab | | | 10577 bc | 1217 a | 11794 ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 95 ab | | 38 ab | | | 12066 a | 1226 a | 13292 a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 95 ab | | 40 a | | | 11534 ab | 1361 a | 12895 a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 96 a | | 39 ab | 20 | 3.5 | 10972 abc | 1111 a | 12084 ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 91 de | | 35 c | | | 8363 d | 1165 a | 9528 c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 93 bc | | 37 b | | | 10428 bc | 1374 a | 11802 ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 94 bc | | 38 b | | | 10909 abc | 1271 a | 12180 ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 94 ab | | 39 ab | | | 11206 ab | 1204 a | 12410 ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| LSD (P=.05) | | | | | 1.3 | 2252.9 | 1.3 | . | . | 912.2 | 394.1 | 1051.5 |
| Standard Deviation | | | | | 0.9 | 1001.3 | 0.9 | . | . | 631.7 | 272.9 | 728.2 |
| CV | | | | | 0.93 | 15.06 | 2.49 | . | . | 6.66 | 22.18 | 6.8 |
| Replicate F | | | | | 2.465 | 1.964 | 7.033 | | | 0.967 | 0.904 | 1.197 |
| Replicate Prob(F) | | | | | 0.0796 | 0.2966 | 0.0009 | | | 0.4201 | 0.4494 | 0.3261 |
| Treatment F | | | | | 17.749 | 96.502 | 63.707 | | | 64.337 | 0.729 | 50.218 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0022 | 0.0001 | | | 0.0001 | 0.703 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Variety by Nitrogen Experiments at Vermilion Parish

**Experiment number** ..........................: 08-VP-01 to VP-09

**Site and design** ..................................:
- **Location/Cooperator** ..................: Vermilion Parish / Kent Lounsberry
- **Tillage type** ..................................: Conventional
- **Experimental design** ..................: Randomized complete block
- **Number of reps** ..........................: 4
- **Plot size** ........................................: 7 x 20 ft
- **Row width/rows per plot** ...........: 7 in / 12

**Soil type** ..............................................: Kaplan Silt Loam
- **% organic matter** ........................: 1.279
- **pH** .................................................: 4.94
- **Extractable nutrients** ppm..........: Ca-560, Cu-1.79, Mg-120, P-5.4, K-62.6, Na-35.2, S-16.2, Zn-0.662

**Crop/Variety** ......................................: Rice / See Data Sheet
- **Planting method/date** .................: Drill seeded / March 19, 2008
- **Seeding rate/depth** ......................: 40 seeds/ $ft^2$ / .5 in
- **Emergence date** ...........................: March 26
- **Harvest date** ................................: August 4

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization** ........................................: 195 lb/A 0-24-24-2.5, March 19
Ratoon - 90 lb N/A 46-0-0, August 15

**Water management** ...........................:
- **Flush** .............................................: March 27, April 14
- **Flood** .............................................: May 1
- **Drain** .............................................: July 21
- **Ratoon Flood** ..............................: August 18
- **Ratoon Drain** ..............................: October 17

**Pest management** ...............................:
- **Herbicides** ....................................: 4.5 qt/A Arrosolo + 1 oz/A Permit + .5 oz/A Londax, April 29
- **Insecticides** ..................................: None
- **Fungicides** ...................................: 21 oz/A Quilt + 6 oz/A Quadris, June 20

Table 10. Determine the agronomic response of drill-seeded Catahoula (302082) to nitrogen fertilizer rate and time of application (3.2) (Vermilion Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | Rice | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/1/08 | | 8/1/08 | 8/1/08 | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Lodge | Lodge | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | rate | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | Main | Main | | Ratoon | | Total | |
| Trt No. | Trt. Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 93 | e | 32 | c | . | . | 5280 | b | 1228 | a | 6508 | b |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 93 | e | 33 | bc | . | . | 7363 | a | 1606 | a | 8968 | a |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 95 | de | 35 | bc | . | . | 8237 | a | 1351 | a | 9588 | a |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 96 | cd | 35 | bc | 10 | 3 | 8680 | a | 1346 | a | 10026 | a |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 97 | c | 34 | bc | . | . | 7944 | a | 1260 | a | 9204 | a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 100 | b | 36 | ab | . | . | 9577 | a | 1348 | a | 10924 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 102 | b | 38 | a | . | . | 9076 | a | 1333 | a | 10409 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 104 | a | 39 | a | . | . | 8868 | a | 1262 | a | 10131 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 95 | de | 33 | bc | . | . | 8522 | a | 1315 | a | 9837 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 96 | cd | 34 | bc | . | . | 9075 | a | 1422 | a | 10497 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 97 | c | 35 | bc | . | . | 8908 | a | 1389 | a | 10297 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 100 | b | 38 | a | . | . | 9698 | a | 1415 | a | 11113 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.72 | | 1.99 | | . | . | 1417.1 | | 216.8 | | 1457.2 | |
| Standard Deviation | | | | | 1.19 | | 1.17 | | . | . | 981.4 | | 150.2 | | 1009.2 | |
| CV | | | | | 1.22 | | 3.33 | | . | . | 11.63 | | 11.07 | | 10.31 | |
| Replicate F | | | | | 1.353 | | 0.141 | | | | 2.399 | | 2.577 | | 2.105 | |
| Replicate Prob(F) | | | | | 0.2742 | | 0.869 | | | | 0.0855 | | 0.0704 | | 0.1185 | |
| Treatment F | | | | | 33.332 | | 10.143 | | | | 5.882 | | 1.742 | | 5.778 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | | | 0.0001 | | 0.1069 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 11. Determine the agronomic response of drill-seeded Jazzman (LA2125) to nitrogen fertilizer rate and time of application (1.2) (Vermilion Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/1/08 | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 101 | de | 32 | g | 4990 | e | 594 | a | 5584 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 100 | e | 33 | fg | 5707 | d | 596 | a | 6302 | d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 101 | de | 34 | efg | 6830 | c | 749 | a | 7579 | c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 103 | cd | 36 | cde | 7233 | bc | 714 | a | 7947 | bc |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 104 | bc | 35 | def | 7297 | bc | 583 | a | 7881 | bc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 106 | ab | 38 | a-d | 8371 | a | 562 | a | 8932 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 106 | ab | 39 | ab | 8245 | a | 493 | a | 8738 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 107 | a | 40 | a | 8453 | a | 486 | a | 8939 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 100 | e | 35 | d-g | 6692 | c | 651 | a | 7343 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 102 | de | 36 | de | 7249 | bc | 658 | a | 7907 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 105 | b | 37 | b-e | 7721 | b | 671 | a | 8391 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 105 | ab | 39 | abc | 8514 | a | 591 | a | 9106 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.3 | | 2 | | 513.6 | | 176 | | 552.1 | |
| Standard Deviation | | | | | 0.9 | | 1.18 | | 355.7 | | 121.9 | | 382.4 | |
| CV | | | | | 0.89 | | 3.26 | | 4.89 | | 19.91 | | 4.85 | |
| Replicate F | | | | | 17.335 | | 4.332 | | 0.693 | | 2.072 | | 0.423 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0259 | | 0.563 | | 0.1229 | | 0.738 | |
| Treatment F | | | | | 25.012 | | 13.523 | | 38.758 | | 1.732 | | 32.013 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.1094 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 12. Determine the agronomic response of drill-seeded Neptune (LA2028) to nitrogen fertilizer rate and time of application (3.2) (Vermilion Parish).

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 103 | cd | 27 | c | 5023 | f | 2000 | a | 7023 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 102 | d | 30 | bc | 5731 | e | 2188 | a | 7919 | e |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 103 | cd | 32 | ab | 7776 | d | 2144 | a | 9920 | cd |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 104 | bcd | 33 | ab | 8182 | cd | 2188 | a | 10370 | bcd |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 105 | b | 33 | ab | 9192 | ab | 2003 | a | 11195 | a-d |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 108 | a | 35 | a | 9501 | a | 2230 | a | 11731 | ab |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | | a | 35 | a | 8978 | abc | 2377 | a | 11355 | a-d |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 109 | a | 35 | a | 9173 | ab | 2345 | a | 11518 | abc |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 103 | cd | 32 | ab | 7847 | d | 1953 | a | 9800 | d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 103 | cd | 32 | ab | 8443 | bcd | 2471 | a | 10913 | a-d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 104 | bc | 33 | ab | 8768 | abc | 2417 | a | 11186 | a-d |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 108 | a | 35 | a | 9722 | a | 2424 | a | 12146 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.2 | | 2.56 | | 659 | | 573.6 | | 1044.8 | |
| Standard Deviation | | | | | 0.8 | | 1.51 | | 456.4 | | 397.3 | | 723.6 | |
| CV | | | | | 0.8 | | 4.62 | | 5.57 | | 17.83 | | 6.94 | |
| Replicate F | | | | | 3.693 | | 4.461 | | 1.85 | | 0.899 | | 1.305 | |
| Replicate Prob(F) | | | | | 0.0214 | | 0.0236 | | 0.1573 | | 0.4522 | | 0.2891 | |
| Treatment F | | | | | 42.252 | | 7.66 | | 40.882 | | 0.825 | | 18.5 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.6168 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 13. Determine the agronomic response of drill-seeded CL131 to nitrogen fertilizer rate and time of application (3.2) (Vermilion Parish).

| Crop Name | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | 8/1/08 | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 98 d | | 29 bc | | 5443 f | | 1214 a | | 6657 f |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 98 d | | 28 c | | 6090 ef | | 1300 a | | 7390 ef |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 98 d | | 30 bc | | 6584 e | | 1382 a | | 7966 de |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 98 d | | 31 abc | | 7552 cd | | 1406 a | | 8958 bcd |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 99 cd | | 33 ab | | 7947 abc | | 1333 a | | 9280 abc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 100 b | | 32 ab | | 8654 ab | | 1425 a | | 10079 ab |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 100 b | | 34 a | | 8789 ab | | 1466 a | | 10254 a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 101 a | | 35 a | | 8747 ab | | 1226 a | | 9972 ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 98 d | | 31 abc | | 6900 de | | 1460 a | | 8360 cde |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 98 d | | 32 ab | | 7779 bcd | | 1317 a | | 9096 abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 99 bcd | | 31 abc | | 7856 bcd | | 1354 a | | 9210 abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 100 bc | | 33 ab | | 8966 a | | 1397 a | | 10363 a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | |
| LSD (P=.05) | | | | | 0.9 | | 2.6 | | 725.5 | | 282.1 | | 829.2 |
| Standard Deviation | | | | | 0.6 | | 1.54 | | 502.5 | | 195.4 | | 574.3 |
| CV | | | | | 0.6 | | 4.88 | | 6.6 | | 14.4 | | 6.41 |
| Replicate F | | | | | 3.824 | | 2.271 | | 6.105 | | 6.903 | | 8.95 |
| Replicate Prob(F) | | | | | 0.0187 | | 0.1269 | | 0.002 | | 0.001 | | 0.0002 |
| Treatment F | | | | | 10.84 | | 5.479 | | 20.711 | | 0.712 | | 16.783 |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0004 | | 0.0001 | | 0.7187 | | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 14. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (2.2) (Vermilion Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/1/08 | | 8/1/08 | | 8/1/08 | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% HD | | Height | | Lodge | | Lodge | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | | rate | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Trt. Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 96 | fg | 33 | d | | | | | 6068 | d | 1319 | a | 7387 | c |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 95 | g | 35 | c | | | | | 8458 | c | 1389 | a | 9847 | b |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 95 | g | 36 | bc | | | | | 9094 | bc | 1379 | a | 10473 | ab |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 96 | fg | 38 | abc | | | | | 9902 | ab | 1460 | a | 11363 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 97 | de | 39 | ab | | | | | 9837 | ab | 1024 | a | 10861 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 98 | bc | 40 | a | 20 | a | 1 | a | 10403 | ab | 1130 | a | 11534 | ab |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 99 | b | 40 | a | 43 | a | 3 | a | 10229 | ab | 1059 | a | 11288 | ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 100 | a | 41 | a | 60 | a | 3 | a | 10351 | ab | 1298 | a | 11649 | ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 95 | g | 36 | bc | | | | | 9226 | bc | 963 | a | 10189 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 96 | fg | 38 | ab | | | | | 10156 | ab | 1264 | a | 11420 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 96 | ef | 38 | abc | | | | | 9964 | ab | 1342 | a | 11306 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 98 | cd | 39 | a | 40 | a | 1 | a | 10667 | a | 1198 | a | 11865 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 0.79 | | 1.99 | | 124.53 | | 3.09 | | 843.2 | | 466.8 | | 1141.6 | |
| Standard Deviation | | | | | 0.55 | | 1.18 | | 40.93 | | 1.02 | | 584 | | 323.3 | | 790.6 | |
| CV | | | | | 0.57 | | 3.12 | | 100.23 | | 49.24 | | 6.13 | | 26.17 | | 7.34 | |
| Replicate F | | | | | 1.65 | | 0.06 | | 0.222 | | 0.222 | | 0.572 | | 5.165 | | 0.243 | |
| Replicate Prob(F) | | | | | 0.1968 | | 0.9418 | | 0.875 | | 0.875 | | 0.6372 | | 0.0049 | | 0.866 | |
| Treatment F | | | | | 39.05 | | 9.842 | | 0.643 | | 5.879 | | 18.606 | | 0.975 | | 9.665 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.6558 | | 0.149 | | 0.0001 | | 0.4875 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 15. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (2.2) (Vermilion Parish).

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | Rice | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | 8/1/08 | | 8/1/08 | 8/1/08 | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% HD | | Height | | Lodge | Lodge | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | rate | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | Main | Main | | Ratoon | | Total | |
| Trt No. | Trt. Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 96 | f | 33 | d | . | . | 4808 | c | 1751 | a | 6559 | c |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 96 | f | 36 | c | . | . | 6029 | b | 2069 | a | 8097 | b |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 97 | ef | 37 | bc | . | . | 7190 | a | 2183 | a | 9372 | a |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 100 | d | 38 | abc | . | . | 7720 | a | 2089 | a | 9809 | a |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 101 | cd | 39 | abc | . | . | 7936 | a | 2032 | a | 9969 | a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 102 | ab | 40 | ab | . | . | 7730 | a | 1924 | a | 9654 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 102 | ab | 41 | a | . | . | 7620 | a | 1973 | a | 9593 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 103 | a | 41 | a | 20 | 2 | 8031 | a | 2169 | a | 10200 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 98 | e | 38 | abc | . | . | 7411 | a | 2050 | a | 9461 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 99 | e | 39 | abc | . | . | 8121 | a | 2170 | a | 10291 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 101 | cd | 38 | abc | . | . | 7876 | a | 1911 | a | 9787 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 102 | bc | 40 | ab | . | . | 8297 | a | 2013 | a | 10310 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.04 | | 2.34 | | . | . | 754.5 | | 409.6 | | 1048.7 | |
| Standard Deviation | | | | | 0.72 | | 1.38 | | . | . | 522.5 | | 283.7 | | 726.3 | |
| CV | | | | | 0.72 | | 3.61 | | . | . | 7.06 | | 13.99 | | 7.71 | |
| Replicate F | | | | | 5.66 | | 2.637 | | | | 3.21 | | 0.938 | | 1.264 | |
| Replicate Prob(F) | | | | | 0.003 | | 0.0941 | | | | 0.0355 | | 0.4335 | | 0.3026 | |
| Treatment F | | | | | 47.825 | | 8.117 | | | | 14.84 | | 0.786 | | 8.803 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | | | 0.0001 | | 0.6519 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 16. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (1.2) (Vermilion Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/1/08 | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 101 | bcd | 32 | b | 4882 | d | 1420 | a | 6302 | c |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 99 | cd | 34 | ab | 6192 | c | 1475 | a | 7667 | b |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 100 | cd | 35 | ab | 6870 | bc | 1510 | a | 8380 | ab |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 101 | bcd | 36 | ab | 7275 | ab | 1642 | a | 8917 | a |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 100 | bcd | 37 | ab | 7534 | ab | 1716 | a | 9250 | a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 103 | abc | 38 | a | 7533 | ab | 1674 | a | 9207 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 104 | ab | 37 | ab | 7027 | ab | 1714 | a | 8741 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 105 | a | 38 | a | 7288 | ab | 1723 | a | 9010 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 98 | d | 35 | ab | 7465 | ab | 1529 | a | 8994 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 99 | cd | 36 | ab | 7774 | ab | 1795 | a | 9569 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 100 | bcd | 36 | ab | 7644 | ab | 1604 | a | 9248 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 102 | a-d | 37 | ab | 8089 | a | 1704 | a | 9793 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 2.62 | | 2.88 | | 688.4 | | 325.6 | | 884.2 | |
| Standard Deviation | | | | | 1.81 | | 1.7 | | 476.8 | | 225.5 | | 612.4 | |
| CV | | | | | 1.8 | | 4.75 | | 6.69 | | 13.87 | | 6.99 | |
| Replicate F | | | | | 4.955 | | 0.038 | | 0.106 | | 2.772 | | 0.672 | |
| Replicate Prob(F) | | | | | 0.006 | | 0.9625 | | 0.9562 | | 0.0569 | | 0.5751 | |
| Treatment F | | | | | 5.408 | | 2.895 | | 12.949 | | 1.077 | | 9.622 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0163 | | 0.0001 | | 0.408 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 17. Determine the agronomic response of drill-seeded Trenasse to nitrogen fertilizer rate and time of application (5.2) + multistate soil test N (Vermilion Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | | | | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | Biomass | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | lb/A | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Ratoon | | Total | |
| Crop Stage Scale | | | | | 10% HD | | | | | | | | | | | |
| Trt No. | Trt. Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | Urea | 0 | lb ai/A | 4-5 leaf | 4503 | b | 89 | f | 31 | e | 4903 | e | 693 | a | 5595 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | | | 89 | f | 32 | e | 6677 | d | 794 | a | 7471 | d |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | | | 90 | ef | 35 | d | 7971 | c | 803 | a | 8774 | c |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | | | 91 | cde | 37 | bcd | 8908 | abc | 1023 | a | 9931 | abc |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 9396 | a | 91 | cd | 36 | cd | 9570 | ab | 810 | a | 10380 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | | | 92 | ab | 38 | bc | 9924 | a | 846 | a | 10770 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | | | 93 | a | 39 | ab | 9905 | a | 981 | a | 10886 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | | | 93 | a | 40 | a | 9972 | a | 1157 | a | 11129 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | | | 90 | def | 35 | d | 8279 | bc | 810 | a | 9089 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | | | 90 | def | 37 | bcd | 9139 | abc | 952 | a | 10092 | abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | | | 91 | cd | 37 | bc | 9411 | ab | 867 | a | 10278 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | | | 92 | bc | 39 | abc | 10087 | a | 1088 | a | 11175 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 1984.8 | | 0.8 | | 1.65 | | 983.7 | | 287.3 | | 1063 | |
| Standard Deviation | | | | | 882.1 | | 0.6 | | 0.97 | | 681.3 | | 198.9 | | 736.2 | |
| CV | | | | | 12.69 | | 0.63 | | 2.68 | | 7.8 | | 22.05 | | 7.64 | |
| Replicate F | | | | | 2.236 | | 3.837 | | 3.784 | | 0.165 | | 4.048 | | 0.392 | |
| Replicate Prob(F) | | | | | 0.2629 | | 0.0184 | | 0.0387 | | 0.9195 | | 0.0148 | | 0.7592 | |
| Treatment F | | | | | 61.538 | | 21.605 | | 25.416 | | 21.312 | | 1.924 | | 20.638 | |
| Treatment Prob(F) | | | | | 0.0043 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0722 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Rice Variety by Nitrogen Experiments at Richland Parish

**Experiment number** .......................... : 08-RPEC-01 to RPEC-09

**Site and design** .................................. :
- **Location/Cooperator** .................. : Richland Parish / Elliot Colvin
- **Tillage type** .................................. : Fall stale
- **Experimental design** ................... : Randomized complete block
- **Number of reps** ........................... : 4
- **Plot size** ........................................ : 7 x 20 ft
- **Row width/rows per plot** ............ : 7 in / 12

**Soil type** .............................................. : Perry Clay
- **% organic matter** ........................ : 2.353
- **pH** ................................................. : 7.3
- **Extractable nutrients** ppm .......... : Ca-3747, Cu-4.2, Mg-743, P-35.4, K-254.3, Na-85.4, S-32.9, Zn-8.02

**Crop/Variety** ...................................... : Rice / See Data Sheet
- **Planting method/date** ................. : Drill seeded / April 15, 2008
- **Seeding rate/depth** ...................... : 40 seeds /$ft^2$ / 1 in
- **Emergence date** ........................... : April 24, 2008
- **Harvest date** ................................ : September 9, 2008

**Seed treatment/cwt** ............................ : Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization** ........................................ : None

**Water management** ........................... :
- **Flush** ............................................ : Rain, April 18
- **Flood** ............................................ : May 22
- **Drain** ............................................ : August 12, 2008

**Pest management** ............................... :
- **Herbicides** .................................... : 4 qt/A Arrosolo + 1 oz/A Permit, May 9
- **Insecticides** .................................. : 2 oz/A Karate, June 3
.33 lb/A Methyl parathion, July 15
- **Fungicides** ................................... : 21 oz/A Quilt, June 25
12 oz/A Quadris, July 15

Table 18. Determine the agronomic response of drill-seeded Catahoula (302082) to nitrogen fertilizer rate and time of application (3.1) + Green seeker N rate (1.1) (Richland Parish).

| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice |
|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | | 9/9/08 | 9/9/08 |
| Rating Type | | | | | Biomass | Biomass | 50% Head | Height | Yield |
| Rating Unit | | | | | lb/A | lb/A | days | in | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Main | Main |
| Crop Stage Scale | | | | | PD | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 1833 c | 3421 b | 92 d | 26 a | 908 a |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 2628 bc | 4844 ab | 93 cd | 26 a | 1007 a |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 3058 bc | 5901 ab | 94 bcd | 26 a | 1092 a |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 4452 ab | 7114 ab | 95 bcd | 28 a | 1308 a |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 3601 abc | 8405 a | 96 abc | 26 a | 1463 a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 5278 a | 9055 a | 97 abc | 29 a | 2127 a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 4364 ab | 8399 a | 97 ab | 28 a | 2683 a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 4038 ab | 8292 a | 99 a | 28 a | 1358 a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | | | 93 cd | 27 a | 1833 a |
| | UREA | 45 | lb ai/A | Midseason | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | | | 97 ab | 27 a | 1242 a |
| | UREA | 45 | lb ai/A | Midseason | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | | 3158 b | 95 bcd | 27 a | 2191 a |
| | UREA | 45 | lb ai/A | Midseason | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | | | 97 ab | 29 a | 1802 a |
| | UREA | 45 | lb ai/A | Midseason | | | | | |
| 13 | UREA | 75 | lb ai/A | 4-5 leaf | | | 95 bcd | 28 a | 1681 a |
| | SBNR-UREA | 0 | lb ai/A | Midseason | | | | | |
| 14 | UREA | 105 | lb ai/A | 4-5 leaf | | | 97 abc | 27 a | 2017 a |
| | SBNR-UREA | 0 | lb ai/A | Midseason | | | | | |
| LSD (P=.05) | | | | | 1418 | 2981.8 | 2.24 | 2.73 | 1585.3 |
| Standard Deviation | | | | | 964.1 | 2027.4 | 1.57 | 1.63 | 1109.3 |
| CV | | | | | 26.37 | 31.14 | 1.64 | 5.97 | 68.38 |
| Replicate F | | | | | 0.823 | 1.966 | 0.765 | 2.272 | 4.245 |
| Replicate Prob(F) | | | | | 0.496 | 0.15 | 0.5207 | 0.1232 | 0.0109 |
| Treatment F | | | | | 5.321 | 5 | 5.921 | 1.352 | 0.862 |
| Treatment Prob(F) | | | | | 0.0013 | 0.0014 | 0.0001 | 0.2476 | 0.5963 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 19. Determine the agronomic response of drill-seeded Jazzman (LA2125) to nitrogen fertilizer rate and time of application (1.3) (Richland Parish).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | Rice | Rice | |
| Rating Date | | | | | | | 9/10/08 | | 9/10/08 | 9/10/08 | 9/10/08 | |
| Rating Type | | | | | 50% Head | | Height | | Lodging | Lodging | Yield | |
| Rating Unit | | | | | days | | in | | % plot | rate 1-5 | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | Main | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 93 | cd | 32 | e | | | 4172 | c |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 92 | d | 34 | de | | | 5413 | bc |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 93 | cd | 36 | cd | | | 6572 | ab |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 94 | bcd | 35 | cd | | | 6019 | bc |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 95 | bc | 36 | cd | | | 7144 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 96 | abc | 39 | ab | 60 | 3 | 8732 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 97 | a | 38 | abc | 32 | 3 | 7697 | ab |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 98 | a | 40 | a | 60 | 3.5 | 8619 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 94 | cd | 34 | de | 60 | 4 | 6206 | abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 94 | bcd | 37 | bcd | 10 | 3 | 7187 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 96 | abc | 38 | abc | 20 | 1 | 7649 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 97 | ab | 38 | abc | 5 | 3 | 7615 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| LSD (P=.05) | | | | | 1.7 | | 2.05 | | . | . | 1564.5 | |
| Standard Deviation | | | | | 1.2 | | 1.21 | | . | . | 1083.5 | |
| CV | | | | | 1.27 | | 3.32 | | . | . | 15.66 | |
| Replicate F | | | | | 11.087 | | 13.85 | | | | 1.54 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0001 | | | | 0.2226 | |
| Treatment F | | | | | 9.356 | | 12.938 | | | | 5.94 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 20. Determine the agronomic response of drill-seeded Neptune (LA2028) to nitrogen fertilizer rate and time of application (3.3) (Richland Parish).

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | 9/10/08 | | 9/10/08 | |
| Rating Type | | | | | 50% Head | | Height | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 95 | c | 29.3 | f | 5898 | f |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 95 | c | 30 | f | 6962 | e |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 95 | bc | 31.7 | e | 8320 | d |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 96 | bc | 32.7 | de | 9044 | cd |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 96 | bc | 33.7 | b-e | 9814 | bc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 97 | b | 35 | abc | 10714 | ab |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 98 | a | 35.3 | ab | 11440 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 99 | a | 36 | a | 11439 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 95 | c | 32.3 | de | 8646 | cd |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 95 | bc | 33 | cde | 9852 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 96 | bc | 34 | a-d | 10676 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 96 | bc | 35 | abc | 10912 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| LSD (P=.05) | | | | | 1.2 | | 1.53 | | 929.8 | |
| Standard Deviation | | | | | 0.8 | | 0.9 | | 643.9 | |
| CV | | | | | 0.88 | | 2.73 | | 6.8 | |
| Replicate F | | | | | 4.208 | | 14.667 | | 12.548 | |
| Replicate Prob(F) | | | | | 0.0126 | | 0.0001 | | 0.0001 | |
| Treatment F | | | | | 11.174 | | 16.111 | | 30.107 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 21. Determine the agronomic response of drill-seeded CL131 to nitrogen fertilizer rate and time of application (3.3) (Richland Parish).

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | 9/9/08 | | 9/9/08 | |
| Rating Type | | | | | 50% Head | | Height | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 86 | f | 26.3 | f | 3705 | d |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 87 | ef | 27 | ef | 5044 | c |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 88 | de | 28.3 | de | 6087 | bc |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 89 | cd | 29 | cd | 6549 | b |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 89 | cd | 30 | a-d | 7489 | a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 90 | bc | 31 | abc | 7927 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 92 | ab | 31.7 | ab | 8260 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 93 | a | 32 | a | 8679 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 87 | ef | 29.3 | bcd | 6032 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 88 | de | 29.7 | a-d | 7885 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 89 | cd | 30.3 | a-d | 8004 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 90 | bc | 31.3 | abc | 8288 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | |
| LSD (P=.05) | | | | | 1.3 | | 1.5 | | 892.5 | |
| Standard Deviation | | | | | 0.9 | | 0.88 | | 618.1 | |
| CV | | | | | 1.05 | | 2.98 | | 8.84 | |
| Replicate F | | | | | 3.858 | | 2.243 | | 2.803 | |
| Replicate Prob(F) | | | | | 0.018 | | 0.1299 | | 0.055 | |
| Treatment F | | | | | 18.115 | | 12.272 | | 24.376 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 22. Determine the agronomic response of drill-seeded CL151 to nitrogen fertilizer rate and time of application (2.3) (Richland Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 9/9/08 | | 9/9/08 | | 9/9/08 | | 9/9/08 | |
| Rating Type | | | | | 50% Head | | Height | | Lodging | | Lodging | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | | rate 1-5 | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 87 | f | 29 | e | 72 | a | 4 | ab | 5229 | c |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 87 | ef | 32 | d | 75 | a | 3 | ab | 7078 | b |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 89 | de | 33 | cd | 65 | a | 3 | b | 7218 | b |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 90 | cd | 34 | cd | 59 | a | 3 | b | 8464 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 92 | bc | 36 | bc | 72 | a | 3 | ab | 8393 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 93 | ab | 37 | ab | 66 | a | 4 | ab | 9499 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 93 | ab | 37 | ab | 70 | a | 4 | ab | 9448 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 94 | a | 38 | a | 80 | a | 4 | a | 9708 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 89 | de | 34 | cd | 83 | a | 4 | ab | 8272 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 90 | cd | 35 | bcd | 85 | a | 4 | ab | 8391 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 90 | cd | 35 | bc | 83 | a | 4 | ab | 9005 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 91 | c | 37 | ab | 85 | a | 4 | a | 8932 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.43 | | 1.74 | | 20.55 | | 0.5 | | 1219.1 | |
| Standard Deviation | | | | | 0.99 | | 1.03 | | 14.19 | | 0.35 | | 844.3 | |
| CV | | | | | 1.1 | | 2.96 | | 19.02 | | 10.29 | | 10.17 | |
| Replicate F | | | | | 4.214 | | 1.286 | | 17.423 | | 28.379 | | 8.754 | |
| Replicate Prob(F) | | | | | 0.0125 | | 0.2962 | | 0.0001 | | 0.0001 | | 0.0002 | |
| Treatment F | | | | | 20.637 | | 17.203 | | 1.462 | | 2.952 | | 9.066 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.2015 | | 0.0101 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 23. Determine the agronomic response of drill-seeded CL171AR to nitrogen fertilizer rate and time of application (2.3) (Richland Parish).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | Rice | Rice | |
| Rating Date | | | | | | | 9/9/08 | | 9/9/08 | 9/9/08 | 9/9/08 | |
| Rating Type | | | | | 50% Head | | Height | | Lodging | Lodging | Yield | |
| Rating Unit | | | | | days | | in | | % plot | Rate 1-5 | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | Main | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 88 | e | 29 | f | | | 4476 | d |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 89 | de | 32 | e | | | 5291 | cd |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 91 | cd | 33 | de | | | 6118 | bc |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 93 | bc | 35 | b-e | | | 7558 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 94 | ab | 37 | a-d | 20 | 3 | 7507 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 94 | ab | 38 | abc | 20 | 2 | 7850 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 95 | a | 40 | a | | | 8344 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 95 | a | 39 | a | 40 | 3 | 8735 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 91 | cd | 35 | cde | 10 | 2 | 7441 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 92 | bc | 37 | a-d | | | 7844 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 93 | bc | 36 | a-d | 10 | 3 | 8391 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 94 | ab | 38 | ab | 10 | 2 | 8917 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | |
| LSD (P=.05) | | | | | 1.59 | | 2.26 | | . | . | 1114.8 | |
| Standard Deviation | | | | | 1.1 | | 1.33 | | . | . | 772.1 | |
| CV | | | | | 1.19 | | 3.73 | | . | . | 10.47 | |
| Replicate F | | | | | 19.451 | | 7.911 | | | | 7.688 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0026 | | | | 0.0005 | |
| Treatment F | | | | | 18.344 | | 16.719 | | | | 12.826 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 24. Determine the agronomic response of drill-seeded Bowman to nitrogen fertilizer rate and time of application (1.3) (Richland Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 9/9/08 | | 9/9/08 | | 9/9/08 | | 9/9/08 | |
| Rating Type | | | | | 50% Head | | Height | | Lodging | | Lodging | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | | rate 1-5 | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 95 | ab | 32 | e | | | | | 5349 | d |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 95 | ab | 34 | d | | | | | 6364 | cd |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 95 | ab | 35 | c | 8 | c | 2 | c | 7106 | bc |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 96 | ab | 38 | ab | 20 | bc | 2 | c | 8611 | a |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 96 | ab | 38 | ab | 15 | bc | 2 | c | 8254 | ab |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 96 | ab | 39 | a | 60 | a | 3 | abc | 9634 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 97 | ab | 40 | a | 41 | ab | 3 | bc | 9807 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 98 | a | 40 | a | 45 | ab | 3 | ab | 9582 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 94 | b | 36 | bc | 63 | a | 4 | ab | 8175 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 95 | ab | 38 | ab | 67 | a | 4 | a | 9108 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 95 | b | 37 | ab | 58 | a | 3 | abc | 9184 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 95 | ab | 39 | a | 48 | ab | 3 | abc | 9017 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.88 | | 1.48 | | 24.31 | | 0.75 | | 1053.7 | |
| Standard Deviation | | | | | 1.3 | | 0.87 | | 16.53 | | 0.51 | | 729.8 | |
| CV | | | | | 1.37 | | 2.36 | | 39.07 | | 18.07 | | 8.74 | |
| Replicate F | | | | | 33.196 | | 0.762 | | 1.145 | | 1.63 | | 47.274 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.4785 | | 0.354 | | 0.2125 | | 0.0001 | |
| Treatment F | | | | | 2.362 | | 22.188 | | 6.567 | | 7.256 | | 14.756 | |
| Treatment Prob(F) | | | | | 0.0279 | | 0.0001 | | 0.0002 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 25. Determine the agronomic response of drill-seeded 0401182 AR to nitrogen fertilizer rate and time of application (1.3) (Richland Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 9/9/08 | | 9/9/08 | | 9/9/08 | | 9/9/08 | |
| Rating Type | | | | | 50% Head | | Height | | Lodging | | Lodging | | Yield | |
| Rating Unit | | | | | days | | in | | % plot | | rate 1-5 | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 91 | g | 30 | e | 27 | b | 2 | b | 3971 | e |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | 92 | fg | 33 | d | 50 | ab | 3 | ab | 4886 | de |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | 93 | efg | 36 | c | 50 | ab | 3 | ab | 5645 | d |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | 95 | cde | 38 | bc | 48 | ab | 3 | ab | 7083 | bc |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 96 | bcd | 40 | ab | 57 | ab | 3 | ab | 7217 | bc |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | 98 | ab | 41 | a | 67 | a | 3 | a | 7997 | abc |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | 96 | bc | 41 | a | 70 | a | 3 | a | 8866 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | 99 | a | 42 | a | 75 | a | 3 | a | 8279 | ab |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | 93 | efg | 37 | c | 78 | a | 4 | a | 6652 | c |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | 94 | def | 39 | ab | 73 | a | 4 | a | 7318 | bc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | 95 | cd | 39 | ab | 78 | a | 4 | a | 8216 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | 98 | ab | 41 | a | 80 | a | 4 | a | 8064 | abc |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 1.5 | | 1.9 | | 24.88 | | 0.8 | | 956.9 | |
| Standard Deviation | | | | | 1.1 | | 1.12 | | 17.12 | | 0.55 | | 662.7 | |
| CV | | | | | 1.11 | | 2.94 | | 27.36 | | 17.63 | | 9.45 | |
| Replicate F | | | | | 103.56 | | 11.044 | | 6.968 | | 8.161 | | 53.706 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0005 | | 0.0014 | | 0.0005 | | 0.0001 | |
| Treatment F | | | | | 20.412 | | 31.477 | | 3.621 | | 3.134 | | 20.267 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0034 | | 0.0081 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 26. Determine the agronomic response of drill-seeded Trenasse to nitrogen fertilizer rate and time of application (5.3) and also, multistate soil test N (Richland Parish).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | | | 9/9/08 | | 9/9/08 | | 9/9/08 | | 9/9/08 | |
| Rating Type | | | | | Biomass | | 50% Head | | Height | | Lodging | | Lodging | | Yield | |
| Rating Unit | | | | | lb/A | | days | | in | | % plot | | rate 1-5 | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | | Main | |
| Crop Stage Scale | | | | | HD | | | | | | | | | | | |
| Trt No. | Trt. Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 4-5 leaf | 7921 | a | 83 | f | 29 | d | 60 | a | 3 | b | 3610 | d |
| 2 | UREA | 30 | lb ai/A | 4-5 leaf | | | 84 | e | 31 | c | 65 | a | 3 | ab | 5171 | c |
| 3 | UREA | 60 | lb ai/A | 4-5 leaf | | | 85 | de | 34 | b | 55 | a | 3 | ab | 6265 | b |
| 4 | UREA | 90 | lb ai/A | 4-5 leaf | | | 86 | bcd | 35 | ab | 80 | a | 4 | a | 7279 | ab |
| 5 | UREA | 120 | lb ai/A | 4-5 leaf | 9528 | a | 86 | bcd | 35 | ab | 90 | a | 4 | a | 7525 | a |
| 6 | UREA | 150 | lb ai/A | 4-5 leaf | | | 88 | ab | 35 | ab | 73 | a | 4 | a | 7950 | a |
| 7 | UREA | 180 | lb ai/A | 4-5 leaf | | | 88 | abc | 37 | a | 90 | a | 4 | a | 8373 | a |
| 8 | UREA | 210 | lb ai/A | 4-5 leaf | | | 88 | a | 37 | a | 90 | a | 4 | a | 7958 | a |
| 9 | UREA | 45 | lb ai/A | 4-5 leaf | | | 85 | de | 34 | b | 90 | a | 4 | a | 6335 | b |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 10 | UREA | 75 | lb ai/A | 4-5 leaf | | | 86 | cd | 36 | ab | 85 | a | 4 | a | 7352 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 11 | UREA | 105 | lb ai/A | 4-5 leaf | | | 87 | bcd | 36 | ab | 90 | a | 4 | a | 7620 | a |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| 12 | UREA | 135 | lb ai/A | 4-5 leaf | | | 87 | abc | 36 | ab | 90 | a | 4 | a | 7414 | ab |
| | UREA | 45 | lb ai/A | PD | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 4864.4 | | 1.2 | | 1.25 | | 21.49 | | 0.66 | | 816.1 | |
| Standard Deviation | | | | | 2161.9 | | 0.8 | | 0.74 | | 14.84 | | 0.45 | | 565.2 | |
| CV | | | | | 24.78 | | 0.98 | | 2.12 | | 18.6 | | 12.7 | | 8.19 | |
| Replicate F | | | | | 1.196 | | 64.362 | | 51.623 | | 2.968 | | 4.107 | | 44.781 | |
| Replicate Prob(F) | | | | | 0.4433 | | 0.0001 | | 0.0001 | | 0.0489 | | 0.0156 | | 0.0001 | |
| Treatment F | | | | | 1.104 | | 15.702 | | 27.665 | | 3.189 | | 4.026 | | 23.272 | |
| Treatment Prob(F) | | | | | 0.3706 | | 0.0001 | | 0.0001 | | 0.0064 | | 0.0014 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Ratoon Nutrition Studies Conducted at the Rice Research Station

**Experiment number** ..........................: 08-CM-12 to CM-16

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (Crowley Main)
- **Tillage type** .................................: Conventional
- **Experimental design** ...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size** ........................................: 7 x 25 ft
- **Row width/rows per plot** ............: 7 in / 12

**Soil type** ..............................................: Crowley silt loam
- **% organic matter** ........................: 1.374
- **pH** .................................................: 7.2
- **Extractable nutrients** ppm..........: Ca-1107, Cu-2.0, Mg-185, P-7.0, K-46.2, Na-54.0, S-9.1, Zn-3.7

**Crop/Variety** ......................................: Rice / See Data Sheet
- **Planting method/date** .................: Drill seeded / March 25, 2008
- **Seeding rate/depth** ......................: 33 seeds/ $ft^2$ / .5 in
- **Emergence date** ...........................: April 5
- **Harvest date** ................................: August 14

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization** ........................................: 195 lb/A 0-24-24-2.5, March 25
1 qt/A Zinc Plus, April 25
165 lb N/A 46-0-0, May 13

**Water management** ...........................:
- **Flush** ............................................: April 2, April 14
- **Flood** ............................................: May 15
- **Drain** ............................................: July 28
- **Ratoon Flood** ..............................: August 20
- **Ratoon Drain** ..............................: October 28

**Pest management** ...............................:
- **Herbicides** ....................................: 15 oz/A Clincher + 1 qt/A Crop oil, April 23
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, April 25
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 14
.6 oz/A Londax, June 21
- **Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides** ...................................: 21 oz/A Quilt + 6 oz/A Quadris, June 2

Table 27. Determine the effect of N source, rate, and variety on ratoon yields (Rice Research Station).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | 8/11/08 | | 8/14/08 | 10/8/08 | | 11/11/08 | |
| Rating Type | | | | | Height | 50% Head | Yield | Grn-Biomass | 50% Head | Yield | Yield |
| Rating Unit | | | | | in | Days | lb/A | lb/A | days | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Trt No. | Treatment Name | Rate | Rate Unit | Source | | | | | | | |
| 1 | Rate Cocodrie | 45 | lb ai/A | 46% | 36 bc | 99 A | 10208 a-d | 3010 b | 52 abc | 730 ab | 10938 bcd |
| 2 | Rate Cocodrie | 90 | lb ai/A | 46% | 38 abc | 99 A | 10458 a-d | 5017 ab | 52 abc | 964 ab | 11422 a-d |
| 3 | Rate Cocodrie | 135 | lb ai/A | 46% | 38 abc | 99 A | 9968 d | 5598 ab | 52 ab | 1111 ab | 11079 a-d |
| 4 | Rate Cocodrie | 45 | lb ai/A | 21% | 37 abc | 99 A | 10182 a-d | 3416 ab | 52 abc | 821 ab | 11004 bcd |
| 5 | Rate Cocodrie | 90 | lb ai/A | 21% | 35 c | 99 A | 9964 d | 6300 a | 53 a | 756 ab | 10720 d |
| 6 | Rate Cocodrie | 135 | lb ai/A | 21% | 38 abc | 99 A | 10380 a-d | 6376 a | 53 a | 770 ab | 11150 a-d |
| 7 | Rate Cocodrie | 45 | lb ai/A | 33% | 39 abc | 99 A | 10108 bcd | 2846 b | 52 abc | 855 ab | 10963 bcd |
| 8 | Rate Cocodrie | 90 | lb ai/A | 33% | 37 abc | 99 a | 10027 cd | 4370 ab | 52 ab | 894 ab | 10920 bcd |
| 9 | Rate Cocodrie | 135 | lb ai/A | 33% | 37 abc | 99 a | 10026 cd | 4885 ab | 53 a | 786 ab | 10812 cd |
| 10 | Rate Trenasse | 45 | lb ai/A | 46% | 39 ab | 96 b | 10584 a-d | 2626 b | 49 cd | 603 b | 11186 a-d |
| 11 | Rate Trenasse | 90 | lb ai/A | 46% | 38 abc | 96 b | 11318 ab | 3569 ab | 46 d | 1117 ab | 12435 abc |
| 12 | Rate Trenasse | 135 | lb ai/A | 46% | 39 abc | 96 b | 10813 a-d | 3624 ab | 46 d | 1153 ab | 11967 a-d |
| 13 | Rate Trenasse | 45 | lb ai/A | 21% | 37 abc | 96 b | 11427 a | 2994 b | 46 d | 874 ab | 12302 a-d |
| 14 | Rate Trenasse | 90 | lb ai/A | 21% | 40 a | 96 b | 10708 a-d | 3684 ab | 48 d | 895 ab | 11603 a-d |
| 15 | Rate Trenasse | 135 | lb ai/A | 21% | 39 abc | 96 b | 11237 a-d | 4545 ab | 46 d | 1412 a | 12649 a |
| 16 | Rate Trenasse | 45 | lb ai/A | 33% | 38 abc | 96 b | 11262 abc | 3366 ab | 47 d | 851 ab | 12113 a-d |
| 17 | Rate Trenasse | 90 | lb ai/A | 33% | 40 a | 96 b | 11374 a | 4359 ab | 46 d | 1173 ab | 12547 ab |
| 18 | Rate Trenasse | 135 | lb ai/A | 33% | 38 abc | 96 b | 10958 a-d | 4161 ab | 49 bcd | 1303 ab | 12261 a-d |
| LSD (P=.05) | | | | | 2.1 | 0 | 723.6 | 1750.502 | 2.2 | 409.9 | 922.2 |
| Standard Deviation | | | | | 1.26 | 0 | 511.6 | 1049.911 | 1.6 | 289.9 | 652.1 |
| CV | | | | | 3.31 | 0 | 4.82 | 25.28 | 3.15 | 30.57 | 5.64 |
| Replicate F | | | | | 17.725 | 0 | 1.898 | 2.74 | 1.98 | 0.81 | 2.126 |
| Replicate Prob(F) | | | | | 0.0001 | 1 | 0.1417 | 0.0789 | 0.1287 | 0.4944 | 0.1083 |
| Treatment F | | | | | 3.23 | 0 | 4.429 | 3.499 | 13.313 | 2.231 | 4.275 |
| Treatment Prob(F) | | | | | 0.0018 | 1 | 0.0001 | 0.0009 | 0.0001 | 0.0141 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 28. Ratoon Response of Rice Varieties to Nitrogen Fertilizer Rates (1.1) (Rice Research Station).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | 8/11/08 | | 8/14/08 | 10/9/08 | | 11/11/08 | |
| Rating Type | | | | | Height | 50% HD | Yield | Grn-Biomass | 50% HD | Yield | Yield |
| Rating Unit | | | | | in | days | lb/A | lb/A | days | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Crop Stage Scale | | | | | | | | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Form Conc | | | | | | | |
| 1 | Catahoula 0 lb/A | 0 | lb ai/A | 46% | 38 abc | 102 c | 10541 bcd | 2369 ab | 48 a | 858 f | 11399 c |
| 2 | Catahoula 30 lb/A | 30 | lb ai/A | 46% | 38 abc | 102 b | 10348 bcd | 3076 ab | 48 a | 1113 ef | 11461 c |
| 3 | Catahoula 60 lb/A | 60 | lb ai/A | 46% | 40 a | 102 b | 10250 cd | 3684 ab | 47 a | 1429 de | 11679 c |
| 4 | Catahoula 90 lb/A | 90 | lb ai/A | 46% | 39 ab | 102 b | 10409 bcd | 4540 ab | 47 a | 1259 de | 11668 c |
| 5 | Catahoula 120 lb/A | 120 | lb ai/A | 46% | 39 abc | 102 b | 10200 cd | 5527 ab | 46 a | 1329 de | 11529 c |
| 6 | Catahoula 150 lb/A | 150 | lb ai/A | 46% | 37 abc | 102 b | 10007 d | 5636 a | 49 a | 1645 d | 11652 c |
| 7 | Neptune 0 lb/A | 0 | lb ai/A | 46% | 36 abc | 105 a | 11083 ab | 2259 b | 49 a | 1250 de | 12333 bc |
| 8 | Neptune 30 lb/A | 30 | lb ai/A | 46% | 37 abc | 105 a | 11266 a | 3114 ab | 47 a | 1583 d | 12848 ab |
| 9 | Neptune 60 lb/A | 60 | lb ai/A | 46% | 36 bc | 105 a | 11357 a | 3865 ab | 46 a | 1987 c | 13344 a |
| 10 | Neptune 90 lb/A | 90 | lb ai/A | 46% | 35 c | 105 a | 11443 a | 4205 ab | 46 a | 2174 bc | 13617 a |
| 11 | Neptune 120 lb/A | 120 | lb ai/A | 46% | 37 abc | 105 a | 11386 a | 4266 ab | 48 a | 2361 ab | 13747 a |
| 12 | Neptune 150 lb/A | 150 | lb ai/A | 46% | 36 bc | 105 a | 10995 abc | 4945 ab | 47 a | 2577 a | 13572 a |
| LSD (P=.05) | | | | | 2.23 | 0 | 537.9 | 1899.8 | 2.5 | 291.2 | 669.7 |
| Standard Deviation | | | | | 1.32 | 0 | 372.5 | 1121.9 | 1.8 | 201.7 | 463.8 |
| CV | | | | | 3.53 | 0 | 3.46 | 28.35 | 3.71 | 12.37 | 3.74 |
| Replicate F | | | | | 8.158 | 0 | 0.186 | 1.738 | 2.159 | 0.731 | 0.034 |
| Replicate Prob(F) | | | | | 0.0022 | 1 | 0.9053 | 0.1991 | 0.112 | 0.5414 | 0.9913 |
| Treatment F | | | | | 3.848 | 0 | 8.15 | 2.976 | 1.659 | 28.03 | 16.947 |
| Treatment Prob(F) | | | | | 0.0035 | 1 | 0.0001 | 0.0142 | 0.130 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 29. Ratoon response to nitrogen fertilizer application timings (3.1) (Rice Research Station).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | 8/11/08 | 8/14/08 | | | 11/11/08 | |
| Rating Type | | | | | 50% HD | Height | Yield | Grn-Biomass | 50% HD | Yield | Yield |
| Rating Unit | | | | | days | in | lb/A | lb/A | days | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Crop Stage Scale | | | | | | | | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | |
| 1 | Cocodrie | | | | 100 a | 37 a | 10759 de | 2676 a | 48 ab | 735 d | 11494 c |
| | Urea | 90 | lb ai/A | MC Head | | | | | | | |
| 2 | Cocodrie | | | | 100 a | 38 a | 10366 e | 2297 a | 48 ab | 826 cd | 11192 c |
| | Urea | 90 | lb ai/A | 7 d Predrain | | | | | | | |
| 3 | Cocodrie | | | | 100 a | 37 a | 10690 de | 4419 a | 47 abc | 1170 bc | 11861 c |
| | Urea | 90 | lb ai/A | MC Harvest | | | | | | | |
| 4 | Cocodrie | | | | 100 a | 37 a | 11151 cd | 2456 a | 45 bcd | 1352 ab | 12502 b |
| | Urea | 60 | lb ai/A | MC Head | | | | | | | |
| | Urea | 30 | lb ai/A | MC Harvest | | | | | | | |
| 5 | Cocodrie | | | | 100 a | 38 a | 10581 e | 3547 a | 46 bcd | 970 cd | 11551 c |
| | Urea | 60 | lb ai/A | 7 d Predrain | | | | | | | |
| | Urea | 30 | lb ai/A | MC Harvest | | | | | | | |
| 6 | Cocodrie | | | | 100 a | 37 a | 10528 e | 4298 a | 49 a | 907 cd | 11435 c |
| | Urea | 60 | lb ai/A | MC Harvest | | | | | | | |
| | Urea | 30 | lb ai/A | *Harv. + 21 d | | | | | | | |
| 7 | Trenasse | | | | 97 b | 37 a | 12015 a | 2220 a | 47 a-d | 970 cd | 12986 b |
| | Urea | 90 | lb ai/A | MC Head | | | | | | | |
| 8 | Trenasse | | | | 97 b | 39 a | 11515 bc | 2538 a | 46 a-d | 1104 bcd | 12619 b |
| | Urea | 90 | lb ai/A | 7 d Predrain | | | | | | | |
| 9 | Trenasse | | | | 97 b | 39 a | 11783 ab | 3991 a | 43 d | 1707 a | 13491 a |
| | Urea | 90 | lb ai/A | MC Harvest | | | | | | | |
| 10 | Trenasse | | | | 97 b | 39 a | 11337 bc | 2917 a | 44 cd | 1397 ab | 12734 b |
| | Urea | 60 | lb ai/A | MC Head | | | | | | | |
| | Urea | 30 | lb ai/A | MC Harvest | | | | | | | |
| 11 | Trenasse | | | | 97 b | 39 a | 11377 bc | 3147 a | 45 bcd | 1386 ab | 12762 b |
| | Urea | 60 | lb ai/A | 7 d Predrain | | | | | | | |
| | Urea | 30 | lb ai/A | MC Harvest | | | | | | | |
| 12 | Trenasse | | | | 97 b | 39 a | 11295 bc | 2708 a | 45 bcd | 1365 ab | 12661 b |
| | Urea | 60 | lb ai/A | MC Harvest | | | | | | | |
| | Urea | 30 | lb ai/A | *Harv. + 21 d | | | | | | | |
| LSD (P=.05) | | | | | 0.3 | 1.87 | 397.9 | 1299 | 2.2 | 264.3 | 495.8 |
| Standard Deviation | | | | | 0.2 | 1.11 | 275.6 | 767.1 | 1.6 | 183 | 343.4 |
| CV | | | | | 0.2 | 2.9 | 2.48 | 24.73 | 3.38 | 15.81 | 2.8 |
| Replicate F | | | | | 2.2 | 3.697 | 5.663 | 1.046 | 2.506 | 3.165 | 7.592 |
| Replicate Prob(F) | | | | | 0.1066 | 0.0413 | 0.003 | 0.3683 | 0.0761 | 0.0373 | 0.0005 |
| Treatment F | | | | | 245.8 | 2.194 | 14.685 | 3.1 | 5.201 | 9.952 | 18.294 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0562 | 0.0001 | 0.0115 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

* Harv. + 21 d was delayed until Harv. + 33 d because of Hurricanes Gustav and Ike.

Table 30. Influence of main-crop straw on ratoon-crop nitrogen efficiency (2.1) (Rice Research Station).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | 8/11/08 | 8/15/08 | | | 11/11/08 | |
| Rating Type | | | | | 50% Head | Height | Yield | Grn-Biomass | 50% Head | Yield | Yield |
| Rating Unit | | | | | days | in | lb/A | lb/A | days | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Crop Stage Scale | | | | | | | | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | |
| 1 | Urea above straw | | | | 100 a | 37 a | 10489 a | 4485 a | 49 a | 655 a | 11144 a |
| | Urea | 45 | lb ai/A | Postharvest | | | | | | | |
| 2 | Urea above straw | | | | 100 a | 38 a | 10643 a | 4858 a | 49 a | 834 a | 11478 a |
| | Urea | 90 | lb ai/A | Postharvest | | | | | | | |
| 3 | Urea above straw | | | | 100 a | 38 a | 10552 a | 4995 a | 49 a | 795 a | 11347 a |
| | Urea | 135 | lb ai/A | Postharvest | | | | | | | |
| 4 | Urea under straw | | | | 100 a | 37 a | 10489 a | 4134 a | 49 a | 784 a | 11274 a |
| | Urea | 45 | lb ai/A | Postharvest | | | | | | | |
| 5 | Urea under straw | | | | 100 a | 37 a | 10456 a | 5960 a | 49 a | 642 a | 11098 a |
| | Urea | 90 | lb ai/A | Postharvest | | | | | | | |
| 6 | Urea under straw | | | | 100 a | 37 a | 10448 a | 5740 a | 49 a | 998 a | 11446 a |
| | Urea | 135 | lb ai/A | Postharvest | | | | | | | |
| 7 | Urea on bare soil | | | | 100 a | 36 a | 10391 a | 4030 a | 49 a | 795 a | 11187 a |
| | Urea | 45 | lb ai/A | Postharvest | | | | | | | |
| 8 | Urea on bare soil | | | | 100 a | 36 a | 10368 a | 5121 a | 49 a | 1025 a | 11393 a |
| | Urea | 90 | lb ai/A | Postharvest | | | | | | | |
| 9 | Urea on bare soil | | | | 100 a | 37 a | 10604 a | 5724 a | 49 a | 877 a | 11481 a |
| | Urea | 135 | lb ai/A | Postharvest | | | | | | | |
| 10 | Untreated Check | | | | 100 a | 36 a | 10400 a | 1913 b | 49 a | 458 a | 10859 a |
| LSD (P=.05) | | | | | 0 | 2.33 | 310.4 | 1648.4 | 0 | 337.6 | 460.1 |
| Standard Deviation | | | | | 0 | 1.36 | 213.9 | 960.9 | 0 | 232.6 | 317.1 |
| CV | | | | | 0 | 3.66 | 2.04 | 20.46 | 0 | 29.58 | 2.81 |
| Replicate F | | | | | 0 | 1.322 | 4.563 | 0.762 | 0 | 0.824 | 3.213 |
| | | | | | | | 0.010 | | | 0.492 | 0.038 |
| Replicate Prob(F) | | | | | 1 | 0.2913 | 4 | 0.4814 | 1 | 1 | 6 |
| Treatment F | | | | | 0 | 0.783 | 0.732 | 4.544 | 0 | 2.12 | 1.598 |
| | | | | | | | 0.676 | | | 0.063 | 0.165 |
| Treatment Prob(F) | | | | | 1 | 0.6351 | 4 | 0.0031 | 1 | 6 | 9 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 31. Evaluation and comparison of the agronomic response of the ratoon rice crop to post-harvest N application source and rate. (Rice Research Station).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | 8/11/08 | 8/14/08 | 10/8/08 | | 11/17/08 | |
| Rating Type | | | | | 50% HD | Height | Yield | Grn-Biomass | 50% HD | Yield | Yield |
| Rating Unit | | | | | days | in | lb/A | lb/A | days | lb/A | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Ratoon | Ratoon | Ratoon | Total |
| Crop Stage Scale | | | | | | | | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | |
| 1 | Agrotain-urea | 0 | lb ai/A | PostHarv | 102 a | 38 a | 10012 a | 2160 b | 55 a | 443 b | 10455 a |
| 2 | Agrotain-urea | 30 | lb ai/A | PostHarv | 102 a | 38 a | 10665 a | 3185 b | 55 a | 722 ab | 11387 a |
| 3 | Agrotain-urea | 60 | lb ai/A | PostHarv | 102 a | 37 a | 10334 a | 4737 ab | 55 a | 893 a | 11227 a |
| 4 | Agrotain-urea | 90 | lb ai/A | PostHarv | 102 a | 38 a | 10626 a | 4446 ab | 55 a | 819 a | 11445 a |
| 5 | Agrotain-urea | 120 | lb ai/A | PostHarv | 102 a | 38 a | 10495 a | 4874 ab | 55 a | 898 a | 11393 a |
| 6 | Agrotain-urea | 150 | lb ai/A | PostHarv | 102 a | 38 a | 10404 a | 7117 a | 55 a | 845 a | 11249 a |
| 7 | Urea | 0 | lb ai/A | PostHarv | 102 a | 39 a | 10473 a | 3427 b | 55 a | 607 ab | 11080 a |
| 8 | Urea | 30 | lb ai/A | PostHarv | 102 a | 39 a | 10400 a | 3975 ab | 55 a | 766 a | 11166 a |
| 9 | Urea | 60 | lb ai/A | PostHarv | 102 a | 39 a | 10595 a | 3591 b | 55 a | 690 ab | 11285 a |
| 10 | Urea | 90 | lb ai/A | PostHarv | 102 a | 38 a | 10489 a | 3284 b | 55 a | 827 a | 11316 a |
| 11 | Urea | 120 | lb ai/A | PostHarv | 102 a | 38 a | 10493 a | 3597 b | 55 a | 848 a | 11341 a |
| 12 | Urea | 150 | lb ai/A | PostHarv | 102 a | 38 a | 10290 a | 5713 ab | 55 a | 595 ab | 10885 a |
| LSD (P=.05) | | | | | 0 | 2.14 | 592.7 | 2165.9 | 0 | 216.3 | 641.3 |
| Standard Deviation | | | | | 0 | 1.27 | 410.5 | 1279 | 0 | 149.8 | 444.2 |
| CV | | | | | 0 | 3.31 | 3.93 | 30.63 | 0 | 20.08 | 3.97 |
| Replicate F | | | | | 0 | 5.006 | 1.002 | 0.192 | 0 | 0.218 | 1.045 |
| Replicate Prob(F) | | | | | 1 | 0.0161 | 0.4041 | 0.8265 | 1 | 0.8829 | 0.3856 |
| Treatment F | | | | | 0 | 0.504 | 0.731 | 3.168 | 0 | 3.477 | 1.553 |
| Treatment Prob(F) | | | | | 1 | 0.8803 | 0.7017 | 0.0103 | 1 | 0.0027 | 0.1596 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Liquid and Starter N Trials Conducted at the Rice Research Station

**Experiment number** ..........................: 08-CM-18, CM-21

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (Crowley Main)
- **Tillage type**.................................: Conventional
- **Experimental design**..................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**.......................................: 7 x 20 ft
- **Row width/rows per plot**...........: 7 in / 12

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**.......................: 1.374
- **pH**.................................................: 7.0
- **Extractable nutrients** ppm..........: Ca-1236, Cu-2.47, Mg-241.1, P-8.04, K-53.6, Na-70.9, S-14.53, Zn-4.27

**Crop/Variety** ......................................: Rice / Cheniere
- **Planting method/date** .................: Drill seeded / March 25, 2008
- **Seeding rate/depth**......................: 33 seeds/ft$^2$ / .5 in
- **Emergence date**...........................: April 5
- **Harvest date** ................................: August 14, 2008
- **Ratoon Harvest date**..................: November 17, 2008

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization**........................................: 195 lb/A 0-24-24-2.5, March 25
1 qt/A Zinc Plus, April 25
90 lb/N 46-0-0, August 14

**Water management** ...........................:
- **Flush** ............................................: April 2, April 14
- **Flood** ............................................: May 15
- **Drain**............................................: July 28
- **Ratoon Flood**..............................: August 20
- **Ratoon Drain**..............................: October 28

**Pest management**...............................:
- **Herbicides**....................................: 15 oz/A Clincher + 1 qt/A Crop oil, April 23
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, April 25
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 14
.6 oz/A Londax, June 21
- **Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides**………………………..: 21 oz/A Quilt + 6 oz/A Quadris, June 2

Table 32. Nitrogen replacement study in rice (Helena Chemical) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/11/08 | | 8/14/08 | | 11/17/08 | | | |
| Rating Type | | | | | 50% Head | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | Urea | 92 | lb ai/A | Preflood | 100 | a | 33.8 | a | 8436 | b | 1153 | a | 9538 | a |
| 2 | Urea | 92 | lb ai/A | Preflood | 100 | a | 34.5 | a | 9140 | ab | 1198 | a | 10338 | a |
| | Urea | 46 | lb ai/A | PI | | | | | | | | | | |
| 3 | Urea | 92 | lb ai/A | Preflood | 100 | a | 35.3 | a | 8466 | b | 1313 | a | 9779 | a |
| | HM9310 | 3 | gal/A | PI | | | | | | | | | | |
| | Quilt | 14 | oz/A | 5%Head | | | | | | | | | | |
| | Penetrator Plus | 8 | oz/A | 5%Head | | | | | | | | | | |
| | HM9310 | 3 | gal/A | 5%Head | | | | | | | | | | |
| 4 | Urea | 92 | lb ai/A | Preflood | 100 | a | 34.8 | a | 9326 | a | 1197 | a | 10523 | a |
| | HM9310 | 3 | gal/A | PI | | | | | | | | | | |
| | Quilt | 14 | oz/A | 5%Head | | | | | | | | | | |
| | Penetrator Plus | 8 | oz/A | 5%Head | | | | | | | | | | |
| | HM9310 | 2 | gal/A | 5%Head | | | | | | | | | | |
| 5 | Urea | 92 | lb ai/A | Preflood | 100 | a | 34.5 | a | 9248 | a | 1323 | a | 10571 | a |
| | HM9310 | 2 | gal/A | PI | | | | | | | | | | |
| | Quilt | 14 | oz/A | 5%Head | | | | | | | | | | |
| | Penetrator Plus | 8 | oz/A | 5%Head | | | | | | | | | | |
| | HM9310 | 2 | gal/A | 5%Head | | | | | | | | | | |
| 6 | Urea | 92 | lb ai/A | Preflood | 100 | a | 34.3 | a | 9122 | ab | 1151 | a | 10272 | a |
| | HM9310 | 3 | gal/A | PI | | | | | | | | | | |
| | Quilt | 14 | oz/A | 5%Head | | | | | | | | | | |
| | Penetrator Plus | 8 | oz/A | 5%Head | | | | | | | | | | |
| | HM9310 | 1 | gal/A | 5%Head | | | | | | | | | | |
| LSD (P=.05) | | | | | 0 | | 1.6 | | 542 | | 265.2 | | 704.6 | |
| Standard Deviation | | | | | 0 | | 1.06 | | 357.4 | | 176 | | 464.5 | |
| CV | | | | | 0 | | 3.09 | | 3.99 | | 14.4 | | 4.57 | |
| Replicate F | | | | | 0 | | 0 | | 6.058 | | 1.577 | | 4.319 | |
| Replicate Prob(F) | | | | | 1 | | 1 | | 0.0073 | | 0.2364 | | 0.0236 | |
| Treatment F | | | | | 0 | | 0.882 | | 4.972 | | 0.765 | | 3.25 | |
| Treatment Prob(F) | | | | | 1 | | 0.5165 | | 0.008 | | 0.5887 | | 0.0373 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 33. Evaluation and comparison of the agronomic response of Agrotain-treated urea and urea as starter N sources (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | 8/11/08 | | | | 8/14/08 | | 11/17/08 | | | |
| Rating Type | | | | | Height | | 50% Head | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | in | | days | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | Agrotain-urea | 10 | lb ai/A | PPI | 34 | a | 101 | a | 8841 | a | 1161 | a | 10001 | a |
| 2 | Agrotain-urea | 20 | lb ai/A | PPI | 35 | a | 101 | a | 9126 | a | 1384 | a | 10510 | a |
| 3 | Urea | 10 | lb ai/A | PPI | 35 | a | 101 | a | 8518 | a | 1182 | a | 9700 | a |
| 4 | Urea | 20 | lb ai/A | PPI | 35 | a | 100 | a | 8843 | a | 1254 | a | 10098 | a |
| LSD (P=.05) | | | | | 2.07 | | 0.7 | | 818 | | 175.4 | | 856.2 | |
| Standard Deviation | | | | | 1.29 | | 0.4 | | 511.4 | | 109.7 | | 535.3 | |
| CV | | | | | 3.72 | | 0.44 | | 5.79 | | 8.81 | | 5.31 | |
| Replicate F | | | | | 1.929 | | 2.143 | | 0.351 | | 10.067 | | 1.067 | |
| Replicate Prob(F) | | | | | 0.1954 | | 0.1649 | | 0.7897 | | 0.0031 | | 0.4106 | |
| Treatment F | | | | | 0.734 | | 1.286 | | 0.945 | | 3.378 | | 1.562 | |
| Treatment Prob(F) | | | | | 0.5573 | | 0.3373 | | 0.4587 | | 0.068 | | 0.2651 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation and Comparison of Agronomic Traits and N-Uptake Efficiency of Agrotain-Treated Urea and Urea at Eight Different Application Timings**

**Experiment number** ..........................: 08-CM-11

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (Crowley Main)
- **Tillage type** .................................: Conventional
- **Experimental design** ...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size** .......................................: 7 x 20 ft
- **Row width/rows per plot** ...........: 7 in / 12

**Soil type** .............................................: Crowley silt loam
- **% organic matter** .......................: 1.252
- **pH** ................................................: 6.8
- **Extractable nutrients** ppm..........: Ca-917, Cu-2.1, Mg-222, P-10.6, K-72.6, Na-74.2, S-12.0, Zn-6.2

**Crop/Variety** ......................................: Rice / Cheniere
- **Planting method/date** .................: Drill seeded / March 25, 2008
- **Seeding rate/depth** ......................: 33 seeds/$ft^2$ / .5 in
- **Emergence date** ...........................: April 5
- **Harvest date** ................................: August 11

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization** ........................................: 195 lb/A 0-24-24-2.5, March 25
1 qt/A Zinc Plus, April 25
90 lb/N 46-0-0, August 15

**Water management** ...........................:
- **Flush** ............................................: April 2, April 14
- **Flood** ............................................: May 15
- **Drain** ............................................: July 28
- **Ratoon Flood** ..............................: August 20
- **Ratoon Drain** ..............................: October 28

**Pest management** ...............................:
- **Herbicides** ....................................: 15 oz/A Clincher + 1 qt/A Crop oil, April 23
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, April 25
3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 14
.6 oz/A Londax, June 21
- **Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides** ...................................: 21 oz/A Quilt + 6 oz/A Quadris, June 2

Table 34. Evaluation and comparison of agronomic traits and N-uptake efficiency of Agrotain-treated urea and urea at eight different application timings (Rice Research Station).

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | | 7/7/08 | | | | | | 8/8/08 | | 8/11/08 | | 11/10/08 | | | |
| Rating Type | | | | | | 50% HD | | Biomass | | Tissue N | | N Uptake | | Height | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | | days | | lb/A | | % | | lb/A | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | | Main | | Main | | 50% HD | | 50% HD | | Main | | Main | | Ratoon | | Total | |
| Crop Stage Scale | | | | | | | | HD | | | | | | | | | | | | | |
| Trt No. | Treatment Name | Appl. Timing | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | | | | | |
| 1 | Agrotain_urea | 10dpf | 150 | lb ai/A | 3-4 leaf | 102 | a-d | 13456 | a | 1.00600 | a | 135 | abc | 36 | a | 9317 | a | 1171 | a | 10489 | a |
| 2 | Agrotain_urea | 8dpf | 150 | lb ai/A | 3-4 leaf | 101 | a-d | 13979 | a | 0.92350 | a | 140 | abc | 36 | a | 10191 | a | 1271 | a | 11461 | a |
| 3 | Agrotain_urea | 6dpf | 150 | lb ai/A | 3-4 leaf | 103 | a | 11710 | a | 0.97150 | a | 107 | bcd | 37 | a | 9864 | a | 1224 | a | 11088 | a |
| 4 | Agrotain_urea | 4dpf | 150 | lb ai/A | 3-4 leaf | 102 | a-d | 13190 | a | 1.26667 | a | 167 | a | 36 | a | 10049 | a | 1423 | a | 11285 | a |
| 5 | Agrotain_urea | 2dpf | 150 | lb ai/A | 3-4 leaf | 102 | a-d | 11817 | a | 1.22800 | a | 156 | ab | 38 | a | 10502 | a | 1260 | a | 11852 | a |
| 6 | Agrotain_urea | 0dpost | 150 | lb ai/A | 3-4 leaf | 100 | cd | 6670 | b | 0.86533 | a | 57 | def | 30 | c | 4884 | cd | 1350 | a | 6234 | cd |
| 7 | Agrotain_urea | 1dpost | 150 | lb ai/A | 3-4 leaf | 101 | a-d | 3691 | b | 0.86600 | a | 34 | f | 30 | c | 3808 | e | 1422 | a | 5189 | d |
| 8 | Agrotain_urea | 4dpost | 150 | lb ai/A | 3-4 leaf | 101 | a-d | 4958 | b | 0.81967 | a | 42 | ef | 28 | d | 3999 | de | 1422 | a | 5421 | d |
| 9 | urea | 10dpf | 150 | lb ai/A | 3-4 leaf | 101 | bcd | 10178 | a | 0.92700 | a | 94 | cde | 34 | b | 8023 | b | 1492 | a | 9516 | b |
| 10 | urea | 8dpf | 150 | lb ai/A | 3-4 leaf | 102 | abc | 12404 | a | 0.82500 | a | 96 | cde | 36 | a | 10093 | a | 1329 | a | 11423 | a |
| 11 | urea | 6dpf | 150 | lb ai/A | 3-4 leaf | 103 | ab | 11180 | a | 1.14867 | a | 129 | abc | 37 | a | 10258 | a | 1230 | a | 11488 | a |
| 12 | urea | 4dpf | 150 | lb ai/A | 3-4 leaf | 103 | a | 13400 | a | 1.15833 | a | 156 | ab | 37 | a | 9872 | a | 1188 | a | 11060 | a |
| 13 | urea | 2dpf | 150 | lb ai/A | 3-4 leaf | 102 | a-d | 11300 | a | 1.19800 | a | 136 | abc | 36 | a | 10025 | a | 1466 | a | 11491 | a |
| 14 | urea | 0dpost | 150 | lb ai/A | 3-4 leaf | 100 | cd | 6577 | b | 0.84333 | a | 58 | def | 31 | c | 5504 | c | 1255 | a | 6759 | c |
| 15 | urea | 1dpost | 150 | lb ai/A | 3-4 leaf | 100 | d | 6860 | b | 0.90200 | a | 61 | def | 30 | c | 4802 | cd | 1407 | a | 6210 | cd |
| 16 | urea | 4dpost | 150 | lb ai/A | 3-4 leaf | 101 | bcd | 6186 | b | 0.76967 | a | 46 | ef | 30 | c | 4925 | cd | 1502 | a | 6427 | cd |
| LSD (P=.05) | | | | | | 1.3 | | 2660.2 | | 0.2834989 | | 37.6 | | 1.55 | | 778.9 | | 330.1 | | 890.8 | |
| Standard Deviation | | | | | | 0.9 | | 1595.5 | | 0.1688783 | | 22.4 | | 0.93 | | 545.1 | | 231 | | 623.4 | |
| CV | | | | | | 0.86 | | 16.2 | | 17.19 | | 22.24 | | 2.73 | | 6.91 | | 17.26 | | 6.77 | |
| Replicate F | | | | | | 1.116 | | 1.415 | | 2.019 | | 1.637 | | 3.223 | | 0.323 | | 7.023 | | 2.598 | |
| Replicate Prob(F) | | | | | | 0.3525 | | 0.2586 | | 0.1531 | | 0.214 | | 0.054 | | 0.8085 | | 0.0006 | | 0.0648 | |
| Treatment F | | | | | | 4.742 | | 13.883 | | 2.826 | | 12.597 | | 37.887 | | 95.625 | | 0.929 | | 70.311 | |
| Treatment Prob(F) | | | | | | 0.0001 | | 0.0001 | | 0.0098 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.5401 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Determine and Compare the Agronomic Response of Drill-Seeded Rice to Agrotain-Treated Urea and Urea at Four Different Application Timings**

| | |
|---|---|
| **Experiment number** .......................... | : 08-EP-01 |
| **Site and design** .................................. | : |
| **Location/Cooperator** .................. | : Evangeline Parish / Dr. Steve Linscombe |
| **Tillage type** .................................. | : Conventional |
| **Experimental design** ................... | : Randomized complete block |
| **Number of reps** ........................... | : 4 |
| **Plot size** ....................................... | : 5 x 16 ft |
| **Row width/rows per plot** ............ | : 7.5 in / 7 |
| **Soil type** ............................................. | : Crowley -Vidrine silt loam complex |
| **% organic matter** ........................ | : NA |
| **pH** ................................................. | : NA |
| **Extractable nutrients** .................. | : NA |
| **Crop/Variety** ...................................... | : Rice |
| **Planting method/date** ................. | : Drill seeded / March 24 |
| **Seeding rate/depth** ...................... | : 33 seeds/ft$^2$ / .75 in |
| **Emergence date** ........................... | : NA |
| **Harvest date** ................................ | : August 1 |
| **Seed treatment/cwt** ............................ | : NA |
| **Fertilization** ....................................... | : 250 lb/A 8-24-24, March 24 |
| **Water management** ........................... | : |
| **Flush** ............................................ | : As needed |
| **Flood** ............................................ | : April 18 |
| **Drain** ............................................ | : July 21 |
| **Pest management** ............................... | : |
| **Herbicides** .................................... | : 2.5 oz/A Grasp, April 14<br>1 gal/A Arrosolo +.5 oz/A Permit + 1 oz/A Londax, April 17 |
| **Insecticides** .................................. | : None |
| **Fungicides** ................................... | : None |

Table 35. Determine and compare the agronomic response of drill-seeded rice to Agrotain-treated urea and urea at four different application timings (Evangeline Parish).

| Crop Name | | | | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|
| Rating Type | | | | | Height | | Yield | |
| Rating Unit | | | | | in | | lb/A | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | |
| 1 | Agrotain-Urea | | | | 34 | a | 4724 | a |
| | 6dpf | 150 | lb ai/A | 3-4 leaf | | | | |
| 2 | Agrotain-Urea | | | | 35 | a | 4755 | a |
| | 3dpf | 150 | lb ai/A | 3-4 leaf | | | | |
| 3 | Agrotain-Urea | | | | 32 | ab | 3787 | b |
| | 0dpost-in water | 150 | lb ai/A | 3-4 leaf | | | | |
| 4 | Agrotain-Urea | | | | 32 | ab | 3586 | b |
| | 2dpost-in water | 150 | lb ai/A | 3-4 leaf | | | | |
| 5 | Urea | | | | 35 | a | 4808 | a |
| | 6dpf | 150 | lb ai/A | 3-4 leaf | | | | |
| 6 | Urea | | | | 35 | a | 4967 | a |
| | 3dpf | 150 | lb ai/A | 3-4 leaf | | | | |
| 7 | Urea | | | | 32 | ab | 3619 | b |
| | 0dpost-in water | 150 | lb ai/A | 3-4 leaf | | | | |
| 8 | Urea | | | | 31 | b | 3254 | b |
| | 2dpost-in water | 150 | lb ai/A | 3-4 leaf | | | | |
| LSD (P=.05) | | | | | 2 | | 509.2 | |
| Standard Deviation | | | | | 1.3 | | 346.2 | |
| CV | | | | | 4.05 | | 8.27 | |
| Replicate F | | | | | 1.674 | | 1.5 | |
| Replicate Prob(F) | | | | | 0.203 | | 0.2435 | |
| Treatment F | | | | | 5.723 | | 15.826 | |
| Treatment Prob(F) | | | | | 8E-04 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluating Nondestructive Measurements to Predict Midseason N Needs for Cocodrie and Wells Rice**

| | |
|---|---|
| **Experiment number** | 08-CM-19 & CM-20 |
| | |
| **Site and design** | |
| **Location/Cooperator** | Rice Research Station (Crowley Main) |
| **Tillage type** | Conventional |
| **Experimental design** | Randomized complete block |
| **Number of reps** | 4 |
| **Plot size** | 7 x 20 ft |
| **Row width/rows per plot** | 7 in / 12 |
| | |
| **Soil type** | Crowley silt loam |
| **% organic matter** | 1.374 |
| **pH** | 7.0 |
| **Extractable nutrients** ppm | Ca-1236, Cu-2.47, Mg-241.1, P-8.04, K-53.6, Na-70.9, S-14.53, Zn-4.27 |
| | |
| **Crop/Variety** | Rice / See Data Sheet |
| **Planting method/date** | Drill seeded / March 25, 2008 |
| **Seeding rate/depth** | seeds/ft$^2$ / in |
| **Emergence date** | April 5 |
| **Harvest date** | August 14 |
| | |
| **Seed treatment/cwt** | Dithane (fungicide)-114 g<br>Release (gibberellic acid)-10 g<br>Zinche (40.5% Zn)-236 ml |
| | |
| **Fertilization** | 195 lb/A 0-24-24-2.5, March 25<br>1 qt/A Zinc Plus, April 25 |
| | |
| **Water management** | |
| **Flush** | April 2, April 14 |
| **Flood** | May 15 |
| **Drain** | July 28 |
| | |
| **Pest management** | |
| **Herbicides** | 15 oz/A Clincher + 1 qt/A Crop oil, April 23<br>3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, April 25<br>3 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 14<br>.6 oz/A Londax, June 21 |
| | |
| **Insecticides** | 2.5 oz/cwt Dermacor seed treatment |
| **Fungicides** | 21 oz/A Quilt + 6 oz/A Quadris, June 2 |

Table 36. Evaluating nondestructive measurements to predict midseason N needs for Cocodrie rice (2.1) (Rice Research Station).

| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | 8/11/08 | | 6/13/08 | | 7/7/08 | | 6/13/08 | | 8/14/08 | |
| Rating Type | | | | | 50% Head | | Height | | Plant samp | | Plant samp | | Plant Tissue | | Yield | |
| Rating Unit | | | | | days | | in | | dry wt g | | dry wt g | | %N/samp. | | lb/A | |
| Sample Size, Unit | | | | | | | | | 3ft | | 3ft | | 3ft | | @12% | |
| Collection Basis, Unit | | | | | | | | | 1row | | 1row | | 1row | | | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | | Main | |
| Crop Stage Scale | | | | | | | | | PD | | HD | | PD | | | |
| Trt No. | Trt Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 3-4 leaf | 96 | cd | 27 | e | 20 | d | 73 | d | 0.944 | e | 3080 | j |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 2 | UREA | 0 | lb ai/A | 3-4 leaf | 95 | e | 27 | e | | | 102 | d | | | 4286 | i |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| 3 | UREA | 30 | lb ai/A | 3-4 leaf | 95 | de | 29 | de | 36 | c | 140 | c | 1.3393 | d | 5237 | h |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 4 | UREA | 30 | lb ai/A | 3-4 leaf | 94 | e | 30 | d | | | 144 | c | | | 6460 | g |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| 5 | UREA | 60 | lb ai/A | 3-4 leaf | 96 | cd | 33 | c | 47 | bc | 170 | bc | 1.7978 | c | 7678 | f |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 6 | UREA | 60 | lb ai/A | 3-4 leaf | 97 | bc | 34 | bc | | | 213 | ab | | | 8970 | e |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| 7 | UREA | 90 | lb ai/A | 3-4 leaf | 98 | ab | 34 | bc | 56 | ab | 215 | ab | 2.2225 | b | 9125 | de |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 8 | UREA | 90 | lb ai/A | 3-4 leaf | 98 | ab | 37 | a | | | 222 | a | | | 9754 | cd |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| 9 | UREA | 120 | lb ai/A | 3-4 leaf | 98 | ab | 36 | ab | 56 | ab | 211 | ab | 2.505 | a | 9855 | bcd |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 10 | UREA | 120 | lb ai/A | 3-4 leaf | 99 | a | 36 | ab | | | 214 | ab | | | 10817 | a |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| 11 | UREA | 150 | lb ai/A | 3-4 leaf | 99 | a | 36 | ab | 68 | a | 205 | ab | 2.4898 | a | 10258 | abc |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | | | |
| 12 | UREA | 150 | lb ai/A | 3-4 leaf | 99 | a | 38 | a | | | 226 | a | | | 10619 | ab |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 1 | | 1.79 | | 14.14 | | 32.29 | | 0.2164 | | 645.1 | |
| Standard Deviation | | | | | 0.7 | | 1.24 | | 9.38 | | 22.36 | | 0.14361 | | 446.8 | |
| CV | | | | | 0.7 | | 3.79 | | 19.87 | | 12.57 | | 7.63 | | 5.58 | |
| Replicate F | | | | | 2.989 | | 4.663 | | 1.109 | | 0.631 | | 1.409 | | 1.517 | |
| Replicate Prob(F) | | | | | 0.045 | | 0.008 | | 0.3764 | | 0.6002 | | 0.2791 | | 0.2283 | |
| Treatment F | | | | | 23.185 | | 38.971 | | 13.237 | | 21.428 | | 79.709 | | 139.753 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 37. Evaluating nondestructive measurements to predict midseason N needs for Wells rice (2.1) (Rice Research Station).

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | 8/11/08 | | 6/13/08 | | 7/7/08 | | 8/14/08 | |
| Rating Type | | | | | 50% Head | | Height | | Biomass | | Biomass | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | | lb/A | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | | Main | |
| Crop Stage Scale | | | | | | | | | PD | | HD | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | |
| 1 | UREA | 0 | lb ai/A | 3-4 leaf | 101 | d | 29 | e | 999 | b | 2788 | e | 2418 | h |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 2 | UREA | 0 | lb ai/A | 3-4 leaf | 100 | e | 31 | d | | | 4205 | d | 3287 | g |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| 3 | UREA | 30 | lb ai/A | 3-4 leaf | 100 | e | 31 | d | 2475 | a | 6846 | c | 4444 | f |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 4 | UREA | 30 | lb ai/A | 3-4 leaf | 100 | e | 32 | d | | | 7678 | c | 6205 | e |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| 5 | UREA | 60 | lb ai/A | 3-4 leaf | 101 | de | 35 | c | 2802 | a | 9929 | b | 7194 | d |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 6 | UREA | 60 | lb ai/A | 3-4 leaf | 100 | e | 36 | bc | | | 10690 | b | 8966 | b |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| 7 | UREA | 90 | lb ai/A | 3-4 leaf | 104 | bc | 37 | bc | 3062 | a | 11386 | b | 8363 | c |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 8 | UREA | 90 | lb ai/A | 3-4 leaf | 103 | c | 39 | ab | | | 10236 | b | 9495 | b |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| 9 | UREA | 120 | lb ai/A | 3-4 leaf | 103 | bc | 38 | ab | 3111 | a | 10820 | b | 9350 | b |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 10 | UREA | 120 | lb ai/A | 3-4 leaf | 103 | bc | 40 | a | | | 11800 | b | 10589 | a |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| 11 | UREA | 150 | lb ai/A | 3-4 leaf | 104 | ab | 39 | ab | 2837 | a | 10946 | b | 10244 | a |
| | UREA | 0 | lb ai/A | PD | | | | | | | | | | |
| 12 | UREA | 150 | lb ai/A | 3-4 leaf | 105 | a | 40 | a | | | 14682 | a | 10414 | a |
| | UREA | 60 | lb ai/A | PD | | | | | | | | | | |
| LSD (P=.05) | | | | | 0.8 | | 2.21 | | 520.8 | | 1298.2 | | 571.8 | |
| Standard Deviation | | | | | 0.5 | | 1.53 | | 345.7 | | 899.1 | | 396 | |
| CV | | | | | 0.53 | | 4.3 | | 13.57 | | 9.63 | | 5.22 | |
| Replicate F | | | | | 0.579 | | 2.474 | | 0.703 | | 4.679 | | 2.904 | |
| Replicate Prob(F) | | | | | 0.633 | | 0.0788 | | 0.5649 | | 0.0079 | | 0.0493 | |
| Treatment F | | | | | 43.474 | | 26.633 | | 20.983 | | 56.134 | | 209.777 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Influence of Zn Fertilization on Rice Yields and Uptake in Rice and Determine Critical Soil Test and Plant Tissue Levels

**Experiment number** ..........................: 08-VP-10

**Site and design** ..................................:
- **Location/Cooperator** ..................: Vermilion Parish / Kent Lounsberry
- **Tillage type**.................................: Conventional
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**.......................................: 7 x 20 ft
- **Row width/rows per plot**...........: 7 in / 12

**Soil type** ..............................................: Kaplan silt loam
- **% organic matter**........................: 1.279
- **pH**.................................................: 4.94
- **Extractable nutrients** ppm..........: Ca-560, Cu-1.79, Mg-120, P-5.4, K-62.6, Na-35.2, S-16.2, Zn-0.662

**Crop/Variety** ......................................: Rice / Cheniere
- **Planting method/date** .................: Drill seeded / March 19, 2008
- **Seeding rate/depth**......................: 33 seeds/$ft^2$ / .5 in
- **Emergence date**...........................: March 26
- **Harvest date** ................................: August 4

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization**........................................: 195 lb/A 0-24-24, March 19
150 lb/N 46-0-0, April 28

**Water management** ...........................:
- **Flush** ............................................: March 27, April 14
- **Flood** ............................................: May 1
- **Drain**............................................: July 21

**Pest management** ...............................:
- **Herbicides**....................................: 4.5 qt/A Arrosolo + 1 oz/A Permit + .5 oz/A Londax, April 29
- **Insecticides** ..................................: None
- **Fungicides** ...................................: 21 oz/A Quilt + 6 oz/A Quadris, June 20

Table 38. Determine the influence of Zn fertilization on rice yields and uptake in rice and determine critical soil test and plant tissue levels (1.2) (Vermilion Parish).

| Crop Name | | | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | | | 8/1/08 | | | | 8/4/08 | | 11/3/08 | | | |
| Rating Type | | | | | | | 50% HD | | Height | | Std count | | Yield | | Yield | | Yield | |
| Rating Unit | | | | | | | days | | in | | number | | lb/A | | lb/A | | lb/A | |
| Sample Size, Unit | | | | | | | | | | | 30 in | | | | | | | |
| Collection Basis, Unit | | | | | | | | | | | 1 row | | | | | | | |
| Crop Stage Majority | | | | | | | Main | | Main | | Main | | Main | | Ratoon | | Total | |
| Trt No. | Treatment Name | Form Conc | Form Unit | Rt. | Rate Unit | Growth Stage | | | | | | | | | | | | |
| 1 | Zn Sulfate | 35.5 | % | 0 | lb ai/A | Planting | 102 | a | 36 | a | 30.0 | a | 9066 | a | 1631 | a | 10696 | a |
| | Sulfur | 90 | % | 10 | lb ai/A | Planting | | | | | | | | | | | | |
| 2 | Zn Sulfate | 35.5 | % | 5 | lb ai/A | Planting | 102 | a | 36 | a | 30.7 | a | 9312 | a | 1742 | a | 11053 | a |
| | Sulfur | 90 | % | 7.6 | lb ai/A | Planting | | | | | | | | | | | | |
| 3 | Zn Sulfate | 35.5 | % | 10 | lb ai/A | Planting | 102 | a | 36 | a | 29.3 | a | 9530 | a | 1623 | a | 11152 | a |
| | Sulfur | 90 | % | 5.2 | lb ai/A | Planting | | | | | | | | | | | | |
| 4 | Zn Sulfate | 35.5 | % | 15 | lb ai/A | Planting | 102 | a | 36 | a | 37.7 | a | 9612 | a | 1811 | a | 11423 | a |
| | Sulfur | 90 | % | 2.8 | lb ai/A | Planting | | | | | | | | | | | | |
| 5 | Zn Sulfate | 35.5 | % | 20 | lb ai/A | Planting | 102 | a | 38 | a | 33.0 | a | 9612 | a | 1881 | a | 11493 | a |
| | Sulfur | 90 | % | 0.4 | lb ai/A | Planting | | | | | | | | | | | | |
| 6 | Zn Sulfate | 35.5 | % | 0 | lb ai/A | Planting | 101 | a | 37 | a | 25.3 | a | 9223 | a | 1707 | a | 10930 | a |
| | Sulfur | 90 | % | 0 | lb ai/A | Planting | | | | | | | | | | | | |
| LSD (P=.05) | | | | | | | 1.2 | | 1.65 | | 7.68 | | 539.5 | | 347 | | 690 | |
| Standard Deviation | | | | | | | 0.8 | | 0.91 | | 4.22 | | 358 | | 230.3 | | 457.9 | |
| CV | | | | | | | 0.79 | | 2.48 | | 13.62 | | 3.81 | | 13.29 | | 4.12 | |
| Replicate F | | | | | | | 3.298 | | 1.081 | | 2.421 | | 3.555 | | 1.368 | | 2.275 | |
| Replicate Prob(F) | | | | | | | 0.0496 | | 0.3758 | | 0.1389 | | 0.0401 | | 0.2906 | | 0.1217 | |
| Treatment F | | | | | | | 0.728 | | 2.014 | | 2.841 | | 1.607 | | 0.773 | | 1.724 | |
| Treatment Prob(F) | | | | | | | 0.6134 | | 0.162 | | 0.0752 | | 0.2182 | | 0.5841 | | 0.1899 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Zinc Efficiency and Uptake in Rice

**Experiment number** ..........................: 08-DL-01to DL-03

**Site and design** ..................................:
- **Location/Cooperator** ..................: Acadia Parish / Dennis Leonards
- **Tillage type**.................................: Fall Stale
- **Experimental design**..................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**........................................: 7 x 20 ft
- **Row width/rows per plot**...........: 7 in / 12

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**........................: 1.293
- **pH**.................................................: 7.6
- **Extractable nutrients** ppm..........: Ca-1789, Cu-1.94, Mg-318.1, P-18.8, K-164.1, Na-128.5, S-11.05, Zn-0.94

**Crop/Variety** ......................................: Rice / CL131
- **Planting method/date** .................: Drill seeded / March 24, 2008
- **Seeding rate/depth**......................: 33 seeds/$ft^2$ / .5 in
- **Emergence date**...........................: April 9
- **Harvest date** ................................: August 6

**Seed treatment/cwt** ............................: Maxim® 4FS + Apron XL® LS at Manufacturer's rate
Release ® LC at 1.0 to 2.0 g/100 lb of seed
Flokote Zn at 8 oz/100 lb of seed

**Fertilization**.......................................: 250 lb/A 0-24-24, March 24
50 lb/N 21-0-0-2.4, March 27
60 lb/N 21-0-0-2.4; May 12
75 lb/N 21-0-0-2.4; May 29

**Water management** ...........................:
- **Flush** ............................................: April, 14; May 2; May 12
- **Flood** ............................................: June 3
- **Drain**............................................: July 24

**Pest management**...............................:
- **Herbicides**....................................: 1 qt/A Roundup + .5 oz/A Aim, March 24
4 oz/A Newpath, April 11
- **Insecticides** ..................................: Info not available
- **Fungicides** ...................................: Info not available

Table 39. Determine the influence of Zn fertilization on rice yields and uptake in rice and determine critical soil test and plant tissue levels (1.1) (Dennis Leonards Farms).

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
| Crop Variety | | | | | | | | | | | CL131 | | | | | | | |
| Description | | | | | | | | | | | Zn | | | | | | | |
| Rating Date | | | | | 5/12/08 | | 5/12/08 | | 5/28/08 | | 5/28/08 | | | | 8/6/08 | | 8/6/08 | |
| Rating Type | | | | | Stand cnt | | Height | | Biomass | | Tissue | | 50% HD | | Height | | Yield | |
| Rating Unit | | | | | number | | cm | | g | | ppm | | days | | in | | lb/A | |
| Sample Size, Unit | | | | | 30 in | | | | 1 ft | | PLANT | | | | | | | |
| Collection Basis, Unit | | | | | 1 row | | | | 1row | | | | | | | | | |
| Crop Stage Majority | | | | | | | | | 5d preGR | | 5d preGR | | | | | | | |
| Crop Stage Scale | | | | | | | | | 2 tiller | | | | | | | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | | | | | | |
| 1 | Zn Sulfate | 0 | lb ai/A | Planting | 30.8 | a | 15 | a | 7.33 | a | 10.975 | b | 111 | a | 28 | a | 5514 | b |
| | Sulfur | 10 | lb ai/A | Planting | | | | | | | | | | | | | | |
| 2 | Zn Sulfate | 5 | lb ai/A | Planting | 23.3 | a | 18 | a | 4.3 | a | 19.851 | b | 109 | b | 30 | a | 6699 | a |
| | Sulfur | 7.6 | lb ai/A | Planting | | | | | | | | | | | | | | |
| 3 | Zn Sulfate | 10 | lb ai/A | Planting | 23.8 | a | 18 | a | 7.75 | a | 29.765 | ab | 108 | b | 29 | a | 6722 | a |
| | Sulfur | 5.2 | lb ai/A | Planting | | | | | | | | | | | | | | |
| 4 | Zn Sulfate | 15 | lb ai/A | Planting | 31.3 | a | 17 | a | 6.93 | a | 44.749 | ab | 109 | b | 29 | a | 6733 | a |
| | Sulfur | 2.8 | lb ai/A | Planting | | | | | | | | | | | | | | |
| 5 | Zn Sulfate | 20 | lb ai/A | Planting | 26.8 | a | 18 | a | 8.4 | a | 53.639 | a | 109 | b | 30 | a | 6855 | a |
| | Sulfur | 0.4 | lb ai/A | Planting | | | | | | | | | | | | | | |
| 6 | Zn Sulfate | 0 | lb ai/A | Planting | 23.8 | a | 16 | a | 5.18 | a | 12.025 | b | 112 | a | 29 | a | 5196 | b |
| | Sulfur | 0 | lb ai/A | Planting | | | | | | | | | | | | | | |
| LSD (P=.05) | | | | | 7.94 | | 2.39 | | 4.132 | | 23.72077 | | 1.88 | | 1.47 | | 838 | |
| Standard Deviation | | | | | 5.27 | | 1.58 | | 2.742 | | 15.74202 | | 1.25 | | 0.81 | | 556.1 | |
| CV | | | | | 19.82 | | 9.53 | | 41.26 | | 55.23 | | 1.14 | | 2.77 | | 8.85 | |
| Replicate F | | | | | 0.29 | | 0.681 | | 1.203 | | 1.268 | | 1.661 | | 0.593 | | 0.228 | |
| Replicate Prob(F) | | | | | 0.8318 | | 0.5772 | | 0.3427 | | 0.321 | | 0.2179 | | 0.571 | | 0.8751 | |
| Treatment F | | | | | 1.912 | | 1.983 | | 1.33 | | 5.007 | | 6.485 | | 2.525 | | 6.901 | |
| Treatment Prob(F) | | | | | 0.1519 | | 0.1397 | | 0.3044 | | 0.0068 | | 0.0021 | | 0.1 | | 0.0016 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 40. Zinc efficacy in rice (Dennis Leonards Farms).

| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | Rice | | Rice | | Rice | | Rice | | Rice | | Rice | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rating Date | | | | 5/12/08 | | 5/12/08 | | 8/6/08 | | | | 8/6/08 | | 8/6/08 | |
| | Rating Type | | | | Stand count | | Height | | Height | | 50% HD | | Height | | Yield | |
| | Rating Unit | | | | number | | cm | | cm | | days | | in | | lb/A | |
| | Sample Size, Unit | | | | 30 in | | | | | | | | | | | |
| | Collection Basis, Unit | | | | 1 row | | | | | | | | | | | |
| | Crop Stage Majority | | | | Main | | Main | | Main | | Main | | Main | | Main | |
| 1 | UTC | | | | 33 | a | 16 | a | 75 | a | 111 | a | 29 | a | 5969 | b |
| 2 | Zinc Sulfate | 5 | lb ai/A | Preplant | 35.5 | a | 16.3 | a | 77 | a | 109 | ab | 30 | a | 7074 | a |
| 3 | Zinc Sulfate | 10 | lb ai/A | Preplant | 28 | a | 17 | a | 76 | a | 109 | ab | 30 | a | 7171 | a |
| 4 | Zinc Sulfate | 15 | lb ai/A | Preplant | 24 | a | 18.5 | a | 77 | a | 108 | b | 30 | a | 7089 | a |
| 5 | Zinc Sulfate | 30 | lb ai/A | Preplant | 30.8 | a | 17 | a | 75 | a | 109 | ab | 30 | a | 7185 | a |
| 6 | HM9863 | 16 | oz/A | Preplant | 23.3 | a | 17 | a | 75 | a | 110 | ab | 29 | a | 6585 | ab |
| 7 | HM9863 | 24 | oz/A | Preplant | 26.5 | a | 16.5 | a | 75 | a | 110 | ab | 30 | a | 6666 | ab |
| 8 | HM9863 | 32 | oz/A | Preplant | 22 | a | 15.8 | a | 73 | a | 110 | ab | 29 | a | 6346 | ab |
| | LSD (P=.05) | | | | 11.11 | | 1.91 | | 3.9 | | 1.42 | | 1.52 | | 616.7 | |
| | Standard Deviation | | | | 7.55 | | 1.3 | | 2.2 | | 0.97 | | 0.87 | | 418.1 | |
| | CV | | | | 27.09 | | 7.73 | | 2.93 | | 0.89 | | 2.93 | | 6.18 | |
| | Replicate F | | | | 0.468 | | 0.844 | | 6.677 | | 3.773 | | 6.669 | | 3.76 | |
| | Replicate Prob(F) | | | | 0.708 | | 0.4852 | | 0.0092 | | 0.0261 | | 0.0092 | | 0.0273 | |
| | Treatment F | | | | 1.658 | | 1.745 | | 1.262 | | 3.048 | | 1.26 | | 4.556 | |
| | Treatment Prob(F) | | | | 0.174 | | 0.1526 | | 0.3357 | | 0.0224 | | 0.3365 | | 0.0035 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 41. Evaluation of foliar and granular Zn applications after onset of bronzing. (Dennis Leonards Farms).

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | |
| Rating Date | | | | | | | 8/6/08 | | 8/6/08 | |
| Rating Type | | | | | 50% Head | | Height | | Yield | |
| Rating Unit | | | | | days | | in | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | |
| 1 | Untreated Check | | | 5d preGR | 110 | a | 30 | a | 5935 | a |
| 2 | TraFix | 1 | lb ai/A | 5d preGR | 109 | a | 29 | a | 6785 | a |
| 3 | Brexil | 24 | oz wt/A | 5d preGR | 110 | a | 30 | a | 6431 | a |
| 4 | Zinc Plus | 1 | lb ai/A | 5d preGR | 110 | a | 28 | a | 6462 | a |
| 5 | ZnSO4 (GR) | 10 | lb ai/A | 5d preGR | 109 | a | 30 | a | 7080 | a |
| 6 | Super Zinc FL | 1 | lb ai/A | 5d preGR | 110 | a | 30 | a | 6213 | a |
| LSD (P=.05) | | | | | 1.63 | | 1.58 | | 921 | |
| Standard Deviation | | | | | 1.08 | | 0.87 | | 611.2 | |
| CV | | | | | 0.98 | | 2.96 | | 9.43 | |
| Replicate F | | | | | 4.236 | | 2.059 | | 2.753 | |
| Replicate Prob(F) | | | | | 0.0235 | | 0.1783 | | 0.079 | |
| Treatment F | | | | | 0.752 | | 2.015 | | 1.767 | |
| Treatment Prob(F) | | | | | 0.5976 | | 0.1618 | | 0.1804 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Influence of P Fertilization on Yield and Uptake and Determine Critical Soil Test and Plant Tissue Concentrations**

**Experiment number** ..........................: 08-VP-11

**Site and design** ..................................:
- **Location/Cooperator** ..................: Vermilion Parish / Kent Lounsberry
- **Tillage type** ..................................: Conventional
- **Experimental design** ...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size** ........................................: 7 x 20 ft
- **Row width/rows per plot** ............: 7 in / 12

**Soil type** ...............................................: Kaplan silt loam
- **% organic matter** ........................: 1.279
- **pH** .................................................: 4.94
- **Extractable nutrients** ppm..........: Ca-560, Cu-1.79, Mg-120, P-5.4, K-62.6, Na-35.2, S-16.2, Zn-0.662

**Crop/Variety** ......................................: Rice / Cheniere
- **Planting method/date** .................: Drill seeded / March 19, 2008
- **Seeding rate/depth** ......................: 33 seeds/ $ft^2$ / .5 in
- **Emergence date** ...........................: March 26
- **Harvest date** ................................: August 4

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization** ........................................: 75 lb/A 0-0-60, March 19
150 lb/N 46-0-0, April 28

**Water management** ...........................:
- **Flush** ............................................: March 27, April 14
- **Flood** ............................................: May 1
- **Drain** ............................................: July 21

**Pest management** ...............................:
- **Herbicides** ....................................: 4.5 qt/A Arrosolo + 1 oz/A Permit + .5 oz/A Londax, April 29
- **Insecticides** ..................................: None
- **Fungicides** ...................................: 21 oz/A Quilt + 6 oz/A Quadris, June 20

Table 42. Determine the influence of P fertilization on yield and uptake and determine critical soil test and plant tissue concentrations (1.1) (Vermilion Parish).

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | | | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | | | | 8/1/08 | 8/4/08 | 11/3/08 | |
| Rating Type | | | | | | | Stand count | 50% Head | Height | Yield | Yield | Yield |
| Rating Unit | | | | | | | number | days | in | lb/A | lb/A | lb/A |
| Sample Size, Unit | | | | | | | 30 in | | | | | |
| Collection Basis, Unit | | | | | | | 1 row | | | | | |
| Crop Stage Majority | | | | | | | Main | Main | Main | Main | Ratoon | Total |
| Trt No. | Treatment Name | Form Conc | Form Unit | Rate | Rate Unit | Growth Stage | | | | | | |
| 1 | Triple Superphosphate | 47 | % | 0 | lb ai/A | Planting | 44 a | 104 a | 36 a | 9394 a | 1702 a | 11096 a |
| 2 | Triple Superphosphate | 47 | % | 20 | lb ai/A | Planting | 36.7 a | 102 b | 37 a | 9411 a | 1854 a | 11266 a |
| 3 | Triple Superphosphate | 47 | % | 40 | lb ai/A | Planting | 43.7 a | 102 b | 36 a | 8970 a | 1672 a | 10641 a |
| 4 | Triple Superphosphate | 47 | % | 60 | lb ai/A | Planting | 41.7 a | 101 b | 36 a | 9518 a | 2099 a | 11617 a |
| 5 | Triple Superphosphate | 47 | % | 80 | lb ai/A | Planting | 33.3 a | 101 b | 36 a | 9550 a | 1945 a | 11495 a |
| 6 | Triple Superphosphate | 47 | % | 100 | lb ai/A | Planting | 33 a | 100 c | 36 a | 9363 a | 2155 a | 11518 a |
| LSD (P=.05) | | | | | | | 10.5 | 1.4 | 2.23 | 632.9 | 562.7 | 747.2 |
| Standard Deviation | | | | | | | 5.77 | 0.9 | 1.22 | 420 | 373.5 | 495.9 |
| CV | | | | | | | 14.91 | 0.92 | 3.39 | 4.48 | 19.61 | 4.4 |
| Replicate F | | | | | | | 0.382 | 1.571 | 0.778 | 3.046 | 0.127 | 1.601 |
| Replicate Prob(F) | | | | | | | 0.6922 | 0.2377 | 0.4853 | 0.0613 | 0.9427 | 0.2309 |
| Treatment F | | | | | | | 2.286 | 9.229 | 0.156 | 0.983 | 1.148 | 2.141 |
| Treatment Prob(F) | | | | | | | 0.1245 | 0.0004 | 0.9734 | 0.4596 | 0.3785 | 0.1163 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

# CULTURAL MANAGEMENT RESEARCH

D.L. Harrell, J.P. Leonards, R.P. Regan, and D.M. Walker

## Cultural Management Research

A crop rotation study was established in 2005 at the Rice Research Station South Unit. Rice rotations included in the study were: rice-rice, rice-soybean, rice-grain sorghum, and rice-fallow. Two tillage systems, no-till and conventional till, were also included in the study. Rice grain yields during the initial year of the study were not significantly different for tillage or rotation systems (data not shown). Rotational crops from all rotations were grown in the fourth year (2008) of the study. Rice yields from both the no-till and conventionally tilled seedbed systems were not significantly different in 2008. A higher post harvest soil bulk density ($P_d$) was observed for all rotations grown in a no-till production system (1.33 – 1.39 g $cm^{-3}$) as compared with those grown in a conventional tillage system (1.23 – 1.27 g $cm^{-3}$). Changes in the soil chemical and physical properties will be evaluated on a multi-year basis following the conclusion of this long-term experiment in 2009.

Two studies were conducted to evaluate the interaction between tillage, seeding rate, and N rate on rice grain yields and agronomic properties. Separate trials evaluated Jupiter, a high yielding semidwarf medium-grain variety, and Cheniere, an early maturing and high yielding semidwarf long- grain variety. Two tillage treatments (stale seedbed and conventional), four N rates (90, 120, 150, and 180 lb/A), and four seeding rates (15, 30, 45, and 60 seed/$ft^2$) were used in the study. The trials were set up as a randomized complete block design.

Analysis of variance results from the Jupiter trial (data not shown) indicated that a significant increase ($P$ = 0.0001) in stand density was observed in the fall stale seedbed tillage system (23 plants/$ft^2$) as compared with the conventional tillage system (15 plants/$ft^2$) when data were pooled across all seeding rates and N treatments. However, a significant tillage effect on grain yield was not observed ($P$ = 0.58) when data were pooled across all seeding and N rates. Neither a seeding rate by tillage interaction ($P$ = 0.78) nor an N rate by tillage interaction ($P$ = 0.35) on grain yield was observed. Optimum grain yields were achieved at a seeding rate of 30 seed/$ft^2$ when data were pooled across N and tillage treatments. Optimum N rate was 120 lb/A.

Analysis of variance from the Cheniere trial (data not shown) indicated that a significant increase ($P$ = 0.0001) in stand density was observed in the fall stale seedbed tillage system (20 plants/$ft^2$) as compared with the conventional tillage system (16 plants/$ft^2$) when data were pooled across all seeding rates and N treatments. In addition, a significant ($P$ = 0.03) grain yield increase of 208 lb/A was observed for the stale seedbed tillage system when data were pooled across all seeding and N rates. A significant seeding rate by tillage interaction ($P$ = 0.001) was observed also. Optimal yield was achieved at a seeding rate of 30- and 45-seed/$ft^2$ for the conventional and stale seedbed tillage systems, respectively. A significant ($P$ = 0.02) tillage system by N rate interaction on grain yield was observed also. Optimum grain yields were achieved at a N rate of 150 and 180 lb/A for the conventional and stale seedbed tillage systems, respectively.

Two trials were initiated in 2008 to determine if differences in optimal N rate occur when rice is planted into a conventional compared with a stale seedbed tillage system using a large range of preflood N rates. The first trial evaluated Neptune, a newly released medium-grain variety, while the second evaluated Catahoula, a newly released long-grain variety. Nine N rates (0, 30, 60, 90, 120, 150, 180, 210, and 240 lb/A) were evaluated in each trial. All N was applied as urea 1 day prior to permanent flood establishment. Stand establishment of Neptune was improved in the stale seedbed (17.7 plants/$ft^2$) compared with the conventional tillage system (9.7 plants/$ft^2$) when data were pooled across all treatments (data not shown). A significant tillage by N rate effect was not observed in the Neptune trial. N was optimized at the 150 lb/A rate when all data were pooled. Stand establishment of the Catahoula trial was improved in the stale seedbed (16 plants/$ft^2$) compared with the conventional tillage system (9 plants/$ft^2$) when data was pooled across all treatments (data not shown). A significant tillage by N rate effect was not observed for Catahoula. Optimum N rate was determined at the 150 lb/A rate.

A cooperative study on the three-way interaction of tillage (stale seedbed and conventional tillage), seeding rate (10, 20, 30, 40, and 50 seed/$ft^2$) and seed treatment for rice water weevil control (Dermacor and non-treated seed) was initiated in 2008. Agronomic data will be summarized at a later date.

**Rice-Based Cropping Systems in a No-Till Production System**

**Experiment number** ..........................: 08-CS-20 (Rice)

**Site and design** ..................................:
**Location/Cooperator** ..................: Rice Research Station (South Farm)
**Tillage type**..................................: No-Till
**Experimental design**...................: Randomized complete block
**Number of reps** ...........................: 4
**Plot size**........................................: 20 x 50 ft
**Row width/rows per plot**............: 7 in / 34

**Soil type** ..............................................: Crowley silt loam
**% organic matter**........................: See data sheet
**pH**.................................................: See data sheet
**Extractable nutrients** ppm..........: See data sheet

**Crop/Variety** ......................................: Rice / Cheniere
**Planting method/date** .................: Drill seeded / June 2, 2008
**Seeding rate/depth**......................: 75 lb/A / .5 in
**Emergence date**...........................: June 12, 2008
**Harvest date** ................................: October 1, 2008

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization**........................................: 250 lb/A 0-24-24-2.5, June 3
165 lb N/A 46-0-0, July 9

**Water management** ...........................:
**Flush** ............................................: June 9, June 24
**Flood**............................................: July 10
**Drain**............................................: September 18

**Pest management**...............................:
**Herbicides**....................................: .5 lb/A Facet DF + 3 qt/A Propanil + 1 oz/A Permit, July 8
**Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
**Fungicides………………………..**: 21 oz/A Quilt + 6 oz/A Quadris, August 26

**Rice-Based Cropping Systems in a No-Till Production System**

**Experiment number** ..........................: 08-CS-20 (Soybeans)

**Site and design** ..................................:
**Location/Cooperator** ..................: Rice Research Station (South Farm)
**Tillage type** .................................: No-Till
**Experimental design** ...................: Randomized complete block
**Number of reps** ...........................: 4
**Plot size** ........................................: 20 x 50 ft
**Row width/rows per plot** ............: 30 in / 8

**Soil type** ..............................................: Crowley silt loam
**% organic matter** ........................: See data sheet
**pH** .................................................: See data sheet
**Extractable nutrients** ppm..........: See data sheet

**Crop/Variety** ......................................: Soybeans / DG5555
**Planting method/date** .................: Drill seeded / June 2, 2008
**Seeding rate/depth** ......................: 130,000 seed/A / 1 in
**Emergence date** ...........................: June 8, 2008
**Harvest date** ................................: October 29, 2008

**Seed treatment/cwt** ............................: None

**Fertilization** ........................................: 250 lb/A 0-24-24-2.5, June 3

**Water management** ...........................:
**Flush** ............................................: None
**Flood** ............................................: None
**Drain** ............................................: None

**Pest management** ...............................:
**Herbicides** ...................................: 1.5 qt/A Glyphosate, June 25
1.5 qt/A Glyphosate, July 16
**Insecticides** ..................................: 4 oz/A Mustang Max @ 15 gpa, September 23
**Fungicides** ………………………..: None

## Rice-Based Cropping Systems in a No-Till Production System

**Experiment number** ..........................: 08-CS-20 (Grain Sorghum)

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (South Farm)
- **Tillage type**..................................: No-Till
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**........................................: 20 x 50 ft
- **Row width/rows per plot**............: 30 in / 8

**Soil type** .............................................: Crowley silt loam
- **% organic matter**........................: See data sheet
- **pH**.................................................: See data sheet
- **Extractable nutrients** ppm..........: See data sheet

**Crop/Variety** ......................................: Grain Sorghum
- **Planting method/date** .................: Drill seeded / June 2, 2008
- **Seeding rate/depth**......................: 75,000 seed/A / 1 in
- **Emergence date**...........................: June 8, 2008
- **Harvest date** ................................: September 24, 2008

**Seed treatment/cwt** ............................: NA

**Fertilization**........................................: 250 lb/A 0-24-24-2.5, June 3
90 lb N/A 46-0-0, July 9

**Water management** ...........................:
- **Flush** ............................................: None
- **Flood** ............................................: None
- **Drain**............................................: None

**Pest management**...............................:
- **Herbicides**....................................: .5 lb/A Facet + 2 qt/A Atrazine, June 25
- **Insecticides** ..................................: None
- **Fungicides**………………………: None

Table 1. Rice-based cropping systems in a no-till production system 4 (RRS-South Unit). Agronomic data.

| Crop Name | Sorghum | Sorghum | Sorghum | Sorghum | Rice | Rice | Rice | Rice | Soybeans | Soybeans | Soybeans |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | | | | | | | | | | | |
| Rating Date | 9/24/08 | 9/24/08 | 9/24/08 | 9/24/08 | 9/29/08 | 9/29/08 | 9/29/08 | 10/1/08 | 10/29/08 | 10/29/08 | 10/29/08 |
| Rating Type | Height | Lodging | Fallen Head | Yield | Height | Lodging | Lodging | Yield | Height | Lodging | Yield |
| Rating Unit | in | Rate 1-5 | % plot | bushel/A | in | % plot | rate 1-5 | lb/A | in | | bushel/A |
| Trt No. Treatment Name | | | | | | | | | | | |
| 1 Continuous Rice | | | | | 37 | 28.8 | 2.3 | 5263 | | | |
| 2 1:1 Rice-Soybean | | | | | | | | | 21.3 | 0 | 13 |
| 3 1:1 Rice-Sorghum | 51.3 | 0 | 18.8 | 46 | | | | | | | |
| 4 1:1 Rice-Fallow | | | | | | | | | | | |
| LSD (P=.05) | . | . | . | . | . | . | . | . | . | . | . |
| Standard Deviation | . | . | . | . | . | . | . | . | . | . | . |
| CV | . | . | . | . | . | . | . | . | . | . | . |
| Replicate F | | | | | | | | | | | |
| Replicate Prob(F) | | | | | | | | | | | |
| Treatment F | | | | | | | | | | | |
| Treatment Prob(F) | | | | | | | | | | | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2.  Rice-based cropping systems in a no-till production system 4  (RRS-South Unit).  Spring soil test data.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | | | | | | | | | | |
| Description | | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring |
| Rating Date | | 6/4/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 |
| Rating Type | | BulkDensity | Soil C | Soil N | Soil OM | Ca | Cu | Mg | pH | P | K | Na | S | Zn |
| Rating Unit | | $g/cm^3$ | % | % | % | ppm | ppm | ppm | 1:1 | ppm | ppm | ppm | ppm | ppm |
| Trt No. | Treatment Name | | | | | | | | | | | | | |
| 1 | Continuous Rice | 1.34 a | 1.39 a | 0.15 a | 2.97 a | 1927 a | 1.91 a | 232 a | 7.0 a | 72 a | 99 ab | 101 a | 9.1 a | 9.7 a |
| 2 | 1:1 Rice-Soybean | 1.33 a | 1.25 a | 0.14 a | 2.55 a | 1760 a | 1.58 a | 205 b | 6.6 c | 67 a | 84 c | 65 b | 8.0 b | 8.9 a |
| 3 | 1:1 Rice-Sorghum | 1.40 a | 1.42 a | 0.15 a | 2.89 a | 1848 a | 1.74 a | 222 ab | 6.8 bc | 74 a | 110 a | 77 b | 8.4 ab | 11.4 a |
| 4 | 1:1 Rice-Fallow | 1.34 a | 1.22 a | 0.14 a | 2.56 a | 1903 a | 1.65 a | 218 ab | 6.9 ab | 73 a | 95 bc | 77 b | 8.1 b | 10.2 a |
| LSD (P=.05) | | 0.17 | 0.185 | 0.025 | 0.3793 | 151.1 | 0.273 | 15.1 | 0.148 | 15.1 | 11.8 | 18.6 | 0.73 | 5.91 |
| Standard Deviation | | 0.106 | 0.116 | 0.015 | 0.2371 | 94.5 | 0.17 | 9.4 | 0.093 | 9.5 | 7.3 | 11.7 | 0.46 | 3.7 |
| CV | | 7.86 | 8.75 | 10.73 | 8.64 | 5.08 | 9.9 | 4.3 | 1.36 | 13.2 | 7.57 | 14.6 | 5.44 | 36.85 |
| Replicate F | | 0.44 | 4.599 | 2.345 | 3.175 | 23.143 | 4.219 | 2.206 | 17.32 | 5.02 | 7.866 | 0.402 | 8.423 | 2.32 |
| Replicate Prob(F) | | 0.7297 | 0.033 | 0.141 | 0.0778 | 0.0001 | 0.0404 | 0.1569 | 4E-04 | 0.03 | 0.0069 | 0.755 | 0.006 | 0.1438 |
| Treatment F | | 0.378 | 3.004 | 0.265 | 3.332 | 2.456 | 2.721 | 5.547 | 10.22 | 0.42 | 8.806 | 6.557 | 4.853 | 0.316 |
| Treatment Prob(F) | | 0.7712 | 0.088 | 0.849 | 0.0701 | 0.1297 | 0.1068 | 0.0196 | 0.003 | 0.75 | 0.0048 | 0.012 | 0.028 | 0.8137 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 3. Rice-based cropping systems in a no-till production system 4 (RRS-South Unit). Fall soil test data.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | | | | | | | | | | |
| Description | | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall |
| Rating Date | | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 |
| Rating Type | | BulkDensity | Soil C | Soil N | Soil OM | Ca | Cu | Mg | pH | P | K | Na | S | Zn |
| Rating Unit | | $g/cm^3$ | % | % | % | ppm | ppm | ppm | 1:1 | ppm | ppm | ppm | ppm | ppm |
| Trt No. | Treatment Name | | | | | | | | | | | | | |
| 1 | Continuous Rice | 1.33 a | 1.42 b | 0.141 b | 2.48 a | 1951 a | 2.5 a | 259.4 a | 7.1 a | 67.2 a | 87.8 b | 117.0 a | 17.9 a | 11.9 a |
| 2 | 1:1 Rice-Soybean | 1.39 a | 1.67 a | 0.157 a | 2.82 a | 1803 a | 2.5 a | 250.1 a | 6.5 b | 95.8 a | 116.2 a | 50.7 b | 23.8 a | 17.5 a |
| 3 | 1:1 Rice-Sorghum | 1.37 a | 1.66 a | 0.160 a | 2.75 a | 2037 a | 2.6 a | 258.8 a | 7.0 a | 90.1 a | 122.6 a | 68.5 b | 17.7 a | 14.4 a |
| 4 | 1:1 Rice-Fallow | 1.36 a | 1.51 ab | 0.153 ab | 2.69 a | 1980 a | 2.4 a | 257.3 a | 6.9 a | 87.6 a | 117.1 a | 73.6 b | 20.3 a | 12.6 a |
| LSD (P=.05) | | 0.115 | 0.1619 | 0.01256 | 0.3331 | 191.34 | 0.3892 | 11.088 | 0.266 | 21.888 | 19.796 | 20.5997 | 8.1697 | 5.641 |
| Standard Deviation | | 0.072 | 0.1012 | 0.00785 | 0.2082 | 119.63 | 0.2433 | 6.9321 | 0.166 | 13.684 | 12.3766 | 12.879 | 5.1077 | 3.5268 |
| CV | | 5.27 | 6.48 | 5.15 | 7.75 | 6.16 | 9.72 | 2.7 | 2.43 | 16.06 | 11.16 | 16.63 | 25.68 | 24.99 |
| Replicate F | | 1.064 | 7.019 | 8.559 | 1.027 | 15.941 | 1.523 | 3.836 | 4.37 | 3.742 | 4.204 | 1.339 | 2.23 | 3.674 |
| Replicate Prob(F) | | 0.4114 | 0.0099 | 0.0053 | 0.4256 | 0.0006 | 0.2741 | 0.0508 | 0.037 | 0.0539 | 0.0407 | 0.3219 | 0.1541 | 0.0562 |
| Treatment F | | 0.511 | 5.652 | 4.561 | 1.962 | 2.787 | 0.389 | 1.521 | 12.257 | 3.323 | 6.447 | 19.089 | 1.24 | 2.033 |
| Treatment Prob(F) | | 0.6845 | 0.0186 | 0.0332 | 0.1903 | 0.1019 | 0.7639 | 0.2746 | 0.0016 | 0.0705 | 0.0127 | 0.0003 | 0.3512 | 0.1797 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Rice-Based Cropping Systems in a Conventional Tillage Production System**

| | |
|---|---|
| **Experiment number** .......................... | 08-CS-21 (Rice) |
| | |
| **Site and design** .................................. | |
| **Location/Cooperator** .................. | Rice Research Station (South Farm) |
| **Tillage type** .................................. | Conventional |
| **Experimental design** ................... | Randomized complete block |
| **Number of reps** ........................... | 4 |
| **Plot size** ........................................ | 20 x 50 ft |
| **Row width/rows per plot** ............ | 7 in / 34 |
| | |
| **Soil type** .............................................. | Crowley silt loam |
| **% organic matter** ........................ | See data sheet |
| **pH** ................................................. | See data sheet |
| **Extractable nutrients** ppm .......... | See data sheet |
| | |
| **Crop/Variety** ...................................... | Rice / Cheniere |
| **Planting method/date** ................. | Drill seeded / June 2, 2008 |
| **Seeding rate/depth** ...................... | 75 lb/A / .5 in |
| **Emergence date** ........................... | June 10, 2008 |
| **Harvest date** ................................ | October 1, 2008 |
| | |
| **Seed treatment/cwt** ............................ | Dithane (fungicide)-114 g<br>Release (gibberellic acid)-10 g<br>Zinche (40.5% Zn)-236 ml |
| | |
| **Fertilization** ........................................ | 250 lb/A 0-24-24-2.5, June 3<br>165 lb N/A 46-0-0, July 9 |
| | |
| **Water management** ........................... | |
| **Flush** ............................................ | June 9, June 24 |
| **Flood** ............................................ | July 10 |
| **Drain** ............................................ | September 18 |
| | |
| **Pest management** ............................... | |
| **Herbicides** .................................... | .5 lb/A Facet DF + 3 qt/A Propanil + 1 oz/A Permit, July 8 |
| **Insecticides** .................................. | 2.5 oz/cwt Dermacor seed treatment |
| **Fungicides** ……………………… | 21 oz/A Quilt + 6 oz/A Quadris, August 26 |

**Rice-Based Cropping Systems in a Conventional Tillage Production System**

**Experiment number** ..........................: 08-CS-21 (Soybeans)

**Site and design** ..................................:
**Location/Cooperator** ..................: Rice Research Station (South Farm)
**Tillage type**.................................: Conventional
**Experimental design**...................: Randomized complete block
**Number of reps** ...........................: 4
**Plot size**.......................................: 20 x 50 ft
**Row width/rows per plot**...........: 30 in / 8

**Soil type** ..............................................: Crowley silt loam
**% organic matter**........................: See data sheet
**pH**................................................: See data sheet
**Extractable nutrients** ppm..........: See data sheet

**Crop/Variety** ......................................: Soybeans / DG5555
**Planting method/date** .................: Drill seeded / June 2, 2008
**Seeding rate/depth**......................: 130,000 seed/A / 1 in
**Emergence date**...........................: June 8, 2008
**Harvest date** ................................: October 29, 2008

**Seed treatment/cwt** ............................: None

**Fertilization**........................................: 250 lb/A 0-24-24-2.5, June 3

**Water management** ...........................:
**Flush** ............................................: None
**Flood** ............................................: None
**Drain**............................................: None

**Pest management**...............................:
**Herbicides**....................................: 1.5 qt/A Glyphosate, June 25
1.5 qt/A Glyphosate, July 16
**Insecticides** ..................................: 4 oz/A Mustang Max @ 15 gpa, September 23
**Fungicides……………………….**: None

**Rice-Based Cropping Systems in a Conventional Tillage Production System**

**Experiment number** ........................... : 08-CS-21 (Grain Sorghum)

**Site and design** ................................... :
- **Location/Cooperator** .................. : Rice Research Station (South Farm)
- **Tillage type** .................................. : Conventional
- **Experimental design** ................... : Randomized complete block
- **Number of reps** ........................... : 4
- **Plot size** ........................................ : 20 x 50 ft
- **Row width/rows per plot** ............ : 30 in / 8

**Soil type** ............................................... : Crowley silt loam
- **% organic matter** ........................ : See data sheet
- **pH** ................................................. : See data sheet
- **Extractable nutrients** ppm .......... : See data sheet

**Crop/Variety** ....................................... : Grain Sorghum
- **Planting method/date** ................. : Drill seeded / June 2, 2008
- **Seeding rate/depth** ...................... : 75,000 seed/A / 1 in
- **Emergence date** ........................... : June 8, 2008
- **Harvest date** ................................ : September 24, 2008

**Seed treatment/cwt** ............................ : NA

**Fertilization** ........................................ : 250 lb/A 0-24-24-2.5, June 3
90 lb N/A 46-0-0, July 9

**Water management** ........................... :
- **Flush** ............................................. : None
- **Flood** ............................................. : None
- **Drain** ............................................. : None

**Pest management** ............................... :
- **Herbicides** .................................... : .5 lb/A Facet + 2 qt/A Atrazine, June 25
- **Insecticides** .................................. : None
- **Fungicides** ………………………..: None

Table 4. Rice-based cropping systems in a conventional tillage production system 4. Agronomic data.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | Sorghum | Sorghum | Sorghum | Sorghum | Rice | Rice | Rice | Rice | Soybeans | Soybeans | Soybeans |
| Description | | | | | | | | | | | | |
| Rating Date | | 9/24/08 | 9/24/08 | 9/24/08 | 9/24/08 | 9/29/08 | 9/29/08 | 9/29/08 | 10/1/08 | 10/29/08 | 10/29/08 | 10/29/08 |
| Rating Type | | Height | Lodging | Fallen Head | Yield | Height | Lodging | Lodging | Yield | Height | Lodging | Yield |
| Rating Unit | | in | rate 1-5 | % plot | bushel/A | in | % plot | rate 1-5 | lb/A | in | rate 1-5 | bushel/A |
| Trt No. | Treatment Name | | | | | | | | | | | |
| 1 | Continuous Rice | | | | | 37.5 | 43.8 | 2.3 | 5154 | | | |
| 2 | 1:1 Rice-Soybean | | | | | | | | | 22.5 | 0.5 | 26 |
| 3 | 1:1 Rice-Sorghum | 49.8 | 1.5 | 40 | 42 | | | | | | | |
| 4 | 1:1 Rice-Fallow | | | | | | | | | | | |
| LSD (P=.05) | | . | . | . | . | . | . | . | . | . | . | . |
| Standard Deviation | | . | . | . | . | . | . | . | . | . | . | . |
| CV | | . | . | . | . | . | . | . | . | . | . | . |
| Replicate F | | | | | | | | | | | | |
| Replicate Prob(F) | | | | | | | | | | | | |
| Treatment F | | | | | | | | | | | | |
| Treatment Prob(F) | | | | | | | | | | | | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 5. Rice-based cropping systems in a conventional tillage production system 4. Spring soil test data.

| Crop Name | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring | Spring |
| Rating Date | 6/4/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 | 6/3/08 |
| Rating Type | BulkDensity | Soil C | Soil N | OM | Ca | Cu | Mg | pH | P | K | Na | S | Zn |
| Rating Unit | $g/cm^3$ | % | % | % | Ppm | ppm | ppm | 1:1 | ppm | ppm | ppm | ppm | ppm |
| Trt No. Treatment Name | | | | | | | | | | | | | |
| 1 Continuous Rice | 1.34 | 1.17 a | 0.13 a | 2.39 a | 1787 a | 1.98 a | 269 a | 6.9 a | 67.1 a | 104.7 a | 120.2 a | 9.17 a | 8.00 a |
| 2 1:1 Rice-Soybean | . | 1.13 a | 0.13 a | 2.33 a | 1807 a | 1.75 a | 240 a | 6.6 a | 70.9 a | 101.1 a | 101.3 a | 9.28 a | 8.97 a |
| 3 1:1 Rice-Sorghum | . | 1.14 a | 0.12 a | 2.40 a | 1796 a | 1.96 a | 254 a | 6.7 a | 62.7 a | 99.4 a | 105.5 a | 9.80 a | 8.17 a |
| 4 1:1 Rice-Fallow | . | 1.07 a | 0.12 a | 2.32 a | 1774 a | 1.87 a | 265 a | 6.8 a | 59.8 a | 104.1 a | 106.4 a | 9.31 a | 7.51 a |
| LSD (P=.05) | . | 0.119 | 0.02 | 0.321 | 176.15 | 0.49 | 48.98 | 0.36 | 21.37 | 15.643 | 24.816 | 1.771 | 2.474 |
| Standard Deviation | . | 0.074 | 0.013 | 0.201 | 110.13 | 0.307 | 30.62 | 0.23 | 13.36 | 9.7803 | 15.515 | 1.107 | 1.547 |
| CV | . | 6.61 | 10.13 | 8.52 | 6.15 | 16.24 | 11.92 | 3.36 | 20.51 | 9.56 | 14.32 | 11.79 | 18.96 |
| Replicate F | | 1.681 | 0.211 | 0.499 | 7.52 | 3.343 | 1.847 | 3.55 | 1.381 | 1.157 | 5.038 | 1.651 | 7.398 |
| Replicate Prob(F) | | 0.24 | 0.887 | 0.692 | 0.008 | 0.07 | 0.209 | 0.06 | 0.31 | 0.3783 | 0.0255 | 0.246 | 0.008 |
| Treatment F | | 1.325 | 0.122 | 0.159 | 0.065 | 0.462 | 0.727 | 0.76 | 0.536 | 0.262 | 1.111 | 0.252 | 0.618 |
| Treatment Prob(F) | | 0.326 | 0.945 | 0.921 | 0.9771 | 0.716 | 0.561 | 0.54 | 0.669 | 0.8512 | 0.3943 | 0.858 | 0.62 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 6. Rice-based cropping systems in a conventional tillage production system 4. Fall soil test data.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | | | | | | | | | | |
| Description | | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall | Fall |
| Rating Date | | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 | 10/30/08 |
| Rating Type | | BulkDensity | Soil C | Soil N | OM | Ca | Cu | Mg | pH | P | K | Na | S | Zn |
| Rating Unit | | g/cm^3 | % | % | % | ppm | ppm | ppm | 1:1 | ppm | ppm | ppm | ppm | ppm |
| Trt No. | Treatment Name | | | | | | | | | | | | | |
| 1 | Continuous Rice | 1.24 a | 1.33 a | 0.12 b | 2.41 a | 1817 a | 1.97 a | 312 a | 6.8 a | 66.63 a | 103.8 a | 151.7 a | 19.39 a | 11.62 ab |
| 2 | 1:1 Rice-Soybean | 1.23 a | 1.41 a | 0.14 a | 2.50 a | 1778 a | 2.59 a | 263 a | 6.4 a | 88.34 a | 122.0 a | 81.8 b | 19.55 a | 14.97 a |
| 3 | 1:1 Rice-Sorghum | 1.27 a | 1.42 a | 0.13 ab | 2.48 a | 1790 a | 2.70 a | 279 a | 6.6 a | 73.90 a | 119.5 a | 87.2 b | 18.93 a | 12.22 ab |
| 4 | 1:1 Rice-Fallow | 1.26 a | 1.31 a | 0.12 b | 2.30 a | 1818 a | 2.67 a | 286 a | 6.6 a | 70.83 a | 125.5 a | 112.1 b | 20.40 a | 9.54 b |
| LSD (P=.05) | | 0.077 | 0.0834 | 0.0074 | 0.1543 | 148.71 | 0.5612 | 49.303 | 0.285 | 19.696 | 17.953 | 36.308 | 1.675 | 3.501 |
| Standard Deviation | | 0.048 | 0.0521 | 0.0046 | 0.0964 | 92.975 | 0.3509 | 30.824 | 0.1782 | 12.314 | 11.225 | 22.7 | 1.047 | 2.189 |
| CV | | 3.87 | 3.81 | 3.61 | 3.98 | 5.16 | 14.14 | 10.82 | 2.7 | 16.44 | 9.54 | 20.98 | 5.35 | 18.11 |
| Replicate F | | 0.956 | 7.325 | 4.706 | 1.943 | 9.44 | 1.453 | 0.7 | 2.977 | 3.83 | 5.656 | 1.976 | 0.638 | 4.936 |
| Replicate Prob(F) | | 0.4542 | 0.0087 | 0.0306 | 0.1933 | 0.0038 | 0.2914 | 0.5755 | 0.0891 | 0.051 | 0.0186 | 0.1882 | 0.609 | 0.027 |
| Treatment F | | 0.523 | 4.696 | 4.722 | 3.616 | 0.182 | 3.874 | 1.781 | 3.548 | 2.343 | 2.922 | 7.865 | 1.361 | 4.188 |
| Treatment Prob(F) | | 0.6774 | 0.0307 | 0.0303 | 0.0583 | 0.9062 | 0.0497 | 0.2207 | 0.0609 | 0.1412 | 0.0926 | 0.007 | 0.315 | 0.041 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Studies Evaluating the Effects of Tillage on Rice Seeding Rates and N Fertilization Conducted at the Rice Research Station-South Unit in 2008**

**Experiment number** ..........................: 08-CS-01 to CS-06

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (South Farm)
- **Tillage type**.................................: Conventional vs. Fall stale
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**.......................................: 7 x 20 ft
- **Row width/rows per plot**............: 7 in / 12

**Soil type** .............................................: Crowley silt loam
- **% organic matter**........................: 1.279
- **pH**................................................: 7.4
- **Extractable nutrients** ppm..........: Ca-1400, Cu-2.4, Mg-357, P-3.7, K-78.8, Na-158.1, S-12.4, Zn-3.7

**Crop/Variety** ......................................: Rice / See Data Sheet
- **Planting method/date** .................: Drill seeded / April 2, 2008
- **Seeding rate/depth**......................: Multiple rates / .75 in
- **Emergence date**...........................: Fall stale- April 10; Conventional- April 15
- **Harvest date** ................................: August 22

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization**.......................................: 195 lb/A 0-24-24-2.5, April 2
1 qt/A Zinc Plus, April 23

**Water management** ...........................:
- **Flush** ............................................: April 14, May 9
- **Flood** ............................................: May 21
- **Drain**............................................: August 8

**Pest management**...............................:
- **Herbicides**...................................: 1 qt/A Glyphosate + 1 qt/A 2, 4-D, February 29
  1 qt/A Glyphosate, April 4
  1 gal/A Rice Beaux + 2.1 pt/A Prowl, April 23
  5 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 20
- **Insecticides** ..................................: 2.5 oz/cwt Dermacor seed treatment
- **Fungicides** ...................................: 19 oz/A Stratego, July 7

Table 7. Evaluate the interaction of tillage, seeding rate, and N rate on Jupiter rice agronomic traits (2.1) (Rice Research Station-South Unit).

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/19/08 | | 5/5/08 | 8/22/08 | 8/19/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | Grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2 row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 1 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 90 | lb ai/A | 37 c-f | 100 gh | 10 h-k | 8757 jk | 553 a | 118 ab | 266 a | 30 a | 1180 a | 66 a-d | 71 ab |
| 2 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 120 | lb ai/A | 38 a-f | 103 b-f | 14 d-k | 9506 hij | 668 a | 140 ab | 321 a | 32 a | 1246 a | 65 cd | 69 bc |
| 3 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 150 | lb ai/A | 38 a-f | 103 b-f | 14 d-k | 10087 c-i | 685 a | 142 ab | 332 a | 30 a | 1180 a | 67 abc | 71 ab |
| 4 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 180 | lb ai/A | 39 a-e | 104 a-d | 13 e-k | 10648 a-g | 741 a | 142 ab | 365 a | 30 a | 1188 a | 67 a-d | 71 ab |
| 5 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 90 | lb ai/A | 36 ef | 99 h | 23 b-f | 9208 ijk | 610 a | 133 ab | 295 a | 33 a | 1240 a | 67 a-d | 70 abc |
| 6 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 120 | lb ai/A | 37 c-f | 100 gh | 25 a-e | 10123 b-i | 622 a | 145 ab | 298 a | 27 a | 1048 a | 65 a-d | 70 abc |
| 7 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 150 | lb ai/A | 37 c-f | 101 e-h | 19 b-k | 10765 a-f | 707 a | 154 ab | 334 a | 32 a | 1208 a | 66 a-d | 70 abc |
| 8 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 180 | lb ai/A | 38 a-f | 102 c-g | 24 a-f | 11210 abc | 759 a | 161 ab | 345 a | 28 a | 1057 a | 68 ab | 71 a |
| 9 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | 90 | lb ai/A | 35 f | 99 h | 25 a-e | 9539 hij | 645 a | 145 ab | 327 a | 32 a | 1187 a | 67 a-d | 70 abc |
| 10 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | 120 | lb ai/A | 36 def | 100 gh | 25 a-e | 10007 e-i | 574 a | 134 ab | 286 a | 28 a | 1042 a | 67 abc | 71 ab |

Continued.

Table 7. Continued.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/19/08 | | 5/5/08 | 8/22/08 | 8/19/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2 row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 11 | Stale Seedbed | | | 37 b-f | 102 c-g | 30 abc | 10688 a-g | 658 a | 163 ab | 316 a | 26 a | 1015 a | 66 a-d | 70 Abc |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 12 | Stale Seedbed | | | 38 a-f | 103 b-f | 26 a-e | 10976 a-e | 708 a | 170 a | 338 a | 28 a | 1104 a | 67 abc | 71 ab |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 13 | Stale Seedbed | | | 36 def | 99 h | 23 b-g | 9209 ijk | 642 a | 158 ab | 300 a | 26 a | 995 a | 65 a-d | 70 abc |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 14 | Stale Seedbed | | | 36 c-f | 99 h | 35 a | 10098 c-i | 638 a | 149 ab | 325 a | 27 a | 1000 a | 68 a | 71 a |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 15 | Stale Seedbed | | | 36 ef | 100 fgh | 31 ab | 10743 a-f | 619 a | 142 ab | 311 a | 32 a | 1183 a | 67 abc | 71 ab |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 16 | Stale Seedbed | | | 38 a-f | 102 c-g | 27 a-d | 11178 a-d | 680 a | 163 ab | 337 a | 30 a | 1135 a | 66 a-d | 71 ab |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 17 | Conv. Till | | | 37 c-f | 104 a-d | 8 ijk | 8482 k | 551 a | 107 ab | 263 a | 31 a | 1213 a | 65 a-d | 70 abc |
| | 15 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 18 | Conv. Till | | | 36 c-f | 105 a | 8 k | 8762 jk | 557 a | 99 b | 267 a | 30 a | 1273 a | 64 d | 69 c |
| | 15 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 19 | Conv. Till | | | 39 abc | 105 ab | 8 jk | 10145 b-i | 630 a | 120 ab | 297 a | 26 a | 1070 a | 66 a-d | 71 ab |
| | 15 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 20 | Conv. Till | | | 41 a | 105 a | 9 h-k | 10884 a-f | 610 a | 113 ab | 272 a | 32 a | 1369 a | 67 a-d | 70 abc |
| | 15 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 21 | Conv. Till | | | 38 a-f | 102 c-g | 12 f-k | 9345 ijk | 529 a | 104 ab | 249 a | 29 a | 1130 a | 66 a-d | 70 abc |
| | 30 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 22 | Conv. Till | | | 38 a-f | 104 a-d | 11 g-k | 10004 e-i | 603 a | 119 ab | 294 a | 31 a | 1210 a | 67 a-d | 71 ab |
| | 30 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 23 | Conv. Till | | | 39 a-d | 104 a-d | 13 e-k | 10527 a-h | 689 a | 141 ab | 335 a | 29 a | 1166 a | 67 abc | 71 a |
| | 30 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |

Continued.

Table 7.  Continued.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/19/08 | | 5/5/08 | 8/22/08 | 8/19/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2 row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 24 | Conv. Till | | | 40 ab | 104 a-d | 16 d-k | 11236 ab | 685 a | 139 ab | 309 a | 31 a | 1259 a | 66 a-d | 70 abc |
| | 30 seed/sq ft | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 25 | Conv. Till | | | 37 c-f | 102 d-g | 21 b-h | 9591 g-j | 571 a | 116 ab | 278 a | 32 a | 1192 a | 65 bcd | 70 abc |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 26 | Conv. Till | | | 37 b-f | 103 b-e | 19 b-k | 10057 d-i | 611 a | 134 ab | 295 a | 29 a | 1081 a | 67 abc | 71 ab |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 27 | Conv. Till | | | 38 a-f | 104 a-d | 16 d-k | 10685 a-g | 651 a | 129 ab | 316 a | 32 a | 1241 a | 67 abc | 71 ab |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 28 | Conv. Till | | | 38 a-f | 103 a-d | 19 b-k | 10960 a-e | 599 a | 122 ab | 294 a | 31 a | 1269 a | 66 a-d | 70 abc |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 29 | Conv. Till | | | 37 b-f | 102 d-g | 20 b-i | 9486 hij | 586 a | 126 ab | 276 a | 34 a | 1268 a | 66 a-d | 70 abc |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 30 | Conv. Till | | | 38 a-f | 103 b-e | 21 b-h | 9783 f-j | 592 a | 117 ab | 274 a | 34 a | 1350 a | 67 a-d | 71 ab |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 31 | Conv. Till | | | 39 a-d | 104 a-d | 20 b-j | 10727 a-f | 562 a | 112 ab | 261 a | 34 a | 1355 a | 66 a-d | 70 abc |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 32 | Conv. Till | | | 39 abc | 104 abc | 19 c-k | 11349 a | 714 a | 148 ab | 320 a | 30 a | 1193 a | 66 a-d | 70 abc |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| LSD (P=.05) | | | | 1.76 | 1.4 | 6.78 | 637 | 140.37 | 36.59 | 79.43 | 6.195 | 253.81 | 1.454 | 0.945 |
| Standard Deviation | | | | 1.08 | 1 | 4.85 | 455 | 68.74 | 17.92 | 38.9 | 3.034 | 124.29 | 0.712 | 0.463 |
| CV | | | | 2.86 | 0.99 | 25.66 | 4.48 | 10.86 | 13.35 | 12.84 | 10.05 | 10.57 | 1.07 | 0.66 |
| Replicate F | | | | 0.036 | 0.276 | 0.251 | 0.999 | 0.574 | 0.142 | 0.69 | 0.01 | 0.299 | 137.85 | 1.702 |
| Replicate Prob(F) | | | | 0.965 | 0.8423 | 0.8602 | 0.3968 | 0.4545 | 0.709 | 0.4124 | 0.9197 | 0.5882 | 0.0001 | 0.2016 |
| Treatment F | | | | 4.623 | 14.792 | 8.765 | 12.158 | 1.481 | 2.212 | 1.092 | 1.123 | 1.33 | 2.953 | 2.822 |
| Treatment Prob(F) | | | | 1E-04 | 0.0001 | 0.0001 | 0.0001 | 0.1397 | 0.015 | 0.4044 | 0.3746 | 0.2159 | 0.0017 | 0.0025 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 8. Evaluate the interaction of tillage, seeding rate, and N rate on Cheniere rice agronomic traits (2.1) (RRS-South Unit).

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/18/08 | | 5/5/08 | 8/19/08 | 8/18/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 1 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 90 | lb ai/A | 36 c | 95 cd | 12 e-h | 9082 ef | 640 a | 135 a-d | 322 a | 29 abc | 1237 bc | 63 a | 74 a |
| 2 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 120 | lb ai/A | 37 abc | 96 bcd | 13 d-h | 10528 a-d | 705 a | 154 a-d | 355 a | 34 abc | 1415 abc | 66 a | 74 a |
| 3 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 150 | lb ai/A | 37 abc | 96 cd | 11 fgh | 9698 cde | 732 a | 151 a-d | 370 a | 34 abc | 1496 abc | 66 a | 74 a |
| 4 | Stale Seedbed<br>15 seed/sq ft<br>UREA | 180 | lb ai/A | 38 abc | 98 a-d | 11 e-h | 11032 abc | 720 a | 147 a-d | 356 a | 33 abc | 1467 abc | 65 a | 73 a |
| 5 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 90 | lb ai/A | 36 bc | 95 cd | 20 b-f | 9464 de | 579 a | 141 a-d | 278 a | 29 abc | 1230 bc | 63 a | 74 a |
| 6 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 120 | lb ai/A | 37 abc | 96 bcd | 18 b-g | 10335 a-e | 635 a | 157 a-d | 331 a | 27 c | 1183 c | 61 a | 74 a |
| 7 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 150 | lb ai/A | 37 abc | 95 cd | 16 c-h | 10385 a-d | 770 a | 172 a | 386 a | 29 abc | 1268 bc | 65 a | 74 a |
| 8 | Stale Seedbed<br>30 seed/sq ft<br>UREA | 180 | lb ai/A | 38 abc | 97 a-d | 14 d-h | 10842 abc | 713 a | 164 ab | 357 a | 30 abc | 1287 bc | 65 a | 74 a |
| 9 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | 90 | lb ai/A | 36 bc | 95 d | 31 a | 9940 b-e | 673 a | 158 a-d | 326 a | 30 abc | 1267 bc | 63 a | 73 a |
| 10 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | 120 | lb ai/A | 37 abc | 96 cd | 18 b-g | 10687 a-d | 704 a | 160 abc | 350 a | 31 abc | 1315 abc | 63 a | 74 a |
| 11 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | 150 | lb ai/A | 37 abc | 96 bcd | 26 abc | 10824 abc | 695 a | 179 a | 346 a | 29 bc | 1260 bc | 64 a | 73 a |

Continued.

Table 8. Continued.

| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | 8/18/08 | | 5/5/08 | 8/19/08 | 8/18/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 12 | Stale Seedbed<br>45 seed/sq ft.<br>UREA | <br><br>180 | <br><br>lb ai/A | 38 abc | 97 bcd | 23 a-d | 11435 a | 711 a | 163 ab | 340 a | 30 abc | 1314 abc | 65 a | 74 a |
| 13 | Stale Seedbed<br>60 seed/sq ft.<br>UREA | <br><br>90 | <br><br>lb ai/A | 36 abc | 96 cd | 31 a | 10036 b-e | 650 a | 162 abc | 324 a | 29 bc | 1252 bc | 63 a | 74 a |
| 14 | Stale Seedbed<br>60 seed/sq ft.<br>UREA | <br><br>120 | <br><br>lb ai/A | 38 abc | 97 bcd | 23 a-d | 10265 a-e | 695 a | 158 abc | 335 a | 35 abc | 1502 abc | 62 a | 74 a |
| 15 | Stale Seedbed<br>60 seed/sq ft.<br>UREA | <br><br>150 | <br><br>lb ai/A | 38 abc | 96 bcd | 27 ab | 10565 a-d | 654 a | 157 a-d | 318 a | 29 abc | 1264 bc | 64 a | 74 a |
| 16 | Stale Seedbed<br>60 seed/sq ft.<br>UREA | <br><br>180 | <br><br>lb ai/A | 38 abc | 97 a-d | 27 ab | 11107 ab | 709 a | 169 a | 342 a | 30 abc | 1361 abc | 64 a | 73 a |
| 17 | Conventional Till<br>15 seed/sq ft<br>UREA | <br><br>90 | <br><br>lb ai/A | 36 c | 100 ab | 8 gh | 8013 g | 644 a | 123 a-d | 319 a | 36 abc | 1572 abc | 62 a | 73 a |
| 18 | Conventional Till<br>15 seed/sq ft<br>UREA | <br><br>120 | <br><br>lb ai/A | 36 bc | 101 a | 6 h | 8389 fg | 556 a | 86 d | 256 a | 46 ab | 2066 ab | 62 a | 73 a |
| 19 | Conventional Till<br>15 seed/sq ft<br>UREA | <br><br>150 | <br><br>lb ai/A | 38 abc | 99 abc | 9 gh | 10163 a-e | 561 a | 96 bcd | 265 a | 41 abc | 1868 abc | 63 a | 74 a |
| 20 | Conventional Till<br>15 seed/sq ft<br>UREA | <br><br>180 | <br><br>lb ai/A | 39 a | 99 abc | 11 fgh | 10395 a-d | 574 a | 90 cd | 280 a | 46 a | 2168 a | 65 a | 73 a |
| 21 | Conventional Till<br>30 seed/sq ft<br>UREA | <br><br>90 | <br><br>lb ai/A | 38 abc | 96 bcd | 11 e-h | 9803 b-e | 666 a | 135 a-d | 334 a | 36 abc | 1579 abc | 62 a | 74 a |
| 22 | Conventional Till<br>30 seed/sq ft<br>UREA | <br><br>120 | <br><br>lb ai/A | 39 a | 98 a-d | 14 d-h | 10222 a-e | 591 a | 112 a-d | 282 a | 34 abc | 1519 abc | 64 a | 73 a |
| 23 | Conventional Till<br>30 seed/sq ft<br>UREA | <br><br>150 | <br><br>lb ai/A | 39 ab | 98 a-d | 15 d-h | 10607 a-d | 679 a | 133 a-d | 323 a | 36 abc | 1648 abc | 64 a | 73 a |
| 24 | Conventional Till<br>30 seed/sq ft<br>UREA | <br><br>180 | <br><br>lb ai/A | 38 abc | 99 abc | 16 d-h | 10988 abc | 692 a | 139 a-d | 344 a | 35 abc | 1607 abc | 65 a | 73 a |

Continued.

Table 8. Continued.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/18/08 | | 5/5/08 | 8/19/08 | 8/18/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 25 | Conventional Till | | | 37 abc | 97 bcd | 23 a-d | 9873 b-e | 619 a | 131 a-d | 304 a | 32 abc | 1395 abc | 64 a | 74 a |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 26 | Conventional Till | | | 38 abc | 98 a-d | 21 b-e | 10193 a-e | 685 a | 157 a-d | 336 a | 28 c | 1202 c | 63 a | 74 a |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 27 | Conventional Till | | | 38 abc | 99 abc | 18 b-g | 10672 a-d | 660 a | 132 a-d | 312 a | 36 abc | 1671 abc | 64 a | 73 a |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 28 | Conventional Till | | | 38 abc | 98 a-d | 18 b-g | 11083 ab | 719 a | 161 abc | 336 a | 38 abc | 1725 abc | 65 a | 73 a |
| | 45 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| 29 | Conventional Till | | | 37 abc | 96 bcd | 23 a-d | 10099 a-e | 691 a | 153 a-d | 342 a | 31 abc | 1322 abc | 63 a | 73 a |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 90 | lb ai/A | | | | | | | | | | | |
| 30 | Conventional Till | | | 37 abc | 98 a-d | 22 a-e | 10516 a-d | 548 a | 120 a-d | 268 a | 28 c | 1224 bc | 64 a | 73 a |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 120 | lb ai/A | | | | | | | | | | | |
| 31 | Conventional Till | | | 38 abc | 99 abc | 18 b-g | 10869 abc | 722 a | 158 abc | 341 a | 30 abc | 1387 abc | 64 a | 73 a |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 150 | lb ai/A | | | | | | | | | | | |
| 32 | Conventional Till | | | 38 abc | 100 ab | 18 b-g | 11008 abc | 714 a | 149 a-d | 344 a | 32 abc | 1543 abc | 65 a | 73 a |
| | 60 seed/sq ft. | | | | | | | | | | | | | |
| | UREA | 180 | lb ai/A | | | | | | | | | | | |
| LSD (P=.05) | | | | 1.77 | 2.29 | 5.73 | 729.7 | 129.24 | 38.08 | 72.24 | 8.852 | 454.79 | 3.28 | 1.19 |
| Standard Deviation | | | | 1.08 | 1.64 | 4.09 | 521.2 | 63.29 | 18.65 | 35.38 | 4.335 | 222.72 | 1.61 | 0.58 |
| CV | | | | 2.9 | 1.69 | 22.97 | 5.07 | 9.51 | 12.99 | 10.86 | 13.16 | 15.29 | 2.51 | 0.79 |
| Replicate F | | | | 1.339 | 2.444 | 1.755 | 3.683 | 5.348 | 0.202 | 4.861 | 4.841 | 1.534 | 2.05 | 1.22 |
| Replicate Prob(F) | | | | 0.269 | 0.069 | 0.1612 | 0.0148 | 0.0275 | 0.656 | 0.035 | 0.0354 | 0.2248 | 0.16 | 0.28 |
| Treatment F | | | | 2.457 | 4.084 | 9.993 | 8.386 | 1.65 | 3.126 | 1.558 | 2.394 | 2.416 | 1.11 | 1.3 |
| Treatment Prob(F) | | | | 0.0013 | 0.0001 | 0.0001 | 0.0001 | 0.0843 | 0.0011 | 0.111 | 0.0088 | 0.0082 | 0.38 | 0.23 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 9. Evaluation of the optimum preflood N rate for Neptune rice as affected by tillage system selection (1.1) (RRS-South Unit).

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | | Rice | | Rice | | Rice | |
| Rating Date | | | | | 5/5/08 | | | | 8/19/08 | | 8/22/08 | |
| Rating Type | | | | | Stand count | | 50% Head | | Height | | Yield | |
| Rating Unit | | | | | pl/sq ft | | days | | in | | lb/A | |
| Crop Stage Majority | | | | | Main | | Main | | Main | | Main | |
| Footnote Number | | | | | | | | | | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | Conv. tillage | 0 | lb ai/A | 3-4 leaf | 8.1 | g | 102 | b-g | 28 | h | 3682 | j |
| 2 | Conv. tillage | 30 | lb ai/A | 3-4 leaf | 10.4 | efg | 102 | b-g | 30 | g | 5354 | i |
| 3 | Conv. tillage | 60 | lb ai/A | 3-4 leaf | 8.6 | fg | 103 | a-d | 32 | d-g | 7242 | gh |
| 4 | Conv. tillage | 90 | lb ai/A | 3-4 leaf | 8.4 | fg | 105 | ab | 33 | c-f | 8756 | ef |
| 5 | Conv. tillage | 120 | lb ai/A | 3-4 leaf | 11.1 | d-g | 104 | abc | 35 | abc | 9705 | de |
| 6 | Conv. tillage | 150 | lb ai/A | 3-4 leaf | 9.3 | fg | 105 | ab | 35 | abc | 10461 | bcd |
| 7 | Conv. tillage | 180 | lb ai/A | 3-4 leaf | 10.1 | efg | 105 | ab | 36 | ab | 11017 | a-d |
| 8 | Conv. tillage | 210 | lb ai/A | 3-4 leaf | 11.7 | c-g | 105 | ab | 36 | ab | 11624 | ab |
| 9 | Conv. tillage | 240 | lb ai/A | 3-4 leaf | 9.4 | fg | 107 | a | 37 | a | 11314 | abc |
| 10 | Stale seedbed | 0 | lb ai/A | 3-4 leaf | 18.4 | a-d | 99 | efg | 28 | h | 4041 | j |
| 11 | Stale seedbed | 30 | lb ai/A | 3-4 leaf | 17.4 | a-e | 98 | g | 31 | fg | 6291 | hi |
| 12 | Stale seedbed | 60 | lb ai/A | 3-4 leaf | 20.1 | ab | 99 | fg | 32 | efg | 7763 | fg |
| 13 | Stale seedbed | 90 | lb ai/A | 3-4 leaf | 19.0 | abc | 100 | d-g | 33 | c-g | 9040 | e |
| 14 | Stale seedbed | 120 | lb ai/A | 3-4 leaf | 16.1 | a-f | 100 | c-g | 33 | c-g | 9860 | cde |
| 15 | Stale seedbed | 150 | lb ai/A | 3-4 leaf | 17.4 | a-e | 103 | a-f | 34 | b-e | 10582 | bcd |
| 16 | Stale seedbed | 180 | lb ai/A | 3-4 leaf | 17.3 | a-e | 103 | a-e | 34 | b-e | 10539 | bcd |
| 17 | Stale seedbed | 210 | lb ai/A | 3-4 leaf | 20.9 | a | 102 | b-g | 36 | ab | 10934 | a-d |
| 18 | Stale seedbed | 240 | lb ai/A | 3-4 leaf | 13.0 | b-g | 102 | b-g | 35 | a-d | 12247 | a |
| LSD (P=.05) | | | | | 4.69 | | 2.5 | | 1.59 | | 1003.7 | |
| Standard Deviation | | | | | 3.31 | | 1.77 | | 0.95 | | 709.7 | |
| CV | | | | | 24.15 | | 1.73 | | 2.88 | | 7.96 | |
| Replicate F | | | | | 0.365 | | 1.343 | | 6.763 | | 4.511 | |
| Replicate Prob(F) | | | | | 0.7785 | | 0.2708 | | 0.0034 | | 0.007 | |
| Treatment F | | | | | 7.43 | | 7.643 | | 24.398 | | 54.603 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 10. Evaluation of the optimum preflood N rate for Neptune rice as affected by tillage system selection. (1.1) (RRS-South Unit) (Continued)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | | | | 7/18/08 | | | |
| Rating Type | | | | | Biomass | N Tissue | N uptake | Recov Eff | Biomass | N Tissue | N uptake | Recov Eff |
| Rating Unit | | | | | lb/A | % | lb/A | % | lb/A | % | lb/A | % |
| Crop Stage Majority | | | | | PD | PD | PD | PD | HD | HD | HD | HD |
| Footnote Number | | | | | | | | 1 | | | | 2 |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | Conv. tillage | 0 | lb ai/A | 3-4 leaf | 1417 c | 1.195 de | 16.6 c | | 3723 e | 0.687 e | 25.5 h | - b |
| 2 | Conv. tillage | 30 | lb ai/A | 3-4 leaf | | | | | 6300 de | 0.697 e | 42.6 gh | 22.37 ab |
| 3 | Conv. tillage | 60 | lb ai/A | 3-4 leaf | | | | | 8710 a-d | 0.758 cde | 65.7 e-h | 48.53 a |
| 4 | Conv. tillage | 90 | lb ai/A | 3-4 leaf | | | | | 7449 cde | 0.915 a-e | 69.7 d-h | 36.78 ab |
| 5 | Conv. tillage | 120 | lb ai/A | 3-4 leaf | 4133 a | 1.798 bc | 74.2 b | 0.749 a | 10824 abc | 0.849 a-e | 90.2 a-g | 44.69 ab |
| 6 | Conv. tillage | 150 | lb ai/A | 3-4 leaf | | | | | 11738 abc | 1.107 ab | 131.7 abc | 63.37 a |
| 7 | Conv. tillage | 180 | lb ai/A | 3-4 leaf | | | | | 9137 a-d | 1.026 a-e | 94.3 a-g | 32.06 ab |
| 8 | Conv. tillage | 210 | lb ai/A | 3-4 leaf | | | | | 9637 a-d | 1.053 a-d | 101.4 a-f | 30.87 ab |
| 9 | Conv. tillage | 240 | lb ai/A | 3-4 leaf | 5043 a | 2.444 a | 123.8 a | 0.565 b | 12447 ab | 1.129 ab | 140.1 a | 43.11 ab |
| 10 | Stale seedbed | 0 | lb ai/A | 3-4 leaf | 2594 b | 0.916 e | 25.5 c | | 5502 de | 0.872 a-e | 47.7 fgh | - b |
| 11 | Stale seedbed | 30 | lb ai/A | 3-4 leaf | | | | | 8029 bcd | 0.717 de | 57.8 e-h | 70.43 a |
| 12 | Stale seedbed | 60 | lb ai/A | 3-4 leaf | | | | | 11016 abc | 0.690 e | 75.8 c-h | 65.36 a |
| 13 | Stale seedbed | 90 | lb ai/A | 3-4 leaf | | | | | 11919 abc | 0.694 e | 82.9 b-g | 51.44 a |
| 14 | Stale seedbed | 120 | lb ai/A | 3-4 leaf | 5450 a | 1.562 cd | 84.4 b | 0.853 a | 10721 abc | 0.835 b-e | 88.8 a-g | 43.52 ab |
| 15 | Stale seedbed | 150 | lb ai/A | 3-4 leaf | | | | | 13310 a | 0.854 a-e | 113.5 a-e | 51.29 a |
| 16 | Stale seedbed | 180 | lb ai/A | 3-4 leaf | | | | | 12706 ab | 0.980 a-e | 122.2 a-d | 47.56 a |
| 17 | Stale seedbed | 210 | lb ai/A | 3-4 leaf | | | | | 12145 abc | 1.077 abc | 130.4 abc | 44.69 ab |
| 18 | Stale seedbed | 240 | lb ai/A | 3-4 leaf | 5525 a | 2.070 ab | 110.7 a | 0.5055 b | 11057 abc | 1.188 a | 133.9 ab | 40.54 ab |
| LSD (P=.05) | | | | | 1163.5 | 0.411 | 20.58 | 0.150 | 2858 | 0.2041 | 33.82 | 27.313 |
| Standard Deviation | | | | | 767.1 | 0.272 | 13.57 | 0.093 | 2020.9 | 0.14432 | 23.91 | 19.313 |
| CV | | | | | 19.05 | 16.4 | 18.71 | 14.05 | 20.63 | 16.11 | 26.66 | 47.19 |
| Replicate F | | | | | 3.839 | 0.202 | 3.43 | 3.93 | 0.446 | 2.166 | 0.941 | 0.611 |
| Replicate Prob(F) | | | | | 0.0338 | 0.893 | 0.0467 | 0.048 | 0.721 | 0.1034 | 0.428 | 0.6111 |
| Treatment F | | | | | 19.272 | 16.97 | 41.573 | 11.77 | 7.17 | 5.553 | 8.243 | 3.925 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0018 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Footnote 1: Mean uptake from all check plots was 21 lb N/A. Recovery Efficiency = (uptake/uptake from check)/N rate.

Footnote 2: Mean uptake from all check plots was 36.6 lb N/A. Recovery Efficiency = (N uptake-N uptake check plot)-N application rate.

Table 11. Evaluation of the optimum preflood N rate for Catahoula rice as affected by tillage system selection (1.1) (RRS-South Unit).

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice |
| Rating Date | | | | | 5/5/08 | | 8/18/08 | 8/19/08 |
| Rating Type | | | | | Stand count | 50% Head | Height | Yield |
| Rating Unit | | | | | pl/sq ft | days | in | lb/A |
| Crop Stage Majority | | | | | Main | Main | Main | Main |
| Crop Stage Scale | | | | | | | | |
| Footnote Number | | | | | | | | |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | |
| 1 | Conv. tillage | 0 | lb ai/A | 3-4 leaf | 10 c-f | 95 f | 32 f | 3316 h |
| 2 | Conv. tillage | 30 | lb ai/A | 3-4 leaf | 10 c-f | 97 def | 35 def | 4569 gh |
| 3 | Conv. tillage | 60 | lb ai/A | 3-4 leaf | 9 def | 98 c-f | 36 cde | 6759 f |
| 4 | Conv. tillage | 90 | lb ai/A | 3-4 leaf | 7 f | 100 bcd | 38 abc | 7746 ef |
| 5 | Conv. tillage | 120 | lb ai/A | 3-4 leaf | 11 c-f | 99 b-e | 38 abc | 9136 b-e |
| 6 | Conv. tillage | 150 | lb ai/A | 3-4 leaf | 8 ef | 101 abc | 39 abc | 9835 bcd |
| 7 | Conv. tillage | 180 | lb ai/A | 3-4 leaf | 11 c-f | 101 abc | 40 ab | 10327 ab |
| 8 | Conv. tillage | 210 | lb ai/A | 3-4 leaf | 9 def | 103 ab | 40 a | 10666 ab |
| 9 | Conv. tillage | 240 | lb ai/A | 3-4 leaf | 10 c-f | 104 a | 39 ab | 10230 abc |
| 10 | Stale seedbed | 0 | lb ai/A | 3-4 leaf | 14 b-f | 94 f | 33 f | 3874 h |
| 11 | Stale seedbed | 30 | lb ai/A | 3-4 leaf | 15 a-e | 95 f | 34 ef | 5611 g |
| 12 | Stale seedbed | 60 | lb ai/A | 3-4 leaf | 16 a-d | 95 f | 37 bcd | 7635 ef |
| 13 | Stale seedbed | 90 | lb ai/A | 3-4 leaf | 13 c-f | 96 ef | 37 bcd | 8411 de |
| 14 | Stale seedbed | 120 | lb ai/A | 3-4 leaf | 20 ab | 97 def | 37 abc | 8632 cde |
| 15 | Stale seedbed | 150 | lb ai/A | 3-4 leaf | 14 b-f | 98 c-f | 39 ab | 9677 bcd |
| 16 | Stale seedbed | 180 | lb ai/A | 3-4 leaf | 16 a-d | 99 b-e | 40 ab | 9754 bcd |
| 17 | Stale seedbed | 210 | lb ai/A | 3-4 leaf | 17 abc | 100 b-e | 40 ab | 10786 ab |
| 18 | Stale seedbed | 240 | lb ai/A | 3-4 leaf | 21 a | 99 b-e | 39 abc | 11536 a |
| LSD (P=.05) | | | | | 4.4 | 2.21 | 1.84 | 1090.2 |
| Standard Deviation | | | | | 3.1 | 1.56 | 1.1 | 770.9 |
| CV | | | | | 24.73 | 1.59 | 2.95 | 9.34 |
| Replicate F | | | | | 0.377 | 1.581 | 2.245 | 1.854 |
| Replicate Prob(F) | | | | | 0.7698 | 0.2055 | 0.1214 | 0.1492 |
| Treatment F | | | | | 6.543 | 12.899 | 14.717 | 41.941 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 12. Evaluation of the optimum preflood N rate for Catahoula rice as affected by tillage system selection (1.1) (RRS-South Unit).

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | | | | | | 7/17/08 | | | |
| Rating Type | | | | | Biomass | Tissue N | N uptake | Recov Eff | Biomass | Tissue N | N uptake | Recov Eff |
| Rating Unit | | | | | lb/A | % | lb/A | % | lb/A | % | lb/A | % |
| Crop Stage Majority | | | | | Main | PD | PD | PD | Main | HD | HD | HD |
| Crop Stage Scale | | | | | PD | | | | HD | | | |
| Footnote Number | | | | | | | | 1 | | | | 2 |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | |
| 1 | Conv. tillage | 0 | lb ai/A | 3-4 leaf | 2516 c | 1.1713 b | 23.5 c | 1.1 b | 6357 e | 0.6383 e | 39.5 fg | 0 b |
| 2 | Conv. tillage | 30 | lb ai/A | 3-4 leaf | | | | | 9603 cde | 0.6750 de | 65.6 efg | 73.7 a |
| 3 | Conv. tillage | 60 | lb ai/A | 3-4 leaf | | | | | 9855 cde | 0.8493 cde | 85.3 d-g | 67.8 a |
| 4 | Conv. tillage | 90 | lb ai/A | 3-4 leaf | | | | | 11105 b-e | 0.8730 cde | 97.1 c-g | 66.4 a |
| 5 | Conv. tillage | 120 | lb ai/A | 3-4 leaf | 4912 bc | 1.6273 b | 80.1 b | 42.5 a | 9508 cde | 0.8850 cde | 85.5 d-g | 40.1 ab |
| 6 | Conv. tillage | 150 | lb ai/A | 3-4 leaf | | | | | 11108 b-e | 1.4110 a | 159.1 a-d | 74.4 a |
| 7 | Conv. tillage | 180 | lb ai/A | 3-4 leaf | | | | | 10517 b-e | 1.1595 abc | 121.9 b-e | 46.9 a |
| 8 | Conv. tillage | 210 | lb ai/A | 3-4 leaf | | | | | 13010 a-d | 1.3258 ab | 171.1 abc | 63.7 a |
| 9 | Conv. tillage | 240 | lb ai/A | 3-4 leaf | 4466 bc | 2.6780 a | 118 ab | 37.1 a | 13841 abc | 1.4150 a | 200.5 a | 63.2 a |
| 10 | Stale seedbed | 0 | lb ai/A | 3-4 leaf | 3812 c | 1.0065 b | 34.6 c | 0 b | 6463 e | 0.5490 e | 35.2 g | 0 b |
| 11 | Stale seedbed | 30 | lb ai/A | 3-4 leaf | | | | | 8013 de | 0.7245 de | 58.8 efg | 49.2 a |
| 12 | Stale seedbed | 60 | lb ai/A | 3-4 leaf | | | | | 10294 b-e | 0.6863 de | 71.2 efg | 56.4 a |
| 13 | Stale seedbed | 90 | lb ai/A | 3-4 leaf | | | | | 13053 a-d | 0.8375 cde | 109.2 b-g | 79.8 a |
| 14 | Stale seedbed | 120 | lb ai/A | 3-4 leaf | 7503 a | 1.1668 b | 87.5 b | 48.7 a | 14316 abc | 0.8285 cde | 116.9 b-f | 66.2 a |
| 15 | Stale seedbed | 150 | lb ai/A | 3-4 leaf | | | | | 16625 a | 1.0355 bcd | 170.1 abc | 77.8 a |
| 16 | Stale seedbed | 180 | lb ai/A | 3-4 leaf | | | | | 14547 abc | 1.1420 abc | 164.2 abc | 70.4 a |
| 17 | Stale seedbed | 210 | lb ai/A | 3-4 leaf | | | | | 15631 ab | 1.2058 abc | 182.6 ab | 69.2 a |
| 18 | Stale seedbed | 240 | lb ai/A | 3-4 leaf | 6708 ab | 2.1680 a | 145.6 a | 48.5 a | 14245 abc | 1.4458 a | 203.7 a | 69.3 a |
| LSD (P=.05) | | | | | 1921.9 | 0.53376 | 33.44 | 16.78 | 3246.6 | 0.2379 | 49.08 | 33.64 |
| Standard Deviation | | | | | 1267.1 | 0.35191 | 22.05 | 11.07 | 2295.7 | 0.1682 | 34.71 | 23.79 |
| CV | | | | | 25.41 | 21.51 | 27.03 | 37.32 | 19.86 | 17.12 | 29.22 | 41.4 |
| Replicate F | | | | | 0.737 | 0.925 | 0.142 | 0.246 | 1.037 | 6.737 | 1.238 | 0.547 |
| Replicate Prob(F) | | | | | 0.5471 | 0.4543 | 0.9333 | 0.8625 | 0.3841 | 0.0006 | 0.3054 | 0.6523 |
| Treatment F | | | | | 8.499 | 14.22 | 18.175 | 17.218 | 6.928 | 12.066 | 10.115 | 3.878 |
| Treatment Prob(F) | | | | | 0.0007 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Footnote 1: Mean check plot recovery was 29.1 lb N/A. N Recovery Efficiency = (N uptake - N uptake check)/N rate*100.

Footnote 2: Mean check plot recovery was 37.4 lb N/A. N Recovery Efficiency = (N uptake - N uptake check)/N rate*100.

Table 13. Evaluation of the optimum seeding rate for drill-seeded Neptune rice as affected by tillage system selection (1.1) (RRS-South Unit).

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
| Rating Date | | | | 8/18/08 | | 5/5/08 | 8/22/08 | | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | head | Total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2 row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 1 | Conv. tillage<br>5 seed/sq foot | 13 | lb/A | 33 a | 106 a | 3 d | 7315 d | 338 c | 50 f | 151 c | 36.3 a | 1538 ab | 65 b | 72 a |
| 2 | Conv. tillage<br>10 seed/sq foot | 26 | lb/A | 34 a | 106 a | 5 d | 9253 c | 491 b | 72 f | 235 b | 41.1 a | 1631 a | 68 a | 72 a |
| 3 | Conv. tillage<br>20 seed/sq foot | 52 | lb/A | 35 a | 104 b | 6 d | 10184 b | 672 a | 114 de | 329 a | 36.3 a | 1397 ab | 67 ab | 72 a |
| 4 | Conv. tillage<br>30 seed/sq foot | 78 | lb/A | 35 a | 104 b | 12 bc | 10797 ab | 645 a | 124 b-e | 312 a | 33.7 a | 1275 ab | 68 a | 73 a |
| 5 | Conv. tillage<br>40 seed/sq foot | 104 | lb/A | 36 a | 103 bc | 15 b | 10982 ab | 658 a | 127 b-e | 321 a | 31.3 a | 1203 ab | 69 a | 73 a |
| 6 | Conv. tillage<br>50 seed/sq foot | 130 | lb/A | 35 a | 103 bc | 15 b | 11354 a | 715 a | 146 a-d | 336 a | 33.4 a | 1224 ab | 69 a | 73 a |
| 7 | Stale seedbed<br>5 seed/sq foot | 13 | lb/A | 35 a | 103 bc | 5 d | 8682 c | 608 a | 103 e | 308 a | 37.5 a | 1417 ab | 68 a | 73 a |
| 8 | Stale seedbed<br>10 seed/sq foot | 26 | lb/A | 34 a | 102 c | 7 cd | 10098 b | 634 a | 119 cde | 317 a | 34.9 a | 1335 ab | 68 a | 73 a |
| 9 | Stale seedbed<br>20 seed/sq foot | 52 | lb/A | 35 a | 100 d | 12 bc | 10564 ab | 675 a | 143 a-e | 323 a | 34.3 a | 1232 ab | 70 a | 73 a |
| 10 | Stale seedbed<br>30 seed/sq foot | 78 | lb/A | 35 a | 99 d | 22 a | 10674 ab | 732 a | 158 abc | 354 a | 30.5 a | 1079 b | 68 a | 73 a |
| 11 | Stale seedbed<br>40 seed/sq foot | 104 | lb/A | 35 a | 99 d | 16 b | 10645 ab | 746 a | 164 ab | 357 a | 32.3 a | 1163 ab | 70 a | 73 a |
| 12 | Stale seedbed<br>50 seed/sq foot | 130 | lb/A | 34 a | 99 d | 15 b | 11067 ab | 742 a | 171 a | 347 a | 30.4 a | 1094 b | 69 a | 73 a |
| LSD (P=.05) | | | | 1.63 | 0.93 | 4.26 | 699 | 87.53 | 27.31 | 51.9 | 7.178 | 280.47 | 1.918 | 1.371 |
| Standard Deviation | | | | 0.97 | 0.65 | 2.95 | 484.1 | 51.69 | 16.12 | 30.65 | 4.239 | 165.62 | 1.133 | 0.81 |
| CV | | | | 2.78 | 0.63 | 26.36 | 4.78 | 8.1 | 12.98 | 9.97 | 12.34 | 12.75 | 1.66 | 1.11 |
| Replicate F | | | | 1.16 | 7.289 | 0.56 | 1.011 | 16.602 | 8.323 | 12.67 | 2.27 | 3.035 | 2.054 | 0.173 |
| Replicate Prob(F) | | | | 0.33 | 0.0007 | 0.645 | 0.4002 | 0.0001 | 0.002 | 0.0002 | 0.127 | 0.0685 | 0.152 | 0.842 |
| Treatment F | | | | 2.15 | 61.157 | 16.091 | 23.413 | 15.599 | 15.277 | 10.987 | 1.637 | 3.192 | 4.007 | 0.914 |
| Treatment Prob(F) | | | | 0.06 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.1565 | 0.0099 | 0.003 | 0.544 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 14. Evaluation of the optimum seeding rate for drill-seeded Catahoula rice as affected by tillage system selection (1.1).

| Crop Name | | | | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice | Rice |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | 8/18/08 | | 5/5/08 | 8/22/08 | 8/18/08 | | | | | | |
| Rating Type | | | | Height | 50% HD | Stand cnt | Yield | WP dry wt. | Panicle # | Grain wt. | 10 P wt. | 10 P seed | Milling | Milling |
| Rating Unit | | | | in | days | pl/sq ft | lb/A | grams | number | grams | grams | number | % Head | % Total |
| Sample Size, Unit | | | | | | | | 1m | 1m | 1m | 1m | 1m | | |
| Collection Basis, Unit | | | | | | | | 2 row | 2 row | 2 row | 2 row | 2 row | | |
| Crop Stage Majority | | | | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main | Main |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | | |
| 1 | Conv. tillage 5 seed/sq foot | 12 | lb/A | 39 a | 100 a | 4 e | 6718 e | 599 a | 82 e | 275 a | 48.9 a | 2063 a | 62 b | 73 b |
| 2 | Conv. tillage 10 seed/sq foot | 24 | lb/A | 39 a | 99 ab | 4 de | 8369 cd | 629 a | 90 de | 308 a | 43.1 ab | 1839 abc | 65 a | 74 a |
| 3 | Conv. tillage 20 seed/sq foot | 48 | lb/A | 39 a | 99 abc | 6 de | 9265 bc | 560 a | 89 de | 260 a | 43.8 ab | 1905 ab | 65 a | 74 a |
| 4 | Conv. tillage 30 seed/sq foot | 72 | lb/A | 39 a | 99 bc | 10 cde | 10230 ab | 711 a | 137 bc | 339 a | 31.7 cd | 1334 d | 66 a | 75 a |
| 5 | Conv. tillage 40 seed/sq foot | 96 | lb/A | 40 a | 98 b-e | 11 cde | 10018 ab | 610 a | 114 cde | 282 a | 32.7 cd | 1399 d | 64 a | 75 a |
| 6 | Conv. tillage 50 seed/sq foot | 120 | lb/A | 40 a | 98 bcd | 14 bc | 10729 a | 706 a | 139 bc | 331 a | 29.0 cd | 1053 d | 65 a | 74 a |
| 7 | Stale seedbed 5 seed/sq foot | 12 | lb/A | 39 a | 97 cde | 5 de | 7712 d | 588 a | 88 de | 295 a | 35.1 cd | 1462 cd | 60 b | 74 a |
| 8 | Stale seedbed 10 seed/sq foot | 24 | lb/A | 39 a | 96 def | 9 cde | 9024 bc | 601 a | 95 de | 284 a | 37.5 bc | 1561 bcd | 60 b | 74 a |
| 9 | Stale seedbed 20 seed/sq foot | 48 | lb/A | 39 a | 96 ef | 11 cd | 9374 bc | 617 a | 117 cd | 285 a | 31.7 cd | 1312 d | 60 b | 75 a |
| 10 | Stale seedbed 30 seed/sq foot | 72 | lb/A | 40 a | 96 f | 18 ab | 9727 ab | 643 a | 132 bc | 299 a | 29.7 cd | 1208 d | 61 b | 75 a |
| 11 | Stale seedbed 40 seed/sq foot | 96 | lb/A | 39 a | 96 ef | 23 a | 9966 ab | 693 a | 153 ab | 323 a | 26.7 d | 1113 d | 62 b | 75 a |
| 12 | Stale seedbed 50 seed/sq foot | 120 | lb/A | 39 a | 97 def | 20 a | 10627 a | 733 a | 172 a | 340 a | 26.9 d | 1120 d | 61 b | 75 a |
| LSD (P=.05) | | | | 1.41 | 1.09 | 4.63 | 820.5 | 123.8 | 21.76 | 70.15 | 5.938 | 325.2 | 2.116 | 0.877 |
| Standard Deviation | | | | 0.83 | 0.75 | 3.21 | 568.2 | 73.15 | 12.85 | 41.42 | 3.507 | 192.04 | 1.25 | 0.518 |
| CV | | | | 2.12 | 0.77 | 28.65 | 6.1 | 11.42 | 10.95 | 13.74 | 10.1 | 13.27 | 2 | 0.7 |
| Replicate F | | | | 1.435 | 4.911 | 1.052 | 2.995 | 2.133 | 7.925 | 1.791 | 1.963 | 0.376 | 5.566 | 2.409 |
| Replicate Prob(F) | | | | 0.259 | 0.0063 | 0.3824 | 0.0447 | 0.142 | 0.0026 | 0.190 | 0.1643 | 0.6911 | 0.0111 | 0.1132 |
| Treatment F | | | | 0.707 | 14.25 | 15.284 | 17.954 | 1.758 | 15.751 | 1.227 | 12.619 | 9.021 | 10.669 | 4.494 |
| Treatment Prob(F) | | | | 0.719 | 0.0001 | 0.0001 | 0.0001 | 0.125 | 0.0001 | 0.327 | 0.0001 | 0.0001 | 0.0001 | 0.0013 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Tillage, Seeding Rate, and Dermacor X100 on Rice Water Weevil Population and Grain Yield of Cheniere and Jupiter Rice (RRS-South Unit)**

**Experiment number** ..........................: 08-CS-07 to CS-08

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (South Farm)
- **Tillage type**..................................: Conventional vs. Fall stale
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**.......................................: 7 x 20 ft
- **Row width/rows per plot**...........: 7 in / 12

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**........................: 1.279
- **pH**................................................: 7.0
- **Extractable nutrients** ppm..........: Ca-1397, Cu-2.7, Mg-300, P-8.1, K-62.2, Na-76.2, S-10.9, Zn-5.1

**Crop/Variety** ......................................: Rice / See Data Sheet
- **Planting method/date** .................: Drill seeded / April 2, 2008
- **Seeding rate/depth**......................: 10, 20, 30, 40, 50 seeds/ft$^2$ / .75 in
- **Emergence date**...........................: Fall stale, April 10; conventional, April 15
- **Harvest date** ................................: August 19

**Seed treatment/cwt** ............................: Dithane (fungicide)-114 g
Release (gibberellic acid)-10 g
Zinche (40.5% Zn)-236 ml

**Fertilization**........................................: 195 lb/A 0-24-24-2.5, April 2
1 qt/A Zinc Plus, April 23
165 lb N/A 46-0-0, May 20

**Water management** ...........................:
- **Flush** ............................................: April 14, May 9
- **Flood**............................................: May 21
- **Drain**............................................: August 8

**Pest management**...............................:
- **Herbicides**....................................: 1 qt/A Glyphosate + 1 qt/A 2,4-D, February 29
1 qt/A Glyphosate, April 4
1 gal/A Rice Beaux + 2.1 pt/A Prowl, April 23
5 qt/A Arrosolo + 1 oz/A Londax + .5 oz/A Permit, May 20
- **Insecticides** ..................................: None
- **Fungicides** ...................................: 19 oz/A Stratego, July 7

Table 15. Evaluation of tillage, seeding rate, and Dermacor X100 on rice water weevil population and grain yield of Cheniere rice (RRS-South Unit).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | | Rice | Rice | Rice | | Rice | | Rice | |
| Rating Date | | | | 8/18/08 | | 8/18/08 | 8/18/08 | | | 5/5/08 | | 8/22/08 | |
| Rating Type | | | | Height | | Lodge | Lodge | 50% HD | | Stand Cnt | | Yield | |
| Rating Unit | | | | in | | % plot | rate 1-5 | days | | pl/sq ft | | lb/A | |
| Crop Stage Majority | | | | Main | | Main | Main | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | | | |
| 1 | Conventional-Dermacor | 2.5 | fl oz/cwt | 38 | a | . | . | 105 | ab | 5.1 | g | 9501 | a |
| | 10 seed/ft sq. | 22 | lb/A | | | | | | | | | | |
| 2 | Conventional | 2.5 | fl oz/cwt | 37 | a-d | . | . | 106 | a | 7.4 | efg | 9957 | a |
| | 20 seed/ft sq. | 44 | lb/A | | | | | | | | | | |
| 3 | Conventional-Dermacor | 2.5 | fl oz/cwt | 38 | a | . | . | 105 | ab | 10.1 | efg | 8842 | a |
| | 30 seed/ft sq. | 66 | lb/A | | | | | | | | | | |
| 4 | Conventional-Dermacor | 2.5 | fl oz/cwt | 38 | ab | . | . | 104 | ab | 12 | d-g | 10289 | a |
| | 40 seed/ft sq. | 88 | lb/A | | | | | | | | | | |
| 5 | Conventional-Dermacor | 2.5 | fl oz/cwt | 38 | a | . | . | 105 | ab | 13 | d-g | 9387 | a |
| | 50 seed/ft sq. | 110 | lb/A | | | | | | | | | | |
| 6 | Conventional-No Dermacor | 0 | fl oz/cwt | 33 | de | . | . | 104 | ab | 5.7 | fg | 8796 | a |
| | 10 seed/ft sq. | 22 | lb/A | | | | | | | | | | |
| 7 | Conventional-No Dermacor | 0 | fl oz/cwt | 32 | e | . | . | 104 | ab | 8.7 | efg | 7890 | a |
| | 20 seed/ft sq. | 44 | lb/A | | | | | | | | | | |
| 8 | Conventional-No Dermacor | 0 | fl oz/cwt | 33 | de | . | . | 101 | bc | 13.4 | d-g | 8728 | a |
| | 30 seed/ft sq. | 66 | lb/A | | | | | | | | | | |
| 9 | Conventional-No Dermacor | 0 | fl oz/cwt | 34 | cde | . | . | 100 | cd | 18.7 | cde | 9275 | a |
| | 40 seed/ft sq. | 88 | lb/A | | | | | | | | | | |
| 10 | Conventional-No Dermacor | 0 | fl oz/cwt | 33 | cde | . | . | 100 | cd | 17.1 | c-g | 9747 | a |
| | 50 seed/ft sq. | 110 | lb/A | | | | | | | | | | |
| 11 | Stale-Dermacor | 2.5 | fl oz/cwt | 36 | a-e | . | . | 99 | cd | 9.3 | efg | 10959 | a |
| | 10 seed/ft sq. | 22 | lb/A | | | | | | | | | | |
| 12 | Stale-Dermacor | 2.5 | fl oz/cwt | 36 | a-e | . | . | 98 | cd | 17.7 | c-f | 9542 | a |
| | 20 seed/ft sq. | 44 | lb/A | | | | | | | | | | |
| 13 | Stale-Dermacor | 2.5 | fl oz/cwt | 36 | a-d | . | . | 99 | cd | 25.2 | abc | 9449 | a |
| | 30 seed/ft sq. | 66 | lb/A | | | | | | | | | | |
| 14 | Stale-Dermacor | 2.5 | fl oz/cwt | 37 | abc | . | . | 98 | cd | 26.2 | abc | 10417 | a |
| | 40 seed/ft sq. | 88 | lb/A | | | | | | | | | | |
| 15 | Stale-Dermacor | 2.5 | fl oz/cwt | 36 | a-d | . | . | 98 | cd | 31.5 | ab | 8661 | a |
| | 50 seed/ft sq. | 110 | lb/A | | | | | | | | | | |
| 16 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | b-e | . | . | 99 | cd | 9.8 | efg | 8339 | a |
| | 10 seed/ft sq. | 22 | lb/A | | | | | | | | | | |
| 17 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | a-e | 5 | 3 | 98 | cd | 15.9 | c-g | 9773 | a |
| | 20 seed/ft sq. | 44 | lb/A | | | | | | | | | | |
| 18 | Stale-No Dermacor | 0 | fl oz/cwt | 33 | cde | 25 | 3 | 97 | cd | 23.1 | bcd | 8036 | a |
| | 30 seed/ft sq. | 66 | lb/A | | | | | | | | | | |
| 19 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | a-e | . | . | 97 | d | 26.1 | abc | 8330 | a |
| | 40 seed/ft sq. | 88 | lb/A | | | | | | | | | | |
| 20 | Stale-No Dermacor | 0 | fl oz/cwt | 33 | cde | . | . | 97 | cd | 35.3 | a | 9124 | a |
| | 50 seed/ft sq. | 110 | lb/A | | | | | | | | | | |
| LSD (P=.05) | | | | 2.34 | | . | . | 2.5 | | 7.21 | | 2305.5 | |
| Standard Deviation | | | | 1.42 | | . | . | 1.8 | | 5.1 | | 1630.2 | |
| CV | | | | 4.02 | | . | . | 1.74 | | 30.79 | | 17.62 | |
| Replicate F | | | | 1.603 | | | | 4.102 | | 2.038 | | 0.178 | |
| Replicate Prob(F) | | | | 0.2145 | | | | 0.0105 | | 0.1187 | | 0.9106 | |
| Treatment F | | | | 6.324 | | | | 13.173 | | 11.839 | | 0.998 | |
| Treatment Prob(F) | | | | 0.0001 | | | | 0.0001 | | 0.0001 | | 0.4774 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 16. Evaluation of tillage, seeding rate, and Dermacor X100 on rice water weevil population and grain yield of Jupiter rice (RRS-South Unit).

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | | | Rice | | Rice | | Rice | | Rice | |
| Rating Date | | | | 8/19/08 | | | | 5/5/08 | | 8/22/08 | |
| Rating Type | | | | Height | | 50% Head | | Stand Count | | Yield | |
| Rating Unit | | | | in | | days | | pl/sq ft | | lb/A | |
| Crop Stage Majority | | | | Main | | Main | | Main | | Main | |
| Trt No. | Treatment Name | Rate | Rate Unit | | | | | | | | |
| 1 | Conventional-Dermacor | 2.5 | fl oz/cwt | 37 | abc | 105 | a | 4.8 | g | 9095 | cde |
| | 10 seed/ft sq. | 26 | lb/A | | | | | | | | |
| 2 | Conventional-Dermacor | 2.5 | fl oz/cwt | 40 | a | 104 | a | 8.7 | efg | 9945 | a-d |
| | 20 seed/ft sq. | 52 | lb/A | | | | | | | | |
| 3 | Conventional-Dermacor | 2.5 | fl oz/cwt | 38 | a | 104 | abc | 10.3 | d-g | 10416 | ab |
| | 30 seed/ft sq. | 78 | lb/A | | | | | | | | |
| 4 | Conventional-Dermacor | 2.5 | fl oz/cwt | 39 | a | 103 | abc | 11.5 | d-g | 11235 | a |
| | 40 seed/ft sq. | 104 | lb/A | | | | | | | | |
| 5 | Conventional-Dermacor | 2.5 | fl oz/cwt | 37 | a-d | 103 | abc | 12.5 | def | 10876 | ab |
| | 50 seed/ft sq. | 130 | lb/A | | | | | | | | |
| 6 | Conventional-No Dermacor | 0 | fl oz/cwt | 35 | bcd | 105 | a | 5.3 | g | 6242 | h |
| | 10 seed/ft sq. | 26 | lb/A | | | | | | | | |
| 7 | Conventional-No Dermacor | 0 | fl oz/cwt | 34 | bcd | 104 | ab | 8.7 | efg | 7315 | fgh |
| | 20 seed/ft sq. | 52 | lb/A | | | | | | | | |
| 8 | Conventional-No Dermacor | 0 | fl oz/cwt | 35 | bcd | 103 | abc | 6 | fg | 8386 | ef |
| | 30 seed/ft sq. | 78 | lb/A | | | | | | | | |
| 9 | Conventional-No Dermacor | 0 | fl oz/cwt | 34 | bcd | 103 | abc | 13.5 | cde | 8499 | ef |
| | 40 seed/ft sq. | 104 | lb/A | | | | | | | | |
| 10 | Conventional-No Dermacor | 0 | fl oz/cwt | 33 | d | 102 | cd | 16.1 | a-d | 8277 | ef |
| | 50 seed/ft sq. | 130 | lb/A | | | | | | | | |
| 11 | Stale-Dermacor | 2.5 | fl oz/cwt | 38 | a | 102 | bcd | 10.1 | d-g | 9816 | bcd |
| | 10 seed/ft sq. | 26 | lb/A | | | | | | | | |
| 12 | Stale-Dermacor | 2.5 | fl oz/cwt | 38 | ab | 99 | e | 14.6 | b-e | 10226 | abc |
| | 20 seed/ft sq. | 52 | lb/A | | | | | | | | |
| 13 | Stale-Dermacor | 2.5 | fl oz/cwt | 38 | a | 99 | e | 19.5 | abc | 11350 | a |
| | 30 seed/ft sq. | 78 | lb/A | | | | | | | | |
| 14 | Stale-Dermacor | 2.5 | fl oz/cwt | 38 | ab | 99 | e | 16.6 | a-d | 11039 | ab |
| | 40 seed/ft sq. | 104 | lb/A | | | | | | | | |
| 15 | Stale-Dermacor | 2.5 | fl oz/cwt | 37 | a-d | 99 | e | 21.8 | a | 11210 | a |
| | 50 seed/ft sq. | 130 | lb/A | | | | | | | | |
| 16 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | bcd | 100 | de | 9.1 | efg | 7046 | gh |
| | 10 seed/ft sq. | 26 | lb/A | | | | | | | | |
| 17 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | cd | 100 | de | 12.9 | de | 7703 | efg |
| | 20 seed/ft sq. | 52 | lb/A | | | | | | | | |
| 18 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | cd | 99 | e | 20.1 | ab | 8695 | de |
| | 30 seed/ft sq. | 78 | lb/A | | | | | | | | |
| 19 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | bcd | 98 | e | 19.7 | abc | 8733 | de |
| | 40 seed/ft sq. | 104 | lb/A | | | | | | | | |
| 20 | Stale-No Dermacor | 0 | fl oz/cwt | 34 | bcd | 98 | e | 21.1 | a | 9039 | cde |
| | 50 seed/ft sq. | 130 | lb/A | | | | | | | | |
| LSD (P=.05) | | | | 2.15 | | 1.6 | | 4.24 | | 891.5 | |
| Standard Deviation | | | | 1.3 | | 1.1 | | 3 | | 630.4 | |
| CV | | | | 3.61 | | 1.1 | | 22.8 | | 6.81 | |
| Replicate F | | | | 3.214 | | 20.421 | | 6.076 | | 1.119 | |
| Replicate Prob(F) | | | | 0.0513 | | 0.0001 | | 0.0012 | | 0.3493 | |
| Treatment F | | | | 8.117 | | 18.163 | | 12.89 | | 23.361 | |
| Treatment Prob(F) | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.0001 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## ROTATIONAL CROP RESEARCH

D.L. Harrell, J.P. Leonards, R.P. Regan, and D.M. Walker

A trial was conducted to evaluate the agronomic effects of seedbed selection in soybean production in southwest Louisiana. Two seedbed treatments, raised and flat, were evaluated. One Group IV and four Group V Roundup-ready soybean varieties were included in the trial. Actual varieties were 95M30, DG5555RR, DK4753, DPL5634, and TV55R15. When data were pooled across all varieties, raised seedbeds significantly increased grain yields by 2.4 bu/A. Plant populations at V2 were increased by 1.3 plants per linear row foot when data were pooled across all varieties. Plants in raised seedbeds were also taller at maturity by 2.2 inches.

A trial was conducted to evaluate four sweet sorghum varieties for their potential as a biofuel source for southwest Louisiana. Their ratoon potential and nitrogen (N) fertilizer response were evaluated also. An estimate of fermentable soluble solids indicated that the M-81E variety provided the greatest potential for ethanol production in the 2008 trial. Results of the fermentable solids estimate were as follows: M-81E (3.1 ton/A), Topper76-6 (2.7 ton/A), Dale (2.1 ton/A), and Theis (1.5 ton/A). Fermentable solids produced from the ratoon crop ranged from 0.46 to 0.75 ton/A. A ratoon fermentable solid yield response to N fertilization was not observed when data were pooled across all varieties.

A trial was initiated in 2008 to evaluate fungicide efficiency on various grain sorghum hybrids in southwest Louisiana. Four grain sorghum hybrids (DG780B, TV93S72, DG758B, and P84G62) and three fungicide treatments (Headline @ 6 oz/A, Quilt @ 14 oz/A, Stratego @ 10 oz/A, and no fungicide) were evaluated. Leaf disease ratings (1 – 9; where 1 is fairly disease free and 9 is very high disease pressure) were taken near physiological maturity. A significant ($P$ = 0.001; LSD = 0.5) reduction in leaf disease over the check was observed for the Headline and Quilt treatments. When data were pooled across all hybrids, mean leaf scores were 2.1, 3.9, 4.1, and 4.4 for the Headline, Quilt, Stratego, and check treatments, respectively. However, grain yields were not increased over the non-treated plots when data were pooled across all hybrids.

Separate variety trials were conducted for Group III, IV, V, and IV soybeans. Data are not included in this text, however, it can be found online at www.lsuagcenter.com. Variety HKB R3824 had the highest yield at the Rice Research Station at 42 bu/A. Group IV varieties USG 74F96 and Progeny 4908RR had the highest 2008 yield averages at 68 and 87 bu/A, respectively. Dyna-Gro DG 32B57 had the highest 2008 yields of the Group V varieties at 48 bu/A at the Rice Research Station location.

Twenty-six grain sorghum varieties were tested in 2008. Data are not included in this text; however, it can be found online at www.lsuagcenter.com. The highest yielding grain sorghum variety at the Rice Research Station location was Dekalb DKS53-67 at 6,530 lb/A.

Fifty-five wheat varieties and experimentals were tested in 2008. The highest yielding wheat entry at the Rice Research Station location was LA98214D-14-1-2 at 83.6 bu/A.

**Evaluation of Flat vs. Raised Seedbeds for Mid-Group V and Late Group IV Soybeans**

**Experiment number** ..........................: 08-CS-09 (Flat vs. Raised Seedbed)

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (South Farm)
- **Tillage type**.................................: Spring Stale
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**.......................................: 10 x 30 ft
- **Row width/rows per plot**............: 30 in / 4

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**........................: 2.666
- **pH**.................................................: 5.38
- **Extractable nutrients** ppm..........: Ca-1242, Cu-1.46, Mg-269.2, P-62.8, K-153, Na-30.5, S-12.2, Zn-3.8

**Crop/Variety** ......................................: Soybeans / Multiple
- **Planting method/date** .................: Drill seeded / May 8, 2008
- **Seeding rate/depth**......................: 7 seeds/ft$^2$ / 1 in
- **Emergence date**...........................: May 14, 2008
- **Harvest date** ................................: October 13, 2008

**Fertilization**........................................: 275 lb/A 0-24-24, April 17, 2008

**Water management** ...........................:
- **Flush** ............................................: NA
- **Flood** ............................................: NA
- **Drain**............................................: NA

**Pest management**...............................:
- **Herbicides**....................................: 1.5 qt/A Glyphosate + .75 oz/A Classic, May 20
  1.5 qt/A Glyphosate + .5 oz/A Classic, June 17
  1.5 qt/A Glyphosate, July 17
- **Insecticides** ..................................: 4 oz/A Mustang Max, July 31
- **Fungicides** ...................................: 10 oz/A Stratego, July 17

Table 1. Evaluation of flat vs. raised seedbeds for mid-Group V and late Group IV soybeans.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crop Name | | Soybeans | | Soybeans | | Soybeans | | Soybeans | | Soybeans | | Soybeans | |
| Rating Date | | 5/22/08 | | 10/13/08 | | 10/13/08 | | 10/13/08 | | | | 10/13/08 | |
| Rating Type | | Stand Cnt. | | Stand Cnt. | | Height | | Lodging | | Maturity | | Yield | |
| Rating Unit | | plants | | plants | | in | | rate 1-5 | | days | | bushel/A | |
| Sample Size, Unit | | row ft | | row ft | | | | | | | | | |
| Crop Stage Majority | | V2 | | R8 | | Maturity | | | | R8 | | | |
| Trt No. | Treatment Name | | | | | | | | | | | | |
| 1 | 95M30 Flat Seedbed | 5.2 | a | 4.6 | ab | 19 | bc | 2 | ab | 140 | bc | 47 | a |
| 2 | 95M30 Raised Seedbed | 5.8 | a | 5 | a | 21 | abc | 1 | ab | 142 | b | 46 | a |
| 3 | DG5555RR Flat Seedbed | 2.1 | b | 2.3 | c | 19 | c | 1 | b | 149 | a | 42 | a |
| 4 | DG5555RR Raised Seedbed | 4.7 | a | 3.7 | abc | 22 | abc | 1 | ab | 149 | a | 50 | a |
| 5 | DK4753 Flat Seedbed | 3.6 | ab | 3.1 | bc | 24 | abc | 3 | ab | 125 | d | 40 | a |
| 6 | DK4753 Raised Seedbed | 5.2 | a | 4.2 | ab | 25 | ab | 3 | ab | 125 | d | 43 | a |
| 7 | DPL5634 Flat Seedbed | 3.9 | ab | 3.8 | abc | 22 | abc | 3 | a | 137 | c | 51 | a |
| 8 | DPL5634 Raised Seedbed | 4.1 | ab | 3.8 | abc | 25 | a | 3 | a | 138 | c | 51 | a |
| 9 | TV55R15 Flat Seedbed | 4.4 | ab | 4.3 | ab | 21 | abc | 2 | ab | 148 | a | 52 | a |
| 10 | TV55R15 Raised Seedbed | 6.1 | a | 4.4 | ab | 23 | abc | 2 | ab | 149 | a | 52 | a |
| LSD (P=.05) | | 1.65 | | 1.12 | | 3.71 | | 1.36 | | 3.4 | | 10.84 | |
| Standard Deviation | | 1.14 | | 0.77 | | 2.56 | | 0.94 | | 2.3 | | 7.47 | |
| CV | | 25.22 | | 19.65 | | 11.56 | | 48.75 | | 1.65 | | 15.82 | |
| Replicate F | | 0.362 | | 0.276 | | 1.644 | | 0.558 | | 1.565 | | 2.883 | |
| Replicate Prob(F) | | 0.781 | | 0.8425 | | 0.202 | | 0.647 | | 0.2207 | | 0.054 | |
| Treatment F | | 4.162 | | 4.147 | | 3.252 | | 2.968 | | 62.044 | | 1.474 | |
| Treatment Prob(F) | | 0.0019 | | 0.0025 | | 0.008 | | 0.013 | | 0.0001 | | 0.207 | |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Sweet Sorghum Ratoon Crop Potential as Affected by Post Harvest N Fertilization**

**Experiment number** ..........................: 08-CS-10 Sweet Sorghum

**Site and design** ...................................:
- **Location/Cooperator**..................: Rice Research Station (South Farm)
- **Tillage type**..................................: Conventional
- **Experimental design**...................: Randomized complete block
- **Number of reps**...........................: 4
- **Plot size**........................................: 10 x 30 ft
- **Row width/rows per plot**............: 30 in / 4

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**........................: 2.638
- **pH**..................................................: 5.3
- **Extractable nutrients** ppm..........: Ca-957, Cu-1.45, Mg-243.4, P-29.8, K-93.5, Na-40.6, S-9.6, Zn-7.08

**Crop/Variety** ......................................: Sweet Sorghum / Multiple
- **Planting method/date** .................: Drill seeded / March 28, 2008
- **Seeding rate/depth**......................: 1.5 lb/A / .25 in
- **Emergence date**...........................: April 7, 2008
- **Harvest date** ................................: Dale & Theis, July 25, 2008
  M81E & Topper, August 11, 2008
- **Ratoon Harvest date…………….:** ALL, November 20, 2008

**Fertilization**........................................: 200 lb/A 8-24-24, April 21, 2008
90 lb N/A 46-0-0, May 6, 2008

**Water management** ...........................:
- **Flush** ............................................: NA
- **Flood**............................................: NA
- **Drain**............................................: NA

**Pest management**...............................:
- **Herbicides**....................................: 2 qt/A Atrazine, April 11
  .5 lb/A Facet, May 6
  .75 lb/A Facet, July 30 **–** Dale & Theis
  .75 lb/A Facet, August 12 – M81E & Topper
- **Insecticides**..................................: None
- **Fungicides** ...................................: None

Table 2. Evaluation of four sweet sorghum varieties ratoon crop potential as affected by post harvest N fertilization (RRS-South Unit).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | | | | | | | | |
| Rating Type | | | | | Stand count | Whole Plant | Defol Plant | Height | Sol. Solids | Stand Count | Biomass | Biomass | Ferm. Solid |
| Rating Unit | | | | | number | pounds | pounds | in | BRIX | stalks/A | (total) | (stalk) | |
| Sample Size, Unit | | | | | 10'row | 10'row | 10'row | | (w/w) | | ton/A | ton/A | ton/A |
| Crop Stage Majority | | | | | 1st crop | 1st crop | 1st crop | 1st crop | 1st crop | 1st crop | 1st crop | 1st crop | 1st crop |
| Crop Stage Scale | | | | | harvest | harvest | harvest | harvest | harvest | harvest | harvest | harvest | harvest |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | |
| 1 | Dale | | | | 15.5 a-e | 18.5 def | 14.6 def | 119 b | 18.23 ab | 27007 a-e | 16 def | 13 def | 2.1 c-f |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 2 | Dale | | | | 18.3 a-d | 21.3 c-f | 16.9 c-f | 124 b | 18.38 ab | 31799 a-d | 19 c-f | 15 c-f | 2.4 a-e |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 3 | Dale | | | | 16.5 a-e | 16.2 ef | 12.5 ef | 121 b | 18.6 a | 28750 a-e | 14 ef | 11 ef | 1.8 def |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 4 | Dale | | | | 18.8 a-d | 19.2 def | 14.6 def | 118 b | 18.15 ab | 32670 a-d | 17 def | 13 def | 2.1 c-f |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 5 | M-81E | | | | 12.5 b-e | 25 a-e | 20.2 a-e | 146 a | 17.02 ab | 21761 b-e | 22 a-e | 18 a-e | 2.7 a-d |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 6 | M-81E | | | | 15.5 a-e | 29.1 abc | 23.1 abc | 147 a | 16.55 ab | 27007 a-e | 25 abc | 20 abc | 3 abc |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 7 | M-81E | | | | 20 abc | 33.3 a | 26.6 a | 143 a | 16.63 ab | 34848 abc | 29 a | 23 a | 3.4 a |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 8 | M-81E | | | | 18 a-d | 32.5 ab | 25.6 ab | 144 a | 16.7 ab | 31363 a-d | 28 ab | 22 ab | 3.3 ab |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 9 | Theis | | | | 9.5 de | 15.7 ef | 12.2 f | 117 b | 16.4 ab | 16553 de | 14 ef | 11 f | 1.5 ef |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 10 | Theis | | | | 9.3 de | 13.7 f | 10.3 f | 116 b | 16.68 ab | 16117 de | 12 f | 9 f | 1.3 f |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 11 | Theis | | | | 8.3 e | 14 f | 10.8 f | 116 b | 16.13 b | 14375 e | 12 f | 9 f | 1.4 f |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 12 | Theis | | | | 10.8 cde | 17.1 ef | 13.2 ef | 119 b | 16.08 b | 18731 cde | 15 ef | 12 ef | 1.7 ef |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 13 | Topper 76-6 | | | | 21.3 ab | 27.9 a-d | 22 a-d | 119 b | 17.53 ab | 37026 ab | 24 a-d | 19 a-d | 3 abc |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 14 | Topper 76-6 | | | | 18.8 a-d | 23.5 b-f | 18.4 b-f | 121 b | 17.48 ab | 32670 a-d | 20 b-f | 16 b-f | 2.5 a-e |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 15 | Topper 76-6 | | | | 15 a-e | 23.5 b-f | 18.2 b-f | 122 b | 16.48 ab | 26136 a-e | 20 b-f | 16 b-f | 2.3 b-f |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 16 | Topper 76-6 | | | | 23.8 a | 29.2 abc | 22.6 abc | 124 b | 17.55 ab | 41382 a | 25 abc | 20 abc | 3.1 ab |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| LSD (P=.05) | | | | | 5.81 | 6.16 | 4.96 | 11.32 | 1.297 | 10126.2 | 5.4 | 4.3 | 0.64 |
| Standard Deviation | | | | | 4.07 | 4.31 | 3.47 | 7.92 | 0.907 | 7085.9 | 3.8 | 3 | 0.45 |
| CV | | | | | 25.87 | 19.18 | 19.72 | 6.3 | 5.29 | 25.87 | 19.18 | 19.72 | 19.03 |
| Replicate F | | | | | 1.959 | 8.424 | 8.895 | 5.076 | 7.121 | 1.959 | 8.424 | 8.895 | 4.952 |
| Replicate Prob(F) | | | | | 0.1341 | 0.0002 | 0.0001 | 0.004 | 0.0005 | 0.1341 | 0.0002 | 0.0001 | 0.0048 |
| Treatment F | | | | | 5.096 | 9.112 | 9.297 | 8.561 | 3.391 | 5.096 | 9.112 | 9.297 | 9.451 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0001 | 1E-04 | 0.0008 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Continued.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Date | | | | | | 11/20/08 | 11/20/08 | | | | | | |
| Rating Type | | | | | Ratoon Head | Stand count | Whole plant | Defol Plant | Height | Sol. Solids | Biomass | Biomass | Ferm. Solid |
| Rating Unit | | | | | J-Date | pl/10' | lb/10' | lb/10' | in | BRIX | (total) | (stalk) | |
| Sample Size, Unit | | | | | | 10'row | 10'row | 10'row | | (w/w) | ton/A | ton/A | ton/A |
| Crop Stage Majority | | | | | | | | | | | | | |
| Crop Stage Scale | | | | | | Ratoon | Ratoon | Ratoon | Ratoon | Ratoon | Ratoon | Ratoon | Ratoon |
| Trt No. | Treatment Name | Rate | Rate Unit | Growth Stage | | | | | | | | | |
| 1 | Dale | | | | 273 e | 14.3 cd | 5.87 d | 4.44 c | 102 ab | 12.88 ab | 5.1 d | 3.9 c | 0.45 ab |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 2 | Dale | | | | 273 e | 15.8 bcd | 7.26 cd | 5.895 abc | 107.5 ab | 11.93 ab | 6.3 cd | 5.1 abc | 0.55 ab |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 3 | Dale | | | | 273 e | 13.8 cd | 5.69 d | 4.445 c | 100.8 ab | 11.5 ab | 5 d | 3.9 c | 0.39 b |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 4 | Dale | | | | 273 e | 13 d | 6.22 d | 5.08 bc | 101.5 ab | 11.2 b | 5.4 d | 4.4 bc | 0.45 ab |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 5 | M-81E | | | | 294.8 bc | 19.8 a-d | 8.4 a-d | 5.535 abc | 92.3 b | 12.98 ab | 7.3 a-d | 4.8 abc | 0.56 ab |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 6 | M-81E | | | | 293.5 bc | 21.8 abc | 12.495 ab | 8.55 ab | 101.3 ab | 12.9 ab | 10.9 ab | 7.4 ab | 0.86 a |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 7 | M-81E | | | | 292 c | 24.8 a | 13.32 a | 9.16 a | 100.8 ab | 11.75 ab | 11.6 a | 8 a | 0.84 ab |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 8 | M-81E | | | | 292 c | 24 a | 12.15 abc | 8 abc | 96.8 b | 12.15 ab | 10.6 abc | 7 abc | 0.75 ab |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 9 | Theis | | | | 279.3 d | 14.3 cd | 7.53 bcd | 5.975 abc | 107 ab | 12.28 ab | 6.6 bcd | 5.2 abc | 0.59 ab |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 10 | Theis | | | | 280 d | 13.3 d | 9.055 a-d | 7.3 abc | 114.8 a | 11.48 ab | 7.9 a-d | 6.4 abc | 0.67 ab |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 11 | Theis | | | | 280 d | 17.5 a-d | 9.535 a-d | 7.435 abc | 107 ab | 11.13 b | 8.3 a-d | 6.5 abc | 0.65 ab |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 12 | Theis | | | | 280 d | 18 a-d | 11.58 abc | 9.24 a | 114.3 a | 12.15 ab | 10.1 abc | 8 a | 0.87 a |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| 13 | Topper 76-6 | | | | 298.5 a | 22.8 ab | 9.085 a-d | 5.645 abc | 75 c | 13.78 a | 7.9 a-d | 4.9 abc | 0.61 ab |
| | Urea | 0 | lb ai/A | Post Har | | | | | | | | | |
| 14 | Topper 76-6 | | | | 296 ab | 19.8 a-d | 9.375 a-d | 5.92 abc | 76.5 c | 13.23 ab | 8.2 a-d | 5.2 abc | 0.62 ab |
| | Urea | 45 | lb ai/A | Post Har | | | | | | | | | |
| 15 | Topper 76-6 | | | | 294 bc | 19.5 a-d | 9.275 a-d | 5.96 abc | 78 c | 13.25 ab | 8.1 a-d | 5.2 abc | 0.62 ab |
| | Urea | 90 | lb ai/A | Post Har | | | | | | | | | |
| 16 | Topper 76-6 | | | | 294 bc | 19 a-d | 9.775 a-d | 6.11 abc | 67.3 c | 12.53 ab | 8.5 a-d | 5.3 abc | 0.6 ab |
| | Urea | 135 | lb ai/A | Post Har | | | | | | | | | |
| LSD (P=.05) | | | | | 2.51 | 4.96 | 3.0547 | 2.3379 | 10.33 | 1.323 | 2.66 | 2.04 | 0.255 |
| Standard Deviation | | | | | 1.76 | 3.47 | 2.1376 | 1.636 | 7.23 | 0.926 | 1.86 | 1.43 | 0.178 |
| CV | | | | | 0.62 | 19.07 | 23.33 | 25 | 7.5 | 7.52 | 23.33 | 25 | 28.25 |
| Replicate F | | | | | 1.781 | 1.666 | 3.963 | 2.741 | 4.647 | 4.708 | 3.963 | 2.741 | 1.386 |
| Replicate Prob(F) | | | | | 0.1644 | 0.1878 | 0.0137 | 0.0542 | 0.0065 | 0.0061 | 0.0137 | 0.0542 | 0.259 |
| Treatment F | | | | | 121.93 | 5.011 | 4.796 | 3.596 | 16.242 | 2.963 | 4.796 | 3.595 | 2.592 |
| Treatment Prob(F) | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0004 | 0.0001 | 0.0025 | 0.0001 | 0.0004 | 0.007 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Fungicide Efficiency on Grain Sorghum Hybrids**

**Experiment number** ..........................: 2008 Grain Sorghum Fungicide Trial

**Site and design** ..................................:
- **Location/Cooperator** ..................: Rice Research Station (South Farm)
- **Tillage type**..................................: Conventional
- **Experimental design**...................: Randomized complete block
- **Number of reps** ...........................: 4
- **Plot size**........................................: 10 x 30 ft
- **Row width/rows per plot**............: 30 in / 4

**Soil type** ..............................................: Crowley silt loam
- **% organic matter**........................: 2.638
- **pH**.................................................: 5.3
- **Extractable nutrients** ppm..........: Ca-957, Cu-1.45, Mg-243.4, P-29.8, K-93.5, Na-40.6, S-9.6, Zn-7.08

**Crop/Variety** ......................................: Grain Sorghum / Multiple
- **Planting method/date** .................: Drill seeded / May 2, 2008
- **Seeding rate/depth**......................: seeds/$ft^2$ / .75 in
- **Emergence date**...........................: May 8, 2008
- **Harvest date** ................................: August 23

**Fertilization**........................................: 200 lb/A 8-24-24, May 6, 2008
90 lb N/A 46-0-0, May 27, 2008

**Water management** ...........................:
- **Flush** ............................................: NA
- **Flood** ............................................: NA
- **Drain**.............................................: NA

**Pest management**...............................:
- **Herbicides**....................................: 2 qt/A Atrazine, May 5
.5 lb/A Facet + .5 oz/A Permit + 1 qt/A Crop oil, May 20
- **Insecticides** ..................................: None
- **Fungicides** ...................................: See Data Sheet

Table 3. Evaluation of fungicide efficiency on grain sorghum hybrids (RRS-South Unit).

| Part Rated / Rating Data Type / Rating Unit / Crop Stage | | | | 50% HD days | Leaf Disease rate 0-9 | F-Leaf height cm | Head base ht. cm | Head top ht. cm | Head type 1-5 | Head bird dmg % | Head count 2 row | Yield lb/A @14% | Test wt. lb/bu | Head count #/A | Head weight lb | Seed weight g/100 | Seed per head #/head |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trt No | Trt. Name | Rt. | Rate Unit | | | | | | | | | | | | | | |
| 1 | DG780B Headline | 6 | oz/A | 68 a-d | 2 fg | 119 a | 124 a | 148 a | 2 e | 8 c | 201 a | 6413 ab | 56.4 a | 29185 a | 0.24 ab | 2.42 a | 4625 a |
| 2 | DG780B Quilt | 14 | oz/A | 68 ab | 2 ef | 120 a | 126 a | 148 a | 2 e | 9 c | 179 a | 6503 a | 55.1 a | 25918 a | 0.30 ab | 2.54 a | 5159 a |
| 3 | DG780B Stratego | 10 | oz/A | 69 a | 3 de | 119 a | 124 a | 148 a | 2 e | 9 c | 185 a | 5437 abc | 55.0 a | 26789 a | 0.22 ab | 2.83 a | 4159 a |
| 4 | DG780B No Fung | | | 68 abc | 3 d | 123 a | 132 a | 154 a | 2 e | 8 c | 196 a | 6382 ab | 55.2 a | 28387 a | 0.24 ab | 2.62 a | 4100 a |
| 5 | TV93S72 Headline | 6 | oz/A | 62 ef | 4 d | 89 b | 108 b | 129 b | 4 abc | 18 ab | 177 a | 6786 a | 54.8 a | 25700 a | 0.27 ab | 2.75 a | 4487 a |
| 6 | TV93S72 Quilt | 14 | oz/A | 61 f | 7 ab | 89 b | 111 b | 133 b | 4 abc | 19 ab | 183 a | 6029 ab | 54.8 a | 26499 a | 0.23 ab | 2.72 a | 3961 a |
| 7 | TV93S72 Stratego | 10 | oz/A | 64 ef | 7 a | 92 b | 106 b | 132 b | 5 ab | 19 ab | 171 a | 4296 c | 55.4 a | 24793 a | 0.18 ab | 2.75 a | 2956 a |
| 8 | TV93S72 No Fung | | | 62 ef | 7 a | 91 b | 106 b | 131 b | 5 a | 21 a | 191 a | 6255 ab | 55.3 a | 27661 a | 0.24 ab | 2.70 a | 4002 a |
| 9 | DG758B Headline | 6 | oz/A | 64 ef | 0 g | 94 b | 102 b | 131 b | 3 d | 14 b | 164 a | 6705 a | 54.9 a | 23740 a | 0.31 a | 2.81 a | 4971 a |
| 10 | DG758B Quilt | 14 | oz/A | 64 def | 1 fg | 93 b | 100 b | 127 b | 3 d | 14 b | 178 a | 6087 ab | 54.8 a | 25809 a | 0.26 ab | 2.77 a | 4258 a |
| 11 | DG758B Stratego | 10 | oz/A | 63 ef | 1 fg | 94 b | 102 b | 130 b | 3 d | 15 b | 182 a | 4680 bc | 53.8 a | 26354 a | 0.19 ab | 2.96 a | 2841 a |
| 12 | DG758B No Fung | | | 64 ef | 1 fg | 98 b | 107 b | 134 b | 3 d | 16 ab | 176 a | 6415 ab | 56.5 a | 25592 a | 0.26 ab | 2.42 a | 4748 a |
| 13 | P84G62 Headline | 6 | oz/A | 65 b-e | 3 de | 101 b | 104 b | 133 b | 3 d | 16 ab | 213 a | 6816 a | 55.4 a | 30928 a | 0.25 ab | 2.82 a | 4077 a |
| 14 | P84G62 Quilt | 14 | oz/A | 65 a-e | 6 bc | 98 b | 101 b | 130 b | 4 cd | 16 ab | 193 a | 5428 abc | 54.1 a | 27987 a | 0.20 ab | 2.75 a | 3303 a |
| 15 | P84G62 Stratego | 10 | oz/A | 66 a-e | 6 c | 97 b | 101 b | 130 b | 4 bcd | 20 ab | 199 a | 4377 c | 54.2 a | 28822 a | 0.17 b | 2.79 a | 2750 a |
| 16 | P84G62 No Fung | | | 65 c-f | 6 bc | 96 b | 101 b | 130 b | 4 bcd | 19 ab | 215 a | 6578 a | 55.5 a | 31218 a | 0.22 ab | 2.54 a | 3906 a |
| LSD (P=.05) | | | | 2.38 | 0.94 | 7.26 | 8.68 | 7.37 | 0.65 | 3.74 | 31.27 | 1104.9 | 1.708 | 4540.1 | 0.0808 | 0.353 | 1455.5 |
| Standard Deviation | | | | 1.67 | 0.66 | 5.08 | 6.08 | 5.16 | 0.45 | 2.62 | 21.88 | 773.16 | 1.195 | 3177.0 | 0.0565 | 0.247 | 1018.5 |
| CV | | | | 2.57 | 18.06 | 5.04 | 5.55 | 3.82 | 13.85 | 17.54 | 11.68 | 13 | 2.17 | 11.68 | 24.04 | 9.15 | 25.34 |
| Replicate F | | | | 62.477 | 2.157 | 4.873 | 7.217 | 6.283 | 1.706 | 13.289 | 60.96 | 0.363 | 2.344 | 60.965 | 23.905 | 0.379 | 21.631 |
| Replicate Prob(F) | | | | 0.0001 | 0.1063 | 0.005 | 5E-04 | 0.001 | 0.179 | 0.0001 | 1E-04 | 0.7801 | 0.087 | 0.0001 | 0.0001 | 0.769 | 0.0001 |
| Treatment F | | | | 7.949 | 53.434 | 21.91 | 12.42 | 11.15 | 23.55 | 12.103 | 1.754 | 4.824 | 1.499 | 1.754 | 2.025 | 1.505 | 2.074 |
| Treatment Prob(F) | | | | 0.0001 | 0.0001 | 1E-04 | 1E-04 | 1E-04 | 1E-04 | 0.0001 | 0.074 | 0.0001 | 0.15 | 0.0738 | 0.0347 | 0.15 | 0.0335 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

# FOUNDATION SEED RICE PROGRAM

Lawrence M. White III

## INTRODUCTION

Foundation seed rice has been produced by the LSU AgCenter's Rice Research Station for distribution to Louisiana farmers since 1949. The Rice Research Station's seed rice program was instituted in response to the critical shortage of pure planting stocks that existed during and after World War II. Since its inception, the program has made available to Louisiana growers more than 159,000 cwt. of pedigreed stock of 39 rice varieties.

Concurrent with the distribution of pure seed by the Rice Research Station, an industry was developed in Louisiana composed of independent seed dealers through whom farmers could conduct trade in registered and certified classes of pedigreed rice.

Foundation seed rice, the planting stock from which registered and certified seed are produced, is the farmer's link with the work of the plant breeder. It is the product of hybridization and successive generations of selection and testing to establish its value as crop seed and eventually as a commercial commodity. For this reason, foundation seed and the basic stocks from which it is produced must be grown and conditioned in a manner that will ensure that viability is maintained and that it be genetically pure and free from mechanical mixtures or contamination by noxious weeds.

Through the Rice Research Station's seed program, Louisiana farmers may obtain seed rice of improved varieties developed through the Rice Research Station's breeding program and of established commercial varieties originating either at Crowley or at research centers in neighboring states.

To fulfill the objectives of the seed program, the Rice Research Station uses the personnel, land, machinery, and other facilities needed to plant, harvest, condition, and store its annual seed rice crop. The production of breeder seed, planting stock for the foundation fields, and the maintenance of purity in commercial rice varieties are functions of the seed program. Breeder seed is sometimes grown within fields of foundation rice or in a special nursery set aside for propagating the Rice Research Station's seed stocks. The nursery also serves as a site for evaluating, purifying, and increasing selections from the Rice Research Station's breeding program that show promise as new varieties.

The distribution of pedigreed seed rice produced by the Rice Research Station is done according to a formula adopted by the Louisiana Seed Rice Growers Association. For each rice-producing parish, the amount of seed allotted is determined by the percentage of the state's total rice acreage grown in that parish during the previous crop year.

Personnel of the Louisiana Cooperative Extension Service, in cooperation with parish committees of the Seed Rice Growers Association, assist in the allocation of foundation seed rice. It is at the parish committee level that the allocation of seed to individual growers is decided. The county agents receive applications for seed rice from growers and handle information and publicity for the pure seed program.

In this state, the official seed-certifying agency for all crops is the Louisiana Department of Agriculture and Forestry. The rules and regulations pertaining to the certification of agricultural seeds are part of the Louisiana Seed Law. They are formulated by the Louisiana Seed Commission and enforced by the Agronomic Programs Division of the Louisiana Department of Agriculture and Forestry. Personnel of the Agronomic Programs Division, operating from district offices, conduct field inspections of growing rice and sampling of bagged rice for laboratory analyses, which consist of purity determinations and germination tests.

## PRODUCTION PRACTICES

Each year, the Rice Research Station devotes approximately 80 acres of land to the production of foundation seed rice. To eliminate noxious weeds, especially red rice, that can disqualify rice from certification, the fields are fallowed for a 2-year period preceding planting. This also enables the fields to meet the crop history requirements specified in the seed rice regulations.

Seedbed preparation of foundation fields are performed in the fall. Burndown herbicides are applied prior to seeding. The foundation fields are planted into a stale seedbed by means of a 24-runner minimum tillage drill. The breeder stock is planted at rates that may vary from 10 to 100 lb/A. The rice receives a preflood application of urea in which the rate of N may vary from 45 to 90 lb/A, as well as basic fertilizer applications based on soil test recommendations. A midseason application of N in rates from 21 to 55 lb/A is also applied.

Seedling grasses and weeds are controlled by means of commercially available herbicides applied by airplane or ground rig. Similarly, aerial applications of insecticides are used to protect the fields from outbreaks of harmful insects.

Roguing of the rice fields for the removal of off-types, varietal mixtures, and noxious weeds begins at the onset of heading and continues until the rice is harvested. During this interval, the headed rice is inspected by personnel of the Agronomic Programs Division to determine whether it meets minimum field standards of the certifying agency.

The rice is harvested with a conventional combine and dried in the Rice Research Station's eight 21-foot diameter grain bins, equipped with vented drying floors and centrifugal fans with temperature-controlled heaters. The rice is dried to a moisture level of approximately 12%. During the storage period between drying and cleaning, the rice is treated with an insecticide to protect it from stored-grain insects.

Cleaning of foundation and breeder seed usually commences in late October and continues until late December. The rice first moves through an air-and-screen cleaner that removes chaff, straw, and other foreign material and grades the grain according to width and thickness.

It then flows through three length-grading machines that consist of rotating, indented metal cylinders. The first two remove small grains and broken or dehulled kernels of rice. The third one removes stemmy rice, grains that have very long awns that are attached to portions of the panicle. In the next phase of cleaning, the rice moves through a machine that performs precision grading of the grain by means of rotating perforated cylinders. This machine is designed to separate medium-grain and/or red rice from long-grain rice. It is also capable of removing shriveled and other slender kernels from medium-grain rice.

In the final phase of cleaning, the rice moves through a machine that aspirates the grain, removing any chaff, straw, and other foreign material from the conditioned product.

From the cleaning machines, foundation and breeder seed rice are bagged, assigned lot numbers, and placed in storage in the Rice Research Station's seed rice warehouse where they remain until they are distributed to Louisiana farmers.

The field and laboratory purity standards for foundation seed rice are very strict with regard to varietal mixtures and noxious weeds. In all phases of production, therefore, great care must be exercised to prevent these impurities from contaminating the seed stocks. It is routine procedure at the Rice Research Station to partially disassemble all planting and harvesting equipment and to clean it thoroughly with water and/or compressed air before using it in the field. The dryer and cleaning plant, including all elevators and other conveying equipment, are also subjected to meticulous cleaning and inspection before and after having been used in stubble fields. Therefore, tractors, plows, harrows, and land levelers are carefully washed before they enter land that is in a fallow cycle. These measures, together with the inspection and roguing, which are done during the growing season, help to ensure that foundation seed is genetically pure and free of mechanical mixtures and noxious weed seeds.

## 2008 ACTIVITIES

Of the 2,974 cwt. of foundation seed rice sold in 2008, the varieties and quantities were as follows: Cheniere, 934 cwt.; Catahoula, 904 cwt.; Cocodrie, 377 cwt.; Jupiter, 265 cwt.; Neptune, 237 cwt.; Trenasse, 128 cwt.; Cypress, 70 cwt.; Della, 29 cwt.; Toro-2, 15 cwt.; and Ecrevisse, 15 cwt.

The Rice Research Station's foundation seed crop in 2008 consisted of 21 acres of Catahoula, 12 acres of Cocodrie, 6 acres of Neptune, 6 acres of LA2125 (an experimental long-grain variety), 1 acre of Pirogue, 1 acre of Toro-2, and 1 acre of Dellrose.

Headrows of Catahoula, LA2125, Neptune, Dellrose, Pirogue, Toro-2, and Cocodrie were grown for replenishment of breeder seed stock.

# AQUACULTURE RESEARCH

## ANNUAL SUMMARY OF ENVIRONMENTAL CONDITIONS AND CRAWFISH PRODUCTION

W.R. McClain and J.J. Sonnier

Table 1 contains the average weekly data for environmental conditions and crawfish catch, 2007-2008 season, crawfish research project, Rice Research Station, Crowley, LA. The catch consisted almost exclusively of red swamp crawfish (*Procambarus clarkii*). The production summary is composed of averages across all experimental plots and treatments.

**Pond History**: Ponds were fallow for a period of 11 months following the previous crawfish season of 2005-2006. Rice crops were planted in May and harvested in Aug 2007, and fields were not stocked with brood crawfish. Rather, recruitment was by intentional stocking of hatchlings in the fall of 2007.

**Soil Type**: Crowley silt loam

**Water Source**: Groundwater

**Pond Area**: Twelve 1-acre ponds

**Forage Crops**: Rice, variety 'Cocodrie,' was seeded by air on 3 May 2007 at 100 lb/A. Grain was harvested by a rice combine on 18 Aug 2007, and a ratoon forage crop was managed from the stubble for crawfish production.

**Permanent Flood Date**: 1 Oct 2007

**Trap Type**: 3-funnel pyramid trap; 0.75-inch square mesh wire

**Bait Used**: Manufactured baits: *Cajun World* and *Early On* (Purina Mills, Inc., St. Louis, MO) and Southern Pride (Country Acres Feed, Inc., Brentwood MO)

**Crawfish Harvest**: 16 traps/A, 5 Mar - 23 June 2008 (46 total trapping days, resulting in 736 total trap-sets/A)

**Crawfish Grades**: Harvested crawfish were subjected to a grader (passive, water type) and sorted into three size-grade categories as follows: "Large" - <15 count/lb, "Medium" - 15-21 count/lb, and "Small" - > 21 count/lb.

**Table 1**. Annual environmental conditions and crawfish production (averaged or totaled weekly). Rice Research Station, Crowley, LA. 2007-2008.

| Weeks | Soil Temp.[1] Min. | Soil Temp.[1] Max. | Air Temp. Min. | Air Temp. Max. | Water Temp. Min. | Water Temp. Max. | Avg. D.O.[2] | Total Rainfall | Large Crawfish Count | Crawfish Harvest | Crawfish Size | Total Trapsets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ---deg.F--- | | | | | | (mg/L) | (inches) | (#/trap) | (lb/A) | (cnt/lb) | (#/A) |
| June 1-2 | 73.5 | 82.5 | 68.5 | 85.0 | | | | | | | | |
| June 3-9 | 75.9 | 84.0 | 73.0 | 88.6 | | | | 1.50 | | | | |
| June 10-16 | 79.6 | 89.7 | 73.4 | 92.9 | | | | 2.84 | | | | |
| June 17-23 | 77.1 | 86.6 | 74.3 | 89.7 | | | | 0.80 | | | | |
| June 24-30 | 79.9 | 90.4 | 74.3 | 89.9 | | | | 0.24 | | | | |
| July 1-7 | 78.4 | 84.3 | 74.1 | 87.0 | | | | 3.34 | | | | |
| July 8-14 | 79.9 | 88.9 | 77.7 | 91.3 | | | | 1.09 | | | | |
| July 15-21 | 78.3 | 85.3 | 73.6 | 86.9 | | | | 0.84 | | | | |
| July 22-28 | 78.7 | 90.0 | 71.4 | 88.7 | | | | | | | | |
| July 29-Aug 4 | 78.4 | 87.4 | 74.9 | 89.9 | | | | 4.08 | | | | |
| Aug 5-11 | 83.6 | 94.4 | 77.4 | 94.1 | | | | | | | | |
| Aug 12-18 | 84.6 | 95.4 | 76.6 | 96.6 | | | | 0.96 | | | | |
| Aug 19-25 | 80.1 | 91.3 | 74.7 | 92.6 | | | | 0.94 | | | | |
| Aug 26-Sept 1 | 79.1 | 87.4 | 73.4 | 91.4 | | | | 1.01 | | | | |
| Sept 2-8 | 79.6 | 87.1 | 74.3 | 90.7 | | | | 3.15 | | | | |
| Sept 9-15 | 78.0 | 85.3 | 72.7 | 89.0 | | | | 0.82 | | | | |
| Sept 16-22 | 72.3 | 86.6 | 66.3 | 87.9 | | | | 2.35 | | | | |
| Sept 23-29 | 77.0 | 84.9 | 72.0 | 88.0 | | | | 0.38 | | | | |
| Sept 30-Oct 6 | 76.4 | 88.0 | 67.9 | 88.3 | | | | | | | | |
| Oct 7-13 | 75.3 | 84.6 | 57.8 | 86.7 | 20.2 | 25.4 | .64 | 0.26 | | | | |
| Oct 14-20 | 72.3 | 80.6 | 63.1 | 85.1 | 21.6 | 25.1 | .91 | 1.15 | | | | |
| Oct 21-27 | 62.6 | 71.9 | 52.0 | 75.3 | 16.0 | 20.2 | 2.18 | 0.64 | | | | |
| Oct 28-Nov 3 | 63.4 | 72.4 | 58.0 | 74.9 | 16.9 | 20.4 | 1.96 | | | | | |
| Nov 4-10 | 61.7 | 71.3 | 50.1 | 74.0 | 15.5 | 18.8 | | | | | | |
| Nov 11-17 | 61.6 | 70.0 | 52.1 | 75.3 | 15.8 | 19.1 | | 0.22 | | | | |
| Nov 18-24 | 59.7 | 67.0 | 52.4 | 69.9 | 15.0 | 17.7 | 1.49 | 3.58 | | | | |
| Nov 25-Dec 1 | 52.9 | 60.6 | 44.7 | 64.6 | 12.0 | 14.8 | 3.65 | 3.75 | | | | |
| Dec 2-8 | 54.6 | 64.0 | 43.9 | 70.6 | 12.6 | 16.4 | 3.69 | 0.10 | | | | |
| Dec 9-15 | 65.9 | 71.0 | 62.9 | 76.0 | 17.9 | 20.5 | .77 | | | | | |
| Dec 16-22 | 52.7 | 62.3 | 42.1 | 66.6 | 11.8 | 14.3 | | 1.57 | | | | |

Continued.

**Table 1**. Continued.

| Weeks | Soil Temp.[1] Min. | Soil Temp.[1] Max. | Air Temp. Min. | Air Temp. Max. | Water Temp. Min. | Water Temp. Max. | Avg. D.O.[2] | Total Rainfall | Large Crawfish Count | Crawfis h Harvest | Crawfis h Size | Total Trapsets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | --------------------------deg.F-------------------------- | | | | | | (mg/L) | (inches) | (#/trap) | (lb/A) | (cnt/lb) | (#/A) |
| Dec 23-29 | 49.3 | 57.0 | 38.9 | 61.9 | 9.1 | 11.4 | | 2.05 | | | | |
| Dec 30-Jan 5 | 46.1 | 54.3 | 34.7 | 57.1 | 7.5 | 10.9 | | | | | | |
| Jan 6-12 | 56.6 | 63.7 | 53.1 | 72.0 | 14.1 | 16.6 | 1.00 | 0.88 | | | | |
| Jan 13-19 | 50.7 | 57.0 | 40.7 | 58.4 | 10.0 | 11.9 | 3.51 | 1.64 | | | | |
| Jan 20-26 | 46.0 | 52.0 | 37.1 | 52.3 | 6.6 | 10.0 | | 2.84 | | | | |
| Jan 27-Feb 2 | 46.9 | 55.9 | 36.7 | 59.9 | 8.0 | 11.7 | 7.90 | 2.30 | | | | |
| Feb 3-9 | 55.1 | 62.6 | 48.7 | 69.9 | 13.5 | 17.4 | 2.93 | 0.46 | | | | |
| Feb 10-16 | 53.3 | 61.0 | 44.6 | 68.9 | 11.9 | 15.5 | 2.20 | 1.10 | | | | |
| Feb 17-23 | 56.6 | 63.7 | 49.7 | 70.1 | 13.9 | 17.8 | | 2.25 | | | | |
| Feb 24-Mar 1 | 56.0 | 63.7 | 45.0 | 68.6 | 12.4 | 18.0 | 3.96 | | | | | |
| Mar 2-8 | 55.4 | 65.0 | 43.1 | 68.4 | 11.2 | 18.4 | 5.09 | 1.60 | 3.7 | 6.9 | 17.2 | 32 |
| Mar 9-15 | 55.1 | 64.9 | 52.3 | 67.3 | 14.5 | 21.5 | 4.80 | 1.85 | 4.1 | 8.0 | 16.6 | 32 |
| Mar 16-22 | 61.0 | 71.4 | 53.6 | 76.6 | 16.4 | 23.6 | 1.70 | 0.90 | 3.7 | 8.4 | 14.0 | 32 |
| Mar 23-29 | 59.4 | 70.3 | 52.6 | 72.6 | 15.8 | 23.2 | 1.10 | | 3.3 | 3.7 | 14.2 | 16 |
| Mar 30-Apr 5 | 69.3 | 77.0 | 64.4 | 81.9 | 21.2 | 26.5 | .66 | 0.89 | 4.5 | 16.6 | 13.1 | 48 |
| Apr 6-12 | 68.4 | 79.0 | 61.9 | 80.6 | 20.4 | 28.6 | 1.01 | 0.26 | 4.3 | 17.4 | 11.9 | 48 |
| Apr 13-19 | 62.3 | 74.9 | 48.1 | 71.1 | 14.6 | 22.8 | | | 3.6 | 14.9 | 11.6 | 48 |
| Apr 20-26 | 67.7 | 79.4 | 63.1 | 84.7 | 21.3 | 28.0 | 1.14 | 0.35 | 5.2 | 22.2 | 11.3 | 48 |
| Apr 27-May 3 | 66.1 | 77.4 | 59.0 | 79.1 | 19.7 | 27.0 | 2.40 | 1.35 | 4.7 | 21.5 | 10.4 | 48 |
| May 4-10 | 69.0 | 79.4 | 64.9 | 83.4 | 21.5 | 28.6 | | 0.72 | 6.0 | 34.9 | 11.0 | 64 |
| May 11-17 | 72.9 | 82.1 | 64.3 | 82.4 | 21.1 | 27.2 | 1.64 | 4.79 | 6.1 | 38.9 | 10.1 | 64 |
| May 18-24 | 72.7 | 81.7 | 69.4 | 85.0 | 23.4 | 30.9 | | 0.64 | 8.7 | 41.4 | 10.1 | 48 |
| May 25- 31 | 78.4 | 88.0 | 71.9 | 89.7 | 26.4 | 34.6 | 1.59 | | 7.5 | 34.7 | 10.3 | 48 |
| June 1-7 | 80.4 | 88.3 | 74.3 | 91.6 | 26.1 | 33.8 | | | 6.9 | 32.2 | 10.2 | 48 |
| June 8-14 | 81.4 | 91.1 | 74.1 | 90.6 | 26.2 | 33.1 | | 0.42 | 5.2 | 24.1 | 10.3 | 48 |
| June 15-21 | 82.1 | 92.6 | 73.0 | 92.1 | 26.5 | 34.9 | | 0.48 | 6.1 | 26.2 | 11.2 | 48 |
| June 22-28 | 79.6 | 90.4 | 71.0 | 91.6 | 25.1 | 30.8 | | 2.04 | 5.9 | 8.4 | 11.2 | 16 |
| | | | | | | | | **62.48**[3] | | **360.3** | | **736** |

[1] Soil temperature was measured at a depth of 4 inches.
[2] Dissolved oxygen readings were taken about 8:00 a.m.
[3] Rainfall total is for one year only (June 1, 2007 - May 31, 2008) and does not include rainfall occurring in June 2008

## ASSESSMENT OF SAMPLING AND HARVEST YIELDS WHEN CRAWFISH PONDS ARE POPULATED ONLY BY STOCKING OF HATCHLINGS

W.R. McClain, R.P. Romaire, and J.J. Sonnier

### INTRODUCTION

Crawfish farming in Louisiana does not rely on a hatchery component for populating grow-out ponds, unlike many aquaculture enterprises around the world. Rather, dependence is upon indigenous and/or supplemented broodstock to reproduce naturally in subsurface burrows as crawfish in the region have evolved to do. Without the reliance on natural reproduction, crawfish farming would probably be nonprofitable. Although the advantages of natural reproduction are great, there are several drawbacks. Reliance on natural reproduction subjects the grower to great variations in yield and harvest size because of large natural variations in adult survival and reproductive success from year to year and pond to pond. Not only are yield and size variations problematic due to variations in recruitment patterns, but these problems are exacerbated by a lack of predictability and a reliable means of assessing pond inventory. Currently, no reliable means accurately determines the success or failure of young-of-the-year recruitment. Without a means of determining population density and structure prior to initiation of harvesting, economic and business planning and implementation of corrective measures are not viable tools for the producer.

Natural, staggered recruitment and heavily vegetated ponds have limited the development of accurate population assessment techniques in crawfish ponds. Previous efforts to establish population sampling in crawfish ponds as a predictor of yield outcomes, though imprecise, were undertaken mainly in crawfish monocropping systems and were accomplished without the knowledge of actual pond densities. Largely unsuccessful, producers do not routinely attempt precise assessments of population density or structure. Therefore, this 2-year project attempted, for the first time, to eliminate natural recruitment and instead, accomplish the tasks of populating ponds with stocking of hatchlings at known numbers. This was done so that systematic sampling efforts could be employed with the intent of establishing some kind of relationship between sampling (with different gear) and known populations and, furthermore, to determine if harvest results could be relatively associated with sampling outcomes. This report presents the results for Year 2 of this study.

**Pond History**: Ponds were fallow for 11 months following a previous crawfish season. Rice crops were planted in May 2007, and fields were not stocked with brood crawfish.

**Soil Type**: Crowley silt loam

**Pond Area**: Twelve 1-acre ponds

**Forage Crop**: Rice (variety 'Cocodrie') was aerially seeded at 100 lb/A on 3 May 2007. Grain was harvested on 18 Aug 2007, and the ratoon forage crop was managed for crawfish production.

**Fertilizer**: Main Crop: 8-24-24 at 250 lb/A at planting, 46-0-0 at 200 lb/A (topdress) on 4 June; Ratoon Crop: 46-0-0 at 100 lb/A (topdress) on 29 Aug 2007.

**Herbicide**: 3 qt Stam, 1 pt Prowl, and 1 oz Permit/A on 18 May; 15 oz Clincher/A on 20 June

**Insecticide**: None on the main or ratoon crop.

**Stocking Rate**: Adults were not stocked into the main rice crop as usual. Instead, hatchlings were stocked after the permanent flood. See treatments.

**Elimination of Natural Recruits**: To eliminate or minimize natural recruitment from indigenous crawfish, the ponds were flooded on 18 Sept 2007, Mustang Max at the rate of 4 oz/A was applied 1 day later, and after 10 days, the ponds were completely drained then reflooded with fresh water beginning 3 days after draining.

**Permanent Flood Date**: 1 Oct 2007

**Stocking of Hatchlings**: Stocking rate and timing constituted the treatments of this study. The intent was to stock 0, 3, and 7 crawfish hatchlings/m$^2$ from hatchlings spawned in the lab from captive broodstock. Spawning success was less than expected; therefore, actual stocking densities were 0, 2.3 (or 3), and 7.0 crawfish/$m^2$ to reflect three treatment densities – 0, high, low, and late low. Stocking timing was accomplished by stocking approximately equal numbers over four dates from 2 Oct to 13 Nov for certain treatments or stocking all at once from 6 Nov thru 8 Nov on the last date for other treatments. Late low stocking was on 11 Dec. Stockings consisted of introducing the hatchlings and adult female (hatchlings clinging to the brood female when possible) to simulate conditions of natural recruitment.

**Counting**: Hatchlings were counted by temporarily separating them from the female and placing them into a shallow (less than 1 cm deep) pool of water, taking a digital photo of the pool, and counting individuals from an enlarged photo on a computer screen at a later time. Hatchlings were subjected to the shallow pool only long enough for a photo to be taken then were reunited with the adult female in a larger volume of water.

**Treatments**: Consisted of low stocking rate one time (**Low-1**), late low stocking rate one time (**Late Low-1**) low stocking rate four times (**Low-4**), high stocking rate one time (**High-1**), high stocking rate four times (**High-4**), and no stocking of hatchlings (0-Stocking). Crawfish densities of 2.3 or 3 crawfish/$m^2$ were considered low densities, and densities of 7 crawfish/$m^2$ were considered high densities for this study. Timing of the multiple stockings occurred every 2 weeks from 2 Oct to 13 Nov 2007. Timing of the late low stocking occurred 11 Dec 2007.

**Samplers**: Sampling consisted of employing four sampling gear: large mesh traps, consisting of standard 0.75-inch square mesh pyramid traps; small mesh traps, consisting of common 0.25-inch wire mesh minnow traps with 1.25-inch funnel openings at each end; long handle dip nets (3-mm mesh); and specially constructed drop sampling devices (0.5 $m^2$ surface area). The drop sampler consisted of a metal cylinder that was rigged to slide up and down on three legs with a trigger that allowed the unit to be "set" in the up position with 50 feet of rope, whereby the unit could be placed in the pond some distance and triggered from the levee to prevent disturbing of crawfish during sampling. When "dropped," the sampler formed an enclosure entrapping any crawfish that were captured within the interior of the cylinder. Water was pumped out and crawfish counted and sized.

**Sampling Protocol**: Sampling was accomplished during six weekly periods (3-7 Dec, 17-21 Dec, 7-11 Jan, 21-25 Jan, 4-8 Feb, and 18-22 Feb). The large- and small-mesh traps were employed with and without bait and were placed both around the pond edge and away from the edge within the interior of the pond (with duplicate traps per pond per location per bait regime). Dip net sweeps were accomplished both around the pond edge and within the pond interior (with 10 random sweeps per pond per location). The drop samplers were operated in the morning (approximately 8:30 am) and afternoon (approximately 4:00 pm). Traps and dip net sweeps were accomplished in duplicate ponds of each treatment, while drop samplers were not duplicated by treatment – occurring in only one rep of each treatment. Crawfish catch, total and by size category, was noted for each sampling effort.

**Feed**: None

**Trap Type and Density**: 3-funnel pyramid trap, constructed of ¾-inch square-mesh wire at 16 traps/A

**Bait Used**: Manufactured baits: *Cajun World* and *Early On* (Purina Mills, Inc., St. Louis, MO); Southern Pride (Country Acres Feed, Inc., Brentwood MO)

**Crawfish Harvest**: 5 Mar - 23 June 2008, for a total of 46 baited trapping days (736 total trap-sets/A)

**Crawfish Grades**: Harvested crawfish were subjected to a grader (passive, water type) and sorted into three size-grade categories as follows: "Large" - <15 count/lb, "Medium" - 15-21 count/lb, and "Small" - > 21 count/lb

**Experimental Design**: Completely randomized design consisting of two replicated ponds

**Parameters**: Crawfish sample catches, crawfish harvest

**Statistical Analysis**: Analysis of variance with means separated by Duncan's multiple range test

**Support**: USDA–Southern Regional Aquaculture Center (SRAC) and the Louisiana Crawfish Promotion and Research Board

**Comments**: A total of 620 spawns (168,912 hatchlings) were stocked for this study (Table 1). Hatchlings were released with the brood female to more accurately stimulate natural recruitment. Actual stocking densities were nearly identical, and the treatments were effectively resolved into low and high stocking densities and into multiple- versus single-stocking occasions, with an additional treatment reflecting a late stocking at the low density. The resulting average harvest yields for this study were low to moderate when compared with typical commercial crawfish yields (Table 2). Overall, annual yields averaged 360 lb/A by weight and 4,012 crawfish/A by number of individuals captured. Highest yielding were those ponds that received the higher stocking rate, regardless of the number of stocking events. The lowest average yield was from ponds that were not stocked, although there was considerable production from those ponds. It is unclear how non-stocked ponds became populated. Perhaps some minimal natural reproduction occurred (even though attempts were made to eliminate that source) and/or some movement of crawfish occurred after stocking. While rare to see small juveniles traversing across levees between ponds, larger crawfish will sometimes migrate at night, and it is possible that some individuals may have moved between ponds via the water inflow structures by way of a central water supply lateral boarding each pond. Crawfish would have to move out of their respective pond against the water flow, or at times of no flow, and into the supply lateral, and then move into a different pond after some time. Movement over time could have occurred by both means although past anecdotal evidence suggests movement between ponds at this research facility has been minimal.

Percent recovery of crawfish from individual ponds, based on numbers stocked (for stocked fields only), ranged from a low of 15.9% to 38.9%, and these were both High-1 stocked ponds. The overall capture rate in this study for ponds where crawfish were introduced represents 26.2% of the total number of crawfish stocked; however, when non-stocked fields are included, the overall capture rate increases to 28.4% of crawfish stocked (Table 3). This is lower than expected, but substantially higher than was observed in a previous experiment (***Assessment of sampling and harvest yields when crawfish ponds are populated only by stocking hatchlings, 99th Annual Research Report, Rice Research Station)*** where the capture rates were only 12.8 and 16.5%, respectively. However, it is unknown what the typical rate of capture is for commercial ponds with natural recruitment because initial recruitment density is unknown. Capture rates were slightly higher for single stockings and for the lower stocking rate. Although in the previous experiment while the lower stocking also provided for the higher recovery rate, the single stockings resulted in a lower recovery than multiple stocking.

In the previous experiment, where the single stocking was the last even chronologically, it was theorized that a later stocking would allow for the opportunity of increased fish and/or predacious insect numbers prior to introduction of crawfish, thus resulting in increased predation and lower recovery percentages at harvest. However, in this experiment, the percent recovery for the late-stocked crawfish was no different than those stocked earlier. It was noted, though, that sunfish populations appeared to be lower in this experiment than in the previous season.

Results of the population sampling generally reflect higher catches with all sampling gear in this experiment when compared with results of the previous experiment. This seems to be the result of greater survival since actual stocking rates differed little. The greatest catch per sampling period for all sampling gear occurred in February (Figure 1). Like the previous experiment, it should be noted that small-mesh traps dominated the catch per unit effort early on, with large-mesh traps gaining a slight edge during late January and February periods. This reflects the relative abundance of individuals by size in the population. As crawfish grew, more were retained by the large-mesh traps. Sampling efficacy was greater for edge of pond sampling as opposed to the pond interior; therefore, seasonal pond averages for each sample gear (at edge of pond) are presented in Table 4, as are some corresponding correlation coefficients. None of the sampling gear results exactly mirrored the yield data in terms of relationship by treatment from largest to smallest, in either numbers or poundage, except drop samplers to yield in pounds per acre, but that gear had no duplicates per treatment. Nonetheless, the correlation coefficients for all comparisons of sampling results (with respect to edge of pond sampling) with yields were high. Also, the sampling methods were all very well correlated with stocking density, and stocking density showed good correlations to yield (Table 4).

Correlation coefficient is a measure of how well one group of data corresponds to a second group of data and whether the trend is a positive or negative correspondence. Based on the correlation coefficients for the sampling averages in Table 4, the best predictor of yield appeared to be large-mesh traps; however, the other sampling methods also have very high coefficients.

Figures 2 through 9 provide additional depictions of the sampling results, by size as well as total counts, for the various gears and sample location or bait, where applicable. As previously stated, edge-of-pond sampling was more effective for both types of test traps and dip net sweeps. Unlike the previous experiment, the sample catch was considerably higher when traps were baited. Perhaps, baited traps are more effective at higher densities. Likewise, there were substantially higher catches with 48-hr sets as opposed to 24-hr sets in this experiment whereas little difference between the two was observed during the last experiment.

In conclusion, while the resulting yield was generally reflective of stocking density, the percentage of crawfish retrieved by trap harvesting was relatively low regardless of stocking density or number of stocking events. Without a means to accurately assess recruitment density in commercial ponds, it is unknown how well these numbers represent the percent recovery of commercial operations. However, based on the strong positive correlations of the sampling protocols used in this experiment and the respective stocking densities, as well as yields, it appears that these systematic sampling approaches may be suitable for a least assessing relative population densities of commercial crawfish ponds and, perhaps with further research, could become a useful tool to predict yield.

**Table 1**. Average number of crawfish stocked into each 1-acre pond for each treatment (two replicated ponds were stocked per treatment). Multiple stockings occurred every 2 weeks from 16 October through 28 November 2006. Single stockings occurred on 28 November. Harvesting commenced on 21 March 2007. Rice Research Station, Crowley, LA. 2008.

| Treatment | No. Hatchlings | No. Adults | Total Crawfish | Density Stocked (No./m$^2$) | Times Stocked |
|---|---|---|---|---|---|
| 0-Stocked | 0 | 0 | 0 | 0 | - |
| Late – Low | 9,310 | 26 | 9,336 | 2.31 | 1 |
| Low – 4 | 9,307 | 34 | 9,341 | 2.31 | 4 |
| Low – 1 | 9,382 | 39 | 9,421 | 2.33 | 1 |
| High – 4 | 28,307 | 110 | 28,417 | 7.02 | 4 |
| High – 1 | 28,150 | 101 | 28,251 | 6.98 | 1 |
| ***Total Stocked*** | ***168,912*** | ***620*** | ***169,532*** | | |

**Table 2**. Average annual yield of harvested crawfish. Values within columns with the same superscript were not significantly different (P > 0.05). Rice Research Station, Crowley, LA. 2008.

| Treatment[1] | Yield by Wt. (lb/A) | Yield by No. (No./A) | Avg. Individual Weight (g) | Avg. Count (No./lb) |
|---|---|---|---|---|
| 0-Stocked | 190.8 | 1,883 | 44.9 | 10.1 |
| Late-Low | 270.8 | 3,011 | 40.5 | 11.2 |
| Low - 4 | 293.9 | 3,078 | 43.2 | 10.5 |
| Low - 1 | 316.2 | 3,301 | 43.2 | 10.5 |
| High - 4 | 467.4 | 5,059 | 42.0 | 10.8 |
| High - 1 | 622.8 | 7,739 | 37.8 | 12.0 |
| | ***Avg.=360.3*** | ***Avg.=4,012*** | | |

[1] Stocking treatments consisted of two replicated ponds.

**Table 3**. Average percent recovery of crawfish per treatment (two replicated ponds per treatment) and individual treatment factors. Rice Research Station, Crowley, LA. 2008.

<table>
<tr><th>Treatment</th><th>No. Crawfish Stocked</th><th>No. Captured</th><th>% Recaptured</th><th>Treatment Avg. for 1 Time[1]</th><th>Treatment Avg. for 4 Times</th><th>Treatment Avg. for Low[1]</th><th>Treatment Avg. for High</th></tr>
<tr><td>0-Stocked</td><td>0</td><td>1883</td><td>-</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Late-Low</td><td>9,336</td><td>3011</td><td>32.25</td><td rowspan="6">31.2</td><td rowspan="6">25.4</td><td rowspan="6">34.0</td><td rowspan="6">22.6</td></tr>
<tr><td>Low - 4</td><td>9,341</td><td>3078</td><td>32.95</td></tr>
<tr><td>Low - 1</td><td>9,421</td><td>3301</td><td>35.04</td></tr>
<tr><td>High - 4</td><td>28,417</td><td>5059</td><td>17.80</td></tr>
<tr><td>High - 1</td><td>28,251</td><td>7739</td><td>27.39</td></tr>
<tr><td>Overall Total</td><td>169,532</td><td>44,376</td><td>26.2[2]%</td></tr>
</table>

[1] Excludes the Late-Low treatment.
[2] When harvests from 0-stocked ponds are included, the average percent recovery based on total stocked individuals was 28.4%.

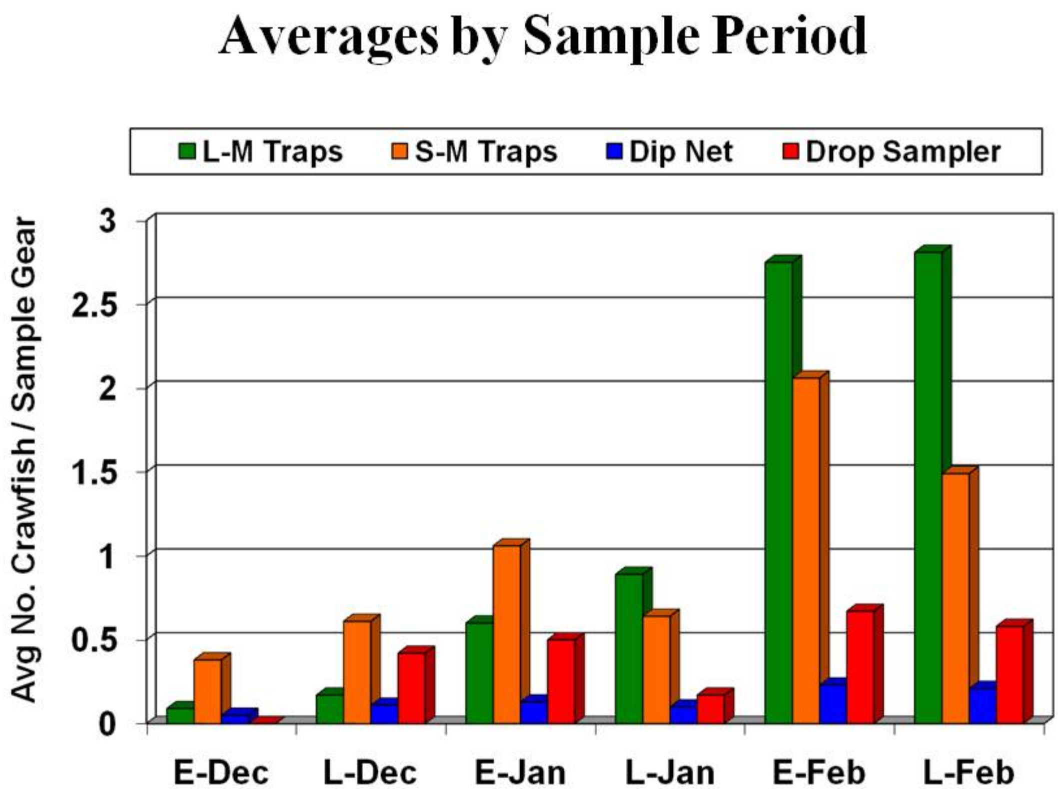



**Figure 1**. Average catch with sampling gear by sampling period (Early and Late December, January, and February). Rice Research Station, Crowley, LA. 2008.

**Table 4**. Average yield and sampler catches for edge of pond sampling with baited large- and small-mesh traps, dip nets, and drop samplers. Correlation coefficients are based on these averages by pond. Rice Research Station, Crowley, LA. 2008.

| **Treatment** | **Total Stocked** | **Yield** (lb/A) | **Yield** (No.) | **Large Trap Catch** (No./trap) | **Small Trap Catch** (No./trap) | **Dip Net Sweep** (No./dip) | **Drop Sampler Catch** (No./set) |
|---|---|---|---|---|---|---|---|
| High - 1 | 28250 | 831.0 | 10995 | 4.33 | 4.13 | 0.55 | . |
| High - 1 | 28253 | 414.6 | 4483 | 3.04 | 4.58 | 0.33 | .42 |
| High - 4 | 28442 | 523.5 | 5598 | 3.29 | 3.13 | 0.20 | . |
| High - 4 | 28391 | 411.3 | 4519 | 2.88 | 2.21 | 0.35 | 1.08 |
| Low - 1 | 9426 | 348.7 | 3592 | 1.46 | 1.96 | 0.37 | .42 |
| Low - 1 | 9415 | 283.7 | 3009 | 0.96 | 1.38 | 0.22 | . |
| Low - 4 | 9346 | 321.8 | 3234 | 1.58 | 1.79 | 0.12 | . |
| Low - 4 | 9336 | 266.0 | 2922 | 1.96 | 0.96 | 0.13 | .17 |
| Late-Low | 9333 | 242.1 | 2882 | 0.33 | 0.54 | 0.00 | .08 |
| Late-Low | 9339 | 299.4 | 3140 | 0.92 | 0.92 | 0.08 | . |
| 0 Stocked | 0 | 256.1 | 2424 | 0.75 | 1.38 | 0.07 | .17 |
| 0 Stocked | 0 | 125.4 | 1341 | 0.50 | 0.42 | 0.02 | . |

| **Correlation** | **Coefficient** |
|---|---|
| Yield (lb) to total crawfish stocked | 0.78817 |
| Yield (#) to total crawfish stocked | 0.73875 |
| Large-mesh trap catch to total crawfish stocked | 0.90405 |
| Large-mesh trap catch to yield (lb) | 0.89724 |
| Large-mesh trap catch to yield (#) | 0.86083 |
| Small-mesh trap catch to total stocked | 0.83878 |
| Small-mesh trap catch to yield (lb) | 0.81069 |
| Small-mesh trap catch to yield (#) | 0.75720 |
| Dip net sweep count to total crawfish stocked | 0.72302 |
| Dip net sweep count to yield (lb) | 0.82777 |
| Dip net sweep count to yield (#) | 0.80868 |
| Drop sampler catch to total crawfish stocked | 0.74367 |
| Drop sampler catch to yield (lb) | 0.80832 |
| Drop sampler catch to yield (#) | 0.79995 |

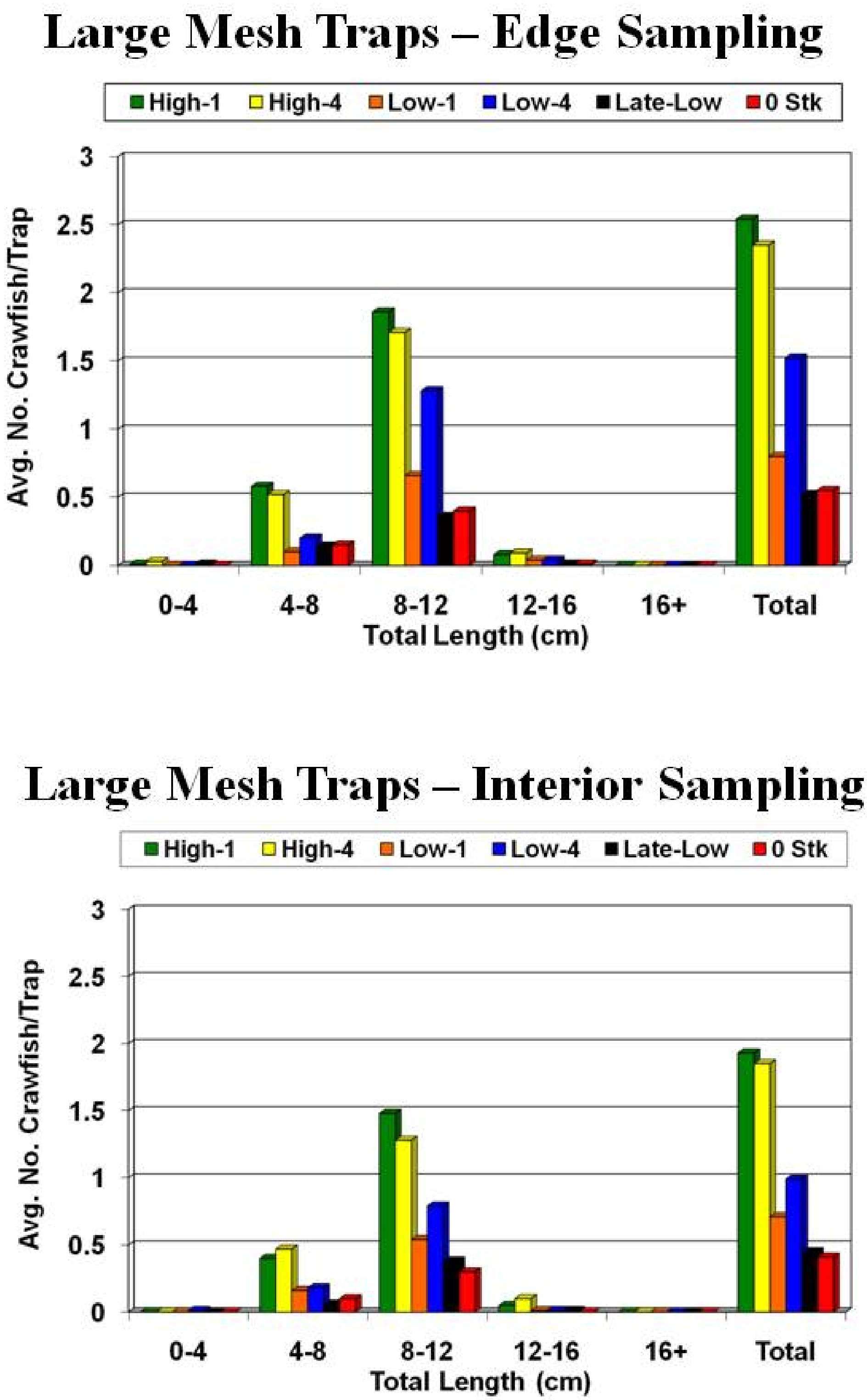
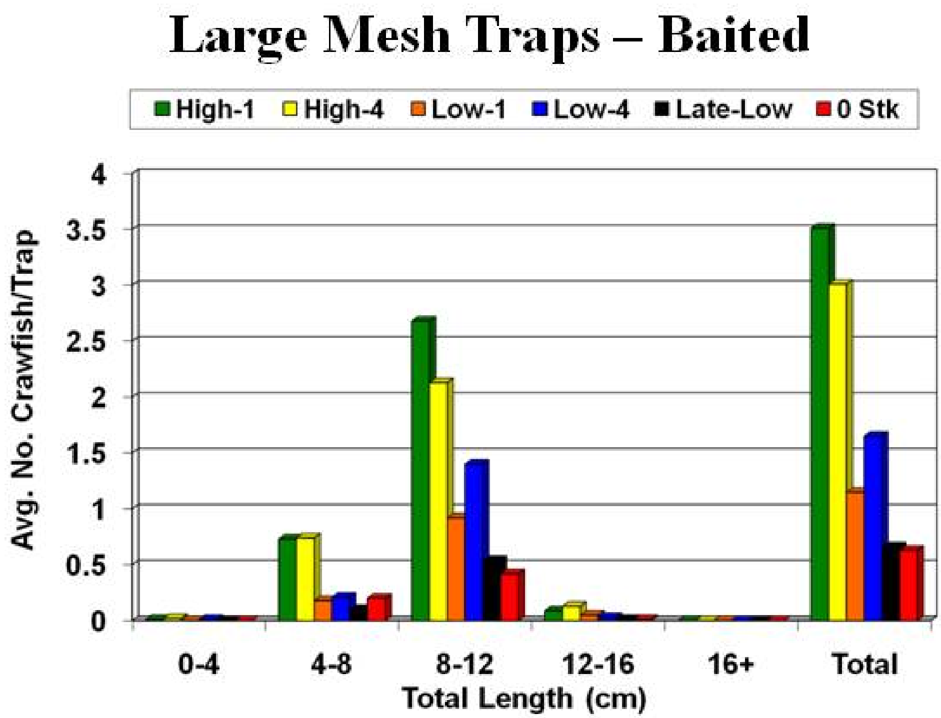



**Figure 2**. Average catch by size category (and average total catch) per trap lift with large-mesh traps set near the pond edge (top chart) or in the interior of the pond (bottom chart). Rice Research Station, Crowley, LA. 2008.



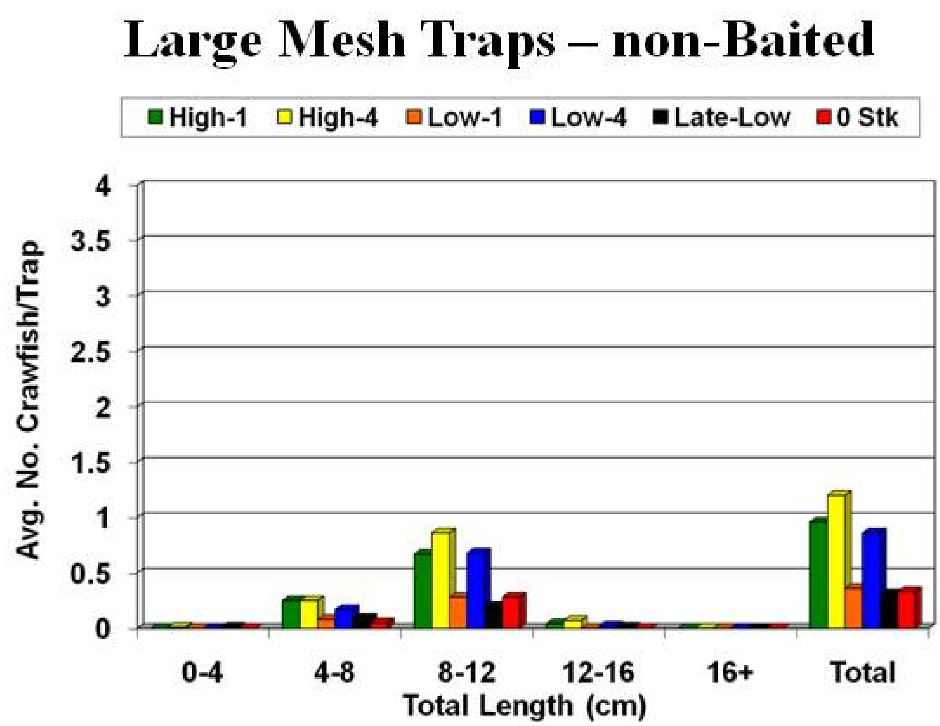




**Figure 3**. Average catch by size category (and average total catch) per trap lift with large-mesh traps baited (top chart) or non-baited (bottom chart). Rice Research Station, Crowley, LA. 2008.

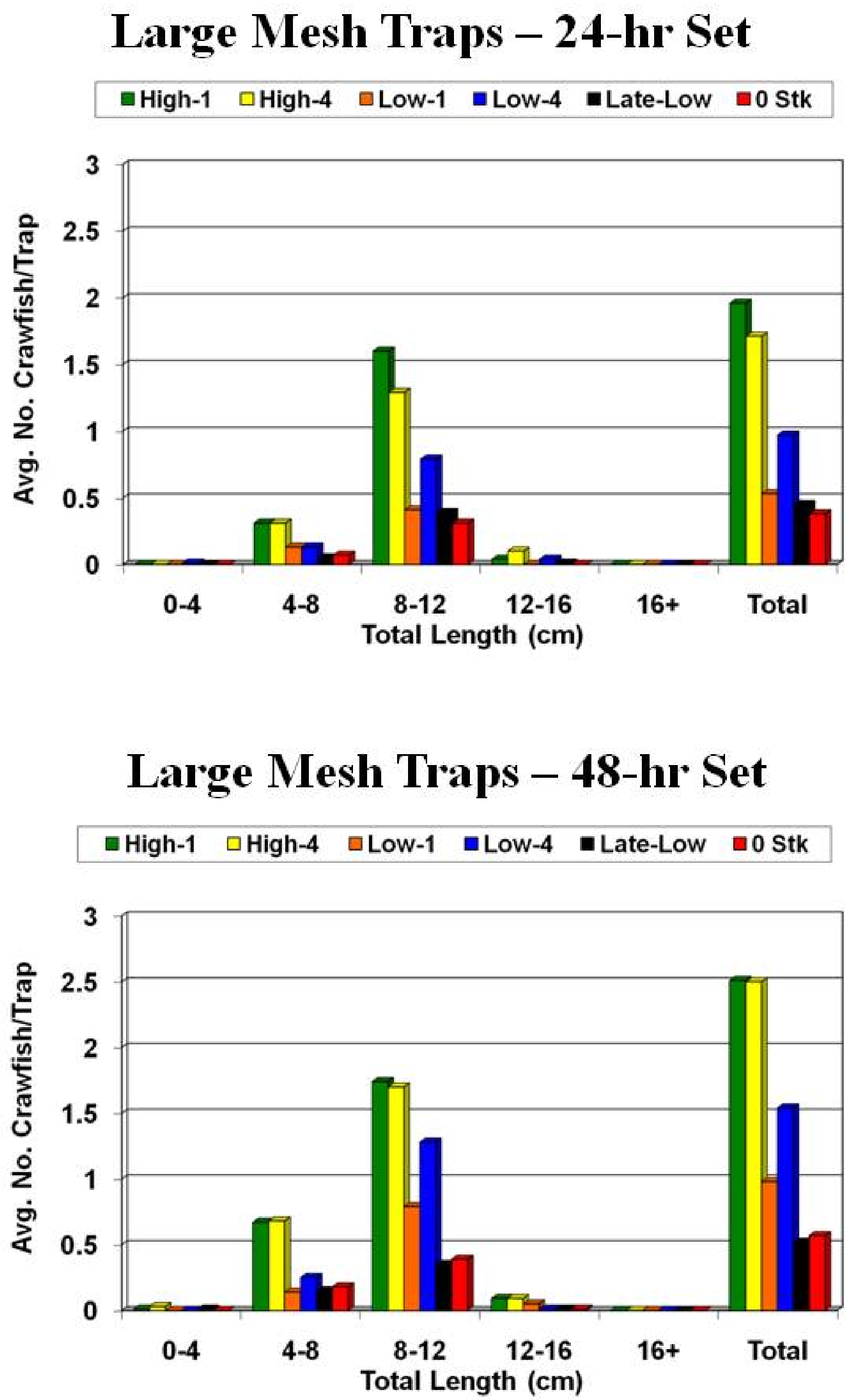
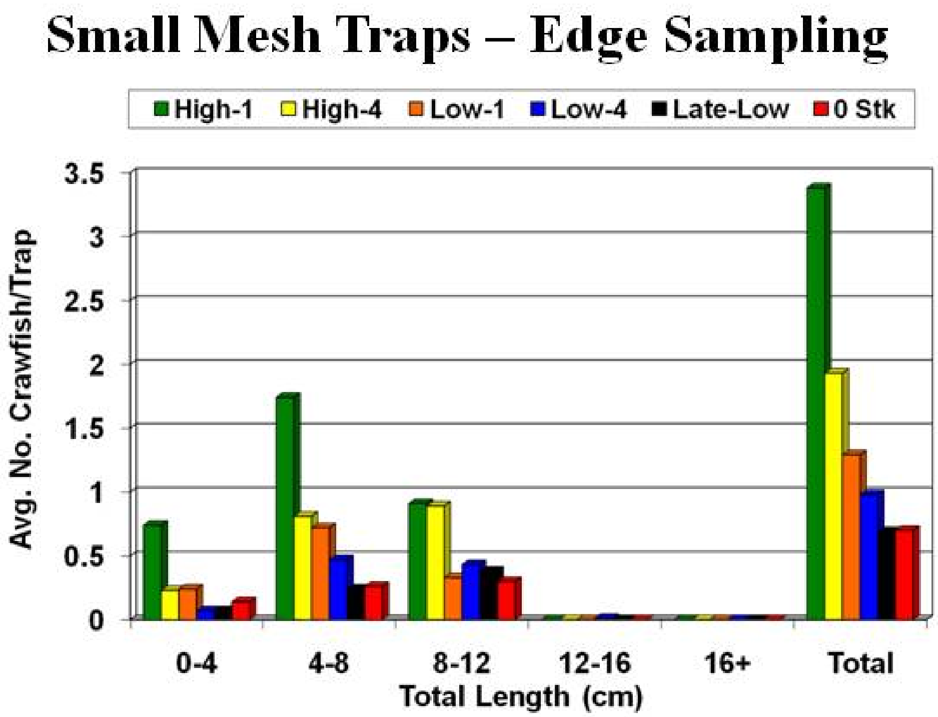



**Figure 4**. Average catch by size category (and average total catch) per trap lift with large-mesh traps set for 24 hours (top chart) or 48 hours (bottom chart). Rice Research Station, Crowley, LA. 2008.



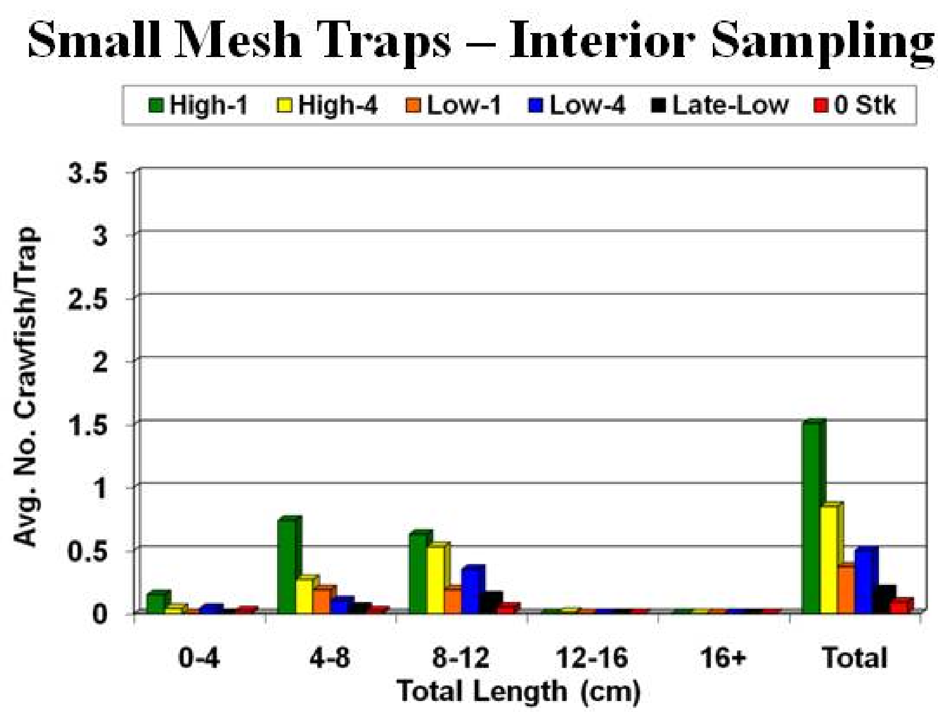
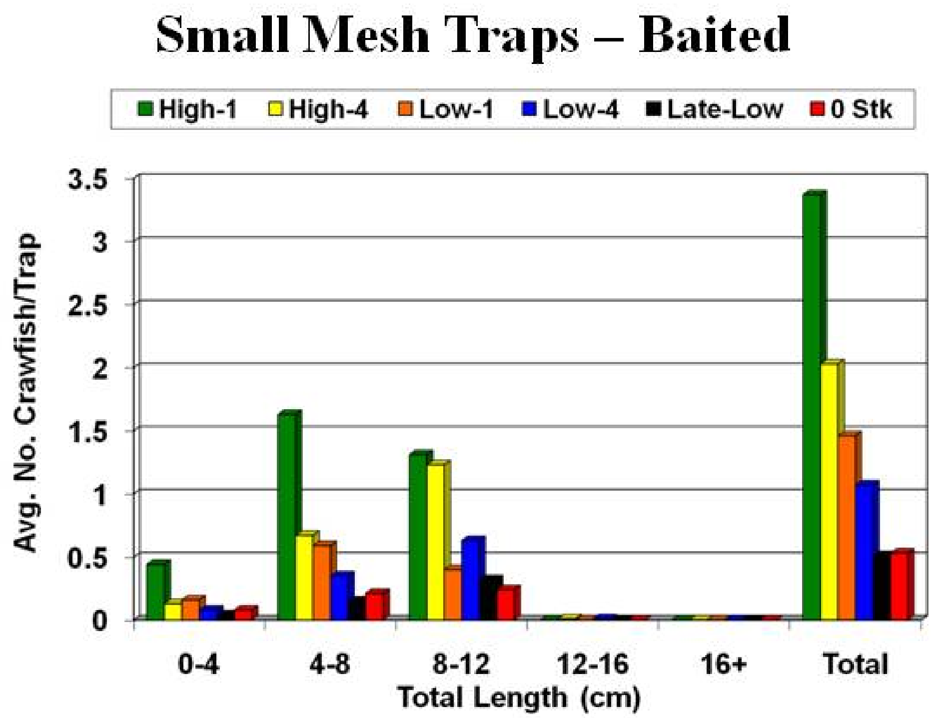




**Figure 5**. Average catch by size category (and average total catch) per trap lift with small-mesh traps set near the pond edge (top chart) or in the interior of the pond (bottom chart). Rice Research Station, Crowley, LA. 2008.



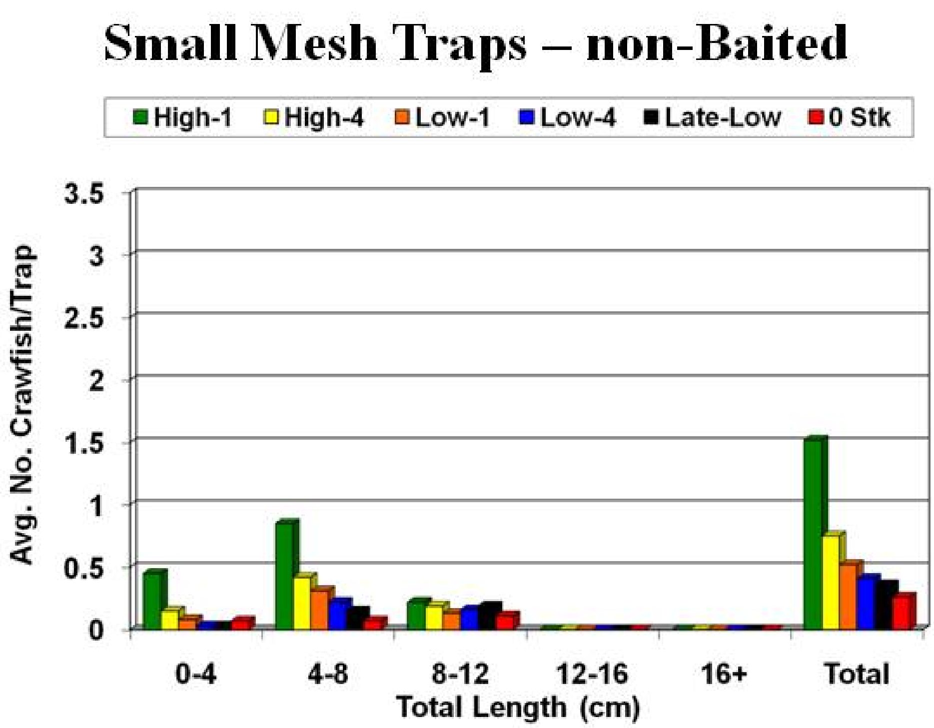
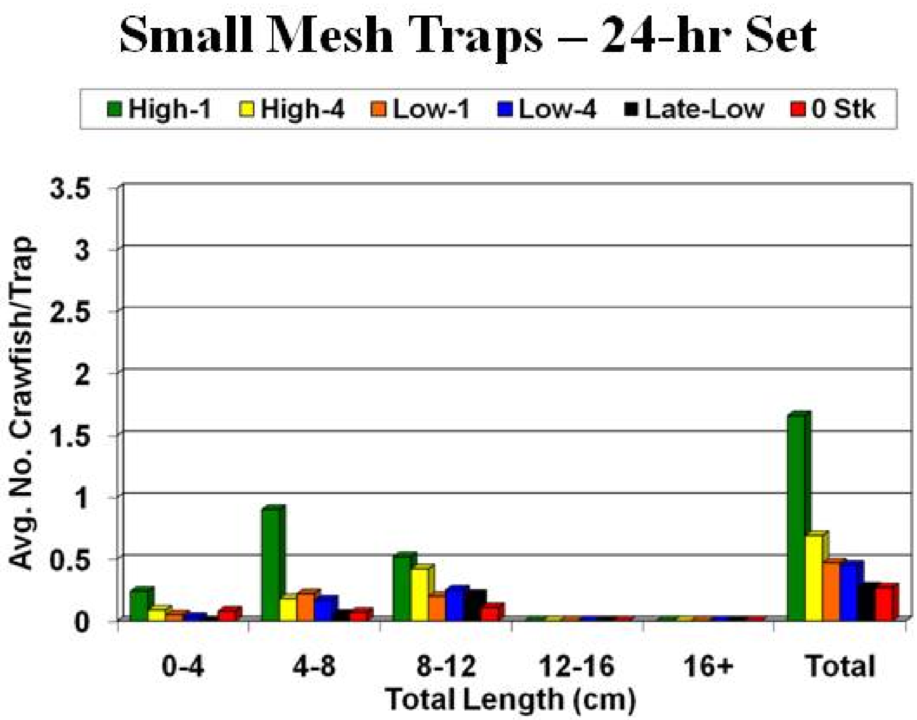




**Figure 6**. Average catch by size category (and average total catch) per trap lift with small-mesh traps baited (top chart) or non-baited (bottom chart). Rice Research Station, Crowley, LA. 2008.



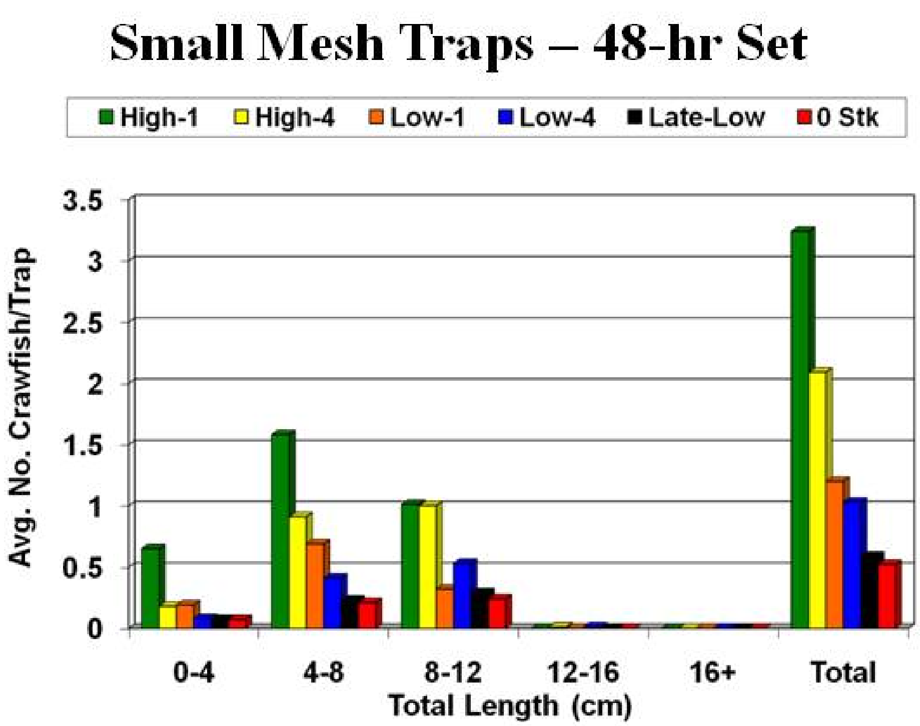
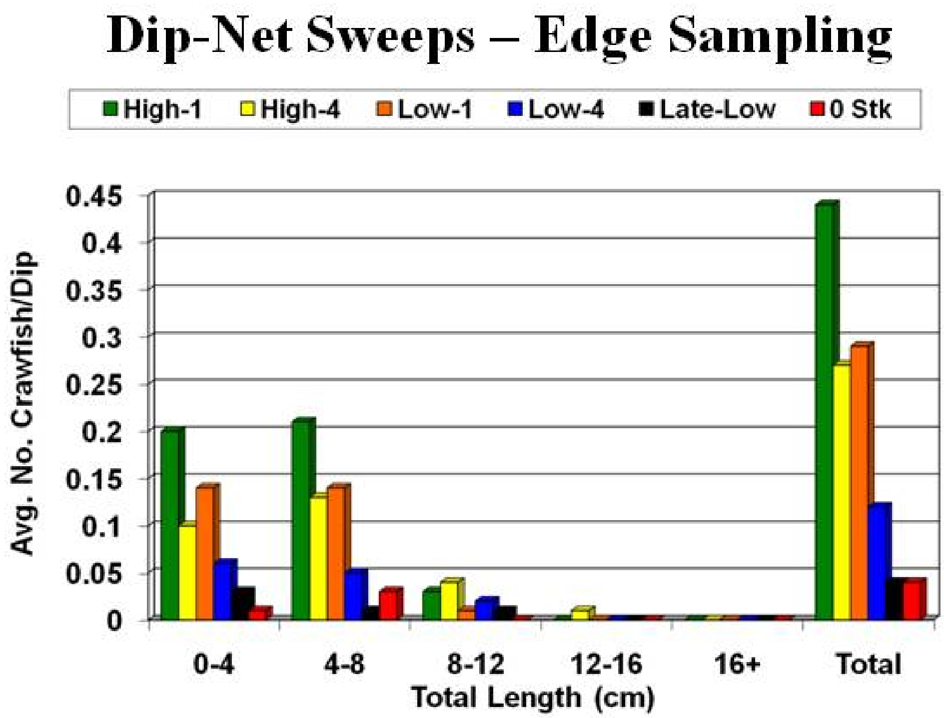




**Figure 7**. Average catch by size category (and average total catch) per trap lift with small-mesh traps set for 24 hours (top chart) or 48 hours (bottom chart). Rice Research Station, Crowley, LA. 2008.



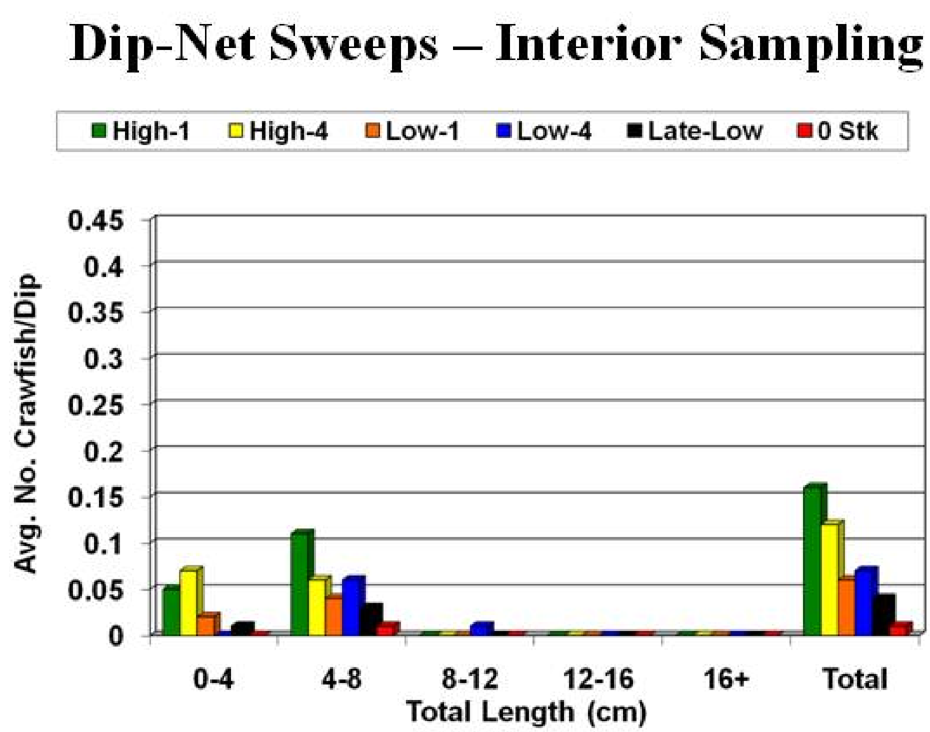




**Figure 8**. Average catch by size category (and average total catch) per dip-net sweep for edge of pond (top chart) or pond interior (bottom chart) sampling. Rice Research Station, Crowley, LA. 2008.

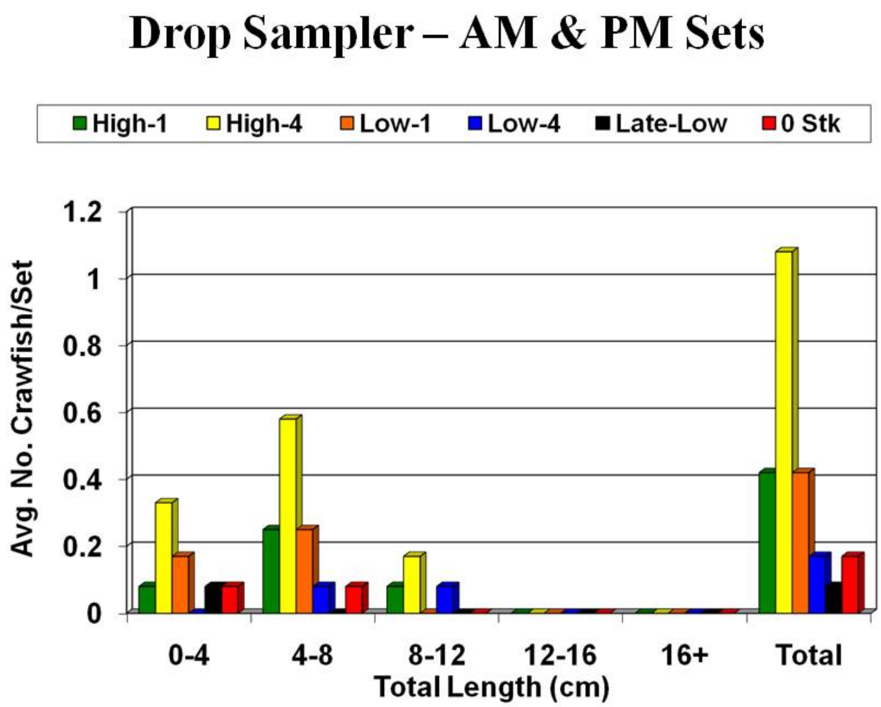



**Figure 9**. Average catch by size category (and average total catch) per drop sampler. Rice Research Station, Crowley, LA. 2008.

**Figure 10**. A drop sampler, set and ready to trip with a slight tug on the rope from the levee. Crawfish are retrieved by pumping out the water from the caisson while the cylinder walls are in contact with the mud bottom, exposing any crawfish trapped within. Rice Research Station, Crowley, LA. 2008.

# EFFECTS OF POST-HARVEST EXPOSURE ON SHELF-LIFE OF REFRIGERATED LIVE CRAWFISH

W.R. McClain and J.J. Sonnier

## INTRODUCTION

A majority of the crawfish produced in Louisiana are sold live for consumption as a whole, boiled product. This necessitates that crawfish remain alive until cooked, which may require several days or up to one week or longer in some cases. Crawfish are typically held in refrigerated coolers, either packed with ice or the relative humidity is replenished by daily wettings and/or with moisture retaining blankets of wet burlap. Live crawfish are sold packaged 30 to 45 pounds in plastic mesh bags or sacks. This allows live crawfish to be tightly packed, thus restricting their movements and their ability to inflict damage to each other with their claws. This type of packaging allows for efficient moisture replenishment but also allows for desiccation if humidity levels are not adequately maintained either in the cooler or immediately after sacking before the sacks can be placed in the cooler. Crawfish in good health and under good refrigerated conditions can be stored up to 4 or 5 days without excessive mortality.

The shelf life of live crawfish during refrigerated storage is a key factor for merchants, especially those who only receive shipments once or twice a week and must hold product for several days. Profits are hampered at the restaurant or retail level when excessive mortality occurs during the time that crawfish are bought and sold/cooked. Excessive and/or unexpected mortality during holding can also negatively affect buyer loyalty to certain farmers or distributors.

Mortality during refrigerated storage can be affected not only by conditions during storage but also by the health and/or handling conditions during and after harvesting. Many farmers harvesting large acreage tracts will often keep sacked crawfish in the boat or deposited on the pond bank for hours prior to transporting them to shelter or a cooler. While harsh exposure to sun and open air conditions is thought to increase mortality during refrigerated storage, this has not been previously documented. Therefore, this study was undertaken to ascertain and better document the effects on shelf life of live crawfish held under refrigerated storage when a modest amount of unnecessary exposure is experienced after harvesting. For this study, crawfish were exposed to four additional hours of ambient outdoor conditions during late morning to midday following sacking.

**Ponds**: Simulated rice/crawfish rotational ponds (see the previous report "***ASSESSMENT OF SAMPLING AND HARVEST YIELDS WHEN CRAWFISH PONDS ARE POPULATED ONLY BY STOCKING OF HATCHLINGS***" for details of experimental conditions).

**Harvest Methods**: Crawfish traps were emptied after a 48-hr soak using formulated bait as the attractant.

**Harvesting**: Traps were emptied beginning at about 8 a.m. and completed within 2 hours.

**Treatments**: Sacked crawfish were selected at random on test days and assigned to one of two treatments. Within 1 to 2 hours after completion of pond harvesting, one sack was placed on the lawn outside the lab without shade or cover (**Exposed** treatment) and a similar sack of crawfish was immediately placed in the cooler (**Control** treatment). After 4 hours, the sack exposed to outdoor conditions was placed in a refrigerated cooler.

**Temperature Monitoring**: At the time of sacking, a temperature data logger was placed within each sack of crawfish near the center. The time of outdoor exposure (and termination) and entrance in the cooler was noted. Temperature readings were recorded every half hour and downloaded upon termination of each test.

**Refrigerated Storage**: Sacked crawfish were maintained in the cooler at 38 to 40°F for 5 days. Sacks were thoroughly watered each day, once per day, but no cover was provided on the sacks inside the cooler.

**Test Dates**: Crawfish harvested on 5 Mar, 7 Mar, 12 Mar, 14 Mar, 20 Mar, 26 Mar, 25 Apr, 9 May, 29 May, and 19 June, for a total of 10 tests, were used to test the effect of additional exposure following the harvest.

**Termination**: Each test was terminated after 5 days of refrigerated storage and crawfish were individually examined for mortality. Mortality was determined by lack of movement after prodding when crawfish were at ambient room temperature. Sexual maturity (mature or immature), weight, and mortality were noted for each individual within each sack.

**Parameters**: Mortality, maturity, weight, % increase in mortality due to exposure, % increase in mortality of immature crawfish due to exposure, ambient outdoor temperatures, and refrigerated cooler temperatures.

**Statistical Analysis**: Analysis of variance; means separated by Duncan's multiple range test.

**Comments**: Table 1 provides the average temperatures recorded during the 4-hour exposure period and the subsequent 5-day refrigerated storage period for each test day of the study. The average temperatures for the control group are also presented. Although only one date (7 March) reflects a relatively cool period, several tests were conducted under moderate temperatures, and three dates captured relatively warm (> 75°F) temperatures; although, none were considered extremely hot days.

The percent mortality after 5 days in refrigerated storage for the control group was rather low. Only on the last two test dates did the mortality exceed 14% (Table 2). An analysis of the mortality data associated with the 4-hour exposure period showed a significant increase in mortality linked to that exposure. While the mortality after 5 days for the control group averaged about 15%, the mortality for the exposed group averaged nearly 24%. This reflects a 54% increase in mortality due to the additional exposure to solar radiation and wind (no rainfall was experienced during these tests). Although wind and solar radiation during the exposed periods were not monitored, the average of these 10 observations reveals reason for concern any time sacked crawfish remain exposed to the elements longer than necessary.

Upon observation as to whether there was any trend of higher mortality among immature crawfish (i.e., thinner shells), the opposite appears to be true. Increased mortality seemed to be more associated with mature crawfish. This is not fully understood but may be confounded by time of year (i.e., % of immature in the catch) and ambient water/air temperatures. There was a positive correlation ($r^2 = 0.60$) with average air temperature during the exposed period and mortality. When correlating average air temperature to the percentage of increased mortality as a result of exposure, the correlation, though positive, was not as strong ($r^2 = 0.28$). However, when grouping the data according to dates with similar air temperatures during the exposure period, the effect of temperature can clearly be seen. The average for cool (46°F), moderate (67°F), and warm (79°F) temperature periods accounted for 34, 46, and 78% additional mortality, respectively, as a result of the 4-hour exposures.

Therefore, as a result of this study, it appears that even as little as 4 hours of additional unprotected exposure of sacked crawfish to ambient outdoor conditions following the harvest can dramatically increase the mortality of crawfish during extended refrigerated storage. Moreover, the extent of the mortality under these conditions of exposure appears to be related to at least temperature, but wind and humidity may also play a role. Clearly, the observed higher mortalities were associated with elevated temperatures. Consequently, for best survival, at least under extended refrigerated storage, it is recommended that sacked crawfish be placed under shelter protected from the wind and sun, and preferably, on ice or in humid coolers as soon as possible/feasible after removal from traps.

**Table 1**. Average temperature (°F) within the sacks of crawfish for each date and period. Rice Research Station, Crowley, LA. 2008.

| | **Exposed Treatment** | | **Control Treatment** |
|---|---|---|---|
| **Date** | **Exposed Period** | **Cooler Period** | **Cooler Period** |
| 5 Mar | 61.5 | 39.4 | 39.2 |
| 7 Mar | 46.4 | 38.1 | 38.1 |
| 12 Mar | 67.5 | 38.5 | 38.3 |
| 14 Mar | 69.8 | 37.2 | 39.0 |
| 20 Mar | 63.5 | 38.5 | 38.5 |
| 26 Mar | 68.5 | 37.4 | 39.0 |
| 25 Apr | 73.4 | 37.4 | 39.6 |
| 9 May | 77.5 | 36.9 | 38.5 |
| 29 May | 79.3 | 37.6 | 38.5 |
| 19 June | 80.6 | 39.4 | 37.9 |

**Table 2**. Mortality of crawfish after 5 days of refrigerated storage following either a non-exposed (control) or 4-hour exposure period to unprotected outdoor conditions following the harvest. Rice Research Station, Crowley, LA. 2008.

| Date | Size (cnt/lb) | % Immature | Avg. Temp (F) | Control (% dead) | Exposed (% dead) | % Increase in Dead | % Increase in Dead Immature |
|---|---|---|---|---|---|---|---|
| 5 Mar | 17.5 | 80 | 61.5 | 8.0 | 12.8 | 60 | -9.9 |
| 7 Mar | 18.2 | 83 | 46.4 | 7.3 | 9.8 | 34 | 0 |
| 12 Mar | 16.7 | 82 | 67.5 | 9.8 | 15.0 | 53 | 3.5 |
| 14 Mar | 17.3 | 83 | 69.8 | 9.5 | 13.9 | 47 | 2.4 |
| 20 Mar | 14.7 | 62 | 63.5 | 12.9 | 20.8 | 61 | -13.2 |
| 26 Mar | 14.5 | 38 | 68.5 | 11.3 | 14.0 | 24 | 1.3 |
| 25 Apr | 10.4 | 18 | 73.4 | 7.6 | 10.0 | 32 | -84.2 |
| 9 May | 9.7 | 32 | 77.5 | 10.0 | 22.4 | 124 | -19.9 |
| 29 May | 9.7 | 20 | 79.3 | 39.1 | 74.9 | 92 | -35.0 |
| 19 June | 12.4 | 27 | 80.6 | 37.6 | 44.1 | 17 | -64.5 |
| ***Avg.*** | ***14.1*** | ***52*** | | ***15.3*** | ***23.8*** | ***54*** | ***-22.0*** |
| ***Data Sorted and Averaged Accorded to Average Air Temperature During Exposure*** | | | | | | | |
| Cool[1] | 18.2 | 83 | 46.4 | 7.3 | 9.8 | 34 | 0 |
| Moderate[2] | 15.2 | 60.6 | 67.4 | 9.9 | 14.4 | 46 | -17 |
| Warm[3] | 10.6 | 26.2 | 79.2 | 28.9 | 47.1 | 78 | -40 |

[1] Reflects March 7 data only.
[2] Average of March 5, 12, 14, 20, and 26 and April 25 data.
[3] Average of May 9 and 29 and June 19 data.

## OBSERVATIONS FOR BURROW EXCAVATIONS IN LATE SEPTEMBER 2008

W.R. McClain and J.J. Sonnier

### INTRODUCTION

Crawfish ponds in Louisiana are populated by natural reproduction and not by the intentional stocking of young, as is the case in most aquaculture operations. New ponds and ponds that have been idle for a season or longer are typically stocked with adult broodstock during the spring or early summer before the ponds are flooded for production the following fall. Permanent ponds or ponds in production for at least two consecutive seasons usually rely on “hold-over” broodstock to populate the ponds during subsequent seasons. In either case, the dynamics of the pond population, and to a great extent, yield and profits, during a production season are largely dictated by the recruitment success and failures and the processes regarding timing.

The number, health, and condition of broodstock going into the summer burrow period and the environmental conditions during the summer and after flood-up will dictate how successful reproduction and recruitment of young will be. Poor survival and/or reproduction of broodstock can result in too few young-of-the-year recruits, and excess recruitment can result in populations of small, sub-marketable crawfish. Timing of spawning and emergence from the burrow are also critical factors affecting successful recruitment and harvests. If spawning and burrow emergence occurs prior to pond filling, recruitment into the pond can be negatively impacted. If spawning and/or emergence occur after the optimum time for pond filling, valuable growing time during the warmer weeks of autumn will be lost.

Each of these factors can have an impact on overall yield and timing of the harvest, which can be critical in terms of profit potential. The biological and environmental factors that affect recruitment can change significantly from year to year and the impacts of these on yield and profits are often difficult to distinguish from various management-associated factors, such as flooding dates, water quality, food resources, and harvest strategies. Therefore, an effort was undertaken in this study to ascertain the possible biological/environmental impacts on recruitment potential prior to pond flooding.

**Pond History**: Ponds were in crawfish production during the fall/winter/spring of 2007/2008. See the procedures and dates associated with management of these ponds in the previous report entitled “**Assessment of Sampling and Harvest Yields When Crawfish Ponds are Populated Only by Stocking of Hatchlings.”**

**Pond Area**: Twelve 1-acre ponds

**Permanent Flood Date**: 1 Oct 2007

**Crawfish Harvest Cessation**: 23 June 2008

**Burrows Identified**: Perimeter levees surrounding the complex of ponds were monitored each week for 4 weeks prior to pond draining and for the week after pond draining, and freshly completed (capped) burrows were noted and flagged for future reference. The flagged burrows represented pre-drain and post-drain burrows.

**Pond Drain Date**: 30 June to 2 July 2008

**Summer Pond Conditions**: Ponds remained fallow after pond draining. No irrigation was implemented and the pond interior was plowed once for weed control. Levees, where flagged burrows were located, were undisturbed and remained intact. In one area of the pond complex, an irrigation riser leaked and water pooled near the base of a levee for approximately 2 days (22-24 July), after which the area dried and remained dry, except for moisture that accumulated due to rainfall. Flagged burrows associated with this “wet” area were segregated and burrow excavations were then resolved into “dry” and “wet” groups.

**Burrow Excavation**: Excavation of flagged burrows occurred from 17 - 19 Sept and findings were noted and collated.

**Comments:** Overall, 198 burrows were flagged at the beginning of the summer dry period. Attempts to excavate these burrows were made approximately 2 to 3 months later. Burrows were segregated into pre- and post-drain classifications based on the timing of burrowing in relation to pond draining. This essentially segregated the burrows into those that were initiated by crawfish at will and those that were initiated by crawfish that were forced to burrow due to draining of the pond. Also, because of the irrigation leak and introduction of moisture at an otherwise dry period near the locations of some burrows, the identified burrows were further segregated into "dry" and "wet" areas in reference to their proximity to the additional moisture.

Of the 198 flagged burrows, nearly 20% were found to be full of sediment (at various stages of moisture/compaction) at the time of excavation. Occupants of those burrows had either died or were forced to abandon the burrow, and heavy rainfall apparently filled the burrow with sediment. Due to the appearance and consistency of the fill, it appeared that all burrows were not filled at the same time, but perhaps over time. Few burrows (about 5%) were too deep and could not be examined thoroughly, and 8 to 40% were found to have been opened (i.e, crawfish had previously emerged). This varied considerably depending on timing of the burrowing but was inconsistent with relation to the proximity to the irrigation leak. Table 1 provides a summary of these findings.

One key observation was that 40% of the burrows in the dry areas contained either dead crawfish or remnants of dead crawfish, while in the wet area, only 4% contained dead remains. Likewise, 25% of burrows in the dry areas yielded live crawfish whereas 37% of those in the wet area produced live crawfish. It is unclear if the wet conditions for a few days in July resulted in the increase in survival within those burrows, but clearly the relationship between summer rainfall/irrigation patterns to crawfish survival in burrows warrants further investigation. Overall, however, the percentage of live crawfish found within burrows for 2008 was lower than expected.

It is not known to what effect temporary drought-like conditions and/or heavy rainfall had on the lower than expected recovery of live crawfish. Heavy rainfall associated with one or both of the hurricanes (Gustav and Ike) and/or occurring at other times during the summer may explain the large number of burrows filled with sediment, and the relatively long dry spell during August may help explain the high number of dead, especially associated with the drier areas of the fields. Table 1 clearly shows that burrows with dead crawfish averaged lower water volumes at the time of excavation.

Of the 50 mature females retrieved from burrows in mid-September, 48% had already spawned but their young had not yet hatched. Only 6% had hatchlings. There appeared to be a relationship, as expected, with burrowing timing – those crawfish that burrowed earlier (pre-drain) were generally associated with greater spawning and more advanced young. It is most advantageous for hatchlings to appear about the time fall flooding occurs; however, some amount of staggered recruitment is desired in a continuous and extended harvest scenario.

**Table 1**. Characteristics for crawfish burrows identified in early summer and excavated in the fall. Burrows were segregated into dry and wet areas as a result of a mid-summer irrigation leak that introduced additional moisture near some burrow locations. Rice Research Station, Crowley, LA. 2008.

| Timing | Num. | Too Deep (%) | Full of Sediment (%) | Open (%) | With Dead (%) | With Live (%) | Burrow Depth (inches) | | Water Volume (ml) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dead | Live | Dead | Live |
| ***Dry Areas*** | | | | | | | | | | |
| Pre-drain | 84 | 4.8 | 17.9 | 8.3 | 38.1 | 31.0 | 29.9 | 31.9 | 228 | 562 |
| Post-drain | 96 | 6.3 | 15.6 | 15.6 | 42.7 | 19.8 | 26.5 | 31.6 | 245 | 683 |
| ***Average*** | | ***6*** | ***17*** | ***12*** | ***40*** | ***25*** | ***28*** | ***32*** | ***237*** | ***623*** |
| ***Wet Area*** | | | | | | | | | | |
| Pre-drain | 5 | 20.0 | 20.0 | 40.0 | 0 | 20.0 | - | 31.0 | - | 825 |
| Post-drain | 13 | 0 | 23.1 | 15.4 | 7.7 | 53.8 | 37.0 | 35.6 | 0.0 | 1879 |
| ***Average*** | | ***10*** | ***22*** | ***28*** | ***4*** | ***37*** | ***37*** | ***33*** | ***0*** | ***1352*** |

**Table 2**. Status of mature female crawfish (and their offspring, if any) extracted from burrows during the September excavations. Dry and Wet areas represent the location of burrows in association with the mid-summer irrigation leak that provided additional moisture near some burrow locations. Rice Research Station, Crowley, LA. 2008.

| Timing | Number Burrows With Live Crawfish | Mature Females (%) | Spawned (%) | Hatched (%) |
|---|---|---|---|---|
| ***Dry Areas*** | | | | |
| Pre-drain | 26 | 100 | 61.5 | 11.5 |
| Post-drain | 19 | 84.2 | 37.5 | 0 |
| ***Average*** | | ***93*** | ***52*** | ***7*** |
| ***Wet Area*** | | | | |
| Pre-drain | 1 | 100 | 100 | 0 |
| Post-drain | 7 | 100 | 14.3 | 0 |
| ***Average*** | | ***100*** | ***25*** | ***0*** |

# SEASONAL INFLUENCES ON GROWTH OF RED SWAMP CRAWFISH IN LOUISIANA

W.R. McClain and J.J. Sonnier

## INTRODUCTION

The Louisiana crawfish aquaculture industry is large, with about 1,300 producers farming over 168,000 acres of crawfish ponds. In 2007, 109 million pounds of crawfish worth $84 million were produced. Unlike most other aquacultural operations that control population density by stocking known numbers of juveniles, crawfish ponds are populated by natural recruitment from indigenous or introduced broodstock. Recruitment can occur over several or more months, resulting in multiple juvenile age classes during the production season.

Crawfish ponds in southern Louisiana are typically flooded in the fall (September – November) and drained the following spring or summer (May or June), following the cessation of crawfish harvest. Crawfish retreat to burrows to survive the period of dewatering, and it is in the burrow where adults typically spawn. Because spawning is not synchronous, young-of-the-year recruitment can occur in any month following flood-up, but usually the bulk occurs in pulses from late fall through winter, with minor waves appearing in early to late spring.

Because recruitment occurs over several months and water temperature is a major determinant of growth rate, it is important to know from an economic perspective when the various waves of recruits will attain market size. Therefore, this study was conducted to ascertain growth rate and time required to attain minimum market size of young crawfish recruits that enter the pond at different months of the production season.

Although crawfish averaging 20 g or larger are desired by consumers and crawfish greater than 30 g are preferred, buyers will often accept crawfish of 15 g if the percentage of the catch is no greater than about 10 to 30%. Therefore, for this study, minimum market size was defined as 15 g.

The specific objectives of this study were to (1) examine growth rates of juvenile red swamp crawfish that simulate recruitment waves entering a population monthly from mid-October through mid-March, (2) determine when market size animals would first appear in the harvest from each month of simulated recruitment, and (3) estimate the cumulative degree-days required for crawfish to attain a minimum acceptable market size.

**Seasons**: This study was conducted over two crawfish seasons; Season 1 = 2001/2002 and Season 2 = 2002/2003.

**Pond History**: Ponds were fallow for a period of 10 months following each of the previous crawfish seasons. Fields were planted in April and the rice was harvest in August each season.

**Soil Type**: Crowley silt loam

**Water Source**: Groundwater

**Pond Area**: Two 0.5-acre ponds

**Forage Crops**: Rice, variety ‘Cocodrie,’ was seeded on 11 Apr at 120 lb/A in Season 1 and on 25 Apr at 110 lb/A in Season 2. Grain was harvested by rice combine on 17 Aug (Season 1) and 29 Aug (Season 2), and the respective ratoon forage crops were managed for crawfish production.

**Fertilizer**: 144 units of N following the rice harvest in Season 1 and 36 units of N after grain harvest in Season 2

**Herbicide**: Arrosolo at 1 gal/A in Season 1 and Stam at 3 qt/A and Basagran at 1.5 pt/A in Season 2 on the main rice crop

**Insecticide**: None

**Permanent Flood Date**: 10 Oct in Season 1 and 5 Oct in Season 2

**Enclosures**: Cylindrical wire-mesh enclosures (31 inches in diameter by 18 inches tall) constructed of 1/8-inch plastic-coated wire mesh, without an enclosed top or bottom, were placed in the pond at random over growing rice plants to serve as a confinement under typical field conditions. The enclosures contained a solid aluminum strip of sheeting (3 inches wide) around the inside top perimeter to prevent escapement from crawfish climbing up the wire mesh and, when the bottom edge was forced into the mud, the enclosures formed a confinement to contain crawfish that could be tracked for growth studies. Each cage had a bottom surface area of 0.5 $m^2$, and crawfish placed in the cages had full access to the water column, sediment and forage substrate within. Crawfish removal was facilitated by placing a metal-sheet caisson over the cages and removing the water within the caisson with a 12-volt water pump. Without water, crawfish could be spotted inside the enclosures and carefully removed for enumeration and weighing.

**Crawfish**: Cages were stocked with post-hatchling red swamp crawfish of approximately 0.5 g each

**Stocking Density**: Cages were stocked with either 2 or 6 crawfish per cage (= 4 or 12 crawfish per $m^2$)

**Timing**: Stockings of cages occurred approximately mid-month, each month from Oct through Mar for both seasons

**Treatments**: 12 treatment combinations (6 monthly stockings x 2 densities); 11 replicated cages per treatment combination for each season

**Weighing Schedules**: At 6 and 9 weeks, crawfish were retrieved and weighed and quickly returned to their respective enclosures. Final weights were determined after 12 weeks.

**Water Temperature**: Pond water temperature was recorded every 4 hours each year by a continuous temperature data-logger (Hobo®).

**Cumulative Degree-Day Determination**: Cumulative degree-days for each weigh period were calculated by summarizing the difference each day between the average daily temperature and the thermal threshold where growth is thought to cease (41°F).

**Parameters**: 6-, 9-, and 12-week weights, growth rate, survival, maturity, % achieving the minimal acceptable size for marketing of 15 g, cumulative degree days

**Statistical Analysis**: Analysis of variance; means separated by Duncan's multiple range test. Simple linear correlation analysis was used to ascertain relationships between water temperature and final weights and cumulative degree days to % market size.

**Support**: Louisiana Crawfish Promotion and Research Board

**Comments**: This study is the first attempt to ascertain growth rates and subsequent time required for juveniles to grow to market size under environmental and ecological conditions that simulate multiple pulses of natural recruitment during different months within a typical crawfish aquaculture production season in southern Louisiana. While it is widely known that growth is regulated by temperature, there are only a few reports on the effects of constant temperatures on growth of crawfish, but no study has looked at the effects of fluctuating temperatures on growth in the red swamp crawfish.

In general, average crawfish survival varied little by month of stocking, growth interval, density, or season (Table 1). Survival was lowest at the high density at 12 weeks. Average survival after 12 weeks was 78.8% for $12/m^2$ and 81.3% for $4/m^2$. Survival was also slightly lower in the second production season.

Average water temperature was slightly lower in Season 2, but it is not known if this had any effect on the lower crawfish survival for that season. Average water temperature varied greatly between the stocking months and growth intervals within months (Table 2). Ranking from lowest to highest based on average water temperature for each 12-week grow-out period (seasons combined) were December, November, October, January, February, and March stockings.

Crawfish weights, growth rates, percentage of mature individuals, and percentage of individuals reaching 15 g did not differ significantly among production seasons. Rankings for overall average growth rates (g/day) of crawfish generally followed in the same order as the average water temperature rankings, with slowest growth to fastest ranked as follows: December, November, October, January, March, and February (Table 3), but the difference in average growth rate did not statistically differ for crawfish stocked in February and March. Growth rate within the 12-week trials was positively correlated with average water temperature during that growth period (Tables 2 and 3), with linear correlation coefficients ($r$) of 0.91, 0.69, and 0.65 for 6, 9, and 12 weeks, respectively.

Average individual crawfish weight at 6, 9, and 12 weeks by initial density and month of stocking is presented in Figure 1. Overall, crawfish in the low density treatment were on average 25% heavier, but month of stocking had the greatest effect on growth. The comparative size of crawfish (averaged over both densities) over time stocked in different months of the production season is depicted in Figure 2, and this size distribution is representative of a typical population structure of crawfish in managed aquaculture impoundments where staggered recruitment occurs throughout the fall, winter, and spring.

Average weights and percent of crawfish that attained 15 g after 12 weeks by month of stocking were as follows: October, 16 g and 54%; November, 11 g and 16%; December, 6 g and 0%; January, 15 g and 50%; February, 23 g and 92%; and March, 24 g and 95% (Table 4). A higher percentage of crawfish attained maturity when stocked in months in which the average water temperature was highest.

The linear correlation coefficients for average weight at 12 weeks with cumulative degree-days for models applying a growth threshold of 41, 46, and 50°F were 0.8774, 0.8740, and 0.8667, respectively. Thus, the DD-41 provided the best fit with crawfish growth, and this relationship is depicted in Figure 3. Linear regression analysis was used to correlate DD-41 data with the percentage of crawfish reaching market size (Table 5) for each density/month of stocking combination (seasonal data combined), and the resulting regression models were used to predict the cumulative degree-days necessary for 50% of crawfish to reach a minimal acceptable market weight of 15 g from a 0.5 g initial weight (Figure 4). The models predicted 50% of crawfish would attain 15 g at a DD-41 of 1,532 at a density of $4/m^2$ and at a DD-41 of 1,803 for crawfish at $12/m^2$.

As indicated, increased density reduced crawfish growth for each month of stocking in this study. Density-dependent growth in crawfish has been widely documented, but the 25% reduction in weight (on average) at the higher density in this study is less than reported in several other studies. It has been suggested that overcrowding, and not necessarily food shortage, is the principal factor affecting size-at-harvest in commercial crawfish ponds. Food shortage was not apparent in this study; therefore, reductions in growth were not expected to be as severe as those studies that experienced overcrowding as well as food shortages.

Month of stocking (simulated recruitment date) was the dominant factor affecting growth in this study, and this was clearly a function of water temperature. No notable differences were discernable with regard to potential food resources within the enclosures. Standing forage (rice stubble/straw) was present in all enclosures, and at each weigh period, plant fragments and living animal forms (insects, worms, etc.) were visible on the sediment surface when water was removed to retrieve the crawfish. From a practical standpoint, producers should be able to easily associate the biological responses to water temperature by associating the ranking of growth rate, final weight, percentage maturity, and the percentage of individuals reaching minimal market size (15 g) to the ranking of average 12-week water temperatures by month of stocking.

When comparing final weights of the November- and December-stocked crawfish (10.5 and 6.0 g, respectively), however, the November crawfish were significantly larger but the average water temperature for both 12-week intervals was very similar (53.4 and 53.0°F, for November and December, respectively). Differences in final weight for crawfish was likely attributable to differences in water temperature during the first 6 weeks after stocking. Average water temperature for November-stocked crawfish during the first 6-week period was 56.3°F while average temperature for the same interval for December-stocked animals was 49.5°F. The period of the life stage when crawfish are exposed to sub-optimal temperatures for growth may have important implications as to the length of time required for juveniles to attain market size, and this should be further investigated.

From a crawfish aquaculture management perspective, the importance of achieving early recruitment and providing for optimal growing conditions in early autumn, before water temperatures decrease during the winter months, is apparent. This is especially pertinent if a producer expects to achieve an early harvest (December – January) derived primarily from young-of-the-year recruits. If recruitment in October/November is missed or delayed until December/January, the findings of this study show that crawfish may not reach harvest size until April or later. None of the December-stocked crawfish were market size by March and only 51% of the January recruits had reached that threshold size by April. Highest prices are typically received for those crawfish harvested before April. Furthermore, ponds are often drained before June, or populations may be overcrowded or depleted of forage by May or June. Thus, late recruits (March/April) may not have ample opportunity to attain market size.

The findings of this study demonstrate that it is highly advantageous to crawfish producers to have good recruitment early in the production season to maximize the opportunity for high yields and high potential profit.

A previous study reported that growth of crawfish in the lab at fluctuating temperature regimes was similar to growth at a constant temperature equal to the average of the fluctuating temperatures. While average water temperature within the suitable thermal range for growth of crawfish may be indicative of expected growth responses, temperature extremes outside the suitable thermal range will skew the relationship of average water temperature to growth. Cumulative degree-day (DD) measurements may be a better tool for relating crawfish growth to water temperature in environments where temperatures widely fluctuate during a production season.

Most critical to all DD models is determination of thermal minimum for growth. This has not been definitively determined for crawfish but is thought to be in the 41 to 50°F range. As stated above, the value of 41°F provided the best correlation of degree-days to crawfish growth; therefore, a DD-41°F model was used to estimate the cumulative degree-days necessary for 50% of juvenile (0.5 g) crawfish to reach a minimal market weight of 15 g. For red swamp crawfish grown under typical aquaculture conditions of south Louisiana, the estimated DD-41 was calculated to be 1,532 for a relatively low density ($4/m^2$) scenario, and 1,803 for a relatively high density ($12/m^2$) situation.

The most common base or threshold value used for reporting DD calculations for growth in many plants and animals seems to be 50°F. Although DD-50°F estimates were also calculated for crawfish densities of $4/m^2$ and $12/m^2$ in this study (DD-50 = 916 and 1,154, respectively), 50°F does not appear to be an optimum threshold for red swamp crawfish.

More research is needed to verify and refine DD requirements, especially with regard to the threshold values for growth, but it appears a DD-41°F model may be useful in estimating growth and other biological response variables, such as DD requirements to market size for red swamp crawfish under culture conditions of the Louisiana crawfish aquaculture industry.

**Table 1**. Average crawfish survival by month of stocking, growth interval, density, and production season for the 2-season study. Rice Research Station, Crowley, LA. 2008.

| ***Month of Stocking*** | | | | | |
|---|---|---|---|---|---|
| **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** |
| 86% | 87% | 82% | 79% | 78% | 79% |
| ***Cumulative Survival by Growth Interval*** | | | | | |
| **0 - 6 weeks** | | **6 - 9 weeks** | | **9 - 12 weeks** | |
| 83.1% | | 82.8% | | 79.4% | |
| ***Stocking Density*** | | | | | |
| **$4/m^2$** | | | **$12/m^2$** | | |
| 83% | | | 81% | | |
| ***Season*** | | | | | |
| **Season 1** | | | **Season 2** | | |
| 84% | | | 79% | | |

**Table 2**. Average water temperature ($^{o}$F) for each growth interval and overall 12-week growth period, by month of stocking (seasons combined*), for the 2-season study. Rice Research Station, Crowley, LA. 2008.

| | Month of Stocking | | | | | |
|---|---|---|---|---|---|---|
| | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** |
| **0 – 6 weeks** | 64.8 | 56.3 | 49.5 | 54.3 | 61.0 | 70.0 |
| **6 – 9 weeks** | 57.4 | 46.9 | 54.0 | 62.1 | 69.4 | 78.6 |
| **9 – 12 weeks** | 46.9 | 54.0 | 59.0 | 64.4 | 78.8 | 80.1 |
| **Overall 12 weeks** | 58.5 | 53.4 | 53.1 | 58.8 | 67.6 | 74.7 |

*Average (and range) of water temperatures for Season 1 were 63.0 (38.5 – 86.9)°F, and for Season 2 were 60.1 (39.4 – 83.7)°F.

**Table 3**. Average daily growth rate (g/day) of crawfish for each growth interval and average overall daily growth rate for each 12-week period, by month of stocking (densities and seasons combined), for the 2-season study. Averages with the same superscript, horizontal comparisons only, do not differ significantly at $\alpha$=0.05. Rice Research Station, Crowley, LA. 2008.

| | Month of Stocking | | | | | |
|---|---|---|---|---|---|---|
| | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** |
| **0 – 6 weeks** | $0.199^{B}$ | $0.106^{D}$ | $0.037^{F}$ | $0.069^{E}$ | $0.152^{C}$ | $0.219^{A}$ |
| **6 – 9 weeks** | $0.244^{B}$ | $0.070^{C}$ | $0.080^{C}$ | $0.212^{B}$ | $0.335^{A}$ | $0.326^{A}$ |
| **9 – 12 weeks** | $0.089^{D}$ | $0.198^{C}$ | $0.115^{D}$ | $0.339^{B}$ | $0.419^{A}$ | $0.340^{B}$ |
| **Overall 12 weeks** | $0.177^{C}$ | $0.125^{D}$ | $0.078^{E}$ | $0.208^{B}$ | $0.303^{A}$ | $0.293^{A}$ |

**Table 4**. Average crawfish weight (g) at each weigh period and average percentage of mature crawfish and average percentage of individuals exceeding 15 g after 12 weeks of growth, by month of stocking (densities and seasons combined), for the 2-season study. Averages with the same superscript, horizontal comparisons only, do not differ significantly at $\alpha$=0.05. Rice Research Station, Crowley, LA. 2008.

| | Month of Stocking | | | | | |
|---|---|---|---|---|---|---|
| | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** |
| **6-week weight** | $8.8^{B}$ | $4.9^{D}$ | $1.9^{F}$ | $3.4^{E}$ | $6.9^{C}$ | $9.7^{A}$ |
| **9-week weight** | $14.0^{B}$ | $6.4^{D}$ | $3.6^{E}$ | $7.8^{C}$ | $13.9^{B}$ | $16.5^{A}$ |
| **12-week weight** | $15.8^{B}$ | $10.5^{C}$ | $5.9^{D}$ | $14.9^{B}$ | $22.8^{A}$ | $23.5^{A}$ |
| **12-wk % Mature** | $26.4\%^{B}$ | $0^{C}$ | $0^{C}$ | $4.8\%^{C}$ | $33.2\%^{B}$ | $44.6\%^{A}$ |
| **12-wk % > 15 g** | $54\%^{B}$ | $16\%^{C}$ | $0^{D}$ | $51\%^{B}$ | $93\%^{A}$ | $95\%^{A}$ |

**Table 5**. Average response variables of crawfish, by treatment density, at weeks 9 and 12, arranged by percentage of individuals > 15 g (seasonal data combined). Highlighted cells correspond to average percentage > 15 g of over 50%. Rice Research Station, Crowley, LA. 2008.

| Month of Stocking | Weigh Period | % Surv. | Density | Avg. Wt. | Growth (g/day) | % Mature | % > 15 g | Avg. Water Temp. | DD41 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ***Low Density Group*** | | | | | |
| Dec | 9 | 85.4 | 3.4 | 3.8 | 0.060 | 0.0 | 0.0 | 51.1 | 194 |
| Nov | 9 | 85.5 | 3.4 | 6.8 | 0.108 | 0.0 | 0.0 | 53.2 | 237 |
| Dec | 12 | 88.2 | 3.5 | 6.4 | 0.076 | 0.0 | 0.0 | 53.1 | 311 |
| Jan | 9 | 76.9 | 3.1 | 8.4 | 0.133 | 0.0 | 5.0 | 56.8 | 310 |
| Nov | 12 | 83.4 | 3.3 | 11.8 | 0.140 | 0.0 | 22.7 | 53.4 | 321 |
| Feb | 9 | 83.6 | 3.3 | 14.9 | 0.236 | 4.8 | 43.9 | 63.9 | 443 |
| Oct | 9 | 88.6 | 3.5 | 16.0 | 0.254 | 29.5 | 54.5 | 62.2 | 413 |
| Jan | 12 | 78.3 | 3.1 | 16.6 | 0.197 | 2.3 | 65.2 | 58.8 | 462 |
| Mar | 9 | 85.9 | 3.4 | 17.4 | 0.276 | 5.6 | 66.7 | 72.9 | 619 |
| Oct | 12 | 81.8 | 3.3 | 17.9 | 0.213 | 36.4 | 72.7 | 58.5 | 452 |
| Feb | 12 | 79.5 | 3.2 | 25.8 | 0.307 | 36.4 | 95.5 | 67.6 | 688 |
| Mar | 12 | 78.1 | 3.1 | 26.1 | 0.310 | 41.3 | 100.0 | 74.7 | 872 |
| | | | Averages* | | | | **75.8*** | | **584*** |
| | | | | ***High Density Group*** | | | | | |
| Dec | 9 | 80.8 | 311 | 3.5 | 0.055 | 0.0 | 0.0 | 51.1 | 194 |
| Jan | 9 | 81.1 | 310 | 7.3 | 0.115 | 0.0 | 0.0 | 53.2 | 310 |
| Dec | 12 | 78.8 | 321 | 5.5 | 0.066 | 0.0 | 0.0 | 53.1 | 311 |
| Nov | 9 | 84.1 | 443 | 5.8 | 0.093 | 0.0 | 0.8 | 56.8 | 237 |
| Nov | 12 | 87.9 | 413 | 9.2 | 0.109 | 0.0 | 8.9 | 53.4 | 321 |
| Oct | 9 | 89.4 | 462 | 11.9 | 0.189 | 12.0 | 17.4 | 63.9 | 413 |
| Feb | 9 | 78.8 | 619 | 12.9 | 0.205 | 6.0 | 21.2 | 62.2 | 443 |
| Oct | 12 | 84.1 | 452 | 13.7 | 0.163 | 16.4 | 35.1 | 58.8 | 452 |
| Jan | 12 | 82.6 | 688 | 13.3 | 0.159 | 6.9 | 36.0 | 72.9 | 462 |
| Mar | 9 | 76.5 | 872 | 15.9 | 0.252 | 10.6 | 60.7 | 58.5 | 619 |
| Feb | 12 | 72.7 | 584 | 19.8 | 0.236 | 30.0 | 89.5 | 67.6 | 688 |
| Mar | 12 | 66.0 | 7.9 | 21.5 | 0.256 | 46.7 | 90.6 | 74.7 | 872 |
| | | | Averages* | | | | **80.3*** | | **727*** |

*Averages represent only those results where greater than 50% of individuals had attained the minimal acceptable market size of 15 g or larger.

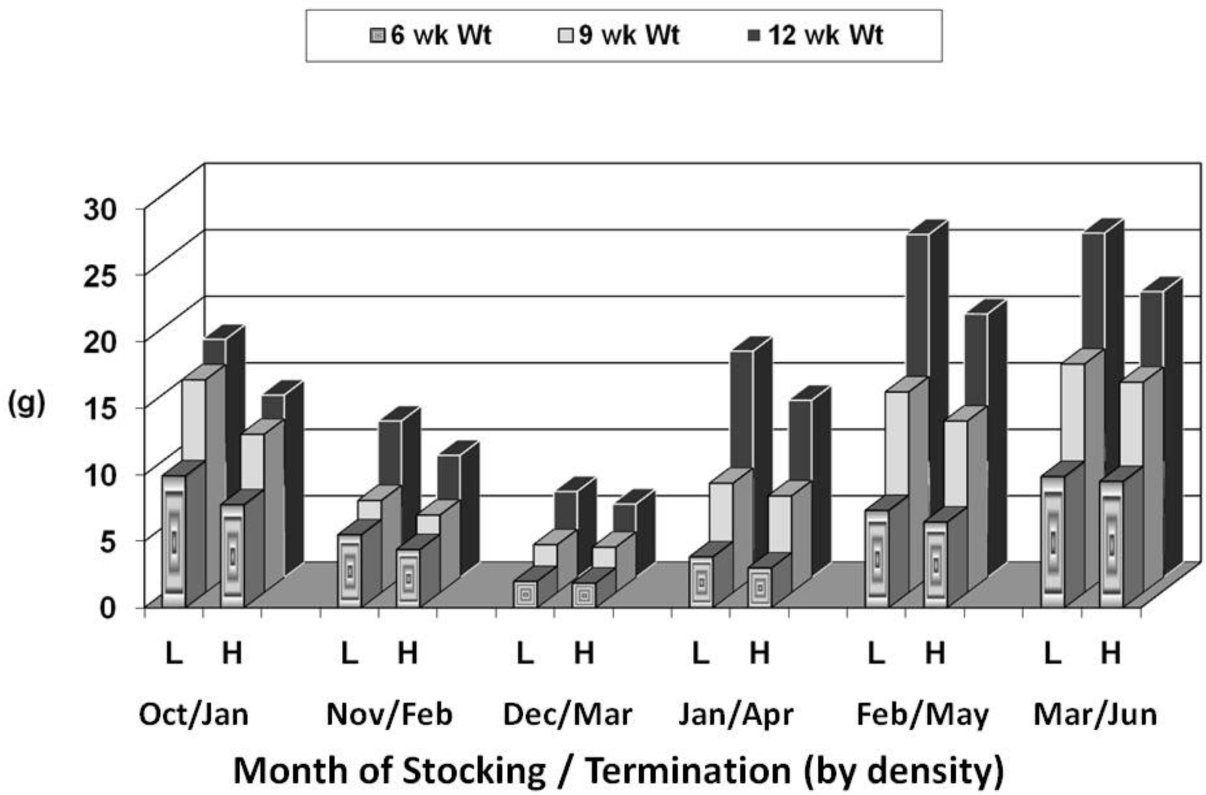



**Figure 1**. Average crawfish weights at 6, 9, and 12 weeks following stocking of hatchlings in enclosures within earthen ponds at two densities (4 and $12/m^2$) for 6 consecutive months, beginning in October. Month of termination is indicated for each month of stocking. Rice Research Station, Crowley, LA. 2008.

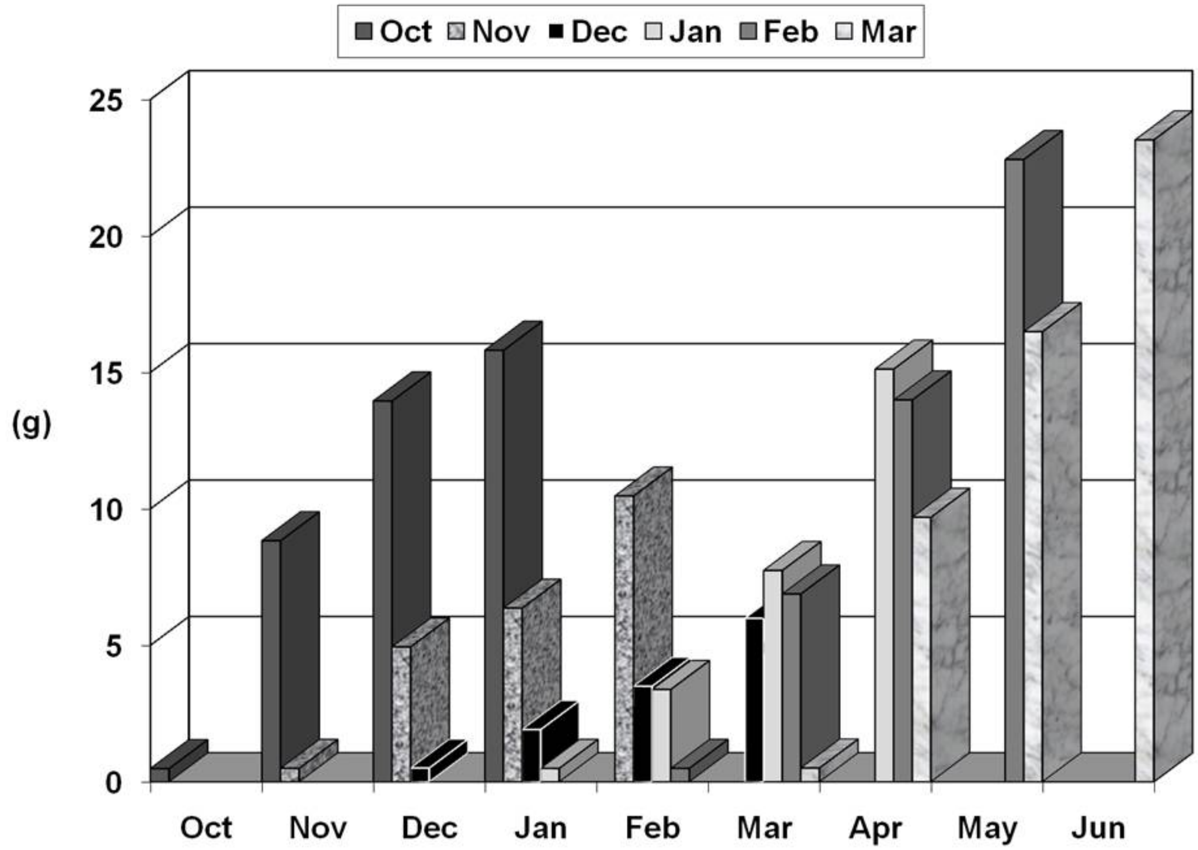



**Figure 2**. Average crawfish weights (densities combined) by month for hatchlings stocked in enclosures within ponds in October, November, December, January, February, and March, and weighed at 6, 9, and 12 weeks following stocking. Rice Research Station, Crowley, LA. 2008.

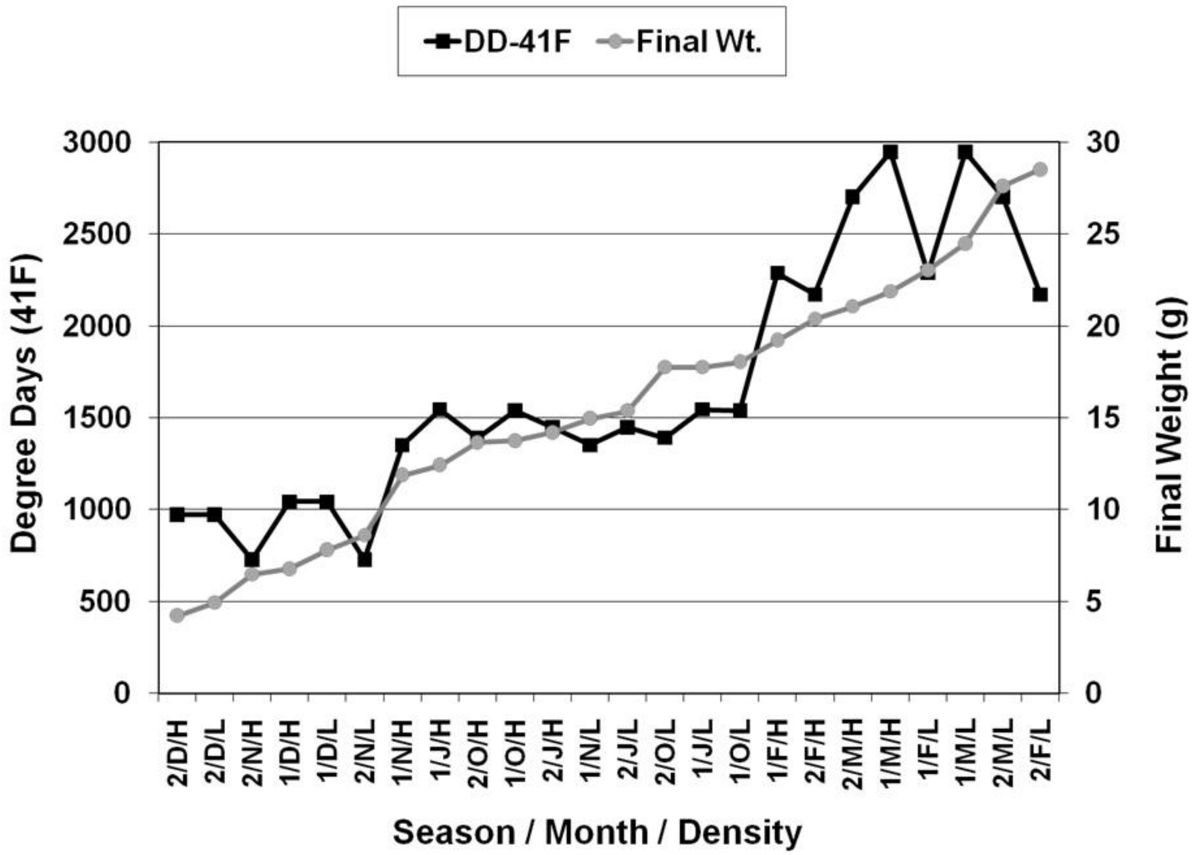



**Figure 3**. Average final weights plotted with the cumulative degree-days (DD-41) using 41°F as the lower threshold for growth for each "season by month by density" arrangement of treatment factors for crawfish grown in enclosures within ponds. Rice Research Station, Crowley, LA. 2008.

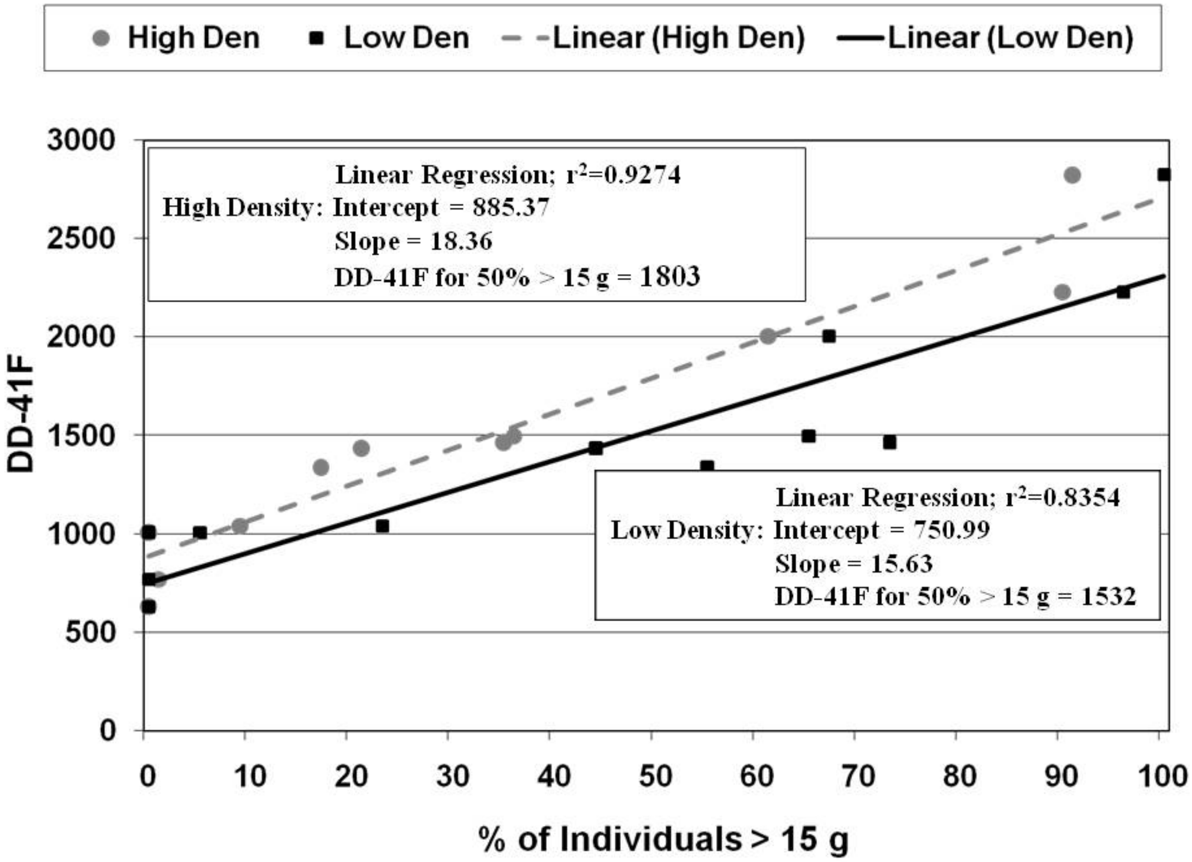



**Figure 4**. Plot of cumulative degree-day (DD-41) values and the percentage of crawfish attaining 15 g after 9 and 12 weeks for the low ($4/m^2$) and high ($12/m^2$) stocking densities. Linear regression was determined for each stocking density and used to estimate DD-41 requirements for 50% of crawfish to reach a minimum acceptable size for market. Rice Research Station, Crowley, LA. 2008.

## OBSERVATIONS FOR POTENTIAL TOXICITY OF EXPERIMENTAL RICE INSECTICIDES TO CRAWFISH

W.R. McClain, M.J. Stout, J.J. Sonnier, and S. Lanka

### INTRODUCTION

Crawfish and rice production are well integrated in Louisiana, and much of the crawfish are produced in rotational cropping systems where the rice field is subsequently used to produce crawfish. Typically, there is a short overlap in seasons, whereby newly planted rice fields are dispersed among crawfish ponds during the peak crawfish production season. Rice and crawfish ponds are often in close proximity and commonly are separated only by a narrow road or levee. In recent years, numerous incidents have occurred whereby crawfish production was halted or seriously damaged because of pesticide drift from an application to a nearby rice field, at great economic loss to the crawfish producer. The rice water weevil is a major pest in Louisiana and typically requires control with a pesticide for profitable production of rice. Therefore, efforts are underway to investigate alternative rice insecticide compounds and/or alternative methods of application, both to mitigate problems with drift and also for increased efficacy, economical, and resistance concerns in the main rice crop. New (Dermacor) and previously evaluated insecticides (Karate and Dinotefuran) were evaluated for potential adverse effects to crawfish in small plot studies at the Rice Research Station.

Following are the synopsis of two trials whereby crawfish were exposed to the rice insecticides under commercial or simulated commercial conditions during 2008. Included for each trial is a brief time line and set of experimental conditions, results in tabular format, followed by a short comment regarding the findings of each bioassay. Fresh, healthy red swamp crawfish were stocked individually in cages. Each plot or field contained several replicates of caged crawfish.

***Trial 1 = Crawfish bioassays within experimental plots at three periods following planting.***

**March 2008**: 12 small plots, each consisting of an individually leveed area measuring 40 x 100 ft (0.092 A) with separate access by pipe to a lateral) were assigned to four insecticide treatments with three replicated plots per treatment arranged according to a randomized block design Treatments consisted of Dermacor treated seed (0.12 lb ai/A), Karate (0.03 lb ai/A) treated the day permanent flood was applied to plots, Dinotefuran (180 g ai/A) treated 23 days after permanent flood was applied to plots, and an untreated control.

**March 25, 2008**: Drill-seeded small subplots with rice; 16 plots of rice seeded in each plot. Subplots measured 4.2 x 18 ft. Area planted with rice in each plot was 1,210 $ft^2$, or approximately 30% of the total area of the plot.

**March 31, 2008**: Flooded plots for a 48-hour duration to aid seed germination and then drained.

**March 31, 2008**: Crawfish were placed individually in small enclosures (16-inch by approximately 8-inch diameter wire mesh cylindrical cages) and randomly distributed in the Dermacor and Control plots for Bioassay #1. A total of 20 crawfish were placed per plot, equaling 60 replicated animals per treatment. An equal mixture of males and females and immature and mature crawfish were placed in each plot.

**April 2, 2008**: Bioassay #1 was terminated after 48 hours, and crawfish mortality or moribundity was assessed.

**April 28, 2008**: A permanent flood was established in all plots.

**April 28, 2008**: Fresh crawfish were placed individually in cages (16 crawfish per plot) in the Dermacor, Karate, and Control plots achieving a total of 48 replicated animals per treatment for Bioassay #2. An equal mixture of males and females and immature and mature crawfish were placed in each plot.

**April 28, 2008**: Karate-designated plots received an application of the insecticide by a hand sprayer. Treatment consisted of applying the recommended rate (0.03 lb ai/A) over rice covered area only, which constituted 30% of the flooded plot area.

**April 30 - May 19, 2008**: Crawfish were assessed after 2, 4, 7, 14, and 21 days for mortality.

**May 20, 2008**: Fresh crawfish were placed individually in cages (16 crawfish per plot) in the Dermacor, Dinotefuran, and Control plots achieving a total of 48 replicated animals per treatment for Bioassay #3. An equal mixture of males and females and immature and mature crawfish were placed in each plot with the exception of one replicate Dermacor plot, which received no immature males and eight immature females.

**May 21, 2008**: First weevil core samples taken from all 12 plots, four core samples per plot

**May 21, 2008**: Dinotefuran applied to designated plots. Each subplot of rice received approximately 0.34 grams ai of Dinotefuran. Only subplots (ca. 30% of total plot area) were treated.

**May 29, 2008**: Second core sampling to assess weevil populations.

**May 23 - May 26, 2008**: Crawfish were assessed after 3 and 6 days (or 2 and 5 days after Dinotefuran treatment) for mortality.

**Table 1.** Bioassay #1: Crawfish mortality at first flush after planting Dermacor-treated seed. Water temperature during the 48-hr period ranged from 69 to 85°F (minimum-maximum). N=60 crawfish per treatment. Rice Research Station, Crowley, LA. 2008.

| | **Maturity/Sex** | **Days after Crawfish Stocking** |
|---|---|---|
| **Dermacor** | Immature / Female | 0 |
| | Immature / Male | 1 |
| | Mature / Female | 0 |
| | Mature / Male | 0 |
| | | **Total = 1** |
| **Control** | Immature / Female | 0 |
| | Immature / Male | 1 |
| | Mature / Female | 0 |
| | Mature / Male | 0 |
| | | **Total = 1** |

**Comments – Bioassay #1**. There appears to be little reason for concern with drilled Dermacor-treated seed at first flush based on these results.

**Table 2**. Bioassay #2: Crawfish mortality after Karate application following the permanent flood (34 days after planting). N=48 crawfish per treatment. Minimum-maximum temperatures were recorded from one random plot. Rice Research Station, Crowley, LA. 2008.

| | | **Days after Crawfish Stocking** | | | | | ***Sub-Total*** |
|---|---|---|---|---|---|---|---|
| | **Mat/Sex** | **2 Days** | **4 Days** | **7 Days** | **14 Days** | **21 Days** | |
| **Dermacor** | Immature / Female | 2 | - | - | 1 | - | 3 |
| | Immature / Male | 5 | - | - | 2 | 1 | 8 |
| | Mature / Female | 1 | - | 1 | - | - | 2 |
| | Mature / Male | 2 | - | - | 1 | - | 3 |
| | | 10 | 0 | 1 | 4 | 1 | **Total=16** |
| | | | | | | | |
| **Karate** | Immature / Female | 2 | - | - | - | 3 | 5 |
| | Immature / Male | 1 | - | 1 | - | - | 2 |
| | Mature / Female | 1 | 1 | | - | - | 2 |
| | Mature / Male | 2 | - | 1 | - | - | 3 |
| | | 6 | 1 | 2 | 0 | 3 | **Total=12** |
| | | | | | | | |
| **Control** | Immature / Female | - | - | - | - | 1 | 1 |
| | Immature / Male | 2 | - | 1 | - | 1 | 4 |
| | Mature / Female | - | - | - | - | 2 | 2 |
| | Mature / Male | - | - | - | - | 2 | 2 |
| | | 2 | 0 | 1 | 0 | 6 | **Total=9** |
| | | | | | | | |
| Min-Max Temp (°F) | | 60-91 | 63-82 | 59-95 | 61-97 | 63-91 | |

**<u>Comments – Bioassay #2</u>**. Based on these results, there does appear to be reason for concern with Dermacor-treated seed and crawfish early on after the permanent flood. However, further trials are needed to corroborate or refute these preliminary findings. Regarding the Karate treatment, fewer than expected deaths occurred, but perhaps this was caused by the relative low treatment rate as affected by dilution due to the large untreated border area.

**Table 3**. Bioassay #3: Crawfish mortality after last insecticide (Dinotefuran) application (57 days after planting and 23 days after establishment of the permanent flood). N=48 crawfish per treatment. Minimum-maximum temperatures were recorded from one random plot. Rice Research Station, Crowley, LA. 2008.

| | | Days after Crawfish Stocking | | |
|---|---|---|---|---|
| | **Mat/Sex** | **3 Days** | **6 Days** | ***Sub-Total*** |
| **Dinotefuran** | Imm / Fem | 9 | 2 | 11 |
| | Imm / Male | 4 | 8 | 12 |
| | Mat / Fem | 1 | 5 | 6 |
| | Mat / Male | 4 | 4 | 8 |
| ***Treatment Total*** | | 18 | 19 | **Total=37** |
| | | | | |
| **Dermacor**[1] | Imm / Fem | 11 | 5 | 16 |
| | Imm / Male | 1 | 6 | 7 |
| | Mat / Fem | 1 | 5 | 6 |
| | Mat / Male | 3 | 3 | 6 |
| ***Treatment Total*** | | 16 | 19 | **Total=35** |
| | | | | |
| **Control**[1] | Imm / Fem | 10 | 2 | 12 |
| | Imm / Male | 6 | 5 | 11 |
| | Mat / Fem | 2 | 5 | 7 |
| | Mat / Male | 5 | 3 | 8 |
| ***Treatment Total*** | | 23 | 15 | **Total=38** |
| | | | | |
| Min-Max Temp ($^{o}$F) | | 72-95 | 75-99 | |

[1] Two of three replicated plots in the Dinotefuran and Control treatments were found to have very shallow water from Day 3 through Day 6, which contributed to very warm water conditions.

**<u>Comments – Bioassay #3</u>**. Elevated water temperatures confounded the results of this bioassay as evident by the relative high mortalities observed in the control group.

***Trial 2 = Crawfish bioassay within experimental plots of simulated tailwater exposure***

**<u>April 25, 2008</u>**: Two experimental plots (21 x 116 ft or 0.56 A, with 10 x 78 ft of planted area) were seeded with either Dermacor treated seed (0.025 mg ai/seed) or non-treated rice seed (Control).

**<u>May 7, 2008</u>**: Plots were flooded for a period of 24 hours to simulate a common first-irrigation practice.

**<u>May 8, 2008</u>**: Irrigation water was diverted to adjacent plots that had not been planted.

**<u>May 9, 2008</u>**: Crawfish were placed individually in small enclosures (16-inch by approximately 8-inch diameter wire mesh cylindrical cages) and randomly distributed in the deeper areas of the shallow flooded plots containing tail water from either the Dermacor or Control plots. A total of 24 crawfish per treatment, equally divided among males and females and mature and immature individuals (N=6 reps of each maturity/sex combination) were placed in each plot.

**<u>May 23 – May 26, 2008</u>**: Crawfish were assessed for mortality at various days after stocking and the bioassay was terminated after 21 days.

**Table 4**. Crawfish mortalities over the 21-day simulated Dermacor tailwater trial. N=24 crawfish per treatment. Rice Research Station, Crowley, LA. 2008.

| | | **Days after Stocking** | | | | | | | | ***Sub-Total*** |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mat/Sex** | **1** | **2** | **3** | **5** | **7** | **11** | **14** | **21** | |
| **Treated** | Imm / Fem | 1 | - | - | - | - | - | - | - | 1 |
| | Imm / Male | 1 | - | 1 | - | - | - | - | - | 2 |
| | Mat / Fem | 3 | - | - | - | - | - | - | - | 3 |
| | Mat / Male | 2 | 1 | | 1 | | | | | 4 |
| ***Treatment Total*** | | 7 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | **Total=10** |
| | | | | | | | | | | |
| **Control** | Imm / Fem | 2 | - | - | 1 | - | - | - | - | 3 |
| | Imm / Male | 0 | - | - | - | - | - | - | - | 0 |
| | Mat / Fem | 3 | 1 | - | - | - | - | - | - | 4 |
| | Mat / Male | 1 | 1 | - | - | - | - | - | - | 2 |
| ***Treatment Total*** | | 6 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | **Total=9** |
| | | | | | | | | | | |
| Min-Max Temp ($^o$F)[1] | | - | - | 62-86 | 69-88 | 70-81 | 66-78 | 72-84 | 72-88 | |

[1] Temperature data-logger readings were not available until Day 3; however, water temperature was warmest during the first 2 days of the trial.

**Comments – Tailwater Bioassay**. Elevated water temperatures during the first 2 days of the trial may have contributed to higher than normal mortality, but evidence of a contaminated tailwater effect is lacking.

# RICE DISEASE CONTROL RESEARCH

## RICE DISEASE CONTROL STUDIES, 2008[1]

D.E. Groth, X.H. Wang, C. Dischler, and M.J. Frey

Sheath blight, bacterial panicle blight, Cercospora, and blast are four of the most important diseases of rice. How a farmer manages these diseases often means the difference between a profit and a loss. A number of factors affect disease development, including varietal resistance, cultural practices, cropping history, and pesticide usage. Environmental conditions also greatly affect disease development but are out of the farmer's hand. However, knowing which conditions are favorable for disease development allows the producer to initiate the appropriate disease control practices. Cultural management often plays an important role as evidenced by the fact that sheath blight was a minor disease until the introduction of semidwarf varieties, high N rates, and soybeans as a rotational crop.

Data from research tests suggest that rice diseases annually cause at least an average range of 7 to 15% loss in yield in the South. With present production costs and the price of rice, this average yield loss translates into an average 33 to 40% loss in potential net return because of rice diseases. Direct losses to disease include reduction in plant stands, lodging, spotted kernels, fewer and smaller grains per plant, and a general reduction in plant efficiency. Indirect losses include the cost of fungicides used to manage disease, application costs, and reduced yields associated with special cultural practices that reduce disease but may not be conducive to producing maximum yields.

The major diseases of rice in Louisiana are the fungal disease blast, caused by Pyricularia grisea; sheath blight, caused by Thanatephorus cucumeris (Rhizoctonia solani); bacterial panicle blight caused by *Burkholderia* glumae; stem rot, caused by Magnaporthe salvinii (Sclerotium oryzae); brown spot, caused by Cochiobolus miyabeanus; narrow brown spot, caused by Sphaerulina oryzina (Cercospora janseana); and kernel smut, caused by Neovossia horrida. Seedling diseases caused by species of Achlya and Pythium are also important in water-seeded rice. Bacterial panicle blight has been identified as a major disease and is caused by the bacterium Burkholderia glumae. Minor diseases include crown rot, causal agent unknown; leaf scald, caused by Gerlachia oryzae; leaf smut, caused by Entyloma oryzae; sheath rot, caused by Sarocladium oryzae; stackburn disease, caused by Alternaria padwickii; sheath spot, caused by Rhizoctonia oryzae; crown sheath rot, caused by Gaeumannomyces graminis var. graminis; black kernel, caused by Curvularia lunata; seedling blights, caused by various fungi; false smut, caused by Ustilaginoidea virens; root rots, caused by several fungi; and several miscellaneous leaf, stem, and glume spotting diseases.

Host resistance and fungicides play an important role in limiting these losses. The objective of these studies is to develop disease management practices that economically reduce rice diseases and increase the yield and quality of rice.

This report is on current research evaluating both registered and experimental compounds. It also represents only one year of data, and multiple years are needed to effectively evaluate agronomic practices. Therefore, no specific recommendation of a product or practice is implied. For specific recommendations and more information, contact your local Cooperative Extension Agent.

The use of a foliar fungicide to reduce rice diseases is often justified under severe disease conditions. Some factors that favor the use of a fungicide include: 1) history of disease in the field, 2) varietal susceptibility, 3) high yield potential, 4) rice being grown for seed, 5) rice planted late, and 6) rice ratooned. The primary targets for rice fungicide applications are sheath blight and blast. Generally, secondary rice diseases are not severe enough to justify a fungicide application. However, control of these secondary diseases, from sheath blight and blast applications, often contributes to the overall increase in yield and quality.

[1] This research is supported in part by funds provided by rice producers through the Louisiana Rice Research Board and various agricultural chemical companies.

All of the fungicides tested have benefits and disadvantages. Tilt gives good narrow brown leaf spot and Cercospora sheath blotch and leaf smut control but no control of blast. Moncut has good activity against sheath blight, but it has the narrowest disease control spectrum. Quadris combines excellent sheath blight activity with control of blast but is weak against narrow brown leaf spot and Cercospora sheath blotch. The combination products, Stratego and Quilt, have broad spectrum disease activity but have slightly less sheath blight activity.

Many other factors affect fungicide efficacy, including application timing, cultural practices, inoculum levels, weather, varietal resistance, spray volume, type of adjuvants added to the spray solution, and the application method used. Problems can develop from these factors that limit fungicide activity. One problem occurs when fungicides are applied by air. Most of the material is deposited on the upper third of the canopy. Redistribution by rain and dew is then required to move the fungicide into the lower canopy where most of the disease is present. Redistribution into the lower canopy is necessary since these fungicides are either non-systemic, or if systemic, they are only locally systemic or only move upward in the plant. Weathering associated with redistribution is also detrimental since some fungicidal activity is lost. Other conditions that limit fungicide activity include drift, volatility, and calibration errors. Rainfall immediately after application, before the fungicide can dry on the plant or be absorbed by the plant, can remove significant amounts of fungicides from the foliage and impair yield performance. Normally, a 4-hour drying period is adequate after application.

Since all fungicides labeled are very specific as to the diseases they control, scouting rice is extremely important to determine disease incidence and severity. Fields should be scouted weekly for disease development beginning when the first tillers begin to develop and continuing through heading. Rice should be sampled at several (20 or more) locations throughout the field. The size of the field and the disease distribution will determine the extent of sampling. At each sampling location, 25 to 50 tillers should be examined for disease symptoms (refer to back pages and the Louisiana Agricultural Experiment Station Bulletin No. 828, Rice Diseases and Disorders in Louisiana). Other diseases that require fungicides for control, especially the rice blast disease, must be noted between scouting stops as damaging levels can develop from light infestations that were not detected at the scouting stops. For sheath blight, the percentage of tillers infected at the sampling locations should be averaged to determine the disease incidence for the field. Spraying a fungicide for sheath blight is warranted if an average of 5 to 10% of the tillers (approximately 20-40% positive stops) are infected during joint elongation stages of growth in susceptible varieties. Spraying moderately susceptible varieties are warranted if more than 15% of the tillers are infected (approximately 50% positive stops). Unfortunately, there is no good scouting/prediction system for blast or bacterial panicle blight at this time, and when leaf blast is found, preventative sprays to protect the head are recommended for susceptible varieties. Prevailing temperatures at heading predict bacterial panicle blight. Disease identification is extremely important since several diseases can be confused.

Table 1. List of fungicides tested in 2008.

| | **Common Name** | **Company** |
|---|---|---|
| Quadris 2.08 SC | Azoxystrobin | Syngenta |
| Stratego 2.08 EC | Trifloxystrobin / Propiconazole | Bayer |
| GEM 500 SC | Trifloxystrobin | Bayer |
| Quilt 1.16 SC | Azoxystrobin/ Propiconazole | Syngenta |
| Moncut 2 SC | Flutolanil | Gowan |
| Tilt 3.6 EC | Propiconazole | Syngenta |
| A15909A 2.2 SC | Azoxystrobin/ Propiconazole | Syngenta |

## 2008 Varietal and URN Disease Resistance Evaluation (DN1)

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Various, 90 lb/A

**Plot Size**: 1 to 3 six-ft rows

**Planting Method/Date**: Drill-seeded, Mar 24

**Fertilization**: Preplant 24-72-72, Mar 24; topdressing, 120-0-0, Apr 25

**Experimental Design**: Randomized complete block design with two to four replications

**Water Management**: Flooded, Apr 28; drained, May 7; reflooded, May 14

**Herbicides**: 4 qt Arrosolo + 1 oz Permit/A, Apr 23

**Insecticides**: Dermacor seed treatment; Karate

**Fungicides**: None

**Inoculation Dates**: Sheath blight, June 5; bacterial panicle blight at early heading, various dates

**Application Equipment**: N/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| N/A | | | | | | | |

**Disease Ratings**: See Tables 2 to 9

**Drained**: July 18

**Harvest**: N/A

**Results**: See Tables 2 to 9

**Comments**: Sheath blight severity was high, and bacterial panicle blight severity was moderate.

Table 2. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (Variety Trial).

| Pathogen Code | | SB | BPB | RNB |
|---|---|---|---|---|
| Rating Unit | | 0-9 | 0-9 | 0-9 |
| Rating Date | | July 17 | July 17 | Aug 27 |
| 1 | Banks | 6.0 efg | 4.7 b-f | 3.0 c-g |
| 2 | CL131 | 8.0 a-d | 5.3 a-d | 1.7 e-i |
| 3 | CL151 | 7.7 a-d | 5.0 b-e | 5.7 ab |
| 4 | CL161 | 8.3 abc | 5.3 a-d | 3.7 a-e |
| 5 | CL171 | 8.3 abc | 5.7 abc | 4.0 a-d |
| 6 | Cocodrie | 8.3 abc | 5.3 a-d | 5.3 abc |
| 7 | Cypress | 8.0 a-d | 6.0 ab | 4.3 a-d |
| 8 | Cybonnet | 7.7 a-d | 5.0 b-e | 2.7 d-h |
| 9 | Cheniere | 7.0 c-f | 4.3 c-g | 6.0 a |
| 10 | Catahoula | 7.3 b-e | 3.7 efg | 1.7 e-i |
| 11 | Dellrose | 6.7 d-g | 4.7 b-f | 2.7 d-h |
| 12 | Della | 5.3 gh | 4.7 b-f | 3.7 a-e |
| 13 | Dellmati | 5.7 fg | 3.3 fgh | 0.3 i |
| 14 | Spring | 8.0 a-d | 4.3 c-g | 4.3 a-d |
| 15 | Trenasse | 8.3 abc | 6.7 a | 3.0 c-g |
| 16 | Wells | 6.0 efg | 5.7 abc | 6.0 a |
| 17 | TORO-2 | 6.3 efg | 5.3 a-d | 4.3 a-d |
| 18 | Bengal | 5.7 fg | 5.0 b-e | 5.0 a-d |
| 19 | Jupiter | 6.0 efg | 2.3 hi | 2.7 d-h |
| 20 | Pirogue | 4.3h | 3.0 ghi | 5.7 ab |
| 21 | Neptune | 6.0 efg | 2.3 hi | 1.0 ghi |
| 22 | AR1124 | 8.0 a-d | 4.0 d-g | 0.7 hi |
| 23 | AR1182 | 6.7 d-g | 5.3 a-d | 1.3 f-i |
| 24 | TX3075 | 4.3 h | 2.0 i | 0.0 i |
| 25 | CY002 | 9.0 a | 3.7 efg | 5.3 abc |
| 26 | CY003 | 8.0 a-d | 4.3 c-g | 3.7 a-e |
| 27 | CY004 | 8.0 a-d | 4.3 c-g | 3.3 b-f |
| 28 | CY005 | 8.7 ab | 4.7 b-f | 4.7 a-d |
| 29 | CY006 | 8.7 ab | 5.0 b-e | 5.7 ab |
| 30 | CY007 | 6.7 d-g | 3.0 ghi | 5.7 ab |
| 31 | CY008 | 8.3 abc | 5.0 b-e | 4.0 a-d |
| 32 | CY009 | 8.0 a-d | 5.7 abc | 4.0 a-d |
| 33 | CY010 | 8.7 ab | 4.7 b-f | 5.3 abc |
| LSD (P=.05) | | 0.84 | 0.84 | 1.30 |
| Standard Deviation | | 0.51 | 0.52 | 0.80 |
| CV | | 7.13 | 11.39 | 21.89 |
| Replicate F | | 0.803 | 0.608 | 0.444 |
| Replicate Prob(F) | | 0.4525 | 0.5475 | 0.6434 |
| Treatment F | | 18.832 | 13.798 | 14.389 |
| Treatment Prob(F) | | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 3. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group I).

| | | SB | BPB | RNB |
|---|---|---|---|---|
| Pathogen Code | | SB | BPB | RNB |
| Rating Unit | | 0-9 | 0-9 | 0-9 |
| Rating Date | | July 17 | July 17 | Aug 27 |
| 1 | GP13416/KATY//PI 312 | 7.0 cde | 5.3 abc | 6.5 b |
| 2 | CFX-18//CCDR/9770532 | 8.0 abc | 4.5 b-e | 4.8 bcd |
| 3 | (LGRU/LSCN)RU9801111 | 6.3 e | 3.5 e | 1.3 i |
| 4 | 91642//KATY/NWBT/5/R | 6.5 de | 5.5 ab | 2.5 f-i |
| 5 | CFX-26/9702128 | 8.0 abc | 5.3 abc | 5.3 bcd |
| 6 | CPRS/LGRU | 7.3 b-e | 4.5 b-e | 3.3 d-h |
| 7 | LBNT/9902/3/DAWN/969 | 6.5 de | 5.5 ab | 5.0 bcd |
| 8 | CCDR/CLR 11 | 8.5 a | 5.3 abc | 5.5 c |
| 9 | CPRS/LGRU | 8.0 abc | 5.3 abc | 4.3 c-f |
| 10 | DREW/UA99-167 | 7.5 a-d | 3.8 de | 2.0 hi |
| 11 | CPRS/KBNT//9502008-A | 7.0 cde | 4.0 de | 2.3 ghi |
| 12 | ((NWBT/RU8303181)/RS | 7.5 a-d | 3.5 e | 4.0 c-g |
| 13 | LBNT/9902/3/DAWN/969 | 7.3 b-e | 4.5 b-e | 5.0 bcd |
| 14 | TBNT/LA110//LMNT/3/T | 7.0 cde | 4.3 cde | 8.0 a |
| 15 | DLMT/KATY | 7.5 a-d | 4.0 de | 5.0 bcd |
| 16 | GFMT/TBNT/LA110 | 8.3 ab | 3.8 de | 3.8 c-h |
| 17 | SPRING | 7.5 a-d | 4.8 bcd | 4.3 c-f |
| 18 | TRENASSE | 8.5 a | 6.3 a | 2.8 e-i |
| 19 | PRESIDIO (PRSD) | 6.5 de | 4.0 de | 4.5 cde |
| 20 | CATAHOULA | 7.8 abc | 4.8 bcd | 3.8 c-h |
| LSD (P=.05) | | 0.69 | 0.70 | 1.19 |
| Standard Deviation | | 0.49 | 0.50 | 0.84 |
| CV | | 6.62 | 10.77 | 20.23 |
| Replicate F | | 1.438 | 3.393 | 2.267 |
| Replicate Prob(F) | | 0.2413 | 0.0239 | 0.0905 |
| Treatment F | | 7.578 | 9.579 | 14.321 |
| Treatment Prob(F) | | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 4. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group II).

| | SB | BPB | RNB |
|---|---|---|---|
| Pathogen Code | SB | BPB | RNB |
| Rating Unit | 0-9 | 0-9 | 0-9 |
| Rating Date | July 18 | July 18 | Aug 27 |
| 21 RU9901127/GP-2 | 7.3 ab | 3.0 bc | 2.8 d-g |
| 22 AC 1398 | 5.8 cd | 3.5 bc | 4.8 b-e |
| 23 (LGRU/LSCN)RU9801111 | 5.8 cd | 3.3 bc | 1.0 g |
| 24 VSNTLM1/L201/PNRZ/3/ | 4.5 e | 4.8 ab | 3.8 b-f |
| 25 96 INT/AHNT | 5.3 de | 5.5 a | 1.8 fg |
| 26 CPRS/LGRU | 7.3 ab | 4.5 abc | 4.0 b-f |
| 27 DREW/UA99-52 | 7.5 ab | 2.8 c | 3.0 d-g |
| 28 AC1055 | 7.5 ab | 4.3 abc | 3.5 c-f |
| 29 CPRS/LGRU | 7.8 ab | 3.3 bc | 2.5 efg |
| 30 CYBT/LM1 | 6.5 bc | 3.5 bc | 3.8 b-f |
| 31 CCDR/0502085 | 7.5 ab | 2.8 c | 5.0 bcd |
| 32 CCDR/L202 | 7.0 b | 3.3 bc | 5.0 bcd |
| 33 IR36/8603006 | 6.5 bc | 3.5 bc | 6.0 b |
| 34 CCDR//9502008//AR 11 | 8.3 a | 3.5 bc | 4.8 b-e |
| 35 MBLE//82CAY21/LMNT | 6.8 bc | 4.0 bc | 5.0 bcd |
| 36 IR36/8603006 | 6.8 bc | 3.8 bc | 5.8 bc |
| 37 JUPITER | 5.8 cd | 2.8 c | 2.3 fg |
| 38 NEPTUNE | 6.5 bc | 3.8 bc | 2.5 efg |
| 39 BOWMAN | 7.3 ab | 3.8 bc | 4.0 b-f |
| 40 FRANCIS | 6.8 bc | 4.5 abc | 7.5 a |
| LSD (P=.05) | 0.75 | 1.01 | 1.37 |
| Standard Deviation | 0.53 | 0.71 | 0.97 |
| CV | 7.93 | 19.28 | 24.65 |
| Replicate F | 2.242 | 0.289 | 2.368 |
| Replicate Prob(F) | 0.0931 | 0.8335 | 0.0802 |
| Treatment F | 12.075 | 4.158 | 10.771 |
| Treatment Prob(F) | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 5. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group III).

| | | SB | BPB | RNB |
|---|---|---|---|---|
| Pathogen Code | | SB | BPB | RNB |
| Rating Data Type | | Severity | Severity | Severity |
| Rating Unit | | 0-9 | 0-9 | 0-9 |
| Rating Date | | July 18 | July 18 | Aug 27 |
| 41 | LGRU//KATY/STBN/5/LG | 6.0 bc | 3.8 cd | 3.3 e-i |
| 42 | 9502008/CPRS | 7.0 ab | 4.0 bcd | 5.8 abc |
| 43 | (92:13768(VSTA/LBNT/ | 6.8 ab | 3.3 cd | 2.3 hi |
| 44 | DREW/UA99-52 | 6.3 b | 4.5 abc | 3.0 f-i |
| 45 | DREW/CFX-18 | 6.5 ab | 4.0 bcd | 3.3 e-i |
| 46 | CPRS/CCDR | 7.0 ab | 4.0 bcd | 2.8 ghi |
| 47 | WLLS/INIAP-12//ZHE 7 | 5.0 c | 4.0 bcd | 1.8 i |
| 48 | CPRS/97T1280 DH1/3/C | 6.5 ab | 3.0 cd | 1.5 i |
| 49 | CPRS/CCDR | 7.3 ab | 3.5 cd | 3.5 d-i |
| 50 | LBNT/9902/3/DAWN/969 | 6.0 bc | 5.5 a | 2.5 ghi |
| 51 | TACAURI/3/CPRS//82CA | 7.5 ab | 3.3 cd | 4.5 b-g |
| 52 | CPRS/CCDR | 6.8 ab | 3.8 cd | 4.0 c-h |
| 53 | RSMT/KATY | 8.0 a | 3.3 cd | 5.0 b-f |
| 54 | CPRS/3/L201//TBNT/BL | 6.8 ab | 5.3 ab | 6.5 ab |
| 55 | RSMT/KATY | 6.5 ab | 3.0 cd | 7.3 a |
| 56 | SABER (SABR) | 7.0 ab | 3.3 cd | 5.3 a-e |
| 57 | PRISCILLA | 6.3 b | 4.3 a-d | 5.5 a-d |
| 58 | CHENIERE | 7.3 ab | 2.8 d | 5.8 abc |
| 59 | COCODRIE | 8.0 a | 3.5 cd | 5.5 a-d |
| 60 | CL 171 AR | 7.5 ab | 4.3 a-d | 4.0 c-h |
| LSD (P=.05) | | 0.88 | 0.91 | 1.32 |
| Standard Deviation | | 0.62 | 0.64 | 0.93 |
| CV | | 9.16 | 16.9 | 22.56 |
| Replicate F | | 0.205 | 1.617 | 2.436 |
| Replicate Prob(F) | | 0.8925 | 0.1955 | 0.0742 |
| Treatment F | | 5.334 | 5.017 | 12.096 |
| Treatment Prob(F) | | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 6. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group IV).

| Pathogen Code | | SB | BPB | RNB |
|---|---|---|---|---|
| Rating Unit | | 0-9 | 0-9 | 0-9 |
| Rating Date | | July 18 | July 18 | Aug 28 |
| 61 | RU9201176/3/NWBT/KAT | 6.0 cde | 3.5 def | 1.5 hi |
| 62 | 9502065/3/MERC//MERC | 6.3 b-e | 4.8 abc | 3.5 c-g |
| 63 | CPRS/LGRU | 7.3 abc | 4.8 abc | 3.5 c-g |
| 64 | DREW/5/NWBT/3/DAWN/9 | 6.0 cde | 5.0 ab | 2.8 e-i |
| 65 | BNGL//MERC/RICO/3/ME | 6.3 b-e | 3.0 f | 3.0 d-h |
| 66 | PNTL/(JCTO/PNTL)0028 | 6.0 cde | 3.0 f | 6.8 a |
| 67 | P97Y228/PI 560265//S | 7.3 abc | 3.5 def | 4.3 b-e |
| 68 | EARL/9902028 | 6.3 b-e | 2.5 f | 6.8 a |
| 69 | ((NWBT/RU8303181)/GF | 6.8 a-e | 3.3 ef | 3.0 d-h |
| 70 | LGRU//KATY/STBN/5/NW | 5.5 de | 4.3 b-e | 3.3 d-g |
| 71 | BNGL/SHORT RICO/4/OR | 6.0 cde | 2.8 f | 5.0 bc |
| 72 | ((NWBT/RU8303181)/RS | 6.3 b-e | 5.3 ab | 1.3 i |
| 73 | IR36/8603006 | 6.8 a-e | 2.8 f | 5.0 bc |
| 74 | GFMT/TBNT/LA110 | 8.0 a | 3.8 c-f | 4.0 b-f |
| 75 | 4483-1693 | 3.3 f | 3.0 f | 2.5 f-i |
| 76 | LGRU//KATY/STBN/5/NW | 5.3 e | 2.8 f | 2.5 f-i |
| 77 | CPRS//NWBT/KATY | 7.0 a-d | 4.5 a-d | 2.0 ghi |
| 78 | Texmont/TeQing | 7.5 abc | 5.5 a | 4.5 bcd |
| 79 | CYBONNET (CYBT) | 7.8 ab | 3.8 c-f | 4.5 bcd |
| 80 | WELLS | 6.3 b-e | 3.8 c-f | 5.3 b |
| LSD (P=.05) | | 0.8 | 0.74 | 1.04 |
| Standard Deviation | | 0.62 | 0.53 | 0.74 |
| CV | | 9.78 | 14.0 | 19.7 |
| Replicate F | | 0.729 | 1.727 | 2.051 |
| Replicate Prob(F) | | 0.5389 | 0.1716 | 0.1169 |
| Treatment F | | 11.072 | 12.377 | 17.395 |
| Treatment Prob(F) | | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 7. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group V).

| | | SB | BPB | RNB |
|---|---|---|---|---|
| Pathogen Code | | SB | BPB | RNB |
| Rating Unit | | 0-9 | 0-9 | 0-9 |
| Rating Date | | July 17 | July 17 | Aug 28 |
| 81 | LGRU//KATY/STBN/3/LG | 6.0 a-d | 4.0 bcd | 5.0 a-e |
| 82 | AR 1142/JODN/4/NWBT/ | 5.5 bcd | 4.5 a-d | 4.0 b-f |
| 83 | RSMT//RXMT/IR36 | 7.0 a-d | 3.5 cd | 5.0 a-e |
| 84 | RU9901133/PI 560239/ | 5.0 cd | 4.5 a-d | 1.5 ef |
| 85 | AR 1188/CCDR//950200 | 7.5 abc | 4.0 bcd | 3.0 c-f |
| 86 | CCDR/L202 | 7.0 a-d | 3.0 d | 7.0 ab |
| 87 | 19991516/6/BASMATI-3 | 7.5 abc | 5.5 abc | 3.0 c-f |
| 88 | KATY/CPRS//NWBT/…/3/ | 7.5 abc | 6.0 ab | 2.0 def |
| 89 | CCDR/LQ275a | 7.0 a-d | 4.5 a-d | 1.0 f |
| 90 | 91642//KATY/NWBT/5/R | 7.5 abc | 4.5 a-d | 3.5 b-f |
| 91 | CFX-18//CCDR/9770532 | 7.5 abc | 5.0 a-d | 5.5 a-d |
| 92 | CCDR/LQ275a | 8.0 ab | 4.5 a-d | 1.5 ef |
| 93 | LBNT/9902/3/DAWN/969 | 6.5 a-d | 3.5 cd | 6.0 abc |
| 94 | NWBT/KATY//9902207x2 | 7.5 abc | 4.0 bcd | 2.5 c-f |
| 95 | PNTL/(JCTO/PNTL)0028 | 7.5 abc | 3.5 cd | 7.0 ab |
| 96 | FRNS/5/LBNT/9902//NW | 7.5 abc | 4.5 a-d | 3.0 c-f |
| 97 | NWBT/KATY//9902207x2 | 7.5 abc | 5.0 a-d | 4.0 b-f |
| 98 | SABR/CCDR | 6.5 a-d | 3.5 cd | 4.0 b-f |
| 99 | CYBT/UA99-94//UA99-1 | 6.5 a-d | 5.5 abc | 3.5 b-f |
| 100 | RSMT//8203035/GCHW | 8.5 a | 4.5 a-d | 4.0 b-f |
| 101 | LGRU/LSCN/CF4-85 | 7.0 a-d | 3.0 d | 4.0 b-f |
| 102 | FRNS/6/LBNT/9902/3/D | 7.0 a-d | 5.5 abc | 4.5 a-f |
| 103 | 9502008-A/DREW/3/NWB | 7.5 abc | 4.5 a-d | 5.0 a-e |
| 104 | LGRU/LSCN/CF4-85 | 6.5 a-d | 3.0 d | 3.5 b-f |
| 105 | FRNS/6/LBNT/9902/3/D | 5.5 bcd | 5.5 abc | 5.5 a-d |
| 106 | 9502008-A/DREW/3/NWB | 7.5 abc | 5.0 a-d | 4.5 a-f |
| 107 | LGRU/LSCN/CF4-85 | 6.0 a-d | 3.5 cd | 3.0 c-f |
| 108 | KATY/NWBT//L201/7402 | 6.5 a-d | 5.5 abc | 3.0 c-f |
| 109 | CPRS/3/NWBT/KATY//99 | 8.0 ab | 5.0 a-d | 3.5 b-f |
| 110 | (DF5-68)/TX8946 | 4.5 d | 4.0 bcd | 2.5 c-f |
| 111 | FRNS/6/LBNT/9902/3/D | 6.0 a-d | 6.5 a | 5.0 a-e |
| 112 | CCDR/3/KATY/CPRS//JK | 7.5 abc | 4.5 a-d | 5.0 a-e |
| 113 | SABR/CCDR | 7.5 abc | 4.0 bcd | 4.5 a-f |
| 114 | RSMT//RXMT/IR36 | 7.0 a-d | 5.5 abc | 6.0 abc |
| 115 | WELLS/DXBL | 6.0 a-d | 4.0 bcd | 4.0 b-f |
| 116 | SABR/CCDR | 5.0 cd | 5.0 a-d | 1.0 f |
| 117 | COCODRIE | 8.0 ab | 4.5 a-d | 5.5 a-d |
| 118 | Hidalgo | 6.0 a-d | 4.0 bcd | 5.0 a-e |
| 119 | M206 | 7.0 a-d | 4.0 bcd | 8.0 a |
| 120 | DIXIEBELLE (DXBL) | 6.5 a-d | 4.5 a-d | 5.5 a-d |
| LSD (P=.05) | | 1.42 | 1.18 | 2.07 |
| Standard Deviation | | 0.71 | 0.59 | 1.02 |
| CV | | 10.31 | 13.13 | 24.9 |
| Replicate F | | 0.226 | 0.328 | 0.584 |
| Replicate Prob(F) | | 0.6369 | 0.5703 | 0.4493 |
| Treatment F | | 3.373 | 4.063 | 5.001 |
| Treatment Prob(F) | | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 8. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group VI).

| Pathogen Code | SB | BPB | RNB |
|---|---|---|---|
| Rating Unit | 0-9 | 0-9 | 0-9 |
| Rating Date | July 17 | July 17 | Aug 28 |
| 121 LGRU/3/LMNT/KATY//LM | 5.0 de | 3.0 bc | 1.5 fg |
| 122 L202//TBNT/BLMT | 6.0 b-e | 5.0 abc | 5.5 a-d |
| 123 LGRU/LSCN/CF4-85 | 6.5 a-e | 3.5 abc | 2.0 efg |
| 124 MDRK/PI 312777//JING | 5.0 de | 5.0 abc | 4.0 b-f |
| 125 AC1055 | 7.5 a-d | 4.0 abc | 3.5 c-g |
| 126 LGRU/LSCN/CF4-85 | 5.5 cde | 3.0 bc | 2.5 d-g |
| 127 91642//KATY/NWBT/5/R | 6.5 a-e | 6.0 a | 2.5 d-g |
| 128 AC1019 | 8.0 abc | 5.0 abc | 4.0 b-f |
| 129 LGRU/LSCN/CF4-85 | 6.5 a-e | 3.0 bc | 3.5 c-g |
| 130 YACU 9/ZHE 733//WC 2 | 6.0 b-e | 4.0 abc | 2.0 efg |
| 131 AC1073 | 7.5 a-d | 3.5 abc | 5.0 a-e |
| 132 (DLMT/(LMNT*3/JSMN)) | 6.5 a-e | 4.5 abc | 1.5 fg |
| 133 FRNS/6/LBNT/9902/3/D | 7.0 a-d | 6.0 a | 5.5 a-d |
| 134 CCDR//CCDR/JEFF | 8.0 abc | 4.5 abc | 4.0 b-f |
| 135 MILL/JSMN | 6.5 a-e | 3.0 bc | 2.5 d-g |
| 136 MDRK/LM 1 | 5.5 cde | 6.0 a | 3.0 d-g |
| 137 AC1106 | 8.5 ab | 4.5 abc | 3.0 d-g |
| 138 CPRS/3/CPRS/NWBT/KAT | 6.5 a-e | 3.5 abc | 4.0 b-f |
| 139 SHUFENG 121-1655 | 4.0 e | 2.5 c | 0.5 g |
| 140 CPRS//L-205/DLLA | 6.5 a-e | 4.5 abc | 3.0 d-g |
| 141 LCSN/LGRU | 7.5 a-d | 4.0 abc | 3.5 c-g |
| 142 KBNT/Q36194 | 6.0 b-e | 6.0 a | 6.5 abc |
| 143 9502008/CPRS/4/CPRS/ | 8.0 abc | 4.0 abc | 3.5 c-g |
| 144 CCDR/L202 | 6.0 b-e | 3.5 abc | 3.0 d-g |
| 145 CCDR/ZHE 733//WC 285 | 6.5 a-e | 4.5 abc | 4.5 b-f |
| 146 NWBT/KATY//9902207X2 | 7.5 a-d | 5.0 abc | 3.5 c-g |
| 147 LCSN/LGRU | 9.0 a | 4.5 abc | 3.0 d-g |
| 148 IRGA409/RXMT/5/BRAZ/ | 6.5 a-e | 5.5 ab | 1.5 fg |
| 149 9502008//KATY/990220 | 8.0 abc | 5.0 abc | 3.0 d-g |
| 150 AR 1188/CCDR/JEFF/CP | 8.0 abc | 3.5 abc | 3.5 c-g |
| 151 STG97F5-01-004/UA99- | 5.5 cde | 4.0 abc | 2.5 d-g |
| 152 LGRU/WELLS | 5.5 cde | 4.0 abc | 3.0 d-g |
| 153 CPRS/CCDR | 7.5 a-d | 4.5 abc | 4.5 b-f |
| 154 RSMT/KATY | 8.5 ab | 4.0 abc | 5.0 a-e |
| 155 MILL//9502008/LGRU | 7.5 a-d | 4.0 abc | 7.0 ab |
| 156 IR36/8603006 | 6.5 a-e | 4.0 abc | 5.5 a-d |
| 157 CPRS//NWBT/KATY | 7.5 a-d | 5.0 abc | 4.0 b-f |
| 158 DELLROSE | 6.5 a-e | 4.0 abc | 2.5 d-g |
| 159 Sabine (SABN) | 8.0 abc | 4.5 abc | 4.0 b-f |
| 160 FRANCIS | 7.0 a-d | 6.0 a | 7.5 a |
| LSD (P=.05) | 1.50 | 1.37 | 1.69 |
| Standard Deviation | 0.74 | 0.68 | 0.84 |
| CV | 10.93 | 15.66 | 23.2 |
| Replicate F | 4.434 | 3.279 | 2.581 |
| Replicate Prob(F) | 0.0417 | 0.0779 | 0.1162 |
| Treatment F | 4.399 | 3.691 | 6.551 |
| Treatment Prob(F) | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 9. Disease reaction of various varieties and experimental lines to sheath blight (SB), bacterial panicle blight (BPB), and rotten neck blast (RNB) at the Rice Research Station, Crowley, LA. 2008. (URN Group VII).

| Pathogen Code | SB | BPB | RNB |
|---|---|---|---|
| Rating Unit | 0-9 | 0-9 | 0-9 |
| Rating Date | July 17 | July 17 | Aug 27 |
| 161 FRNS/6/LBNT/9902/3/D | 7.0 a-e | 4.5 a-e | 4.5 a-d |
| 162 BNGL/SHORT RICO/4/OR | 5.0 def | 4.5 a-e | 4.0 bcd |
| 163 JEFF/CPRS/CPRS | 6.5 a-e | 5.5 a-d | 4.5 a-d |
| 164 RU9201127/5/LBNT/990 | 6.0 b-f | 6.0 abc | 6.5 ab |
| 165 BNGL/SHORT RICO/4/OR | 7.0 a-e | 4.5 a-e | 6.0 abc |
| 166 4484-1665 | 4.0 f | 2.5 e | 0.0 f |
| 167 FRNS/6/LBNT/9902/3/D | 7.0 a-e | 6.0 abc | 7.5 a |
| 168 BNGL/SHORT RICO/4/OR | 5.0 def | 3.5 cde | 6.0 abc |
| 169 LGRU/LSCN/CF4-85 | 7.0 a-e | 4.0 b-e | 5.5 abc |
| 170 97Y228/PI 560265//ST | 7.0 a-e | 5.0 a-e | 0.5 ef |
| 171 BNGL/SHORT RICO//LFT | 7.0 a-e | 3.5 cde | 7.0 ab |
| 172 CPRS/CCDR | 8.0 abc | 5.0 a-e | 6.0 abc |
| 173 RU9901127/GP-2 | 7.5 a-d | 4.0 b-e | 1.0 ef |
| 174 NWBT/KATY//9902207x2 | 7.5 a-d | 4.5 a-e | 4.0 bcd |
| 175 CCDR/L202 | 8.0 abc | 3.5 cde | 6.0 abc |
| 176 FRNS/6/LBNT/9902/3/D | 6.0 b-f | 6.0 abc | 5.0 a-d |
| 177 WELLS/MBLE | 7.0 a-e | 4.5 a-e | 5.0 a-d |
| 178 LGRU/LSCN/CF4-85 | 6.0 b-f | 3.5 cde | 4.0 bcd |
| 179 LBNT/9902/3/DAWN/969 | 6.0 b-f | 6.5 ab | 4.5 a-d |
| 180 9502008-A/DREW/3/NWB | 8.5 ab | 4.0 b-e | 4.5 a-d |
| 181 CPRS/CCDR | 6.5 a-e | 5.0 a-e | 2.0 def |
| 182 FRNS/6/LBNT/9902/3/D | 6.5 a-e | 7.0 a | 6.0 abc |
| 183 CPRS/KBNT//DREW | 8.0 abc | 5.5 a-d | 5.5 abc |
| 184 L201/SABR | 5.5 c-f | 6.0 abc | 0.0 f |
| 185 FRNS/6/LBNT/9902/3/D | 6.5 a-e | 6.5 ab | 7.0 ab |
| 186 CPRS//NWBT/KATY | 7.5 a-d | 5.5 a-d | 5.0 a-d |
| 187 Tesanai 2 | 4.5 ef | 2.5 e | 2.0 def |
| 188 VSNTLM//L201/9NRZ/3/ | 6.5 a-e | 5.5 a-d | 6.5 ab |
| 189 LM-1//CPRS/KBNT | 6.5 a-e | 4.5 a-e | 4.5 a-d |
| 190 CPRS/CCDR | 7.0 a-e | 5.0 a-e | 4.5 a-d |
| 191 CPRS//NWBT/KATY | 8.0 abc | 5.0 a-e | 4.0 bcd |
| 192 9502008//KATY/990220 | 8.5 ab | 6.0 abc | 6.5 ab |
| 193 LMNT//8203035/GCHW | 6.0 b-f | 4.5 a-e | 4.5 a-d |
| 194 CPRS//NWBT/KATY | 8.0 abc | 5.5 a-d | 3.0 cde |
| 195 CCDR/3/CPRS/NWBT//KA | 9.0 a | 5.5 a-d | 5.0 a-d |
| 196 LMNT//TBNT/LA110… | 7.5 a-d | 3.5 cde | 4.0 bcd |
| 197 CPRS//NWBT/KATY | 9.0 a | 5.5 a-d | 7.0 ab |
| 198 CPRS//NWBT/KATY | 8.5 ab | 7.0 a | 4.0 bcd |
| 199 BENGAL | 5.5 c-f | 3.5 cde | 4.0 bcd |
| 200 XL 723 | 7.0 a-e | 3.0 de | 0.5 ef |
| LSD (P=.05) | 1.34 | 1.36 | 1.77 |
| Standard Deviation | 0.66 | 0.67 | 0.88 |
| CV | 9.66 | 13.9 | 19.73 |
| Replicate F | 1.814 | 5.444 | 4.714 |
| Replicate Prob(F) | 0.1858 | 0.0249 | 0.0361 |
| Treatment F | 6.323 | 6.014 | 10.379 |
| Treatment Prob(F) | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

**2008 Blast and Secondary Disease Nurseries (DN-2)**

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Various, ~90 lb/A

**Plot Size**: 1 to 3 six-ft rows

**Planting Method/Date**: Drill-seeded, May 15

**Fertilization**: Preplant 24-72-72, May14; preflood 120-0-0, June 18

**Experimental Design**: Randomized complete block with two to four replications

**Water Management**: Flood, June 18; drained to induce blast, June 29; reflooded, July 7

**Herbicides**: 3 qt Propanil + 1 oz Permit, June 8; 4 qt Arrosolo + 1 pt Basagran, June 15; 16.5 oz Clincher, June 20

**Insecticides**: Dermacor seed treatment; 4 oz Mustang Max

**Fungicides**: None

**Inoculation Dates**: None, all from natural sources

**Application Equipment**: N/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| N/A | | | | | | | |

**Disease Ratings**: See Tables 2 to 9

**Drained**: Aug 22

**Harvest**: N/A

**Results**: See Tables 2 to 9

**Comments**: Blast severity was moderate, and other diseases were very light and erratic.

**2008 Variety X Fungicide Trial (RRS)**

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Cocodrie, 90 lb/A

**Plot Size**: 4 x 16 ft, 7 rows w/7-in spacing

**Planting Method/Date**: Drill-seeded, Mar 25

**Fertilization**: Preplant 24-72-72, Mar 24; topdressing 120-0-0, Apr 25

**Experimental Design**: Factorial arranged in a randomized complete block design with five replications

**Water Management**: Flooded, Apr 28; drained, May 7; reflooded, May 14

**Herbicides**: 4 qt Arrosolo + 1 oz Permit/A, Apr 23

**Insecticides**: Dermacor seed treatment; Karate

**Fungicides**: Early boot spray, June 12

**Inoculation Dates**: Sheath blight, June 5

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| Early Boot | June 12 | 7:30 am | 78°F | 6-8 mph | 90% | 0% | Heavy |

**Disease Ratings**: July 23

**Drained**: July 18

**Harvest**: July 28

**Results**: See Table 10

**Comments**: Sheath blight severity was high, and other diseases were light in severity.

Table 10. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Rice Research Station, Crowley, LA. 2008.

| Fungicide | Rate | Timing | SB 0-9 July 23 | SB % July 23 | Yield lb/A July 29 | Milling % Total Sept 18 | Milling % Whole Sept 18 |
|---|---|---|---|---|---|---|---|
| | | | | **CL151** | | | |
| Unsprayed | | | 7.0 ab | 66.0 ab | 7407 abc | 71.6 b | 66.3 c |
| Quadris | 9 fl oz/A | B | 3.6 cd | 15.2 c | 8138 ab | 71.7 b | 66.9 bc |
| Quilt | 28 fl oz/A | B | 4.0 cd | 21.4 c | 8304 a | 71.8 b | 66.5 c |
| Stratego | 19 fl oz/A | B | 4.2 c | 22.8 c | 8133 ab | 72.5 ab | 68.0 abc |
| | | | | **Cheniere** | | | |
| Unsprayed | | | 7.6 a | 69.2 ab | 6712 cd | 71.7 b | 65.7 c |
| Quadris | 9 fl oz/A | B | 3.6 cd | 17.4 c | 7174 abc | 73.0 ab | 67.5 bc |
| Quilt | 28 fl oz/A | B | 4.2 c | 24.2 c | 7970 ab | 72.6 ab | 67.6 bc |
| Stratego | 19 fl oz/A | B | 4.4 c | 25.8 c | 8063 ab | 72.2 ab | 67.2 bc |
| | | | | **Catahoula** | | | |
| Unsprayed | | | 7.6 a | 80.2 a | 6154 d | 72.9 ab | 65.0 c |
| Quadris | 9 fl oz/A | B | 3.6 cd | 21.8 c | 7390 abc | 73.8 ab | 69.5 ab |
| Quilt | 28 fl oz/A | B | 4.4 c | 21.2 c | 6668 cd | 74.0 ab | 69.5 ab |
| Stratego | 19 fl oz/A | B | 4.6 c | 30.2 c | 6918 bcd | 74.7 a | 70.2 a |
| | | | | **Neptune** | | | |
| Unsprayed | | | 6.2 b | 56.2 b | 7593 abc | 69.0 c | 65.8 c |
| Quadris 2.08 SC | 9 fl oz/A | B | 2.8 d | 13.4 c | 7583 abc | 69.1 c | 66.9 b |
| Quilt 1.04 SC | 28 fl oz/A | B | 2.8 d | 12.8 c | 7623 abc | 68.0 c | 65.0 c |
| Stratego 2.08 EC | 19 fl oz/AB | | 3.4 cd | 13.4 c | 7659 abc | 69.2 c | 66.9 bc |
| LSD (P=.05) | | | 0.8 | 12.85 | 717.4 | 1.65 | 1.74 |
| Standard Deviation | | | 0.63 | 10.16 | 567.1 | 0.99 | 1.04 |
| CV | | | 13.72 | 31.79 | 7.59 | 1.38 | 1.56 |
| Replicate F | | | 2.870 | 1.887 | 0.472 | 4.478 | 3.370 |
| Replicate Prob(F) | | | 0.0305 | 0.1244 | 0.7560 | 0.0199 | 0.0478 |
| Treatment F | | | 31.429 | 24.310 | 5.826 | 11.647 | 6.459 |
| Treatment Prob(F) | | | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

**2008 Variety X Fungicide Trial (Fenton)**

**Location**: Jimmy Hoppe Farm, Fenton, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Various (See Table 11), 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill-seeded, Mar 17

**Fertilization**: Preplant 8-24-24, Mar 17; topdressing 46-0-0, Apr 28

**Experimental Design**: Factorial arranged in a randomized complete block design with five replications

**Water Management**: Flushed, Apr 13; flooded, Apr 29; drained, July 21

**Herbicides:** 3 qt Stam/A, Apr 1; 4.5 qt Arrosolo + 2 oz Londax + 0.5 oz Permit/A, Apr 28

**Insecticides**: Dermacor seed treatment; foliar Karate

**Fungicides**: Boot spray, June 13

**Inoculation Dates**: N/A, natural inoculum

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| Boot | June 13 | 10 am | 90°F | 5 mph | 85% | 50% | None |

**Disease Ratings**: July 29

**Drained**: July 21

**Harvest**: Aug 1

**Results**: See Table 11

**Comments**: Sheath blight severity was high, and other diseases were light.

Table 11. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Hoppe Farm, Fenton, LA. 2008.

| Fungicide | Rate | Timing | SB 0-9 July 29 | SB % July 29 | Yield lb/A July 29 | Milling % Total Sept 16 | Milling % Whole Sept 16 |
|---|---|---|---|---|---|---|---|
| **CL151** | | | | | | | |
| Unsprayed | | | 7.4 a | 70.8 a | 8290 abc | 70.9 a | 64.1 a |
| Quadris | 9 fl oz/A | B | 5.4 bc | 35.2 de | 9331 ab | 72.3 a | 66.1 a |
| Quilt | 28 fl oz/A | B | 4.2 de | 23.4 de | 9692 a | 71.6 a | 65.0 a |
| Stratego | 19 fl oz/A | B | 4.8 bcd | 29.4 de | 9586 a | 72.2 a | 66.2 a |
| **Cheniere** | | | | | | | |
| Unsprayed | | | 6.8 a | 63.6 ab | 8210 abc | 72.3 a | 63.0 a |
| Quadris | 9 fl oz/A | B | 4.8 bcd | 30.0 de | 9295 ab | 74.1 a | 66.3 a |
| Quilt | 28 fl oz/A | B | 4.0 de | 21.0 de | 8918 abc | 70.8 a | 59.9 a |
| Stratego | 19 fl oz/A | B | 5.4 bc | 39.4 cd | 8898 abc | 72.6 a | 62.8 a |
| **Catahoula** | | | | | | | |
| Unsprayed | | | 7.4 a | 67.8 a | 8016 bc | 71.7 a | 65.6 a |
| Quadris | 9 fl oz/A | B | 4.8 bcd | 31.8 de | 8825 abc | 73.0 a | 67.3 a |
| Quilt | 28 fl oz/A | B | 4.6 cd | 26.8 de | 8981 abc | 72.5 a | 67.5 a |
| Stratego | 19 fl oz/A | B | 5.4 bc | 35.6 de | 7701 c | 73.9 a | 68.1 a |
| **Neptune** | | | | | | | |
| Unsprayed | | | 5.8 b | 52.2 bc | 9403 ab | 72.0 a | 68.2a |
| Quadris | 9 fl oz/A | B | 3.8 de | 19.4 de | 9013 abc | 73.1 a | 69.4a |
| Quilt | 28 fl oz/A | B | 3.6 e | 17.4 e | 9322 ab | 72.9 a | 69.5 a |
| Stratego | 19 fl oz/A | B | 4.2 de | 23.0 de | 9153 abc | 72.6 a | 69.3 a |
| LSD (P=.05) | | | 0.68 | 12.84 | 893.6 | 2.92 | 5.24 |
| Standard Deviation | | | 0.53 | 10.15 | 706.5 | 1.37 | 2.46 |
| CV | | | 10.37 | 27.69 | 7.92 | 1.89 | 3.72 |
| Replicate F | | | 3.246 | 1.871 | 1.460 | 0.019 | 2.310 |
| Replicate Prob(F) | | | 0.0178 | 0.1273 | 0.2258 | 0.8915 | 0.1494 |
| Treatment F | | | 25.123 | 14.898 | 3.357 | 0.887 | 2.395 |
| Treatment Prob(F) | | | 0.0001 | 0.0001 | 0.0004 | 0.5907 | 0.0507 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

**2008 Variety X Fungicide Trail (Lake Arthur)**

**Location**: Lounsberry Farm, Lake Arthur, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Various (see Table 12), 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill-seeded, Mar 19

**Fertilization**: Preplant 8/24/24 (250 lb/A), Mar 17; 46-0-0 (150 lb N/A), Apr 28

**Experimental Design**: Factorial arranged in a randomized complete block design with five replications

**Water Management**: Flushed, Apr 13; flooded, Apr 28; drained, July 21

**Herbicides**: 3 qt Stam/A, Apr 1; 4.5 qt Arrosolo + 2 oz Londax + 0.5 oz Permit/A, Apr 28

**Insecticides**: Dermacor seed treatment; foliar Karate

**Fungicides**: Boot spray, June 17

**Inoculation Dates**: NA, natural inoculum

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| Boot | June 17 | 9:30 | 90°F | 5 mph | 68% | 20% | Light |

**Disease Ratings**: July 30

**Drained**: July 21

**Harvest**: Aug 3

**Results**: See Table 12

**Comments**: Sheath blight and other disease severities were very light.

Table 12. Effect of varietal resistance and fungicide applications on sheath blight development and yield of rice at the Lounsberry Farm, Lake Arthur, LA. 2008.

| Fungicide | Rate | Timing | SB 0-9 July 30 | SB % July 30 | Yield lb/A Aug 3 | Milling % Total Sept 17 | Milling % Whole Sept 17 |
|---|---|---|---|---|---|---|---|
| | | | **CL151** | | | | |
| Unsprayed | | | 5.0 ab | 30.8 ab | 9465ab | 70.5 bc | 63.6a |
| Quadris | 9 fl oz/A | B | 4.2 bcd | 23.6 bcd | 9065a-d | 68.9 c | 61.6 a |
| Quilt | 28 fl oz/A | B | 4.0 b-e | 19.6 bcd | 9656a | 70.5 bc | 63.3 a |
| Stratego | 19 fl oz/A | B | 3.8 b-e | 21.8 bcd | 9458ab | 71.5 abc | 63.1 a |
| | | | **Cheniere** | | | | |
| Unsprayed | | | 5.6 a | 39.2 a | 8110de | 74.5 a | 66.2 a |
| Quadris | 9 fl oz/A | B | 3.8 b-e | 20.6 bcd | 8154de | 70.7 bc | 62.2 a |
| Quilt | 28 fl oz/A | B | 3.8 b-e | 21.0 bcd | 8347cde | 71.8 abc | 63.4 a |
| Stratego | 19 fl oz/A | B | 4.0 b-e | 16.8 bcd | 8487b-e | 70.7 bc | 62.5 a |
| | | | **Catahoula** | | | | |
| Unsprayed | | | 5.6 a | 36.6 a | 9009a-d | 74.0 ab | 68.4 a |
| Quadris | 9 fl oz/A | B | 4.6 abc | 29.2 ab | 8974a-d | 72.7 ab | 66.9 a |
| Quilt | 28 fl oz/A | B | 5.0 ab | 27.2 abc | 9174 abc | 72.4 abc | 66.1 a |
| Stratego | 19 fl oz/A | B | 5.0 ab | 29.0 ab | 9030 a-d | 70.5 bc | 63.1 a |
| | | | **Neptune** | | | | |
| Unsprayed | | | 4.0 b-e | 19.0 bcd | 7629 e | 72.9 ab | 65.9 a |
| Quadris | 9 fl oz/A | B | 3.0 e | 10.8 d | 7935 e | 73.2 ab | 64.9 a |
| Quilt | 28 fl oz/A | B | 3.4 de | 14.4 cd | 7808 e | 73.1 ab | 70.7 a |
| Stratego | 19 fl oz/A | B | 3.6 cde | 18.0 bcd | 7698 e | 72.8 ab | 70.2 a |
| LSD (P=.05) | | | 0.73 | 8.57 | 639.6 | 2.05 | 5.25 |
| Standard Deviation | | | 0.58 | 6.77 | 505.7 | 0.96 | 2.47 |
| CV | | | 13.46 | 28.7 | 5.86 | 1.34 | 3.78 |
| Replicate F | | | 5.528 | 12.764 | 7.669 | 0.215 | 0.225 |
| Replicate Prob(F) | | | 0.0007 | 0.0001 | 0.0001 | 0.649 | 0.641 |
| Treatment F | | | 9.006 | 6.686 | 9.086 | 4.962 | 2.589 |
| Treatment Prob(F) | | | 0.0001 | 0.0001 | 0.0001 | 0.0018 | 0.0376 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls.

## 2008 Sheath Blight Fungicide Trial (SB-1)

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: Cocodrie, 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill-seeded, Mar 25

**Fertilization**: Preplant 24-72-72, Mar 24; topdress 120-0-0, Apr.25

**Experimental Design**: Randomized complete block design with four replications

**Water Management**: Flood, Apr 28; drained, May 7; reflooded, May 14

**Herbicides** : 4 qt Arrosolo + 1 pt Basagran/A, Apr 23

**Insecticides**: Dermacor seed treatment; Foliar Karate

**Fungicides**: Boot spray, June 13

**Inoculation Dates**: Sheath blight, June 5

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| Early Boot | June 13 | 8:30 am | 80°F | 3 mph | 85% | 10% | Light |

**Disease Ratings**: July 21

**Drained**: July 18

**Harvest**: July 28

**Results**: See Table 13

**Comments**: Sheath blight severity was high, and other diseases were light in severity.

Table 13. Effect of various fungicides, rates and timings on sheath blight (SB) development and yield of Cocodrie rice at the Rice Research Station, Crowley, LA. 2008.

| Disease Code | | | | | | | SB | SB | Yield | Milling | Milling |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rating Data Type | | | | | | | 0-9 | % | lb/A | % Total | % Whole |
| Rating Date | | | | | | | July 21 | July 21 | July 30 | Sept 25 | Sept 29 |
| 1 | Untreated | | | | | | 7.8 a | 89 a | 6394 b | 71.89 b | 65.27 b |
| 2 | A15909A | 2.2 | SC | 17.5 | fl oz/A | B | 3.3 c | 12 cd | 8190 a | 72.88 a | 67.36 a |
| 3 | A15909A | 2.2 | SC | 21 | fl oz/A | B | 3.5 c | 9 d | 8256 a | 73.65 a | 67.68 a |
| 4 | Quadris | 2.08 | SC | 10 | fl oz/A | B | 3.8 bc | 21 c | 7607 a | 73.22 a | 68.09 a |
| | Tilt | 3.6 | EC | 5 | fl oz/A | B | | | | | |
| 5 | Quilt | 1.66 | SC | 20 | fl oz/A | B | 3.8 bc | 15 cd | 7970 a | 73.40 a | 67.99 a |
| | Quadris | 2.08 | SC | 6.3 | fl oz/A | B | | | | | |
| 6 | Stratego | 2.08 | EC | 19 | fl oz/A | B | 4.8 b | 30 b | 8123 a | 73.35 a | 67.63 a |
| 7 | Quilt | 11.6 | SC | 28 | fl oz/A | B | 4.3 bc | 17 cd | 8008 a | 73.33 a | 67.99 a |
| 8 | Quadris | 2.08 | SC | 12 | fl oz/A | B | 3.5 c | 13cd | 7993 a | 73.01 a | 67.20 a |
| LSD (P=.05) | | | | | | | 0.79 | 6.36 | 1074.5 | 0.718 | 1.567 |
| Standard Deviation | | | | | | | 0.54 | 4.33 | 730.6 | 0.410 | 0.895 |
| CV | | | | | | | 12.52 | 16.6 | 9.34 | 0.56 | 1.33 |
| Replicate F | | | | | | | 0.429 | 4.350 | 0.152 | 1.738 | 5.450 |
| Replicate Prob (F) | | | | | | | 0.7346 | 0.0156 | 0.9271 | 0.2117 | 0.0178 |
| Treatment F | | | | | | | 29.571 | 148.527 | 2.767 | 5.148 | 3.160 |
| Treatment Prob (F) | | | | | | | 0.0001 | 0.0001 | 0.0333 | 0.0045 | 0.0318 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

**2008 Sheath Blight Fungicide Trial (SB-2)**

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: CL161, 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill seeded, Apr 15

**Fertilization**: Preplant 24-72-72, Apr 14; 120-0-0 topdressed, May 15

**Experimental Design**: Randomized complete block design with four replications

**Water Management**: Flooded, May 14

**Herbicides**: 4 qt Arrosolo + 1 oz Permit/A (by airplane), May 7; 4 qt Propanil + 1 oz Permit + 2 oz Londax, May 21

**Insecticides**: Dermacor seed treatment; Foliar Karate

**Fungicides**: Boot spray, June 26

**Inoculation Dates**: Sheath blight, June 19

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| B | June 26 | 6:45 am | 74°F | 3 mph | 88% | 10% | Heavy |

**Disease Ratings**: Aug 4

**Drained**: July 31

**Harvest**: Aug 14

**Results**: See Table 14

**Comments**: Sheath blight severity was heavy, and other diseases were light in severity.

Table 14. Effect of various fungicides, rates and timings on sheath blight (SB) development and yield of CL161 rice at the Rice Research Station, Crowley, LA. 2008.

| Disease Code<br>Rating Data Type<br>Rating Date | | | | | | | SB<br>0-9<br>Aug 4 | SB%<br>%<br>Aug 4 | Yield<br>lb/A<br>Aug 14 | Milling<br>% Total<br>Oct 6 | Milling<br>% Whole<br>Oct 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Unsprayed Check | | | | | | 7.8 a | 88.5 a | 6948 b | 70.28 b | 61.27 b |
| 2 | JAU6476&TRIF. | 2.7 | SC | 12 | oz/A | B | 3.8 d | 21.0 de | 9039 a | 71.53 ab | 64.72 a |
| 3 | STRTEGO | 2.08 | EC | 19 | oz/A | B | 6.0 b | 45.3 c | 8825 a | 71.47 ab | 64.05 a |
| 4 | QUILT | 1.66 | SC | 21 | oz/A | B | 4.0 d | 24.5 de | 9273 a | 71.29 ab | 64.45 a |
| | QUADRIS | 2.08 | SC | 3 | oz/A | B | | | | | |
| 5 | USF 729 | 4.16 | SC | 8 | oz/A | B | 4.0 d | 27.3 de | 9637 a | 71.25 ab | 64.40 a |
| 6 | USF 729 | 4.16 | SC | 10 | oz/A | B | 4.3 cd | 26.3 de | 9459 a | 71.58 a | 64.92 a |
| 7 | USF 0927 | 4 | SC | 3.34 | oz/A | B | 4.3 cd | 26.0 de | 9344 a | 71.76 a | 64.59 a |
| | USF1205 | 4.16 | SC | 2.4 | oz/A | B | | | | | |
| | USF 0512 | 2.00 | SC | 5 | oz/A | B | | | | | |
| 8 | USF 0927 | 4 | SC | 4.16 | oz/A | B | 4.5 cd | 24.3 de | 9531 a | 71.52 ab | 64.55 a |
| | USF1205 | 4.16 | SC | 3 | oz/A | B | | | | | |
| | USF 0512 | 2 | SC | 6.2 | oz/A | B | | | | | |
| 9 | STRTEGO | 2.08 | EC | 19 | oz/A | B | 4.5 cd | 29.3 de | 9253 a | 71.19 ab | 63.94 a |
| | USF 1205 | 4.16 | SC | 1.5 | oz/A | B | | | | | |
| 10 | STRTEGO | 2.08 | EC | 19 | oz/A | B | 4.0 d | 23.0 de | 9565 a | 70.98 ab | 63.90 a |
| | USF 1205 | 4.16 | SC | 3 | oz/A | B | | | | | |
| 11 | QUADRIS | 2.08 | SC | 12 | oz/A | B | 3.8 d | 19.0 de | 9470 a | 71.11 ab | 63.60 a |
| 12 | QUILT | 1.66 | SC | 34 | oz/A | B | 4.0 d | 25.3 de | 9776 a | 71.96 a | 64.96 a |
| 13 | QUILT | 1.66 | SC | 21 | oz/A | B | 3.6 d | 14.5 e | 9500 a | 71.26 ab | 63.84 a |
| | QUADRIS | 2.08 | SC | 6 | oz/A | B | | | | | |
| 14 | STRTEGO | 2.08 | EC | 19 | oz/A | B | 5.5 bc | 36.8 cd | 9081 a | 70.92 ab | 63.06 ab |
| | GEM | 50 | DF | 1.5 | oz/A | B | | | | | |
| 15 | STRATEGO | 2.08 | EC | 19 | oz/A | B | 4.5 cd | 29.0 de | 9569 a | 71.92 a | 64.75 a |
| | QUADRIS | 2.08 | SC | 3 | oz/A | B | | | | | |
| 16 | QUADRIS | 2.08 | SC | 9 | oz/A | B | 4.3 cd | 24.0 de | 9578 a | 71.53 ab | 64.27 a |
| | TILT | 3.6 | EC | 6 | oz/A | B | | | | | |
| 17 | TILT | 3.6 | EC | 10 | oz/A | B | 6.3 b | 63.5 b | 8715 a | 71.15 ab | 63.04 ab |
| LSD (P=.05) | | | | | | | 0.87 | 10.58 | 753.0 | 0.725 | 1.603 |
| Standard Deviation | | | | | | | 0.61 | 7.40 | 526.9 | 0.435 | 0.962 |
| CV | | | | | | | 13.06 | 22.99 | 5.72 | 0.61 | 1.5 |
| Replicate F | | | | | | | 0.588 | 0.937 | 4.599 | 4.009 | 4.017 |
| Replicate Prob(F) | | | | | | | 0.6261 | 0.4299 | 0.0066 | 0.0279 | 0.0278 |
| Treatment F | | | | | | | 13.323 | 24.616 | 6.114 | 2.605 | 2.716 |
| Treatment Prob(F) | | | | | | | 0.0001 | 0.0001 | 0.0001 | 0.0103 | 0.0079 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

## 2008 Blast Fungicide Trial

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: M202, 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill seeded, May 15

**Fertilization**: Preplant 24-72-72, Mar 19; preflood 120-0-0, June 18

**Experimental Design**: Randomized complete block with four replications

**Water Management**: Flood, June 18; drained to induce blast, June 29; reflooded, July 7

**Herbicides**: 3 qt Propanil + 1 oz Permit, June 8; 4 oz Arrosolo + 1 pt Basagran, June 15; 16.5 oz Clincher, June 20

**Insecticides**: 4 oz Mustang Max, June 25; 4 oz Mustang Max, July 16

**Fungicides**: Various, see Table 15

**Inoculation Dates**: None all from natural sources

**Application Equipment**: $CO_2$, backpack sprayer, 8002 tips, 15 gal/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| Heading | Aug 8 | 9:00AM | 85°F | 4 mph | 84% | 10% | Heavy |

**Disease Ratings**: Sept 10

**Drained**: Aug 22

**Harvest**: Sept 10

**Results**: See Table 15

**Comments**: Blast severity was heavy, and other diseases were very light.

Table 15. Effect of fungicide applications on blast development and yield of M202 rice at the Rice Research Station, Crowley, LA. 2008.

| Disease Code | | | | Lf Blast | RNB | Yield | Milling | Milling |
|---|---|---|---|---|---|---|---|---|
| Rating Data Type | | | | 0-9 | % | lb/A | % Total | % Head |
| Rating Date | | | | July 4 | July 4 | July 29 | Sept 22 | Sept 22 |
| 1 | UNSPRAYED | | | 6.3a | 58.8a | 1382d | 59.68b | 38.36 c |
| 2 | Quadris 2.08 SC | 9 oz/A | B+H | 6.0a | 55.0a | 3204abc | 61.50ab | 42.83abc |
| 3 | Quadris 2.08 EC | 9 oz/A | H | 6.0a | 55.5a | 2644bc | 61.48ab | 41.50abc |
| 4 | Quadris 2.08 SC | 12 oz/A | H | 5.8a | 54.5a | 2461c | 61.31ab | 40.07abc |
| 5 | GEM 50 DF | 8 oz/A | B+H | 7.5a | 82.0a | 3607a | 62.03ab | 45.85ab |
| 6 | GEM 50 DF | 8 oz/A | H | 7.0a | 72.5a | 3026abc | 61.90ab | 42.96abc |
| 7 | GEM 50 DF | 9.6 oz/A | H | 6.5a | 56.0a | 2851abc | 59.88b | 39.00bc |
| 8 | Stratego 2.08 SC | 19 oz/A | B | 6.3a | 55.0a | 3405ab | 61.12ab | 41.02abc |
| 9 | Stratego 2.08 SC | 19 oz/A | H | 7.0a | 61.8a | 2688bc | 61.01ab | 40.02abc |
| 10 | Quilt 1.66 SC | 21 oz/A | B | 5.8a | 49.8a | 2467c | 60.63b | 37.78c |
| 11 | Quilt 1.66 SC | 21 oz/A | H | 6.8a | 64.0a | 3021abc | 61.93ab | 44.00abc |
| 12 | Quilt 1.66 SC | 28 oz/A | H | 6.0a | 55.8a | 3156abc | 61.84ab | 43.25abc |
| 13 | Quadris 2.08 SC | 9 oz/A | B | 6.0a | 51.5a | 2461c | 60.57b | 39.29bc |
| 14 | A15909A 2.2 SC | 18 oz/A | H | 5.5a | 54.8a | 3122abc | 61.57ab | 41.79abc |
| 15 | A15909A 2.2 SC | 21 oz/A | H | 5.5a | 52.0a | 3126abc | 62.37ab | 44.31abc |
| 16 | USF 729 4.16 SC | 8 oz/A | H | 6.8a | 72.8a | 3459ab | 62.63ab | 44.71abc |
| 17 | USF 729 4.16 SC | 10 oz/A | H | 6.8a | 65.5a | 3586a | 64.34a | 46.86a |
| LSD (P=.05) | | | | 1.2 | 20.99 | 530.0 | 2.116 | 4.168 |
| Standard Deviation | | | | 0.90 | 14.69 | 370.8 | 1.481 | 2.917 |
| CV | 14.33 | | | 24.56 | 12.69 | 2.41 | 6.94 | |
| Replicate F | | | | 0.018 | 0.880 | 17.091 | 1.327 | 1.498 |
| Replicate Prob(F) | | | | 0.9967 | 0.4582 | 0.0001 | 0.2768 | 0.2274 |
| Treatment F | | | | 1.627 | 1.456 | 8.741 | 2.148 | 3.323 |
| Treatment Prob(F) | | | | 0.0976 | 0.1570 | 0.0001 | 0.0216 | 0.0007 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

**2008 Rush's Germplasm Yield Trials**

**Location**: Rice Research Station, Crowley, LA

**Soil Type**: Crowley silt loam (pH 6.0, Clay 12%, Silt 71%, Sand 17%, CEC 9.4 cmole/kg)

**Variety/Seed Rate**: 90 lb/A

**Plot Size**: 4 x 16 ft

**Planting Method/Date**: Drill seeded, Apr 15

**Fertilization**: Preplant 24-72-72, Apr 14; 120-0-0 topdressed

**Experimental Design**: Randomized block design with three replications

**Water Management**: Flooded, May 14

**Herbicides**: 4 qt Arrosolo + 1 oz Permit/A, May 7; 4 qt Propanil + 1 oz Permit + 2 oz Londax, May 21

**Insecticides**: Dermacor seed treatment; Foliar Karate

**Fungicides**: None

**Inoculation Dates**: June 19

**Application Equipment**: N/A

**Application Dates**:

| Growth Stage | Date | Time | Temp | Wind | RH | Clouds | Dew |
|---|---|---|---|---|---|---|---|
| None | | | | | | | |

**Disease Ratings**: July 15 and July19

**Drained**: July 31

**Harvest**: Aug 18

**Results**: See Tables 16 and 17

**Comments**: Sheath blight severity was high, and other diseases were low in severity.

Table 16. Agronomic and quality performance of sheath blight (SB) resistant rice lines. Rice Research Station, Crowley, LA. 2008.

| Pathogen Code<br>Rating Unit<br>Rating Date | | Heading<br>Date<br>Julian | Plant Ht.<br>cm<br>Aug 1 | SB<br>0-9<br>Aug 15 | Yield<br>lb/A<br>Aug 19 | Milling<br>% Total<br>Oct 14 | Milling<br>% Head<br>Oct 14 |
|---|---|---|---|---|---|---|---|
| 1 | 07-0507 | 198.0a | 85.83 e-k | 5.7 c-f | 6667 b-f | 67.17 d-h | 56.73 b-g |
| 2 | 07-0515 | 198.7a | 85.00 f-k | 5.7 c-f | 6928 a-f | 66.54 gh | 53.83 fgh |
| 3 | 07-0616 | 196.3a | 95.50 b-e | 4.3 fg | 7171 a-e | 69.71 abc | 62.37 a-d |
| 4 | 07-0921 | 187.7a | 92.67 b-h | 7.0 bc | 6316 b-g | 67.92 b-h | 46.13 i |
| 5 | 07-0949 | 195.0a | 104.17 a | 4.0 g | 7702 ab | 69.53 a-e | 51.98 gh |
| 6 | 07-1243 | 194.7a | 75.17 l | 5.3 d-g | 4821 g | 68.22 a-h | 53.79 fgh |
| 7 | 07-1264 | 201.0a | 84.17 h-k | 4.3 fg | 6664 b-f | 66.51 gh | 57.86 a-g |
| 8 | 07-1279 | 196.7a | 98.50 abc | 5.0 efg | 6852 a-f | 67.08 fgh | 59.90 a-f |
| 9 | 07-1286 | 196.0a | 96.83 bcd | 5.0 efg | 6568 b-f | 68.73 a-h | 55.20 c-h |
| 10 | 07-1393 | 194.0a | 94.50 b-g | 4.3 fg | 8300 a | 69.56 a-d | 51.90 gh |
| 11 | 07-1448 | 196.0a | 79.00 kl | 5.7 c-f | 6178 b-g | 68.86 a-g | 60.20 a-f |
| 12 | 07-1452 | 195.0a | 84.83 g-k | 5.7 c-f | 6240 b-g | 67.15 e-h | 58.92 a-g |
| 13 | 07-1494 | 193.3a | 84.00 h-k | 5.0 efg | 5897 d-g | 67.70 c-h | 54.06 e-h |
| 14 | 07-1537 | 193.0a | 87.83 d-k | 6.0 cde | 6501 b-f | 68.65 a-h | 49.45 hi |
| 15 | 07-1605 | 203.0a | 84.33 h-k | 4.0 g | 6883 a-f | 68.76 a-h | 62.34 a-d |
| 16 | 07-1625 | 196.3a | 94.67 b-f | 5.0 efg | 6637 b-f | 68.46 a-h | 62.60 abc |
| 17 | 07-1631 | 194.0a | 99.00 ab | 5.3 d-g | 6322 b-g | 69.32 a-f | 64.89 a |
| 18 | 07-1643 | 193.3a | 90.83 b-i | 4.3 fg | 7641 abc | 66.42 h | 60.16 a-f |
| 19 | 07-1695 | 160.7b | 87.83 d-k | 4.0 g | 7229 a-e | 68.07 b-h | 57.79 a-g |
| 20 | 07-1701 | 189.7a | 86.33 e-k | 4.7 efg | 6850 a-f | 67.36 c-h | 59.36 a-f |
| 21 | 07-1762 | 196.0a | 89.17 c-i | 6.7 bcd | 6393 b-f | 68.18 a-h | 61.13 a-f |
| 22 | 07-1767 | 195.0a | 89.83 b-i | 6.7 bcd | 5948 d-g | 68.71 a-h | 57.90 a-g |
| 23 | 07-1779 | 193.0a | 95.17 b-e | 5.0 efg | 6678 b-f | 68.47 a-h | 59.66 a-f |
| 24 | 07-1785 | 193.0a | 90.33 b-i | 5.0 efg | 6880 a-f | 69.54 a-e | 61.36 a-e |
| 25 | 07-1814 | 185.0a | 90.50 b-i | 5.7 c-f | 6718 b-f | 69.05 a-f | 63.66 ab |
| 26 | 07-1928 | 192.3a | 85.33 f-k | 5.7 c-f | 7117 a-e | 69.29 a-f | 64.02 ab |
| 27 | 07-1953 | 193.0a | 81.50 i-l | 4.3 fg | 5688 efg | 67.84 b-h | 59.92 a-f |
| 28 | 07-1972 | 198.0a | 79.33 jkl | 5.3 d-g | 5637 efg | 69.43 a-f | 62.70 abc |
| 29 | 07-2264 | 196.7a | 91.00 b-i | 5.3 d-g | 6065 c-g | 68.07 b-h | 60.30 a-f |
| 30 | 07-2288 | 186.3a | 92.67 b-h | 6.0 cde | 7334 a-d | 70.23 ab | 62.80 ab |
| 31 | 07-2485 | 195.0a | 85.33 f-k | 6.0 cde | 6649 b-f | 68.76 a-h | 60.35 a-f |
| 32 | 07-2545 | 196.0a | 83.67 h-k | 5.3 d-g | 6036 c-g | 70.19 ab | 63.82 ab |
| 33 | 07-2588 | 193.3a | 88.83 d-j | 7.3 b | 7127 a-e | 68.04 b-h | 58.33 a-g |
| 34 | 07-2884 | 196.0a | 96.33 bcd | 5.0 efg | 6528 b-f | 68.85 a-g | 57.38 a-g |
| 35 | 07-2888 | 195.0a | 83.33 h-k | 4.0 g | 7111 a-e | 69.43 a-f | 63.61 ab |
| 36 | 07-2913 | 191.7a | 84.17 h-k | 4.0 g | 6180 b-g | 70.48 a | 62.68 abc |
| 37 | 07-3026 | 189.0a | 87.67 d-k | 6.0 cde | 6292 b-g | 69.66 abc | 55.00 d-h |
| 38 | Cocodrie | 186.3a | 87.50 d-k | 8.7 a | 6140 b-g | 69.42 a-f | 61.36 a-e |
| 39 | Catahoula | 191.0a | 88.83 d-j | 7.7 b | 5477 fg | 68.63 a-h | 54.73 e-h |
| 40 | CL151 | 188.3a | 96.50 bcd | 7.0 bc | 7380 a-d | 68.85 a-g | 57.61 a-g |
| LSD (P=.05) | | 14.73 | 5.282 | 0.81 | 871.7 | 1.303 | 4.080 |
| Standard Deviation | | 9.02 | 3.234 | 0.49 | 533.8 | 0.798 | 2.499 |
| CV | | 4.67 | 3.64 | 9.1 | 8.1 | 1.16 | 4.26 |
| Replicate F | | 1.322 | 35.280 | 7.486 | 19.823 | 1.726 | 7.434 |
| Replicate Prob (F) | | 0.2725 | 0.0001 | 0.0011 | 0.0001 | 0.1849 | 0.0011 |
| Treatment F | | 1.556 | 10.680 | 14.793 | 4.590 | 5.041 | 8.888 |
| Treatment Prob (F) | | 0.0493 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

Table 17. Agronomic and quality performance of sheath blight (SB)-resistant rice lines. Rice Research Station, Crowley, LA. 2008.

| Pathogen Code<br>Rating Unit<br>Rating Date | | Heading<br>date<br>Julian | Plant H.<br>cm<br>July 1 | SB<br>0-9<br>July 15 | Yield<br>lb/A<br>July 19 | Milling<br>% Total<br>Oct 20 | Milling<br>% Head<br>Oct 20 |
|---|---|---|---|---|---|---|---|
| 1 | 07SBYT14 | 196.3 bc | 92.00 abc | 6.0 bc | 6276 abc | 69.29 b-f | 62.21 bc |
| 2 | 07SBYT15 | 193.3 cde | 94.17 ab | 5.3 c | 7230 a | 68.85 c-f | 62.12 bc |
| 3 | 07SBYT16 | 191.7 cde | 92.33 abc | 4.7 c | 6888 ab | 70.32 bc | 62.38 bc |
| 4 | 07SBYT17 | 186.3 ef | 95.33 a | 6.0 bc | 6748 abc | 68.71 def | 63.24 bc |
| 5 | 07SBYT18 | 193.7 cd | 84.50 d-g | 4.7 c | 7023 ab | 69.20 b-f | 61.76 bc |
| 6 | 07SBYT19 | 192.3 cde | 87.00 c-f | 5.0 c | 7441 a | 69.02 c-f | 63.90 abc |
| 7 | 07SBYT20 | 192.7 cde | 83.50 efg | 6.0 bc | 6889 ab | 69.11 b-f | 61.83 bc |
| 8 | 07SBYT26 | 189.7 c-f | 90.50 a-d | 5.0 c | 6762 abc | 68.47 def | 62.87 bc |
| 9 | 07SBYT27 | 189.0 def | 88.33 cde | 5.3 c | 6463 abc | 68.69 def | 62.88 bc |
| 10 | 07SBYT29 | 199.7 b | 80.83 g | 4.7 c | 6237 abc | 67.71 f | 60.30 c |
| 11 | 07SBYT30 | ---- | 80.67 g | 4.7 c | 6227 abc | 68.17 ef | 60.70 c |
| 12 | 07SBYT43 | 195.0 bcd | 87.00 c-f | 5.7 bc | 6162 abc | 70.54 b | 64.75 ab |
| 13 | 07SBYT45 | 192.3 cde | 85.33 d-g | 6.0 bc | 6277 abc | 68.93 c-f | 64.04a bc |
| 14 | 07SBYT49 | 193.0 cde | 84.33 d-g | 5.0 c | 6693 abc | 71.82 a | 66.78 a |
| 15 | 07SBYT53 | 191.7 cde | 86.83 c-f | 5.0 c | 7021 ab | 69.51 b-e | 62.76 bc |
| 16 | 07SBYT54 | 191.0 c-f | 89.33 b-e | 5.0 c | 6667 abc | 68.95 c-f | 63.27 bc |
| 17 | 07SBYT58 | 189.7 c-f | 87.67 cde | 7.0 b | 6497 abc | 69.87 bcd | 63.92 abc |
| 18 | 2 plot YL 19 | 206.0 a | 81.17 fg | 5.0 c | 5785 bc | 68.55 def | 61.58 bc |
| 19 | Cocodrie | 185.0 f | 88.00 cde | 8.7 a | 5532 c | 69.98 bcd | 60.97 bc |
| 20 | CL151 | 188.3 def | 94.17 ab | 7.0 b | 6803 ab | 69.33 b-e | 61.48 bc |
| LSD (P=.05) | | 4.10 | 3.694 | 0.94 | 712.4 | 0.913 | .094 |
| Standard Deviation | | 2.46 | 2.239 | 0.57 | 431.7 | 0.553 | 1.2692 |
| CV | | 1.28 | 2.55 | 10.19 | 6.56 | 0.8 | 2.02 |
| Replicate F | | 3.775 | 3.415 | 1.596 | 2.862 | 4.910 | 0.905 |
| Replicate Prob (F) | | 0.0328 | 0.0433 | 0.2160 | 0.0695 | 0.0127 | 4.325 |
| Treatment F | | 11.081 | 11.930 | 9.634 | 3.583 | 8.288 | 0.4131 |
| Treatment Prob (F) | | 0.0001 | 0.0001 | 0.0001 | 0.0004 | 0.0001 | 0.0001 |

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls).

# DISEASE MANAGEMENT IN RICE

M.C. Rush, D.E. Groth, X.Y. Sha, R. Nandakumar, N. Nyaupane, and S.D. Linscombe

## INTRODUCTION

Sheath blight (SB) is the most serious rice disease in Louisiana because of its endemic, and occasionally epidemic, development each year and also because of the significant yield losses experienced by Louisiana rice growers. So far, no completely resistant cultivars have been identified for this disease worldwide. However, our program for breeding for SB resistance has created and identified several hundred breeding lines with a useful level of partial resistance. Many of these lines have desirable agronomic characteristics coupled with high yield potential and the grain quality characteristics required by the rice industry. The sources for SB resistance used in our program have different genes for partial resistance and were crossed with susceptible commercial cultivars, our elite resistant lines, and lines from our progeny row selections. Resistance sources used include LSBR-5, LSBR-33, H4/CODF, Taducan, Rice/Grass, Teqing, Jasmine 85, Leah, Katy, Yangdao-4, Yangdao-6, Earl, Bengal, and varieties with medium levels of partial resistance and selected lines with combined SB resistance sources from our program.

Bacterial panicle blight (BPB), identified by our laboratory in 1996, is a seedborne disease of rice that affects the florets in developing panicles and causes linear, bordered sheath lesions. In years of unusually high temperature at night, the disease can reduce potential yields up to 40%. The use of resistant cultivars, if they were available, would be the best way to control both of these diseases. At this time, only partial resistance is known for both diseases. Several sources of high-level partial resistance to BPB have been identified by our laboratory, including Jupiter, Nipponbare, Teqing, AB649, LM-1, LA2065, and several breeding lines developed from crosses with Cocodrie (susceptible) and the above sources of partial resistance.

Seeds were prepared for planting for 2,000 progeny rows from panicles selected in 2007, 260 rows of lines planted in yield/agronomic characters tests, and 180 packets for replicated yield tests. These tests were planted by Dr. Don Groth for selecting and harvested in 2008 by Drs. Don Groth and X. Sha. They will continue the research with this SB- and BPB-resistant germplasm in the future in anticipation of my retirement from the LSU AgCenter in 2009.

Two field tests were conducted in cooperation with Dr. Don Groth at the LSU AgCenter Rice Research Station in 2007 and two in 2008 to study the efficacy of treatments with antimicrobial chemicals during pre-sprouting of rice seeds for water-seeding to control the seedborne pathogen *Burkholderia glumae* and BPB on susceptible rice.

## MATERIALS AND METHODS

In 2007, tests were planted on May 24 using Foundation healthy and infected Trenasse seed in the first test, and on June 29 using Foundation healthy seed and diseased Francis seed in the second test. This test was planted late in the season to try and have hot weather at the late-boot/heading stages of growth to favor BPB development. Sixteen antibacterial compounds used at different rates on the Trenasse seed included on a w/w basis chemical to water Lactic Acid- 5%, Lactic Acid- 3%, Acetic Acid- 0.3%, Acetic Acid- 0.1%, Starner- 5%, Starner- 3%, Clorox- 10%, Clorox- 7.5%, Copper Sulfate- 1%, Copper Sulfate- 0.6%, Copper Chloride- 1%, Copper Chloride- 0.6%, and Kocide 2000- 2.5 gram/5000 ml i.e. 5000 ppm (Table 1). Chemicals used on Francis in the second test were corrected based on phytotoxicity in the first test and included Lactic Acid- 1%, Lactic Acid- 0.5%, Acetic Acid- 0.2%, Acetic Acid- 0.1%, Starner- 5%, Starner- 3%, Clorox- 5%, Clorox- 3.5%, Clorox- 2.5%, Copper Sulfate- 0.4%, Copper Sulfate- 0.3%, Copper Sulfate- 0.1%, Copper Chloride- 0.4%, Copper Chloride- 0.3%, Copper Chloride-0.1%, Kocide 2000- 2.5 gram/5000 ml i.e. 5000 ppm (Table 3). The chemicals were dissolved in 4 liters of water in separate buckets, and small cotton bags with the seeds for all replicates were soaked in the pre-sprouting solution for 30 hr. The buckets were emptied and the seeds drained for 24 to 30 hr. Seeds were then hand-seeded into individual flooded plots that were drained after 3 days and flushed as needed. Stand counts were made when plants were at the 3- to 4-leaf stage of growth or June 13 in the first test and July 13 in the second test. Plants were fertilized and flooded with the permanent flood. A flood was maintained until a few days before harvest (first test =

August 23, second test = October 12). Plots were rated for BPB development and 10 panicles collected from each plot after draining. Panicles were to be evaluated for the presence of *B. glumae* using the semi-selective S-PG medium. Harvest was by small-plot combine, and grain weights were converted to pounds/A at 12% moisture.

In 2008, replicate tests were water seeded in 14 x 5 ft plots (70 $ft^2$) planted on April 4 and April 28. The 25 treatments in each test were the same and included two control treatments; untreated foundation Trenasse (healthy control) and diseased seed control (untreated Trenasse seed from plots inoculated in 2007 with *B. glumae*). Diseased Trenasse seed were treated with chemicals in the pre-sprouting water. Seeds were pre-sprouted for 30 hr in the bactericidal solutions, drained for 24 hr, and water seeded by hand into flooded experimental plots. Control seed were pre-sprouted without chemical treatment. Chemicals tested included formulations of copper sulfate, copper chloride, lactic acid, acetic acid, Starner, copper nitrate, copper gluconate, Super Algecide™, Cutrine Plus™, Cutrine Ultra™, Clearigate™, Algimycin™, zinc sulfate, and zinc sulfate + copper chloride. Stand counts were taken on the first test on May 2 and on May 19 for the second test. Two tests were planted to try and have weather favoring BPB (high day and nighttime temperatures) at the heading stages on one or both of the tests. Stand counts on the first test were made on April 28 and on the second test on May 20. The tests were rated for BPB and harvested at maturity. The first test was harvested on Aug 4 and the second was harvested on Aug 27. Seeds from each treatment saved at planting were to be cultured for *B. glumae*. Ten panicles were harvested from each plot in each test before harvest and saved for isolation of the pathogen and for PCR identification of the pathogen from each treatment.

## RESULTS AND DISCUSSION

The first test in 2007 was conducted using healthy (non-inoculated) Foundation Trenasse seed and diseased Trenasse seed from plots inoculated with *B. glumae* in 2006. The second test used Foundation Francis seed and infected Francis seed from plots inoculated in 2006. The treatments used in the first test in 2007 are listed in Table 1. Stand count and yield data from the first test are shown in Table 2. Several treatments including the high rates of Copper Sulfate (1%), Acetic Acid (0.3%), Copper Chloride (1%), Lactic Acid (5%), and Lactic Acid (3%). Lactic acid gave the most severe stand reductions at the rates used and this damage to pre-sprouting seeds carried over to cause severe yield reductions (Table 2). There were not significant yield differences between the healthy rice and other treatments except for the Lactic acid treatments. However, Starner (5), Acetic Acid (0.1), Copper Chloride (0.6), Copper Sulfate (1), Clorox (7.5), the Healthy Control, the hot water treatment, and Copper Sulfate (0.6) gave the highest yields even though the stands were reduced with some of these treatments (Table 2). Disease data collected on this test were inconclusive as normal weather at heading was not favorable for disease development. Isolations of *B. glumae* from treated seeds indicated that treatments Copper Chloride and Copper Sulfate, at both rates of each, completely controlled all bacterial growth (100%) on treated seeds, including *B. glumae*. The hot water treatment gave 97% control of *B. glumae*, both lactic acid treatments gave 99% control of the pathogen, Starner at 5% gave 93% control of *B. glumae*, and Clorox at 7.5% gave 91% control. The least effective treatment was Kocide 2000 at 5000 ppm concentration with 41% control of the pathogen. This copper compound (copper hydroxide) has low solubility in water and may not have had enough copper ions in the solution over the short treatment period to control the pathogen. The *B. glumae* isolation tests only worked where the treatments controlled other bacteria so that *B. glumae* could grow. No *B. glumae* colonies were isolated from the diseased control seeds as another bacterium grew and completely inhibited growth of the pathogen. We are presently studying this antagonistic bacterium to see if it has potential for biological control of *B. glumae*. Treated seeds and seeds on panicles collected before maturity in all tests will be evaluated for *B. glumae* growth with S-PG medium when we develop a method to inhibit this antagonistic bacterium.

Treatments used in the second test in 2007 are listed in Table 3. Data on stand counts and yields produced by the different treatments are also listed in Table 3. The high rates of Copper Sulfate, Lactic Acid, and Acetic Acid gave significant phytotoxicity even though the rates were reduced from those used in the first test. The variety was different (Francis) and there may be variety differences in response to these antibacterial chemicals. Rates were further adjusted in the 2008 tests. The Acetic Acid, Copper Chloride, Copper Sulfate, and Clorox treatments gave the highest yields in the test (Table 4). These compounds also produced high stands. The healthy seed gave a high stand, but a low yield. This may be explained by the fact that the BPB disease was present in the test, and there was evidence of plot-to-plot spread of the disease by maturity. The rice produced from "healthy" seed had a heavy disease infestation in this test. The copper compounds, acetic acid, Clorox, and Starner treatments had the least BPB disease in this test.

Table 1. Treatments used on pre-sprouting Trenasse rice seeds in the first 2007 seed sprouting in antimicrobial solutions test at the LSU AgCenter Rice Research Station in Crowley, LA.

| Treatment | Rate (%)[1] | g or ml/4000 L water | Rate/100 gal $H_2O$ |
|---|---|---|---|
| Healthy Control | 0 | 0 | 0 |
| Diseased Control | 0 | 0 | 0 |
| Hot water | 0 | 0 | 0 |
| Lactic Acid | 3 | 60 | 25.02 lb |
| Lactic Acid | 5 | 200 | 41.7 lb |
| Acetic Acid | 0.1 | 4 | 0.84 lb |
| Acetic Acid | 0.3 | 12 | 2.52 lb |
| Starner | 3 | 120 | 25.21 lb |
| Starner | 5 | 200 | 42.02 lb (20% Wp) |
| Clorox | 7.5 | 300 | 7.5 gal |
| Clorox | 10 | 400 | 10 gal |
| Copper Sulfate | 0.6 | 24 | 5.04 lb |
| Copper Sulfate | 1 | 40 | 84 lb |
| Copper Chloride | 0.6 | 24 | 5.04 lb |
| Copper Chloride | 1 | 40 | 84 lb |
| Kocide SD | 5000 ppm | | |

[1]Rate based on w/w active chemical to water.

Table 2. Stand count and yield from the first seed sprouting in the antimicrobial chemicals test in 2007 for control of seedborne *Burkholderia glumae*, cause of bacterial panicle blight.

| **Treatment (%)** | **Mean stand counts (4 reps)[1]** | **Treatment (%)** | **Mean yield ( lb/ha)** |
|---|---|---|---|
| Kocide 2000 (5000 ppm) | 37 a | Starner (5) | 8640 a |
| Healthy Control | 34.4 a | Acetic Acid (0.1) | 8631 a |
| Diseased Control | 33.1 ab | Copper Chloride (0.6) | 8485 ab |
| Starner (5) | 27.4 bc | Copper Sulfate (1) | 8384 ab |
| Hot Water | 26.2 cd | Starner (5) | 8372 ab |
| Acetic Acid (0.1) | 25.7 cd | Clorox (7.5) | 8294 ab |
| Copper Sulfate (0.6) | 25.3 cd | Healthy Control | 8254 ab |
| Starner (3) | 24.7 cd | Hot water | 8311 ab |
| Clorox (7.5) | 24.1 cd | Copper Sulfate (0.6) | 8169 abc |
| Clorox (10) | 21.9 cde | Acetic Acid (0.3) | 7999 abc |
| Copper Chloride (0.6) | 20.2 def | Copper Chloride (1) | 7600 abc |
| Copper Sulfate (1) | 19.2 def | Clorox (10) | 7557 abc |
| Acetic Acid (0.3) | 15.9 ef | Diseased Control | 7366 abc |
| Copper Chloride (1) | 14.6 f | Lactic Acid (3) | 7281 abc |
| Lactic Acid (5) | 7.3 g | Kocide 2000 | 7175 bc |
| Lactic Acid (3) | 6.8 g | Lactic Acid (5) | 6721 c |
| Grand Mean | 22.7 | Grand Mean | 7952 |
| LSD (P=. 05) | 7 | LSD (P=. 05) | 1454.8 |

[1]Means followed by same letter do not significantly differ (Duncan's multiple range test, P=. 05).
Stand counts indicate plants/$ft^2$.

Table 3. Stand count and yield from the 2007 second seed sprouting/treatment test using Foundation and infected seed of Francis rice. Test conducted at the AgCenter Rice Research Station at Crowley, LA.

| **Treatment (%)** | **Mean stand counts (4 reps)[1]** | **Treatment (%)** | **Mean yield (lb/ha at 12% moisture)** |
|---|---|---|---|
| Clorox (5) | 36.2 a | Acetic Acid (0.1) | 5830 a |
| Clorox (2.5) | 35.9 a | Copper Chloride (0.1) | 5817 a |
| Healthy Control | 35 ab | Copper Sulfate (0.1) | 5565 ab |
| Copper Chloride (0.3) | 34.3 ab | Copper Chloride (0.4) | 5505 abc |
| Copper Sulfate (0.1) | 34.2 ab | Kocide 2000 | 5358 abc |
| Lactic Acid (0.5) | 32.5 ab | Clorox (5) | 5253 abc |
| Clorox (3.5) | 31.8 ab | Copper Sulfate (0.3) | 5174 abc |
| Starner (5) | 31.6 ab | Clorox (2.5) | 5155 abc |
| Copper Chloride (0.4) | 30 ab | Lactic Acid (0.5) | 5143 abc |
| Acetic Acid (0.1) | 29.8 ab | Starner (5) | 5130 abc |
| Starner (3) | 29.6 ab | Starner (3) | 5098 abc |
| Copper Chloride (0.1) | 29.4 ab | Copper Chloride (0.3) | 5040 abc |
| Kocide | 29.4 ab | Diseased Control | 5036 abc |
| Copper Sulfate (0.4) | 28.7 ab | Copper Sulfate (0.4) | 5029 abc |
| Diseased Control | 27.3 abc | Clorox (3.5) | 4968 abc |
| Copper Sulfate (0.3) | 24.5 bc | Lactic Acid (1) | 4734 bc |
| Lactic Acid (1) | 24 bc | Healthy Control | 4672 bc |
| Acetic Acid (0.2) | 17.1 c | Acetic Acid (0.2) | 4570 bc |
| Grand Mean | 30.1 | Grand Mean | 5171 |
| LSD (P=. 05) | 11.3 | LSD (P=. 05) | 977 |

[1]Means followed by same letter do not significantly differ (Duncan's multiple range test, P=. 05).
Stand counts indicate plants/ft$^2$.

Treatments used in the two 2008 plantings are listed in Table 4. Stand count and yield data from the first planting are listed in Table 5. In general, the copper treatments and zinc sulfate had the highest stand counts when compared with the healthy control. These same treatments tended to have the highest yields. Copper Nitrate treatments were outstanding for producing stand and for high yields. In the second planting in 2008, the Healthy Control, Cutrine Ultra (0.05), Zinc Sulfate + $CuCl_2$ (0.1 + 0.1), Copper Chloride (0.1), Copper Sulfate (0.1), and Clearigate (0.075) produced the highest stands (Table 5). The Copper Sulfate (0.1), Zinc Sulfate (0.25), Zinc Sulfate + $CuCl_2$ (0.1 + 0.1), the Healthy Control, Copper Chloride (0.25), Copper Chloride (0.1), and the two Copper Nitrate treatments gave the best yields. Results from the second test are listed in Table 6. Copper Sulfate (0.1), Zinc Sulfate (0.25), Zinc Sulfate + $CuCl_2$ (0.1 + 0.1), the Healthy Control, Copper Chloride (0.25), Copper Chloride (0.1), Copper Nitrate (0.05), and Copper Nitrate (0.25) gave the best yields.

Table 4. The treatment list for the two 2008 seed sprouting in antimicrobial solutions tests.

| **Treatment** | **Rate (% based on w/w)** | **g or ml/4000 L water** | **Rate/100 gal $H_2O$** |
|---|---|---|---|
| Healthy Control | 0 | 0 | 0 |
| Diseased Control | 0 | 0 | 0 |
| Copper Sulfate | 0.25 | 10 | 2.08 lb |
| Copper Sulfate | 0.1 | 4 | 0.84 lb |
| Copper Chloride | 0.25 | 10 | 2.08 lb |
| Copper Chloride | 0.1 | 4 | 0.84 lb |
| LacticAcid | 0.5 | 20 | 4.17 lb |
| AceticAcid | 0.1 | 4 | 0.84 lb |
| Starner | 2.5 | 100 | 21.01 lb (20% Wp) |
| Copper Nitrate | 0.05 | 2 | 0.42 lb |
| Copper Nitrate | 0.25 | 10 | 2.08 lb |
| Copper Gluconate | 0.1 | 4 | 0.84 lb |
| Copper Gluconate | 0.05 | 2 | 0.42 lb |
| Super Algecide | 0.05 | 2 | 189 ml |
| Clorox | 5 | 200 | 5 gal |
| Cutrine Plus | 0.05 | 2 | 189 ml |
| Cutrine Plus | 0.01 | 0.4 | 38ml |
| Cutrine Ultra | 0.05 | 2 | 189 ml |
| Cutrine Ultra | 0.01 | 0.4 | 38 ml |
| Clearigate | 0.1 | 4 | 378 ml |
| Clearigate | 0.075 | 3 | 284 ml |
| Algimycin | 0.25 | 10 | 946 ml |
| Algimycin | 0.1 | 4 | 378 ml |
| Zinc Sulfate | 0.25 | 4 | 2.08 lb |
| Zinc Sulfate + $CuCl_2$ | 0.1 + 0.1 | 4 + 4 | 0.84 + 0.84 lb |

Table 5. Stand counts and yields by Trenasse rice from 2008 in the first planting of the seed sprouting in antimicrobial pre-sprouting test.

| **Treatment (%)** | **Mean stand counts (plants/ft$^2$)[1]** | **Treatment (% on w/w basis)** | **Mean yield (lb/A at 12% moisture)[1]** |
|---|---|---|---|
| Healthy Control | 32.4 a | Copper Nitrate (0.25) | 11058 a |
| Copper Nitrate (0.25) | 27.5 ab | Copper Chloride (0.1) | 10642 a |
| Copper Chloride (0.25) | 27.2 abc | Cutrine Plus (0.01) | 10226 a |
| Copper Nitrate (0.05) | 25.8 bc | Healthy Control | 10155 a |
| Cutrine Plus (0.01) | 25.6 bc | Zinc Sulfate (0.25) | 9828 a |
| Zinc Sulfate (0.25) | 25.3 bc | Copper Nitrate (0.05) | 9818 a |
| Copper Gluconate (0.1) | 24.7 bcd | Copper Sulfate (0.1) | 9661 a |
| Algimycin (0.25) | 24.1 bcd | Algimycin (0.1) | 9628 a |
| Copper Chloride (0.1) | 23.8 bcd | Starner (2.5) | 9485 a |
| Cutrine Plus (0.05) | 23.8 bcd | Copper Gluconate (0.1) | 9465 a |
| Zinc Sulfate + $CuCl_2$ (0.1 + 0.1) | 23.4 bcd | Cutrine Plus (0.05) | 9368 a |
| AceticAcid (0.1) | 23.2 bcd | Cutrine Ultra (0.05) | 9343 a |
| Algimycin (0.1) | 23.1 bcd | Super Algecide (0.05) | 9295 a |
| Copper Gluconate (0.05) | 22.6 bcd | AceticAcid (0.1) | 9283 a |
| Copper Sulfate (0.25) | 22.6 bcd | Copper Gluconate (0.05) | 9267 a |
| Clorox (5) | 22.5 bcd | Cutrine Ultra (0.01) | 9168 a |
| Copper Sulfate (0.1) | 21.9 bcd | Clearigate (0.075) | 9086 a |
| Clearigate (0.075) | 21.7 bcd | Algimycin (0.25) | 9039 a |
| Cutrine Ultra (0.05) | 21.4 bcd | Clearigate (0.1) | 9037 a |
| Cutrine Ultra (0.01) | 21.3 bcd | Zinc Sulfate + $CuCl_2$ (0.1 + 0.1) | 8905 a |
| Clearigate (0.1) | 20.3 bcd | Clorox (5) | 8897 a |
| LacticAcid (0.5) | 20.3 bcd | Diseased Control | 8713 a |
| Starner (2.5) | 20.1 cd | Copper Sulfate (0.25) | 8671 a |
| Super Algecide (0.05) | 20.1 cd | Copper Chloride (0.25) | 8381 a |
| Diseased Control | 17.9 d | LacticAcid (0.5) | 7897 a |
| Grand Mean | 23.3 | Grand Mean | 9373 |
| LSD (P=. 05) | 7.6 | LSD (P=. 05) | 6550.2 |

[1]Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 6. Stand count and yield from the second planting of Trenasse rice in 2008 in the seed sprouting in antimicrobial solutions test.

| **Treatment (% on w/w basis)**[1] | **Mean stand counts (plants/ $ft^2$)**[1] | **Treatment (% on w/w basis)** | **Mean yield (lb/ha at 12% moisture)**[1] |
|---|---|---|---|
| Healthy Control | 25.4 a | Copper Sulfate (0.1) | 10774 a |
| Cutrine Ultra (0.05) | 22.4 ab | Zinc Sulfate (0.25) | 10462 ab |
| Zinc Sulfate + $CuCl_2$ (0.1 + 0.1) | 21.9 ab | Zinc Sulfate + $CuCl_2$ (0.1 + 0.1) | 10409 ab |
| Copper Chloride (0.1) | 19.1 abc | Healthy Control | 9961 abc |
| Copper Sulfate (0.1) | 18.6 abc | Copper Chloride (0.25) | 9880 abc |
| Clearigate (0.075) | 18.4 abc | Copper Chloride (0.1) | 9717 abc |
| Diseased Control | 18.3 abc | Copper Nitrate (0.05) | 9704 abc |
| Cutrine Plus (0.05) | 17.8 bc | Copper Nitrate (0.25) | 9668 abc |
| Copper Gluconate (0.05) | 17.6 bc | Diseased Control | 9665 abc |
| Algimycin (0.25) | 17.4 bc | Copper Sulfate (0.25) | 9621 abc |
| Copper Nitrate (0.05) | 17.3 bc | Starner (2.5) | 9465 abc |
| Copper Nitrate (0.25) | 17.3 bc | Clearigate (0.1) | 9437 abc |
| Copper Sulfate (0.25) | 17.1 bc | Cutrine Ultra (0.01) | 9387 abc |
| Cutrine Plus (0.01) | 17.0 bc | AceticAcid (0.1) | 9378 abc |
| Clorox (5) | 16.4 bc | Algimycin (0.1) | 9353 abc |
| Clearigate (0.1) | 16.3 bc | Algimycin (0.25) | 9294 abc |
| Algimycin (0.1) | 16.1 bc | Cutrine Plus (0.05) | 9212 abc |
| Copper Chloride (0.25) | 15.9 bc | Copper Gluconate (0.1) | 9088 abc |
| Cutrine Ultra (0.01) | 15.6 bc | Copper Gluconate (0.05) | 9039 abc |
| Super Algecide (0.05) | 15.6 bc | Super Algecide (0.05) | 8690 abc |
| Zinc Sulfate (0.25) | 14.6 bc | Cutrine Ultra (0.05) | 8561 bc |
| Starner (2.5) | 13.9 c | Clearigate (0.075) | 8575 bc |
| AceticAcid (0.1) | 12.0 c | LacticAcid (0.5) | 8492 bc |
| LacticAcid (0.5) | 11.8 c | Clorox (5) | 8468 bc |
| Copper Gluconate (0.1) | 11.4 c | Cutrine Plus (0.01) | 8193 c |
| Grand Mean | 17.0 | Grand Mean | 9380 |
| LSD (P=. 05) | 8.5 | LSD (P=. 05) | 3042.8 |

[1]Means followed by same letter do not significantly differ (Duncan's multiple range test, P=. 05).

In the 2008 plantings, several new copper compounds were used. Copper Nitrate treatments and several chelated copper anti-algae compounds like Cutrine Plus (0.01) and Clearigate (0.075) performed well for both stand establishment and yield. Neither of the two plantings in 2008 had weather that favored BPB development at their heading stages, so no visible BPB was observed in the plots and ratings were not made. In the first planting, stands were highest in the healthy control plots, but the chemical treatments did not significantly reduce stands, indicating that phytotoxicity of the treatments used was not a factor. Acceptable stands were also obtained in the second planting. We are presently conducting isolation tests on S-PG selective medium and PCR tests to determine control of *B. glumae*.

It is clear that several of the antimicrobial compounds tested have the potential for controlling *B. glumae* on rice seed pre-sprouted in solutions of the compounds without causing phytotoxicity to the sprouting seeds. We are working to refining rates and treatment times that would be feasible for treatment of commercial seed before water seeding. Potential uses for this method would be to treat Foundation seed of newly released varieties to remove seedborne *B. glumae* before the variety gets to the rice industry. Another use would be to treat Certified seed of varieties already in use in the industry to remove the pathogen from rice seeds produced in fields not showing BPB symptoms. The severe symptoms are only produced when temperatures are in the 90°Fs into the early night, but seeds can be infected and carry the pathogen. Our research indicates that up to 60% of the rice seed used in Louisiana carries the pathogen.

Data from tests conducted in 2007 and 2008 indicate that seedborne *B. glumae* on rice seeds can be controlled by treatment with antibacterial compounds in solution in pre-sprout water. If developed for commercial use, this would give growers a chemical treatment for BPB and seed growers a method for producing Certified seed free of *B. glumae*. Also, we have been working to develop a better selective medium for isolation and identification of *B. glumae* on infected seeds and other rice tissues.

# RICE PRODUCTION ECONOMICS RESEARCH

M.E. Salassi

Rice enterprise production cost budget projections for 2009 were developed in the fall of 2008 for alternative rice production systems in Louisiana. A summary of the enterprise budgeting analysis for rice production systems in Southwest Louisiana is presented in Tables 1 and 2. Values presented represent rice breakeven prices to cover direct (variable) and total estimated rice production costs per hundredweight and per barrel of rice produced for selected yield levels. Direct production costs include expenses for seed, fertilizer, chemicals, fuel, labor, repairs, custom charges, and interest on operating capital. Total specified expenses include direct expenses plus fixed costs on machinery and equipment. These values can also be interpreted as the breakeven price or income per output unit required to cover total production costs. Tenant-operator situations shown in the tables were budgeted for each enterprise with a 70/30 share rent arrangement with the landlord/waterlord paying the irrigation pumping costs.

Rice production costs were estimated for the following types of rice production systems: water-planted, drill-planted, conventional variety, Clearfield variety, conventional tillage, stale seedbed, in rotation, and fallow land. Base yield level for Southwest Louisiana was 58.0 cwt/A for water-planted and drill-planted rice. Variable production costs ranged from $11.03 to $11.90/cwt ($17.87 to $19.28/barrel) for water-planted rice and from $9.98 to $11.09/cwt ($16.17 to $17.97/barrel) for drill-planted rice at the base yield level of 58.0 cwt (35.8 barrels)/A. Cost differences were influenced by use of conventional or herbicide-resistant variety, conventional versus stale seedbed tillage system, and rice production in rotation or on fallow land. Total projected rice production costs for 2008 ranged from $12.18 to $13.75/cwt ($19.73 to $22.28/barrel) for water-planted rice and from $11.34 to $12.36/cwt ($18.37 to $20.03/barrel) for drill-planted rice at the base yield level of 58.0 cwt (35.8 barrels)/A. Detailed enterprise budgets and supporting data were published in A.E.A. Information Series Number 259, January 2009 (Dept. of Agricultural Economics and Agribusiness, Louisiana Agricultural Experiment Station, L.S.U. Agricultural Center).

The Projected 2009 Rice Farm Cash Flow Model was developed to assist producers in planning for the 2009 crop year. The model is an Excel spreadsheet that allows rice producers to enter projected acreage, yield, market price and production cost data for 2009 to estimate net returns above variable production costs and to easily evaluate the impact of changing percent of base planted on net returns. The primary purpose of the model is to evaluate the impact on net returns above variable production costs for alternative rice rental arrangements and percent of base acreage planted. The model also includes entry cells for whole farm fixed expenses to estimate projected returns from rice production over all costs. The model is available on the LSU AgCenter web page (*Projected 2009 Rice Farm Cash Flow Model*, Dept. of Agricultural Economics and Agribusiness, Louisiana Agricultural Experiment Station, L.S.U. Agricultural Center, Staff Report No. 2009-02, January 2009).

An economic evaluation of rice irrigation pumping costs was conducted to evaluate the cost differences in diesel and electric powered rice irrigation systems. Irrigation expenses are a major component of rice production costs in Louisiana. The recent rise in oil prices, causing the price of diesel fuel to rise dramatically, has renewed interest in the conversion of rice irrigation pumping systems from diesel power to electric power. The economic study conducted identified factors to consider when converting rice irrigation systems to electric power and also includes comparable pumping cost estimates for the two power sources for both deep well and surface irrigation systems. The most important factors to consider in evaluating the decision to convert to electric power, from an economic perspective, are the additional expenses necessary to purchase required irrigation equipment and the potential fuel cost savings from the use of electric power units. It is also important to have an accurate estimate of current diesel pumping costs with the existing system in order to make reliable estimates of possible cost savings from conversion to electric power. Tables 3 through 6 present comparable irrigation pumping cost estimates for surface and deep well rice irrigation systems powered by diesel and electric power units. Fuel consumption rates are based on full load estimates. Pumping cost estimates, on both a per acre-foot and per acre-inch basis, are presented for a range of diesel and electric fuel prices. Power unit sizes for each type of rice irrigation system, 75 hp for the surface system and 150 hp for the deep well system, are the same for both power sources in this example for comparison purposes.

**Table 1. Estimated Rice Breakeven Prices to Cover Variable Production Costs, Southwest Louisiana, 2009.**

| Crop Description | -10% | -5% | Base | +5% | +10% |
|---|---|---|---|---|---|
| | Yield Level (cwt/A) | | | | |
| | 52.2 | 55.1 | 58.0 | 60.9 | 63.8 |
| | Dollars/cwt | | | | |
| Southwest Louisiana: | | | | | |
| (1) Water-Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 12.24 | 11.66 | 11.14 | 10.67 | 10.24 |
| - Fallow Land | 12.54 | 11.94 | 11.41 | 10.93 | 10.49 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 12.12 | 11.55 | 11.03 | 10.57 | 10.14 |
| - Fallow Land | 12.43 | 11.84 | 11.31 | 10.83 | 10.40 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 12.79 | 12.18 | 11.63 | 11.14 | 10.69 |
| - Fallow Land | 13.09 | 12.46 | 11.90 | 11.40 | 10.94 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 12.67 | 12.07 | 11.53 | 11.04 | 10.59 |
| - Fallow Land | 12.97 | 12.36 | 11.80 | 11.30 | 10.84 |
| (2) Drill-Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 10.95 | 10.44 | 9.98 | 9.57 | 9.19 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 11.27 | 10.74 | 10.27 | 9.84 | 9.45 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 11.73 | 11.18 | 10.68 | 10.24 | 9.83 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 12.19 | 11.61 | 11.09 | 10.63 | 10.20 |
| | Yield Level (Barrels/A) | | | | |
| | -10% | -5% | Base | +5% | +10% |
| | 32.2 | 34.0 | 35.8 | 37.6 | 39.4 |
| | Dollars/Barrel | | | | |
| Southwest Louisiana: | | | | | |
| (1) Water-Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 19.83 | 18.89 | 18.05 | 17.28 | 16.59 |
| - Fallow Land | 20.31 | 19.35 | 18.48 | 17.70 | 16.99 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 19.63 | 18.71 | 17.87 | 17.12 | 16.43 |
| - Fallow Land | 20.13 | 19.18 | 18.32 | 17.54 | 16.84 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 20.71 | 19.73 | 18.85 | 18.05 | 17.32 |
| - Fallow Land | 21.20 | 20.19 | 19.28 | 18.46 | 17.72 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 20.52 | 19.55 | 18.67 | 17.88 | 17.16 |
| - Fallow Land | 21.02 | 20.02 | 19.12 | 18.31 | 17.57 |
| (2) Drill-Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 17.74 | 16.92 | 16.17 | 15.50 | 14.89 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 18.26 | 17.40 | 16.64 | 15.94 | 15.31 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 19.00 | 18.11 | 17.31 | 16.58 | 15.92 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 19.74 | 18.81 | 17.97 | 17.21 | 16.53 |

**Table 2. Estimated Rice Breakeven Prices to Cover Total Specified Production Costs, Southwest Louisiana, 2009.**

| | Yield Level (cwt/A) | | | | |
|---|---|---|---|---|---|
| | -10% | -5% | Base | +5% | +10% |
| Crop Description | 52.2 | 55.1 | 58.0 | 60.9 | 63.8 |
| | Dollars/cwt | | | | |
| Southwest Louisiana: | | | | | |
| (1) Water Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 13.94 | 13.27 | 12.67 | 12.13 | 11.63 |
| - Fallow Land | 14.59 | 13.89 | 13.26 | 12.69 | 12.17 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 13.39 | 12.75 | 12.18 | 11.66 | 11.19 |
| - Fallow Land | 14.05 | 13.38 | 12.77 | 12.22 | 11.72 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 14.49 | 13.79 | 13.17 | 12.60 | 12.08 |
| - Fallow Land | 15.14 | 14.41 | 13.75 | 13.16 | 12.62 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 13.94 | 13.27 | 12.67 | 12.13 | 11.64 |
| - Fallow Land | 14.60 | 13.90 | 13.26 | 12.69 | 12.17 |
| (2) Drill Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 12.46 | 11.87 | 11.34 | 10.86 | 10.42 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 12.72 | 12.12 | 11.58 | 11.09 | 10.64 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 13.06 | 12.44 | 11.88 | 11.37 | 10.91 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 13.60 | 12.95 | 12.36 | 11.83 | 11.35 |

| | Yield Level (Barrels/A) | | | | |
|---|---|---|---|---|---|
| | -10% | -5% | Base | +5% | +10% |
| | 32.2 | 34.0 | 35.8 | 37.6 | 39.4 |
| | Dollars/Barrel | | | | |
| Southwest Louisiana: | | | | | |
| (1) Water Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 22.58 | 21.50 | 20.53 | 19.65 | 18.85 |
| - Fallow Land | 23.64 | 22.50 | 21.48 | 20.55 | 19.71 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 21.70 | 20.66 | 19.73 | 18.89 | 18.12 |
| - Fallow Land | 22.76 | 21.67 | 20.69 | 19.80 | 18.99 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 23.47 | 22.35 | 21.33 | 20.41 | 19.58 |
| - Fallow Land | 24.53 | 23.34 | 22.28 | 21.31 | 20.44 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 22.58 | 21.50 | 20.53 | 19.65 | 18.85 |
| - Fallow Land | 23.65 | 22.51 | 21.49 | 20.56 | 19.72 |
| (2) Drill Planted – Tenant Operator: | | | | | |
| (a) Conventional Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 20.19 | 19.23 | 18.37 | 17.60 | 16.89 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 20.61 | 19.63 | 18.75 | 17.96 | 17.23 |
| (b) Clearfield Variety: | | | | | |
| (i) Conventional Tillage: | | | | | |
| - In Rotation | 21.16 | 20.15 | 19.25 | 18.43 | 17.68 |
| (ii) Stale Seedbed: | | | | | |
| - In Rotation | 22.03 | 20.98 | 20.03 | 19.17 | 18.39 |

| Table 3. Diesel fuel pumping cost estimates - surface irrigation system, 2500 gpm pumping rate, 75 hp diesel power unit. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fuel Price/gal | Fuel Use gal/hp-hr | Power Unit Size - hp | Fuel Use gal/hr | Pumping Time hr/ac-ft | gal/ac-ft | Fuel Cost/ac-ft | Fuel Cost/ac-in |
| $2.50 | 0.0678 | 75 | 5.09 | 2.17 | 11.05 | $27.62 | $2.30 |
| $2.75 | 0.0678 | 75 | 5.09 | 2.17 | 11.05 | $30.38 | $2.53 |
| $3.00 | 0.0678 | 75 | 5.09 | 2.17 | 11.05 | $33.14 | $2.76 |
| $3.25 | 0.0678 | 75 | 5.09 | 2.17 | 11.05 | $35.90 | $2.99 |
| $3.50 | 0.0678 | 75 | 5.09 | 2.17 | 11.05 | $38.66 | $3.22 |

| Table 4. Electric fuel pumping cost estimates – surface irrigation system, 2500 gpm pumping rate, 75 hp electric power unit. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fuel Price/kWh | Fuel Use kWh/hp-hr | Power Unit Size - hp | Fuel Use kWh/hr | Pumping Time hr/ac-ft | Fuel Use gal/ac-ft | Fuel Cost/ac-ft | Fuel Cost/ac-in |
| $0.06 | 0.847 | 75 | 63.53 | 2.17 | 138.00 | $8.28 | $0.69 |
| $0.08 | 0.847 | 75 | 63.53 | 2.17 | 138.00 | $11.04 | $0.92 |
| $0.10 | 0.847 | 75 | 63.53 | 2.17 | 138.00 | $13.80 | $1.15 |
| $0.12 | 0.847 | 75 | 63.53 | 2.17 | 138.00 | $16.56 | $1.38 |
| $0.14 | 0.847 | 75 | 63.53 | 2.17 | 138.00 | $19.32 | $1.61 |

| Table 5. Diesel fuel pumping cost estimates- deep well irrigation system, 3500 gpm pumping rate, 150 hp diesel power unit. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fuel Price/gal | Fuel Use gal/hp-hr | Power Unit Size - hp | Fuel Use gal/hr | Pumping Time hr/ac-ft | Fuel Use gal/ac-ft | Fuel Cost/ac-ft | Fuel Cost/ ac-in |
| $2.50 | 0.0678 | 150 | 10.17 | 1.55 | 15.78 | $39.45 | $3.29 |
| $2.75 | 0.0678 | 150 | 10.17 | 1.55 | 15.78 | $43.40 | $3.62 |
| $3.00 | 0.0678 | 150 | 10.17 | 1.55 | 15.78 | $47.34 | $3.95 |
| $3.25 | 0.0678 | 150 | 10.17 | 1.55 | 15.78 | $51.29 | $4.27 |
| $3.50 | 0.0678 | 150 | 10.17 | 1.55 | 15.78 | $55.23 | $4.60 |

| Table 6. Electric fuel pumping cost estimates - deep well irrigation system, 3500 gpm pumping rate, 150 electric power unit. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fuel Price/kWh | Fuel Use kWh/hp-hr | Power Unit Size - hp | Fuel Use kWh/hr | Pumping Time hr/ac-ft | Fuel Use gal/ac-ft | Fuel Cost/ac-ft | Fuel Cost/ac-in |
| $0.06 | 0.847 | 150 | 127.05 | 1.55 | 197.14 | $11.83 | $0.99 |
| $0.08 | 0.847 | 150 | 127.05 | 1.55 | 197.14 | $15.77 | $1.31 |
| $0.10 | 0.847 | 150 | 127.05 | 1.55 | 197.14 | $19.71 | $1.64 |
| $0.12 | 0.847 | 150 | 127.05 | 1.55 | 197.14 | $23.66 | $1.97 |
| $0.14 | 0.847 | 150 | 127.05 | 1.55 | 197.14 | $27.60 | $2.30 |

# RICE INSECTS RESEARCH

## RICE INSECT CONTROL STUDIES, 2008

M.J. Stout, M.J. Frey, M.R. Riggio, and N. Hummel

### INTRODUCTION

The goal of the Rice Insects (Entomology) Project is the development and implementation of cost-effective management programs for arthropod pests of Louisiana rice. Insects and other arthropods can cause severe yield losses in rice; feeding by the rice water weevil, for example, can reduce yields by 25% or more. The use of insecticides remains the primary means of controlling arthropod pests, but alternatives to insecticides are needed to reduce costs, improve sustainability, and minimize environmental impacts. In 2008, approximately 20 separate experiments were conducted at the Rice Research Station to evaluate insecticides, cultural practices, and host-plant resistance as management tools for rice insect pests. In addition, a number of experiments related to rice insect pest management were conducted in laboratories and greenhouses on the LSU campus in Baton Rouge, and commercial fields were sampled to assess the efficacy of newly registered insecticides. Most of these experiments involved the major early-season insect pest of rice, the rice water weevil, or the major late-season pest of rice, the rice stink bug. However, a number of experiments were also conducted with stem-boring insects. Research on stem borers was initiated several years ago in anticipation of the entry of a new stem-boring species into Louisiana (the Mexican rice borer, which was found in Louisiana for the first time in December of 2008) and the potential for the increased importance of stem borers as pests of rice in the future.

The Entomology Project continued a very active program of evaluating insecticides for efficacy against the rice water weevil in order to identify alternatives to the currently registered pyrethroid insecticides. Efforts over the last several years have focused on five insecticides that are being seriously considered for full (Section 3) registrations for use in rice. Three of these insecticides have been tested as seed treatments, and two others are formulated as granules. One of the granular insecticides, Trebon 3G (Mitsui Chemicals, Inc.), now has a full (Section 3) registration, while one of the seed treatments (Dermacor™ X-100) will be available in 2009 under a Section 18 exemption. All of the pyrethroid alternatives appear to be effective in reducing rice water weevil infestations, although optimal rates and use patterns are still being determined. Results from small-plot evaluations of two of these alternative insecticides are presented in the following reports.

All insecticides that are being considered for registration are being evaluated with respect to their compatibility with crawfish production also. Results of experiments using caged crawfish in field plots and of acute laboratory toxicity tests suggest that all of the alternatives being considered for registration against the rice water weevil are less toxic to crawfish than are pyrethroids.

Several new insecticides are also being tested for efficacy against the rice stink bug. In particular, several neonicotinoid insecticides (a relatively new class of insecticide) have shown promise as alternatives to currently registered pyrethoids and organophosphates. Also, work has begun to re-evaluate treatment thresholds for stink bugs (i.e., to determine population levels that warrant insecticide applications against stink bugs).

The impacts of planting date and seeding rate on rice water weevil management have also been investigated over the past several years. Rice planted at low seeding rates is more vulnerable to infestations by, and yield losses from, rice water weevils, and infestations of weevils in early-planted rice often are less severe than infestations in rice planted in April or May.

A long-term goal of the Entomology Project is to cooperate with breeders to develop rice varieties that are more resistant to or tolerant of rice water weevil and stem borer injury. Several experiments were conducted in 2008 to identify rice lines or varieties with resistance to these two pests.

## EVALUATION OF DERMACOR™ X-100 SEED TREATMENT AGAINST THE RICE WATER WEEVIL IN DRILL- AND WATER-SEEDED RICE, 2008

M.J. Stout, M.J. Frey, and N. Hummel

Dermacor™ X-100 (active ingredient: Rynaxypyr™ [chlorantraniliprole]; DuPont) is a new insecticidal seed treatment that belongs to a novel class of insecticides, the anthranilic diamides. This insecticide has been tested over the past several years and has provided good to excellent control of the rice water weevil in all tests. It will be available under a Section 18 exemption in 2009 (as it was in 2008). In 2008, experiments were conducted to address questions surrounding the performance of Dermacor™ X-100 seed treatment at low seeding rates on hybrid rice and to investigate whether Dermacor™ X-100 would be effective in a water-seeded cultural system.

### DRILL-SEEDED TRIAL

**Location**: Rice Research Station, Crowley, LA

**Variety/Seeding Rate**: Cocodrie, 100 lb/A and XL 723 (hybrid), 40 lb/A (all seed treated and supplied by Dupont)

**Plot Size**: 4.1 x 18 ft (7 rows at 7-in spacing)

**Planting Method/Date**: Drill-seeded, 25 April 2008

**Agronomic Practices**: Standard for drill-seeded rice

**Water Management**: Permanent flood, 20 May 2008 (4-leaf stage)

**Experimental Design**: Randomized complete block, nine treatments, four replicates

**Treatments (seeds treated by Dupont)**:

1. Cocodrie, 100 lb/A seeding rate, 0.025 mg ai/seed
2. Cocodrie, 100 lb/A seeding rate, 0.05 mg ai/seed
3. Cocodrie, 100 lb/A seeding rate, 0.1 mg ai/seed
4. Hybrid, 40 lb/A seeding rate, 0.025 mg ai/seed
5. Hybrid, 40 lb/A seeding rate, 0.05 mg ai/seed
6. Hybrid, 40 lb/A seeding rate, 0.1 mg ai/seed
7. Cocodrie, 100 lb/A seeding rate, HGW86, 0.1 mg ai/seed
8. Cocodrie, UTC
9. Hybrid, UTC

*mg ai/seed = milligrams of active ingredient per seed

**Sampling**: Two to four root/soil core samples per plot

**Sampling Dates**: June 11 (22 dpf [days postflood]), June 18 (29 dpf), June 27 (38 dpf)

**Harvested**: 8 August 2008 (interior five rows only harvested)

**Data Analysis**: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the two (June 18) or four (June 11 and 27) core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields were converted to lb/A (adjusted to 12% moisture) and analyzed by mixed-model ANOVA.

**Results**:

Results of a small-plot evaluation of Dermacor™ X-100 conducted at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2008.

| Treatment | Larvae per core sample (± S.E.) on: | | | Total larvae | Yield (lb/A, adjusted to 12% moisture) |
|---|---|---|---|---|---|
| | 6/11 | 6/18 | 6/27 | | |
| Coco-UTC | 11.1±1.4 a | 12.0±2.1 ab | 19.0±4.4 a | 42.1±7.4 | 7560±198 b |
| Coco-0.025 | 0.5±0.2 b | 1.0±0.3 c | 3.5±0.2 c | 5.0±0.4 | 8077±366 ab |
| Coco-0.05 | 0.3±0.1 b | 0.8±0.4 c | 0.6±0.4 c | 1.7±0.6 | 7872±192 ab |
| Coco-0.1 | 0.6±0.3 b | 0.0±0.0 c | 2.8±1.0 c | 3.3±1.0 | 7953±162 ab |
| Coco-HGW | 0.6±0.3 b | 1.5±0.9 c | 5.6±1.2 bc | 7.7±1.3 | 8194±608 ab |
| | | | | | |
| Hyb-UTC | 13.4±1.1 a | 14.3±2.0 a | 14.3±3.1 ab | 41.9±3.8 | 9235±419 ab |
| Hyb-0.025 | 1.9±0.3 b | 4.3±0.3 b | 6.5±1.4 bc | 12.6±1.5 | 8501±458 ab |
| Hyb-0.05 | 1.5±0.3 b | 5.5±1.8 b | 6.0±1.4 bc | 13.0±3.2 | 9381±219 a |
| Hyb-0.1 | 2.0±1.1 b | 2.9±2.1 b | 5.8±1.1 c | 10.6±2.9 | 9128±594 ab |

Means in the same column followed by the same lower-case letter do not differ significantly (means for "Total larvae" were not separated).

**Comments:** Weevil infestations in this experiment were moderate. Dermacor™ X-100 provided excellent control of rice water weevil at all rates in Cocodrie plots, but control was not as good in plots of XL 723 (which was seeded at a lower rate). In particular, reduction in larval densities in XL 723 plots treated at the lowest rate of Dermacor™ X-100 was only 55% on June 27 (63 d after planting). The HGW compound did not perform as well as Dermacor™ X-100. Yield benefits resulting from insecticide treatment were greater in Cocodrie plots than in XL 723 plots.

### WATER-SEEDED TRIAL

**Location**: Rice Research Station, Crowley, LA

**Variety/Seeding Rate**: Cocodrie, 140 lb seed/A (see below)

**Plot Size**: 5 x 15 ft, approximately 10 ft minimum between plots, no barriers between plots

**Planting Method/Date**: Water-seeded on 20 May 2008 at rate of 140 lb/A by casting dry seed into flooded plots.

**Agronomic Practices**: Standard for water-seeded rice

**Water Management**: Planting flood drained on 23 May; permanent flood applied on 28 May (1- to 2-leaf)

**Experimental Design**: Randomized complete block, five treatments, four replicates

**Treatments:** (seeds treated with Dermacor at specified rates by DuPont):

1. UTC
2. Dermacor low rate, 0.025 mg ai/seed
3. Dermacor mid rate, 0.05 mg ai/seed
4. Dermacor low rate, 0.10 mg ai/seed
5. HGW86, 0.1 mg ai/seed

**Sampling**: Four root/soil core samples per plot

**Sampling Dates**: 23 June 2008 (26 dpf [days postflood]), 7 July (40 dpf), and 14 July (47 dpf)

**Harvested**: 29 August 2008 (interior five rows only harvested)

**Data Analysis**: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the four core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as a fixed effect and block as a random effect (Tukey mean separation). Plot yields were adjusted to 12% moisture but were not converted to pounds per acre; yields are expressed as grams of seed per plot.

**Results**:

Results of a small-plot evaluation of Dermacor™ X-100 conducted in water-seeded rice at the LSU AgCenter Rice Research Station, Acadia Parish, Louisiana, in 2008

| **Treatment** | **Larvae per core sample (± S.E.) on:** | | | **Total larvae** | **Yield (lb/A, adjusted to 12% moisture)** |
|---|---|---|---|---|---|
| | 6/23 | 7/7 | 7/14 | | |
| UTC | 16.6±0.9 | 22.1±2.5 | 7.6±2.2 | 46.3±2.2 | 2188±230 |
| 0.025 | 1.4±0.7 | 2.6±1.1 | 3.0±1.4 | 7.0±2.6 | 3611±383 |
| 0.05 | 0.3±0.3 | 1.0±0.2 | 1.4±1.1 | 2.7±1.1 | 3956±415 |
| 0.1 | 0.2±0.1 | 0.9±0.3 | 0.5±0.2 | 1.6±0.2 | 4159±418 |
| HGW | 4.1±0.9 | 5.3±1.0 | 4.1±1.3 | 13.4±0.4 | 3052±138 |

**Comments**: The efficacy of Dermacor™ X-100 was excellent in this water-seeded test. Effects of treatment on larval densities were significant at all three core sampling dates, and the treatment effect on yields was also significant. The "HGW" compound appeared to perform slightly worse than Dermacor™ X-100. The practice of broadcasting dry seed into a flood, although not typical, is sometimes used in south Louisiana. DuPont has not yet decided to pursue a registration for Dermacor™ X-100 for water-seeded rice.

# EVALUATION OF CLOTHIANIDIN AS A SEED TREATMENT AGAINST THE RICE WATER WEEVIL, 2008

M.J. Stout, M.J. Frey, and N. Hummel

Clothianidin/V10170 (Valent U.S.A Corporation) is a neonicotinoid insecticide that has been evaluated as a seed treatment against the rice water weevil over the past several years at the LSU AgCenter Rice Research Station. In 2008, a drill-seeded test was conducted to determine the efficacy of a range of clothianidin rates against the rice water weevil.

**Location**: Rice Research Station, Crowley, LA

**Variety/Seeding Rate**: Cocodrie, ~ 90 lb/A (seed supplied and treated by Valent)

**Plot Size**: 4.1 x 19 ft (7 rows at 7-in spacing)

**Planting Method/Date**: Drill seeded, 17 April 2008

**Agronomic Practices**: Standard for drill-seeded rice

**Water Management**: Permanent flood, 15 May 2008 (4-leaf stage)

**Experimental Design**: Randomized complete block, eight treatments, four replicates

**Treatments (seeds treated by Valent)**:

1. Untreated control
2. Untreated control (originally designated to receive single post-flood application of Karate [pyrethroid], but application was not made)
3. V-10170 seed treatment @ 25 gm ai/100 kg seed
4. V-10170 seed treatment @ 50 gm ai/100 kg seed
5. V-10170 seed treatment @ 75 gm ai/100 kg seed
6. V-10170 seed treatment @ 100 gm ai/100 kg seed
7. V-10170 seed treatment @ 125 gm ai/100 kg seed
8. V-10170 seed treatment @ 150 gm ai/100 kg seed

**Sampling**: Three root/soil core samples per plot

**Sampling Dates**: 5 June 2008 (21 dpf [days postflood]); 13 June (29 dpf), for core samples

**Harvested**: 8 August 2008 (interior five rows only harvested)

**Data Analysis**: A mean number of larvae per core sample was calculated for each plot at each sampling date by averaging numbers of larvae from the three core samples at each sampling date. Treatment effects on mean numbers of larvae per core were analyzed by PROC MIXED in SAS with treatment as fixed effect and block as a random effect (Tukey mean separation). Plot yields were adjusted to 12% moisture and were converted to lb/A. Yields were analyzed by one-way ANOVA.

**Results**:

| Treatment | Larvae per core sample (± S.E.) | | Overall % control | Yield (lb/A, adjusted to 12% moisture) |
|---|---|---|---|---|
| | 6/5/08 (21 d post-flood) | 6/13/08 (29 d post-flood) | | |
| UTC | 21.3 ± 1.7 | 15.9 ± 2.6 | -- | 7731 ± 682 |
| UTC* | 19.6 ± 2.0 | 16.3 ± 2.2 | -- | 8121 ± 457 |
| 25 | 11.5 ± 3.5 | 9.4 ± 3.1 | 43% | 8102 ± 595 |
| 50 | 4.4 ± 1.7 | 4.2 ± 1.1 | 76% | 8117 ± 167 |
| 75 | 3.7 ± 0.7 | 2.1 ± 0.8 | 84% | 8454 ± 394 |
| 100 | 2.3 ± 0.8 | 5.8 ± 1.1 | 78% | 8069 ± 496 |
| 125 | 3.1 ± 1.5 | 4.3 ± 2.1 | 80% | 8776 ± 367 |
| 150 | 2.9 ± 1.0 | 2.3 ± 0.6 | 86% | 9225 ± 394 |

* Plots in this treatments were originally assigned to receive a post-flood treatment of Karate, but application was not made.

**Comments**: Statistically significant effects of treatment on larvae per core sample were found at 21 and 29 d post-flood, but yields did not differ significantly among treatments. Rates above 75 gm ai/100 kg seed gave adequate control of weevil larvae (80% + overall reductions in weevil densities). A preliminary experiment conducted later in the 2008 growing season indicated that pre- and post-flood foliar applications of a liquid formulation of clothianidin might also control weevils adequately. This possibility will be investigated further in 2009.

# DEMONSTRATION OF DERMACOR™ X-100 RICE SEED TREATMENT IN COMMERCIAL RICE FIELDS IN LOUISIANA, 2008

N. Hummel, T. McCown, M. Stout, M. Frey, G. Daniels, C. Eskew, S. Gauthier, D. Ring, and R. Levy

The rice water weevil (RWW) is the most important invertebrate pest of the rice production system in Louisiana. Until recently, RWW control has been limited to applications of pyrethroid or pyrethroid-like insecticides or reliance on cultural practices. The timing of these insecticide applications is critically tied to application of permanent flood. It is important to apply the insecticide immediately before or after application of permanent flood if adult weevils are present in the field. The goal of the insecticide use is to control adult weevils before they have the opportunity to oviposit. Adverse weather conditions and proximity to crawfish fields can often interfere with the application of pyrethroids to commercial fields. Cultural management practices for RWW control have included early planting of rice, draining fields, and delayed application of flood. These cultural management practices do not always prevent or adequately control RWW infestations.

In 2008, DuPont Crop Protection obtained a Section 18 registration in Louisiana for Dermacor™ X-100 seed treatment for use in dry-seeded rice. This seed treatment acts as a slightly systemic compound that is taken up into the plant. Weevil larvae are controlled when they begin feeding on the roots. Following the Section 18 registration, we coordinated a replicated demonstration trial in seven parishes in Louisiana. The purpose of this trial was to evaluate the ability of Dermacor™ X-100 to control weevils in commercial production fields and also to educate growers on how this product can be incorporated into the current rice water weevil IPM program.

**Locations**: Commercial farms in the following parishes: Acadia, Avoyelles, Concordia, Jeff-Davis, St. Landry, Tensas, and Vermilion.

**Variety/Seeding Rate**: Varied depending on location (all seed treated and supplied by DuPont)

**Plot Size**: Commercial fields, acreage varied across locations

**Planting Method**: Drill-seeded

**Agronomic Practices**: Standard for drill-seeded rice

**Water Management**: Permanent flood at the discretion of the farmer

**Experimental Design**: One replicate per farm. All treatments were present at all locations (with the exception of St. Landry, which did not have an untreated control.

**Treatments (seeds treated by Dupont)**:
1. Untreated Control (Check)
2. Dermacor™ X-100 (0.025 mg ai/seed)
3. Karate Z (2 oz/A)

**Sampling**: Five to 14 root/soil core samples per field

**Sampling Dates**: Three to 4 weeks after flood, varied by location based on date of permanent flood

**Harvested**: Varied depending on location

**Data Analysis**: Fisher's exact test was used to determine the probability that Dermacor™ X-100-treated fields had less RWW larvae per core than the untreated check.

**Results**: Results of a commercial demonstration evaluation of Dermacor™ X-100 conducted at Various on-farm locations throughout Louisiana in 2008.

| **Variety** | **Parish** | **Treatment** | **Average # RWW Larvae/Core** | **Std. Dev.** | **Number of Core Samples** |
|---|---|---|---|---|---|
| CL161 | Acadia | Dermacor | 1.09 | 1.58 | 11 |
| CL161 | Acadia | Check | 12.80 | 8.00 | 10 |
| CL161 | Avoyelles | Dermacor | 1.00 | 1.44 | 5 |
| CL161 | Avoyelles | Check | 12.80 | 7.33 | 5 |
| Cocodrie | Concordia | Dermacor | 2.33 | 0.64 | 6 |
| Cocodrie | Concordia | Karate | 4.33 | 3.44 | 6 |
| Cocodrie | Concordia | Check | 2.67 | 1.04 | 6 |
| CL151, 161, 171 | St. Landry | Dermacor | 0.57 | 0.89 | 14 |
| CL151, 161, 171 | St. Landry | Karate | 11.46* | 7.22 | 13 |
| CLXP 745 | Jeff Davis | Dermacor | 3.10 | 2.33 | 10 |
| CLXP 729 | Jeff Davis | Check | 17.78 | 9.87 | 9 |
| Cocodrie | Tensas | Dermacor | 0.70 | 1.06 | 10 |
| Cocodrie | Tensas | Check | 10.00 | 7.41 | 10 |
| Cocodrie | Vermilion #1 | Dermacor | 3.60 | 3.69 | 10 |
| Cocodrie | Vermilion #1 | Check | 6.00 | 3.97 | 10 |
| CL161 | Vermilion #2 | Dermacor | 2.40 | 2.30 | 5 |
| CL161 | Vermilion #2 | Karate | 2.40 | 2.40 | 5 |
| CL161 | Vermilion #2 | Check | 21.80 | 9.60 | 5 |
| | | | | total | 256 |

| | | | |
|---|---|---|---|
| **Commercial** | Average # RWW larvae/core | Dermacor | 1.85 |
| **Demo** | Average # RWW larvae/core | Karate | 3.37 |
| **Summary** | Average # RWW larvae/core | Check | 11.98 |

*The insecticide application was delayed due to bad weather conditions, thus this value was not included in the calculation of the average.

Fisher's exact test found a *p*-value of $< 0.05$ causing us to conclude that the Dermacor™ X-100 treatment resulted in significantly less RWW larvae per core than in the untreated check fields. This test will be repeated next field season.

**Comments:** The results of this project were satisfactory, with no cases of product failure observed. In some locations, Dermacor™ X-100 was compared with an untreated check, while in other locales, it was compared with a pyrethroid-treated field. Number of RWW larvae per core 3 weeks after permanent flood and yield data were gathered at as many sites as possible. The decrease in RWW larval infestation in Dermacor™-treated fields varied across sites from no difference to a 12-fold reduction in larval infestation. The average number of RWW larvae per core was substantially lower (mean: 1.85 RWW larvae/core) in Dermacor™-treated fields than in untreated fields (mean: 11.98 RWW larvae/core). Furthermore, the average number of RWW larvae per core was lower in Dermacor™-treated fields (mean: 1.85 RWW larvae/core) than in pyrethroid-treated fields (mean: 3.37 RWW larvae/core). Overall, an average 85% reduction in the number of RWW larvae per core was observed when all Dermacor™-treated sites were compared with an untreated check. Results of this study were presented at summer field meetings and winter rice schools to producers, county agents, and other rice industry representatives.

# COASTAL EROSION CONTROL RESEARCH

## GROWTH, SEED MATURITY, SHATTERING SEED CHARACTERISTICS, AND GERMINATION RATES OF FERTILE SMOOTH CORDGRASS SYNTHETIC POPULATION

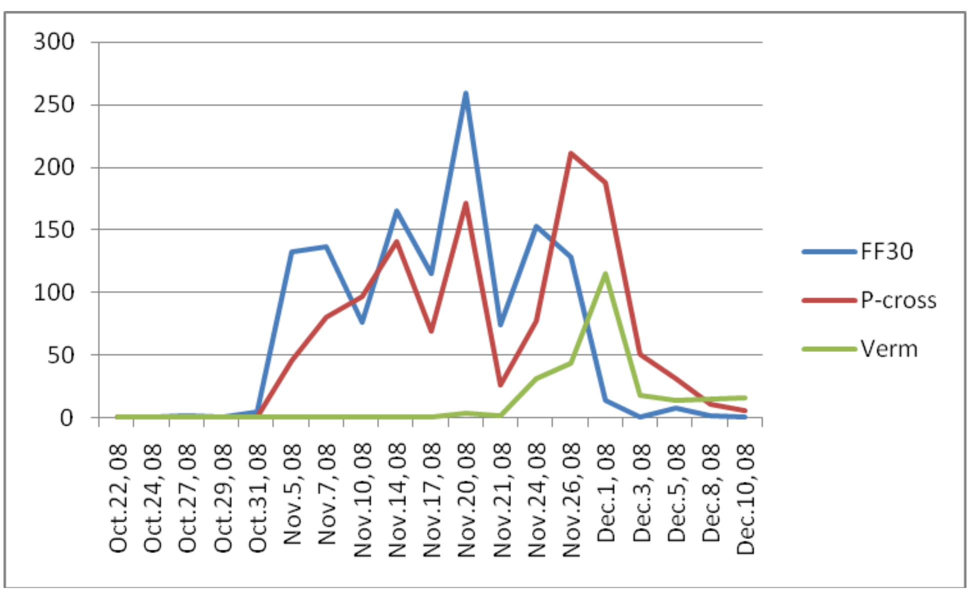
H.S. Utomo, I. Wenefrida, M.D. Materne, and S.A. Harrison

A production of *S. alterniflora* seed under a managed environment will provide a steady supply of *S. alterniflora* seed needed to carry out large scale plantings for not only restoring the degraded coastal marshes but also maintaining the productivity of the entire coastal saltmarsh ecosystems. Seed harvested can be used in aerial seeding applications or grown to produce a large number of plugs, 4-inch potted plants, or a gallon trade container plants. A synthetic population of smooth cordgrass has been developed for use in restoration efforts in Louisiana. The synthetic population consists of 13 genetically diverse, superior, and high seed producing lines. These lines were designated as VRES-1, VRES-2, VRES-3, VRES-4, VRES-5, VRES-6, VRES-7, VRES-8, VRES-9, VRES-10, VRES-11, VRES-12, and VRES-13. Each of these lines was allowed to intermate randomly to produce synthetic seed that will produce genetically diverse progenies. To create random mating of the synthetic population, each of these lines was space planted randomly. Important phenotypic characteristics, including growth, seed maturity and shattering, and germination rates of synthetic population, were studied.

### Seed Maturity and Shattering Characteristics

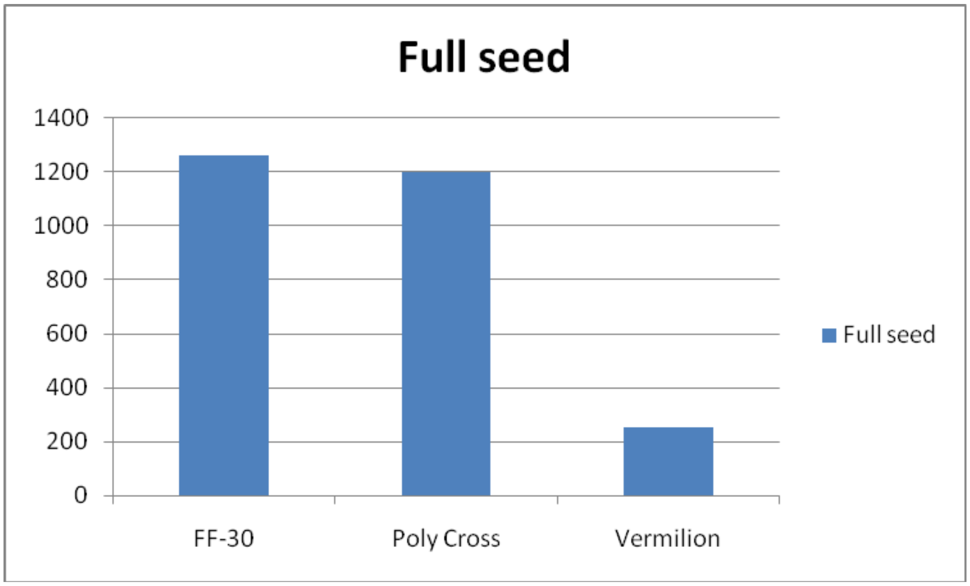
*Spartina alterniflora* seed does not mature at the same time. In the last growing season (2008), seed maturity and shattering characteristics of the polycross population were monitored during the ripening period from October 22 to December 10, 2008. Genotype FF30 and cultivar Vermilion were included as checks. It is assumed that once the *S. alterniflora* seed matures, the seed shatters. The *S. alterniflora* seed within the panicle did not reach its full maturity at the same time. Figure 1 shows that both seed from synthetic population and line FF30 started to mature on October 29, 2008. The full maturity process took place in about 4 weeks. Cultivar Vermilion had a shorter maturity duration and achieved the peak maturation period later than both FF30 and polycoss popluations.

Figure 1. Number of full seed collected from the Synthetic population (P-cross), line FF30, and cultivar Vermilion (Verm) from October 22 to December 10, 2008. Seed was collected using handheld 9.6V Wet/Dry Cordless Vacuum.



The amount of full seed that can be harvested from the three genotypes studied varied. The total number of full seed collected from 15 panicles varies, ranging from 1,226 seeds for FF30 to 224 seeds for Vermilion (Figure 2).

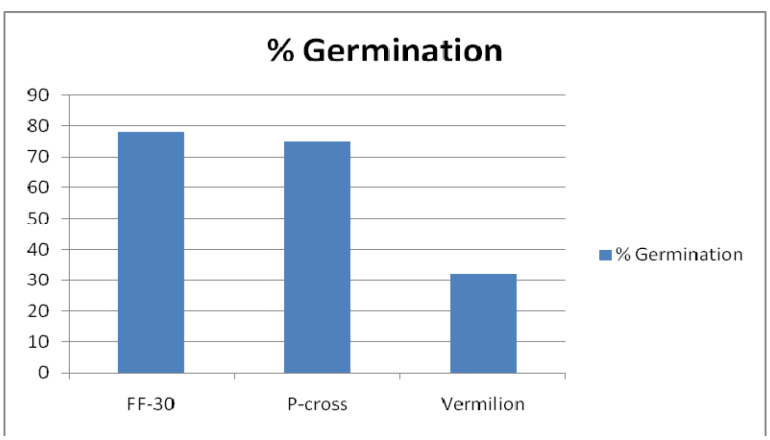
Figure 2: Number of full matured seed of three smooth cordgrass genotypes collected from five randomly selected panicles. Data are average of three replicates and seed was collected from Oct. 22, 2008, to Dec. 10, 2008, using handheld 9.6V Wet/Dry Cordless Vacuum.




**Percent Germination**

To evaluate the germination rates of each *S. alterniflora* genotype evaluated, seed was pre-treated to eliminate its dormancy. Seed was cold stratified at 2$^{o}$C in 100% humidity for 1 month. Following the pre-treatment, seed was stored in airtight sealed containers in a wet condition with a temperature set to 2±1$^{o}$C. Vitavax solution (5 mg/L) was applied to minimize fungus contamination during storage. The germination rate of FF30 was slightly better than the synthetic population (78 vs. 74%; Figure 3). Germination rate of cultivar Vermilion was the lowest (32%).

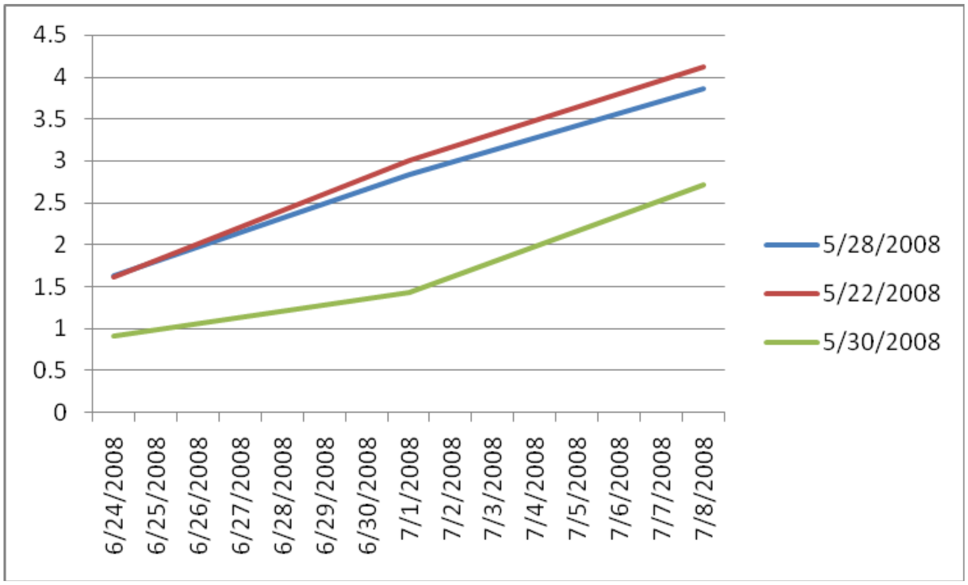
Figure 3. Germination rates of FF30 genotype, synthetic population (P-cross), and Vermilion from seed harvested in 2008



**Growth Rate of Syn-1 Plants**

Seedling establishment and initial growth rate are crucial in a successful coastal marsh revegetation. A preliminary study conducted at the Rice Research Station plots indicated that seedling establishment with plant height of about 1.5 cm was achieved in an approximately 4-week period (Figure 4). Following that period, the seedlings grew to 3 cm long in about 2 weeks. More comprehensive seedling establishment studies will be conducted in 2009 in coastal marshes involving much earlier planting dates.

Figure 4. The growth of Syn-1 seed planted in three different dates. Three planting dates (May 22, 28, and 30, 2008) were applied, and the growth was determined as plant height (cm) measured daily from June 24 to July 8, 2008. Data are based on an average measurement of 20 seedlings in three replicates.




**Potential Cultivation and Nursery Industry**

*Spartina alterniflora* could be an alternative agricultural crop in some areas. This plant has the ability to tolerate a wide range of salinities, from sea strength to freshwater. Populations of *S. alterniflora* have been cultivated and maintained under freshwater conditions at several research institutions for years and have performed consistently well. Since *S. alterniflora* can be cultivated in a broad range of salinity environments, large-scale commercial seed production is highly probable and could be an adjunct to aquatic crops, such as rice, with little modification to existing equipment or land. Due to increasing salt contamination of inland groundwater, many areas historically used for rice production have been abandoned, thus providing opportunity for *S. alterniflora* production as an alternative crop. In addition for use in aerial seeding applications, seed can be used to produce plugs or potted plants that are currently under high demand to support restoration projects/contracts. The availability of *S. alterniflora* seed for commercial use will help nursery industry to keep up with the demand.

**Other On-Going Studies**

a. Mechanical Harvest:

Three new seed production plots had been established at the Rice Research Station site for mechanical harvest studies using the Flail-Vac head harvester during the 2009 harvest. These lines were designated as VRES-1, VRES-2, VRES-3, VRES-4, VRES-5, VRES-6, VRES-7, VRES-8, VRES-9, VRES-10, VRES-11, VRES-12, and VRES-13. Each of these lines will be allowed to intermate randomly to produce synthetic seed that will produce genetically diverse progenies. To create random mating of synthetic population, each of these lines was space planted randomly (5x5 ft spacing). Plants are being grown in permanent flood with an occasional drain for weed control. RoundUp (glyposate) (1 qt/A) and Basagran (bentazon ) (1 qt/A) are used to spray around or adjacent to the smooth cordgrass plants to control weeds. To control rust, Benlate (benomyl) will be applied at the rate of 1 lb ai/A. Cultural practices (fertilizer application and water management) used to grow Spartina will be similar to the cultural practices used to grow rice.

b. Aerial Seeding Studies:

Simulated aerial seeding using stratified seed is being conducted in two locations, at the Rockefeller Wildlife Refuge Center and the Rice Research Station. Three seeding rates were applied (75, 50, and 25 seeds/ft$^2$). The 2008 seeding rate study failed due to high temperatures (June). This seeding rate study will be repeated in the early spring of 2009 (March – early April 2009). Survival rate and seedling establishment rate will be accessed weekly for 6 weeks. Other important growth parameters (plant density, spread, plant height, and biomass accumulation) will be evaluated monthly. Seed production aspects will be evaluated at harvest.

c. Multi-Location Trials of Syn-1 Generation:

Progeny from polycross of 13 smooth cordgrass parental lines was evaluated in replicated tests in two locations (at the Rice Research Station and Rockefeller Wildlife Refuge Center). A total of 900 syn-1 progeny lines are being evaluated in the multi-location field trials in a randomized block design. The 13 parental lines together with self Vermilion are used as a control. Important vegetative growth parameters and seed characteristic and production will be evaluated. Data collected will be used for seed-based releases.

d. Genetic Improvement Through Recurrent Selection of Syn-1 Population:

The objective of this study is to conduct recurrent selection to further improve synthetic population. A refined version of the mass selection procedure (i.e. recurrent selection) will be conducted to genetically improve the performance of synthetic population. Visual observation, as well as DNA marker diversity tests, will be used to select 15 to 30 promising lines from the base population (current synthetic population) that are undergoing progeny testing at the Rockefeller Wildlife Refuge site. The selected progeny line then will be increased vegetatively and randomly space planted to allow crosses with each other in every possible way to produce seed. The seed produced will be used to form the new base population. The cycle will be repeated every year until desirable progeny performance is achieved.

**SELECTION OF PROMISING CALIFORNIA BULRUSH LINES FOR USE IN HABITAT RESTORATION AND EROSION CONTROL**

H.S. Utomo, I. Wenefrida, S. Harrison, and M. Materne

California bulrush (*Schoenoplextus californicus*) is native to Louisiana. It is a perennial graminoid plant that is commonly found in marshes, swamps, seeps, lake, washes, floodplains, along lake and stream margins, and in wet meadows. It spreads primarily by vegetative propagation, producing new stems from an extensive system of underground rhizomes, and to a limited extent, through seed dispersal. It can grow in relatively deep water of 36 inches or more to produce extensive colonies. When established in conjunction with shorelines, California bulrush provides an effective buffer that dissipates wave energy, reduces shoreline scouring, and traps suspended sediments and other solids. Dense stands of California bulrush produce significant amounts of organic matter. The accumulative effects of organic matter production, sediment trapping, and erosion control provide shoreline protection and help accelerate sediment accumulation and near-shore building. California bulrush also supports wildlife, including some endangered species.

A series of tests has been conducted to identify superior California bulrush that will perform well throughout Louisiana wetland habitats and provide planting materials suitable for use in marsh restoration. Replicated field tests for 48 California bulrush ecotypes collected across Louisiana were conducted at the Rice Research Station. Nine best lines that have good spreadability, stem density, biomass accumulation, and seed production were selected and further tested in multi-location trials at the Great Lake site. An additional testing site at Sweet Lake, Cameron, LA, was added in mid 2008. In parallel to the field tests, greenhouse screening to determine the salt-tolerance level among these ecotypes was also carried out in the same years. After exposure in a salt concentration of 12 parts per thousand in continuous flooding for 6 months, eight survivors were recovered, increased in the greenhouse, and included in the replicated multi-location trials together with the original nine lines.

Among the promising lines, experimental line LA268 has the fastest spread. Under a freshwater environment, LA268 spreads vegetatively with an average rate of 7.5 $m^2$ annually (Table 1). As a comparison, cultivar *Restorer* that was released by USDA-NRCS Georgia Plant Materials Center, Americus, GA, has an average spread of 5.17 $m^2$ per year. With an average height of 182.8 cm (18 cm taller than *Restorer*), LA268 has dark green hard stems with an average diameter of 1.3 cm. An established LA268 colony of 2 years of age has an average stem density of 89 stems per $m^2$ around the center. Each productive stem produces a reddish brown stalk on the tip of the stems in the spring and fall. The stalk contains florets that bear hard-coated dark seeds. Mature seed has an average germination rate of 4%, shows dormancy, and if the seed is left in the ground, a portion of the seed remains viable for more than five years. The LA268 flower is composed of many spikelets that typically produce a total of 400 bracts. Twenty to 40 full seed are produced from one flower. Development of improved California bulrush lines will help in erosion control efforts, remediate metal toxicity and pollutant problems, and increase the effectiveness of wastewater treatments.

Table 1. Means of five California bulrush elite lines and cultivar Restorer for plant height, spread, stem diameter, stem count, germination rate, and vigor rating evaluated in three testing sites.

| | **Rice Research Station Site** | | | | | **Big Lake Site** | **Sweet Lake Site** | |
|---|---|---|---|---|---|---|---|---|
| Accession | Plant Height (cm) | Spread ($m^2$) | Stem Diameter (mm) | Stem Count | Germination Rate (%) | Stem Count | Vigor Rating[¶] | Stem Count (After Hurricane Gustav) |
| 68267 | 171.7 | 4.67 | 12.7 | 318.4 | 6.6 | 37.0 | 4.2 | 1.4 |
| 68268 | 186.5 | 7.53 | 13.1 | 297.8 | 4.6 | 81.6 | 3.8 | 0.2 |
| 68275 | 190.5 | 6.67 | 12.5 | 167.4 | 5.8 | 69.0 | 4.4 | 2.1 |
| 68309 | 176.8 | 6.67 | 12.7 | 241.1 | 4.0 | 76.8 | 4.2 | 0.2 |
| 68328 | 181.2 | 1.89 | 11.8 | 134.8 | 7.5 | 37.1 | 3.8 | 1.2 |
| Restorer | 164.7 | 5.17 | 12.4 | 171.3 | 3.0 | 43.3 | 4.0 | 0.3 |
| LSD (0.05) | 14.3 | 1.97 | 2.03 | 88.9 | 4.37 | 28.7 | 2.1 | 1.8 |
| CV | 7.14 | 43.82 | 13.56 | 61.2 | 76.9 | 79.9 | 40 | 55 |

[¶] Subjective rating (1= poor, 9=excellent).

# LOUISIANA RICE RESEARCH VERIFICATION PROGRAM - 2008[1]

J.K. Saichuk and K.J. Landry

## Introduction

The Louisiana Rice Research Verification Program (LRRVP) began in 1997 in three parishes: Allen, Calcasieu, and Jeff Davis. In 1998, the program was funded and expanded to 10 parishes: Acadia, Avoyelles, Calcasieu, East Carroll, Evangeline, Jeff Davis, Madison, Morehouse, St. Landry, and Vermilion. From 1999 to 2007, 88 fields had been included in the verification program. In 2008, the program included eight fields (Figure 1).

The fields were visited on at least a weekly basis by a Specialist, County Agent, or the Extension Associate. Production practice recommendations were made by the Specialist or Agent. These recommendations included, but were not limited to, fertilization, weed control, disease control, insect control, and water management to a limited degree. The fields were followed from planting to harvest.

Yield data were collected for each of the fields (Table 1). Yields of the first crop averaged 7730 lb/A (172 bu/A or 48 bbl/A) at 12% moisture. This is nearly identical to the first crop yield in 2007. Second crop was harvested in Calcasieu, Jeff Davis, and Vermilion parishes, adding another 1343 lb/A to the total for a final average of 8228 lb/A (183 bu/A or 51 bbl/A). This yield exceeded that of the parishes participating in the program by 2181 lb/A.

Economic data continue to reveal large production cost differences between growers. It is also clear that more needs to be done to help farmers reduce production costs (Table 2).

The program continues to provide an accurate evaluation of current recommendations and provide insight into other areas of research. The educational value of the program to all concerned (farmers, researchers, and extension personnel) increases each year.

[1] This project is supported in part by funding provided by rice producers through their check-off contributions to the Louisiana Rice Research Board.

**Figure 1. 2008 Louisiana Rice Research Verification Program Parishes**

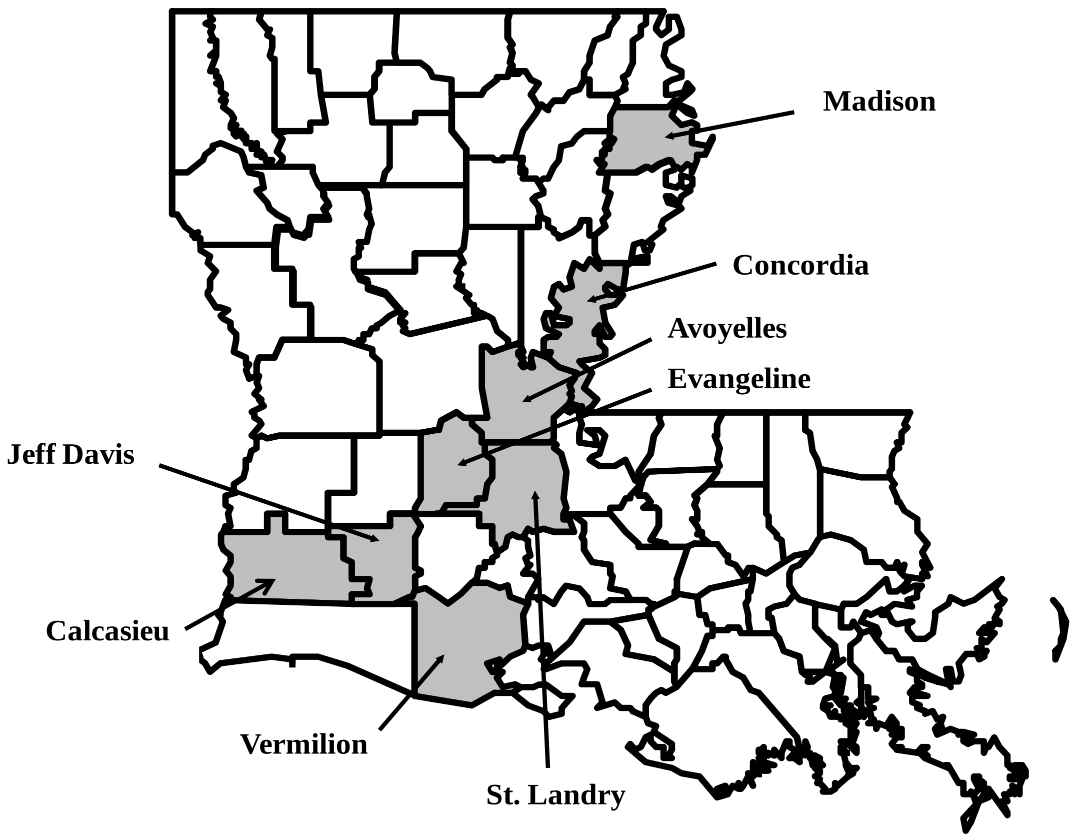


**Table 1. 2008 Louisiana Rice Research Verification Program Yield Summary.**

| Parish | Acres in Verification Program | Verification Yield/A @ 12% Moisture | | Verification Program | | | Average Parish Yield[1] | Parish Acreage | Total Parish Production |
|---|---|---|---|---|---|---|---|---|---|
| | | 1st Crop Alone | Second Crop | Total Yield/A | 1st Crop Production | Total Production | | | |
| **Avoyelles** | 40.9 | 7657 | 0 | 7657 | 313,171 | 313,171 | 6700 | 14,560 | 97,552,,000 |
| **Calcasieu** | 55.1 | 7124 | 1123 | 8247 | 392,532 | 454,410 | 5200 | 12,556 | 65,291,200 |
| **Concordia** | 54.7 | 7178 | 0 | 7178 | 392,637 | 392,637 | 6400 | 13,440 | 86,041,600 |
| **Evangeline** | 46.6 | 6840 | 0 | 6840 | 318,744 | 318,744 | 6820 | 44,326 | 302,303,320 |
| **Jeff Davis** | 37.7 | 7109 | 1372 | 8481 | 268,009 | 319,734 | 5630 | 79,385 | 40,322,060 |
| **Madison** | 41.5 | 8208 | 0 | 8208 | 340,632 | 340,632 | 6000 | 7,162 | 476,310,000 |
| **St. Landry** | 60.2 | 7801 | 0 | 7801 | 469,620 | 469,620 | 5200 | 26,116 | 135,803,200 |
| **Vermilion** | 51.1 | 9800 | 1559 | 11359 | 500,780 | 580,445 | 5900 | 61,296 | 361,646,400 |
| | | | | | | | | | |
| **TOTAL** | **387.6** | **7730** | **1343** | | | | | | |
| | | | | | | **Verif. Avg.** | **Parish Avg.** | | **Difference** |
| **Average yield (lb/A)** | | | | | | **8228** | **6047** | | **2181** |

**Table 2. 2008 Louisiana Rice Research Verification Program Yield, Milling, and Economic Summary.**

| Parish | Variety | Yield @ 12% Moisture (cwt/A)[1] | Milling (% Whole / % Total) | Variable Costs ($/A)[2] | Cost of Production ($/cwt)[2] | Return on Variable Costs ($/A)[2,3] |
|---|---|---|---|---|---|---|
| **Avoyelles** | Cheniere | 76.57 | 60.6/68.7 | 436.93 | 5.71 | 814.99 |
| **Calcasieu** | CLXL 730 | 82.47 | 63.3/72.5 | 830.87 | 10.07 | 517.51 |
| **Concordia** | CL 161 | 71.78 | 56/66.7 | 551.74 | 7.69 | 621.86 |
| **Evangeline** | Cheniere | 68.40 | 66.9/72.0 | 488.47 | 7.14 | 629.87 |
| **Jeff Davis** | Cheniere | 84.81 | 63.6/70.8 | 689.41 | 8.13 | 700.34 |
| **Madison** | Cheniere | 82.08 | 65.5/72.5 | 565.72 | 6.89 | 776.29 |
| **St. Landry** | Cheniere | 78.01 | 67.1/71.9 | 400.63 | 5.14 | 874.83 |
| **Vermilion** | CLXL 745 | 113.59 | 63.4/71.2 | 644.63 | 5.68 | 1212.57 |

1 - Yield includes ratoon crop yield.
2 - Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transporting, drying, storing, or fixed costs.
3 - This value was obtained using a selling price of $16.35/cwt.

## AVOYELLES PARISH

The field in Avoyelles Parish was laser leveled in 2006 but not put into production that year. It was set on zero grade so there were no internal levees in the field. Production in 2007 was the first rice crop to be grown on the field. Following harvest, wet conditions then flooding for duck hunting prevented any fall seed bed preparation. In the spring of 2008, remaining stubble had not decomposed, a significant amount of volunteer regrowth from old stubble was present.

The field surface was in excellent condition so we recommended burning the field down with herbicide then no-till planting. The grower said he was not able to do this because he did not have a drill available to him. The field was too wet to prepare a seedbed by plowing and it appeared it would not dry enough until much later. As a compromise, the grower attempted to drag the field in a flooded state. As expected, this did not work well on the heavy red clay soil. In spite of the poor seedbed, 130 lb/A of dry Cheniere seed was sown aerially into the flooded field. The resulting stand was surprisingly good.

In late May, potassium fertilizer, herbicide, and insecticide were applied and a permanent flood established. Two weeks later his well collapsed. The best the farmer could do for the next month or so was to keep the field muddy. Clincher herbicide had to be applied to suppress sprangletop and some barnyardgrass. At midseason, nitrogen was applied. An increase in nitrogen rate was discussed out of concern for possible losses when the well failed, but it was decided to stay with the original planned rate. This was probably the best decision made in this field this year.

Sheath blight pressure remained light, but fungicide was applied because of the history of kernel smut and the fear of the net blotch phase of narrow brown leaf spot. About 2 weeks later, an insecticide was applied to control stink bugs.

We recommended draining on August 13. Hurricanes Gustav and Ike completely flooded the field, causing extensive lodging and delaying harvest until September 18. In spite of all of the difficulties, the field yielded an impressive 76.57 cwt/A (47.3 bbl/A or 170 bu/A).

## AVOYELLES PARISH

**Cooperator:** Johnny Coco
**Agent:** Carlos Smith and Trent Clark
**Field Size:** 40.9

### Cultural Practices

**Variety:** Cheniere
**Method of Planting:** Water Seeded
**Water Management:** Delayed Flood

**Seeding Rate:** 130 lb/A
**Date of Planting:** April 29
**Date of Emergence:** May 6

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 6-19 | 6-4 |
| **PD** | 7-2 | 6-13 |
| **50% Heading** | 7-21 | 7-5 |
| **Drain for Harvest** | | |
| **Harvest** | 9-18 | 8-9 |

**Yield, Milling, and Economic Data**

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 76.57 | 60.6/68.7 | 436.93 | 5.71 | 814.99 |
| **2nd Crop** | -- | -- | -- | -- | -- |

Average Parish Yield (1st and 2nd Crop): 67.0 cwt/A. (harvested acres only)

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2]This value was obtained using a selling price of $16.35/cwt.

**Fertilization**

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 5 | 46-0-0 | 210 | 97 | - | - |
| 6-23 | 46-0-0 | 140 | 64 | - | - |
| Total | | | 161 | - | - |

**Weed Management**

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Sprangletop, Narrowleaf Aster, Water Starwart, Native Rice, Buttercup | 4-7 | 28 oz Glyphosate |
| Redstem, Sprangletop, Ducksalad | 5-21 | 1 gal propanil + 1 oz Londax |
| Barnyardgrass, Sprangletop | 6-19 | 1.5 oz Clincher + 1 qt Crop Oil |

**Disease Management**

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Sheath Blight | 7-10 | 17 oz Stratego |

**Insect Management**

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 5-21 | Karate |
| Rice Stink Bug | 8-7 | Karate |

## CALCASIEU PARISH

The seedbed in this field left a lot to be desired because the farmer had to prepare it under wetter than desirable conditions. It also was in dire need of laser leveling because each paddy had high spots and low spots in the contour leveed field. Against the recommendation of the advisors, RiceTec's bronze blend (CL730 blend) was flown into the flooded field at the rate of 60 lb/A (an equivalent of 30 lb/A of good hybrid seed). Two years of experience with water planting of hybrids has shown this method to be a method of last resort because of the low seeding rates associated with hybrids.

It was the intention to make the first Newpath application as soon as the field was drained, but the poor stand and cool weather prevented it. An application of 4 oz of Newpath was finally made when rice plants were in the 1- to 3-leaf stage. Susceptible plants were killed, reducing the apparent stand. An application of 20 lb/A actual nitrogen was made with all of the potassium and phosphorus and the field was flushed.

About 3 weeks later, an application of Clearpath and insecticide (to control rice water weevil) was made followed by 170 lb/A of urea and the field was flooded. The use of Clearpath herbicide was the best decision made in this field. More susceptible plants died following this application. Between green ring and panicle differentiation, the second application of nitrogen was made, bringing the total (not counting the original 20 lb/A) to 125 lb/A actual nitrogen.

Even though no disease was found with thorough scouting 6 oz of propiconazole was applied as a preventative to the net blotch phase of narrow brown leaf spot. At heading, an insecticide was applied to control rice stink bugs.

We recommended draining on July 16. Afternoon thundershowers then hurricanes Gustav and Ike came in, delaying harvest until August 8. Yield was 71.24 cwt (44 bbl or 158 bu) per acre. This was somewhat disappointing and attributed to the uneven stand and shattering associated with the hurricanes. The field was immediately fertilized and flooded to produce a second crop.

Second crop produced another 11.23 cwt/A (7 bbl/A or 25 bu/A) for a total of 82.47 cwt/A (51 bbl/A or 183 bu/A). A uniform stand and no hurricanes would likely have produced an additional 10 to 15 cwt/A on the first crop and 8 to 10 cwt/A on the second crop.

## CALCASIEU PARISH

**Cooperator:** Ryan Stelly
**Agent:** Jerry Whatley
**Field Size:** 55.1

### Cultural Practices

**Variety:** CLXL730
**Method of Planting:** Water Seeded
**Water Management:** Delayed Flood

**Seeding Rate:** 60 lb/A
**Date of Planting:** March 20
**Date of Emergence:** Estimated March 30

### Growth and Development

| Stage | Observation Date | DD50 Date[1] |
|---|---|---|
| **Green Ring** | 5-22 | - |
| **PD** | 6-6 | - |
| **50% Heading** | 6-30 | - |
| **Drain for Harvest** | 7-17 | |
| **Harvest** | 8-8 | - |

[1] No threshold data available.

### Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 71.24 | 63.3/72.5 | 731.64 | 10.27 | 433.13 |
| **2nd Crop** | 11.23 | | 99.23 | 8.84 | 84.38 |

Average Parish Yield (1st and 2nd Crop): 52.0 cwt/A.

[1]Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2]This value was obtained using a selling price of $16.35/cwt.

### Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 4-24 | blend | 200 | 20 | 40 | 60 |
| 5-5 | 46-0-0 agrotain | 170 | 78 | - | - |
| 5-26 | 46-0-0 | 100 | 46 | - | - |
| Total | -- | -- | 144 | 40 | 60 |

### Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Alligatorweed, Rush, Smartweed, Water Paspalum, Knotgrass | 4-11 | 4 oz Newpath |
| Sesbania, Nutsedge, Alligatorweed, Eclipta, Common Bermudagrass, Southern Watergrass | 5-5 | .5 lb Clearpath + Crop Oil |

### Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Preventative | 6-16 | 6 oz Propimax |

### Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 5-5 | Karate |
| Rice Stink Bug | 7-3 | Karate |

## CONCORDIA PARISH

The field in Concordia Parish was the same field we used in 2006. The heavy clay soil had been prepared for planting in the fall of 2007. CL161 was drill seeded at 100 lb/A, which turned out to be at least 10 lb/A too much because it appeared that every seed emerged. The first application of 4 oz of Newpath was made between spiking and 1 leaf. The field was flushed to maintain good soil moisture, provide some protection against anticipated record low temperatures, and assist the herbicide.

At the 3- to 4-leaf stage, 50 lb/A of urea was applied and the field flushed. Normally, the second application of Newpath herbicide would have been made at this time, but the colder than normal conditions and glyphosate drift from a nearby field prevented it because we did not think rice would tolerate it well. At the beginning of tillering, the second application of Newpath plus Permit (for hemp sesbania) was made, followed by 225 lb/A urea and the field was flooded.

About 2 weeks later, rice water weevils were detected as were symptoms of glyphosate drift on to the field. Insecticide was applied to control weevils. Injury from glyphosate was monitored for the next few weeks.

At midseason, the second application of nitrogen was made as planned. At ½-inch panicle a mixture of Quilt + Quadris was applied to slow down heavy sheath blight pressure. We recommended a high rate of fungicide because we had to make the application early. Rain and hurricanes delayed harvest, thus looking back the higher rate of fungicide was the most critical decision we made in this field. Stink bugs never reached treatable levels. We recommended draining on July 30 and could probably have drained a little earlier.

Three weeks of afternoon rains followed by hurricanes Gustav and Ike caused major problems. An attempt was made to harvest on August 29, but the field was too wet. Combines were getting stuck. Then, the hurricanes arrived. Finally, on September 17, harvest was completed. This field had been the best appearing CL161 ever in the program and yield was expected to be very high. By the time it was harvested, all of the rice was completely lodged and much of it had sprouted.

In spite of these problems, the field still produced 71.78 cwt/A (44.3 bbl/A or 159.5 bu/A). A very conservative estimate of potential yield would have been at least 95 cwt/A (59 bbl/A or 211 bu/A).

## CONCORDIA PARISH

**Cooperator:** Noble Guedon
**Agent:** Glen Daniels
**Field Size:** 54.7

### Cultural Practices

**Variety:** CL161
**Method of Planting:** No-Till Drill
**Water Management:** Delayed Flood
**Seeding Rate:** 100 lb/A
**Date of Planting:** March 28
**Date of Emergence:** Estimated April 4

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 5-29 | 5-23 |
| **PD** | 6-14 | 6-3 |
| **50% Heading** | 7-6 | 6-26 |
| **Drain for Harvest** | 7-30 | |
| **Harvest** | 8-22 | 7-31 |

## Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 71.78 | 65/66.7 | 551.74 | 7.69 | 621.86 |
| **2nd Crop** | -- | -- | -- | -- | -- |

Average Parish Yield (1st and 2nd Crop): 64.0 cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

## Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 4-24 | 46-0-0 | 50 | 23 | - | - |
| 5-10 | 46-0-0 | 225 | 103.5 | - | - |
| 5-30 | 46-0-0 | 125 | 57.5 | - | - |
| Total | | | 184 | - | - |

## Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Burn Down | 2-19 | 1 lb Glyphosate + .6 oz First Shot |
| | 3-31 | 16 oz Command |
| Smartweed, Nutsedge, Dayflower | 4-7 | 4 oz Newpath + 1% Crop Oil |
| Sesbania | 5-9 | 4 oz Newpath + .6 oz Permit + 1% Crop Oil |

## Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Preventative | 6-23 | 21 oz Quilt + 6 oz Quardis |

## Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Stink Bug | 7-17 | Karate |

## EVANGELINE PARISH

Stubble from the 2007 corn crop remained in this field until a couple of weeks prior to planting. It was worked prior to planting then flooded. Dry seed were flown in and allowed to pip then the field was drained. The combination of a slick seedbed and dry seed resulted in a lot of drifted seed and an uneven stand. Throughout the growing season, there was a difference in maturity from the top of the field to the bottom.

Command herbicide was applied to 1-leaf rice in a dry field then the field was flushed. The primary weed targets were sprangletop and fall panicum. The use of Command herbicide in this field was the most important decision made in this field.

Plants at the top of the field reached floodable stage before those at the bottom. In an effort to "speed things up," 38 pounds of actual nitrogen were applied to the field. By the time plants at the bottom of the field were large enough to flood, some sprangletop had begun to break through. This required the addition of propanil to a mixture of Londax and Permit. The herbicide mix was applied followed by 200 lb/A of urea then the field was flooded.

A few days later over 5 inches of rain caused complete coverage of plants with water. The farmer drained the field to prevent injury, which raised concerns about both herbicide and nitrogen losses.

An insecticide was applied to control rice water weevils. By the time rice reached panicle differentiation, no sheath blight had been detected. A recommendation of propiconazole fungicide for prevention of smut and narrow brown leaf spot was made. Scouting for disease continued. Sheath blight did eventually reach a treatable level so Quadris was applied with insecticide to control rice stink bugs.

The greatest damage to the field was done by feral hogs. We roughly estimated a loss of as much as 1000 lb/A from this damage. Black birds added to these losses.

In spite of all of the problems, the field produced 68.4 cwt/A (42 bbl/A or 152 bu/A) at 12% moisture.

## EVANGELINE PARISH

**Cooperator:** Jeffrey Sylvester
**Agent:** Keith Fontenot
**Field Size:** 46.4

### Cultural Practices

**Variety:** Cheniere (registered)
**Method of Planting:** Water Seeded
**Water Management:** Pinpoint Flood

**Seeding Rate:** 130 lb/A
**Date of Planting:** April 1
**Date of Emergence:** April 9

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 5-30 | 4-9 |
| **PD** | 6-16 | 5-29 |
| **50% Heading** | 7-11 | 6-20 |
| **Drain for Harvest** | 7-30 | |
| **Harvest** | 8-19 | 7-25 |

### Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 68.40 | 66.9/72.0 | 488.47 | 7.14 | 629.87 |
| **2nd Crop** | -- | -- | -- | -- | -- |

Average Parish Yield (1st and 2nd Crop): 68.2 cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

### Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 5-1 | 38-0-0 | 100 | 38 | | |
| 5-8 | 46-0-0 | 200 | 92 | | |
| 5-30 | 46-0-0 | 100 | 46 | | |
| Total | -- | -- | 176 | | |

### Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Sprangletop, fall panicum | 4-10 | 1⅓ pt Command |
| Sprangletop, Ducksalad, Alligatorweed, Eclipta, Spilanthes, Nutsedge | 5-8 | 3 pt Propanil + 1 oz Londax + ½ oz Permit |

### Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Kernel Smut | 7-1 | 6 oz Tilt |
| Sheath Blight | 7-17 | 6 oz Quardis |

### Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 5-19 | Karate |
| Rice Stick Bug | 7-17 | Malathion |

## JEFF DAVIS PARISH

The field in Jeff Davis was prepared in the fall of 2007. Weeds present the following spring included a species of rush in the genus *Juncus*, alligatorweed, and water starwort in the field and rice cutgrass along the levee. Even though glyphosate is fairly weak on *Juncus,* we recommended an application to at least suppress this weed and control some of the others.

Dry seed of Cheniere were flown into a flooded field with the intention of utilizing pinpoint floodwater management to combat a known red rice problem. We recommended holding the water in anticipation of a cold front. This recommendation turned out to be one of the more critical of the season.

Cold weather over the next 10 to 14 days prevented a true pinpoint flood from being established. The field was maintained in a very wet condition by the combination of rain and flushing until we felt it was warm enough to maintain a flood. At that point, we applied 200 lb/A of urea and 40 lb/A of $K_2O$ and flooded the field. A mixture of Londax, Permit, zinc chelate, and crop oil was then applied. The decision to use this mixture was based on past experience with Londax being only fair to good on *Juncus* and the knowledge that Permit was very good on sedges and some rushes. It worked extremely well.

Within a week of establishing permanent flood, rice water weevils were found and treatment was made. The inability to truly pinpoint flood resulted in red rice escapes along the shallow south side of the field.

The remainder of the season required relatively routine recommendations. Topdressing was performed at midseason. A fungicide plus malathion was applied to control sheath blight and rice stink bugs. Malathion was used because crawfish had recently been stocked in the field. When stink bugs built up again, we felt it was safe to use one of the more effective pyrethroids to control them.

Even though the field was drained 18 days prior to harvest, a pattern of regular afternoon thundershowers kept the field wet, resulting in rutting of the field in the course of harvesting. Because second crop was planned, it was discouraging and likely affected second crop yields.

The first crop produced 71.09 cwt/A (43.9 bbl/A or 158 bu/A) at 12% moisture. Second crop was better than in many of the surrounding fields, producing 13.72 cwt/A (8.5 bbl/A or 30.5 bu/A), for a total crop yield of 84.81 cwt/A (52.4 bbl/A or 188.5 bu/A).

## JEFF DAVIS PARISH

**Cooperator:** Ronnie Zaunbrecher
**Agent:** Eddie Eskew
**Field Size:** 37.7

### Cultural Practices

**Variety:** Cheniere
**Method of Planting:** Water Seed (pre sprout)
**Water Management:** Pinpoint Flood

**Seeding Rate:** 120 lb/A
**Date of Planting:** March 20
**Date of Emergence:** March 29

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 5-14 | 5-10 |
| **PD** | 5-30 | 5-20 |
| **50% Heading** | 6-20 | 6-11 |
| **Drain for Harvest** | 7-11 | |
| **Harvest** | 7-29 | 7-16 |

### Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 71.09 | 63.6/70.8 | 546.14 | 7.68 | 616.18 |
| **2nd Crop** | | | 143.28 | 10.95 | 81.04 |

Average Parish Yield (1st and 2nd Crop): 56.3 cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

### Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 4-2 | 46-0-0 | 200 | 92 | - | - |
| 4-2 | 0-0-60 | 40 | - | - | 24 |
| 4-2 | Zinc | 1 gal | - | - | - |
| 5-14 | 46-0-0 | 100 | 46 | - | - |
| Total | | | 138 | - | 24 |

### Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Burn Down | 2-9 | 1 qt Glyphosate |
| Water Starwart, Rush (Juncus) Alligatorweed, Red Rice, | 4-3 | .5 oz Londax, + 1 oz Permit, + 1% Crop Oil |
| Alligatorweed | 5-16 | 2,4-D Levees & Field Margins |

### Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Preventative | 6-19 | 9 oz Quardis |

### Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 4-12 | Mustang Max |
| Rice Stink Bug | 6-19 | Malathion |
| Rice Sink Bug | 6-27 | Karate |

## MADISON PARISH

A mixture of glyphosate and Valor was applied to the heavy clay soil in this field about 6 weeks prior to planting. A mixture of Command and glyphosate was applied and the field was rolled just ahead of the drill then Cheniere seed were drilled at the rate of 90 lb/A on April 22. Sufficient rain within a couple of days alleviated the need to flush the field.

By the time the rice was in the 3- to 4-leaf stage, rice water weevils had been detected. Weeds present were texasweed, hemp sesbania, and scattered broadleaf Signalgrass. Urea was applied at the rate of 235 lb/A followed by flood establishment then the application of a mixture of Londax, Permit, and a pyrethroid insecticide. No grass herbicide was used at this point because pressure was light, although the need for a later grass herbicide application was discussed. This decision likely saved more money than any other decision all year.

At midseason, the remaining nitrogen fertilizer was applied and parts of the field were "spot sprayed" with Clincher for grass control.

The entire perimeter of the field had been "double drilled," resulting in an excessive plant population. In these areas, sheath blight showed up early. When rice reached the late boot stage, a fungicide was applied. Stink bugs were monitored but never reached treatable levels.

We recommended draining on August 18. Hurricane Gustav blew through before the field could be harvested. All of the double planted area was completely flattened by the storm. In spite of the damage, the field produced 82.08 cwt/A (50.7 bbl/A or 182.4 bu/A).

## MADISON PARISH

**Cooperator:** Trey Varner
**Agent:** Donna Lee & Ralph Frazier
**Field Size:** 41.5

### Cultural Practices

**Variety:** Cheniere
**Method of Planting:** Drill
**Water Management:** Delayed Flood

**Seeding Rate:** 90 lb/A
**Date of Planting:** April 22
**Date of Emergence:** May 3

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 6-17 | 6-5 |
| **PD** | 7-7 | 6-14 |
| **50% Heading** | 7-27 | 7-6 |
| **Drain for Harvest** | 8-18 | |
| **Harvest** | 8-27 | 8-10 |

### Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 82.08 | 65.5/72.5 | 565.72 | 6.89 | 776.29 |
| **2nd Crop** | | | | | |

Average Parish Yield (1st and 2nd Crop): 60.0cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

### Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 6-3 | 46-0-0 | 235 | 108 | - | - |
| 6-20 | 46-0-0 | 160 | 73 | - | - |
| | | | 181 | - | - |

### Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Burn Down | 3-10 | 1½ pt Glyphosate + 1 oz Valor |
| | 4-21 | 1½ pt Command + 1½ pt Roundup Weather Max |
| Mexican Weed, Sesbania, Broadleaf Signalgrass, Barnyardgrass, Johnsongrass, Pigweed, Morningglory | 6-9 | $^{2}/_{3}$ oz Londax + $^{1}/_{3}$ oz Permit + 1% Crop Oil |
| Barnyard | 6-24 | Clincher Spot Spray (10 A) |

### Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Sheath Blight | 7-18 | 21 oz Quilt + 3 oz Quardis |

### Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 6-6 | Karate |

## ST. LANDRY PARISH

The St. Landry field was no-tilled into grain sorghum stubble, the first time we have had that experience in the verification program. It was drilled with Cheniere then Command and glyphosate were applied. We waited 24 hours then flushed the field.

Cool weather was blamed for slow seedling growth. We applied 100 lb/A of ammonium sulfate to give it a little boost. During the next few weeks, blackbirds thinned out one end of the field and weeds began to emerge.

When we had enough plant size to flood, we recommended a mixture of Duet plus Permit followed by 190 lb/A of urea. The day after this was applied flooding began. Two weeks later heavy rains completely covered the field.

At midseason, nitrogen was applied again at the rate of 100 lb/A of urea. Sheath blight started to show up about a week later. Because of the heavy pressure and early appearance of the disease, we recommended a mixture of Quilt plus Quadris to provide the longevity of protection we thought we would need. Timing of the fungicide application was the most critical decision made in this field. When the rice was in the milk to soft-dough stage, we applied an insecticide to control rice stink bugs.

One of the advantages of no-till is a firmer field. In spite of all of the rain between draining and harvest, the field was harvested without serious problems. It yielded 78.01 cwt/A (48.2 bbl/A or 173 bu/A). There was never any obvious evidence of negative effects of grain sorghum on the rice crop.

## ST. LANDRY PARISH

**Cooperator:** Kenneth Olivier
**Agent:** Keith Normand
**Field Size:** 60.24

### Cultural Practices

**Variety:** Cheniere
**Method of Planting:** No-Till Drill
**Water Management:** Delayed Flood

**Seeding Rate:** 85 lb/A
**Date of Planting:** March 26
**Date of Emergence:** Estimated April 6

### Growth and Development

| Stage | Observation Date | DD50 Date |
|---|---|---|
| **Green Ring** | 5-29 | 5-19 |
| **PD** | 6-13 | 5-29 |
| **50% Heading** | 7-4 | 6-16 |
| **Drain for Harvest** | 7-25 | |
| **Harvest** | 8-14 | 7-25 |

## Yield, Milling, and Economic Data

| | Yield @ 12 % Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 78.01 | 67.1/71.9 | 400.63 | 5.14 | 874.83 |
| **2nd Crop** | -- | -- | -- | -- | -- |

Average Parish Yield (1st and 2nd Crop): 52.0 cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

## Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 4-24 | 21-0-0 | 100 | 21 | - | - |
| 5-2 | 46-0-0 | 190 | 87 | - | - |
| 6-2 | 46-0-0 | 100 | 46 | - | - |
| Total | | | 154 | - | - |

## Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Burn Down | 3-1 | 1½ pt Gramaxone Intenion |
| Burn Down | 3-26 | .8 pt Command + 1 pt Glyphosate |
| Sedge, Broadleaf Signalgrass, Texasweed, Crabgrass, Eclita | 5-1 | 4 qt Propanil + .8 oz Londax + .4 oz Permit |

## Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Sheath Blight | 6-24 | 21 oz Quilt + 3 oz Quardis |

## Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 5-19 | Karate |
| Rice Stink Bug | 7-15 | Karate |

## VERMILION PARISH

CLXL745 was drill seeded at 28 lb/A on March 25. Phosphorus and potassium had been applied just prior to planting and worked into the soil. The farmer had also applied chicken litter to the cut areas of the field. The field was then flushed.

The need to apply Newpath with a ground rig delayed its application. It also gave us an opportunity to evaluate the stand. An average of 2.5 plants per foot of drill row was deemed good enough to keep. This was probably the single most critical decision of the year. Newpath was applied as soon as the field firmed up enough.

Delaying spraying and establishing a permanent flood produced the expected results, heavy grass pressure in some areas of the field. Grass weeds included fall Panicum, sprangletop, and barnyardgrass. A mixture of Newpath and Permit followed by 200 lb/A of urea was applied then the field was flooded. Weather conditions delayed these applications at least a week longer than it should have been made.

To control the grasses, we applied Clincher which was mixed with a pyrethroid insecticide to control rice water weevils. We insisted on a 10-gal/A application rate and got it applied in that manner. The resulting control was excellent.

At green ring, water was being added to the field. We recommended he finish flooding the field then apply 100 lb/A of urea. This delayed the nitrogen application by only a few days.

Given the disease package of the hybrids, we recommended propiconazole only as a preventative for *Cercospora*. The grower elected to use Quilt instead. One application of a pyrethroid insecticide was made to control rice stink bugs.

Harvest started on August 4. Between machinery breakdowns and afternoon thundershowers, harvest extended until August 10 to finish it. Yield was the best in the verification program; 98 cwt/A (60.5 bbl/A or 218 bu/A). The field was then fertilized and flooded to produce a second crop.

Ruts made during the first crop harvest caused a delay in maturity of rice in those areas, consequently delaying second crop harvest. On November 20, it was finally harvested. Yield was lower than had been anticipated because of the damage done by hurricanes Gustav and Ike. We harvested 15.59 cwt/A (9.6 bbl/A or 34.6 bu/A). This brought the total production from this field to 113.59 cwt/A (70.1 bbl/A or 252 bu/A).

## VERMILION PARISH

**Cooperator:** Durel Romanie
**Agent:** Howard Cormier & Stuart Gauthier
**Field Size:** 51

### Cultural Practices

**Variety:** CLXL745
**Method of Planting:** No-Till Drill
**Water Management:** Delay Flood
**Seeding Rate:** 28 lb/A
**Date of Planting:** March 25
**Date of Emergence:** April 4

### Growth and Development

| Stage | Observation Date | DD50 Date[1] |
|---|---|---|
| **Green Ring** | 5-28 | - |
| **PD** | 6-7 Estimated | - |
| **50% Heading** | 7-4 | - |
| **Drain for Harvest** | 7-21 | - |
| **Harvest** | 8-4 – 8-10 | - |

[1] No threshold data available.

### Yield, Milling, and Economic Data

| | Yield @ 12% Moisture (cwt/A) | Milling Yield (% whole / % total) | Variable Costs ($/A)[1] | Cost of Production ($/cwt)[1] | Return on Variable Costs ($/A)[1,2] |
|---|---|---|---|---|---|
| **1st Crop** | 98.00 | 63.4/71.2 | 542.11 | 5.53 | 1060.19 |
| **2nd Crop** | | | 115.02 | 7.38 | 139.88 |

Average Parish Yield (1st and 2nd Crop): 59.0 cwt/A.

[1] Costs captured are from land preparation to getting the crop to the truck. They do not include land rent, transportation, drying, storage, or fixed costs.

[2] This value was obtained using a selling price of $16.35/cwt.

### Fertilization

| Date | Source | Rate (lb/A) | N (lb/A) | P (lb/A) | K (lb/A) |
|---|---|---|---|---|---|
| 3-4 | Chicken Litter | 500 lb Cut Soil | - | - | - |
| 3-24 | 0-20-30 | 200 | - | 40 | 60 |
| 5-7 | 46-0-0 | 200 | 92 | - | - |
| 6-4 | 46-0-0 | 100 | 46 | - | - |
| Total | | | 138 | 40 | 60 |

### Weed Management

| Weeds Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Jointvetch, Smartweed, Alligatorweed, Dock, Narrowleaf Aster, Rush, Barnyardgrass, Sedge | 4-17 | 4 oz Newpath |
| Alligatorweed, Eclipta, Junus, Narrowleaf Aster, Jointvetch, Barnyardgrass, Fall Panicum, Sedge | 5-5 | 4 oz Newpath + $^{2}/_{3}$ oz Permit + Crop Oil |
| Fall Panicum, Alligatorweed, Spangletop | 5-21 | 15 oz Clincher + Crop Oil |

### Disease Management

| Diseases Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Preventative | 6-19 | 21 oz Quilt |

### Insect Management

| Insects Present | Date of Treatment Decision | Recommendation |
|---|---|---|
| Rice Water Weevil | 5-5 | Karate |
| Rice Water Weevil | 5-21 | Karate |
| Rice Stink Bug | 7-3 | Mustang Max |

**Table 3. Eleven-Year Louisiana Rice Research Verification Summary.**

| 1998 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia* | 53.0 | 32.8 | 118.1 | 5314 |
| Avoyelles | 32.5 | 42.9 | 154.4 | 6950 |
| Calcasieu* | 60.0 | 34.1 | 122.8 | 5524 |
| East Carroll | 33.9 | 41.1 | 148.0 | 6658 |
| Evangeline | 33.0 | 42.9 | 154.4 | 6950 |
| Jeff Davis* | 61.8 | 37.3 | 134.3 | 6043 |
| Madison | 36.6 | 39.0 | 140.4 | 6318 |
| Morehouse | 63.0 | 33.8 | 121.7 | 5476 |
| St. Landry | 37.1 | 38.2 | 137.5 | 6188 |
| Vermilion | 16.7 | 29.4 | 105.8 | 4763 |
| **TOTALS** | **427.6** | **37.2** | **133.7** | **6018.4** |

* Yields include second crop.

| 1999 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia* | 31.1 | 37.4 | 134.6 | 6059 |
| Avoyelles | 32.5 | 46.6 | 167.8 | 7549 |
| Calcasieu | 49.3 | 34.6 | 124.6 | 5605 |
| Catahoula | 30.4 | 33.4 | 120.2 | 5411 |
| East Carroll | 36.1 | 47.0 | 169.2 | 7614 |
| Evangeline | 22.3 | 43.1 | 155.2 | 6982 |
| Jeff Davis* | 26.6 | 30.8 | 110.9 | 4990 |
| Madison | 38.1 | 39.0 | 140.4 | 6318 |
| St. Landry | 30.1 | 38.8 | 139.7 | 6286 |
| Vermilion | 23.8 | 36.5 | 131.4 | 5913 |
| **TOTALS** | **320.3** | **38.7** | **139.4** | **6272.7** |

* Yields include second crop.

| 2000 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia | 53.3 | 39.4 | 141.8 | 6383 |
| Avoyelles | 63.2 | 36.7 | 132.1 | 5945 |
| Calcasieu | 22.1 | 25.1 | 90.4 | 4066 |
| Catahoula | 39.6 | 36.4 | 131.0 | 5897 |
| East Carroll | 45.1 | 49.1 | 176.8 | 7956 |
| Evangeline | 19.9 | 38.2 | 137.5 | 6188 |
| Jeff Davis | 30.6 | 26.7 | 96.1 | 4325 |
| Morehouse | 27.7 | 28.3 | 101.9 | 4585 |
| St. Landry | 70.7 | 39.2 | 141.1 | 6350 |
| Vermilion* | 21.6 | 37.7 | 135.7 | 6107 |
| **TOTALS** | **393.8** | **35.7** | **128.4** | **5780.2** |

* Yields include second crop.

**Table 3. Continued.**

| 2001 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia* | 60.6 | 50.8 | 182.9 | 8230 |
| Allen | 41.6 | 35.1 | 126.4 | 5686 |
| Avoyelles | 63.2 | 38.1 | 137.2 | 6172 |
| Calcasieu* | 61.9 | 39.4 | 142.0 | 6388 |
| Concordia | 79.6 | 36.1 | 130.1 | 5853 |
| Evangeline* | 20.8 | 52.7 | 189.7 | 8538 |
| Jeff Davis* | 21.6 | 57.3 | 206.4 | 9289 |
| Richland | 65.9 | 46.0 | 165.5 | 7447 |
| St. Landry* | 40.6 | 51.1 | 184.0 | 8282 |
| Vermilion* | 33.3 | 52.4 | 188.7 | 8493 |
| **TOTALS** | **489.1** | **45.9** | **165.3** | **7437.8** |

* Yields include second crop.

| 2002 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia* | 38.4 | 49.8 | 179.3 | 8068 |
| Allen* | 25.1 | 46.0 | 165.6 | 7452 |
| Avoyelles | 37.4 | 49.9 | 179.6 | 8084 |
| Beauregard* | 49.5 | 53.1 | 191.2 | 8602 |
| Calcasieu* | 41.4 | 42.4 | 152.6 | 6869 |
| Concordia | 67.6 | 48.2 | 173.5 | 7808 |
| Evangeline | 42.0 | 37.6 | 135.4 | 6091 |
| Jeff Davis* | 31.7 | 45.0 | 162.0 | 7290 |
| Richland | 35.8 | 42.1 | 151.5 | 6819 |
| St. Landry | 32.7 | 48.8 | 175.7 | 7906 |
| Vermilion* | 32.0 | 49.8 | 179.4 | 8072 |
| **TOTALS** | **433.6** | **46.6** | **167.8** | **7551.0** |

* Yields include second crop.

| 2003 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia | 57.2 | 44.0 | 158.4 | 7128 |
| Allen* | 35.7 | 46.1 | 166.0 | 7469 |
| Avoyelles | 37.4 | 50.1 | 180.4 | 8116 |
| Beauregard* | 45.7 | 48.7 | 175.2 | 7884 |
| Concordia | 79.5 | 49.2 | 177.1 | 7970 |
| Evangeline* | 48.4 | 44.5 | 160.2 | 7209 |
| Jeff Davis* | 52.9 | 28.7 | 103.3 | 4649 |
| Richland | 40.2 | 44.7 | 160.8 | 7234 |
| St. Landry* | 32.7 | 61.1 | 220.0 | 9898 |
| Vermilion* | 33.0 | 40.0 | 144.0 | 6480 |
| **TOTALS** | **462.7** | **45.7** | **164.5** | **7403.7** |

* Yields include second crop.

**Table 3. Continued.**

| 2004 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Allen* | 53.2 | 40.9 | 147.1 | 6620 |
| Avoyelles | 33.3 | 32.8 | 118.0 | 5307 |
| Beauregard* | 21.8 | 42.5 | 153.3 | 6899 |
| Concordia | 82.3 | 36.0 | 130.0 | 5843 |
| East Carroll | 54.8 | 45.8 | 165.0 | 7427 |
| Evangeline | 30.7 | 34.8 | 125.2 | 5638 |
| Jeff Davis* | 42.3 | 38.5 | 138.6 | 6237 |
| Natchitoches | 47.2 | 44.1 | 158.8 | 7144 |
| St. Landry* | 60.1 | 65.1 | 234.3 | 10543 |
| Vermilion* | 30.0 | 42.1 | 151.6 | 6824 |
| **TOTALS** | **455.7** | **42.3** | **152.2** | **6848.2** |

*Yields include second crop.

| 2005 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Acadia | 28.9 | 39.6 | 143.8 | 6427 |
| Allen | 76.7 | 25.6 | 92.0 | 4140 |
| Avoyelles | 32.1 | 35.9 | 129.3 | 5819 |
| Calcasieu | 49.0 | 51.0 | 184.0 | 8282 |
| Concordia | 60.5 | 43.0 | 156.0 | 7003 |
| East Carroll | 30.4 | 47.9 | 172.7 | 7771 |
| Evangeline | 30.0 | 37.1 | 133.6 | 6014 |
| Jeff Davis | 39.2 | 32.5 | 117.0 | 5264 |
| Natchitoches | 30.0 | 43.3 | 156.0 | 7022 |
| Richland | 47.4 | 49.2 | 177.2 | 7974 |
| St. Landry | 61.7 | 47.5 | 170.9 | 7689 |
| Vermilion | 52.8 | 40.9 | 147.3 | 6631 |
| **TOTALS** | **538.7** | **41.1** | **148.3** | **6669.7** |

*Yields include second crop.

**2006 Verification Acres and Yields**

| | | Yield @ 12% Moisture | | |
|---|---|---|---|---|
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Avoyelles | 41.8 | 43.0 | 155.0 | 6972 |
| Concordia | 54.7 | 50.8 | 183.0 | 8237 |
| East Carroll | 60.4 | 44.5 | 150.0 | 7210 |
| Evangeline | 29.4 | 32.3 | 116.0 | 5227 |
| Jeff Davis | 21.5 | 43.8 | 157.8 | 6000 |
| St. Landry | 40.9 | 36.8 | 132.5 | 5962 |
| Vermilion | 29.6 | 37.0 | 133.3 | 7100 |
| West Carroll | 50.1 | 53.1 | 191.2 | 8603 |
| **TOTALS** | **328.4** | **43.4** | **156.4** | **7040** |

*Yields include second crop.

**Table 3. Continued.**

| 2007 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Avoyelles | 40.9 | 56.7 | 204 | 9187 |
| Concordia | 53.8 | 53.6 | 193 | 8680 |
| East Carroll | 23.0 | 49.0 | 176 | 7917 |
| Evangeline – St. Landry | 33.9 | 50.1 | 180 | 8122 |
| Jeff Davis* | 38.9 | 55.8 | 201 | 9046 |
| Vermilion* | 36.6 | 46.0 | 166 | 7451 |
| West Carroll | 40.2 | 45.4 | 164 | 7356 |
| **TOTALS** | **267.3** | **51.2** | **184** | **8293** |

*Yields include second crop

| 2008 Verification Acres and Yields | | | | |
|---|---|---|---|---|
| | | Yield @ 12% Moisture | | |
| **Parish** | **Acres** | **Barrels/A** | **Bushels/A** | **Pounds/A** |
| Avoyelles | 40.9 | 47 | 170 | 7657 |
| Calcasieu* | 55.1 | 51 | 183 | 8247 |
| Concordia | 54.7 | 44 | 160 | 7178 |
| Evangeline | 46.4 | 42 | 152 | 6840 |
| Madison | 41.5 | 51 | 182 | 8208 |
| Jeff Davis* | 37.7 | 52 | 189 | 8481 |
| St. Landry | 60.2 | 48 | 173 | 7801 |
| Vermilion* | 51.1 | 70 | 252 | 11359 |
| **TOTALS** | **387.8** | **51** | **183** | **8,228** |

*Yields include second crop

| 1998 - 2008 Verification Summary | | | | | |
|---|---|---|---|---|---|
| Verification Totals | | | Verification Parish Totals | | |
| **Year** | **Acres** | **Pounds/A** | **Acres** | **Pounds/A** | **Verification - Parish** |
| 1998 | 427.6 | 6018 | 475,103 | 5052 | 966 |
| 1999 | 320.3 | 6273 | 444,015 | 5502 | 771 |
| 2000 | 393.8 | 5780 | 385,824 | 5620 | 160 |
| 2001 | 489.1 | 7438 | 412,286 | 5794 | 1644 |
| 2002 | 433.6 | 7551 | 412,630 | 5764 | 1787 |
| 2003 | 462.7 | 7404 | 327,843 | 5843 | 1561 |
| 2004 | 455.7 | 6848 | 311,606 | 5582 | 1266 |
| 2005 | 538.7 | 6670 | 402,759 | 6165 | 505 |
| 2006 | 328.4 | 7040 | 185,249 | 5644 | 1396 |
| 2007 | 267.3 | 8293 | 183,357 | 6501 | 1792 |
| 2008 | 387.6 | 8228 | 258,845 | 6047 | 2181 |
| **Totals** | **4504.8** | **7021** | **3,799,517** | **5716** | **1305** |

# RICE WEED CONTROL

## WEED MANAGEMENT IN HERBICIDE-RESISTANT/TOLERANT AND CONVENTIONAL RICE

E.P. Webster, S. Bottoms, J. Hensley, and T. Carlson

### Introduction and Justification

Weed control studies were conducted at the Rice Research Station and producer fields in south Louisiana in 2008. A total of 47 studies were established with a total of 2,000 research plots. These studies indicate that weed control in rice will continue to be more effective as the new technologies and new herbicides become available to the producers. Many of these studies have been conducted over two to three years and have been completed. However, several of these studies have one year of data and need to be repeated in order to verify the results over time. This project continues to work on different application methods for products in drill- and water-seeded rice, and it continues to supply data for herbicide development and to aid in the expansion of current herbicide labels.

### The Use of Permit in Water-Seeded Rice

Permit was applied at 0.5, 1.0, and 2.0 oz/A at 14, 7, and 0 days prior to planting (DPP) and 3 and 5 days after planting. The area was conventionally tilled prior to the initial herbicide application (14 DPP), and no other tillage was performed after the initial application. The 0 DPP application was applied and a seeding flood was immediately established. Pregerminated CL161 was planted in all the studies. Two other studies were established with Trenasse and Jupiter rice and Permit was applied immediately prior to planting. Barnyardgrass and ducksalad control and crop injury were evaluated. This research indicates that broad spectrum weed control with Permit was not as consistent as observed in 2007. However, barnyardgrass pressure was not as high in 2008 and control was achieved by using a pinpoint flood system. Rice injury was below 5% when Permit was applied prior to planting. This research will be used for label support by reducing the plant back interval for Permit.

### Ducksalad Control in a Rice Production System

A study was established to evaluate several broadleaf herbicides for control of ducksalad. The area was conventionally tilled and a seeding flood was established in order to simulate a water-seeded system. Rice was not seeded in order to eliminate any competition from rice with ducksalad. The initial flood was removed 48 hours after flooding and herbicides with residual activity were applied 24 hours later as a preemergence application prior to ducksalad emergence. Two postemergence timings were evaluated. The first postemergence timing was applied to ducksalad in the cotyledon stage and the second application timing was applied when ducksalad reached the spoon stage. At each timing, the flood was removed to guarantee herbicide coverage. Command and Newpath were applied as a preemergence application and prevented ducksalad emergence for approximately 2 weeks, and this delay in emergence allows for rice stand establishment, which is more competitive with ducksalad. Newpath applied at the spoon stage controlled ducksalad 97% at approximately 30 days after treatment. V-10142 applied preemergence did not control ducksalad at the level observed in 2007. Herbicides applied postemergence that controlled ducksalad 85 to 98% were Grasp, Newpath, Regiment, and Unison.

### Newpath and Propanil Formulations and Application Timings

A study was established in 2008 to evaluate the addition of propanil to Newpath in a Clearfield rice production system. The standard program of two applications of Newpath applied at 4 oz/A was used. The first application was applied early postemergence (EPOST) to 2- to 3-leaf rice and the second application was applied late POST (LPOST) to 5-leaf to 1-tiller rice. The various propanil formulations were mixed with either the EPOST or LPOST applications of Newpath. The propanil formulations evaluated were Stam M4, Stam SC, Riceshot, Superwham, and Stam EDF. Weed control was similar for all combinations and application timings; however, yield was generally higher with all Newpath plus propanil applied at the EPOST timing. An economic analysis will be conducted for all treatments to determine the best propanil formulation to be used with Newpath based on economic returns.

**Newpath and Beyond Application Rates and Timings for Use in Clearfield Rice**

This project has conducted over 100 field, greenhouse, and laboratory trials on the Clearfield rice production system. This project has focused on application timing and rate of Newpath, Clearpath, and Beyond to best control red rice and other weeds present in rice fields. It appears the Beyond label will change and allow the use of two applications of Beyond at 5 oz/A in the Clearfield production system. With this in mind, a study was established to evaluate application timings of Beyond with and without the use of Newpath. This study indicates the most important factor for obtaining the best red rice control is the use of Newpath applied as early as possible. Beyond only treatments did not provide acceptable season-long red rice and yellow nutsedge control. However, when Newpath was applied at 4 oz/A early and followed by two applications of Beyond at 5 oz/A, control was similar to a Newpath only program. Based on these results, Newpath should remain as the initial or base herbicide used for red rice control in a Clearfield system.

**Ricestar HT plus UAN or AMS to Enhance Grass Activity and Potentially Overcome Antagonism**

Several studies were established in 2008 to evaluate the use of UAN with Ricestar HT. Results indicate Ricestar HT activity on grasses can be increased and the speed of activity can be increased by 2 to 3 days with the addition of UAN.

A Ricestar HT plus a broadleaf herbicide tank-mix study was also evaluated. Published research has indicated grass herbicide antagonism can be overcome with the addition of AMS as a spray additive. The addition of AMS did not aid the herbicide mixture by overcoming the antagonism of Ricestar by Regiment, Strada, and Grasp. However, this study indicated that Londax and Permit did not antagonize Ricestar HT with or without the addition of AMS.

**Evaluation of Experimental Herbicides**

This project continues to evaluate several experimental herbicides for potential use in rice. In 2008, four experimental herbicides were evaluated as postemergence herbicides in rice. One herbicide has both residual and postemergence activity and may receive a federal label in the next 2 to 3 years. These projects are often supported by the company that has the product under development. However, when enough of a product is available, this project expands the research program to gain a better understanding of the herbicide and how it best fits in Louisiana rice production.

**Evaluation of Herbicide Drift in Rice with Roundup, Liberty, Newpath, and Beyond**

This project continues to evaluate herbicide drift of Roundup, Ignite, Newpath, and Beyond on rice. The acreage of Roundup Ready crops is expanding, and in the next few years, Liberty Link soybean acreage will expand along with expanded production of Clearfield rice. With this in mind, the potential for herbicide drift will increase. This project must remain in an active roll in recognizing drift on rice.

**Extension Activities**

This project is continuing to extend the findings from the weed management research programs in Louisiana to producers, agents, and consultants. An annual report is published every year in a timely manner in order to transfer research findings to the clientele of the state and the region. The weed identification publication was released in 2008 for use by the clientele of the state and other rice growing states. This project continues to establish research and demonstration projects at on-farm locations throughout the rice growing region. This project has done numerous on-farm calls to aid producers, agents, and consultants by making herbicide recommendations and to identify weeds, consult on herbicide failures, and identify herbicide drift problems.

This is a summary of the research that was conducted in 2008. To see the complete weed control annual report, please go to

http://www.lsuagcenter.com/en/our_offices/departments/SPESS/Weed+Science/Weed+Science+Annual+Reports.htm

# STATION PERSONNEL

**Steve Linscombe, Professor ------------------------------------------------------------------------------- Resident Coordinator**

| | |
|---|---|
| Jodie R. Gautreaux | Administrative Coordinator |
| Kimberly G. Guidry | Accounting Specialist |
| Carol D. LeDoux | Administrative Program Specialist |
| Darlene M. Regan | Administrative Coordinator |
| Donna L. Sonnier | Custodian |

**S. Brooks Blanche, Assistant Professor/Research ----------------------------------------------------------------- Rice Breeding**

| | |
|---|---|
| Raymond R. Dilly, Jr.[1] | Research Associate |
| Quentin J. Zaunbrecher[2] | Research Associate |

**Michael D. Dronet, Research Farm Maintenance Manager ------------------------------------------------------------Shop**

| | |
|---|---|
| Rayford E. Ancelet[3] | Maintenance Repairer I |
| Todd Cormier[4] | Maintenance Repairer I |
| Harold J. Doucet | Maintenance Repairer Master |
| Joshua P. Regan[5] | Maintenance Repairer I |
| Ted Trahan[6] | Maintenance Repairer I |

**Donald E. Groth, Professor/Research Coordinator-----------------------------------------------------------Rice Pathology**

| | |
|---|---|
| Marty J. Frey (25%) | Research Associate |
| Carl Dischler[7] | Research Associate |
| Joseph Nugent[8] | Research Farm Specialist II |
| Xin Hua Wang | Research Associate |

**Dustin Harrell, Assistant Professor -----------------------------------------------------Rice Agronomy/Rotational Crops**

| | |
|---|---|
| James P. Leonards | Research Associate |
| Ronald P. Regan | Research Associate |
| Douglas M. Walker | Research Associate |

**William J. Leonards, Jr., Research Associate/Coordinator/Manager ------------------------------ Farm Management**

| | |
|---|---|
| Brian D. Broussard | Research Farm Specialist II |
| Paul A. Miller | Research Farm Assistant II |
| Timothy C. Miller | Research Farm Supervisor |
| Jimmy D. Pellerin | Research Farm Specialist II |
| Ronald J. Pellerin | Research Farm Manager I |
| Thomas J. Reed | Research Farm Specialist II |

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[1] Moved from the Physiology Project.
[2] Resigned 02/01/08.
[3] Resigned 02/01/08.
[4] Resigned 02/08/08
[5] Resigned 10/31/08.
[6] Appointed 07/21/08.
[7] Appointed 07/14/08.
[8] Retired 06/01/08.

## STATION PERSONNEL
**(Continued)**

**Steven D. Linscombe, Professor------------------------------------------------------------------------------------ Rice Breeding**

| | |
|---|---|
| Karen F. Bearb | Research Associate |
| Corey A. Conner[9] | Research Associate |
| Herman L. Hoffpauir | Research Farm Specialist II |
| Laura E. Leonards | Research Farm Assistant I |
| Brent W. Theunissen | Research Associate |

**Mona M. Meche, Research Associate ------------------------------------------ Rice Anther Culture/Tissue Culture**

| | |
|---|---|
| Jennifer Dronet | Research Farm Assistant II |
| Xue Jin | Research Farm Specialist I |
| Christie Louvier[10] | Research Farm Assistant II |

**W. Ray McClain, Professor ------------------------------------------------------------------------------------------ Aquaculture**

| | |
|---|---|
| John J. Sonnier | Research Farm Specialist II |

**John K. Saichuk, Professor--------------------------------------------------------------------------- Rice Agronomy/Extension**

| | |
|---|---|
| Kim Landry | Extension Associate |

**Xueyan Sha, Associate Professor---------------------------------------------------------------------------------- Rice Breeding**

| | |
|---|---|
| Blake J. Henry | Research Farm Specialist II |
| Shane J. Theunissen | Research Associate |

**Michael J. Stout (Baton Rouge) -------------------------------------------------------------------------------------Entomology**

Marty J. Frey, Research Associate (75%)

**Herry Utomo, Assistant Professor ----------------------------------Marker-Assisted Selection Breeding/Biotechnology**

| | |
|---|---|
| Gretchen Zaunbrecher[11] | Research Associate |
| Anna L. McClain | Research Farm Specialist II |

**Ida Wenefrida, Assistant Professor/Research--------------------------------------------------------------------- Biotechnology**

**Lawrence M. White, III, Research Associate------------------------------------------------------------ Foundation Seed Rice**

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[9] Resigned 11/21/08.
[10] Resigned 08/15/08.
[11] Appointed 07/07/08.

# COOPERATING PERSONNEL

Cooperating personnel on research projects at the Rice Research Station include the following:

Lucas Aviles ---------------------------------------------------------------------------------------------------- Rice Breeding
University of Puerto Rico Research & Extension Center
Lajas, Puerto Rico

Jeff Davis------------------------------------------------------------------------------------------------- Soybean Entomology
Entomology Department
Louisiana State University Agricultural Center

Jong Hyun Ham ---------------------------------------------------------------------------------------------------Rice Diseases
Department of Plant Pathology and Crop Physiology
Louisiana State University Agricultural Center

Steve A. Harrison ------------------------------------------------------------------ Wheat and Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Clayton A. Hollier------------------------------------------------------------------------------------------ Plant Pathology
Louisiana Cooperative Extension Service
Louisiana State University Agricultural Center

Natalie Hummel ------------------------------------------------------------------------------------------ Rice Insect Control
Department of Entomology
Louisiana State University Agricultural Center

Rick Mascagni ---------------------------------------------------------------------------------------------Grain Sorghum
Northeast Research Station
Louisiana State University Agricultural Center

Mike Materne----------------------------------------------------------------------------------------- Coastal Erosion Control
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Steven Moore ---------------------------------------------------------------------------------------Soybean Variety Trial
Dean Lee Research Station
Louisiana State University Agricultural Center

James H. Oard ---------------------------------------------------------------------------------------------------Rice Genetics
School of Plant, Environmental and Soil Sciences
Louisiana State University Agricultural Center

Boyd Padgett-------------------------------------------------------------------------------------------- Sorghum Diseases
Macon Ridge Research Station
Louisiana State University Agricultural Center

Anthony Rivera---------------------------------------------------------------------------------------------- Rice Breeding
University of Puerto Rico Research & Extension Center
Lajas, Puerto Rico

## COOPERATING PERSONNEL
(Continued)

Robert Romaire------------------------------------------------------------------------------------------------------Aquaculture
Aquaculture Research Station
Louisiana State University Agricultural Center

Milton C. Rush ----------------------------------------------------------------------------------------------------Rice Diseases
Department of Plant Pathology & Crop Physiology
Louisiana State University Agricultural Center

Michael Stout ---------------------------------------------------------------------------------------------- Rice Insect Control
Department of Entomology
Louisiana State University Agricultural Center

Sonny Viator---------------------------------------------------------------------------------------------------- Sweet Sorghum
Iberia Research Station
Louisiana State University Agricultural Center

Eric Webster -------------------------------------------------------------------------------------------------------- Weed Control
Department of Plant Pathology & Crop Physiology
Louisiana State University Agricultural Center

Bill Williams-------------------------------------------------------------------------------------------------------- Weed Control
Northeast Research Station
Louisiana State University Agricultural Center

E. Allen Wilson ------------------------------------------------------------------------------------------------------ Bird Control
USDA Animal Damage Control
Crowley, Louisiana