87th Annual Research Report

RICE RESEARCH STATION

Crowley, Louisiana

1995

Louisiana State University Agricultural Center
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INTRODUCTION

Research work at the Rice Research Station, Crowley, Louisiana, is conducted cooperatively by the Louisiana Agricultural Experiment Station and the United States Department of Agriculture, Agricultural Research Service. The 1995 rice research program included breeding, biotechnology, variety testing, production and distribution of foundation seed, fertilization, soil and water management, cultural practices, weed control, insect control, disease investigations, rice drying, bird control in rice, and physiology studies. Forages and 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, crawfish forages, and multi-cropping of crawfish with agronomic crops. Although most of the research work was performed by members of the Rice Station staff, several staff members from Baton Rouge conducted research at this station.

The research activities of this station include both fundamental and applied research, although the latter predominates due to the mission of the Rice Research Station. Research accomplishments and general progress of the Rice Station during 1995 are presented in this report representing the 87th Annual Research Report of the Rice Research Station, Louisiana Agricultural Experiment Station, Louisiana State University Agricultural Center.

In addition to research responsibilities of the Rice Research Station staff and cooperators, a large number of farmers, extension personnel, and others were trained and otherwise contacted during 1995. Approximately 700 persons attended the annual Rice Research Station field day to view plots and participate in discussions of research findings. Field days were also conducted in East Carroll, Morehouse, and Vermilion parishes. In addition, the staff 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 1995.

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 1995 are listed.

MONTHLY RAINFALL DATA
RICE RESEARCH STATION - CROWLEY, LA
1995

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	YEAR TOTAL
1	.70		.10			.94	.90	1.00					
2					.05	.13					3.30		
3	.10		.09		.04					1.07	3.50		
4	.05		.10	.04			.10			.13			
5			.40	.73			.10						
6				.42			3.03	.10					
7	.50		.51					1.60			.34		
8		.05	1.79										
9					1.50							.60	
10					.08								
11				1.33	.02						.30		
12		1.20			.15								
13	1.26				3.50					.03			
14		.02	5.10				1.80	.80			.03		
15			.12				.20						
16							.20						
17		.66	.19						.30			.50	
18									1.70			5.70	
19	.33				1.48		.52	1.0				.12	
20		.10		.05							.90		
21				.10				.50	.14		.01		
22								.35	1.48				
23	.90			3.30				.35					
24								.10					
25													
26													
27	2.19		.10										
28	1.17	1.20						.10		.20			
29	.01		1.15			.14	1.20				.17		
30			2.30		1.25	.11	.20			.20		.60	
31	.01				.17					.43			
MONTH TOTAL	7.22	3.23	11.95	5.97	8.24	1.32	8.25	5.90	3.62	2.06	8.55	7.52	73.83
1994	5.63	2.19	3.28	6.97	5.50	4.68	8.11	4.90	1.46	2.70	.98	13.00	59.40

RICE BREEDING

GENETIC IMPROVEMENT OF RICE FOR LOUISIANA PRODUCTION[1]

S.D. Linscombe, F. Jodari, K.F. Carriere, J.P. Leonards, K.C. Leonards,
R.J. Guidry, C.G. Gravot, H.L. Hoffpauir, and R. Pollingue

INTRODUCTION

The primary objective of the Rice Breeding project is the development of superior varieti for the Louisiana rice industry. The Breeding project is developing improved genotypes of bo long- and medium-grain types since both are grown in the state and region. Also, under t direction of Dr. Farman Jodari, a major emphasis is placed on the development of spec purpose types.

One new variety was released for commercial production in 1995. 'Lafitte' is a very ear short-statured, medium-grain variety with very good resistance to the currently predomina races of blast disease. The new variety has excellent milling characteristics and should be acceptable for ratoon crop production.

A secondary objective of the Breeding project is to conduct other research studies th may have direct and/or indirect bearing on varietal development activities. Included here a studies on herbicide tolerance of rice genotypes, milling quality, mutation breeding, physiologic characteristics associated with genetic gain, date of planting studies, and evaluation of genetically engineered herbicide resistant rice lines.

The 1995 rice breeding nursery included 53,875 panicle rows, 392 F_1 transpla populations, and 217 F_2 bulk populations. On- and off-station testing included over 4500 plo Yield testing included the Uniform Regional Nursery, which contained 200 experimentals lin and checks (52 Louisiana experimentals). The advanced yield test was conducted at the Ri Research Station and six off-station locations. The 1995 advanced yield test at Crowley w evaluated for sheath blight resistance by the use of paired inoculated versus uninoculated plo The commercial variety test was conducted at the Rice Research Station and five off-stati locations. The preliminary and single plot yield tests provided an initial evaluation of over 8 experimental lines.

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

COOPERATIVE UNIFORM REGIONAL RICE NURSERY (URN)

Public rice breeders in the United States conduct cooperative yield nurseries in whi experimental lines and commercial varieties are grown and evaluated at research locations in Arkansas, Louisiana, Mississippi, Texas, Florida, and California. The nurseries are used to te the adaptation of entries in the diverse rice growing environments of the United States. T entries in the 1995 nursery included material from Arkansas, California, Louisiana, Mississip Texas, and some entries from foreign countries. Main and ratoon crop data were generat from the URN at the Rice Research Station and are presented in Tables 1-14. In tables whe main and ratoon crop numbers are presented, total yield numbers may vary by 1 digit becau of rounding. Information on performance characteristics from all states is compiled and stor in the Rice Data Bank by the Department of Experimental Statistics, LSU Agricultural Center

Experiment: Uniform Regional Nursery - Group I

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23;
46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4;
harvest drainage, July 17; reflood, Aug 9,
harvest drainage, Oct. 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 2; ratoon crop, Oct 11

Experimental Design: Randomized complete block with four replications

Results: Tables 1 and 2

Table 1. Agronomic and milling performance of 1995 uniform regional nursery, Group I. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
8	CPRS//82CAY21/TBNT	L	4	83	37	25	8939	61 - 69
14	L201//TBNT/BLMT	L	4	81	37	10	8792	54 - 68
15	VSTA/LBNT//L201/3/SKBT	L	4	81	40	35	8382	58 - 67
11	LBLE-X2/2/BJ-1*F1//ELBL/...	L	4	75	37	0	8365	59 - 67
16	ALAN	L	3	86	41	30	8301	57 - 66
10	LBNT/STBN//NWBT	L	4	81	42	85	8214	59 - 67
2	MBLE///LMNT/20001-5	L	5	84	40	68	8071	53 - 66
1	ALAN/TBNT	L	4	82	44	80	7966	58 - 69
4	BN73*2/NV76//NWRX	L	4	82	40	8	7958	56 - 66
13	LBNT/9902/3/DAWN/9695//...	L	4	79	38	63	7948	61 - 68
20	JACKSON	L	4	82	41	55	7906	58 - 66
19	MILLIE	L	4	82	41	38	7810	60 - 69
18	JODON	L	5	82	36	30	7604	60 - 68
6	VSTA/LBNT//RSMT	L	8	87	37	0	7553	59 - 67
7	LBLE/L201//TBNT	L	4	83	42	90	7438	61 - 69
5	CPRS/MBLE	L	5	77	33	0	7132	57 - 69
12	GFMT*2/TQNG	L	7	81	37	73	7125	57 - 68
9	GFMT*2/TQNG	L	8	88	38	25	6650	59 - 69
3	GFMT*2/TQNG	L	7	85	37	33	6558	56 - 69
17	MAYBELLE	L	5	74	37	88	5982	58 - 66
C.V., %			9.9	1.9	3.1	--	6.7	3.4 1.8
LSD (0.05)			1	2	2	--	768	3 2

* L = Long grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 2. Performance of main and ratoon crops of 1995 uniform regional nursery, Group I, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
14	L201//TBNT/BLMT	8792	2755	11546
2	MBLE///LMNT/20001-5	8071	2848	10918
15	VSTA/LBNT//L201/3/SKBT	8382	2536	10918
8	CPRS//82CAY21/TBNT	8939	1959	10898
10	LBNT/STBN//NWBT	8214	2429	10643
4	BN73*2/NV76//NWRX	7958	2584	10542
19	MILLIE	7810	2715	10524
11	LBLE-X2/2/BJ-1*F1//...	8365	2157	10521
16	ALAN	8301	2185	10486
20	JACKSON	7906	1956	9861
18	JODON	7604	2098	9702
7	LBLE/L201//TBNT	7438	2180	9618
13	LBNT/9902/3/DAWN/969	6897	2696	9593
12	GFMT*2/TQNG	7125	2037	9162
6	VSTA/LBNT//RSMT	7553	1471	9024
9	GFMT*2/TQNG	6650	2107	8757
1	ALAN/TBNT	6735	1980	8715
5	CPRS/MBLE	7132	1499	8631
3	GFMT*2/TQNG	6558	1890	8447
17	MAYBELLE	5982	2100	8082
C.V., %		6.7	11.2	10.0
LSD (0.05)		768	368	1388

Experiment: Uniform Regional Nursery - Group II

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23;
46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage,
July 17; reflood, Aug 9; harvest drainage, Oct 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 7; ratoon crop, Oct 17

Experimental Design: Randomized complete block with four replications

Results: Tables 3 and 4

Table 3. Agronomic and milling performance of 1995 uniform regional nursery, Group II. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
34	BNGL/CM101	M(W)	5	93	41	25	8627	65 - 70
36	L201//TBNT/BLMT	L	4	84	36	18	8366	56 - 67
22	LAFITTE	M	4	82	37	55	8110	68 - 71
38	BENGAL	M	4	89	36	38	8029	65 - 70
25	MERC//MERC/KOSH	M	5	85	38	88	7891	64 - 69
40	LAGRUE	L	5	85	43	58	7852	53 - 66
33	8403113/3/KCAI/LEAH//LEAH	L	4	80	38	10	7737	59 - 69
27	88427	L	4	78	38	0	7578	58 - 65
21	LBNT/STBN//NWBT	L	4	84	43	90	7522	58 - 67
32	MBLE/RU8703196	L	6	88	44	18	7377	61 - 68
24	ALAN/TBNT	L	4	85	41	90	7274	61 - 69
39	MARS	M	3	88	44	88	7267	63 - 68
28	RICO/V4716	M	4	89	44	80	7184	65 - 70
30	88427	L	4	79	34	0	7151	62 - 89
26	PCOS/LMNT//GFMT	L	7	90	39	0	7073	58 - 68
35	TRO2/LMNT	L	6	93	33	0	6946	59 - 68
23	RU8303116/LMNT	L	8	83	33	0	6600	58 - 67
37	ORION	M	5	89	41	90	6494	60 - 66
29	PCOS/LMNT//GFMT	L	8	92	38	15	6334	59 - 68
31	DMSI//LMNT/NWBT/3/LMNT/...	L(A,E)	5	83	42	35	5731	64 - 69
C.V., %			8.9	1.5	3.8	--	7.4	2.2 1.4
LSD (0.05)			1	2	2	--	781	2 1

* L = Long grain, M = Medium grain (A = aromatic, E = elongating).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 4. Performance of main and ratoon crops of 1995 uniform regional nursery, Group II, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
27	88427	7578	3436	11014
26	PCOS/LMNT//GFMT	7073	3748	10821
36	L201//TBNT/BLMT	8366	2329	10695
35	TRO2/LMNT	6946	3509	10455
34	BNGL/CM101	8627	1828	10455
22	LAFITTE	8110	2007	10117
40	LAGRUE	7852	2177	10029
30	88427	7151	2842	9993
31	DMSI//LMNT/NWBT/3/LMNT...	5731	3824	9555
39	MARS	7267	2288	9554
33	8403113/3/KCAI/LEAH//LEAH	7737	1643	9379
21	LBNT/STBN//NWBT	7522	1708	9230
25	MERC//MERC/KOSH	7891	1057	8948
32	MBLE/RU8703196	7377	1519	8896
24	ALAN/TBNT	7274	1552	8826
28	RICO/V4716	7184	1600	8784
38	BENGAL	8029	657	8686
23	RU8303116/LMNT	6600	1374	7974
37	ORION	6494	638	7132
29	PCOS/LMNT//GFMT	6334	669	7003
C.V., %		7.4	39.6	10.6
LSD (0.05)		781	1144	1466

Experiment: Uniform Regional Nursery - Group III

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23;
46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage,
July 17; reflood, Aug 9; harvest drainage, Oct 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 7; ratoon crop, Oct 17

Experimental Design: Randomized complete block with four replications

Results: Tables 5 and 6

Table 5. Agronomic and milling performance of 1995 uniform regional nursery, Group III. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
50	NWBT/KATY	L	4	84	41	88	9193	60 - 68
44	NWBT/KATY	L	5	87	41	25	8759	62 - 69
47	KATY/NWBT/3/LBNT/STBN//...	L	5	82	40	0	8628	61 - 69
59	CYPRESS	L	4	85	34	0	8185	63 - 69
42	KATY/CPRS	L	5	87	32	0	8076	61 - 69
48	902207X2(25KR)	L	4	86	33	0	8045	62 - 69
55	TBNT/LA110//LMNT/3/...	L	5	91	42	38	7922	52 - 65
53	NWBT/KATY	L	4	81	40	65	7897	62 - 70
41	NWBT/KATY//RA73/LMNT	L	5	81	37	28	7877	60 - 69
45	CPRS/MBLE	L	5	80	30	0	7797	58 - 68
51	LMNT/LBLE SC-5	L	6	92	40	0	7773	46 - 63
60	NEWBONNET	L	5	88	42	80	7659	60 - 68
58	LEMONT	L	6	88	34	0	7594	60 - 69
54	L201//TBNT/BLMT	L	5	95	41	0	7504	58 - 68
57	KAYBONNET	L	5	83	40	85	7344	62 - 68
46	RU8303181/CB801	L	6	85	31	0	7075	61 - 68
56	GULFMONT	L	5	87	35	15	7002	61 - 69
49	GFMT*2/I409	L	7	91	39	0	6864	58 - 67
52	LBLE-X2/2/BJ-1*F1//ELBL/...	L	7	88	37	8	6575	56 - 66
43	GFMT*2/I409	L	8	95	37	0	5924	59 - 68
C.V., %			7.4	1.4	2.9	--	5.8	3.4 1.6
LSD (0.05)			1	2	2	--	644	3 2

* L = Long grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 6. Performance of main and ratoon crops of 1995 uniform regional nursery, Group III, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
50	NWBT/KATY	9193	1280	10472
47	KATY/NWBT/3/LBNT/STBN/...	8628	1736	10364
44	NWBT/KATY	8759	1572	10331
59	CYPRESS	8185	1756	9941
41	NWBT/KATY//RA73/LMNT	7877	1944	9821
42	KATY/CPRS	8076	1716	9792
51	LMNT/LBLE SC-5	7773	1979	9752
46	RU8303181/CB801	7075	2584	9659
57	KAYBONNET	7344	2079	9423
53	NWBT/KATY	7897	1486	9383
48	902207X2(25KR)	8045	1244	9289
45	CPRS/MBLE	7797	1308	9105
58	LEMONT	7594	1352	8946
54	L201//TBNT/BLMT	7504	1276	8780
60	NEWBONNET	7659	986	8645
56	GULFMONT	7002	1625	8627
55	TBNT/LA110//LMNT/3/...	7922	440	8362
52	LBLE-X2/2/BJ-1*F1//ELBL/...	6575	1560	8134
49	GFMT*2/I409	6864	1188	8052
43	GFMT*2/I409	5924	1004	6928
C.V., %		5.8	18.1	5.9
LSD (0.05)		644	398	781

Experiment: Uniform Regional Nursery - Group IV

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 (N-P_2O_5-K_2O) preplant incorporated, Mar 23;
46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage, July 17; reflood, Aug 9; harvest drainage, Oct 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 7; ratoon crop, Oct 17

Experimental Design: Randomized complete block with four replications

Results: Tables 7 and 8

Table 7. Agronomic and milling performance of 1995 uniform regional nursery, Group IV. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
62	MERC/V4716	M	4	80	33	0	8572	63 - 71
76	KATY/STBN	L	4	83	39	18	8551	63 - 69
74	SMARS/MARS//MARS/3/BNGL	M	5	90	37	0	8417	66 - 70
67	NWBT//LBNT/STBN	L	5	85	39	28	8264	58 - 67
73	L201//TBNT/BLMT/3/8403113	L	5	81	31	0	8131	56 - 68
68	BNGL/RICO	M	5	86	42	85	8059	60 - 68
64	ZNTH/3/164986-4/NV66//...	M	4	88	42	88	7954	67 - 70
70	LMNT/RA73	L	5	88	38	18	7760	60 - 68
65	BNGL/RICO	M	5	88	34	13	7716	66 - 69
77	NWBT/KATY	L	4	83	44	65	7713	63 - 69
79	RICO 1	M	6	88	43	65	7591	59 - 67
66	PCOS/LMNT//GFMT	L	7	94	36	0	7459	59 - 67
71	MERC/RICO	M	4	80	35	38	7426	65 - 70
61	88362	L	5	88	36	0	7403	62 - 68
75	PCOS/RU8703196//GFMT	L	6	90	36	0	7377	62 - 69
63	RU8003050/CA82Y24//LMNT	L	7	89	34	0	7200	61 - 68
72	LBNT-WX/BLMT	L(W)	6	88	36	0	7137	62 - 69
69	LMNT/KATY	L	7	90	35	0	6898	59 - 68
80	TORO-2	L	9	92	43	43	6826	60 - 69
78	GFMT*2/TQNG	L	7	91	43	0	6396	58 - 68
C.V., %			8.9	1.3	3.4	--	6.3	2.1 1.1
LSD (0.05)			1	2	2	--	691	2 1

* L = Long grain, M = Medium grain (W = waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 8. Performance of main and ratoon crops of 1995 uniform regional nursery, Group IV, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
62	MERC/V4716	8572	2522	11094
76	KATY/STBN	8551	1947	10498
67	NWBT//LBNT/STBN	8264	1792	10055
73	L201//TBNT/BLMT/3/84	8131	1846	9976
64	ZNTH/3/164986-4/NV66/...	7954	1824	9778
63	RU8003050/CA82Y24//LMNT	7200	2500	9700
77	NWBT/KATY	7713	1918	9631
68	BNGL/RICO	8059	1113	9171
75	PCOS/RU8703196//GFMT	7377	1738	9115
74	SMARS/MARS//MARS/3/BNGL	8417	690	9107
66	PCOS/LMNT//GFMT	7459	1592	9050
61	88362	7403	1603	9006
65	BNGL/RICO	7716	1280	8996
71	MERC/RICO	7426	1530	8956
70	LMNT/RA73	7760	1014	8774
69	LMNT/KATY	6898	1667	8566
72	LBNT-WX/BLMT	7137	1285	8421
79	RICO 1	7591	635	8226
78	GFMT*2/TQNG	6396	1391	7787
80	TORO-2	6826	751	7577
C.V., %		6.3	27.2	7.3
LSD (0.05)		691	603	963

Experiment: Uniform Regional Nursery - Group V

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23; 46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage, July 17; reflood, Aug 9; harvest drainage, Oct 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 2; ratoon crop, Oct. 11

Experimental Design: Randomized complete block with two replications

Results: Tables 9 and 10

Table 9. Agronomic and milling performance of 1995 uniform regional nursery, Group V. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
90	TBNT/NROS//NV66*2/IR-8/3/...	L	4	82	38	30	8621	60 - 69
120	ADAIR	L	4	81	42	50	8616	54 - 66
99	KATY/NWBT/3/LBNT/9902//NWBT	L	4	84	37	0	8354	58 - 67
112	CFRS//82CAY21/TBNT	L	5	78	35	0	8258	59 - 69
108	KATY/NWBT/3/LBNT/9902//NWBT	L	4	82	39	70	8246	62 - 68
91	CFRS/MBLE	L	5	87	34	0	8049	60 - 67
114	LMNT/CR1113	L	3	90	43	40	7869	58 - 67
105	V6DW/STTD//L201/3/VSTA/NTAI	L	5	76	32	0	7809	55 - 65
87	88427	L	4	78	34	0	7790	62 - 70
115	77O2008*2/LBLE//CFRS	L	4	80	32	0	7786	60 - 68
93	88427	L	4	77	32	0	7784	58 - 68
100	GCHW/GFMT	L	3	90	43	35	7636	58 - 66
88	CFRS//82CAY21/TBNT	L	5	75	35	0	7552	60 - 69
104	MBLE/RU8703196	L	6	84	41	0	7536	63 - 68
111	V6DW/STTD//L201/3/VSTA/NTAI	L	4	75	32	0	7460	54 - 65
84	88427	L	4	79	37	0	7441	58 - 66
117	ROSEMONT	L	5	76	30	0	7404	54 - 64
119	L202	L	3	76	33	40	7390	50 - 65
102	V6DW/STTD//L201/3/VSTA/NTAI	L	5	76	36	75	7369	47 - 65
97	JODN/LBLE SC-5	L	5	86	38	0	7296	56 - 64
85	82CAY21/TBNT/3/...	L	5	83	36	0	7159	55 - 66
98	VSTA/LBNT//RSMT	L	8	87	35	0	7120	60 - 66
81	88427	L	4	79	37	0	7082	55 - 64
96	BRAZ/TBNT/3/1649864/NV66/...	M	4	75	39	40	6990	63 - 68
94	CFRS/GFMT	L	4	85	31	0	6980	60 - 67
110	GFMT/KATY//RSMT	L	7	91	44	0	6959	54 - 63
83	TRO2/IR841-85	L	4	84	41	45	6922	57 - 66
113	GFMT*2/TQNG	L	7	81	40	35	6907	48 - 69
116	TXMT/RU8703196	L	6	79	35	35	6864	56 - 67
107	VSTA/LBNT//RSMT	L	8	87	35	0	6849	62 - 68
109	CFRS//82CAY21/TBNT	L	5	71	35	0	6764	61 - 70
103	JODN/LBLE SC-5	L	6	90	40	0	6758	50 - 59
89	GFMT*2/TQNG	L	7	83	37	15	6653	58 - 69
86	LMNT/KATY	L	6	95	34	0	6520	60 - 68
82	CFRS/MBLE	L	5	76	31	0	6457	60 - 89
106	CFRS/MBLE	L	5	76	31	70	6302	59 - 68
101	GFMT*2/I409	L	7	80	38	0	6237	61 - 69
92	RU8903095/GFMT	L	7	84	36	0	6103	52 - 66
118	LABELLE	L	5	76	47	80	6088	61 - 69
95	GFMT*2/I409	L	7	82	38	85	5569	59 - 68
C.V., %			9.2	1.4	3.2	--	6.1	4.1 2.2
LSD (0.05)			1	2	2	--	912	5 3

* L = Long grain, M = Medium grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 10. Performance of main and ratoon crops of 1995 uniform regional nursery, Group V, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
90	TBNT/NROS//NV66*2/IR-8/3/...	8621	1902	10522
120	ADAIR	8616	1852	10467
108	KATY/NWBT/3/LBNT/9902//NWBT	8246	1934	10180
99	KATY/NWBT/3/LBNT/9902//NWBT	8354	1744	10098
112	CFRS//82CAY21/TBNT	8258	1596	9853
105	V6DW/STTD//L201/3/VSTA/NTAI	7809	2030	9839
93	88427	7784	1896	9680
87	88427	7790	1822	9612
111	V6DW/STTD//L201/3/VSTA/NTAI	7460	1995	9454
117	ROSEMONT	7404	2040	9444
115	77O2008*2/LBLE//CFRS	7786	1650	9436
91	CFRS/MBLE	8049	1150	9199
97	JODN/LBLE SC-5	7296	1853	9149
119	L202	7390	1725	9115
88	CFRS//82CAY21/TBNT	7552	1554	9105
102	V6DW/STTD//L201/3/VSTA/NTAI	7369	1629	8998
103	JODN/LBLE SC-5	6758	2101	8859
104	MBLE/RU8703196	7536	1265	8801
113	GFMT*2/TQNG	6907	1860	8767
114	LMNT/CR1113	7869	892	8761
84	88427	7441	1205	8646
96	BRAZ/TBNT/3/1649864/NV66/...	6990	1642	8632
100	GCHW/GFMT	7636	872	8507
85	82CAY21/TBNT/3/...	7159	1289	8447
98	VSTA/LBNT//RSMT	7120	1205	8324
81	88427	7082	1201	8283
116	TXMT/RU8703196	6864	1355	8218
107	VSTA/LBNT//RSMT	6849	1333	8181
89	GFMT*2/TQNG	6653	1526	8179
83	TRO2/IR841-85	6922	1225	8147
110	GFMT/KATY//RSMT	6959	1165	8124
94	CFRS/GFMT	6980	990	7970
109	CFRS//82CAY21/TBNT	6764	1108	7872
101	GFMT*2/I409	6237	1581	7818
86	LMNT/KATY	6520	1194	7714
118	LABELLE	6088	1577	7665
106	CFRS/MBLE	6302	1341	7642
82	CFRS/MBLE	6457	1116	7573
92	RU8903095/GFMT	6103	1041	7144
95	GFMT*2/I409	5569	574	6143
C.V.		6.1	12.7	6.1
LSD (0.05)		912	386	1091

Experiment: Uniform Regional Nursery - Group VI

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23; 46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage, July 17; reflood, Aug 9; harvest drainage, Oct 1

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 7; ratoon crop, Oct 17

Experimental Design: Randomized complete block with two replications

Results: Tables 11 and 12

Table 11. Agronomic and milling performance of 1995 uniform regional nursery, Group VI. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
128	SMARS/MARS//PCOS	M	4	82	32	0	8824	68 - 71
134	MERC/RICO	M	4	79	38	75	7983	62 - 69
136	KATY//TBNT/BLMT	L	4	81	34	0	7908	62 - 71
131	MERC/RICO	M	4	80	37	0	7866	65 - 70
130	KATY//TBNT/NWRX	L	4	80	37	45	7771	59 - 68
127	89482	L	4	83	37	15	7759	65 - 71
154	CB801/8403113	L	5	88	39	80	7753	59 - 69
125	7702008*2/LBLE//CFRS	L	5	87	32	0	7730	62 - 69
133	KATY/NWBT//MILLIE	L	4	81	37	0	7723	58 - 68
152	MARS/M201//MARS/3/MERC/RICO	M	5	88	34	0	7710	66 - 69
122	MARS/NWRX//TBNT/BLMT	L	6	86	32	0	7675	53 - 63
137	LEAH/DLLA	L	5	91	42	0	7641	53 - 68
148	NWBT/3/LBNT/9902//LBLE	L	5	79	35	0	7627	60 - 70
149	SMARS/MARS//PCOS	M	5	81	32	0	7585	65 - 69
143	CFRS/ESD	L(E)	5	88	32	0	7490	62 - 69
145	KATY//TBNT//BLMT	L	5	85	33	0	7459	64 - 71
124	KATY//TBNT/BLMT	L	6	84	31	0	7413	59 - 69
142	LBNT/STBN//NWBT/3/MILLIE	L	4	80	36	0	7395	61 - 70
150	PCOS/RU8703196//GFMT	L	7	88	37	0	7325	63 - 69
121	88427	L	4	78	37	0	7233	58 - 66
156	LMNT/3/TBNT/LA110//LMNT	L	5	85	33	0	7232	64 - 69
155	TXMT/3/LBNT//9881/331581	L	7	89	40	0	7169	52 - 65
151	NWBT/3/LBNT/9902//LBLE	L	4	80	35	0	7055	63 - 70
160	LACASSINE	L	7	88	34	0	6943	58 - 70
139	KATY/NWBT/3/V6DW/STTD//...	L	4	83	38	20	6860	63 - 70
132	LBNTWX/BLMT	L(W)	7	89	33	0	6836	65 - 69
158	REXMONT	L	6	86	33	0	6807	56 - 66
147	KATY//GFMT/PCOS	L	7	86	42	65	6801	60 - 68
146	A301/JSMN	L(A)	5	91	42	85	6697	48 - 66
153	LMNT/TQNG	L	6	88	36	0	6649	62 - 70
157	LMNT/DLLA	L	5	84	32	0	6606	64 - 70
144	GFMT*2/TQNG	L	9	89	39	50	6598	49 - 64
138	PCOS/LMNT//GFMT	L	6	93	33	0	6592	62 - 69
141	GFMT/RU8703196	L	6	91	37	0	6539	58 - 68
129	RU8803072/(VSTA/LBNT)	L	7	89	34	0	6417	55 - 66
123	RSMT//LMNT/TQNG	L	8	89	33	0	6239	63 - 70
126	DLMT/B8462T3-710	L(A,E)	8	89	38	40	6127	55 - 69
135	RXMT/IR48//GFMT	L	7	90	40	20	6112	57 - 66
159	DELLA	L(A)	7	91	51	80	5684	54 - 68
140	DMSI//LMNT/NWBT/3/LMNT/...	L(A,E)	5	75	43	90	4683	58 - 70
C.V.			11.3	1.5	3.8	--	6.8	3.5 1.7
LSD (0.05)			1	2	3	--	993	4 2

* L = Long grain, M = Medium grain (A = aromatic, E = elongating, W = waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 12. Performance of main and ratoon crops of 1995 uniform regional nursery, Group VI, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
148	NWBT/3/LBNT/9902//LBLE	7627	3776	11402
127	89482	7759	2439	10198
136	KATY//TBNT/BLMT	7908	2221	10129
128	SMARS/MARS//PCOS	8824	1294	10118
133	KATY/NWBT//MILLIE	7723	2300	10023
149	SMARS/MARS//PCOS	7585	2221	9806
145	KATY//TBNT//BLMT	7459	2288	9746
130	KATY//TBNT/NWRX	7771	1882	9653
155	TXMT/3/LBNT//9881/331581	7169	2411	9579
131	MERC/RICO	7866	1711	9577
150	PCOS/RU8703196//GFMT	7325	2191	9515
137	LEAH/DLLA	7641	1801	9441
134	MERC/RICO	7983	1348	9331
122	MARS/NWRX//TBNT/BLMT	7675	1497	9172
156	LMNT/3/TBNT/LA110//LMNT	7232	1913	9145
125	7702008*2/LBLE//CFRS	7730	1365	9095
151	NWBT/3/LBNT/9902//LBLE	7055	2027	9082
142	LBNT/STBN//NWBT/3/MILL	7395	1675	9070
143	CFRS/BSD	7490	1565	9055
152	MARS/M201//MARS/3/MERC/RICO	7710	1241	8951
157	LMNT/DLLA	6606	2335	8941
132	LBNTWX/BLMT	6836	1873	8708
121	88427	7233	1413	8645
124	KATY//TBNT/BLMT	7413	1165	8577
139	KATY/NWBT/3/V6DW/STTD//...	6860	1700	8560
160	LACASSINE	6943	1573	8516
153	LMNT/TQNG	6649	1845	8493
154	CB801/8403113	7753	708	8461
158	REXMONT	6807	1486	8292
138	PCOS/LMNT//GFMT	6592	1636	8228
147	KATY//GFMT/PCOS	6801	1271	8072
141	GFMT/RU8703196	6539	1283	7822
123	RSMT//LMNT/TQNG	6239	1366	7605
144	GFMT*2/TQNG	6598	864	7462
146	A301/JSMN	6697	592	7289
129	RU8803072/(VSTA/LBNT)	6417	838	7255
135	RXMT/IR48//GFMT	6112	1098	7210
126	DLMT/B8462T3-710	6127	697	6825
140	DMSI//LMNT/NWBT/3/LMNT/...	4683	2084	6767
159	DELLA	5684	590	6273
C.V., %		6.8	26.1	7.4
LSD (0.05)		993	889	1336

Experiment: Uniform Regional Nursery - Group VII

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Mar 28, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 100-50-50 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23;
46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 18 ft (84 ft^2)

Water Management: Flood, Mar 27; drain, Apr 1; reflood, Apr 4; harvest drainage,
July 24; reflood, Aug 10; harvest drainage, Oct 8

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28
Ordram (molinate) 3 lb ai/A, May 5

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 9; ratoon crop, Oct 20

Experimental Design: Randomized complete block with two replications

Results: Tables 13 and 14

Table 13. Agronomic and milling performance of 1995 uniform regional nursery, Group VII. Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
200	TQNG	M	6	95	44	90	9999	51 - 66
168	PCOS/MERC	M	5	86	33	0	8624	67 - 69
165	SMARS/MARS//MARS/3/RICO	M	3	85	33	0	8605	66 - 70
174	STRN//MERC/RICO/4/...	M	3	89	40	0	8318	61 - 64
170	LMNT/RA73//KATY	L	4	88	38	0	8184	62 - 67
183	RICO/MERC	M	5	84	39	80	8175	64 - 68
192	ORIN//MERC/RICO	M	4	87	37	0	8116	63 - 67
186	TBNT/LA110//LMNT/3/...	L	5	96	39	0	8002	55 - 66
179	87290	L	5	91	42	20	7951	61 - 69
173	LMNT/KATY	L	4	88	44	10	7948	62 - 69
188	LMNT/RA73/3/LBNT/9902//...	L	4	86	41	45	7795	59 - 67
172	RXMT/IR48//RSMT	L	6	87	39	0	7794	54 - 65
196	LMNT/KATY	L	4	89	34	0	7792	58 - 67
177	A301/LBNTX2	L(A)	5	92	35	0	7776	55 - 66
161	LMNT/RA73//KATY	L	4	89	42	40	7683	62 - 68
197	KATY	L	4	87	43	90	7679	59 - 67
180	CPRS/LMNTX2	L	5	87	37	0	7649	61 - 69
169	PCOS/LMNT//GPMT	L	7	96	37	0	7634	57 - 67
167	LMNT/RA73//KATY	L	4	88	39	0	7600	61 - 67
185	LMNT/KATY	L	6	92	35	0	7596	60 - 68
193	NWBT/KATY	L	4	86	43	0	7534	62 - 68
194	LMNT/KATY	L	4	89	34	0	7502	57 - 69
191	TBNT/LA110//LMNT/3/...	L	5	96	40	0	7424	56 - 67
162	NWBT/LMNT//TBNT/3/V7817	L	6	97	40	0	7423	55 - 65
184	LBNT-WX/BLMT	L(W)	6	91	36	0	7279	63 - 68
175	GPMT*2/TQNG	L	6	98	40	0	7266	56 - 68
182	LMNT/RA73//KATY	L	5	91	34	0	7249	56 - 66
198	A301	L(A)	6	87	39	0	7207	56 - 68
166	LMNT/RXMT	L	7	96	40	0	7005	59 - 69
163	DLMT/B8462T3-710	L(E)	6	90	39	0	6962	57 - 69
176	LMNT/RA73//KATY	L	5	95	39	0	6919	55 - 88
164	LMNT/RA73//KATY	L	5	95	40	45	6873	57 - 67
189	MERC/RICO//BNGL	M	4	85	40	0	6863	65 - 68
187	WC1403/GPMT*2	L	7	94	41	55	6764	58 - 88
178	DLMT/B8462T3-710	L	7	90	36	0	6602	54 - 69
171	DLLA//TTEP*4/LMNT	L(A)	5	79	43	90	6371	54 - 69
190	DLMT/B8462T3-710	L(E)	8	92	35	0	6308	55 - 68
181	LMNT*3/JSMN	L(A)	9	105	38	0	5950	56 - 66
199	SATURN	M	3	87	50	90	5824	61 - 65
195	DMSI//LMNT/NWBT/3/LMNT/...	L(A,E)	5	83	44	0	5325	59 - 68
C.V., %			13.0	1.1	2.7	--	7.0	3.4 1.8
LSD (0.05)			1	2	2	--	1068	4 2

* L = Long grain, M = Medium grain (A = aromatic, E = elongating, W = waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 14. Performance of main and ratoon crops of 1995 uniform regional nursery, Group VII, Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		------lb/A @ 12%-------		
183	RICO/MERC	8175	2555	10730
170	LMNT/RA73//KATY	8184	2136	10320
200	TQNG	9999	-	-
168	PCOS/MERC	8624	1205	9829
173	LMNT/KATY	7948	1588	9535
165	SMARS/MARS//MARS/3/RICO	8605	832	9437
167	LMNT/RA73//KATY	7600	1776	9376
174	STRN//MERC/RICO/4/...	8318	968	9286
197	KATY	7679	1498	9177
180	CFRS/LMNTX2	7649	1421	9070
175	GFMT*2/TQNG	7266	1730	8995
161	LMNT/RA73//KATY	7683	1270	8952
188	LMNT/RA73/3/LBNT/9902//...	7795	1153	8948
163	DLMT/B8462T3-710	6962	1937	8899
169	PCOS/LMNT//GFMT	7634	1245	8879
184	LBNT-WX/BLMT	7279	1517	8796
193	NWBT/KATY	7534	1170	8703
185	LMNT/KATY	7596	1084	8680
172	RXMT/IR48//RSMT	7794	875	8668
192	ORIN//MERC/RICO	8116	534	8650
177	A301/LBNTX2	7776	863	8639
179	87290	7951	636	8587
186	TBNT/LA110//LMNT/3/...	8002	546	8547
190	DLMT/B8462T3-710	6308	2034	8341
171	DLLA//TTEP*4/LMNT	6371	1904	8275
198	A301	7207	1044	8251
178	DLMT/B8462T3-710	6602	1557	8159
196	LMNT/KATY	7792	374	8094
191	TBNT/LA110//LMNT/3/...	7424	625	8048
182	LMNT/RA73//KATY	7249	768	8017
162	NWBT/LMNT//TBNT/3/V7817	7423	587	8009
194	LMNT/KATY	7502	466	7968
181	LMNT*3/JSMN	5950	1997	7947
166	LMNT/RXMT	7005	651	7656
189	MERC/RICO//BNGL	6863	704	7566
187	WC1403/GFMT*2	6764	661	7425
195	DMSI//LMNT/NWBT/3/LMNT	5325	1948	7273
176	LMNT/RA73//KATY	6919	327	7156
164	LMNT/RA73//KATY	6873	184	7057
199	SATURN	5824	-	-
C.V., %		7.0	26.2	6.4
LSD (0.05)		1068	663	1180

COMMERCIAL VARIETY TESTS

The Rice Breeding project annually conducts yield trials on commercial rice varieties. Included in these tests are the major commercial varieties and advanced experimental lines in final stages of testing before release from cooperating public and private breeding programs.

These tests were conducted at five locations in Louisiana in 1995. These included the Rice Research Station, the Northeast Research Station at St. Joseph, and on-farm locations in Calcasieu, East Carroll, and Vermilion parishes. The East Carroll location was conducted in cooperation with Dr. Patrick Bollich. The Northeast Research Station location was conducted in cooperation with Dr. David Jordan, weed scientist at that location.

These tests included the following entries:

Entry	Grain type*	Source**
Very Early Group		
Adair	L	AAES
Akitakomachi	S	Japan
Alan	L	AAES
Jackson	L	TAES, USDA; MAFES
Jefferson	L	TAES, USDA
Jodon	L	LAES
Koshihikari	S	Japan
L-202	L	CCRRF
LaGrue	L	AAES
Maybelle	L	TAES, USDA
Millie	L	AAES
RT 7015	L	Rice Tec
Tebonnet	L	AAES
Early Group		
AB 869	M	Busch Ag.
Bengal	M	LAES
Cypress	L	LAES
Della	L (aromatic)	LAES
Dellmont	L (aromatic)	TAES, USDA
Dellrose	L (aromatic)	LAES

Continued.

Continued.

Entry	Grain type*	Source**
Early Group (continued)		
Drew	L	AAES
Gulfmont	L	TAES, USDA
Katy	L	AAES
Kaybonnet	L	AAES
LA (900)2177	M	LAES
LA (920)2071	L	LAES
LA (930)2065	L	LAES
LA (930)2165	M	LAES
LA (940)2028	M	LAES
LA (940)2048	L	LAES
LA (950)2031	L (aromatic,elongating)	LAES
LA (950)2137	L (aromatic)	LAES
Lacassine	L	LAES
Lafitte	M	LAES
Lemont	L	TAES, USDA
Mars	M	AAES
MS (940)4077	L	MAFES
MS (940)4186	L	MAFES
Newbonnet	L	AAES
Orion	M	AAES
Rico 1	M	TAES, USDA
Saturn	M	LAES
Toro 2	L (low amylose)	LAES
TX (900)3092	L	TAES, USDA

* L = long grain, M = medium grain, and S = short grain.
** Busch Ag., Jonesboro, AR; AAES, Rice Research and Extension Center, Arkansas Agricultural Experiment Station, Stuttgart, AR; MAFES, Delta Research and Extension Center, Mississippi Agricultural and Forestry Experiment Station, Stoneville, MS; LAES, Rice Research Station, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Crowley, LA; CCRRF, Rice Experiment Station, California Cooperative Rice Research Foundation, Biggs, CA; TAES, USDA, Texas A & M Research and Education Center, Texas Agricultural Experiment Station, U.S. Department of Agriculture, Beaumont, TX; RiceTec Inc., Alvin, TX.

Individual location data are presented in Tables 15 to 25. Summary data are presented in Tables 26 and 27.

Experiment: Commercial Variety Test - Very Early Group

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, Mar 24, 1995

Planting Method: Drill-seeded

Fertilization: 17-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23; 92 lb N/A, Apr 28; 46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Mar 28; flood, May 1; harvest drainage, July 7; reflood, Aug 9; harvest drainage, Sept 22

Herbicides: Stam (propanil) 4 lb ai/A, Apr 20; Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), Apr 28

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 2; ratoon crop, Oct 2

Experimental Design: Randomized complete block with four replications

Results: Tables 15 and 16

Table 15. Agronomic and milling performance of 1995 commercial varieties, very early group, Crowley, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
MILLIE	5	89	43	0	8080	61 - 69
JEFFERSON	7	89	37	0	7934	59 - 67
JODON	6	90	37	0	7933	58 - 66
JACKSON	5	91	43	20	7828	54 - 66
RT 7015	6	89	36	0	7729	56 - 66
LAGRUE	5	92	44	0	7706	52 - 66
ALAN	4	89	42	10	7593	58 - 67
MAYBELLE	5	80	39	40	7567	61 - 68
L-202	5	87	36	0	7266	49 - 63
ADAIR	5	88	46	63	7259	53 - 66
TEBONNET	6	89	55	90	6391	59 - 67
AKITAKOMACHI	7	85	40	85	6143	71 - 73
KOSHIHIKARI	6	86	42	85	4420	67 - 71
C.V., %	8.5	1.0	3.1	--	7.5	3.3 1.6
LSD (0.05)	1	1	7	--	793	3 2

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 16. Performance of main and ratoon crops of 1995 commercial varieties, very early group, Crowley, LA.

1995 entry	Main crop yield	Ratoon crop yield	Total yield
	lb/A @ 12%		
MILLIE	8080	2746	10826
LAGRUE	7706	2047	9753
RT 7015	7729	1941	9670
ALAN	7593	1998	9591
JEFFERSON	7934	1513	9447
JACKSON	7828	1572	9400
MAYBELLE	7567	1711	9278
JODON	7933	1339	9272
L-202	7266	1953	9218
ADAIR	7259	1877	9136
AKITAKOMACHI	6143	1672	7815
TEBONNET	6391	1144	7535
KOSHIHIKARI	4420	1745	6165
C.V., %	7.5	17.2	6.8
LSD (0.05)	793	454	903

Experiment: Commercial Variety Test - Early Group

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, Mar 24, 1995

Planting Method: Drill-seeded

Fertilization: 17-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23; 92 lb N/A, Apr 28; 46 lb N/A, May 31; 62 lb N/A, Aug 9 (ratoon crop)

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Mar 28; flood, May 1; harvest drainage, July 19; reflood, Aug 9; harvest drainage, Sept 28

Herbicides: Stam (propanil) 4 lb ai/A, Apr 20; Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), Apr 28

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 4; ratoon crop, Oct 10

Experimental Design: Randomized complete block with four replications

Results: Tables 17 and 18

Table 17. Agronomic and milling performance of 1995 commercial varieties, early group, Crowley, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
RICO 1	7	93	44	0	10718	62 - 68
LA 2028	5	95	41	0	8930	67 - 71
MARS	4	90	46	5	8881	65 - 69
DREW	6	92	43	0	8797	60 - 68
LA 2165	5	91	36	0	8643	64 - 70
LA 2177	7	90	37	0	8529	62 - 68
ORION	6	90	41	0	8408	64 - 69
LAFITTE	5	92	38	0	8166	68 - 71
LACASSINE	6	93	36	0	8162	59 - 70
KAYBONNET	5	95	41	0	8161	62 - 69
LA 2065	5	98	33	0	8152	63 - 70
KATY	6	93	44	0	8102	62 - 68
LA 2048	5	96	36	0	8061	63 - 69
AB 869	6	89	37	0	7947	65 - 69
NEWBONNET	5	91	41	0	7944	60 - 68
LA 2071	6	103	40	0	7905	56 - 67
BENGAL	4	96	34	0	7817	66 - 70
CYPRESS	4	96	35	0	7695	64 - 69
TORO-2	9	95	42	0	7621	60 - 69
LA 2137	5	98	42	0	7526	56 - 69
DELIMONT	7	95	35	0	7456	56 - 70
SATURN	5	90	54	90	7429	66 - 68
GULFMONT	6	91	37	0	7252	62 - 69
LEMONT	7	97	36	0	7172	60 - 69
TX 3092	7	92	33	0	7021	61 - 68
DELLROSE	6	96	39	0	6944	65 - 71
DELLA	7	92	54	60	6131	55 - 67
LA 2031	6	93	42	0	6012	63 - 70
C.V., %	9.3	1.1	3.5	--	6.0	2.3 1.2
LSD (0.05)	1	1	2	--	688	2 1

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 18. Performance of main and ratoon crops of 1995 commercial varieties, early group, Crowley, LA.

1995 entry	Main crop yield	Ratoon crop yield	Total yield
	----------lb/A @ 12%----------		
RICO 1	10797	1237	12034
LA 2028	8930	1188	10118
DREW	8797	1285	10082
LA 2071	7905	1973	9878
LA 2165	8643	1204	9847
MARS	8881	919	9800
LACASSINE	8162	1615	9777
KATY	8102	1654	9756
LA 2065	8152	1475	9627
KAYBONNET	8161	1273	9435
ORION	8408	865	9273
LAFITTE	8166	1085	9250
LA 2177	8529	715	9243
DELLMONT	7456	1752	9208
NEWBONNET	7944	1248	9192
LA 2137	7526	1548	9074
AB 869	7947	1030	8977
DELLROSE	6944	1986	8930
LEMONT	7172	1704	8876
LA 2048	8061	809	8870
CYPRESS	7695	1121	8815
BENGAL	7817	957	8774
TORO-2	7621	1146	8767
TX 3092	7021	1694	8715
GULFMONT	7252	1326	8578
SATURN	7429	181	7610
LA 2031	6012	1365	7377
DELLA	6131	558	6689
C.V., %	6.0	14.4	5.7
LSD (0.05)	688	258	752

Experiment: Commercial Variety Test - Very Early Group

Location: Ralph Hardy Farm, Calcasieu Parish

Seeding Rate/Date: 100 lb/A, Mar 28, 1995

Planting Method: Drill-seeded

Fertilization: 17-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 28; 92 lb N/A, Apr 27; 21 lb N/A, May 31; 21 lb N/A, June 13

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Mar 28; flood, Apr 27; harvest drainage, July 17

Herbicides: Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), Apr 24

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 24

Harvest: Aug 1

Experimental Design: Randomized complete block with four replications

Results: Table 19

Table 19. Agronomic performance of 1995 commercial varieties, very early group, Calcasieu Parish, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)
ADAIR	5	89	43	0	7616
ALAN	5	90	40	0	6985
JEFFERSON	8	92	37	0	6872
LAGRUE	5	92	43	0	6691
TEBONNET	6	92	51	8	6642
MILLIE	5	90	41	0	6556
JACKSON	5	91	40	0	6539
KOSHIHIKARI	8	88	39	43	6523
AKITAKOMACHI	7	87	39	0	6283
L-202	5	87	36	0	6207
JODON	8	95	37	0	6172
RT 7015	9	97	38	0	5411
MAYBELLE	5	83	37	0	5070
C.V., %	10.6	1.7	3.6	--	10.6
LSD (0.05)	1	2	2	--	1012

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Commercial Variety Test - Early Group

Location: Ralph Hardy Farm, Calcasieu Parish

Seeding Rate/Date: 100 lb/A, Mar 28, 1995

Planting Method: Drill-seeded

Fertilization: 17-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 28; 92 lb N/A, Apr 27; 21 lb N/A, May 31; 21 lb N/A, June 13

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Mar 28; flood, Apr 27; harvest drainage, July 25

Herbicides: Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), Apr 24

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 24

Harvest: Aug 8

Experimental Design: Randomized complete block with four replications

Results: Table 20

Table 20. Agronomic performance of 1995 commercial varieties, early group, Calcasieu Parish, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)
RICO 1	6	97	45	0	8179
DREW	7	100	47	0	8037
KAYBONNET	6	95	45	8	7732
LA 2165	6	98	40	0	7721
LA 2028	5	94	45	0	7608
CYPRESS	5	95	38	0	7488
LA 2048	6	99	38	0	7459
LACASSINE	6	96	37	0	7346
LAFITTE	6	91	39	0	7210
DELLROSE	7	96	41	0	7208
ORION	6	95	40	0	7137
LA 2177	7	98	37	0	6999
BENGAL	5	97	37	0	6970
LA 2065	6	103	36	0	6969
GULFMONT	6	94	39	0	6541
AB 869	6	92	38	0	6452
DELLMONT	6	100	38	0	6360
KATY	6	103	49	0	6312
MS 4077	6	94	41	0	6295
LEMONT	8	104	38	0	6110
TX 3092	7	97	36	0	6052
LA 2137	7	101	45	0	5962
SATURN	5	94	52	58	5926
MARS	4	93	46	0	5856
MS 4186	6	100	41	0	5853
LA 2071	7	105	40	0	5495
DELLA	8	105	53	0	5335
NEWBONNET	5	98	44	0	4994
LA 2031	7	93	43	0	4577
TORO-2	9	105	42	0	3610
C.V., %	11.7	2.1	3.4	--	11.1
LSD (0.05)	1	3	2	--	1036

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Commercial Variety Test - Early Group

Location: Pine Island, Trahan Farm, Vermilion Parish

Seeding Rate/Date: 100 lb/A, Apr 19, 1995

Planting Method: Drill-seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O) preplant incorporated, Apr 19; 75 lb N/A, May 16

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flood, May 17; harvest drainage, Aug 9

Herbicides: Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), May 12

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 29

Harvest: Aug 21

Experimental Design: Randomized complete block with four replications

Results: Table 21

Table 21. Agronomic performance of 1995 commercial varieties, early group, Pine Island, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)
LA 2048	5	87	35	0	5645
BENGAL	5	88	34	0	5618
KAYBONNET	5	88	41	0	5380
LACASSINE	5	88	36	0	5355
DELLMONT	5	89	36	0	5086
GULFMONT	5	87	36	0	5058
LA 2028	5	88	41	0	5034
LAFITTE	6	88	36	0	4984
RICO 1	5	88	39	0	4884
DREW	6	90	43	0	4846
LA 2165	6	89	37	0	4814
SATURN	4	90	47	0	4739
KATY	5	90	43	0	4707
LA 2137	5	89	41	0	4653
NEWBONNET	5	90	42	0	4650
ORION	6	88	39	0	4536
DELLROSE	6	89	38	0	4511
LA 2177	5	88	35	0	4491
CYPRESS	5	89	37	0	4441
MARS	3	87	40	0	4432
TX 3092	6	89	34	0	4318
AB 869	4	85	36	0	4244
LA 2065	7	92	37	0	4243
MS 4186	6	92	39	0	4094
LEMONT	7	92	37	0	4051
LA 2071	7	91	39	0	3977
MS 4077	5	88	37	0	3738
DELLA	7	91	47	0	3673
LA 2031	6	85	39	0	2661
TORO-2	9	93	37	0	2157
C.V., %	14.2	1.6	3.8	--	14.7
LSD (0.05)	1	2	2	--	944

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Commercial Variety Test - Very Early and Early Groups

Location: Northeast Research Station, St Joseph

Seeding Rate/Date: 100 lb/A, Apr 5, 1995

Planting Method: Drill-seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O) preplant incorporated, Apr 5; 150 lb N/A, May 15

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flood, Mar 15; harvest drainage, Aug 1

Herbicides: Facet (quinclorac) .375 lb ai/A, Apr 20; Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), May 9

Harvest: Aug 9

Experimental Design: Randomized complete block with four replications

Results: Tables 22 and 23

Table 22. Agronomic performance of 1995 commercial varieties, very early group, St. Joseph, LA.

1995 entry	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)
JACKSON	111	47	40	7174
L-202	104	41	70	6979
MILLIE	105	51	0	6734
JODON	111	43	0	6668
LAGRUE	107	51	0	6476
ALAN	111	49	0	6407
ADAIR	106	50	50	6061
TEBONNET	116	58	20	5613
JEFFERSON	111	40	0	5304
RT 7015	111	42	0	5187
MAYBELLE	105	46	0	5018
AKITAKOMACHI	107	39	55	4679
KOSHIHIKARI	104	40	75	4665
C.V., %	NS	3.7	--	9.9
LSD (0.05)	NS	3	--	864

Table 23. Agronomic performance of 1995 commercial varieties, early group, St. Joseph, LA.

1995 entry	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)
BENGAL	108	43	0	10369
KAYBONNET	113	51	0	8329
DELLROSE	107	44	0	7745
MS 4077	110	53	0	7722
KATY	108	54	0	7669
DREW	116	53	0	7663
NEWBONNET	109	51	0	7600
LA 2177	108	42	0	7565
AB 869	106	46	0	7547
LEMONT	110	42	0	7528
LA 2028	102	50	47	7506
DELLMONT	111	42	0	7501
LA 2048	111	45	0	7367
LA 2137	108	51	0	7322
LACASSINE	110	44	0	7293
CYPRESS	110	46	0	7283
LA 2065	111	42	0	7261
LA 2071	114	47	0	7190
MS 4186	113	48	0	7165
RICO 1	106	49	53	7039
TX 3092	107	39	0	7028
GULFMONT	107	42	0	6970
LA 2165	112	45	0	6672
DELLA	106	54	60	6338
ORION	104	46	35	6327
TORO-2	113	46	60	6258
LAFITTE	101	42	30	6202
MARS	105	50	80	5777
SATURN	109	52	85	5381
LA 2031	109	48	0	4460
C.V., %	NS	3.4	--	12.6
LSD (0.05)	NS	3	--	1283

Experiment: Commercial Variety Test - Very Early and Early Groups

Location: Epps, Buford Perry Farm, East Carroll Parish

Seeding Rate/Date: 100 lb/A, May 11, 1995

Planting Method: Drill-seeded

Fertilization: 150 lb N/A, June 15

Plot Size: 7 x 25 ft (175 ft^2)

Water Management: Flush, May 15, May 21, May 26 and June 6; flood, June 17; harvest drainage, Sept 1

Herbicides: Stam (propanil) 4.8 lb ai/A + Facet (quinclorac) .3 lb ai/A + Londax (bensulfuron) .03 oz ai/A, June 3; Londax .66 oz ai/A, June 29 and July 17

Insecticides: Furadan (carbofuran) .5 lb ai/A, July 7

Fungicides: Benlate (benomyl) .75 lb ai/A, Aug 5

Harvest: Sept 26

Experimental Design: Randomized complete block with four replications

Results: Tables 24 and 25

Table 24. Agronomic and milling performance of 1995 commercial varieties, very early group, East Carroll Parish, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
LAGRUE	4	93	48	23	8886	51 - 67
ADAIR	4	87	46	60	8328	49 - 66
JODON	6	90	42	0	7861	58 - 68
TEBONNET	5	89	55	80	7124	57 - 68
ALAN	4	88	45	53	7106	56 - 69
MILLIE	4	87	48	28	7069	63 - 72
JACKSON	5	89	41	0	6738	58 - 69
JEFFERSON	6	86	38	0	6680	62 - 69
RT 7015	5	89	39	0	6311	60 - 70
L-202	5	87	37	0	6279	53 - 68
KOSHIHIKARI	6	85	44	90	6082	71 - 74
MAYBELLE	6	79	38	0	5894	53 - 71
AKITAKOMACHI	6	78	42	88	5375	72 - 74
C.V., %	8.5	1.0	6.3	--	6.9	3.8 1.5
LSD (0.05)	1	1	3	--	708	3 1

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 25. Agronomic and milling performance of 1995 commercial varieties, early group, East Carroll Parish, LA.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
RICO 1	5	91	49	75	10118	62 - 70
BENGAL	4	91	39	10	8215	66 - 71
DREW	5	96	50	15	7531	62 - 69
LA 2028	5	90	46	18	7377	66 - 70
KAYBONNET	5	93	47	0	7315	59 - 70
LAFITTE	5	91	39	0	7190	67 - 71
LA 2165	5	95	41	0	7173	62 - 69
MARS	3	89	48	68	7163	64 - 69
NEWBONNET	6	91	46	0	7103	59 - 68
LA 2048	4	95	41	0	6910	62 - 69
LA 2177	6	93	41	0	6868	62 - 69
LA 2071	6	93	46	0	6819	54 - 68
CYPRESS	5	96	43	0	6721	63 - 69
TORO-2	8	93	44	0	6493	60 - 70
LA 2137	6	90	47	28	6486	47 - 71
SATURN	4	88	47	83	6445	66 - 70
AB 869	4	85	40	0	6433	65 - 69
LA 2065	5	96	39	0	6423	61 - 70
TX 3092	6	90	36	0	6329	59 - 70
ORION	5	88	42	0	6213	64 - 70
LEMONT	6	96	37	0	6061	61 - 71
KATY	5	97	48	0	5824	61 - 68
DELLROSE	5	90	39	0	5748	59 - 70
GULFMONT	5	92	37	0	5667	53 - 70
DELLMONT	6	95	36	0	5625	58 - 71
DELLA	7	92	50	5	5419	51 - 69
LACASSINE	5	93	37	0	5203	54 - 69
LA 2031	6	87	45	3	4186	57 - 69
C.V., %	8.4	1.3	3.9	-	5.8	3.8 1.6
LSD (0.05)	1	2	3	-	542	3 1

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 26. Agronomic and milling performance of 1995 commercial varieties, very early group, five location means.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
LAGRUE	5	94	45	8	7440	52 - 67
ADAIR	4	91	45	43	7316	51 - 66
JODON	6	95	38	0	7158	58 - 67
MILLIE	5	92	44	9	7110	62 - 70
JACKSON	5	94	41	15	7070	56 - 68
ALAN	4	93	42	21	7023	57 - 68
JEFFERSON	7	93	37	0	6697	60 - 68
L-202	5	90	37	18	6683	51 - 65
TEBONNET	6	95	53	49	6442	58 - 68
RT 7015	7	95	38	0	6160	58 - 68
MAYBELLE	5	86	39	13	5887	57 - 69
AKITAKOMACHI	6	88	39	58	5620	71 - 73
KOSHIHIKARI	7	90	40	76	5422	69 - 73
C.V., %	10.6	2.3	4.4	--	10.6	4.4 1.4
LSD (0.05)	1	3	2	--	1061	5 2

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 27. Agronomic and milling performance of 1995 commercial varieties, early group, five location means.

1995 entry	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
RICO 1	6	95	45	26	8188	62 - 69
BENGAL	5	96	37	3	7798	66 - 71
KAYBONNET	5	97	45	2	7383	59 - 70
AR 1176	6	98	47	4	7375	61 - 69
LA 2028	5	94	44	13	7291	66 - 70
LA 2048	5	98	39	0	7088	62 - 69
LA 2165	6	97	40	0	7004	63 - 69
LA 2177	6	95	38	0	6890	62 - 69
LAFITTE	5	92	39	6	6750	67 - 71
CYPRESS	5	97	40	0	6725	63 - 69
LACASSINE	5	96	38	0	6672	57 - 70
LA 2065	6	100	38	0	6610	61 - 70
AB 869	5	91	39	0	6525	65 - 69
ORION	5	93	42	7	6524	64 - 69
KATY	5	98	47	0	6523	61 - 68
NEWBONNET	5	96	45	0	6458	59 - 68
DELLROSE	6	95	40	0	6431	59 - 70
MARS	4	93	46	31	6422	65 - 69
DELLMONT	6	98	37	0	6405	57 - 70
LA 2137	6	97	45	7	6390	47 - 71
GULFMONT	5	94	38	0	6297	58 - 70
LA 2071	7	101	42	0	6277	54 - 68
LEMONT	7	100	38	0	6184	60 - 70
TX 3092	6	95	36	0	6149	60 - 69
SATURN	5	94	50	63	5984	66 - 69
DELLA	7	97	52	25	5379	53 - 68
TORO-2	9	100	42	12	5228	60 - 70
LA 2031	6	94	43	1	4379	57 - 69
C.V., %	9.5	2.4	4.4	--	10.7	3.1 1.1
LSD (0.05)	1	3	2	--	941	5 2

* Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

ADVANCED YIELD TESTS

The Rice Breeding project annually conducts on-farm testing of advanced experimental lines to complement tests conducted on station. The primary goal of this program is to sample additional environments in yield, milling, and agronomic variable testing of new promising selections from the varietal development program. These additional evaluations are needed to identify the performance characteristics, strengths, and weaknesses of the test entries. Multi-location and multi-year testing are essential to provide the information needed to make decisions relative to the release of new varieties.

These tests were conducted at the Rice Research Station (RRS), the Northeast Research Station at St. Joseph (in cooperation with Dr. David Jordan) and at four off-station locations in 1995. The off-station (on-farm) locations were as follows:

East Carroll Parish (Epps, LA) - Buford Perry Farm
Jefferson Davis Parish (Fenton, LA) - Jimmy Hoppe Farm
Morehouse Parish (Jones, LA) - Kirk Zaunbrecher Farm
Vermilion Parish (Gueydan, LA) - Errol Lounsberry Farm

Twenty-six experimentals and four checks were included in the 1995 testing program. Ratoon crop information was generated at the RRS and at the Vermilion Parish location. The East Carroll, Morehouse, and Vermilion parish locations were conducted in cooperation with Dr. Pat Bollich and the Rice Fertilization and Cultural Management Project. The East Carroll and Morehouse locations were managed by Mr. Doug Walker.

The advanced yield test at the RRS was conducted in such a way to quantify the level of sheath blight resistance of the various lines. The test was planted in the normal manner, then an entire second set of the test was planted in an adjacent cut. The second set was inoculated with Rhizoctonia solani just after the panicle initiation stage of development. Thus, these plots were subjected to high levels of sheath blight pressure. This work was conducted in cooperation with Dr. Don Groth. Tables 28-32 present data from these studies. Data from the Northeast Research Station and off-station locations are presented in tables 33-38. Summary data are presented in Table 39 (Summary data includes only the uninoculated test from the RRS).

Experiment: Advanced Yield Test

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, Mar 24, 1995

Planting Method: Drill-seeded

Fertilization: 17-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 23; 92 lb N/A, Apr 28; 63 lb N/A, Aug 9

Plot Size: 4.66 x 20 ft (93 ft^2)

Water Management: Flood, May 1; harvest drainage, July 19; reflood, Aug 9; harvest drainage, Sept 28

Herbicides: Stam (propanil) 4 lb ai/A, Apr 20; Arrosolo (propanil 3 lb ai/A + molinate 3 lb ai/A), Apr 28

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Harvest: Aug 4; ratoon crop, Oct 10

Experimental Design: Randomized complete block with four replications

Results: Tables 28-32

Table 28. Agronomic and milling performance of 1995 advanced yield test (uninoculated), Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	%SB[1]	SB[1]
212	BNGL/RICO	M	5	94	45	0	9481	62 - 68	12	2
222	RICO/V4716	M	5	95	41	0	8930	67 - 71	16	2
220	STRN//MERC/RICO/4/...	M	4	96	39	0	8625	62 - 66	22	3
214	SMARS/MARS//MARS/...	M	6	99	38	0	8598	66 - 69	18	3
210	MERC/V4716	M	4	93	32	0	8576	68 - 71	38	5
211	BNGL/RICO	M	6	96	33	0	8567	66 - 69	16	3
201	MBLE//LMNT/20001-5	L	5	91	38	0	8249	59 - 68	52	5
204	CPRS//82CAY21/TBNT	L	6	92	35	0	8207	64 - 70	48	5
203	LAFITTE	M	5	92	38	0	8166	68 - 71	26	3
205	MERC//MERC/KOSH	M	5	95	37	0	8166	67 - 70	26	3
230	KAYBONNET	L	5	95	41	0	8161	62 - 69	22	3
213	KATY/CPRS	L	5	98	33	0	8152	63 - 70	44	5
209	90 2207X2(25KR)	L	5	96	36	0	8061	63 - 69	40	4
215	82CAY21/TBNT/3/...	L	6	94	34	0	7946	55 - 67	36	4
216	LMNT/LBLE SC-5	L	6	103	40	0	7905	56 - 67	14	3
228	BENGAL	M	4	96	34	0	7817	66 - 70	18	3
207	LBLE2-2/BJ-1*F1//...	L	5	88	34	0	7739	64 - 70	44	6
229	CYPRESS	L	4	96	35	0	7695	64 - 69	42	5
219	MARS/M201//MARS/3/...	M	5	95	37	0	7671	66 - 69	20	3
208	CPRS/MBLE	L	6	96	32	0	7663	59 - 69	32	4
223	LEAH/DLLA	L(A)	5	98	42	0	7526	56 - 69	30	4
217	JODN/LBLE SC-5	L	6	94	33	0	7504	60 - 65	28	4
221	ORIN//MERC/RICO	M	5	96	36	0	7449	61 - 67	16	3
218	PCOS/MERC	M	6	98	33	0	7433	65 - 70	20	3
227	DELLROSE	L(A)	6	96	39	0	6944	65 - 71	28	4
206	CPRS/MBLE	L	6	90	31	0	6882	61 - 70	52	6
202	CPRS/MBLE	L(A,E)	5	87	33	0	6706	62 - 70	50	7
225	DMSI//LMNT/NWBT/3/...	L(A,E)	6	93	42	0	6012	63 - 70	24	3
226	DMSI//LMNT/NWBT/3/...	L	6	88	45	8	5335	53 - 69	30	4
224	BNGL/CM101	M(W)	6	102	37	0	4928	45 - 69	12	2
C.V., %			9.6	1.3	3.4	-	6.7	3.1 1.2		
LSD (0.05)			1	2	2	-	733	3 1		

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] %SB = percent sheath blight; SB = sheath blight rating, scale 0-9.

Table 29. Performance of main and ratoon crops of 1995 advanced yield test (uninoculated). Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		----------lb/A @ 12%----------		
212	BNGL/RICO	9481	1295	10775
201	MBLE//LMNT/20001-5	8249	1982	10231
222	RICO/V4716	8930	1188	10118
216	LMNT/LBLE SC-5	7905	1973	9878
220	STRN//MERC/RICO/4/...	8625	1132	9758
211	BNGL/RICO	8567	1181	9748
210	MERC/V4716	8576	1122	9698
214	SMARS/MARS//MARS/3/...	8598	1035	9633
213	KATY/CFRS	8152	1475	9627
230	KAYBONNET	8161	1273	9435
204	CFRS//82CAY21/TBNT	8207	1185	9392
205	MERC//MERC/KOSH	8166	1193	9358
203	LAFITTE	8166	1085	9250
215	82CAY21/TBNT/3/...	7946	1221	9167
223	LEAH/DLLA	7526	1548	9074
217	JODN/LBLE SC-5	7504	1446	8949
227	DELIROSE	6944	1986	8930
209	90 2207X2(25KR)	8061	809	8870
219	MARS/M201//MARS/3/...	7671	1198	8868
207	LBLE2-2/BJ-1*F1//...	7739	1094	8833
229	CYPRESS	7695	1121	8815
228	BENGAL	7817	957	8774
208	CFRS/MBLE	7663	967	8630
218	PCOS/MERC	7433	1021	8453
221	ORIN//MERC/RICO	7449	814	8263
206	CFRS/MBLE	6882	955	7837
202	CFRS/MBLE	6706	1072	7779
225	DMSI//LMNT/NWBT/3/...	6012	1365	7377
226	DMSI//LMNT/NWBT/3/...	5335	1355	6690
224	BNGL/CM101	4928	1167	6095
C.V., %		6.7	13.4	6.3
LSD (0.05)		733	238	822

Table 30. Agronomic and milling performance of 1995 advanced yield test (inoculated with Rhizoctonia solani). Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	%SB[1]	SB[1]
222	RICO/V4716	M	5	95	41	10	8923	66 - 71	16	4
212	BNGL/RICO	M	6	93	43	0	8737	60 - 69	21	4
220	STRN//MERC/RICO/4/...	M	5	96	39	0	8622	60 - 65	20	4
214	SMARS/MARS//MARS/...	M	5	98	37	0	8584	64 - 69	40	4
211	BNGL/RICO	M	6	96	34	0	8455	65 - 68	28	4
210	MERC/V4716	M	5	92	32	0	8341	68 - 71	56	5
203	LAFITTE	M	5	92	38	0	8316	67 - 70	38	5
228	BENGAL	M	4	95	35	0	8064	66 - 70	28	4
205	MERC//MERC/KOSH	M	5	93	36	0	7920	66 - 70	48	5
218	PCOS/MERC	M	6	96	32	0	7874	64 - 69	24	4
221	ORIN//MERC/RICO	M	6	96	36	0	7717	60 - 67	28	4
201	MBLE//LMNT/20001-5	L	5	90	38	0	7687	61 - 69	62	5
230	KAYBONNET	L	5	94	39	0	7681	61 - 69	54	5
219	MARS/M201//MARS/3/...	M	5	95	37	0	7600	66 - 69	40	5
207	LBLE2-2/BJ-1*F1//...	L	5	88	34	0	7447	63 - 70	88	8
209	90 2207X2(25KR)	L	5	96	35	20	7304	61 - 69	76	7
216	LMNT/LBLE SC-5	L	6	101	40	0	7195	52 - 66	28	5
229	CYPRESS	L	4	95	36	0	7181	63 - 70	70	7
223	LEAH/DLLA	L(A)	5	98	40	0	7117	57 - 70	24	4
208	CFRS/MBLE	L	6	94	31	0	7080	53 - 68	68	6
204	CFRS//82CAY21/TBNT	L	5	92	35	0	7046	63 - 70	82	7
213	KATY/CFRS	L	4	95	32	0	6995	64 - 71	70	7
217	JODN/LBLE SC-5	L	5	94	33	0	6861	61 - 66	56	6
227	DELLROSE	L(A)	6	95	37	0	6756	65 - 71	78	6
215	82CAY21/TBNT/3/...	L	6	94	34	0	6607	53 - 66	82	7
206	CFRS/MBLE	L	6	89	32	30	6105	53 - 69	94	8
225	DMSI//LMNT/NWBT/3/...	L(A,E)	6	92	42	0	5798	63 - 70	74	6
202	CFRS/MBLE	L	5	87	31	40	5294	55 - 68	98	8
226	DMSI//LMNT/NWBT/3/...	L(A,E)	6	89	44	50	5081	54 - 70	54	5
224	BNGL/CM101	M(W)	6	101	36	0	4855	39 - 69	22	4
C.V., %			9.5	0.9	3.4	--	5.7	3.4 1.2		
LSD (0.05)			1	1	2	--	597	3 1		

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] %SB = percent sheath blight; SB = sheath blight rating, scale 0-9.

Table 31. Performance of main and ratoon crops of 1995 advanced yield test (inoculated with Rhizoctonia solani). Crowley, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		----------lb/A @ 12%----------		
222	RICO/V4716	8923	1038	9961
212	BNGL/RICO	8737	1085	9822
220	STRN//MERC/RICO/4/...	8622	1068	9690
201	MBLE//LMNT/20001-5	7687	1996	9683
211	BNGL/RICO	8455	1191	9646
210	MERC/V4716	8341	1182	9522
203	LAFITTE	8316	1117	9433
214	SMARS/MARS//MARS/3/...	8584	770	9353
205	MERC//MERC/KOSH	7920	1204	9123
216	LMNT/LBLE SC-5	7195	1778	8973
230	KAYBONNET	7681	1243	8923
228	BENGAL	8064	797	8861
223	LEAH/DLLA	7117	1738	8855
218	PCOS/MERC	7874	941	8815
219	MARS/M201//MARS/3/...	7600	991	8592
227	DELLROSE	6756	1823	8578
207	LBLE2-2/BJ-1*F1//...	7447	1074	8521
221	ORIN//MERC/RICO	7717	689	8406
204	CFRS//82CAY21/TBNT	7046	1256	8301
209	90 2207X2(25KR)	7304	940	8244
213	KATY/CFRS	6995	1245	8240
217	JODN/LBLE SC-5	6861	1378	8238
229	CYPRESS	7181	973	8154
208	CFRS/MBLE	7080	914	7995
215	82CAY21/TBNT/3/...	6607	986	7593
206	CFRS/MBLE	6105	1095	7200
225	DMSI//LMNT/NWBT/3/...	5798	1322	7120
226	DMSI//LMNT/NWBT/3/...	5081	1456	6537
202	CFRS/MBLE	5294	1094	6387
224	BNGL/CM101	4855	1013	5868
C.V., %		5.7	20.4	5.7
LSD (0.05)		598	344	696

Table 32. Comparison of performance of 1995 advanced yield entries under uninoculated versus inoculated (*Rhizoctonia solani*) conditions. Crowley, LA.

1995 entry	Pedigree	Yield		Difference	%
		Uninoculated	Inoculated		
		--------lb/A @ 12%--------			
212	BNGL/RICO	9481	8737	744	7.8
222	RICO/V4716	8930	8923	7	---
220	STRN//MERC/RICO/4/...	8625	8622	3	---
214	SMARS/MARS//MARS/...	8598	8584	14	---
210	MERC/V4716	8576	8341	235	2.7
211	BNGL/RICO	8567	8455	112	1.3
201	MBLE//LMNT/20001-5	8249	7687	562	6.8
204	CFRS//82CAY21/TBNT	8207	7046	1161	14.1
203	LAFITTE	8166	8316	-150	+1.8
205	MERC//MERC/KOSH	8166	7920	246	3.0
230	KAYBONNET	8161	7681	480	5.9
213	KATY/CFRS	8152	6995	1157	14.2
209	90 2207X2(25KR)	8061	7304	757	9.4
215	82CAY21/TBNT/3/...	7946	6607	1339	16.9
216	LMNT/LBLE SC-5	7905	7195	710	9.0
228	BENGAL	7817	8064	-247	+3.2
207	LBLE-2/BJ-1*F1//...	7739	7447	292	3.8
229	CYPRESS	7695	7181	514	6.7
219	MARS/M201//MARS/3/...	7671	7600	71	1.0
208	CFRS/MBLE	7663	7080	583	7.6
223	LEAH/DLLA	7526	7117	409	5.4
217	JODN/LBLE SC-5	7504	6861	643	8.6
221	ORIN//MERC/RICO	7449	7717	-268	3.6
218	PCOS/MERC	7433	7874	-441	+5.9
227	DELLROSE	6944	6756	188	2.7
206	CFRS/MBLE	6882	6105	777	11.3
202	CFRS/MBLE	6706	5294	1412	21.1
225	DMSI//LMNT/NWBT/3/...	6012	5798	214	3.6
226	DMSI//LMNT/NWBT/3/...	5335	5081	254	4.8
224	BNGL/CM101	4928	4855	73	1.5

Experiment: Advanced Yield Test

Location: Epps, Buford Perry Farm, East Carroll Parish

Seeding Rate/Date: 100 lb/A, May 11, 1995

Planting Method: Drill-seeded

Fertilization: 150 lb N/A, June 15

Plot Size: 7 x 25 ft (175 ft^2)

Water Management: Flush, May 15, 21 and 26, June 6; flood, June 17; harvest drainage, Sept 1

Herbicides: Stam (propanil) 4.8 lb ai/A + Facet (quinclorac) .3 lb ai/A + Londax (bensulfuron) .3 oz ai/A, June 3; Londax .66 oz ai/A, June 29 and July 17

Insecticides: Furadan (carbofuran) .5 lb ai/A, July 7

Fungicides: Benlate (benomyl) .75 lb ai/A, Aug 5

Harvest: Sept 26

Experimental Design: Randomized complete block with four replications

Results: Table 33

Table 33. Agronomic and milling performance of 1995 advanced yield test. East Carroll Parish, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
211	BNGL/RICO	M	5	96	38	3	8534	64 - 69
214	SMARS/MARS//MARS/...	M	5	97	43	0	8468	65 - 71
204	CFRS//82CAY21/TBNT	L	5	95	43	0	8269	60 - 69
212	BNGL/RICO	M	5	95	46	30	8255	59 - 69
228	BENGAL	M	4	97	39	10	8215	66 - 71
218	PCOS/MERC	M	5	96	39	50	7689	66 - 70
210	MERC/V4716	M	5	94	36	0	7397	67 - 71
222	RICO/V4716	M	5	96	46	18	7377	66 - 70
205	MERC//MERC/KOSH	M	5	92	39	58	7344	65 - 70
230	KAYBONNET	L	5	99	47	0	7315	59 - 70
220	STRN//MERC/RICO/4/...	M	4	97	43	10	7286	60 - 66
203	LAFITTE	M	5	97	39	0	7190	67 - 71
219	MARS/M201//MARS/3/...	M	4	97	42	5	7140	65 - 70
215	82CAY21/TBNT/3/...	L	5	99	42	0	6996	59 - 69
209	90 2207X2(25KR)	L	4	101	41	0	6910	62 - 69
207	LBLE2-2/BJ-1*F1//...	L	5	85	41	0	6902	57 - 69
216	LMNT/LBLE SC-5	L	6	99	46	0	6819	54 - 68
221	ORIN//MERC/RICO	M	5	94	37	0	6731	64 - 69
229	CYPRESS	L	5	102	43	0	6721	63 - 69
208	CFRS/MBLE	L	6	96	33	0	6640	57 - 69
217	JODN/LBLE SC-5	L	4	94	36	0	6574	58 - 66
223	LEAH/DLLA	L(A)	6	96	47	28	6486	47 - 71
201	MBLE//LMNT/20001-5	L	5	90	45	35	6477	46 - 67
213	KATY/CFRS	L	5	102	39	0	6423	61 - 70
224	BNGL/CM101	M(W)	6	98	41	13	6376	61 - 70
202	CFRS/MBLE	L	6	86	32	0	5964	57 - 71
206	CFRS/MBLE	L	6	86	32	0	5858	56 - 71
227	DELLROSE	L(A)	5	96	39	0	5748	59 - 70
225	DMSI//LMNT/NWBT/3/...	L(A,E)	6	93	45	3	4186	57 - 69
226	DMSI//LMNT/NWBT/3/...	L(A,E)	5	89	49	63	4133	50 - 70
C.V., %			9.5	1.3	4.0	--	6.4	4.2 1.4
LSD (0.05)			1	2	1	--	624	4 1

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Advanced Yield Test

Location: Jones, Zaunbrecher Farm, Morehouse Parish

Seeding Rate/Date: 150 lb/A, May 18, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 120 lb N/A, June 14

Plot Size: 7 x 25 ft (175 ft^2)

Water Management: Flood, May 17; drain, May 22; flush, May 25, June 6 and 10; flood, June 17; harvest drainage, Sept 1

Herbicides: Stam (propanil) 4 lb ai/A + Facet (quinclorac) .25 ai/A + 2 pt/A crop oil, June 9; Londax (bensulfuron) .66 oz ai/A, June 29

Insecticides: Furadan (carbofuran) .5 lb ai/A, July 7

Harvest: Sept 20

Experimental Design: Randomized complete block with four replications

Results: Table 34

Table 34. Agronomic and milling performance of 1995 advanced yield test. Morehouse Parish, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
214	SMARS/MARS//MARS/3/...	M	5	86	41	0	8410	60 - 69
212	BNGL/RICO	M	4	82	47	20	8148	59 - 70
211	BNGL/RICO	M	4	84	37	0	8115	63 - 69
228	BENGAL	M	4	85	38	0	8007	63 - 69
204	CFRS//82CAY21/TBNT	L	4	82	40	13	7897	57 - 68
209	90 2207X2(25KR)	L	5	88	40	25	7790	59 - 68
230	KAYBONNET	L	4	86	45	30	7428	58 - 69
210	MERC/V4716	M	5	82	35	0	7314	56 - 71
220	STRN//MERC/RICO/4/...	M	3	86	41	0	7262	62 - 67
223	LEAH/DLLA	L(A)	5	87	37	0	7085	60 - 69
208	CFRS/MBLE	L	6	85	33	0	6991	55 - 68
222	RICO/V4716	M	5	85	42	28	6976	61 - 70
219	MARS/M201//MARS/3/...	M	4	84	39	0	6661	64 - 70
218	PCOS/MERC	M	5	83	35	0	6633	62 - 68
229	CYPRESS	L	4	88	40	8	6506	59 - 68
207	LBLE2-2/BJ-1*F1//...	L	4	74	39	0	6494	55 - 69
216	LMNT/LBLE SC-5	L	5	87	42	0	6460	49 - 67
217	JODN/LBLE SC-5	L	4	81	34	0	6447	60 - 67
213	KATY/CFRS	L	4	88	36	0	6364	60 - 70
215	82CAY21/TBNT/3/...	L	5	86	38	0	6347	58 - 69
203	LAFITTE	M	5	82	37	0	6257	67 - 71
206	CFRS/MBLE	L	6	75	31	0	5842	57 - 71
221	ORIN//MERC/RICO	M	5	83	36	0	5818	66 - 70
205	MERC//MERC/KOSH	M	5	79	37	33	5799	65 - 71
202	CFRS/MBLE	L	6	74	31	0	5736	54 - 70
201	MBLE//LMNT/20001-5	L	4	77	40	60	5583	49 - 68
225	DMSI//LMNT/NWBT/3/...	L(A,E)	5	81	47	70	5541	48 - 70
227	DELLROSE	L(A)	5	83	37	0	5339	57 - 70
224	BNGL/CM101	M(W)	7	101	33	0	5096	59 - 70
226	DMSI//LMNT/NWBT/3/...	L(A,E)	5	77	48	75	4221	50 - 70
C.V., %			9.6	1.2	3.9	--	6.5	5.3 1.8
LSD (0.05)			1	1	2	--	618	4 2

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Advanced Yield Test

Location: Fenton, Jimmy Hoppe Farm, Jefferson Davis Parish

Seeding Rate/Date: 100 lb/A, Apr 10, 1995

Planting Method: Drill-seeded

Fertilization: 17-53-53 lb/A (N-P_2O_5-K_2O) preplant incorporated, Apr 10; 92 lb N/A, May 3; 21 lb N/A, June 13

Plot Size: 4.66 x 20 ft (93 ft^2)

Water Management: Flush, Apr 26; flood, May 3; harvest drainage, July 28

Herbicides: Stam (propanil) 4 lb ai/A, Apr 20; Arrosolo (propanil) 3 lb ai/A + (molinate) 3 lb ai/A, Apr 24; Londax (bensulfuron) 1 oz ai/A, May 12

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 24

Harvest: Aug 9

Experimental Design: Randomized complete block with four replications

Results: Table 35

Table 35. Agronomic performance of 1995 advanced yield test. Jeff Davis Parish, LA.

1995 entry	Pedigree	Grain type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging %	Yield (lb/A @ 12%)
218	PCOS/MERC	M	5	87	37	0	8090
204	CPRS//82CAY21/TBNT	L	5	84	38	0	7880
211	BNGL/RICO	M	5	88	36	0	7794
201	MBLE//LMNT/20001-5	L	4	82	41	25	7643
212	BNGL/RICO	M	5	88	48	28	7619
203	LAFITTE	M	5	81	40	48	7599
207	LBLE2-2/BJ-1*F1//...	L	4	79	37	0	7556
230	KAYBONNET	L	6	89	47	8	7330
221	ORIN//MERC/RICO	M	5	87	37	0	7304
220	STRN//MERC/RICO/4/...	M	4	90	41	5	7210
214	SMARS/MARS//MARS/...	M	5	91	41	0	7154
205	MERC//MERC/KOSH	M	5	82	38	73	7150
222	RICO/V4716	M	5	89	47	18	7138
219	MARS/M201//MARS/3/...	M	4	88	41	0	7031
217	JODN/LBLE SC-5	L	4	85	37	0	7024
208	CPRS/MBLE	L	6	78	35	0	6964
227	DELLROSE	L(A)	6	88	43	5	6925
229	CYPRESS	L	5	91	40	0	6920
209	90 2207X2(25KR)	L	5	91	40	0	6872
208	CPRS/MBLE	L	5	86	36	0	6809
215	82CAY21/TBNT/3/...	L	6	90	39	0	6786
228	BENGAL	M	4	90	38	0	6712
213	KATY/CPRS	L	5	91	37	0	6644
202	CPRS/MBLE	L	6	77	35	0	6479
223	LEAH/DLLA	L(A)	5	91	48	10	6163
216	LMNT/LBLE SC-5	L	7	92	42	0	5963
210	MERC/V4716	M	4	84	34	0	5945
224	BNGL/CM101	M(W)	6	79	47	58	5330
226	DMSI//LMNT/NWBT/3/...	L(A,E)	6	79	47	38	4971
225	DMSI//LMNT/NWBT/3/...	L(A,E)	6	86	44	0	4438
C.V., %			9.7	1.8	3.5	--	7.1
LSD (0.05)			1	2	3	--	698

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Advanced Yield Test

Location: Northeast Research Station, St. Joseph

Seeding Rate/Date: 100 lb/A, May 5, 1995

Planting Method: Drill-seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O) preplant incorporated, Apr 5; 150 lb N/A, May 15

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flood, May 15; harvest drainage, Aug 1

Herbicides: Facet (quinclorac) .375 lb ai/A, Apr 20; Arrosolo (propanil) 3 lb ai/A + (molinate) 3 lb ai/A, May 9

Harvest: Aug 9

Experimental Design: Randomized complete block with four replications

Results: Table 36

Table 36. Agronomic performance of 1995 advanced yield test. St. Joe, LA.

1995 entry	Pedigree	Grain type*	Days to 50% heading	Plant height (in)	Lodging %	Yield (lb/A @ 12%)
228	BENGAL	M	108	43	0	10369
211	BNGL/RICO	M	103	39	0	9351
214	SMARS/MARS//MARS/3/...	M	107	45	0	8862
204	CFRS//82CAY21/TBNT	L	106	44	0	8774
210	MERC/V4716	M	103	39	0	8752
221	ORIN//MERC/RICO	M	109	42	0	8532
230	KAYBONNET	L	113	51	0	8329
220	STRN//MERC/RICO/4/...	M	106	45	55	8283
219	MARS/M201//MARS/3/...	M	107	42	0	8057
217	JODN/LBLE SC-5	L	115	43	0	8018
215	82CAY21/TBNT/3/...	M	111	44	0	7976
218	PCOS/MERC	M	103	39	30	7966
227	DELLROSE	L(A)	107	44	0	7745
208	CFRS/MBLE	L	107	40	0	7642
207	LBLE2-2/BJ-1*F1//...	L	102	43	0	7534
222	RICO/V4716	M	102	50	47	7506
212	BNGL/RICO	M	107	47	40	7401
209	90 2207X2(25KR)	L	111	45	0	7367
223	LEAE/DLLA	L(A)	108	51	0	7322
229	CYPRESS	L	110	46	0	7283
213	KATY/CFRS	L	111	42	0	7261
216	LMNT/LBLE SC-5	L	114	47	0	7190
203	LAFITTE	M	101	42	30	6202
201	MBLE//LMNT/20001-5	L	110	45	0	5559
205	MERC//MERC/KOSH	M	106	40	60	5552
225	DMSI//LMNT/NWBT/3/...	L(A,E)	109	48	0	4460
226	DMSI//LMNT/NWBT/3/...	L(A,E)	103	52	0	3881
C.V., %			NS	4.5	--	12.9
LSD (0.05)			NS	3	--	1394

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Experiment: Advanced Yield Test

Location: Gueydan, Errol Lounsberry Farm, Vermilion Parish

Seeding Rate/Date: 150 lb/A, Mar 27, 1995

Planting Method: Water-seeded (pre-germinated seed)

Fertilization: 90-45-45 (N-P_2O_5-K_2O) preplant incorporated, Mar 23; preplant incorporated, ratoon crop, 75 lb N/A, July 30

Plot Size: 7 x 25 ft (175 ft^2)

Water Management: Flood, Mar 24; drain, Apr 1; reflood, Apr 6; harvest drainage, July 17; reflood, Aug 5; harvest drainage, Oct 12

Herbicides: Londax (bensulfuron) 1 oz ai/A, Apr 28

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 5

Fungicides: Benlate (benomyl) .75 lb ai/A, June 19

Harvest: Aug 2

Experimental Design: Randomized complete block with four replications

Results: Tables 37-38

Table 37. Agronomic and milling performance of 1995 advanced yield test. Vermilion Parish, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
214	SMARS/MARS//MARS/...	M	4	92	41	0	8614	63 - 68
211	BNGL/RICO	M	6	90	37	0	8569	65 - 68
212	BNGL/RICO	M	4	89	47	5	7961	64 - 69
204	CPRS//82CAY21/TBNT	L	4	83	36	0	7863	60 - 68
221	ORIN//MERC/RICO	M	5	88	38	0	7669	65 - 68
203	LAFITTE	M	4	81	36	0	7557	69 - 72
201	MBLE//LMNT/20001-5	L	6	86	40	7	7556	59 - 69
220	STRN//MERC/RICO/4/...	M	3	92	42	3	7501	60 - 64
218	PCOS/MERC	M	5	88	35	0	7443	67 - 70
205	MERC//MERC/KOSH	M	5	86	37	0	7167	67 - 71
215	82CAY21/TBNT/3/...	L	6	87	37	1	7035	57 - 68
230	KAYBONNET	L	5	90	41	9	6930	60 - 68
207	LBLE2-2/BJ-1*F1//...	L	3	78	36	0	6901	56 - 67
216	LMNT/LBLE SC-5	L	6	91	42	0	6651	47 - 64
229	CYPRESS	L	4	90	38	2	6473	57 - 66
217	JODN/LBLE SC-5	L	3	81	37	0	6451	59 - 67
208	CPRS/MBLE	L	6	84	33	0	6444	55 - 65
222	RICO/V4716	M	4	90	44	6	6424	67 - 70
227	DELLROSE	L(A)	7	88	39	6	6311	63 - 70
209	90 2207X2(25KR)	L	3	89	38	2	6284	57 - 66
213	KATY/CPRS	L	4	89	39	0	6247	63 - 70
219	MARS/M201//MARS/3/...	M	4	88	39	0	6154	64 - 68
228	BENGAL	M	5	92	37	0	5968	58 - 65
202	CPRS/MBLE	L	5	76	35	0	5829	62 - 71
223	LEAH/DLLA	L(A)	4	93	44	3	5594	51 - 67
210	MERC/V4716	M	6	83	35	0	5485	61 - 66
206	CPRS/MBLE	L	4	77	36	0	5134	57 - 69
225	DMSI//LMNT/NWBT/3/...	L(A,E)	4	85	39	0	4846	63 - 70
224	BNGL/CM101	M(W)	4	77	42	9	4822	60 - 72
226	DMSI//LMNT/NWBT/3/...	L(A,E)	5	79	43	9	4705	56 - 71
C.V., %			17.6	1.2	9.1	-	7.0	4.1 2.5
LSD (0.05)			1	1	5	-	668	4 3

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

Table 38. Performance of main and ratoon crops of 1995 advanced yield test. Vermilion Parish, LA.

1995 entry	Pedigree	Main crop yield	Ratoon crop yield	Total yield
		----------lb/A @ 12%----------		
214	SMARS/MARS//MARS/3/...	8614	1835	10449
201	MBLE//LMNT/20001-5	7556	2752	10308
211	BNGL/RICO	8569	1643	10212
216	LMNT/LBLE SC-5	6651	3331	9983
220	STRN//MERC/RICO/4/...	7501	2404	9904
204	CFRS//82CAY21/TBNT	7863	1844	9707
212	BNGL/RICO	7961	1571	9532
230	KAYBONNET	6930	2511	9442
221	ORIN//MERC/RICO	7669	1730	9399
203	LAFITTE	7557	1565	9122
205	MERC//MERC/KOSH	7167	1807	8975
227	DELLROSE	6311	2581	8892
229	CYPRESS	6473	2319	8792
218	PCOS/MERC	7443	1331	8773
207	LBLE2-2/BJ-1*F1//...	6901	1843	8744
215	82CAY21/TBNT/3/...	7035	1494	8529
209	90 2207X2(25KR)	6284	2206	8489
213	KATY/CFRS	6247	2154	8401
222	RICO/V4716	6424	1880	8304
217	JODN/LBLE SC-5	6451	1719	8170
208	CFRS/MBLE	6444	1706	8150
228	BENGAL	5968	1985	7953
219	MARS/M201//MARS/3/...	6154	1668	7822
223	LEAH/DLLA	5594	2184	7778
202	CFRS/MBLE	5829	1680	7509
210	MERC/V4716	5485	1549	7034
224	BNGL/CM101	4822	2035	6856
206	CFRS/MBLE	5134	1493	6627
225	DMSI//LMNT/NWBT/3/...	4846	1744	6590
226	DMSI//LMNT/NWBT/3/...	4705	1850	6555
C.V., %		7.0	10.2	9.7
LSD (0.05)		668	341	1076

Table 39. Agronomic and milling performance of 1995 advanced yield test. Five location means.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
211	BNGL/RICO	M	5	93	36	1	8488	65 - 68
214	SMARS/MARS//MARS/3/BNGL	M	5	95	41	0	8351	65 - 69
204	CFRS//82CAY21/TBNT	L	5	90	41	3	8148	62 - 69
212	BNGL/RICO	M	5	92	46	25	8144	63 - 69
228	BENGAL	M	4	94	38	2	7848	62 - 68
220	STRN//MERC/RICO/4/...	M	4	94	41	12	7694	61 - 65
230	KAYBONNET	L	5	95	46	25	7582	61 - 68
218	PCOS/MERC	M	5	92	36	11	7542	66 - 70
222	RICO/V4716	M	5	93	46	27	7392	67 - 71
221	ORIN//MERC/RICO	M	5	93	38	0	7250	63 - 68
210	MERC/V4716	M	5	90	36	0	7245	64 - 68
209	90 2207X2(25KR)	L	4	96	41	9	7214	60 - 68
207	LBLE2-2/BJ-1*F1//...	L	4	84	38	0	7188	60 - 69
215	82CAY21/TBNT/3/...	L	5	94	38	3	7181	56 - 68
203	LAFITTE	M	5	89	38	11	7162	69 - 71
219	MARS/M201//MARS/3/MERC/RICO	M	4	93	41	1	7119	65 - 69
208	CFRS/MBLE	L	6	92	36	0	7031	57 - 67
217	JODN/LBLE SC-5	L	4	92	36	0	7003	59 - 66
229	CYPRESS	L	4	96	41	6	6933	61 - 68
205	MERC//MERC/KOSH	M	5	90	38	38	6863	67 - 70
213	KATY/CFRS	L	5	96	38	0	6848	63 - 70
201	MBLE//LMNT/20001-5	L	5	89	41	37	6844	59 - 69
216	LMNT/LBLE SC-5	L	6	98	43	0	6831	52 - 65
223	LEAH/DLLA	L(A)	5	95	46	13	6696	54 - 68
227	DELLROSE	L(A)	6	93	41	12	6502	64 - 71
202	CFRS/MBLE	L	6	80	33	0	6143	62 - 70
206	CFRS/MBLE	L	6	81	33	0	6136	59 - 69
224	BNGL/CM101	M(W)	6	91	41	31	5310	53 - 70
225	DMSI//LMNT/NWBT/3/LMNT/...	L(A,E)	5	91	43	15	4914	63 - 70
226	DMSI//LMNT/NWBT/3/LMNT/...	L(A,E)	5	86	47	54	4541	55 - 70
C.V., %			7.6	2.3	6.2	--	11.6	4.1 1.6
LSD (0.05)			1	2	3	--	506	4 2

* L = Long grain, M = Medium grain (A = Aromatic, E = Elongating, W = Waxy).
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

PRELIMINARY YIELD TESTS

The preliminary yield tests provide the first stage of yield plot testing of promising experimental lines. The program includes both replicated and unreplicated tests, depending on grain type priority and/or seed availability. The more promising selections will be advanced for additional testing.

Experiment: Preliminary Yield Test - Entries 501-925

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, Apr 17-18, 1995

Planting Method: Drill-seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O), Apr 17; 92 lb N/A, May 10; 46 lb N/A, June 7; 21 lb N/A, June 14

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Apr 26; flood, May 11; harvest drainage, Sept 6

Herbicides: Arrosolo (propanil) 3 lb ai/A + (molinate) 3 lb ai/A, May 10

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 31

Harvest: Entries 501-600, Aug 14; entries 601-675, Aug 17; entries 676-850, Aug 23; entries 851-925, Aug 25

Experimental Design: Randomized complete block with two replications

Results: Tables 40-56

Table 40. Agronomic and milling performance of 1995 preliminary yield test, Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
501	L202/TBNT//L202/LMNT	L	6	71	32	0	8431	59 - 70	6	0
512	2207/NWBT//2207	L	5	77	36	0	8230	64 - 70	6	0
510	2207/NWBT//2207	L	6	75	34	0	8060	62 - 70	6	0
516	LBLEX2-2/BJ-1*F1//.../3/...	L	5	75	36	0	7934	56 - 68	6	1
508	9881/331581//L201/3/TBNT	L	5	75	33	0	7841	44 - 68	7	3
519	L201/7402003 (9001007)//...	L	5	77	36	0	7824	59 - 67	4	0
507	L202/TBNT//RSMT/MBLE	L	5	73	33	0	7814	62 - 71	7	0
522	2207/L82CAY21/TBNT	L	5	67	33	0	7523	59 - 68	7	0
511	82CAY21/TBNT/3/82CAY21//...	L	5	42	33	0	7342	63 - 71	7	0
525	JACKSON	L	3	72	36	0	7338	53 - 69	7	0
518	2207/NWBT//2207	L	5	75	34	0	7334	57 - 69	8	3
502	8303116/LMNT//MBLE	L	6	74	31	0	7333	52 - 68	8	2
523	2207/MBLE	L	6	75	30	0	7324	61 - 71	9	-
517	MBLE/CB801//MBLE	L	5	75	36	0	7281	48 - 67	7	0
504	RSMT/MBLE	L	4	68	33	0	7200	57 - 67	7	4
515	ALAN/MBLE	L	4	75	38	0	7118	48 - 67	6	1
520	2207/L82CAY21/TBNT	L	4	72	34	0	7077	56 - 69	6	1
514	2207//82CAY21/TBNT	L	4	69	33	0	6975	56 - 68	7	2
513	2207//82CAY21/TBNT	L	5	67	36	0	6954	59 - 70	8	3
505	L202/TBNT//L202/LMNT	L	6	72	32	0	6833	57 - 69	7	2
521	2207/L82CAY21/TBNT	L	5	67	33	0	6717	60 - 68	9	2
506	RSMT/MBLE	L	4	69	34	0	6247	55 - 68	8	5
503	LMNT/NWBT/3/L202//LMNT/...	L	5	67	30	0	5929	50 - 67	8	4
524	MAYBELLE	L	4	68	34	35	5390	57 - 68	9	-
509	LBNT/L201//TBNT/3/LMNT	L	5	72	36	65	5135	55 - 67	7	2
C.V., %			14.5	12.8	3.2	--	6.9	2.7 1.2		
LSD (0.05)			1	4	2	--	1047	3 2		

* L = Long grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 41. Agronomic and milling performance of 1995 preliminary yield test, Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
542	SMARS/MARS//MARS/3/RICO	M	4	77	40	0	9167	55 - 65	6	0
532	2214/RICO1	M	5	77	42	0	8896	58 - 67	5	1
528	LBLESC-5/CFRS	L	5	74	37	0	8854	53 - 64	5	0
546	MERC//MERC/MOSH	M	5	72	39	0	8751	65 - 69	5	0
550	KAYBONNET	L	3	74	42	0	8725	60 - 69	6	0
539	MERC/RICO//2214	M	5	76	36	0	8723	61 - 67	4	6
530	V4716/4/M101/MARS/3/NTAI/...	M	6	77	37	0	8674	60 - 69	4	0
535	2214/RICO1	M	5	74	34	0	8647	56 - 69	6	1
538	MERC/RICO//2214	M	4	76	38	0	8607	63 - 69	5	1
531	2214/RICO1	M	5	74	40	0	8605	57 - 67	4	1
540	2214/4/MARS/M201//MARS/3/...	M	5	77	40	0	8560	56 - 67	3	1
549	CYPRESS	L	4	77	36	0	8552	63 - 69	7	1
541	RICO/3/CI11048/LEAH//TTEP	M	5	77	43	0	8476	53 - 67	6	0
547	MERC/ORIN	M	4	76	36	0	8380	58 - 68	6	1
527	LMNT/4/82CAY21//TTEP/IR-8	L	5	77	35	0	8300	52 - 68	7	3
529	2207//2201/7402003	L	6	76	32	0	8278	58 - 68	4	1
543	SMARS/MARS//MARS/3/RICO	M	4	77	39	0	8139	56 - 66	5	0
533	RICO1/2*MERC	M	5	72	38	0	7953	56 - 69	6	2
537	RICO1/2*MERC	M	6	73	38	0	7732	55 - 69	4	0
545	MERC/RICO1	M	4	75	37	0	7624	66 - 71	6	0
536	RICO1/2*MERC	M	5	76	37	0	7620	60 - 69	6	2
534	RICO1/2*MERC	M	4	75	37	0	7567	63 - 70	4	0
544	MERC/RICO1	M	5	73	35	0	7476	64 - 70	6	0
526	2207/MBLE	L	5	74	32	0	7435	60 - 68	8	2
548	MERC//MERC/RICO/3/SASAN	M	7	69	39	35	7224	56 - 68	7	3
C.V., %			9.6	0.7	2.8	--	3.3	3.2 1.3		
LSD (0.05)			1	1	2	--	577	4 2		

* L = Long grain; M = Medium grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 42. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
566	LBLEX2-2/BJ-1*F1//.../3/...	L	4	74	35	0	9081	58 - 68	7	2
572	2207/NWBT//2207	L	4	76	37	0	8958	61 - 68	7	0
552	2031/LBLE SC-5//2031	L	5	75	36	0	8785	62 - 69	3	1
554	LMNT//20001-5/LMNT	L	5	76	36	0	8739	59 - 67	5	0
567	2207/NWBT//2207	L	5	76	36	0	8635	62 - 69	7	2
564	LBLEX2-2/BJ-1*F1//.../3/...	L	5	77	37	0	8576	58 - 67	6	0
573	2207/NWBT//2207	L	5	77	34	0	8573	63 - 69	7	0
553	RSMT//2001-5/LMNT	L	5	74	32	0	8481	57 - 66	7	1
562	2207//82CAY21/TBNT	L	4	73	35	0	8355	57 - 66	6	0
557	2001-5/LMNT//8303116/LMNT	L	5	77	36	0	8345	56 - 67	5	1
555	20001-5/LMNT//L202/LMNT	L	5	76	36	0	8309	55 - 63	7	0
560	LBLEX2-2/BJ-1*F1//.../3/...	L	5	75	35	0	8237	53 - 67	8	2
571	2207/NWBT//2207	L	5	79	33	0	8219	62 - 69	7	0
569	2207/L82CAY21/TBNT	L	4	70	34	0	8162	61 - 71	8	3
563	KATY//L202/TBNT	L	5	75	40	0	8070	58 - 67	7	1
556	L202/TBNT//L202/LMNT	L	5	72	34	0	8046	61 - 69	6	2
570	KATY//8303116/LMNT	L	6	78	34	0	7998	57 - 67	7	0
551	2031/LBLE SC-5//2031	L	4	68	37	0	7973	53 - 68	6	2
568	KATY//8303116/LMNT	L	6	80	34	0	7961	56 - 67	4	0
575	LEMONT	L	5	79	34	0	7920	61 - 69	6	2
565	KATY//8303116/LMNT	L	7	79	34	0	7912	53 - 67	7	1
558	2207//2001-5/LMNT	L	6	78	38	0	7897	63 - 68	6	0
574	JODON	L	5	73	33	0	7776	56 - 67	8	3
561	KATY//8303116/LMNT	L	5	78	36	0	7772	60 - 67	6	0
559	KATY//8303116/LMNT	L	7	77	34	0	7634	50 - 64	7	1
C.V., %			13.3	1.1	2.8	-	5.3	1.8	1.0	
LSD (0.05)			1	2	2	-	912	2	1	

* L = Long grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 43. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
590	82CAY21//LMNT/LEAH/3/TTEP	L	5	77	40	0	9308	53 - 66	7	0
581	2207/L82CAY21/TBNT	L	3	73	36	0	9044	59 - 69	6	0
594	LMNT/4/82CAY21//TTEP/IR-8	L	5	81	34	0	9008	57 - 68	5	0
595	LMNT/4/82CAY21//TTEP/IR-8	L	5	84	34	0	8881	58 - 66	7	0
583	2207//82CAY21/TBNT	L	4	75	37	0	8829	54 - 66	7	0
578	2207/NWBT//2207	L	4	78	34	0	8742	63 - 69	7	0
588	KATY/LEAH	L	3	80	43	0	8730	52 - 67	5	0
593	LMNT/4/82CAY21//TTEP/IR-8	L	5	79	34	0	8668	61 - 68	8	1
576	2207/L82CAY21/TBNT	L	5	72	34	0	8529	58 - 69	6	0
600	9302065	L	4	77	34	0	8506	61 - 70	8	2
596	LMNT/4/82CAY21//TTEP/IR-8	L	4	75	35	0	8472	47 - 68	8	2
580	LBLEX2-2/BJ-1*F1//.../3/...	L	5	72	35	0	8450	57 - 68	7	1
597	LMNT/4/82CAY21//TTEP/IR-8	L	5	79	32	0	8421	53 - 68	7	0
598	LMNT/4/82CAY21//TTEP/IR-8	L	6	82	34	0	8281	56 - 67	7	0
582	82CAY21/TBNT/3/LBNT//9881	L	5	76	37	0	8270	52 - 70	6	1
591	LMNT/4/82CAY21//TTEP/IR-8	L	5	79	34	0	8246	58 - 67	8	0
586	2207/NWBT//2207	L	5	76	36	0	8207	60 - 68	6	3
589	LMNT/4/82CAY21//TTEP/IR-8	L	6	77	32	0	8179	59 - 68	7	0
599	LACASSINE	L	5	77	35	0	8008	55 - 68	8	3
592	LMNT/4/82CAY21//TTEP/IR-8	L	6	80	33	0	7920	52 - 66	7	1
585	82CAY21/TBNT/3/LBNT//...	L	5	78	34	0	7872	58 - 68	4	0
577	MBLE/3/LMNT//82CAY21/TDCN	L	6	74	31	0	7811	59 - 70	8	3
579	MBLE/CB801//MBLE	L	4	77	38	0	7529	52 - 66	5	0
587	MBLE/3/LMNT//82CAY21/TDCN	L	6	71	34	0	7438	54 - 69	9	-
584	MBLE/3/LMNT//82CAY21/TDCN	L	7	76	33	0	7344	57 - 68	8	4
C.V., %			7.8	1.5	2.9	-	3.1	3.7 1.3		
LSD (0.05)			1	2	2	-	554	4 2		

* L = Long grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 44. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
621	2207//2201/7402003	L	4	73	38	0	9194	60 - 70	4	0
624	8401 - CPO3	L	4	80	37	0	8837	62 - 68	7	1
625	9102071	L	5	77	38	0	8580	53 - 67	6	0
623	LCSN/KATY	L	4	79	45	0	8390	55 - 68	6	0
612	82CAY21/LMNT//ALAN	L	5	80	33	0	8368	61 - 69	7	1
607	NWBX/2207	L	5	73	36	0	8366	57 - 66	3	0
616	20001-5/LMNT//JKSN	L	4	71	39	0	8300	53 - 66	6	0
606	LMNT/4/82CAY21//TTEP/IR-8	L	5	76	34	0	8222	54 - 70	7	2
603	LMNT/4/82CAY21//TTEP/IR-8	L	6	81	32	0	8184	61 - 71	7	0
605	LMNT/4/82CAY21//TTEP/IR-8	L	6	77	31	0	8080	58 - 69	8	0
620	JODN/CPRS	L	4	75	36	0	8066	59 - 67	6	0
617	20001-5/LMNT//L202/LMNT	L	5	81	35	0	7998	58 - 67	4	0
608	ORIN/89Y246	M	3	76	42	0	7995	61 - 68	4	0
615	LMNT/4/82CAY21//TTEP/IR-8	L	6	79	34	0	7952	58 - 68	7	0
601	LMNT/4/82CAY21//TTEP/IR-8	L	5	77	34	0	7892	49 - 68	7	3
613	L202/LMNT//LMNT*2/CR1113	L	5	75	32	0	7868	60 - 68	7	1
614	LMNT/4/82CAY21//TTEP/IR-8	L	6	78	32	0	7818	60 - 68	6	0
602	LMNT/4/82CAY21//TTEP/IR-8	L	6	81	33	0	7751	62 - 69	6	2
611	LMNT/4/82CAY21//TTEP/IR-8	L	6	77	32	0	7747	59 - 68	8	1
609	LMNT/4/82CAY21//TTEP/IR-8	L	5	79	34	0	7711	57 - 67	7	0
604	LMNT/4/82CAY21//TTEP/IR-8	L	5	78	34	0	7706	56 - 66	7	0
622	KATY/CPRS	L	4	81	34	0	7483	60 - 68	7	1
610	LMNT/4/82CAY21//TTEP/IR-8	L	6	76	28	0	7309	58 - 69	6	0
619	20001-5/LMNT//L202/LMNT	L	6	83	36	0	7059	49 - 61	3	1
618	20001-5/LMNT//8303116/...	L	5	81	35	0	6976	55 - 65	6	0
C.V., %			13.0	1.4	2.9	-	4.0	1.9 1.6		
LSD (0.05)			1	2	2	-	672	2 2		

* L = Long grain, M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 45. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
649	KAYBONNET	L	4	75	42	0	9150	60 - 69	6	0
628	L201//TBNT/BLMT/3/KATY	L	4	75	40	0	8741	58 - 68	6	0
632	L201//TBNT/BLMT/3/KATY	L	5	75	37	0	8643	57 - 67	6	0
631	KATY/CPRS	L	4	80	34	0	8433	61 - 69	7	0
635	KATY/CPRS	L	4	80	34	0	8193	61 - 68	7	0
630	KATY/CPRS	L	4	77	40	0	8135	57 - 67	6	0
647	L202//LMNT/LEAH/3/2146	L	5	81	41	0	8081	55 - 64	5	0
645	JODN/CPRS	L	4	75	37	0	8077	55 - 66	8	1
633	LBLESC-5/CPRS	L	5	84	37	0	7956	53 - 63	4	0
626	LMNT/4/82CAY21//TTEP/IR-8	L	5	76	34	0	7948	56 - 67	7	2
643	LMNT/4/82CAY21//TTEP/IR-8	L	5	77	33	0	7882	52 - 67	6	0
646	LMNT*2/82CAY20//80CAY50/...	L	5	80	38	0	7880	56 - 67	3	0
644	KATY/LEAH	L	4	75	39	0	7872	50 - 68	6	0
629	KATY/CPRS	L	4	79	37	0	7701	56 - 65	6	0
650	ORION	L	4	76	42	0	7679	61 - 68	4	0
636	2146/LBLE SC-5	L	4	76	41	0	7638	50 - 67	6	0
637	8902031/LBLE SC-5//...	L	6	76	36	0	7568	58 - 66	7	0
641	LMNT//20001-5/LMNT	L	3	76	39	0	7559	58 - 67	5	0
639	CPRS/LCSN	L	4	79	35	0	7541	63 - 70	6	0
642	CPRS/JODN	L	5	75	34	0	7453	55 - 65	7	2
638	LMNT/3/82CAY21//LMNT/LEAH	L	7	79	32	0	7220	57 - 69	5	0
640	20001-5/LMNT//JKSN	L	4	77	40	0	7173	57 - 69	6	0
648	KATY/CPRS	L	4	80	38	0	7132	61 - 68	7	0
627	KATY/CPRS	L	4	77	36	0	6993	56 - 65	6	1
634	GFMT/KATY	L	5	76	33	0	6958	56 - 68	6	0
C.V., %			7.1	0.6	2.7	-	4.3	3.3 1.7		
LSD (0.05)			1	1	2	-	718	4 2		

* L = Long grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 46. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
671	SMARS/MARS//MARS/3/RICO1	M	4	78	41	0	9079	63 - 71	4	0
672	MERC/RICO//2214	M	4	76	41	0	8788	52 - 65	6	0
675	LAFITTE	M	5	75	37	0	8595	63 - 69	6	1
662	LMNT//20001-5/LMNT	L	5	74	33	0	8474	56 - 67	-	-
656	CFRS/2042	L	5	76	36	0	8454	57 - 88	8	3
654	CFRS/JODN	L	5	76	34	0	8402	60 - 69	8	0
655	CFRS/2042	L	5	78	35	0	8272	60 - 70	8	1
652	JODN/CFRS	L	4	75	34	0	8044	58 - 68	7	2
661	20001-5/LMNT//JMSN	L	5	74	40	0	7977	56 - 67	7	0
653	L202/LMNT//LMNT*2/CR1113	L	5	76	34	0	7975	56 - 68	8	1
880	2207//20001-5/LMNT	L	4	74	38	0	7968	52 - 65	6	0
883	2207/MBLE	L	4	74	36	0	7783	59 - 68	8	3
658	CFRS/LCSN	L	5	78	37	0	7731	61 - 69	6	2
670	MERC/ORIN	M	4	75	40	0	7713	57 - 67	3	0
669	V4716/4/M101/MARS/3/NTAI/...	M	5	75	38	0	7700	62 - 69	5	0
673	SMARS/MARS//MARS/3/RICO1	M	5	78	37	0	7683	59 - 67	5	0
666	MERC/ORIN	M	5	77	36	0	7632	60 - 67	6	1
668	ORIN/89Y246	M	5	70	39	10	7472	56 - 66	3	2
651	KATY/CFRS	L	5	80	36	0	7340	56 - 67	5	0
667	ORIN/4/M101/MARS/3/NTAI//...	M	5	75	39	0	7245	58 - 66	5	1
657	KATY/LEAH	L	6	81	43	0	7225	47 - 65	6	0
665	MERC/ORIN	M	5	76	38	0	7156	61 - 68	5	0
659	2207//20001-5/LMNT	L	5	75	38	0	7069	52 - 64	7	1
664	JKSN/8902031	L	5	74	39	0	6717	57 - 67	6	0
674	BENGAL	M	-	84	36	0	3328	44 - 67	-	-
C.V., %			15.8	1.5	2.3	--	3.5	3.6 1.7		
LSD (0.05)			2	2	2	--	574	4 2		

* L = Long grain, M = Medium grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 47. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
686	2214/RICO1	M	5	77	40	0	9691	53 - 67	4	0
697	SMARS/MARS//MARS/3/RICO1	M	4	80	43	0	9317	51 - 69	5	0
692	SMARS/MARS//MARS/3/RICO1	M	5	77	42	0	8781	48 - 69	5	2
690	2214/RICO1	M	5	76	37	0	8736	48 - 69	4	0
677	89Y485/RICO	M	4	71	34	40	8682	53 - 69	7	3
694	2214/RICO1	M	4	77	35	0	8680	57 - 70	4	1
688	MERC/RICO//2214	M	4	75	35	0	8648	58 - 67	4	1
693	SMARS/MARS//MARS/3/RICO1	M	5	81	42	0	8581	62 - 69	4	0
695	2214/RICO1	M	4	80	44	0	8575	55 - 70	6	0
700	9402028	M	4	77	43	60	8530	65 - 72	5	0
696	2214/RICO1	M	5	78	40	0	8513	58 - 71	6	0
687	MERC/RICO//2214	M	5	75	39	0	8511	53 - 67	5	0
685	SMARS/MARS//MARS/3/RICO1	M	5	80	41	0	8507	56 - 66	3	0
681	89Y485/RICO	M	5	71	37	45	8476	57 - 68	5	0
689	SMARS/MARS//MARS/3/RICO1	M	4	77	43	0	8448	55 - 69	7	0
679	RICO1/S101	M	6	76	36	0	8270	56 - 68	5	0
682	RICO1/S101	M	5	76	36	0	8108	59 - 67	4	2
691	RICO1/2*MERC	M	5	76	39	0	8023	64 - 70	4	0
680	RICO1/S101	M	6	80	33	0	7861	59 - 68	5	0
699	8412 - CPO4	M	4	79	36	0	7740	59 - 67	7	0
676	RICO1/S101	M	6	77	35	0	7565	56 - 65	4	0
684	RICO1/S101	M	5	70	37	0	7408	60 - 70	7	3
678	RICO1/S101	M	6	77	36	0	7326	58 - 67	6	1
698	MERC/RICO//MARS	M	4	75	39	0	6944	49 - 64	4	0
683	ORIN/89Y246	M	4	70	36	40	6723	59 - 68	5	4
C.V., %			11.1	0.6	3.9	--	4.7	6.3 1.5		
LSD (0.05)			1	1	3	--	823	7 2		

* M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 48. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
720	MERC/RICO//2214	M	5	79	35	0	9383	64 - 72	4	1
712	MERC/RICO//2214	M	4	76	37	0	9374	61 - 70	6	0
704	MERC/RICO//2214	M	4	76	36	0	9227	57 - 70	6	0
709	MERC/RICO//2214	M	5	76	39	0	9039	61 - 69	5	1
708	MERC/RICO//2214	M	5	80	37	0	8978	63 - 69	6	2
716	MERC/RICO//2214	M	4	76	37	0	8922	63 - 70	5	0
713	MERC/RICO//2214	M	4	75	39	0	8846	58 - 69	3	0
705	2214/RICO1	M	5	73	34	0	8785	59 - 69	7	1
706	MERC/RICO//2214	M	5	75	39	0	8739	62 - 70	4	0
711	2214/RICO1	M	4	76	41	0	8698	54 - 69	5	0
718	2214/RICO1	M	4	77	41	10	8596	51 - 68	6	0
715	MERC/RICO//2214	M	4	76	36	0	8557	56 - 70	6	0
722	RICO1/2*MERC	M	4	75	36	0	8502	63 - 70	7	0
707	2214/RICO1	M	4	74	39	0	8466	53 - 69	6	0
702	2214/RICO1	M	5	78	42	35	8448	49 - 69	5	0
721	2214/RICO1	M	5	75	35	0	8350	64 - 72	6	0
725	CYPRESS	L	4	76	36	0	8283	60 - 69	8	2
714	RICO1/2*MERC	M	5	77	39	0	8257	63 - 71	4	0
723	MERC/RICO//MARS	M	5	80	43	0	8094	58 - 67	5	1
701	MERC/RICO//2214	M	4	80	36	0	8061	65 - 71	4	0
703	SMARS/MARS//MARS/3/RICO1	M	5	80	42	0	7997	61 - 68	4	0
717	RICO1/2*MERC	M	6	78	35	0	7941	65 - 71	7	0
719	2214/RICO1	M	5	74	43	85	7919	53 - 67	7	0
710	MERC/RICO//MARS	M	4	76	39	0	7701	54 - 66	7	0
724	8423 - LM25	L	5	79	36	0	7401	20 - 65	7	0
C.V., %			12.0	0.9	3.1	--	4.1	4.3 0.8		
LSD (0.05)			1	1	3	--	742	5 1		

* L = Long grain; M = Medium grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 49. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
738	2214/RICO1	M	6	76	35	0	9323	55 - 69	5	2
730	MERC/RICO//2214	M	6	78	35	0	9242	60 - 69	3	0
747	BNGL//MERC/RICO	M	5	76	38	0	9235	61 - 70	7	1
736	SMARS/MARS//MARS/3/RICO1	M	4	78	41	0	9227	58 - 70	5	0
749	RICO 1	M	5	80	43	0	9132	60 - 69	5	0
741	MARS/M201//MARS/3/SMARS/...	M	4	78	38	0	9087	61 - 70	5	2
733	MERC/RICO//MARS	M	4	76	43	0	8901	60 - 68	3	0
728	MERC/RICO//MARS	M	4	76	41	0	8882	58 - 66	4	0
748	MERC/RICO/3/SMARS/MARS//...	M	4	80	40	0	8716	65 - 71	7	0
731	2214/RICO1	M	5	77	39	0	8687	44 - 68	4	0
726	2214/RICO1	M	4	75	39	0	8634	47 - 65	6	2
739	MERC/RICO//2214	M	4	75	38	0	8632	54 - 67	5	3
735	MERC/RICO//2214	M	4	75	43	0	8607	53 - 66	6	0
745	MERC/RICO//RICO	M	4	80	42	0	8564	64 - 70	5	0
744	MERC/LMNT//MERC/3/2214	M	5	80	38	0	8314	56 - 68	4	1
729	2214/RICO1	M	5	77	43	80	8228	46 - 66	5	0
727	MERC/RICO//MARS	M	4	76	40	0	8136	57 - 67	5	0
746	BNGL//MERC/RICO	M	4	78	43	0	8055	54 - 67	7	0
740	MERC/LMNT//MERC/3/2214	M	5	81	37	0	7845	55 - 68	4	1
743	MARS/M201//MARS/3/MERC/...	M	5	76	37	0	7712	60 - 67	4	2
737	RICO1/2*MERC	M	4	75	39	0	7465	63 - 71	6	0
732	MERC/RICO//MARS	M	4	75	42	0	7174	52 - 64	7	3
734	SMARS/MARS//MARS/3/RICO	M	5	81	38	0	7154	57 - 64	5	4
742	2214/4/MARS/M201//MARS/3/...	M	4	87	43	0	6747	50 - 64	6	0
750	BENGAL	M	6	84	34	0	3588	57 - 69	5	5
C.V., %			9.2	0.7	2.5	--	5.5	4.7 1.3		
LSD (0.05)			0.8	1	2	--	961	5 2		

* M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 50. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
762	SRICO/BNGL	M	4	75	43	40	8941	56 - 65	4	0
754	SRICO/BNGL	M	5	78	44	40	8741	45 - 70	6	0
764	MERC/RICO	M	4	76	40	0	8726	62 - 68	6	1
756	BNGL//MERC/RICO	M	4	75	36	0	8660	59 - 68	8	0
753	BNGL//MERC/RICO	M	4	76	37	0	8608	57 - 68	7	2
763	SMARS/MARS//MARS/3/RICO	M	4	77	39	0	8586	54 - 66	5	0
765	MERC/RICO	M	3	81	43	0	8582	59 - 67	6	0
766	MERC/RICO/3/SMARS/MARS//...	M	4	79	40	0	8581	63 - 70	7	0
757	SMARS/MARS//MARS/3/BNGL	M	4	79	40	0	8566	55 - 68	6	2
758	SMARS/MARS//MARS/3/RICO	M	4	76	38	0	8536	54 - 65	3	0
755	ORIN//MERC/RICO	M	5	80	35	0	8510	59 - 66	3	0
751	MERC/RICO//RICO	M	4	80	42	0	8458	64 - 70	5	0
770	ORIN/89Y246	M	4	76	43	10	8382	58 - 68	4	1
774	8435 - LC13	L	4	81	40	0	8334	58 - 66	7	3
752	SRICO/BNGL	M	3	76	45	0	8272	43 - 67	4	0
760	SMARS/MARS//MARS/3/RICO	M	4	80	38	0	8167	54 - 65	5	0
761	ORIN//MERC/RICO	M	5	77	35	0	8110	60 - 68	4	0
767	STRN/3/MARS/M201//MARS	M	5	84	37	0	7942	61 - 68	3	0
759	SMARS/MARS//MARS/3/RICO	M	4	79	37	0	7780	57 - 66	5	0
769	ORION//MERC/RICO	M	5	80	37	0	7657	53 - 67	5	0
772	STRN/MERC/RICO/4/MARS/...	M	4	79	42	0	7643	53 - 61	6	1
775	MARS	M	3	77	45	10	7354	61 - 67	3	1
771	MERC/ORIN	M	3	76	43	45	7271	61 - 68	6	0
773	ORION//MERC/RICO(9202128)	M	4	76	43	0	7218	59 - 67	5	1
768	MERC//MERC/RICO/3/SASAN	M	4	73	48	0	6456	52 - 65	5	0
C.V., %			11.2	0.8	3.0	--	4.8	3.0 1.7		
LSD (0.05)			1	1	3	--	846	4 2		

* L = Long grain; M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 51. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
781	V4916/STRN	M	5	80	39	0	9717	65 - 70	6	0
793	MERC//MERC/MOSB	M	4	71	38	0	9231	64 - 70	6	2
795	ORIN/4/M101/MARS/3/NTAI/...	M	3	75	43	0	8783	57 - 68	6	0
779	MERC/RICO/3/SMARS/MARS//...	M	4	80	39	0	8782	62 - 69	6	0
778	ORION//MERC/RICO(9202128)	M	4	77	44	0	8769	56 - 67	5	1
780	MERC/RICO/3/SMARS/MARS//...	M	4	80	39	0	8688	64 - 70	7	0
799	LAFITTE	M	5	72	38	0	8662	63 - 70	5	0
777	MERC/RICO/3/SMARS/MARS//...	M	5	79	39	0	8647	64 - 70	5	0
800	9302065	L	4	77	34	0	8568	60 - 70	7	2
790	MERC/RICO/3/SMARS/MARS//...	M	4	79	41	0	8567	64 - 70	6	0
782	MERC/RICO//RICO	M	3	79	42	0	8567	61 - 69	6	0
789	MERC/RICO	M	4	76	44	0	8411	61 - 66	6	0
776	SMARS/MARS//MARS/3/RICO	M	5	80	38	0	8362	55 - 66	3	0
794	2214/4/MARS/M201//MARS/3/...	M	5	79	48	90	8338	59 - 69	3	0
791	MERC/PCOS/3/MERC//MERC/...	M	4	74	38	0	8311	44 - 68	4	0
792	MERC/RICO//RICO	M	4	80	43	0	8295	62 - 70	7	1
784	SRICO/BNGL	M	4	76	45	25	8265	55 - 67	6	0
785	BNGL//MERC/RICO	M	5	79	39	0	8144	61 - 68	3	0
797	MERC/PCOS/3/MERC//MERC/...	M	5	74	37	0	8116	40 - 67	6	0
796	SMARS/MARS//MARS/3/MERC/...	M	5	78	35	0	8045	64 - 69	7	0
783	BNGL//MERC/RICO	M	5	76	38	0	7973	63 - 69	6	1
788	ORION//MERC/RICO(9202128)	M	5	80	37	0	7845	56 - 68	3	0
786	SMARS/MARS//MARS/3/STRN	M	4	85	39	0	7590	63 - 69	6	0
798	ORIN//MERC/RICO	M	4	75	42	90	7473	64 - 70	4	0
787	SRICO/BNGL	M	4	76	45	35	6672	45 - 66	5	2
C.V., %			11.9	1.0	4.6	--	4.4	3.9 1.4		
LSD (0.05)			1	2	4	--	771	5 2		

* L = Long grain; M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 52. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
812	BNGL//MERC/RICO	M	4	77	38	0	9201	61 - 69	7	1
822	MERC//MERC/RICO/3/SASAN	M	5	76	39	0	9169	51 - 71	5	0
821	SMARS/MARS//MARS/3/RICO1	M	4	77	44	0	9127	54 - 68	3	0
809	2214/RICO1	M	4	73	40	0	8618	62 - 70	4	0
813	RICO/BNGL	M	4	81	46	60	8609	57 - 67	6	0
802	MERC/RICO//MERC/PCOS	M	4	76	38	0	8486	48 - 66	4	0
810	MERC/RICO/3/SMARS/MARS//...	M	4	81	39	0	8483	65 - 70	4	0
820	SMARS/MARS//MARS/3/RICO1	M	3	77	45	75	8421	56 - 67	4	0
801	ORIN//MERC/RICO	M	4	76	36	0	8397	58 - 69	5	0
807	2214/RICO1	M	5	77	35	0	8311	55 - 69	5	2
808	2214/RICO1	M	5	74	36	0	8270	58 - 69	4	1
804	MERC/RICO//2214	M	4	75	37	0	8241	57 - 69	4	0
819	89Y485/RICO	M	4	70	42	80	8232	60 - 70	7	1
816	RICO1/2*MERC	M	5	75	39	0	8232	57 - 68	6	0
806	MERC/3/SMARS/MARS//MARS	M	5	81	38	0	8051	60 - 68	5	2
825	9002177	M	4	77	37	0	7921	54 - 68	5	0
824	9302106	M	5	74	37	0	7877	60 - 68	6	0
815	MERC/RICO//MARS	M	4	79	42	0	7774	54 - 65	6	0
817	2214/RICO1	M	5	80	37	0	7689	59 - 69	6	0
814	MERC/3/SMARS/MARS//MARS	M	4	77	41	0	7612	60 - 66	4	0
805	MERC/3/SMARS/MARS//MARS	M	4	77	40	0	7494	59 - 66	4	2
811	ORIN/89Y246	M	5	72	36	0	7160	57 - 65	7	1
823	MERC//MERC/RICO/3/SASAN	M	5	76	35	0	7154	46 - 65	5	0
803	MERC/RICO//MARS	M	4	77	39	0	7014	48 - 65	6	0
818	LMNT/MERC//MERC/4/M101/...	M	5	75	36	0	6547	57 - 67	6	0
C.V., %			8.2	0.7	3.0	--	5.0	5.1 1.3		
LSD (0.05)			1	1	3	--	857	6 2		

* M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 53. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
826	89Y485/RICO	M	4	72	40	0	8809	58 - 67	7	0
829	V4916/NTAI	M	4	77	38	0	8702	56 - 67	5	3
845	BNGL/RICO1	M	4	74	35	0	8663	56 - 69	7	0
830	2214/RICO1	M	5	76	36	0	8610	59 - 69	5	0
833	RICO1/V4716	M	5	76	39	0	8500	59 - 68	3	0
844	SMARS/MARS//MARS/3/RICO	M	4	80	40	0	8467	53 - 65	6	0
841	RICO/MERC	M	4	73	40	0	8457	53 - 67	5	0
836	RICO/MERC	M	4	75	42	0	8421	57 - 68	3	0
834	RICO1/V4716	M	4	77	38	0	8388	58 - 68	5	0
831	MARS/M201//2*MARS	M	5	79	37	0	8298	60 - 68	5	1
837	V4716/4/M101/MARS/3/NTAI/...	M	4	75	39	0	8120	57 - 67	6	3
827	ORIN/4/M101/MARS/3/NTAI//...	M	4	77	41	0	8089	60 - 68	3	0
838	ORIN//MERC/RICO	M	5	77	44	0	8062	61 - 68	3	0
840	MERC/CAM9/MARS (9202795)	M	4	76	40	0	8035	55 - 67	3	0
832	2214/RICO1	M	4	77	37	0	7989	58 - 68	4	0
847	2214/RICO1	M	5	76	40	0	7945	59 - 68	2	0
835	V4916/MARS	M	4	77	34	0	7906	60 - 68	6	3
843	ORIN/89Y246	M	4	77	43	0	7838	57 - 67	5	1
839	ORIN/3/SMARS/MARS//MARS	M	4	76	45	0	7766	57 - 67	5	2
828	ORIN/89Y246	M	4	76	41	40	7683	59 - 68	4	0
848	V4916/NTAI	M	4	83	45	80	7669	55 - 63	3	0
842	ORIN/89Y246	M	3	76	43	0	7607	56 - 68	6	1
846	MERC/BRAZ	M	5	76	37	0	7018	56 - 67	6	0
850	SATURN	M	3	80	47	90	4615	59 - 67	5	0
849	BENGAL	M	-	84	36	0	3924	54 - 68	-	-
C.V., %			10.9	1.0	3.3	--	7.2	3.3 1.2		
LSD (0.05)			1	2	3	--	1169	4 2		

* M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 54. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
854	MARS/CM101	S	4	73	46	30	8549	58 - 70	4	0
873	MARS/CM101	S	5	77	44	10	8420	59 - 67	3	0
856	M203//MERC/RICO	M	4	74	38	30	7569	48 - 65	4	0
855	MARS/CM101	S	5	76	36	40	7533	58 - 69	3	0
851	MARS/CM101	S	6	73	36	0	7467	64 - 70	5	0
853	MARS/CM101	S	6	76	38	0	7413	62 - 70	5	1
852	MARS/CM101	S	6	77	43	0	7412	60 - 68	3	0
857	M203//MERC/RICO	M	3	68	43	30	7342	50 - 68	7	3
867	CPRS/U/DMSI/...	L	5	75	35	0	7202	58 - 70	8	0
864	BNGL/CM101	S	5	71	38	25	6837	52 - 68	3	2
863	BNGL/CM101	S	5	72	36	0	6740	29 - 66	4	2
865	BNGL/CM101	S	5	77	34	0	6576	52 - 73	6	2
862	DMSI/203//TTEP/RSMT	L	4	73	37	0	6548	56 - 64	3	2
866	BNGL/CM101	M	5	77	38	0	6406	61 - 67	2	3
858	LBNTX2/A301	L	5	81	36	0	6286	51 - 68	4	2
860	MARS/CM101	S	6	75	37	0	6266	62 - 70	5	2
869	DLLA//TTEP*4/LMNT	L	6	75	34	0	6132	39 - 69	7	4
859	LEAH//DLLAX2/LMNT*2	L	6	86	39	0	6072	49 - 64	6	2
870	TORO2/A301	L	5	89	46	0	5973	30 - 63	3	1
861	A301/BNGL	M	4	80	37	0	5911	55 - 65	5	5
871	KDKAHUROSE/BNGL	M	5	90	43	0	5437	52 - 62	-	-
868	82CAY/LMNT//DLLA	L	6	84	33	0	5377	59 - 68	6	1
872	MDKAHUROSE/BNGL	M	5	90	42	0	5125	53 - 64	4	0
874	A301/JSMN	L	5	95	42	0	5091	39 - 60	2	0
875	CM101	S	5	69	36	70	878	64 - 70	-	-
C.V., %			10.1	1.5	3.5	--	11.3	7.7 2.0		
LSD (0.05)			1	2	3	--	1533	9 3		

* L = Long grain; M = Medium grain; S = Short grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.
[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 55. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
880	BNGL/CM101	S	4	70	37	0	7006	64 - 69	6	3
899	LMNT/DLLA//82CAY2/LMNT	L	5	72	36	70	6681	58 - 70	8	3
894	2214/CM101	S	6	76	35	0	6629	66 - 72	2	0
893	DMSI/DLLAX2//LMNT/DLLA/3/...	L	5	81	43	30	6563	51 - 66	6	1
900	DELLROSE	L	6	77	35	0	6550	59 - 69	7	0
876	MERC//DLLA//MERC	M	4	75	39	30	6434	60 - 68	6	4
877	DMSI/DLLAX2//A301	L	4	74	39	80	6311	48 - 67	6	3
879	DLMT 88462../4/DMSI/...	L	5	76	40	0	6217	48 - 66	7	0
887	CFRS/3/DMSI/203//TTEP/...	L	5	76	41	80	6057	37 - 66	3	0
895	KOKAHUROSE/2214	M	5	86	35	0	6056	54 - 63	-	-
898	DLLA//TTEP*4/LMNT	L	5	74	34	0	6010	47 - 69	8	3
896	DLLAX2/LMNT*2/3/DMSI/DLLA	L	6	76	36	55	5791	48 - 65	6	3
878	A301/JSMN	L	5	86	42	0	5761	51 - 64	4	0
890	DMSI/203//TTEP/4*LMNT/3/...	L	5	70	41	65	5677	48 - 67	3	3
897	M201/3/5242/UKN//RXRE/4/...	M	6	74	34	0	5676	52 - 67	4	2
892	DMSI/DLLAX2//LMNT/DLLA/3/...	L	5	93	44	0	5629	43 - 61	3	0
886	BN73/9857//P1256116.../3/...	L	5	76	43	85	5357	51 - 68	4	0
884	BN73/9857//P1256116.../3/...	L	4	76	44	85	5280	51 - 67	7	0
882	BN73/9857//P1256116.../3/...	L	5	72	43	90	5040	54 - 68	7	0
889	CFRS/3/DMSI/203//TTEP/...	L	5	79	43	60	4992	47 - 66	3	1
888	CFRS/3/DMSI/203//TTEP/...	L	7	79	43	75	4970	49 - 67	3	0
891	KOKAHUROSE/2214	M	5	76	37	0	4935	48 - 59	-	-
885	BN73/9857//P156116.../3/...	L	5	68	44	90	4887	50 - 70	6	0
883	BN73/9857//P1256116.../3/...	L	5	68	44	80	4519	54 - 67	8	0
881	DMSI//LMNT/NWBT/3/LMNT/...	L	6	82	40	15	4464	56 - 68	5	0
C.V., %			10.5	1.9	3.4	--	6.6	2.9 1.2		
LSD (0.05)			1	3	3	--	794	3 2		

* L = Long grain; M = Medium grain; S = Short grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Table 56. Agronomic and milling performance of 1995 preliminary yield test. Rice Research Station, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)	SB[1]	BL[1]
905	#2 DLLA/2214	M	4	84	37	0	7663	44 - 67	4	0
910	LEAH/DLLA	L	4	83	40	0	7412	52 - 67	3	0
921	JSMN/MBLE	L	4	92	53	0	7118	47 - 64	2	0
916	JSMN/TORO2	L	5	83	45	35	7088	54 - 64	2	0
924	DMSI/DLLAX2//LMNT/DLLA	L	5	79	44	5	7031	55 - 68	5	0
901	DMSI//LMNT/NWBT/3/...	L	5	75	39	0	6651	37 - 64	3	9
920	LEAH/DLLA	L	4	81	40	20	6598	52 - 64	-	-
917	DMSI/LMNT/NW....	L	4	78	42	60	6102	51 - 66	6	0
925	DELLA	L	5	82	49	0	6089	50 - 67	5	0
918	JSMN/DLLA	L	6	96	42	0	6041	47 - 64	3	0
909	LEAH/DLLA	L	6	84	47	5	6031	47 - 65	4	0
906	DMSI//LMNT/NWBT/3/LMNT/...	L	5	74	38	45	5898	46 - 70	7	2
915	JSMN/DLLA	L	6	93	41	0	5865	39 - 63	3	0
919	JSMN/DLLA	L	5	90	40	0	5860	34 - 61	2	0
902	DMSI/203//TTEP/4*LMNT/3/...	L	5	73	37	70	5653	36 - 68	5	0
911	DMSI/203//TTEP/4*LMNT/3/...	L	7	79	36	60	5336	40 - 68	4	1
913	JSMN/DLLA	L	6	93	40	0	5286	47 - 61	2	0
922	DMSI/DLLAX2//LMNT	L	5	91	43	0	5243	49 - 64	2	0
908	DLLA//TTEP*4/LMNT	L	4	73	41	80	5217	51 - 67	3	2
903	82CAY21/LMNT//DLLA	L	5	74	34	45	5200	59 - 67	7	4
923	JSMN/DLLA	L	5	84	38	0	4937	49 - 64	6	0
907	A301/JSMN	L	4	88	43	0	4907	44 - 64	2	0
914	JSMN/DLLA	L	6	93	40	0	4578	33 - 58	2	0
912	JSMN/DLLA	L	7	96	41	0	4355	42 - 58	2	0
904	SDRI/MBLE	L	3	80	43	85	3566	52 - 67	4	0
C.V., %			12.9	1.8	6.7	--	7.4	8.2 1.3		
LSD (0.05)			1	3	2	--	916	8 2		

* L = Long grain; M = Medium grain.

** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

[1] SB = sheath blight rating, 0-9 scale; BL = blast rating (rottenneck), 0-9 scale

Experiment: Non-Replicated Preliminary Yield Test (Entries 1-400)

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, Apr 17-18, 1995

Planting Method: Drill-seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O), Apr 17; 92 lb N/A, May 10; 46 lb N/A, June 7; 21 lb N/A, June 14

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flush, Apr 26; flood, May 11; harvest drainage, Aug 6

Herbicides: Arrosolo (propanil) 3 lb ai/A + (molinate) 3 lb ai/A, May 10; Londax (bensulfuron) 1 oz ai/A, May 16

Insecticides: Furadan (carbofuran) .5 lb ai/A, May 31

Harvest: Aug 25

Experimental Design: Single plot test

Results: Table 57

Table 57. Agronomic and milling performance of 1995 non-replicated preliminary yield test (entries 1-400). Rice Research Station, Crowley, LA.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
074	2214/RICO1	5	80	42	0	9495	49 - 70
054	SMARS/MARS//MARS/3/RICO1	5	87	39	0	9411	59 - 68
058	SMARS/MARS//MARS/3/RICO1	4	81	37	0	9273	57 - 66
099	MERC/RICO//2214	4	76	40	0	9173	60 - 69
057	2214/RICO1	4	75	40	0	9165	61 - 69
035	ORIN//MERC/RICO	4	71	43	0	9111	57 - 65
153	BNGL//MERC/RICO	3	80	38	0	9055	58 - 69
202	MARS/M201//MARS/3/SMARS/MARS//MARS	4	80	35	0	8969	54 - 69
062	MERC/RICO//2214	4	76	36	0	8967	63 - 69
117	MERC/RICO//2214	6	80	33	0	8894	59 - 69
037	ORIN//MERC/RICO	3	73	40	0	8884	52 - 65
208	MARS/M201//MARS/3/MARS	4	80	39	0	8834	59 - 68
199	BNGL//MERC/RICO	4	76	38	0	8797	64 - 70
052	MERC/RICO//2214	4	76	37	0	8723	58 - 70
104	RICO1/2*MERC	4	77	40	0	8688	62 - 68
043	SMARS/MARS//MARS/3/RICO1	4	77	38	0	8667	55 - 65
130	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	4	75	30	0	8651	62 - 69
066	MERC/RICO//2214	4	76	35	0	8644	58 - 67
040	RICO1/2*MERC	4	81	41	0	8608	61 - 68
060	SMARS/MARS//MARS/3/2214	4	81	38	0	8605	60 - 68
061	SMARS/MARS//MARS/3/2214	4	81	37	0	8578	63 - 70
212	SMARS/MARS//MARS/3/BNGL	4	79	39	0	8545	52 - 67
065	SMARS/MARS//MARS/3/RICO1	6	78	41	0	8511	48 - 86
175	9402028	4	79	43	30	8510	64 - 72
070	MERC/RICO//MARS	3	75	40	0	8510	62 - 69
127	STRN//MERC/RICO	4	81	40	0	8507	56 - 66
147	82CAY21//LMNT/LEAH/3/TTEFX2S/4/...	4	78	38	30	8494	47 - 64
086	MERC/RICO//2214	4	76	42	0	8491	49 - 68
298	MARS/CM101	5	75	39	0	8476	58 - 69
045	SMARS/MARS//MARS/3/2214	5	81	38	0	8466	59 - 65
071	SMARS/MARS//MARS/3/2214	5	81	37	0	8456	61 - 70
192	SMARS/MARS//MARS/3/BNGL	5	79	38	0	8424	57 - 70
294	JSMN/RAXCLEAR	4	83	42	40	8413	54 - 63
042	SMARS/MARS//MARS/3/RICO1	3	76	40	0	8411	54 - 63
067	2214/RICO1	5	77	38	0	8399	55 - 68
197	MERC/RICO/3/SMARS/MARS//MARS	4	81	39	0	8383	62 - 70
374	RED MG	4	88	37	0	8346	46 - 63
120	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	3	77	40	0	8324	60 - 67
219	MERC//MERC/KOSH	4	74	35	0	8313	63 - 70
187	BNGL//MERC/RICO	4	76	35	0	8306	60 - 68
220	SMARS/MARS//MARS/3/MERC/RICO	4	77	35	0	8304	62 - 67
093	2214/RICO1	5	75	41	0	8286	62 - 70
078	SMARS/MARS//MARS/3/2214	5	81	37	0	8265	63 - 71
169	MERC/RICO//RICO	4	80	40	0	8264	64 - 71
213	SMARS/MARS//MARS/3/BNGL	4	80	37	0	8261	52 - 68
164	KATY/CPRS	4	77	35	0	8258	55 - 68
246	RICO1/MERC	4	71	40	20	8256	58 - 68
171	MARS/M201//MARS/3/SMARS/MARS//MARS	5	83	38	0	8252	48 - 66
137	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	4	77	40	0	8250	62 - 68
128	ORIN/89Y246	4	78	40	0	8237	60 - 68
088	MERC/RICO//2214	5	79	40	0	8216	56 - 68
180	MARS/M201//MARS/3/MARS	4	80	36	0	8203	49 - 68
258	ORIN/V4716	5	79	39	80	8203	64 - 70
055	KATY//8303116/LMNT	6	81	34	0	8190	53 - 66
059	RICO1/2*MERC	5	75	38	0	8184	52 - 68
167	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	80	32	0	8183	61 - 68
100	LAFITTE	5	73	38	0	8150	64 - 69
134	MARS/M201//MARS/3/SMARS/MARS//MARS	4	81	37	0	8140	52 - 66
218	STRN/3/MARS/M201//MARS	3	77	43	70	8128	58 - 68
209	MERC/RICO/3/SMARS/MARS//MARS	4	81	40	0	8122	61 - 68
211	BNGL//MERC/RICO	5	81	36	0	8118	58 - 69

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
050	CYPRESS	4	77	35	0	8090	61 - 68
162	MERC/RICO//92Y010	4	76	37	0	8058	61 - 68
155	20001-5/LMNT//JKSN	5	75	32	0	8049	60 - 67
201	CPRS//LMNT*2/82CAY21	5	77	35	0	8043	58 - 68
072	MERC/RICO//2214	0	82	40	0	8042	53 - 67
140	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	4	75	31	0	8035	56 - 68
150	KAYBONNET	4	75	39	40	8032	57 - 67
124	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	4	78	31	0	8025	52 - 67
276	MARS/CM101	5	77	44	20	8023	48 - 68
244	MARS/M201//MARS/3/SMARS/MARS//MARS	4	80	39	0	8022	54 - 67
160	BNGL//MERC/RICO	4	80	41	0	8019	50 - 66
138	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	4	81	34	0	8013	62 - 69
168	MERC/RICO/3/SMARS/MARS//MARS	4	80	40	0	8011	62 - 68
257	ORIN/V4716	6	84	38	10	8006	59 - 69
163	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	76	32	0	7990	52 - 65
080	SMARS/MARS//MARS/3/2214	5	82	37	0	7984	58 - 69
190	ORIN/4/M101/MARS/3/NTAI//9545/...	4	79	37	0	7968	64 - 70
106	TQNG/MBLE	5	78	36	0	7962	60 - 68
098	2207/NWBT//2207	4	81	36	0	7952	60 - 67
145	2207//20001-5/LMNT	4	75	37	0	7924	55 - 68
196	SMARS/MARS//MARS/3/BNGL	8	81	39	0	7919	58 - 68
121	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	3	77	39	0	7910	58 - 66
087	MERC/RICO//2214	5	78	39	0	7900	56 - 68
133	LMNT//L202/TDCN/3/20001-5/LMNT	6	78	36	0	7869	50 - 65
077	MERC/3/SMARS/MARS//MARS	4	81	33	0	7882	64 - 69
041	MERC/3/SMARS/MARS//MARS	3	79	40	0	7857	56 - 63
115	MERC/RICO//MARS	4	80	42	0	7841	57 - 66
173	MERC/PCOS/3/MERC//MERC/RICO	5	76	31	0	7838	42 - 68
183	MERC/RICO	4	77	38	0	7832	58 - 87
340	MARS/CM101(GL)	6	84	38	0	7824	54 - 68
157	MERC//LMNT/MERC/3/MERC/3/MERC/RICO	5	83	42	0	7823	56 - 66
185	GPMT/KATY	6	79	33	0	7815	61 - 69
149	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	79	36	0	7809	54 - 67
210	CPRS//LMNT*2/82CAY21	4	77	37	0	7793	59 - 67
112	MERC/3/SMARS/MARS//MARS	4	81	39	0	7791	61 - 66
188	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	6	77	34	0	7758	42 - 88
207	STRN/MERC/RICO/4/MARS/M201/...	4	81	39	0	7757	53 - 68
235	KATY/CPRS	4	90	38	0	7748	52 - 67
143	MARS/M201//MARS/3/SMARS/MARS//MARS	5	81	36	0	7746	50 - 87
094	MERC/RICO//2214	4	77	38	0	7742	56 - 66
283	JSMN/TORO2	4	74	35	0	7730	42 - 68
105	SMARS/MARS//MARS/3/RICO1	6	81	37	0	7713	55 - 68
255	ORIN/V4716	5	80	42	0	7712	61 - 87
165	MERC//MERC/RICO/3/SASAN	5	72	37	0	7707	56 - 69
154	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	74	32	0	7695	48 - 65
191	MERC/RICO//RICO	4	81	41	0	7694	62 - 70
119	MARS/M201//MARS/3/SMARS/MARS//MARS	4	82	37	0	7694	57 - 66
204	RICO1/MERC	4	84	44	0	7691	51 - 65
107	SMARS/MARS//MARS/3/2214	4	77	36	0	7679	57 - 66
247	MERC//MERC/RICO/3/MERC/PCOS5	4	74	38	0	7671	61 - 69
003	S201	4	77	39	0	7668	59 - 68
189	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	78	34	0	7662	54 - 66
195	MERC/RICO/3/SMARS/MARS//MARS	4	80	40	0	7651	61 - 68
069	MERC/RICO//MARS	4	75	39	0	7650	54 - 66
362	38D-WHITE-LONG	4	94	42	20	7650	51 - 64
240	ORIN//MERC/RICO	4	77	42	40	7641	52 - 66
198	SMARS/MARS//MARS/3/MERC/RICO	4	80	35	0	7631	64 - 69
177	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	76	34	0	7631	54 - 67
166	6-30426MG/LMNTR2//2207	5	84	38	0	7623	56 - 67
242	MERC//LMNT/MERC/3/MERC/3/MERC/RICO	5	80	40	0	7620	57 - 65
216	BNGL//MERC/RICO	4	77	37	0	7617	54 - 69
081	MERC/3/SMARS/MARS//MARS	4	77	39	0	7614	64 - 68

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
073	MERC/3/SMARS/MARS//MARS	5	81	34	0	7608	61 - 68
290	M203//MERC/RICO	5	77	40	0	7585	56 - 66
049	MERC/RICO//MARS	4	77	39	0	7571	56 - 63
068	MERC/RICO//MARS	4	77	38	0	7566	51 - 65
214	MERC//MERC/RICO/3/MERC/PCOS	4	77	35	0	7550	64 - 70
109	MERC/RICO//MARS	4	79	40	0	7546	61 - 67
095	MERC/3/SMARS/MARS//MARS	4	81	40	0	7541	62 - 68
200	9002177	5	77	37	0	7538	51 - 68
083	2214/RICO1	6	75	33	0	7533	60 - 68
151	BNGL//MERC/RICO	5	79	34	0	7529	58 - 70
182	STRN/MERC/RICO/4/MARS/M201/...	4	79	39	0	7527	55 - 63
125	9302065	4	77	31	0	7522	58 - 68
245	MERC/RICO//MERC/PCOS	4	75	39	0	7519	61 - 69
103	2207/NWBT//2207	5	76	36	0	7514	55 - 65
148	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	78	32	0	7500	56 - 67
102	2207/NWBT//2207	6	89	39	0	7474	56 - 66
215	MERC/PCOS/3/MERC//MERC/RICO	5	75	35	0	7468	58 - 69
118	LMNT//82CAY21/TDCN/3/LEAH	5	77	31	0	7468	49 - 69
038	LMNT*2/82CAY81//L202/LMNT	5	78	37	0	7462	51 - 63
146	KATY/CFRS	5	84	37	0	7459	43 - 67
328	A301/JSMN	4	82	37	20	7456	55 - 64
084	MERC/RICO//MARS	4	79	41	0	7445	57 - 66
116	E MERC/V4716	4	73	34	50	7440	57 - 67
224	L202/LMNT//KATY	5	80	35	0	7440	61 - 69
108	KATY//8303116/LMNT	5	80	34	0	7440	59 - 68
239	CFRS/JODN	4	77	34	0	7433	58 - 66
034	20001-5/LMNT//L202/LMNT	5	71	35	0	7433	53 - 65
277	MARS/CM101	6	75	40	20	7423	53 - 68
004	91Y171	3	66	38	0	7419	66 - 72
206	MERC//MERC/RICO/3/SASAN	6	69	37	40	7418	54 - 70
174	KATY/CFRS	3	78	45	50	7417	62 - 68
005	429	4	65	30	0	7411	66 - 72
063	MERC/RICO//MARS	5	74	34	0	7406	66 - 70
178	MERC/PCOS (9202008)/3/MERC//...	5	72	35	0	7395	56 - 68
139	MERC/LNMT//MERC/3/2214	5	84	37	0	7369	43 - 66
047	MERC/RICO//MARS	4	75	37	0	7368	55 - 64
205	SMARS/MARS//MARS/3/RICO	5	81	43	0	7368	53 - 64
090	9881/331581//L201/3/TBNT	6	75	34	0	7355	48 - 25
241	MERC/PCOS/3/MERC//MERC/RICO	6	75	37	0	7340	43 - 67
161	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	77	31	0	7319	51 - 63
275	9302106	6	76	35	0	7311	59 - 69
233	CFRS//L202/TBNT	4	76	35	0	7306	57 - 68
044	2207//82CAY21/TBNT	4	73	35	0	7303	54 - 65
278	MARS/CM101	6	75	36	0	7298	57 - 69
176	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	6	77	31	0	7292	56 - 67
144	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	78	37	0	7286	59 - 66
076	SMARS/MARS//MARS/3/2214	5	80	36	0	7277	51 - 68
225	ORION	4	77	41	40	7276	55 - 69
113	82CAY21/TBNT/3/LBNT//9881/331581/...	5	75	32	0	7270	58 - 68
111	MERC/RICO//MARS	4	77	39	0	7265	52 - 65
186	20001-5/LMNT//L202/LMNT	5	74	32	0	7248	61 - 66
339	MARS/CM101	4	71	40	0	7248	64 - 69
217	JODN/CFRS	4	77	35	0	7245	60 - 69
243	LMNT/3/L202//LMNT	5	84	39	0	7231	53 - 66
194	LMNT//20001-5/LMNT	4	81	37	0	7222	57 - 65
141	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	81	35	0	7215	55 - 66
248	SRICO/BNGL	4	77	42	70	7209	47 - 66
156	82CAY21//LMNT/LEAH/3/TTEPX2S/4/...	4	76	33	0	7191	31 - 62
064	MERC/RICO//MARS	4	77	33	0	7182	62 - 68
299	JSMN/DLLA	4	87	42	0	7175	48 - 65
399	DMSI/DLLAX2//LMNT/DLLA/...	4	78	40	30	7168	57 - 65
203	L202//80CAY50/LBLE	5	77	33	0	7154	59 - 68

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
170	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	4	75	35	0	7150	56 - 67
236	CFRS/ADAR	5	79	43	30	7139	56 - 67
079	SMARS/MARS//MARS/3/2214	0	87	38	0	7138	54 - 67
039	LMNT*2/82CAY81//L202/LMNT	5	77	39	0	7127	47 - 62
254	ORIN/V4716	4	76	35	0	7113	65 - 70
122	MARS/M201//MARS/3/SMARS/MARS//MARS	0	83	36	0	7095	52 - 65
123	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	77	32	0	7093	46 - 67
269	LSBR-5 X LMNT	4	79	35	0	7091	56 - 65
310	CFRS/U/DMSI/LM...	5	79	37	0	7089	59 - 69
089	MERC/RICO//MARS	6	82	39	0	7081	52 - 63
126	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	6	81	31	0	7077	58 - 67
158	82CAY21/TBNT/3/LBNT//9881/331581/...	5	80	38	0	7075	58 - 70
249	STRN/MERC/RICO/4/MARS/M201/...	4	83	39	0	7064	50 - 62
101	MERC/3/SMARS/MARS//MARS	4	81	37	0	7061	59 - 65
046	MBLE/3/LMNT//82CAY21/TDCN	5	77	32	0	7051	45 - 64
360	#2 DLLA/2214	4	84	35	0	7048	51 - 66
138	L202/LMNT//LMNT*2/CR1113	5	76	33	0	7036	54 - 66
266	92-5904 X 92-0955	5	77	45	60	7032	55 - 66
159	KATY/CFRS	4	84	38	0	7029	56 - 67
009	M103	4	64	34	0	7004	66 - 70
268	CFRS X 92-0072	3	84	45	0	7000	55 - 65
261	20001-5/LMNT//3072	5	77	34	0	6997	49 - 64
270	LSBR-5 X LMNT	4	83	35	0	6976	50 - 60
048	L202/LMNT (8902031)//CFRS	4	70	36	0	6972	51 - 65
193	6-30426MG/LMNTR2//2207	6	84	38	0	6970	58 - 67
303	JSMN/RAX CLEAR -F3	5	87	38	0	6968	36 - 60
132	ORIN/4/M101/MARS/3/NTAI//9545/NOVA	4	77	32	0	6956	57 - 67
279	MARS/CM101	0	77	40	0	6946	58 - 68
131	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	5	81	34	0	6905	60 - 69
354	JSMNX2/KDM105	4	82	40	80	6899	63 - 70
359	JSMN/3/82CAY21//LMNT/...(91B6784)	6	88	37	0	6886	54 - 66
006	93Y195	4	66	33	0	6878	54 - 69
033	2207//2001-5/LMNT	4	77	38	0	6872	46 - 58
306	DMSI/203//TTEP/RSMT	4	76	41	20	6868	38 - 64
181	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	6	77	29	0	6865	45 - 66
114	2207//82CAY21/TBNT	5	70	33	0	6861	57 - 69
394	38D-WHITE-LONG	5	97	39	60	6860	49 - 61
135	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	6	80	33	0	6858	48 - 62
110	CFRS//L202/LMNT (8902031)	4	75	37	0	6847	55 - 66
305	DMSI/DLLAX2//A301/3/L202	5	77	37	0	6842	50 - 66
333	KOKAHUROSE/BNGL	5	82	38	0	6832	60 - 66
082	2207/L82CAY21/TBNT	4	69	37	0	6829	56 - 67
228	CFRS/LCSN	5	78	37	40	6816	52 - 66
234	KATY/CFRS	4	84	33	0	6785	57 - 66
184	PCOS/MERC	5	77	33	0	6767	61 - 67
238	JODN/CFRS	4	80	35	0	6728	61 - 69
338	A301/JSMN(16.3-6-7)	5	84	46	70	6721	54 - 67
253	ALAN/RT7015	4	74	33	0	6713	54 - 66
142	RICO1/TTEPX2E//RICO	5	80	38	0	6711	59 - 66
152	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	4	76	33	0	6701	48 - 66
309	CFRS/U/DMSI/LM...	5	77	33	0	6699	61 - 71
085	MERC/RICO//MARS	6	79	37	0	6693	54 - 65
311	3072/DLLA	5	77	37	0	6660	56 - 67
381	2207//DLMT/B8462Y3-710	5	77	33	0	6653	61 - 69
336	DMSI/DLLAX2//LMNT	4	90	45	20	6646	49 - 61
264	RSMT//20001-5/LMNT	5	84	29	0	6643	55 - 64
321	82CAY21/LEAH//TORO2	5	83	40	0	6636	56 - 67
221	KATY/3072	4	75	40	80	6625	56 - 66
053	MBLE/CB801//MBLE	5	72	37	0	6625	54 - 66
307	DMSI//LMNT.../4/CFRS	5	76	40	0	6613	58 - 67
313	LMNT/DLLA//82CAY21/LMNT	5	81	35	0	6571	58 - 67
327	A301/3/DMSI//DLLAX2//A301	4	86	40	0	6563	57 - 67

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
289	82CAY21/LEAH//TORO	5	81	29	0	6550	62 - 69
271	LSBR-5 X LMNT	5	88	37	0	6549	51 - 62
335	DMSI/DLLAX2//LMNT	5	87	44	0	6543	45 - 65
226	CPRS/JODN	4	77	35	20	6525	60 - 68
097	MERC/RICO//MARS	4	83	42	0	6516	50 - 61
056	KATY//8303116/LMNT	6	83	30	0	6503	56 - 68
325	DELLROSE	6	80	35	0	6487	62 - 69
263	RSMT//20001-5/LMNT	4	84	37	0	6467	51 - 62
397	TORO2/JSMN	5	88	37	0	6459	44 - 60
281	JSMN/DLLA	5	92	42	0	6454	27 - 61
357	JSMN/TORO2	5	89	41	0	6449	36 - 56
172	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	0	81	32	0	6438	56 - 67
232	L202/TBNT//JKSN	4	73	40	30	6413	58 - 69
308	BNGL/CM101	5	74	34	0	6405	56 - 66
273	LSBR-5 X LMNT	5	83	37	0	6387	53 - 64
265	92-0978 X LMNT	5	83	33	0	6386	58 - 64
280	LMNT/2001/5//GFMT	6	80	35	0	6357	59 - 66
129	LMNT/4/82CAY21//TTEP/IR-8/3/LMNT	0	81	29	0	6341	49 - 66
351	DLMT 88462../4/DMSI/...	4	77	38	40	6323	47 - 64
291	S101/TORO2	4	83	38	0	6317	58 - 66
272	LBLE X LSBR-33	0	84	41	0	6316	44 - 65
179	MERC/RICO/4/MARS/M201//MARS/3/...	0	84	34	0	6313	59 - 68
361	KDM105	4	**	49	0	6311	37 - 58
227	CPRS/JODN	4	78	34	20	6291	56 - 64
400	REXMONT	6	82	36	0	6279	50 - 63
020	92Y328	4	64	33	0	6277	44 - 63
025	S301	4	71	37	0	6269	59 - 66
318	82CAY21/LMNT//DLLA	5	81	35	0	6267	58 - 67
379	DMSI/DLLAX2//LMNT/DLLA/3/JSMN	0	87	43	0	6265	47 - 65
366	3072/DLLA/3/DMSI/203//TTEP/4*LMNT/...	6	84	41	0	6249	31 - 65
229	2207/MBLE	4	80	31	0	6249	63 - 69
259	LMNT/2001/5//GFMT	4	87	35	0	6242	57 - 65
008	M203	3	61	32	0	6238	49 - 64
295	LBNTX2/A301	5	84	40	0	6235	46 - 68
348	L202/LMNT (9202031)//TORO2	4	79	37	0	6227	56 - 65
231	KATY/CPRS	4	80	39	30	6226	55 - 67
012	M204	3	66	35	0	6176	44 - 63
274	LMNT X LSBR-5	5	83	39	0	6168	56 - 64
002	AKITAKOMACHI	6	73	35	90	6167	68 - 73
036	LMNT*2/82CAY81//L202/LMNT	5	80	34	0	6147	33 - 55
341	A301/LBNTX2	6	82	34	0	6124	48 - 65
297	MARS/CM101	5	76	37	0	6124	55 - 68
344	A301/JSMN	5	84	43	60	6122	50 - 64
223	2207/MBLE	5	73	33	60	6118	60 - 67
237	2207/MBLE	5	77	31	50	6098	59 - 69
365	DMSI/LMNT/NWBT/3/LMNT/DLLA/4/2207...	5	71	38	90	6097	55 - 67
292	DLLA/2214	5	81	42	0	6085	53 - 63
301	JSMN/TORO2	4	87	38	0	6059	46 - 62
346	DLLA/BNGL	4	83	37	0	6049	57 - 66
337	DMSI/DLLAX2//LMNT	5	84	46	0	6012	43 - 68
011	M202	3	65	34	0	5979	49 - 61
319	82CAY21/LMNT//DLLA	4	77	34	0	5941	60 - 67
355	BNGL/CM101	6	70	35	0	5922	62 - 70
334	DMSI/DLLAX2//LMNT	6	89	44	0	5922	44 - 64
314	LMNT/DLLA//82CAY21/LMNT	5	77	31	0	5912	58 - 68
096	LBLEX2-2/BJ-1*F1//.../3/GCHW/...	4	69	32	60	5893	57 - 68
007	93Y185	3	59	30	0	5880	55 - 66
092	82CAY21/TBNT/3/82CAY21//LMNT/LEAH	5	73	34	0	5857	55 - 68
222	CB801//82CAY21/LMNT	0	90	33	0	5854	52 - 67
342	82CAY21/LMNT//DLLA	5	76	33	0	5835	53 - 63
350	CM101	5	69	31	50	5782	45 - 69
386	DMSI/DLLAX2//LMNT/DLLA/3/DMSI/203/..	5	88	40	0	5757	46 - 62

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
296	A301/LBLE SC-163	6	79	36	0	5744	43 - 65
300	DELLA	5	84	51	70	5681	43 - 66
230	V7817/3/9881/331581//L201	6	91	39	0	5668	49 - 63
380	DMSI/DLLAX2//LMNT/DLLA/3/DMSI/203/...	6	82	41	0	5631	47 - 64
345	JSMN/DLLA	5	89	43	40	5630	40 - 54
353	DMSI/DLLAX2../4/DLM/B5461	4	82	43	10	5624	47 - 64
293	DMSI//DLLAX2/A301/3/L202	4	76	37	0	5558	48 - 64
312	3072/DLLA	6	79	34	0	5552	48 - 64
382	DLLAX2/LMNT*2/3/DMSI/DLLAX2//LMNT/DLLA	6	78	35	0	5541	48 - 67
032	8303116/LMNT//MBLE*2	4	68	38	0	5536	45 - 58
016	L202	4	69	37	0	5500	31 - 53
304	A301/LBNTX2	5	84	37	0	5489	56 - 66
395	DMSI/203//TTEP/4*LMNT/3/A301	6	77	39	70	5470	42 - 68
021	418	3	61	30	0	5459	49 - 61
030	93Y421	4	68	35	0	5449	48 - 65
385	DMSI/DLLAX2//LMNT/DLLA/3/MBLE	4	74	37	40	5410	51 - 62
051	SMARS/MARS//MARS/3/2214	5	81	35	0	5408	60 - 69
387	NWBT/LEAH//DLLAX2	4	87	34	0	5401	54 - 68
022	91Y381	3	62	34	0	5360	39 - 58
028	94Y118	4	70	35	0	5334	50 - 62
320	DLLA//82CAY21/LMNT	4	72	35	0	5326	57 - 66
262	20001-5/LMNT//3072	4	79	39	0	5324	54 - 67
031	A301	4	81	37	0	5310	40 - 61
013	91Y381	4	63	31	0	5309	45 - 60
375	TORO2	8	84	40	0	5273	64 - 69
398	JSMN/DLLA	5	88	43	0	5272	50 - 63
256	ORIN/V4716	4	75	46	90	5254	55 - 65
018	94Y383	4	66	33	0	5253	44 - 60
376	RED SEG	-	--	56	80	5199	41 - 56
010	M201	4	65	31	0	5175	44 - 61
369	BN73/9857//P1256116.../3/L202/TBNT	5	74	40	50	5163	59 - 69
371	2214/CM101	6	42	40	73	5152	56 - 67
326	LMNT/DLLA/A301	5	71	40	0	5132	43 - 65
288	82CAY21/LMNT//DLLA/3/A301	6	72	32	0	5117	46 - 67
285	A301/JSMN -F5	5	91	41	0	5112	36 - 59
367	BN73/9857//P1256116.../3/L202/TBNT	5	35	90	70	5088	54 - 66
370	BN73/9857//P1256116.../3/L202/TBNT	5	73	40	90	4925	51 - 66
091	82CAY21/TBNT/3/LBNT//9881/331581/...	6	77	34	0	4906	56 - 68
302	DLLA//82CAY21/LMNT	5	72	32	0	4887	55 - 65
023	92Y624	5	68	35	0	4881	40 - 60
014	93Y413	3	63	33	0	4864	34 - 55
317	JSMN/DLLA	5	92	39	0	4710	29 - 57
349	BNGL/MOKR	5	90	46	0	4683	46 - 60
284	JSMN//LMNT/DLLA	6	88	29	0	4683	38 - 65
323	A301/JSMN	5	84	44	0	4671	44 - 67
024	93Y589	4	66	33	0	4665	48 - 61
001	CM101	4	68	35	45	4577	59 - 68
392	NWBT/LEAH//DLLAX2	5	89	38	0	4552	54 - 66
393	KAYEEMA	4	82	43	70	4552	54 - 63
330	BASMATI	5	91	39	0	4530	48 - 58
286	JSMN/RAX CLEAR -F3	4	87	35	0	4528	44 - 62
368	BN73/9857//P1256116.../3/L202/TBNT	5	74	42	80	4497	62 - 70
280	JSMN/DLLA	5	93	39	0	4488	30 - 59
252	8303116/LMNT//MBLE*2	3	69	35	90	4470	52 - 65
384	M201/3/5242/UKN//RXRE/4/CM101	8	77	31	0	4461	59 - 68
029	M401	4	79	41	0	4460	38 - 56
352	DLMT 88462../4/DMSI/...	5	75	37	90	4449	42 - 65
377	KOKAHUROSE/2214	5	91	42	0	4423	50 - 60
391	A301/JSMN(16.3-6-7)	6	89	45	0	4418	52 - 66
287	82CAY21/LMNT//DLLA/3/A301	6	84	33	0	4313	61 - 68
282	JSMN/DLLA	5	91	47	0	4281	40 - 62
329	JSMN/TORO2	0	94	39	0	4153	48 - 60

Continued.

Table 57. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
322	A301/JSMN	0	94	43	0	4127	41 - 53
364	A301/JSMN	4	98	50	0	4099	36 - 63
250	MAYBELLE	3	68	37	90	3988	51 - 66
017	L203	3	68	34	0	3905	11 - 42
332	KOKAHUROSE/BNGL	4	95	39	0	3898	49 - 62
372	DMSI/203//TTEP/4*LMNT/3/ALAN	0	77	43	0	3854	51 - 66
019	94Y591	3	67	32	0	3766	49 - 61
324	DMSI/DLLAX2//A301	5	91	41	0	3752	20 - 57
316	JSMN/DLLA	6	93	40	0	3750	35 - 59
347	ARBORIO//MERC/RICO	6	77	38	0	3746	37 - 59
378	DMSI/DLLAX2//LMNT/DLLA/3/JSMN	5	96	43	0	3642	32 - 50
363	A301/JSMN	5	97	46	0	3568	25 - 57
373	DMSI/203//TTEP/4*LMNT/3/ALAN	6	77	37	90	3479	36 - 64
015	93Y218	3	61	29	0	3407	47 - 59
343	BNGL/CM101	7	71	31	0	3364	57 - 66
383	DLLAX2/LMNT*2/3/DMSI/DLLAX2//LMNT/...	8	88	35	0	3319	44 - 63
356	V7713/JSMN	5	88	35	0	3262	37 - 57
358	V7713/JSMN	4	95	34	0	3149	39 - 58
390	DMSI/DLLAX2//LMNT/DLLA/3/DMSI/...	6	72	43	90	3088	45 - 68
027	94Y576	3	68	33	0	3072	- - -
267	92-1938 X 92-0592	5	99	49	0	2860	34 - 54
331	A301/JSMN	5	90	40	0	2551	48 - 68
026	94Y589	3	66	31	0	2277	29 - 46
075	BENGAL	0	84	33	0	2262	50 - 66
398	JSMN/MBLE	5	99	43	0	2052	- - -
315	JSMN/DLLA	5	94	38	0	0	53 - 66

* Subjective rating, 1 to 9 where 1 = excellent, 9 = poor.

Experiment: Non-Replicated Preliminary Yield Test (Entries 401-505)

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, May 26, 1995

Planting Method: Drill-seeded

Fertilization: 100-52-52 lb/A (N-P_2O_5-K_2O), May 25; 92 lb N/A, June 14

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flood, June 15; harvest drainage, Sept 20

Herbicides: Stam (propanil) 4 lb ai/A, June 7; Londax (bensulfuron) 1 oz ai/A, June 19

Insecticides: Furadan (carbofuran) .5 lb ai/A, June 23

Harvest: Sept 29

Experimental Design: Single plot test

Results: Table 58

Table 58. Agronomic and milling performance of 1995 non-replicated preliminary yield test (entries 401-505). Rice Research Station, Crowley, LA.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
440	LAFITTE	4	74	39	94	6984	61 - 67
453	BSMT 5875/CFRS	4	66	41	81	6577	55 - 66
445	SMARS/MARS//PCOS (9402770)	5	73	35	0	6565	54 - 66
444	SMARS/MARS//PCOS (9402770)	5	73	34	0	6515	52 - 64
428	CFRS//82CAY21/TBNT (9402561)	4	77	42	0	6214	54 - 66
416	JODN/LBLE SC-5//JODN	6	79	40	0	6138	48 - 62
426	MERC/RICO	7	79	42	0	6090	60 - 68
424	MERC/RICO	5	80	43	0	6060	62 - 69
447	STRN/MERC/RICO/4/MARS/M201/...	6	85	46	0	5995	61 - 66
413	L202/TBNT//RSMT/MBLE	4	73	37	34	5809	53 - 67
437	20001-5/LMNT//L202/LMNT (9402668)	7	84	49	33	5724	62 - 70
495	CFRS//DLMT/B8462Y3-710	5	73	37	83	5718	45 - 65
492	CFRS//DLMT/B8462Y3-710	4	81	42	54	5665	58 - 67
450	KAYBONNET	3	76	47	95	5620	47 - 57
421	JODN/LBLE SC-5//JODN	5	71	40	0	5593	42 - 59
417	JODN/LBLE SC-5//JODN	5	74	40	0	5572	22 - 59
423	20001-5/LMNT//L202/LMNT	6	80	38	0	5571	54 - 65
439	ORIN/89Y246 (9402699)	6	80	41	0	5566	55 - 68
434	CFRS//L201/7402003	6	86	41	0	5535	61 - 69
406	CFRS (MUTANT)	4	80	40	84	5517	57 - 65
409	CYPRESS	6	80	40	95	5465	57 - 67
498	DLLAX2/LMNT*2/3/DMSI/DLLAX2//...	4	77	37	95	5460	52 - 65
435	CFRS//L201/7402003	6	87	44	0	5455	59 - 68
433	CFRS/MBLE (9402632)	6	79	35	0	5447	57 - 66
420	BENGAL	3	78	39	0	5425	55 - 62
446	STRN/MERC/RICO/4/MARS/M201/...	5	78	44	0	5417	43 - 54
448	MERC/RICO (92URN025) (9402818)	7	76	40	0	5393	63 - 69
488	BNGL/CM101	5	80	37	0	5387	39 - 69
449	MERC/RICO (92URN025) (9402818)	7	76	41	0	5383	60 - 67
490	BNGL/CM101	4	77	39	0	5365	60 - 71
438	ORIN/4/M101/MARS/3/NTAI//9545/NOVA...	6	85	43	0	5353	59 - 69
415	L202/TBNT//RSMT/MBLE	6	75	38	0	5340	64 - 67
408	CFRS (MUTANT)	5	81	42	0	5320	59 - 68
419	JODN/LBLE SC-5//JODN	5	72	40	0	5299	43 - 60
411	LMNT (MUTANT)	7	77	45	0	5298	58 - 70
402	CFRS (MUTANT)	5	83	41	0	5291	59 - 66
461	BNGL/KOKR	7	78	46	0	5289	48 - 66
427	MERC/RICO	6	77	40	0	5281	61 - 67
464	BNGL/KOKR	6	84	44	0	5269	51 - 68
496	CFRS//DLMT/B8462Y3-710	6	80	41	0	5262	54 - 65
436	20001-5/LMNT//L202/LMNT (9402668)	5	84	48	95	5258	61 - 70
489	KOKAHUROSE/BNGL	5	87	37	0	5212	58 - 65
473	DLLA//TTEP*4/LMNT	6	80	36	0	5193	16 - 63
441	ORIN/89Y246 (9402699)	6	80	41	0	5111	56 - 68
414	L202/TBNT//RSMT/MBLE	5	73	37	33	5109	55 - 65
493	CFRS//DLMT/B8462Y3-710	5	79	45	0	5092	48 - 62
401	CFRS (MUTANT)	4	80	41	0	5077	58 - 65
430	2065	4	76	37	0	4996	44 - 58
491	CFRS//DLMT/B8462Y3-710	5	77	42	0	4986	58 - 66
418	JODN/LBLE SC-5//JODN	5	69	39	0	4977	21 - 58
412	LMNT (MUTANT)	6	81	35	0	4964	58 - 68
484	DMSI/DLLAX2//LMNT/DLLA/3/JSMN	7	86	46	0	4940	54 - 67
494	CFRS//DLMT/B8462Y3-710	5	79	41	0	4920	31 - 64
443	V4916/MARS (9402757)	6	80	38	0	4916	34 - 60
442	V4916/MARS (9402757)	6	79	37	0	4848	58 - 66
466	DLMT 8462.../4/DMSI/...	7	86	41	0	4827	53 - 68
407	CFRS (MUTANT)	5	80	40	33	4784	59 - 67
425	MERC/RICO	6	76	38	0	4762	54 - 63
457	BSMT 5875/3/DMSI/DLLA...	7	85	47	0	4762	43 - 64
485	DMSI/DLLAX2//LMNT/DLLA/3/JSMN	7	86	48	0	4723	41 - 65
452	BSMT 5875/CFRS	7	83	48	75	4654	57 - 68

Continued.

Table 58. Continued.

Plot	Pedigree	Seedling vigor*	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tol)
454	BSMT 5875/ALAN	6	83	53	92	4653	44 - 67
432	CPRS/MBLE (9402627)	6	84	36	0	4646	60 - 68
481	KOKAHUROSE/BNGL	6	91	42	0	4640	56 - 65
460	BSMT 5875/3/DMSI/DLLA...	7	78	52	0	4637	42 - 67
505	DMSI//LMNT/NWBT/3/LMNT/DLLA	6	72	38	0	4624	7 - 61
472	DLMT 88462.../4/DMSI	7	85	40	0	4608	55 - 68
504	CM101	6	70	39	0	4588	25 - 63
476	KOKAHUROSE/BNGL	4	92	47	0	4581	54 - 69
405	CPRS (MUTANT)	5	83	38	74	4578	60 - 67
422	JODN/LBLE SC-5//JODN	7	78	41	0	4554	41 - 57
499	DMSI/DLLAX2//LMNT/DLLA/3/MBLE	5	80	47	0	4483	52 - 65
463	BNGL/KOKR	5	84	49	34	4455	60 - 67
497	DLLAX2/LMNT*2/3/DMSI/DLLAX2//...	7	86	41	0	4432	51 - 68
410	CYPRESS	3	77	41	95	4426	54 - 65
403	CPRS (MUTANT)	6	85	41	0	4420	58 - 66
404	CPRS (MUTANT)	5	80	39	33	4408	59 - 66
431	CPRS/GFMT (9402612)	6	86	35	0	4293	60 - 69
469	DLLA/BNGL	6	85	39	0	4289	60 - 69
470	DLLA/BNGL	5	80	34	0	4257	60 - 69
456	BSMT 5875/ALAN	7	79	50	0	4213	53 - 66
458	BSMT 5875/3/DMSI/DLLA...	7	87	44	0	4202	35 - 66
486	DMSI/DLLAX2//LMNT/DLLA/3/JSMN	7	86	43	0	4134	3 - 64
429	CPRS/GFMT (9402612)	7	87	37	0	4095	56 - 66
474	JSMN/JSMNX2	5	70	36	0	4024	19 - 64
487	DMSI/DLLAX2//LMNT/KLLA/3/DMSI/...	7	86	39	0	4002	56 - 68
479	KOKAHUROSE/BNGL	6	83	57	0	3963	54 - 62
462	BNGL/KOKR	6	73	48	0	3920	42 - 64
455	BSMT 5875/ALAN	5	91	51	95	3912	45 - 66
502	DELLA	6	77	52	95	3788	56 - 67
482	KOKAHUROSE/BNGL	6	85	37	0	3716	64 - 71
500	DLLA//TTEP*4/LMNT	5	76	37	0	3704	38 - 63
480	KOKAHUROSE/BNGL	6	72	44	0	3700	22 - 63
503	DMSI/DLAAX2//LMNT/DLLA/3/...	6	77	42	0	3635	40 - 60
477	KOKAHUROSE/BNGL	6	92	42	0	3634	62 - 68
471	BSMT 5875/3/DMSI/DLLA	7	85	37	0	3609	46 - 64
475	DMSI//LMNT/NWBT/3/LMNT/DLLA/4/...	6	82	50	0	3423	48 - 64
467	DLMT 8462.../4/DMSI/...	9	86	42	0	3364	54 - 67
468	CPRS/KASTURI	6	96	55	85	3350	33 - 64
478	KOKAHUROSE/BNGL	6	82	43	0	3268	57 - 67
465	DLMT 8462.../4/DMSI/...	7	86	41	0	3205	50 - 65
451	BSMT 5875/CPRS	7	85	46	95	3069	57 - 66
483	SDRI/MBLE	7	89	44	0	2735	44 - 61
459	BSMT 5875/3/DMSI/DLLA...	8	93	43	0	1761	42 - 65

* Subjective rating, 1 to 9 where 1 = excellent, 9 = poor.

ADVANCED SPECIALTY TEST

The advanced specialty test contained entries of various specialty classes. Included here were Jasmine types, red bran lines, and premium quality short and medium grains.

Experiment: Advanced Specialty Test

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, May 26, 1995

Planting Method: Drill-seeded

Fertilization: 100-52-52 lb/A (N-P_2O_5-K_2O), May 25; 92 lb N/A, June 14

Plot Size: 4.66 x 16 ft (74.5 ft^2)

Water Management: Flood, June 15; harvest drainage, Sept 20

Herbicides: Stam (propanil) 4 lb ai/A, June 7; Londax (bensulfuron) 1 oz ai/A, June 19

Insecticides: Furadan (carbofuran) .5 lb ai/A, June 23

Harvest: Sept 29

Experimental Design: Randomized complete block with four replications

Results: Table 59

Table 59. Agronomic and milling performance of 1995 advanced specialty test, Crowley, LA.

1995 entry	Pedigree	Grain Type*	Seedling vigor**	Days to 50% heading	Plant height (in)	Lodging (%)	Yield (lb/A @ 12%)	Milling % (Whl-Tot)
405	022	M	6	77	40	23	6188	63 - 69
407	085	M	6	74	44	23	6093	48 - 67
424	92R6671-RED BRAN...	L	5	84	48	0	5950	56 - 67
406	025	M	7	78	43	30	5929	63 - 69
414	JSMN/3/82CAY21//...	L	4	91	41	0	5709	55 - 66
423	9217227-RED BRAN...	L	5	88	45	0	5688	47 - 64
403	MERC//401/NTAI...	M	5	72	43	27	5415	53 - 67
422	9217217-RED BRAN...	L	4	89	46	0	5406	46 - 66
401	MERC/AKIHIKARI	M	5	71	38	0	5203	57 - 67
418	RED BRAN	L	4	89	42	0	4929	46 - 63
410	BENGAL	M	5	79	39	0	4912	51 - 65
402	MERC/KOSH//MERC	M	5	75	40	7	4804	48 - 65
419	RED BRAN	L	4	86	41	0	4719	58 - 67
404	008	M	6	69	36	0	4603	44 - 68
420	RED BRAN(93SP292)	L	4	87	50	0	4356	53 - 64
421	RED BRAN(93SP291)	L	4	86	51	0	4220	57 - 65
425	CYPRESS	L	5	79	43	0	4156	43 - 60
409	KOSHIHIKARI	M	5	69	41	30	4125	40 - 71
408	AKITAKOMACHI	M	7	69	39	0	4035	48 - 69
416	V7713/JSMN	L	4	95	38	0	3779	52 - 66
411	KOKR/BNGL	M	5	90	52	0	3585	49 - 67
413	A301/JSMN(93SP316)	L	5	86	43	0	3403	41 - 61
412	A301/JSMN	L	5	85	47	0	2908	54 - 67
417	A301/JSMN	L	5	85	49	0	2792	- - -
415	A301/JSMN(...	L	4	87	49	0	1755	50 - 63
C.V., %			17	1	4	--	11.5	7 2
LSD (0.05)			1.7	2	3	--	1023	6 2

* L = Long grain; M = Medium grain.
** Subjective rating 1 to 9, where 1 = excellent, 9 = poor.

MULTIPLE GENERATION RICE BREEDING NURSERY[1,2]

S.D. Linscombe, F. Jodari, L. Aviles, W.J. Leonards, Jr.,
L.M. White, and H.L. Hoffpauir

A winter nursery facility is an important feature of a rice breeding program. The nursery allows the production of additional generations of breeding material per year, thus, decreasing the amount of time required to develop new varieties.

The agricultural experiment stations of Arkansas, Louisiana, Texas, and Puerto Rico have a cooperative agreement to operate a year-round rice nursery on the University of Puerto Rico Experiment Station located at Lajas for the purpose of advancement, selection, and seed increase of breeding lines. This cooperative venture facilitates efficient utilization of the nursery area, equipment, and labor and is allowing these breeding programs to grow a large number of breeding lines to expedite the development and release of improved rice varieties for the southern U.S. rice growing area.

1995 Activities

Two successful nurseries were planted and harvested in Puerto Rico in 1995. The first planting consisted of 4,300 rows and included bulked F_3 populations, advanced breeding panicle rows, and three seed increases. One of the increases was Lafitte (300 rows) and the seed harvested from this was used to plant the 7 acres used to produce foundation seed on the Station. A second nursery was planted on August 17. This was the earliest the fall nursery has ever been planted. This nursery, consisting primarily of F_2 populations, was harvested in mid-December. Much of the selected material was replanted into the spring nursery. Because of the earliness of these plantings and harvestings, the spring nursery was harvested in early April. This allowed this material to be planted at the Rice Research Station at a much more representative planting date and, thus, selection is more efficient.

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[1] Cooperative investigators, Louisiana Agricultural Experiment Station, Crowley, LA; University of Puerto Rico Agricultural Experiment Station, Lajas, PR; Texas Agricultural Experiment Station and USDA-ARS, Beaumont, TX; and Arkansas Agricultural Experiment Station, Stuttgart, AR.

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

EFFECTS OF LONDAX RATE, TIMING, AND FLOOD DEPTH ON THE PERFORMANCE OF WATER-SEEDED RICE

S.D. Linscombe, E. Castner, D.E. Sanders, R. Strahan, and F. Jodari

Londax is a widely used rice herbicide that fits well in many water-seeded (and dry-seeded) situations typical of southwest Louisiana. In previous growing seasons, there have been reports of Londax applications causing an inhibition of rice root growth and development under certain environmental conditions. This inhibition has been characterized by reduction in root growth and development, as well as a decrease in soil penetration by some affected rice plants. This study was designed to see if this root growth inhibition could be created under experimental conditions and if root inhibition would have any adverse effects on rice agronomic development and yield.

Location: Rice Research Station, Crowley, LA

Seeding Rate/Date: 150 lb/A, Mar 30, 1995

Seeding Method: Water seeded (pregerminated seed)

Fertilization: 100-52-52 lb/A (N-P_2O_5-K_2O) preplant incorporated, Mar 27;
21 lb N/A, May 24, June 9

Water Management: Flood, Mar 27; drain, Apr 4; reflood, Apr 7;
harvest drainage, July 17

Harvest: July 25

Treatments: **Londax Rates**

1) 0
2) .66 oz ai/A
3)1.0 oz ai/A

Water Depths (for 14 days after treatment)

1) 2-inch
2) 6-inch

Timing of Application

1) Early (1-leaf rice)
2) Late (4- to 5-leaf rice)

Variety: Cypress

Experimental Design: Randomized complete block with a factorial arrangement of treatments (3x2x2), three replications.

Comments: Individual leveed plots were established and a flood was applied 3 days prior to seeding. Water depths were maintained as either a pinpoint flood (2-inch) or a deep flood (6-inch). Treatments were applied using a CO_2 sprayer calibrated to deliver a spray volume of 15 gal/A using 8002 E tips. Evaluations included dry root weights from 20 randomly selected plants per plot, with samples being taken on May 8 and June 7, plant height at maturity, days to 50% heading, and grain yield (adjusted to 12% moisture).

When rice roots were visibly evaluated, some reductions in root growth and development were noted when some Londax treatment combinations were compared with the untreated check. However, there were no significant differences noted among the different treatment combinations at either the first or second root sampling.

For the variable plant height, there were no significant differences between flooding depths and Londax rates, nor were any of the interactions significant. However, the later Londax application treatment caused a plant height reduction of approximately 1 inch, which was statistically significant but probably not agronomically significant.

For the variable days to 50% heading, there was a significant difference between flood depth and Londax timing, and the depth x timing interaction was also significant. However, when comparing the various depth x timing combinations, only an early timing with a deep flood caused a substantial delay in maturity (2 days).

For the variable yield, there were no significant differences among the two timings. There was, however, a significant difference between the two flood depths and the three Londax rates, and the depth x timing and rate x timing interactions were significant. Table 1 shows yield information for the various depth x timing combinations. The highest yield level was found with a shallow flood and early timing of Londax, while the lowest yield level was displayed where a deeper flood and earlier timing were used. This would indicate that flood depth at an earlier Londax application timing is much more critical than at a later timing. Table 2 shows yield information from the six combinations of Londax rates and timings. The highest yield was obtained at the highest rate of applied Londax at the earliest treatment timing, while the lowest yield level was found where Londax was not applied. However, in those plots where Londax was not applied, uncontrolled ducksalad probably reduced yield from both space and applied nitrogen competition. This was an unforeseen complication that will be addressed in later studies.

Summary. This preliminary study has shown that under certain combinations of Londax treatments and environmental conditions yield reductions could be realized when compared with other Londax treatments (and environmental conditions). However, in general, yields were lower where Londax was not applied, which was partially due to the lack of ducksalad control in these treatments. The study has shown that any root inhibition caused by Londax application is minimal and temporary, at least under the environmental conditions encountered in this study.

Table 1. Effects of two flooding depths and two timings of Londax application on the yield of Cypress rice. Rice Research Station, Crowley, LA. 1995.

Timing	2-inch depth	6-inch depth
	---------(lb/A @ 12%)----------	
1-leaf rice	7026 a*A**	6201 b A
4- to 5-leaf rice	6666 a A	6500 a A

* Numbers followed by the same small case letters are not significantly different within rows (Duncan's multiple range test, P = 0.05).

** Numbers followed by the same capital letters are not significantly different within columns (Duncan's multiple range test, P = 0.05).

Table 2. Effects of three rates of Londax and two timings of application on the yield of Cypress rice. Rice Research Station, Crowley, LA. 1995.

Timing	Rates (oz/A) 0	.66	1.0
	----------(lb/A)----------		
1-leaf rice	5971 b* A**	6774 a A	7150 a A
4- to 5-leaf rice	6484 a A	6366 a A	6900 a A

* Numbers followed by the same small case letters are not significantly different within rows (Duncan's multiple range test, P = 0.05).

** Numbers followed by the same capital letters are not significantly different within columns (Duncan's multiple range test, P = 0.05).

FIELD EVALUATION OF GENETICALLY ENGINEERED GLUFOSINATE RESISTANT RICE LINES

S.D. Linscombe, P. Christou, F. Jodari, D.E. Sanders,
M.P. Braverman, J.H. Oard, and R. Strahan

Genetically engineered glufosinate resistant rice lines were field evaluated at the Rice Research Station, Crowley, Louisiana. This field study was conducted to evaluate rice lines that have been genetically engineered to contain the BAR gene, which imparts resistance to the broad spectrum herbicide glufosinate. This is a non-selective contact herbicide that has activity on non-transformed rice, as well as on red rice and most other rice weeds. Since rice and red rice are very closely related genetically, no herbicide is currently available that will selectively control red rice in an established rice crop. Glufosinate is very efficacious on red rice and the concept this research is exploring could lead to the development of glufosinate-resistant rice varieties on which the herbicide could be used to selectively kill red rice (as well as other rice weeds) without damage to the commercial crop.

The genetic engineering was accomplished by Dr. Paul Christou with John Innes Center, Norwich, England (formerly with Agracetus, Inc, Madison, WI). Glufosinate is an active ingredient of a registered product of AgrEvo.

The transgenic lines evaluated in the study were derived from Cypress and Gulfmont (both semidwarf southern long grains), Bengal (a semidwarf southern medium grain), and Koshihikari (a Japanese premium quality short grain).

Experiment: Transgenic (glufosinate resistance) study

Location: Rice Research Station

Seeding Rate/Date: 100 lb/A, May 26, 1995

Planting Method: Drill seeded

Fertilization: 14-42-42 lb/A (N-P_2O_5-K_2O) preplant incorporated, May 25;
92 lb N/A, June 19

Plot Size: 4.67 x 12 ft (56 ft^2)

Water Management: Flushed, May 26; flooded, June 20; harvest drainage, Sept 5

Rice Lines: Transgenic Gulfmont-derived lines

1. GFMT 517-1-R1
2. GFMT 517-2-R1
3. GFMT 517-3-R1
4. GFMT 517-5-R1
5. GFMT 517-7-R1
6. GFMT 526-1

Transgenic Koshihikari-derived lines

7. KOSH 495-1-R1
8. KOSH 495-1-R2
9. KOSH 496-1-R1
10. KOSH 496-1-R2
11. KOSH 496-2-R1
12. KOSH 496-3-R1
13. KOSH 496-3-R2
14. KOSH 496-4-R1
15. KOSH 496-4-R2

Transgenic Bengal-derived lines

16. BNGL HC-11
17. BNGL HU-10
18. BNGL MB-15
19. BNGL SX-2

Transgenic Cypress-derived lines

20. CPRS PB-6
21. CPRS PB-13

Non-transformed lines

22. Bengal
23. Cypress
24. Gulfmont
25. Koshihikari

Herbicide Treatments: Glufosinate 1 lb ai/A and 2 lb ai/A; Control

Harvest: Sept 27

Experimental Design: Randomized complete block with a split-plot arrangement of treatments; main plots, herbicide treatments; split plots, rice lines.

Results: Tables 1-4 show yield and agronomic information for the different transformed lines compared with their respective non-transformed parental variety where no glufosinate was applied. The non-transformed parental line had a numerically higher yield than its derived transgenic lines with the exceptions of KOSH 496-4- R1and KOSH 496-2-R1 (compared with Koshihikari) and BNGL HU-10 (compared with Bengal). Table 5 shows yields of selected transgenic lines as affected by 0, 1, and 2 lb/A of glufosinate. With a few exceptions, there was little or no yield reduction associated with glufosinate treatment.

Table 1. Agronomic performance of transgenic and non-transgenic Bengal. No glufosinate treatment, Crowley, LA. 1995.

Entry	Days to 50% heading	Plant height	Yield
		-(in)-	(lb/A @ 12%)
BNGL HU-10	79 b	36 ab	4993 a
Bengal	79 b	38 a	4927 a
BNGL MB-15	79 b	34 b	4359 ab
BNGL HC-11	89 a	37 a	4273 ab
BNGL SX-2	79 b	35 ab	3832 b

Means followed by the same letter are not significantly different (Duncan's multiple range test, P=.05).

Table 2. Agronomic performance of transgenic and non-transgenic Cypress. No glufosinate treatment, Crowley, LA. 1995.

Entry	Days to 50% heading	Plant height -(in)-	Yield
Cypress	81 a	40 a	5240 a
CPRS PB-6	80 a	40 a	4233 ab
CPRS PB-13	81 a	40 a	3754 bc

Means followed by the same letter are not significantly different (Duncan's multiple range test, P=.05).

Table 3. Agronomic performance of transgenic and non-transgenic Gulfmont. No glufosinate treatment, Crowley, LA. 1995.

Entry	Days to 50% heading	Plant height -(in)-	Yield (lb/A @ 12%)
Gulfmont	81 a	38 a	5292 a
GFMT 517-7-R1	85 a	36 a	4591 abc
GFMT 517-1-R1	83 a	37 a	4391 abcd
GFMT 517-3-R1	83 a	36 a	4371 abcd
GFMT 517-2-R1	84 a	37 a	4467 bcd
GFMT 517-5-R1	85 a	37 a	3586 cd
GFMT 526-1	85 a	37 a	3308 de

Means followed by the same letter are not significantly different (Duncan's multiple range test, P=.05).

Table 4. Agronomic performance of transgenic and non-transgenic Koshihikari. No glufosinate treatment, Crowley, LA. 1995.

Entry	Days to 50% heading	Plant height	Yield
		-(in)-	(lb/A @ 12%)
KOSH 496-4-R1	76 a	104 ab	4739 a
KOSH 496-2-R1	76 a	100 b	4515 a
Koshihikari	74 a	107 a	4395 a
KOSH 496-3-R2	75 a	106 a	4239 a
KOSH 496-1-R2	74 a	108 a	4081 a
KOSH 496-3-R1	75 a	109 a	3897 a
KOSH 496-4-R2	75 a	103 ab	3881 a
KOSH 496-1-R1	74 a	106 a	3645 a
KOSH 495-1-R1	78 a	98 b	2442 b
KOSH 495-1-R2	77 a	99 b	2269 b

Means followed by the same letter are not significantly different (Duncan's multiple range test, P=.05).

Table 5. Yields of transgenic rice lines as affected by glufosinate treatments. Rice Research Station, Crowley, LA. 1995.

Entry	Glufosinate (lb/A, ai)		
	0	1	2
	----------lb/A----------		
GFMT 517-7-R1	5041	5181	5347
GFMT 517-1-R1	4032	4411	4857
GFMT 517-3-R1	4976	4853	4796
CPRS PB-6	4685	3952	4500
CPRS PB-13	4106	3669	4194
BNGL HU-10	5466	4157	4672
BNGL HC-11	4686	4640	4910
KOSH 496-4-R1	5344	4394	4937
KOSH 496-2-R1	5075	4283	4798
KOSH 496-3-R2	4804	4003	4591
KOSH 496-1-R2	4560	5069	4244

EVALUATION OF BLAST RESISTANT RICE LINES

Y.K. Liu, S.D. Linscombe, D.E. Groth, and F. Jodari

The experiment was conducted in the flooded blast nursery at the Rice Research Station at Crowley to evaluate rice lines selected from 1994's blast nursery and elite lines from the Breeding project. Each line was planted in a single row, and some lines with good agronomic performance were put into a yield trial. The experiment was drill seeded on May 3. High nitrogen fertilizer (21-0-0, 160 lb/A) was used to facilitate blast development.

The single row evaluation included 195 lines from 1994's blast nursery and eight cultivars (checks) or elite breeding lines. The rows were 6 feet long with 10 inches between rows. A check cultivar or an elite breeding line was inserted in every twentieth row. M201, an extremely blast susceptible cultivar, was seeded surrounding the test rows as a blast inoculum source.

The yield trial was a randomized complete block design with four replications. The plot size was 4.66 x 12 ft. The test plots were surrounded by M201 to serve as an inoculum source. Lines and cultivars involved in the test are listed in Table 1.

Leaf blast and neck blast were both evaluated in the single row evaluation and yield trial. Leaf blast ratings were made 44 to 45 days after seedling emergence, and neck blast ratings were made 32 to 36 days after heading.

The leaf blast rating scale was as follows: 0 = no evidence of infection, immune; 1 = small pinpoint brown lesions (type-1 lesion); 2 = larger, pinhead brown lesions, few with necrotic ashen centers (type-2 lesions), mixed with type-1; 3 = small round to slightly elongated necrotic ashen lesions with brown margins, 1-2 mm diameter (type-3 lesions), mixed with type-1 and type-2; 4 = like 3, but with development of a few spindle-shaped eyespot lesions with brown margins, 0.5-1 cm long, among type-1, -2, and -3 lesions; 5 = about 10% of the lesions are ashen eyespots with brown margins, 0.5-2 cm long (type-4 lesions), mixed with type-1, -2, and -3; 6 = between 5 and 7; 7 = 25-50% of the lesions are type-4, some not completely delineated with brown margins, usually mixed with type -1, -2, and -3 lesions; 8 = more than 50% type -4 lesions, some larger than 2 cm, many without complete brown margins, appearing water-soaked at the base, lesions completely coalesce, usually some type -1, -2, and -3 lesions; 9 = plants are killed.

A 0-9 scale estimating incidence of disease and a 0-9 scale estimating the degree of yield loss were used to evaluate neck blast. The criterion are shown in Table 2.

Grain yield, milling quality, and agronomic characters were evaluated in the yield trial in addition to leaf and neck blast ratings.

Table 1. Lines and cultivars in yield trial. Rice Research Station, Crowley, LA.

1995 entry	1994 number	Pedigree	Grain type*	Source
1	LY73	KATY//8303116/LMNT	L	Blast Nursery
2	LY86	KATY//8303116/LMNT	L	Blast Nursery
3	LY92	KATY//8303116/LMNT	L	Blast Nursery
4	LY124	KATY//8303116/LMNT	L	Blast Nursery
5	LY125	KATY//8303116/LMNT	L	Blast Nursery
6	LY126	KATY//8303116/LMNT	L	Blast Nursery
7	LY132	KATY//8303116/LMNT	L	Blast Nursery
8	LY158	M202/DLLA	M	Blast Nursery
9	LY437	20001-5/LMNT//KATY	L	Blast Nursery
10	LY512	GFMT/KATY	L	Blast Nursery
11	LY516	KATY//CI11048/LEAH	L	Blast Nursery
12	LY634	20001-5/LMNT//KATY	L	Blast Nursery
13	2065		L	Breeding Project
14	CPRS		L	Breeding Project
15	KBNT		L	Breeding Project
16	2008		M	Breeding Project
17	BNGL		M	Breeding Project
18	JODN		L	Breeding Project
19	KATY		L	Breeding Project
20	1176		L	Breeding Project

* L = long grain; M = medium grain.

Table 2. The criterion of disease incidence and yield loss of neck blast.

Scale	Incidence of Disease	Yield Loss
0	0	0
1	below 10%	below 10%
2	below 20%	below 20%
3	below 30%	below 30%
4	below 40%	below 40%
5	below 50%	below 50%
6	below 60%	below 60%
7	below 70%	below 70%
8	below 80%	below 80%
9	above 81%	above 81%

Single Row Evaluation

All the lines selected from 1994's blast nursery were highly resistant to resistant to leaf blast, almost the same as in 1994. There were 168 lines that rated highly resistant, (similar to the resistant check cultivars Katy and Kaybonnet), and 27 lines rated resistant among the 195 selected lines. Three elite breeding lines also were rated highly resistant or resistant to leaf blast. The check cultivars were almost the same as in 1994's blast nursery, except Cypress displayed much better resistance than in 1994.

Although neck blast was more variable and complicated in comparison with leaf blast, most of the experimental materials were almost as resistant as in 1994's blast nursery, but Cypress was rated as more highly resistant than in 1994. For incidence of disease of neck blast, of the 195 selected lines, 143 lines were rated 0 to 2, 36 lines were rated 3, and 16 lines were rated 4 to 5. Resistant check cultivars Katy and Kaybonnet were rated 1 to 3. Of the 195 lines, 112 lines were rated 0 for yield loss to neck blast, 77 lines were rated 1 to 2, 4 lines were rated 3, and 2 lines were rated 4. Resistant checks Katy and Kaybonnet were rated 0. Line 2008 was rated lowest among the elite breeding lines. It showed excellent neck blast resistance with a rating of 1 for disease incidence and 0 for yield loss.

Thirteen lines were selected for high levels of blast resistance and good agronomic characters.

Yield Trial Performance

The results of the yield trial are shown in Table 3. Most of the lines rated at least as resistant as Katy and Kaybonnet to leaf and neck blast. Three lines produced higher grain yields than Kaybonnet, but the differences were not significant. Twelve lines had higher yields than Katy and seven of them were significantly different from Katy. The elite breeding line 2008 was highly resistant to neck blast with the lowest disease incidence rating (1 degree, 1.25%) compared with all other yield trial lines and check cultivars; although, it rated for higher leaf blast than most of the experimental lines at the seedling stage.

Evaluation of Neck Blast

The loss of yield from blast disease is caused directly by neck blast. The leaf and neck blast showed significant correlation in this test. However, some lines were resistant to leaf blast but not as resistant to neck blast, while some lines showed much better resistance to neck blast than to leaf blast. It is imperative to evaluate neck blast even though it is not as easy as leaf blast. Neck blast took place at a different phase after heading among those lines of the same heading date, both in 1994 and 1995. The lines where neck blast was noted earlier had more yield loss than the lines where neck blast was detected later even though the rating of incidence was the same. That is why yield loss was estimated along with incidence.

Table 3. Blast resistant and agronomic performance of the yield trial, Rice Research Station, Crowley, LA.

Entry number	1994 number	Leaf blast	Neck Blast disease incidence	Neck blast yield loss	Days to 50% heading	Plant height (in)	Yield* (lb/A)	Milling (whole-total)
20	1176	2.1	1.5	0	72	46	8992.7 a	49-67
16	LAFITTE	3.1	1.0	0	71	40	8916.7 a	55-70
8	LY158	2.0	1.0	0	85	45	8802.0 a	32.68
15	KAYBONNET	2.0	2.0	0	72	45	8629.9 ab	53-68
13	2065	2.1	4.5	0	74	37	8233.0 abc	53-69
1	LY73	2.0	1.3	0	71	43	7894.7 bcd	48-67
11	LY516	1.5	1.5	0	71	39	7839.2 bcd	33-69
12	LY634	1.5	1.0	0	70	45	7708.8 cde	36-68
2	LY86	1.0	1.5	0	74	36	7290.3 def	51-65
7	LY132	1.5	1.0	0	72	36	7900.9 defg	50-67
14	CYPRESS	3.5	3.8	2.0	74	41	6837.0 efgh	53-66
9	LY437	1.5	1.3	0	80	49	6785.0 fgh	50-64
6	LY126	2.0	2.0	0	75	37	6568.5 fghi	50-66
3	LY92	2.0	1.5	0	74	36	6555.5 fghi	47-65
19	KATY	1.8	1.5	0	77	48	6461.0 fghij	50-64
10	LY512	1.8	3.8	0	78	35	6351.1 ghij	55-66
4	LY124	1.5	1.8	0	74	37	6301.3 ghij	52-66
5	LY125	2.0	2.5	0	74	37	6204.2 hij	49-66
18	JODON	3.5	9.0	6.3	69	37	5770.3 ij	41-62
17	BENGAL	5.1	9.0	6.3	73	38	5565.6 j	48-62

* Numbers followed by same letter are not significantly different (Duncan's multiple range test, P=0.05).

DATE OF PLANTING STUDIES

S.D. Linscombe, F. Jodari, K. Carriere, J.P. Leonards, K.C. Leonards,
R.J. Guidry, C.G. Gravot, and H.L. Hoffpauir

A study was initiated in 1995 to evaluate the effects of plant date on the yield and agronomic performance of major rice varieties. These studies are important to evaluate stability of rice varieties under the various environmental conditions posed by differential times of planting.

Experiment: Date of Planting

Location: Rice Research Station

Seeding Rate: 100 lb/A

Planting Method: Drill-seeded

Fertilization: All planting dates: 14-42-42 lb/A (N-P_2O_5-K_2O) preplant incorporated; 92 lb N/A preflood; 42 lb N/A midseason

Plot Size: 4.66 x 16 ft (75 ft^2)

Water Management: All tests were flushed to a stand if rainfall was not adequate for germination; permanent flood was applied when the rice was at the 4- to 5-leaf stage; plots were drained approximately 2 weeks prior to harvest.

Herbicides: Stam (propanil) 3 lb ai/A - applied to all planting dates 1 to 3 days prior to permanent flood

Planting Dates: Mar 23, Apr 10, Apr 26, May 5, May 29, and June 14

Varieties: Bengal, Cypress, Drew, Jackson, Jodon, Kaybonnet, LA 9302065, Lafitte, LaGrue, and Lemont

Harvest: Planting Dates - Aug 2, Aug 18, Sept 1, Sept 8, Sept 21, and Sept 29

Experimental Design: Randomized complete block with three replications

Results: Planting date had a very substantial effect on rice variety performance in 1995. The first three planting dates (through April 26) displayed good yields for all cultivars within the test. However, the final three planting dates showed a distinctive decrease in yield with each later date of planting. This was probably due primarily to extremely hot weather conditions during the periods of pollination and grain fill for these planting dates. These conditions led to decreased seed set, as well as panicle blight, a physiological condition that leads to grain abortion.

Table 60 shows grain yield, Table 61 shows days to 50% heading, and Table 62 shows plant height over the six planting dates.

Table 60. Grain yield (12% moisture) of 10 varieties planted over six planting dates, Rice Research Station, Crowley, LA. 1995.

Variety	Planting Date					
	Mar 23	Apr 10	Apr 26	May 5	May 29	June 14
	(lb/A)					
Bengal	7839	7192	6501	4865	2587	1317
Jodon	7547	7199	7614	5203	4475	1871
Cypress	7751	7236	7769	6014	3709	1078
Lafitte	8250	7004	7614	6971	4543	2134
Jackson	7429	6456	6932	5447	4131	1837
Kaybonnet	7930	7434	8298	7031	4600	1654
LaGrue	8411	7227	6734	4252	3938	1315
Drew	8370	7113	8302	6971	4095	970
LA 9302065	7301	5932	7052	6613	4675	1602
Lemont	6916	6454	6657	5196	2989	1948
C.V., %	7.1					
LSD (0.05)*	673					

* Least significant difference for mean comparisons among and within planting dates.

Table 61. Days to 50% heading of 10 varieties planted over six planting dates, Rice Research Station, Crowley, LA. 1995.

Variety	Planting Date					
	Mar 23	Apr 10	Apr 26	May 5	May 29	June 14
Bengal	96	87	83	82	97	90
Jodon	93	83	77	76	97	88
Cypress	95	86	84	81	102	92
Lafitte	93	81	78	79	95	86
Jackson	94	82	78	75	99	89
Kaybonnet	95	84	81	78	100	91
LaGrue	95	83	81	78	93	92
Drew	96	84	81	80	104	92
LA 9302065	96	90	85	82	104	89
Lemont	99	92	87	82	109	93
C.V., %	2.2					
LSD (0.05)*	3					

* Least significant difference among and within planting dates.

Table 62. Plant height of 10 varieties planted over six planting dates. Rice Research Station, Crowley, LA. 1995.

Variety	Planting Date					
	Mar 23	Apr 10	Apr 26	May 5	May 29	June 14
	(in)					
Bengal	35	34	37	34	37	33
Jodon	34	35	36	35	38	32
Cypress	35	35	39	37	38	32
Lafitte	36	35	37	37	37	30
Jackson	37	35	40	39	41	33
Kaybonnet	41	38	43	41	42	39
LaGrue	41	37	43	41	41	37
Drew	42	39	45	42	43	34
LA 9302065	34	33	36	34	38	33
Lemont	35	34	36	34	37	33
C.V., %	8.1					
LSD (0.05)*	5					

* Least significant difference among and within planting dates.

TOLERANCE OF RICE VARIETIES AND EXPERIMENTAL LINES TO RICE HERBICIDES

D.E. Sanders, R. Strahan, S.D. Linscombe, F. Jodari, and K.F. Carriere

Some of the newer rice varieties have displayed susceptibility to damage from labelled and developmental rice herbicides. These studies were designed to provide information of which rice line/herbicide combinations may display sufficient phytotoxicity to warrant non-recommendation. This report summarizes 2 years of research in this area (1994-1995).

Experiment: Herbicide Tolerance Study

Location: Rice Research Station

Seeding Rate/Date: 150 lb/A, Apr 27, 1994 and May 5, 1995

Planting Method: Water seeded (pre-germinated seed)

Fertilization: 1994 14-42-42 (lb/A N-P_2O_5-K_2O) preplant incorporated, Apr 26; 92 lb N/A, June 7

1995 14-42-42 (lb/A N-P_2O_5-K_2O) preplant incorporated, May 3; 92 lb N/A, May 31

Plot Size: 4.66 x 12 ft (56 ft^2)

Water Management: 1994: Flood, Apr 26; drain, Apr 30; reflood, June 7; harvest drainage, Aug 20

1995: Flood, May 4; drain, May 8; reflood, June 1; harvest drainage, Aug 9

Rice Lines: Adair, Bengal, Cypress, Dellrose, Jodon, Kaybonnet, LA 2071, LaGrue, and Lafitte

Herbicide Treatments:

1. Propanil 4 lb ai/A post (preflood) (Stam 4 EC)
2. Propanil 2.25 lb ai/A + Molinate 2.25 lb ai/A post (preflood) (Arrosolo 6 EC)
3. Quinclorac .38 lb ai/A post (preflood) (Facet 50 WP)
4. Fenoxyprop .06 lb ai/A post (preflood) (Whip 360)
5. Propanil 4 lb ai/A + Triclopyr .38 lb ai/A post (preflood) (Stam 4 EC + Grandstand 3 L)
6. Propanil 4 lb ai/A + pendimethalin 1.0 lb ai/A post (preflood) (Stam 4 EC + Prowl 3.3 EC)
7. Propanil (4 lb ai/A + bensulfuron .037 lb ai/A post (preflood) (Stam 4 EC + Londax 60 DF)
8. Control (weed free)

Harvest: Sept 3, 1994; Sept 5, 1995

Experimental Design: Randomized complete block with a factorial arrangement of treatments (rice lines x herbicides), three replications

Results: Table 1

Comments: There were no significant yield reductions (compared with the control) for any herbicide treatment in either year for Cypress, Dellrose, Jodon, and LaGrue. There were significant yield reductions associated with herbicide treatments noted for the other varieties. However, the only significant yield reduction noted for both years was fenoxyprop on LA 2071.

Table 1. Effects of herbicide treatments on rice yields. Rice Research Station, Crowley, LA. 1994-1995.

Herbicide Treatment	Yield (lb/A) 1994	1995
Adair		
Propanil	5802	7945
Propanil + Molinate	5838	7786
Quinclorac	6806	7407
Fenoxyprop	6797	7115
Propanil + Triclopyr	6438	7375
Propanil + Pendimethalin	6518	7505
Propanil + Bensulfuron	6802	6374*
Control	6523	7338
Bengal		
Propanil	5565	6710
Propanil + Molinate	5291	6598
Quinclorac	5499	7184
Fenoxyprop	5742	6262*
Propanil + Triclopyr	5326	6204*
Propanil + Pendimethalin	5637	6688
Propanil + Bensulfuron	5367	6764
Control	5210	6947
Cypress		
Propanil	6402	5892
Propanil + Molinate	7254	5670
Quinclorac	6776	6142
Fenoxyprop	6751	5625
Propanil + Triclopyr	6504	5881
Propanil + Pendimethalin	7555	5711
Propanil + Bensulfuron	7037	6054
Control	7106	6101

Continued.

Table 1. Continued.

Herbicide Treatment	Yield (lb/A) 1994	1995
Dellrose		
Propanil	5266	5934
Propanil + Molinate	5452	6166
Quinclorac	6084	6297
Fenoxyprop	5050	5678
Propanil + Triclopyr	5621	5843
Propanil + Pendimethalin	5782	6178
Propanil + Bensulfuron	5548	6128
Control	5650	5996
Jodon		
Propanil	6412	6248
Propanil + Molinate	6324	5317
Quinclorac	6558	5710
Fenoxyprop	6178	5241
Propanil + Triclopyr	6189	5532
Propanil + Pendimethalin	6846	5429
Propanil + Bensulfuron	7352	5441
Control	6377	5621
Kaybonnet		
Propanil	8512	7096
Propanil + Molinate	8810	7202
Quinclorac	8391	7094
Fenoxyprop	8364	6877
Propanil + Triclopyr	8242*	6831
Propanil + Pendimethalin	8431	7004
Propanil + Bensulfuron	8250*	6692
Control	8971	7362

Continued.

Table 1. Continued.

Herbicide Treatment	Yield (lb/A) 1994	1995
LA 2071		
Propanil	5650	6409
Propanil + Molinate	5983	5077*
Quinclorac	6156	4934*
Fenoxyprop	5691*	4740*
Propanil + Triclopyr	6277	4883*
Propanil + Pendimethalin	6204	5441
Propanil + Bensulfuron	6115	5195*
Control	6210	5933
LaGrue		
Propanil	6527	6327
Propanil + Molinate	6248	6497
Quinclorac	6446	6293
Fenoxyprop	6205	6328
Propanil + Triclopyr	6499	6745
Propanil + Pendimethalin	5949	6312
Propanil + Bensulfuron	6449	6009
Control	6577	5782
Lafitte		
Propanil	6847*	7453
Propanil + Molinate	7887*	7604
Quinclorac	7797*	7922
Fenoxyprop	7096*	7290
Propanil + Triclopyr	8056	6994
Propanil + Pendimethalin	8320	6951
Propanil + Bensulfuron	8433	7047
Control	8577	7502

* Significant yield reduction when compared with control (LSD, P = 0.05).

Objective 3: Develop efficient protocols for gene transfer to rice

We have developed and conducted a 3-year field trial for agronomic performance of transgenic rice that carries a gene for resistance to the herbicide Liberty™ (Oard et al., 1996. *Mol. Breeding*, submitted). The commercial cultivars Gulfmont, IR72, and Koshihikari were genetically engineered using electric discharge particle bombardment to express the *bar* gene, which confers resistance to the non-selective herbicide glufosinate (trade name "Liberty"). Southern and northern analyses of transgenic material revealed stable integration and expression of introduced transgenes in all lines evaluated. In a few plants, silencing of the *uidA* marker gene was detected at both the transcriptional and post-transcriptional levels. Field studies were conducted in 1993, 1994, and 1995 at the Rice Research Station where non-transgenic plants at the 4-leaf stage were killed within 7 days after 1.12 or 2.24 kg/ha glufosinate applications (Table 2). All 11 independently-derived transgenic lines produced fertile, normal looking seed at maturity. Significant differences were observed in the absence of the herbicide between parental cultivars and certain transgenic Gulfmont and Koshihikari lines for days to 50% heading, plant height, and grain yield. Foliar applications of glufosinate had little or no effect on agronomic performance of transgenic Gulfmont or IR72 lines, while herbicide applications affected grain yield and plant height for transgenic Koshihikari. Significant differences across certain transgenic lines were observed for agronomic traits after herbicide applications. These results demonstrate that the *bar* gene was effective in conferring field-level resistance to glufosinate in rice. Variation among transgenic lines required traditional breeding selection procedures to identify superior agronomic types with high levels of herbicide resistance.

The soil bacterium *Agrobacterium tumefaciens* has been engineered and used for more than a decade to transfer cloned genes to dicotylendenous plants, such as tomato and lettuce. We have obtained a modified *A. tumefaciencs* strain from a Japanese research team that may allow transfer of genes to rice callus material. Initial transformation experiments have begun and are in the selection stage with hygromycin used as the antibiotic to help select transformed cells.

Spm elements are mobile transposons first discovered in maize that cause genetic instability and differing phenotypes in various tissues and organs. We have recently used the polymerase chain reaction (PCR) with specific primers to amplify flanking inverted repeats and internal portions of Spm-like fragments from cultivated rice and two related wild relatives. Spm fragments were amplified from a minimum of four to six regions of the rice genome. Amplified Spm product sizes ranged from 0.4 to 4.9 kb that included a high-copy 1.7 fragment that is virtually identical in length to a corresponding region of the Tpn1 transposon in Japanese morning glory. PCR profiles of Spm fragments from cultivated rice differed from those of two related species. Digestion of amplified Spm-like fragments with BglI, EcoRV, and DraI restriction enzymes also revealed polymorphism among cultivated and wild rice. Significant variation was observed among different Spm-like fragments of rice, wheat, and sweet potato. This research is the first to report the existence of Spm-like elements in rice and wheat genomes.

Objective 4. Development of specific DNA profiles for related Louisiana rice cultivars

There has been a need to rapidly establish identity and purity of certain seed lots that can be difficult, if not impossible, to accomplish in the mature seed or seedling stage. We have developed a simple and rapid DNA-based method to distinguish the 22 long- and medium-grain cultivars currently recommended for commercial production in Louisiana. Four advanced breeding lines developed by Dr. Steve Linscombe were also evaluated in this study. For the initial RAPD analysis, DNA was isolated from young leaf tissue. Over 200 commercially available 10-mers were used as primers to produce fragments that could distinguish all pairwise combinations of the 26 cultivars/lines that included three sets of full sibs. The RAPD results were repeated a minimum of 3-4 times to identify primers that gave reproducible banding patterns. A blind test resulted in correct identification of eight out of eight cultivars. Amplified fragments were visualized on ethidium-stained, non-denaturing polyacrylamide gels. Several cultivars could also be distinguished on 1% agarose gels. RAPD fragments ranged in size from ~ 300 to 2000 bp with medium- and high-copy fragments detected over all material. Banding patterns appeared to be consistent whether templates were obtained from leaf, root, or endosperm sources.

DEVELOPMENT OF AN EFFICIENT BIOLISTIC PDS-1000/He MEDIATED TRANSFORMATION SYSTEM AND REGENERATION OF RICE PLANTS WITH A HIGH LEVEL OF IGNITE HERBICIDE RESISTANCE[1]

Q.J. Xie, M.C. Rush, J. Oard, and S.D. Linscombe

The objectives of this research were to develop a reliable and efficient system for transformation of rice with foreign DNA and to generate transgenic rice plants with a high level of Ignite herbicide resistance as novel germplasms for rice breeding for red rice control.

Four plasmids, pAHC25, pDM302, pDM307, and pBSL21, all having the phosphinothricin acetyl transferase (*bar*) gene, were used in this research. pDM302 (Act1 promoter) and pDM307 (CaMV 35S promoter) were supplied by Dr. R. Wu from Cornell University. The plasmid pBSL21 was constructed by Dr. Mikhail F. Alexeev, Visiting Assistant Professor at the Rice Research Station, by combining pDM307 and a hygromycin phosphotransferase gene from pTRA15 supplied by Dr. Norimoto Murai of the Department of Plant Pathology and Crop Physiology, LSU Agricultural Center.

The first transformation experiment was carried out from January 29, 1993 to April 16, 1993. Transformation equipment was Dr. Jim Oard's, Agronomy Department, LSU Agricultural Center, air gun. The plasmids pDM302 and pAHC25 were used for these transformation studies. Rice immature panicles (1 - 5 cm in length), and 7 to 30 days old immature panicle derived calli were used as explant tissue for transformation. Ninety-five plates were bombarded. Transitional gene expression was checked by GUS assay. The pAHC25 plasmid was used in these assays. The number of blue spots varied from 0 to 200 blue spots/plate. No *in vitro* screening was carried out in this experiment. More than 5,000 plants were regenerated from bombarded explant tissues and were sprayed with 500 ppm Ignite herbicide in the greenhouse. Twenty-six plants survived the herbicide spray. One plant derived from Lemont showed positive PCR results. However, the ratoons and progenies from these plants were all highly susceptible to Ignite herbicide, indicating that the gene was not expressing or transformation was not successful.

The second transformation experiment was carried out from July 2, 1993 to September 8, 1993. The Biolistic PDS-1000/He machine from Dr. J. Oard's laboratory was used as the transformation equipment. The plasmid and explant tissue used were the same as those used in the first experiment. Two hundred and seventy-eight plates were bombarded. The frequency of transitional gene expression was still very low in the calli bombarded with the new transformation equipment. The number of blue spots varied from 100 to 200 blue spots/plate. After bombardment, the calli were cultured in media with 1 to 5 ppm Ignite herbicide incorporated for 2 to 3 months. About 300 plants were

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

regenerated from this experiment. These plants were transplanted into the greenhouse and were sprayed with 500 ppm Ignite herbicide. No plants survived the herbicide spray. No transgenic plants were generated from this experiment.

The third experiment was carried out from September 17, 1993 to March 4, 1994. The pBSL21 plasmid was used in this experiment. One hundred and eighty-seven plates were bombarded in Dr. J. Oard's lab using the Biolistic PDS-1000/He in this experiment. After bombardment, the calli were *in vitro* screened with 50 - 100 ppm hygromycin for 20 days. The calli that survived the screening were used for plant regeneration. More than 300 regenerated plants were sprayed with 500 ppm Ignite herbicide in the greenhouse. Fifteen plants survived the herbicide test. Five plants showed positive PCR results. The ratoon plants and the progeny plants, however, were not resistant to either the herbicide or the antibiotic hygromycin. Either no transgenic plants were generated in this experiment or the genes were not expressing.

The fourth experiment was carried out from August 19, 1994 to January 20, 1995 in Dr. M. C. Rush's laboratory in the Department of Plant Pathology and Crop Physiology. Many transformation parameters, such as explant source; microcarrier material, diameter, and quantity; DNA coating of microcarrier, DNA load, sample distance for bombardment, helium pressure, and chamber vacuum were studied in this experiment. The final transformation parameters used in this experiment are listed in Table 1. By modifying these parameters, gene transformation efficiency was improved. The frequency of transitional gene expression tested by GUS assay increased significantly. The number of blue spots per tested plate varied from 400 to 2,000, with most plates between 1,000 to 2,000 blue spots/plate. The *in vitro* screening procedures were also modified. After bombardment, calli were cultured for 2 weeks in the callus induction medium with 80 ppm hygromycin incorporated. Calli showing active growth were transferred to fresh medium with 80 ppm hygromycin for another 2 weeks. Calli growing vigorously in the hygromycin medium were transferred to plant regeneration medium with 50 ppm hygromycin and subcultured every 2 weeks. After 4 weeks in the plant regeneration medium, calli that did not develop green shoots were discarded. In this experiment, 132 plates were bombarded. Hundreds of green plants were regenerated from 29 calli from 22 plates. Based on greenhouse test and laboratory tests, plants regenerated from 22 calli were resistant to both the antibiotic hygromycin and the herbicide Ignite. Plants regenerated from one callus were only resistant to Ignite. Plants from three calli were only resistant to hygromycin. Plants from one callus segregated for resistance to Ignite. Plants regenerated from the other two calli were not resistant to either hygromycin or Ignite.

One problem associated with transformation was the high mutation frequency of transgenic plants, especially for fertility. These mutations were not caused by somaclonal variation, but appeared to be caused by incorporation of the pBSL21 plasmid into the rice genome. More than 100 tissue culture derived non-transgenic plants, including plants regenerated from the two non-transgenic calli mentioned above, which went through exactly the same transformation and *in vitro* screening treatment, were transplanted and

tested for herbicide resistance in the greenhouse. These plants did not have the Ignite resistance, nor did they show much somaclonal variation. All of these plants were fertile. However, among plants regenerated from 24 Ignite resistant calli, only plants from six calli had normal fertility. Fertility of plants derived from four additional calli was very low. All plants regenerated from the rest of the calli were sterile. The same phenomenon was observed from rice plants regenerated from calli that underwent PEG mediated protoplast transformation. We assume that the mutation was caused by the insertion of foreign DNA into the rice chromosome, which could by chance disrupt the coding sequence of some important genes. With increasing numbers of insertions occurred within a cell, the larger the chance that the coding sequence of important genes could be disrupted. In this research, all the fertile and normal transgenic plants tested had only one copy of the plasmid DNA based on the progeny test.

Transgenic plants regenerated from 24 Ignite resistant calli were transplanted into the field at the Rice Research Station under the supervision of Dr. S. D. Linscombe. Two weeks after transplanting, plants were sprayed with Ignite herbicide. Transgenic plants regenerated from 22 calli resistant to both hygromycin and Ignite showed a high level of herbicide resistance in the field test. Plants regenerated from the callus resistant only to Ignite had a moderate level of field resistance. Plants derived from the remaining callus showed the same segregation as those tested in the greenhouse.

Preliminary progeny tests were carried out on four normal-fertile transgenic plants regenerated from four calli resistant to both hygromycin and Ignite and two plants regenerated form a callus resistant only to Ignite. Progeny from the four plants derived from calli resistant to both hygromycin and Ignite segregated in a ratio of 3 resistant to Ignite to 1 susceptible, indicating that the resistance was controlled by a single dominant gene. No difference was observed for the level of Ignite resistance among the resistant progeny plants that were homozygous and the two thirds of the population resistant plants that were heterozygous. Inheritance of herbicide resistance from the remaining two moderately resistant plants, however, was not stable. Among 103 plants tested, only three showed their parent level of moderate resistance and the rest of the plants were highly susceptible.

In conclusion, we have developed an efficient and reliable transformation system for rice through use of the Biolistic PDS-1000/He equipment. In this system, the following three aspects were very important. The first was efficient delivery of the plasmid DNA inside plant cells. The second was the development of culture conditions that stimulate the incorporation of the plasmid DNA into the plant chromosome. The third was an efficient *in vitro* screening system. This was necessary as original transformation events would occur with low frequency. A successful *in vitro* screening system had to be capable of eliminating all the nontransgenic cells without significantly affecting the growth and development of the transgenic cells.

We have also regenerated a number of transgenic plants with a high level of resistance to Ignite herbicide. Even though transformation caused significant change in a large portion of transgenic plants, transgenic plants regenerated from six different calli had normal characteristics, similar to their corresponding parent cultivars. The herbicide resistance from most fertile transgenic plants was stable and heritable. Their performance as a new source of rice germplasm for herbicide resistance in the breeding program will be tested in 1996. These resistant plants will be used to make crosses with a large number of different US cultivars, disease resistant cultivars and lines, and elite breeding lines.

Table 1. Transformation parameters used with the Biolistic PDS-1000/He equipment.

Parameter	Description
Explant tissue	calli or suspended calli from immature panicles
Microcarrier material	gold
Microcarrier diameter	1.0 μm
Microcarrier quantity	1 mg/bombardment
DNA load	1 μg DNA/1 mg microcarrier
Sample position	4
Helium pressure	1550 psi
Distance from rupture disk to macrocarrier	10 mm
Distance from macrocarrier to stopping screen	11 mm
Chamber vacuum	27 in. Hg
Number of bombardments	2

SPECIAL PURPOSE RICE BREEDING

F. Jodari and S.D. Linscombe

Certain special purpose rice varieties continue to be in increasing demand as the consumption and market for these types in the U.S. continue to expand. Recent changes in the rice export market are also adding to this demand to a certain extent. Part of the objectives of the state project 2925 is to develop specialty rice varieties that are adapted to Louisiana's environment and possess superior agronomic, milling, cooking, and specific specialty qualities. The major emphasis is being placed on breeding for Jasmine, Della, Basmati, Kokuho, and waxy types.

The specialty germplasm introductions obtained in 1994 from the breeding program of the International Rice Research Institute (IRRI) were processed through quarantine at the Rice Research Station. Nearly 200 of these lines are currently being increased for evaluation and crossing. A small number of new germplasm introductions were also obtained in 1995 and are in the quarantine stage. During 1995, 94 new crosses and backcrosses were made with specialty parents. The early generation specialty nursery included 110 F_1 populations, 75 F_2 populations, 10,500 progeny rows, and 350 anther culture-derived breeding rows. Twenty-eight of the F_2 populations are part of a genetic study designed to determine the inheritance of flavor components in aromatic rice.

For the preliminary yield evaluation, 75 selections were tested in replicated trials and 150 in single plots. These selections included long- and medium-grain aromatics, soft cooking Jasmine, elongating Basmati, medium- and short-grain waxy, Kokuho, and red bran selections. The agronomic practices used for these trials were similar to other drill-seeded trials explained earlier in the general breeding section. The results are reported in tables 54-57, pages 72-74, 76-82.

During 1995, nine entries were tested in the Uniform Regional Nursery. These entries were selected based primarily on their cooking qualities followed by their agronomic, disease reaction, and milling characteristics. Among these lines were one Jasmine, five elongating Basmati, two Della, and one short-grain waxy-type lines (tables 3-4, 11-14, pages 7, 16, 17, 19, 20).

Four advanced experimental lines were also tested in statewide advanced yield trials. Entries 223-226 included one Della type, one waxy, and two Basmati types (see Advanced Yield Tests section, pgs. 38-56). Detailed quality evaluations of these lines have shown superior specialty qualities and acceptable to excellent agronomic characteristics.

A considerable number of anther culture-derived selections were also included in 1995 yield trials. The anther culture procedure is especially advantageous when used for distant crosses, such as Basmati and southern long-grain crosses.

The process of evaluation and screening of specialty breeding lines is an integral part of specialty rice breeding. Clearly preservation and enhancement of specialty and cooking qualities are primary objectives. The standardized cooking procedure developed at the Rice Research Station was used to evaluate 240 preliminary and advanced breeding lines from 1995 selections for various cooking quality attributes, such as flavor, texture, aroma, flakiness, elongation, and color. Five hundred and twenty early generation lines were also screened for their grain and cooking characteristics using test tube milling and small sample cooking procedures.

The experimental line 9102085 was released in May 1995 as 'Dellrose.' Dellrose is a Della-type aromatic variety. In 1991-1994 performance trials, it showed high first and second crop yield potentials and high milling yield. Dellrose is early maturing and has a semidwarf plant type. The aroma and cooking qualities of Dellrose are similar to the variety 'Della.'

GRAIN MOISTURE VARIABILITY AT HARVEST AMONG RICE GENOTYPES

F. Jodari and S.D. Linscombe

This study was initiated in 1994 as part of State Project 2925. The objectives were 1) to evaluate newly released rice cultivars and advanced experimental breeding lines for uniformity in grain maturity and moisture content at harvest and 2) to determine the effect of such uniformity on milling yield of rice genotypes.

Lack of uniformity in grain maturation among and within rice panicles can cause considerable reductions in milling yield either due to high percentage of immature grains or due to fissuring of very low moisture grains before and after harvest. Rice cultivars with uniformly maturing grains and panicles can contribute to both improved grain and milling quality.

During 1994, 16 cultivars and 24 advanced experimental lines were tested for grain moisture contents at the upper, middle, and lower one-third portions of panicles. Five of the greenest and five of the driest panicles from each plot were visually selected and harvested and grain moisture of respective portions determined. The oven drying method was used for grain moisture measurement. Grains were dried at 130°F for 16 hours. Dried sample weight measurements were reproducible to +-1 mg. Sampling was done once at approximately 20% harvest moisture.

Results for 1994 tests are shown in tables 1-__. Large variations were found in moisture contents of the upper and lower one-third sections of panicles. These differences were two to five times larger in the greenest panicles than the driest ones. Whole grain and total milling yields were significantly higher among genotypes that had small moisture variability both among and within panicles. Among cultivars tested, the most uniform were 'Millie,' 'Akitakomachi,' 'CM101,' 'Lemont,' 'Jackson,' and 'Cypress.' Experimental lines 214, 213, 211, and 204 showed the least variability among and within panicles, with head rice yields of 63, 67, 65, and 69%, respectively. Medium-grain genotypes had significantly higher variability than the long grains. Among all genotypes, within panicle, moisture variability ranged between 1 to 17%, and among whole panicles, moisture variation was 1 to 7%. Cypress and Lemont cultivars showed larger variability in water-seeded than in drill-seeded systems.

Considerable differences observed among genotypes in grain moisture variability suggest that selection for such traits can contribute to improved milling quality. This test was not conducted in 1995 but will continue in 1996.

Table 1. Head rice yield and grain moisture range over all panicles and panicle sections (mg g^{-1}). Rice Research Station, Crowley, LA. 1994.

Cultivar	Min	Max	Mean	Diff	HR
Jodon	140	260	190	121	590
L202	184	387	238	204	540
Maybelle	145	276	191	131	600
Alan	186	380	248	194	610
Millie	174	211	188	37	650
Cypress	146	251	184	105	640
Kaybonnet	130	270	174	141	630
Lemont	156	176	176	52	520
Bengal	173	251	198	79	630
Rico	176	340	228	165	600
Orion	158	281	203	123	650
Lafitte	170	294	214	123	680
Akitakomachi	191	226	214	33	590
LSD (0.05)	11	27	13	22	17

Table 2. Grain moisture variations among and within panicles, long grain cultivars. Rice Research Station, Crowley, LA. 1994.

Cultivar	Pan	Top	Mid	Bot	Mean	Diff
Alan	G	214	276	380	290	166
	D	186	201	239	208	53
Maybelle	G	147	181	276	201	129
	D	144	166	233	181	88
Jodon	G	143	185	264	197	121
	D	165	168	207	180	42
Cypress	G	163	185	251	199	88
	D	146	162	192	167	46
Kaybonnet	G	146	177	270	197	124
	D	129	141	180	150	50
Millie	G	170	201	211	194	41
	D	174	178	195	182	21
Lemont	G	156	169	208	178	52
	D	162	166	193	174	31
LSD (0.05)		17	21	33	24	16

Table 3. Grain moisture variations among and within panicles, medium-grain cultivars. Rice Research Station, Crowley, LA. 1994.

Cultivar	Pan	Top	Mid	Bot	Mean	Diff
Rico 1	G	191	242	341	258	149
	D	176	193	250	206	73
Orion	G	169	220	281	223	112
	D	158	172	218	183	60
Bengal	G	177	202	252	210	74
	D	173	180	201	185	28
Akitakomachi	G	205	218	224	215	19
	D	191	224	226	214	35
Lafitte	G	191	237	294	240	103
	D	170	179	211	185	46
LSD (0.05)		17	21	33	24	16

Table 4. Grain moisture variations among and within panicles, Louisiana experimental lines. Rice Research Station, Crowley, LA. 1994.

Genotype	Pan	Top	Mid	Bot	Mean	Diff
CPRS X2	G	172	184	218	191	46
(9402211)	D	174	179	213	189	38
CPRS/LMNT...	G	173	176	192	180	20
(9402214)	D	172	172	193	179	21
MARSX2/...	G	199	216	280	232	81
(9402221)	D	179	197	223	200	44
LSD (0.05)		13	17	22	17	9

Table 5. Grain moisture variation, Lemont, water-seeded vs. drill-seeded method. Rice Research Station, Crowley, LA. 1994.

Method	Pan	Top	Mid	Bot	Mean	Diff
Drill-seeded	G	156	169	208	178	52
	D	162	166	193	174	31
Water-seeded	G	182	215	302	232	119
	D	168	177	226	190	58
LSD (0.05)		16	19	27	17	23

Table 6. Grain moisture variation, Cypress, water-seeded vs. drill-seeded method. Rice Research Station, Crowley, LA. 1994.

Method	Pan	Top	Mid	Bot	Mean	Diff
Drill-seeded	G	163	185	251	199	88
	D	143	162	192	167	46
Water-seeded	G	171	215	302	231	138
	D	172	179	221	191	49
LSD (0.05)		16	19	27	17	23

RICE FERTILIZATION AND CULTURAL MANAGEMENT[1]

EFFECT OF N RATE ON AGRONOMIC PERFORMANCE OF SELECTED RICE VARIETIES AND EXPERIMENTAL LINES IN LOUISIANA RICE PRODUCING AREAS

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INTRODUCTION

Fertilizer nitrogen (N) is required on virtually all of the rice acreage in Louisiana for optimum production. Efficiency and uptake of applied N are influenced by factors such as placement, rate, and timing in relation to water management. Growing a suitable rice variety coupled with management practices that conserve applied N generally increase the chance of profitable rice production.

The placement and timing of fertilizer N are dependent upon the cultural system used. In Louisiana, rice is grown in water- and dry-seeded cultural systems. In the water-seeded, permanently flooded system, the optimum N rate should be placed 2 to 3 inches below the soil surface within 5 to 7 days of establishing the flood. In the dry-seeded system, the optimum N rate should be broadcast onto a dry soil surface prior to establishing the permanent flood. There is generally no advantage to applying multiple applications of fertilizer N in either cultural system provided there is precision in N application and placement and sound water management. Split applications may be desirable if the optimum N rate is not known, if the farmer is unfamiliar with a field, or if a variety is susceptible to lodging. When split applications are applied, it is important to apply an adequate amount of basal N to maintain the rice plant through tillering and into early reproductive growth. Generally, a split application consists of two-thirds of the estimated total N requirement applied preplant in water-seeded rice and preflood in dry-seeded rice, followed by a topdressing of the remaining one-third at either panicle initiation, panicle differentiation, or when deficiency symptoms appear.

Rice varieties may differ in their response to the amount and timing of applied N. Maximum or optimum yields of many varieties may occur over a wide range of N rates, depending on such factors as lodging, disease susceptibility, and inherent N utilization efficiency. Environmental influences, such as soil type, growing conditions, pest pressure, and weather, may affect varietal performance. Conducting field research in the major rice producing areas of Louisiana provides valuable information for developing fertilization and management strategies for new varieties.

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

The objectives of these variety evaluations are to 1) determine yield potential and agronomic performance of new rice varieties and advanced experimental lines in different environments and 2) determine the optimum N rate for each variety.

MATERIALS AND METHODS

Thirteen rice varieties and/or advanced experimental lines were grouped by maturity for testing. Each entry is followed by a short agronomic description and its origination.

The very early entries were:

Maybelle (MBLE)- short statured, long-grain Texas variety with very good yield potential, good straw strength, excellent ratoon potential, moderately resistant to straighthead, matures 8 to 10 days earlier than Tebonnet.

Jackson (JKSN)- long-grain Texas variety very similar to Maybelle in yield potential, slightly taller and 7 to 10 days later in maturity than Maybelle, moderately resistant to lodging, moderately resistant to straighthead.

Jodon (JODN)- long-grain, semidwarf Louisiana variety with excellent yield potential in the main and ratoon crop, resistant to lodging, very susceptible to straighthead.

The early entries were:

Cypress (CPRS)- long-grain, semidwarf Louisiana variety with excellent yield potential in the main and ratoon crop, good seedling vigor, resistant to lodging, moderately susceptible to straighthead.

Bengal (BNGL)- medium-grain, semidwarf Louisiana variety with excellent main crop and good ratoon crop potential, moderately resistant to lodging, susceptible to straighthead.

LaGrue (LGRU)- tall, long-grain Arkansas variety, moderately susceptible to lodging, high main crop yield potential, good ratoon potential, moderately susceptible to straighthead.

Kaybonnet (KBNT)- tall, long-grain Arkansas variety in its second year of testing in variety by N trials, excellent main crop yield potential, good ratoon potential, moderately susceptible to lodging, moderately susceptible to straighthead.

Lafitte (LFTE)- medium-grain, semidwarf Louisiana variety previously tested as 2008 in variety by N trials, moderately susceptible to lodging, susceptible to straighthead, resistant to blast, very good yield potential in the main and ratoon crops.

Dellrose (DLRS)- long-grain, aromatic, semidwarf Louisiana variety released for commercial production in 1995. Good yield potential in the main and ratoon crops, resistant to lodging, moderately susceptible to straighthead.

2065- long-grain, semidwarf, Louisiana line in its second year of testing in variety by N trials. Moderately susceptible to straighthead in limited testing, very good yield potential in the main and ratoon crops.

Drew- tall, long-grain, Arkansas variety released for 1996 in its second year of testing in variety by N trials. Very good yield potential in the main and ratoon crops, susceptible to lodging, moderately resistant to straighthead in limited testing.

Varieties and advanced experimental lines in the very early and early maturity groups were tested in five different locations. Experiments at the Rice Research Station and in Vermilion Parish were water seeded in a pinpoint flood cultural system. The trials in Morehouse Parish were water seeded in a delayed flood cultural system. Evaluations in East Carroll and Rapides parishes were drill seeded. Entries were tested at four N rates, ranging from 60 to 150 lb/A in 30 lb/A increments, with N being applied as single applications at the Rice Research Station and in Vermilion and Morehouse parishes. In Rapides and East Carroll parishes, N rates ranged from 90 to 180 lb/A in 30 lb/A increments.

Fertilizer N as ammonium sulfate was banded approximately 2 inches deep 1 to 2 days prior to flooding in the water-seeded, pinpoint flood experiments. On soils requiring P and K, approximately 45 lb/A P_2O_5 and K_2O were also banded. In drill-seeded experiments and in the water-seeded, delayed flood experiment, basal N treatments (urea) were applied as a single broadcast application prior to establishment of the permanent flood.

Water-seeded experiments were seeded at the rate of 150 lb/A with presoaked seed. After 3 to 6 days, the experiments were drained briefly to promote seedling anchorage. A permanent flood was established 2 to 4 days after drainage, never allowing the soil to dry. In the water-seeded, delayed flood experiment, the entries were seeded at a rate of 150 lb/A with presoaked seed, drained after 4 days, and flushed periodically until permanent flood establishment. In drill-seeded experiments, entries were seeded at 100 lb/A and flushed periodically until the permanent flood was established (4 to 5 weeks after planting).

Pest control (weeds, insects, disease) was practiced when necessary. Individual whole plots were combine-harvested at field maturity. Days to 50% heading, plant height, lodging, and grain yield were measured.

Second crop data were generated in the Vermilion Parish and Rice Research Station variety evaluations. Following main crop harvest, 75 lb N/A were broadcast into the dry stubble, and a shallow flood was established within 2 to 3 days after N application. Individual whole plots were combine-harvested at field maturity. Grain yield was determined.

Sixty entries were screened in 1994 for reaction to arsenic (As)-induced straighthead. Included in the nursery were 28 commercial varieties, both public and private, and 27, 2, 2, and 1 advanced experimental lines from the rice varietal development programs of Louisiana, Mississippi, Texas, and Arkansas, respectively.

The nursery was established on a Crowley silt loam soil. Approximately 120 lb N/A and 60 lb/A P_2O_5 and K_2O were banded 2 inches deep prior to planting. Arsenic as MSMA (monosodium salt of methylarsonic acid) was surface applied at the rate of 4 lb As/A, and the test area was flooded. The test was water seeded in a pinpoint flood cultural system. Evaluation for straighthead reaction was made at maturity, with each entry being rated on a scale of 0 to 9, based on the estimated percentage of normal grain yield. A rating of 0 indicated that there was no damage or apparent symptoms present and was considered to be highly resistant. A rating of 9 indicated that no grain was produced due to severe damage and was considered to be highly susceptible. Results of the evaluation are shown in Table 15.

Plant growth stages were determined for all varieties at each location for use in updating or establishing predictions in the DD50 Rice Management Program (Tables 16-20).

Experiment: Very early variety x nitrogen

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 5.9; O.M.: 1.44%; extractable nutrients (mg/kg): P-32, Na-84, K-72, Ca-1087, Mg-205, Zn-6.18, S-9.66, As-2.83, Fe-98.5

Variety/Seeding Rate: MBLE, JKSN, JDON, 150 lb/A

Planting Method/Date: Water-seeded, Mar 30

Fertilization: 45 lb/A P_2O_5 and K_2O PPI; N source, ammonium sulfate; second crop, 75 lb N/A; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: MBLE, JKSN, Apr 9; JDON, Apr 11

Water Management: Flooded, Mar 29; drained, Apr 3; reflooded, Apr 10; harvest drainage, July 17; second crop flooded, July 28; harvest drainage, Oct 16

Herbicides: 1.0 oz ai/A Londax (bensulfuron), Apr 21

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5; 0.25 lb ai/A methyl parathion, July 2

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Main crop, July 27; ratoon crop, Nov 8

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged over a 3-day period. Maybelle headed 9 to 15 days earlier than the other entries (Table 1). Maybelle lodged at the highest rate of N. Main crop grain yields of Jackson and Jodon were excellent, yielding in excess of 8000 lb/A. Maybelle yielded significantly less. Approximately 90 to 120 lb N/A were required for optimum yield. Ratoon yields were average (Table 2). Total grain yields of Jackson and Jodon exceeded 10,000 lb/A.

Table 1. Effect of N rate on agronomic performance of water-seeded very early rice varieties. Rice Research Station, Crowley, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	60	90	120	150	Mean
						(cm)									(lb/A)				
Maybelle	72	71	72	71	71	78	84	86	85	83	0/0	0/0	3/1	28/2	5909	6850	6935	8903	6649
Jackson	79	79	82	81	80	82	89	92	93	89	0/0	0/0	0/0	0/0	7868	8569	8789	8882	8422
Jodon	83	86	88	88	88	78	85	81	86	82	5/1	0/0	0/0	0/0	7922	8434	8518	8172	8262
N																			
Mean	78	79	80	80		79	86	86	88						7166	7951	8081	7912	
C.V., %			1.85					3.45									4.48		
LSD (0.01):																			
Nitrogen			2					4									668		
Variety			1					3									343		
N x V			*					ns									ns		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Table 2. Effect of N rate in main crop on grain yields of water-seeded very early rice varieties. Rice Research Station, Crowley, LA. 1995.

	Main crop grain yield at 12% moisture					Ratoon crop grain yield at 12% moisture					Total grain yield at 12% moisture				
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	Mean
	(lb/A)														
Maybelle	5909	6850	6935	6903	6649	1181	1244	1714	1830	1492	7090	8093	8649	8734	8141
Jackson	7668	8569	8789	8662	8422	1644	1824	1755	1453	1669	9311	10393	10544	10115	10091
Jodon	7922	8434	8518	8172	8262	1974	2116	2034	1827	1988	9897	10550	10553	9999	10250
N															
Mean	7166	7951	8081	7912		1600	1728	1834	1703		8766	9679	9915	9616	
C.V., %			4.46					13.20					4.75		
LSD (0.01):															
Nitrogen			668					206					777		
Variety			343					224					446		
N x V			ns					*					ns		

Experiment: Early variety x nitrogen

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.0; O.M.: 1.34%; extractable nutrients (mg/kg): P-37, Na-79, K-74, Ca-1090, Mg-194, Zn-4.33, S-6.61, As-2.76, Fe-106.6

Variety/Seeding Rate: CPRS, BNGL, LGRU, KBNT, LFTE, DLRS, DREW, 2065, 150 lb/A

Planting Method/Date: Water-seeded, Mar 30

Fertilization: 45 lb/A P_2O_5 and K_2O PPI; N source, ammonium sulfate; second crop, 75 lb N/A; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: LFTE, Apr 7; BNGL, CPRS, Apr 8; DLRS, LGRU, KBNT, DREW, 2065, Apr 9

Water Management: Flooded, Mar 29; drained, Apr 3; reflooded, Apr 10; harvest drainage, July 21; second crop flooded, Aug 4; harvest drainage, Oct 16

Herbicides: 1.0 oz ai/A Londax (bensulfuron), Apr 21

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5; 0.25 lb ai/A methyl parathion, July 2

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Main crop, Aug 3; ratoon crop, Nov 8

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged over a 3-day period. Lafitte headed 4 to 13 days earlier than the other entries (Table 3). Lodging was moderate to severe for most entries. Main crop grain yields were good to excellent, with all entries yielding in excess of 8000 lb/A except Dellrose. Cypress required only 60 lb N/A for optimum yield. All other entries required 90 to 120 lb N/A for optimum yield. Ratoon yields were average for most entries (Table 4). Total grain yields of all entries exceeded 10,000 lb/A, with LaGrue exceeding 11,000 lb/A.

Table 3. Effect of N rate on agronomic performance of water-seeded early rice varieties and advanced experimental lines. Rice Research Station, Crowley, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	60	90	120	150	Mean
						(cm)									(lb/A)				
Cypress	82	84	87	87	85	78	84	83	79	81	8/1	20/2	30/2	45/3	8834	8888	8901	8568	8798
Bengal	90	91	92	93	91	86	85	85	87	86	5/1	0/0	3/1	8/2	8626	9292	9278	9150	9087
LaGrue	78	81	82	87	82	92	91	89	94	91	35/3	25/2	40/4	58/4	8643	9284	9572	9428	9232
Kaybonnet	85	84	86	88	86	88	88	89	89	88	15/2	38/4	55/4	60/4	8483	8455	8751	8750	8610
Lafitte	77	78	79	79	78	81	87	87	82	84	3/1	18/1	10/3	5/1	7270	8418	9137	9132	8489
Dellrose	83	83	85	86	84	84	83	87	85	85	3/1	0/0	5/1	20/3	6996	7890	7884	7897	7667
Drew	82	85	86	88	85	92	91	92	87	91	5/1	33/2	33/3	68/4	8752	9096	8778	8715	8835
2065	83	89	89	89	87	77	82	80	81	80	20/1	10/1	3/1	20/2	7486	8759	8770	8552	8392
N																			
Mean	82	84	86	87		84	86	87	85						8136	8760	8884	8774	
C.V., %			1.97					6.63									5.43		
LSD (0.01):																			
Nitrogen			2					ns									575		
Variety			2					5									437		
N x V			*					ns									*		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Table 4. Effect of N rate in main crop on grain yields of water-seeded early rice varieties and advanced experimental lines. Rice Research Station, Crowley, LA. 1995.

Variety	Main crop grain yield at 12% moisture					Ratoon crop grain yield at 12% moisture					Total grain yield at 12% moisture				
	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	Mean
	(lb/A)														
Cypress	8834	8888	8901	8588	8798	2337	2102	2218	1858	2128	11170	10990	11118	10424	10926
Bengal	6826	9292	9278	9150	9087	1591	1880	1832	1748	1712	10217	10972	11110	10895	10799
LaGrue	8643	9284	9572	9428	9232	2333	2019	1901	2140	2098	10976	11303	11474	11588	11330
Kaybonnet	8483	8455	8751	8750	8810	2717	2358	2312	1733	2280	11200	10813	11083	10483	10890
Lafitte	7270	8418	9137	9132	8489	1752	1611	1722	1783	1717	9021	10029	10880	10915	10208
Dellrose	6998	7890	7884	7897	7667	2364	2655	2841	2588	2562	9360	10545	10525	10485	10229
Drew	8752	9098	8778	8715	8835	2418	2231	1656	1344	1912	11170	11327	10433	10058	10747
2065	7486	8759	8770	6552	6392	2420	2295	2430	2398	2386	9908	11054	11200	10950	10778
N															
Mean	8136	8760	6884	6774		2241	2119	2089	1948		10378	10879	10973	10722	
C.V., %			5.43					13.11					5.56		
LSD (0.01):															
Nitrogen			575					225					ns		
Variety			437					256					557		
N x V			*					*					*		

Experiment: Very early variety x nitrogen

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.6; O.M.: 3.03%; extractable nutrients (mg/kg): P-228, Na-68, K-461, Ca-6741, Mg-1388, Zn-10.27, S-9.48, As-11.9, Fe-371.9

Variety/Seeding Rate: MBLE, JKSN, JDON, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: MBLE, JKSN, May 23; JDON, May 25

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 25

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged 8 to 10 days after the first flush. Maybelle headed 11 days earlier than the other entries (Table 5). Grain yields of all entries were average to good. Yields were down significantly from previous years. High temperature during flowering and grain formation are thought to have reduced yields. All entries required 150 to 180 lb N/A for optimum yields.

Table 5. Effect of N rate on agronomic performance of drill-seeded very early rice varieties. Buford Perry Farm, East Carroll Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	90	120	150	180	Mean	90	120	150	180	Mean	90	120	150	180	90	120	150	180	Mean
						----------(cm)----------									----------(lb/A)----------				
Maybelle	79	79	80	80	80	79	82	83	86	82	0/0	0/0	0/0	0/0	5261	5567	5730	5706	5566
Jackson	89	90	91	93	91	94	97	99	105	99	0/0	0/0	0/0	0/0	6354	6607	7236	6999	6799
Jodon	89	90	91	92	91	90	90	96	97	93	0/0	0/0	0/0	0/0	7207	7409	7556	7749	7481
N																			
Mean	86	86	87	89		88	90	93	96						6274	6528	6841	6818	
C.V., %			0.86					2.76									3.09		
LSD (0.01):																			
Nitrogen			1					8									ns		
Variety			1					2									202		
N x V			*					ns									ns		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Experiment: Early variety x nitrogen

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.4; O.M.: 2.86%; extractable nutrients (mg/kg): P-226, Na-71, K-483, Ca-6720, Mg-1395, Zn-10.06, S-10.66, As-10.28, Fe-353.8

Variety/Seeding Rate: CPRS, BNGL, LGRU, KBNT, LFTE, DLRS, DREW, 2065, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: CPRS, BNGL, LGRU, KBNT, LFTE, DREW, 2065, May 23; DLRS, May 25

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 26

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged 8 to 10 days after the first flush. All entries reached 50% heading over a 6-day period (Table 6). Grain yields of all entries were average to excellent. Yield of Dellrose was less than 6,000 lb/A. Only Bengal and LaGrue yielded over 8,000 lb/A. Yields were down significantly from previous years. High temperatures during flowering and grain formation are thought to have reduced yields. Most entries required 90 to 120 lb N/A for optimum yields. Lafitte required 180 lb N/A for optimum yield.

Table 6. Effect of N rate on agronomic performance of drill-seeded early rice varieties and advanced experimental lines. Buford Perry Farm, East Carroll Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	90	120	150	160	Mean	90	120	150	160	Mean	90	120	150	180	90	120	150	180	Mean
						(cm)									(lb/A)				
Cypress	94	95	96	97	95	95	96	99	95	96	0/0	0/0	0/0	0/0	6462	6420	6450	8533	6468
Bengal	89	91	91	94	91	87	93	93	95	92	0/0	0/0	0/0	0/0	7973	8317	8334	8349	8243
LaGrue	90	93	94	98	93	108	110	113	112	111	0/0	0/0	0/0	0/0	9039	9207	9155	9135	9134
Kaybonnet	92	93	93	95	93	109	111	113	116	112	0/0	0/0	0/0	0/0	7248	7525	7336	7336	7361
Lafitte	87	88	89	91	89	66	93	94	95	92	0/0	0/0	0/0	0/0	6592	7035	7199	7469	7074
Dellrose	88	89	90	92	90	89	92	91	90	90	0/0	0/0	0/0	0/0	6118	5973	5724	5345	5790
Drew	94	95	96	97	95	113	116	117	120	116	0/0	0/0	0/0	0/0	7518	7557	7271	7344	7422
2065	94	95	96	97	95	90	91	93	93	92	0/0	0/0	0/0	0/0	6554	6869	6793	6566	6700
N																			
Mean	91	92	93	95		97	100	102	102						7188	7365	7283	7259	
C.V., %			0.75					2.50									4.30		
LSD (0.01):																			
Nitrogen			1					4									ns		
Variety			1					2									291		
N x V			*					ns									*		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Experiment: Very early variety x nitrogen

Location: Vermilion Parish, Errol Lounsberry Farm

Soil Type/Analysis: Crowley silt loam; pH: 5.6; O.M.: 1.30%; extractable nutrients (mg/kg): P-109, Na-25, K-91, Ca-976, Mg-126, Zn-5.47, S-10.35, As-3.56, Fe-167.1

Variety/Seeding Rate: MBLE, JKSN, JDON, 150 lb/A

Planting Method/Date: Water-seeded, Mar 27

Fertilization: 45 lb/A P_2O_5 and K_2O PPI, fall 1994; N source, ammonium sulfate; 0.54 lb/A Zn (foliar), Apr 28; ratoon crop, 75 lb N/A

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: MBLE, Apr 7; JKSN, Apr 8; JDON, Apr 9

Water Management: Flooded, Mar 24; drained, Apr 1; reflooded, Apr 6; harvest drainage, July 18; ratoon crop flooded, Aug 5; harvest drainage, Oct 12

Herbicides: 1.0 oz ai/A Londax (bensulfuron), Apr 28; 0.38 lb ai/A Grandstand (triclopyr), May 22; ratoon crop, 0.75 lb ai/A Hi-Dep (2,4-D), Aug 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Main crop, July 28; ratoon crop, Oct 31

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: Entries emerged over a 3-day period. Maybelle reached 50% heading 14 to 17 days earlier than the other entries (Table 7). Grain yields were average, with Maybelle yielding significantly less than Jackson and Jodon. All entries required 90 lb N/A for optimum yields. Ratoon yields were very low, especially for Maybelle (Table 8). Total grain yields of Jackson and Jodon were significantly higher than that of Maybelle.

Table 7. Effect of N rate on agronomic performance of water-seeded very early rice varieties. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	80	90	120	150	Mean
						(cm)									(lb/A)				
Maybelle	75	77	76	78	76	87	87	88	89	88	0/0	20/2	33/4	25/3	5943	6252	6053	5747	5999
Jackson	88	89	91	91	90	89	98	96	98	95	0/0	3/1	25/3	63/4	6880	7093	6881	6158	6753
Jodon	91	92	94	94	93	86	88	92	93	89	0/0	0/0	5/2	13/1	6882	7088	6905	8999	6958
N																			
Mean	85	86	87	88		87	91	92	93						6562	6804	6613	6301	
C.V., %			1.55					3.53									7.65		
LSD (0.01):																			
Nitrogen			2					4									ns		
Variety			1					3									497		
N x V			ns					ns									ns		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning snd 5 = complete.

Table 8. Effect of N rate in main crop on grain yields of water-seeded very early rice varieties. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

	Main crop grain yield at 12% moisture					Ratoon crop grain yield at 12% moisture					Total grain yield at 12% moisture				
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	Mean
	(lb/A)														
Maybelle	5943	6252	6053	5747	5999	1032	925	844	840	910	6976	7177	6897	6587	6909
Jackson	6880	7093	6881	8158	6753	1350	1279	1247	992	1217	8230	8372	8128	7150	7970
Jodon	6862	7066	6905	6999	6958	1398	1353	1328	1311	1348	8260	8419	8234	8310	8308
N															
Mean	6562	6804	6613	8301		1260	1186	1140	1048		7822	7990	7753	7349	
C.V., %			7.65					16.14					7.48		
LSD (0.01):															
Nitrogen			ns					ns					ns		
Variety			497					185					572		
N x V			ns					ns					ns		

Experiment: Early variety x nitrogen

Location: Vermilion Parish, Errol Lounsberry Farm

Soil Type/Analysis: Crowley silt loam; pH: 5.4; O.M.: 1.26%; extractable nutrients (mg/kg): P-95, Na-23, K-96, Ca-870, Mg-110, Zn-4.83, S-13.01, As-7.24, Fe-154.4

Variety/Seeding Rate: CPRS, BNGL, LGRU, KBNT, LFTE, DLRS, DREW, 2065, 150 lb/A

Planting Method/Date: Water-seeded, Mar 27

Fertilization: 45 lb/A P_2O_5 and K_2O PPI, fall 1994; N source, ammonium sulfate; 0.54 lb/A Zn (foliar), Apr 28; ratoon crop, 75 lb N/A

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: CPRS, LGRU, Apr 6; BNGL, KBNT, LFTE, 2065, Apr 7; DLRS, DREW, Apr 8

Water Management: Flooded, Mar 24; drained, Apr 1; reflooded, Apr 6; harvest drainage, July 18; ratoon crop flooded, Aug 5; harvest drainage, Oct 12

Herbicides: 1.0 oz ai/A Londax (bensulfuron), Apr 28; 0.38 lb ai/A Grandstand (triclopyr), May 22; ratoon crop, 0.75 lb ai/A Hi-Dep (2,4-D), Aug 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Main crop, July 28; ratoon crop, Oct 31

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: Entries emerged over a 3-day period. Lafitte reached 50% heading 3 to 7 days earlier than the other entries (Table 9). Grain yields were fair for most entries. All entries required 60 to 90 lb N/A for optimum yields. Ratoon yields were average, with most entries yielding above 1500 lb/A (Table 10). Total grain yields of all entries except Bengal were higher than 8,000 lb/A.

Table 9. Effect of N rate on agronomic performance of water-seeded early rice varieties and advanced experimental lines. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture					
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	60	90	120	150	Mean	
						(cm)									(lb/A)					
Cypress	90	92	92	93	92	85	90	93	90	89	0/0	3/1	18/2	43/3	6636	6531	6307	5845	6330	
Bengal	93	94	95	96	94	83	88	88	87	86	0/0	0/0	0/0	0/0	7237	6744	6144	5497	6405	
LaGrue	87	91	91	92	90	93	101	107	108	102	13/1	8/1	13/1	18/1	7049	6931	5818	5362	6290	
Kaybonnet	92	93	93	94	93	96	102	103	102	101	18/1	35/3	83/5	83/5	7450	7184	7002	6702	7084	
Lafitte	85	85	87	90	87	83	87	87	88	86	0/0	0/0	0/0	0/0	6681	7371	7204	7150	7102	
Dellrose	91	92	93	93	92	90	96	99	93	95	0/0	8/2	43/4	33/3	6211	6419	6495	5705	6208	
Drew	93	94	95	96	94	103	107	111	107	107	3/1	15/1	55/3	75/5	7073	7007	7153	6433	6917	
2065	92	94	95	95	94	79	86	87	91	86	0/0	0/0	10/2	18/2	6773	6897	6611	6326	6652	
N																				
Mean	90	92	93	94		89	95	97	95						6889	6886	6592	6127		
C.V., %			1.39					3.34									5.73			
LSD (0.01):																				
Nitrogen			2					5									428			
Variety			1					3									353			
N x V			ns					*									*			

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Table 10. Effect of N rate in main crop on grain yields of water-seeded early rice varieties and advanced experimental lines. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

Variety	Main crop grain yield at 12% moisture					Ratoon crop grain yield at 12% moisture					Total grain yield at 12% moisture				
	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	Mean
	(lb/A)														
Cypress	6636	6531	6307	5845	6330	1726	1974	1974	1867	1885	8362	8506	8281	7712	8215
Bengal	7237	6744	6144	5497	6405	1730	1690	1390	1331	1535	8966	8435	7534	6827	7941
LaGrue	7049	6931	5818	5362	6290	2114	2481	2293	2404	2323	9164	9412	8112	7765	8613
Kaybonnet	7450	7184	7002	6702	7084	2207	2199	1804	1669	1970	9657	9383	8806	8371	9054
Lafitte	6681	7371	7204	7150	7102	1198	1264	1344	1205	1253	7879	8635	8548	8355	8354
Dellrose	6211	6419	6495	5705	6208	2201	2139	1984	1750	2019	8412	8559	8479	7455	8226
Drew	7073	7007	7153	6433	6917	1993	1974	1839	1929	1934	9066	8982	8992	8362	8850
2065	6773	6897	6611	6326	6652	2052	2026	1907	1930	1978	8826	8922	8517	8256	8630
N															
Mean	6889	6886	6592	6127		1903	1968	1817	1761		8791	8854	8409	7888	
C.V., %			5.73					17.42					7.13		
LSD (0.01):															
Nitrogen			428					ns					638		
Variety			353					302					564		
N X V			*					ns					ns		

Experiment: Very early variety x nitrogen

Location: Rapides Parish, Will Bollich Farm

Soil Type/Analysis: Moreland clay; pH: 6.3; O.M.: 2.95%; extractable nutrients (mg/kg): P-227, Na-38, K-411, Ca-4322, Mg-1399, Zn-15.97, S-11.22, As-12.47, Fe-323.3

Variety/Seeding Rate: MBLE, JKSN, JDON, 100 lb/A

Planting Method/Date: Drill-seeded, May 26

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 30, June 6, June 13, June 21; flooded, July 11; harvest drainage, Sept 18

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil) + 2.5 lb ai/A Bolero (thiobencarb), June 19; 1.0 oz ai/A Londax (bensulfuron), Aug 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 24

Fungicides: 0.5 lb ai/A Rovral (iprodione), Aug 31

Harvest: Oct 9

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: Emergence and stand establishment were poor for all entries. Maybelle reached 50% heading 9 to 10 days earlier than the other entries (Table 11). Application of PF N was delayed due to wet soil conditions. N was applied to very damp soil, which resulted in reduced N efficiency. Yields were poor for all entries and were attributed to thin stands, poor N utilization, and high temperatures during flowering and early grain formation.

Table 11. Effect of N rate on agronomic performance of drill-seeded very early rice varieties. Will Bollich Farm, Rapides Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture				
Variety	90	120	150	180	Mean	90	120	150	180	Mean	90	120	150	180	90	120	150	180	Mean
						(cm)									(lb/A)				
Maybelle	78	78	81	79	79	83	88	87	90	86	0/0	0/0	0/0	0/0	2788	3377	3253	3441	3215
Jackson	88	89	89	90	89	89	90	94	97	93	0/0	0/0	0/0	0/0	3572	4262	4479	4611	4231
Jodon	88	88	89	89	88	84	87	89	91	88	0/0	0/0	0/0	0/0	3259	3878	4489	4474	4025
N																			
Mean	85	85	86	86		85	87	90	93						3206	3839	4074	4175	
C.V., %			0.88					3.67									11.44		
LSD (0.01):																			
Nitrogen			2					4									909		
Variety			1					3									433		
N x V			*					ns									ns		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Experiment: Early variety x nitrogen

Location: Rapides Parish, Will Bollich Farm

Soil Type/Analysis: Moreland clay; pH: 6.5; O.M.: 2.96%; extractable nutrients (mg/kg): P-247, Na-39, K-409, Ca-4586, Mg-1389, Zn-12.81, S-11.92, As-10.06, Fe-293.0

Variety/Seeding Rate: CPRS, BNGL, LGRU, KBNT, LFTE, DLRS, DREW, 2065, 100 lb/A

Planting Method/Date: Drill-seeded, May 26

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 30, June 6, June 13, June 21; flooded, July 11; harvest drainage, Sept 18

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil) + 2.5 lb ai/A Bolero (thiobencarb), June 19; 1.0 oz ai/A Londax (bensulfuron), Aug 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 24

Fungicides: 0.5 lb ai/A Rovral (iprodione), Aug 31

Harvest: Oct 11

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: Emergence and stand establishment were poor for all entries. Lafitte reached 50% heading much earlier than the other entries (Table 12). Application of PF N was delayed due to wet soil conditions. N was applied to very damp soil, which resulted in reduced N efficiency. Yields were poor for all entries and were attributed to thin stands, poor N utilization, and high temperatures during flowering and early grain formation. Cypress and LaGrue were the only entries that yielded above 5,000 lb/A.

Table 12. Effect of N rate on agronomic performance of drill-seeded early rice varieties and advanced experimental lines. Will Bollich Farm, Rapides Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture					
Variety	90	120	150	180	Mean	90	120	150	180	Mean	90	120	150	180	90	120	150	180	Mean	
						(cm)									(lb/A)					
Cypress	92	93	94	94	93	90	94	92	97	93	0/0	0/0	0/0	0/0	4632	5428	4827	5534	5106	
Bengal	86	87	87	88	87	78	79	79	79	79	0/0	0/0	0/0	0/0	3504	3569	3198	4051	3581	
LaGrue	89	91	93	94	92	103	103	103	103	103	0/0	0/0	0/0	0/0	6092	5959	6283	6661	6249	
Kaybonnet	90	91	93	93	92	100	102	102	104	102	0/0	0/0	0/0	0/0	4178	4402	4838	4401	4455	
Lafitte	84	84	84	85	84	81	83	82	87	83	0/0	0/0	0/0	0/0	2881	3791	2944	3535	3288	
Dellrose	90	91	91	92	91	85	83	88	87	85	0/0	0/0	0/0	0/0	3714	4223	4094	4577	4152	
Drew	93	93	94	96	94	106	107	108	111	108	0/0	0/0	0/0	0/0	4449	4793	4950	5349	4885	
2065	92	93	94	94	93	78	79	79	78	78	0/0	0/0	0/0	0/0	2823	3301	3070	3332	3131	
N																				
Mean	89	90	91	92		90	91	91	93						4034	4434	4276	4680		
C.V., %			1.27					3.43									11.62			
LSD (0.01):																				
Nitrogen			2					ns									ns			
Variety			1					3									472			
N x V			ns					ns									ns			

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Experiment: Very early variety x nitrogen

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Hebert silty clay; pH: 6.1; O.M.: 2.85%; extractable nutrients (mg/kg): P-202, Na-140, K-331, Ca-3236, Mg-864, Zn-12.67, S-13.62, As-12.09, Fe-651.0

Variety/Seeding Rate: MBLE, JKSN, JDON, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 18

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: MBLE, JKSN, May 26; JDON, May 27

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron),June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 20

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged 8 to 9 days after water seeding. Maybelle headed 9 to 10 days earlier than the other entries (Table 13). All entries required 120 to 150 lb N/A to reach maximum yield. Grain yields were fair to good with Jodon yielding over 7000 lb/A. Yields were down significantly from previous years. High temperatures during flowering and early grain formation are thought to have reduced yields.

Table 13. Effect of N rate on agronomic performance of water-seeded very early rice varieties. Zaumbrecher Farm, Morehouse Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture					
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	60	90	120	150	Mean	
						----------(cm)----------									----------(lb/A)----------					
Maybelle	76	77	77	77	77	74	80	81	79	78	0/0	0/0	0/0	0/0	5567	5660	5801	5845	5718	
Jackson	84	86	87	88	86	82	87	90	92	88	0/0	0/0	0/0	0/0	5989	6053	6242	6621	6226	
Jodon	86	87	88	89	87	84	88	90	92	88	0/0	0/0	0/0	0/0	6717	6893	7537	7456	7151	
N																				
Mean	82	83	84	85		80	85	87	88						6091	6202	6527	6641		
C.V., %			0.91					3.20									5.24			
LSD (0.01):																				
Nitrogen			2					3									416			
Variety			1					3									330			
N x V			*					ns									ns			

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Experiment: Early variety x nitrogen

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Hebert silty clay; pH: 6.1; O.M.: 2.96%; extractable nutrients (mg/kg): P-201, Na-125, K-295, Ca-2894, Mg-762, Zn-12.44, S-13.62, As-10.17, Fe-643.8

Variety/Seeding Rate: CPRS, BNGL, LGRU, KBNT, LFTE, DLRS, DREW, 2065, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 19

Fertilization: N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: CPRS, BNGL, LGRU, KBNT, LFTE, DREW, 2065, May 23; DLRS, May 24

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron),June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 21

Experimental Design: Split plot in a randomized complete block with four replications, N assigned to main plots and varieties to subplots

Comments: All entries emerged 4 to 5 days after water seeding. Lafitte headed 3 to 8 days earlier than the other entries (Table 14). Lodging occurred at 150 lb N/A for Cypress, LaGrue, Kaybonnet, and Lafitte. Most entries required 150 lb N/A to reach maximum yield. Grain yields were fair to good, with LaGrue yielding over 8000 lb/A. Lafitte, Dellrose, and 2065 yields were significantly lower than the other entries. Yields were down significantly from previous years. High temperatures during flowering and early grain formation are thought to have reduced yields.

Table 14. Effect of N rate on agronomic performance of water-seeded early rice varieties and advanced experimental lines. Zaunbrecher Farm, Morehouse Parish, LA. 1995.

	N rate (lb/A)																			
	Days to 50% heading					Plant height					% Lodging/type[1]				Grain yield at 12% moisture					
Variety	60	90	120	150	Mean	60	90	120	150	Mean	60	90	120	150	60	90	120	150	Mean
						----------(cm)----------									----------(lb/A)----------				
Cypress	86	86	89	89	87	89	91	94	96	92	0/0	5/1	13/1	20/2	6955	7371	7205	7287	7205
Bengal	82	83	84	85	83	80	83	85	89	84	0/0	3/1	0/0	0/0	7189	7357	7906	8199	7662
LaGrue	83	84	87	88	85	99	101	105	108	103	0/0	0/0	0/0	23/2	8468	8432	8105	8801	8451
Kaybonnet	83	84	86	87	85	99	102	105	107	103	0/0	13/1	0/0	28/2	6965	7213	7097	7702	7244
Lafitte	77	79	81	82	80	82	86	88	91	86	0/0	0/0	0/0	28/1	5703	6208	8835	7159	6476
Dellrose	82	82	84	85	83	82	82	84	85	83	0/0	0/0	0/0	0/0	5512	5467	5411	5415	5451
Drew	86	87	89	89	88	104	108	112	115	110	0/0	0/0	0/0	8/1	6595	7158	7047	7198	6999
2065	86	87	89	89	88	79	81	84	83	82	0/0	0/0	0/0	0/0	6448	6617	6214	6877	6539
N																			
Mean	83	84	86	87		89	92	95	97						6729	6978	6977	7330	
C.V., %			0.73					2.67									5.09		
LSD (0.01):																			
Nitrogen			1					6									386		
Variety			1					2									332		
N x V			*					ns									*		

[1] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.

Table 15. Straighthead evaluation for commercial rice varieties and advanced experimental lines. Rice Research Station, Crowley, LA. 1995.

Entry	Pedigree	Grain type[1]	Rating[2]
Jodon		L	7.3
9502174	STRN//MERC/RICO/4/...	M	7.0
9202071	LMNT/LBLE SCS	L	7.0
Mars		M	7.0
Chui		L	7.0
Taim		L	7.0
9502085	82CAY21/TBNT/3/...	L	7.0
9402125	MERC/V4716	M	7.0
TX3092		L	7.0
El Paso 144		L	7.0
Akitakomachi		S	6.7
9502008	CPRS//82CAY21/TBNT	L	6.7
Millie		L	6.7
Kaybonnet		L	6.7
Orion		M	6.7
9502165	SMARS/MARS//MARS/3/RICO	M	6.7
9502128	SMARS/MARS//PCOS	M	6.7
9502002	MBLE//LMNT/20001-S	L	6.7
Lacassine		L	6.3
9502168	PCOS/MERC	M	6.3
Della		L	6.3
9502149	SMARS/MARS//PCOS	M	6.3
MS4077		L	6.3
Adair		L	6.3
Bengal		M	6.0
9402028	RICO/V4716	M	6.0
Lafitte		M	6.0
9002177	MARS/M201//MARS	M	6.0
Katy		L	6.0
9302106	MERC//MERC/KOSH	M	6.0
Dellrose		L	6.0
AB 869		M	5.7
Lemont		L	5.7
9502152	MARS/M201//MARS/3/MERC/RICO	M	5.7
9502192	ORION//MERC/RICO	M	5.7
9502065	2214/RICO	M	5.3
MS4186		L	5.3
Dellmont		L	5.3
9502074	SMARS/MARS//MARS/3/2214	M	5.3
9502125	7702008*2/LBLE//2207	L	5.3
LaGrue		L	5.3
Saturn		M	5.0

Continued.

Table 15. Continued.

Entry	Pedigree	Grain type[1]	Rating[2]
Alan		L	4.7
Gulfmont		L	4.7
Jefferson		L	4.3
Newbonnet		L	4.3
9502068	BNGL/RICO	M	4.3
RT 7015		L	4.3
9502134	MERC/RICO	M	4.3
Cypress		L	4.3
9502131	MERC/RICO	M	4.0
9302065	KATY/CPRS	L	4.0
Koshihikari		S	4.0
9303166		L	3.7
Drew	NWBT/KATY	L	3.7
Jackson		L	3.7
9502048	902207X2	L	3.0
Maybelle		L	2.3
9402180	2201/LMNTX2	L	2.0
9502115	7702008*2/LBLE//2207	L	1.3

[1] L = long grain, M = medium grain, S = short grain.
[2] Rating based on a scale from 0 to 9, where 0 = resistant and 9 = highly susceptible.

Table 16. Growth stage information for the DD-50 Rice Management Program. Water-seeded rice varieties and advanced experimental lines. Rice Research Station, Crowley, LA. 1995.

Variety	Emergence date	First tiller	Green ring	Panicle 2 mm	Date of 50% heading
Very Early					
Maybelle	4-09	4-28	5-17	5-23	6-09
Jackson	4-09	4-27	5-19	5-29	6-17
Jodon	4-11	5-02	5-20	5-30	6-23
Early					
Cypress	4-08	4-27	5-20	5-29	6-22
Bengal	4-08	4-27	5-18	5-31	6-29
LaGrue	4-09	5-01	5-20	5-31	6-19
Kaybonnet	4-09	4-30	5-19	5-28	6-21
Lafitte	4-07	4-29	5-21	5-28	6-15
Dellrose	4-09	4-30	5-21	6-01	6-22
2065	4-09	4-29	5-21	6-01	6-26
Drew	4-09	4-29	5-20	5-29	6-23

Table 17. Growth stage information for the DD-50 Rice Management Program. Drill-seeded rice varieties and advanced experimental lines. Buford Perry Farm, East Carroll Parish, LA. 1995.

Variety	Emergence date	First tiller	Green ring	Panicle 2 mm	Date of 50% heading
Very Early					
Maybelle	5-23	6-04	7-06	7-15	8-02
Jackson	5-23	6-04	7-08	7-20	8-12
Jodon	5-25	6-05	7-08	7-22	8-13
Early					
Cypress	5-23	6-04	7-08	7-26	8-18
Bengal	5-23	6-04	7-09	7-23	8-14
LaGrue	5-23	6-04	7-08	7-24	8-15
Kaybonnet	5-23	6-05	7-09	7-27	8-16
Lafitte	5-23	6-05	7-10	7-17	8-11
Dellrose	5-25	6-06	7-08	7-18	8-12
2065	5-23	6-05	7-08	7-26	8-18
Drew	5-23	6-05	7-07	7-27	8-18

Table 18. Growth stage information for the DD-50 Rice Management Program. Water-seeded rice varieties and advanced experimental lines. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

Variety	Emergence date	First tiller	Green ring	Panicle 2 mm	Date of 50% heading
Very Early					
Maybelle	4-07	4-27	5-16	5-22	6-12
Jackson	4-08	4-26	5-21	5-28	6-24
Jodon	4-09	4-29	5-20	5-29	6-27
Early					
Cypress	4-06	4-24	5-16	5-30	6-27
Bengal	4-07	4-24	5-21	5-30	6-29
LaGrue	4-06	4-25	5-18	5-28	6-26
Kaybonnet	4-07	4-27	5-21	5-29	6-28
Lafitte	4-07	4-24	5-20	5-28	6-21
Dellrose	4-08	4-27	5-21	6-01	6-27
2065	4-07	4-24	5-21	5-30	6-29
Drew	4-08	4-25	5-22	6-01	6-29

Table 19. Growth stage information for the DD-50 Rice Management Program. Drill-seeded rice varieties and advanced experimental lines. Will Bollich Farm, Rapides Parish, LA. 1995.

Variety	Emergence[1] date	First tiller	Green ring	Panicle 2 mm	Date of 50% heading
Very Early					
Maybelle	--	--	--	7-29	8-18
Jackson	--	--	--	8-08	8-27
Jodon	--	--	--	8-08	8-27
Early					
Cypress	--	--	7-24	8-11	8-31
Bengal	--	--	--	8-11	8-25
LaGrue	--	--	--	8-11	8-29
Kaybonnet	--	--	--	8-12	8-28
Lafitte	--	--	--	8-04	8-22
Dellrose	--	--	--	8-07	8-30
2065	--	--	--	8-10	8-31
Drew	--	--	--	8-12	8-31

[1] Data not taken.

Table 20. Growth stage information for the DD-50 Rice Management Program. Water-seeded rice varieties and advanced experimental lines. Zaunbrecher Farm, Morehouse Parish, LA. 1995.

Variety	Emergence date	First tiller	Green ring	Panicle 2 mm	Date of 50% heading
Very Early					
Maybelle	5-26	6-07	7-06	7-14	8-02
Jackson	5-26	6-07	7-08	7-20	8-12
Jodon	5-27	6-09	7-08	7-21	8-13
Early					
Cypress	5-23	6-07	7-05	7-24	8-13
Bengal	5-23	6-07	7-07	7-19	8-10
LaGrue	5-23	6-07	7-06	7-22	8-11
Kaybonnet	5-23	6-07	7-07	7-22	8-11
Lafitte	5-23	6-07	7-07	7-18	8-05
Dellrose	5-24	6-07	7-05	7-18	8-09
2065	5-23	6-07	7-06	7-23	8-14
Drew	5-23	6-07	7-06	7-24	8-13

RICE NUTRITION STUDIES

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A series of studies was conducted to evaluate various aspects of rice plant nutrition in both drill- and water-seeded rice. Most of the studies concerned fertilizer N management, with emphasis on N source, time of N application in relation to water management, and midseason N applications.

Calcium silicate applications were evaluated statewide to determine the response of Si on rice from both nutritional and disease management aspects.

Various formulations of inorganic fertilizer and organic supplements were evaluated as seed and foliar treatments to determine their potential use in rice.

Experiment: Starter N

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 5.9; O.M.: 1.19%; extractable nutrients (mg/kg): P-28, Na-80, K-50, Ca-1067, Mg-190, Zn-3.50, S-7.35, As-0.71, Fe-111.7

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 45 lb/A P_2O_5 and K_2O, Mar 28; 30 lb starter applied according to treatment timing; 135 lb N/A PF; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10, Apr 15; permanent flood, Apr 28; harvest drainage, July 24

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18

Fungicides: None

Harvest: Aug 3

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Starter N had no effect on growth and grain yield of Cypress and Kaybonnet (Table 1).

Table 1. Influence of starter N on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Rice Research Station, Crowley, LA. 1995.

Variety	Starter N rate/ Timing[1]	Preflood N rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
	-------(lb/A)-------			-(cm)-	----(lb/A)-----
Cypress	30 PP	135	92	88	8948
Cypress	30 1-leaf	135	94	87	9052
Cypress	30 2-leaf	135	95	87	8919
Cypress	--	135	95	87	9087
Cypress	--	165	96	86	8886
Kaybonnet	30 PP	135	91	99	9364
Kaybonnet	30 1-leaf	135	92	99	8770
Kaybonnet	30 2-leaf	135	93	102	9293
Kaybonnet	--	135	94	99	9208
Kaybonnet	--	165	95	104	9107
C.V., %			0.82	3.07	3.56
		Main Effects			
Variety:					
Cypress			94	87	8978
Kaybonnet			93	100	9148
LSD (0.05)			1	2	ns
Starter N					
0			94	93	9148
30 PP			92	93	9156
30 1-leaf			93	93	8911
30 2-leaf			94	94	9106
30 PF			96	95	8997
LSD (0.05)			1	ns	ns
Variety x Starter N			ns	ns	ns

[1] PP = preplant; PF = preflood.

Experiment: Starter N

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.6; O.M.: 3.26%; extractable nutrients (mg/kg): P-249, Na-65, K-499, Ca-6877, Mg-1410, Zn-11.09, S-8.00, As-13.50, Fe-352.0

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: 30 lb starter N/A applied according to treatment timing; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 23

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 25

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Except for small differences in days to 50% heading, starter N had no other effects on Cypress or Kaybonnet (Table 2).

Table 2. Influence of starter N on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Buford Perry Farm, East Carroll Parish, LA. 1995.

Variety	Starter N rate/ Timing[1]	Preflood N rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
	-------(lb/A)-------			-(cm)-	----(lb/A)-----
Cypress	30 PP	135	94	94	6347
Cypress	30 1-leaf	135	93	94	6731
Cypress	30 2-leaf	135	94	97	6380
Cypress	--	135	94	97	6405
Cypress	--	165	95	96	6444
Kaybonnet	30 PP	135	93	110	7006
Kaybonnet	30 1-leaf	135	91	107	7271
Kaybonnet	30 2-leaf	135	92	109	7167
Kaybonnet	--	135	92	111	7191
Kaybonnet	--	165	93	111	7196
C.V., %			0.70	2.00	4.68
			Main Effects		
Variety:					
Cypress			94	95	6461
Kaybonnet			92	110	7166
LSD (0.05)			1	1	207
Starter N					
0			93	104	6798
30 PP			93	102	6677
30 1-leaf			92	101	7001
30 2-leaf			93	103	6774
30 PF			94	103	6820
LSD (0.05)			1	ns	ns
Variety x Starter N			ns	ns	ns

[1] PP = preplant; PF = preflood.

Experiment: Starter N

Location: Rapides Parish, Will Bollich Farm

Soil Type/Analysis: Moreland clay; pH: 6.3; O.M.: 3.44%; extractable nutrients (mg/kg): P-237, Na-38, K-440, Ca-4594, Mg-1476, Zn-13.09, S-11.83, As-11.02, Fe-350.7

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 26

Fertilization: 30 lb starter N/A applied according to treatment timing; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 30, June 6, June 13, June 21; flooded, July 11; harvest drainage, Sept 18

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil) + 2.5 lb ai/A Bolero (thiobencarb), June 19; 1.0 oz ai/A Londax (bensulfuron), Aug 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 24

Fungicides: 0.5 lb ai/A Rovral (iprodione), Aug 31

Harvest: Oct 9

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Starter N had only minor influence on days to 50% heading (Table 3). Plant height and grain yield of Cypress and Kaybonnet were not affected.

Table 3. Influence of starter N on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Will Bollich Farm, Rapides Parish, LA. 1995.

Variety	Starter N rate/ Timing[1]	Preflood N rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
	-------(lb/A)-------			-(cm)-	----(lb/A)-----
Cypress	30 PP	135	92	95	4450
Cypress	30 1-leaf	135	92	94	4504
Cypress	30 2-leaf	135	92	97	5014
Cypress	--	135	92	99	5007
Cypress	--	165	93	97	4956
Kaybonnet	30 PP	135	90	99	3995
Kaybonnet	30 1-leaf	135	91	102	4648
Kaybonnet	30 2-leaf	135	91	103	4615
Kaybonnet	--	135	91	101	4790
Kaybonnet	--	165	92	101	4534
C.V., %			0.80	4.30	11.31
			Main Effects		
Variety:					
Cypress			92	96	4786
Kaybonnet			91	101	4516
LSD (0.05)			1	3	ns
Starter N					
0			92	100	4898
30 PP			91	97	4223
30 1-leaf			92	98	4576
30 2-leaf			92	100	4814
30 PF			93	99	4745
LSD (0.05)			1	ns	ns
Variety x Starter N			ns	ns	ns

[1] PP = preplant; PF = preflood.

Experiment: Starter N

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Hebert silty clay; pH: 6.0; O.M.: 2.43%; extractable nutrients (mg/kg): P-166, Na-143, K-317, Ca-3150, Mg-862, Zn-10.46, S-14.36, As-9.05, Fe-570.0

Variety/Seeding Rate: CPRS, KBNT, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 18

Fertilization: 30 lb starter N/A applied according to treatment timing; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 26

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron), June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 19

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Starter N had no effect on growth or grain yield of Cypress and Kaybonnet (Table 4).

Table 4. Influence of starter N on agronomic performance of water-seeded Cypress and Kaybonnet rice. Kirk Zaunbrecher Farm, Morehouse Parish, LA. 1995.

Variety	Starter N rate/ Timing[1]	Preflood N rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
	-------(lb/A)-------			-(cm)-	----(lb/A)-----
Cypress	30 PP	135	91	95	6380
Cypress	30 1-leaf	135	91	98	6792
Cypress	30 2-leaf	135	91	93	6701
Cypress	--	135	92	96	6658
Cypress	--	165	92	95	6830
Kaybonnet	30 PP	135	89	110	7075
Kaybonnet	30 1-leaf	135	89	107	7272
Kaybonnet	30 2-leaf	135	89	111	6560
Kaybonnet	--	135	90	111	6952
Kaybonnet	--	165	90	106	6878
C.V., %			0.86	3.51	6.26
			Main Effects		
Variety:					
Cypress			91	95	6672
Kaybonnet			89	109	6948
LSD (0.05)			1	2	ns
Starter N					
0			91	103	6805
30 PP			90	102	6728
30 1-leaf			90	102	7032
30 2-leaf			90	102	6631
30 PF			91	101	6854
LSD (0.05)			1	ns	ns
Variety x Starter N			ns	ns	ns

[1] PP = preplant; PF = preflood.

Experiment: N source x time of application

Location: Vermilion Parish, Errol Lounsberry Farm

Soil Type/Analysis: Crowley silt loam; pH: 5.3; O.M.: 1.40%; extractable nutrients (mg/kg): P-89, Na-28, K-108, Ca-882, Mg-124, Zn-5.63, S-12.49, As-1.40, Fe-148.4

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, Mar 26

Fertilization: 45 lb/A P_2O_5 and K_2O PPI, fall 1994; N source, urea and ammonium sulfate; 0.54 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 8

Water Management: Flooded, Mar 24; drained, Apr 1; reflooded, Apr 6; harvest drainage, July 18

Herbicides: 0.9 oz ai/A Londax (bensulfuron), Apr 28; 0.38 lb ai/A Grandstand (triclopyr), May 22

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Aug 1

Experimental Design: Randomized complete block with four replications

Comments: Source of N had no influence on any variables measured (Table 1). Plant height was increased with 90 lb N/A when applied as a single application. A single preplant application of N was the most efficient and resulted in the highest grain yield. A split application with one half being applied preplant yielded slightly less. Yields were significantly reduced when no N was applied preplant.

Table 1. Influence of N source and time of application N on agronomic performance of water-seeded, Cypress rice. Errol Lounsberry Farm, Vermilion Parish, LA. 1995.

N[1] Source	N[2] time/rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
(%)	(lb/A)		(cm)	(lb/A)
21	90 PP	94	81	6208
21	90 PF	96	81	5583
21	90 Post	93	74	5516
21	45 PP + 45 Post	93	74	6054
21	45 PF + 45 Post	94	77	5551
46	90 PP	94	82	6349
46	90 PF	97	82	5356
46	90 Post	92	72	5576
46	45 PP + 45 Post	93	76	5972
46	45 PF + 45 Post	95	79	5438
C.V., %		0.96	3.51	3.76
	Main Effects			
N Source:				
21%		94	77	5782
46%		94	78	5738
LSD (0.05)		ns	ns	ns
N time/rate:				
90 PP		94	81	6278
90 PF		96	82	5469
90 Post		92	73	5546
45 PP + 45 Post		93	75	6013
45 PF + 45 Post		95	78	5495
LSD (0.05)		1	3	222
N source x time/rate		ns	ns	ns

[1] 46% = urea; 21% = ammonium sulfate.
[2] PP = preplant; PF = preflood; Post = postflood.

Experiment: Single vs 2- and 3-way N splits

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.0; O.M.: 1.19%; extractable nutrients (mg/kg): P-57, Na-78, K-68, Ca-1159, Mg-210, Zn-3.68, S-9.92, As-2.25, Fe-102.2

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 45 lb/A P_2O_5 and K_2O, Mar 28; PF N Apr 26; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10, Apr 15; permanent flood, Apr 28; harvest drainage, July 24

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18

Fungicides: None

Harvest: Aug 3

Experimental Design: Randomized complete block with four replications

Comments: Days to 50% heading were decreased with all split applications (Table 1). Plant height was also reduced when N was applied in split applications. Yield of Cypress was significantly higher with a single PF application of N. The 2-way and 3-way applications reduced grain yield. Yield of Kaybonnet was similar when N was applied as a single or 2-way application. Yield was reduced significantly with a 3-way split. In a 2-way split, yields of each variety was similar, regardless of whether the split application was timed according to growth stage or visual observation. In a 3-way split, yields of each variety increased significantly when the midseason applications were applied visually rather than at a specific growth stage.

Table 1. Influence of N rate and timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Rice Research Station, Crowley, LA. 1995.

Variety	Method of application	Time and rate[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
		(lb/A)		(cm)	-----(lb/A)----
Cypress	Growth stage	150 PF	95	89	9247
Kaybonnet	Growth stage	150 PF	94	103	8832
Cypress	Growth stage	100PF|50PI	93	83	8640
Kaybonnet	Growth stage	100PF|50PI	92	97	8643
Cypress	Growth stage	50PF|50PI|50PD	90	77	7291
Kaybonnet	Growth stage	50PF|50PI|50PD	88	82	7341
Cypress	Visual	100PF|50	92	84	8689
Kaybonnet	Visual	100PF|50	92	98	8930
Cypress	Visual	50PF|50|50	91	76	7931
Kaybonnet	Visual	50PF|50|50	89	87	7862
C.V., %			0.83	3.07	3.20
LSD (0.05)			1	4	387
Contrast:					
Single vs split N			*	*	*

[1] PF = preflood, PI = panicle initiation, PD = panicle differentiation.

Experiment: Preflood-postflood N timing

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.3; O.M.: 1.27%; extractable nutrients (mg/kg): P-91, Na-94, K-71, Ca-1236, Mg-205, Zn-5.16, S-7.22, As-4.22, Fe-150.6

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 45 lb/A P_2O_5 and K_2O, Mar 28; 135 lb N/A according to timing treatment; 75 lb/A ratoon crop N, Aug 3; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10, Apr 15, Apr 28; permanent flood, May 4; harvest drainage, July 24; ratoon flooded, Aug 4; harvest drainage, Oct 16

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18; 0.25 lb ai/A methyl parathion, July 2

Fungicides: 0.75 lb ai/A Benlate (benomyl), July 2

Harvest: Aug 3, Nov 8

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading were slightly affected by time of N application (Table 1). Plant height was significantly reduced when N was applied 3 and 6 days postflood. Highest yields occurred with PF applications of N. The 3-day PF application yielded less than the other PF treatments due to application to a wet seedbed. The postflood treatments were significantly lower. An interaction between variety and timing occurred for the ratoon yields. Kaybonnet ratoon yields were significantly higher than those of Cypress when N was applied postflood.

Table 1. Influence of N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Rice Research Station, Crowley, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture: Main crop	Second crop	Total
(lb/A)			(cm)	----------(lb/A)----------		
Cypress	9-day PF	94	78	7563	1669	9232
Cypress	6-day PF	95	83	7821	2094	9915
Cypress	3-day PF	95	79	7066	1794	8860
Cypress	0-day PF	96	85	8676	2055	10731
Cypress	3-day PO	94	72	5151	1707	6858
Cypress	6-day PO	94	74	4527	1991	6518
Kaybonnet	9-day PF	93	86	7073	2286	9359
Kaybonnet	6-day PF	93	90	7398	2282	9680
Kaybonnet	3-day PF	93	86	6597	2194	8791
Kaybonnet	0-day PF	96	89	7891	1985	9876
Kaybonnet	3-day PO	93	75	4344	2457	6801
Kaybonnet	6-day PO	93	76	4318	2430	6747
C.V., %		.82	8.46	6.94	11.48	6.69
			Main Effects			
Variety:						
Cypress		95	78	6801	1885	8686
Kaybonnet		93	83	6270	2272	8543
LSD (0.05)		1	4	266	140	ns
N timing:						
9-day PF		93	82	7318	1978	9296
6-day PF		94	86	7609	2188	9797
3-day PF		94	82	6832	1994	8826
0-day PF		96	87	8283	2020	10303
3-day PO		93	73	4748	2082	6829
6-day PO		94	75	4422	2210	6633
LSD (0.05)		1	7	461	ns	586
Variety x N Timing		ns	ns	ns	*	ns

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Preflood-postflood N timing

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.6; O.M.: 3.10%; extractable nutrients (mg/kg): P-246, Na-69, K-513, Ca-7282, Mg-1488, Zn-11.93, S-9.96, As-8.53, Fe-386.9

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: 135 lb N/A according to timing treatment; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 23

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 25

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading and plant height were increased when the time between N application and flooding was decreased (Table 2). Height decreased with postflood N. Yields among the PF N timing treatments were similar. A 6-day postflood application significantly reduced yield.

Table 2. Influence of N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Buford Perry Farm, East Carroll Parish, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	9-day PF	90	92	6503
Cypress	6-day PF	92	96	6609
Cypress	3-day PF	94	98	6181
Cypress	0-day PF	95	96	6602
Cypress	3-day PO	91	91	6477
Cypress	6-day PO	90	88	5726
Kaybonnet	9-day PF	87	101	6918
Kaybonnet	6-day PF	90	104	7015
Kaybonnet	3-day PF	92	108	6904
Kaybonnet	0-day PF	93	112	7028
Kaybonnet	3-day PO	89	100	6329
Kaybonnet	6-day PO	87	94	6033
C.V., %		1.03	3.89	5.63
		Main Effects		
Variety:				
Cypress		92	93	6350
Kaybonnet		90	103	6705
LSD (0.05)		1	2	216
N timing:				
9-day PF		89	96	6710
6-day PF		91	100	6812
3-day PF		93	103	6543
0-day PF		94	104	6815
3-day PO		90	95	6403
6-day PO		88	91	5879
LSD (0.05)		1	4	373
Variety x N Timing		ns	ns	ns

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Preflood-postflood N timing

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Hebert silty clay; pH: 6.2; O.M.: 2.50%; extractable nutrients (mg/kg): P-163, Na-147, K-303, Ca-3366, Mg-891, Zn-9.40, S-11.57, As-11.95, Fe-494.7

Variety/Seeding Rate: CPRS, KBNT, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 18

Fertilization: 135 lb N/A according to timing treatment; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 26

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron), June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 20

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading and plant height tended to increase as the time between N application and flooding decreased (Table 3). Height was significantly reduced at 6 days postflood. Yields of all PF treatments were similar. An interaction between variety and N timing occurred for grain yield. Yields of Cypress with both postflood applications of N were significantly reduced, while yield of Kaybonnet was reduced only with the 6-day postflood treatment.

Table 3. Influence of N timing on agronomic performance of water-seeded Cypress and Kaybonnet rice. Kirk Zaumbrecher Farm, Morehouse Parish, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	9-day PF	89	93	6601
Cypress	6-day PF	89	90	6965
Cypress	3-day PF	91	94	6469
Cypress	0-day PF	92	93	7169
Cypress	3-day PO	88	91	6376
Cypress	6-day PO	88	87	6157
Kaybonnet	9-day PF	86	100	6865
Kaybonnet	6-day PF	85	99	6737
Kaybonnet	3-day PF	89	108	7187
Kaybonnet	0-day PF	90	105	6903
Kaybonnet	3-day PO	85	99	7064
Kaybonnet	6-day PO	85	93	5938
C.V., %		0.76	3.97	5.18
		Main Effects		
Variety:				
Cypress		89	91	6623
Kaybonnet		86	101	6782
LSD (0.05)		1	2	ns
N timing:				
9-day PF		88	97	6733
6-day PF		87	95	6851
3-day PF		90	101	6828
0-day PF		91	99	7036
3-day PO		86	95	6720
6-day PO		86	90	6048
LSD (0.05)		1	4	353
Variety x N Timing		ns	ns	*

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Preflood-postflood N timing (early planting)

Location: Northeast Research Station, St. Joe, LA

Soil Type/Analysis: Sharkey clay; pH: 6.9; O.M.: 2.1%

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 4

Fertilization: 135 lb N/A according to timing treatment; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, Apr 12, Apr 25; flooded, May 18; harvest drainage, Aug 5

Herbicides: 0.38 lb ai/A Facet (quinclorac) + Prowl (pendimethalin), Apr 11; 4.5 lb ai/A Arrosolo (molinate + propanil) + 0.9 oz ai/A Londax (bensulfuron), May 9; 4.5 lb ai/A Arrosolo + 0.38 lb ai/A Facet, May 18

Insecticides: None

Fungicides: None

Harvest: Aug 17

Experimental Design: Randomized complete block with three replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading and plant height were not affected by time of N application (Table 4). Yields of PF treatments tended to increase as the time between N application and flooding decreased. Yields were significantly reduced when N was applied after permanently flooding. All PF N treatments were similar. Cypress significantly outyielded Kaybonnet.

Table 4. Influence of N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice (early planting). Northeast Research Station, St. Joe, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	9-day PF	104	96	6016
Cypress	6-day PF	104	92	5990
Cypress	3-day PF	104	100	6403
Cypress	0-day PF	106	90	7376
Cypress	3-day PO	102	93	5947
Cypress	6-day PO	107	90	5214
Kaybonnet	9-day PF	101	95	5077
Kaybonnet	6-day PF	103	97	4972
Kaybonnet	3-day PF	104	103	6555
Kaybonnet	0-day PF	104	106	6573
Kaybonnet	3-day PO	102	98	4779
Kaybonnet	6-day PO	103	91	4815
C.V., %		2.20	9.41	17.02
	Main Effects			
Variety:				
Cypress		105	94	6158
Kaybonnet		103	98	5462
LSD (0.05)		2	ns	684
N timing:				
9-day PF		103	95	5547
6-day PF		104	94	5481
3-day PF		104	102	6479
0-day PF		105	98	6975
3-day PO		102	96	5363
6-day PO		105	91	5014
LSD (0.05)		ns	ns	1184
Variety x N Timing		ns	ns	ns

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Preflood-postflood N timing (late planting)

Location: Northeast Research Station, St. Joe, LA

Soil Type/Analysis: Sharkey clay; pH: 6.9; O.M.: 2.1%

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 27

Fertilization: 135 lb N/A according to timing treatment; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 20, May 27; flooded, June 3; harvest drainage, Sept 1

Herbicides: 0.38 lb ai/A Facet (quinclorac) + 1.0 lb ai/A Basagran (bentazon), May 9; 4.5 lb ai/A Arrosolo (molinate + propanil) + 0.9 oz ai/A Londax (bensulfuron), May 22; 4.0 lb ai/A Stam (propanil), June 3

Insecticides: None

Fungicides: None

Harvest: Sept 20

Experimental Design: Randomized complete block with three replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading were not influenced by time of N application (Table 5). Height was significantly reduced when N was applied postflood. Height was reduced slightly with a 0-day application. Yields of all PF treatments were similar. Yields of the postflood N treatments were significantly reduced.

Table 5. Influence of N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice (late planting). Northeast Research Station, St. Joe, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	9-day PF	95	87	5854
Cypress	6-day PF	97	85	6147
Cypress	3-day PF	97	85	6159
Cypress	0-day PF	96	85	5183
Cypress	3-day PO	97	79	4565
Cypress	6-day PO	96	80	4073
Kaybonnet	9-day PF	94	97	5760
Kaybonnet	6-day PF	92	96	5909
Kaybonnet	3-day PF	94	99	5846
Kaybonnet	0-day PF	93	94	5677
Kaybonnet	3-day PO	93	84	3642
Kaybonnet	6-day PO	92	84	4061
C.V., %		1.62	2.93	10.23
		Main Effects		
Variety:				
Cypress		97	83	5330
Kaybonnet		93	92	5149
LSD (0.05)		1	2	ns
N timing:				
9-day PF		95	92	5807
6-dsy PF		95	91	6028
3-day PF		95	92	6002
0-day PF		95	89	5430
3-day PO		95	82	4103
6-day PO		94	82	4067
LSD (0.05)		ns	3	642
Variety x N Timing		ns	*	ns

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Preflood-postflood N timing

Location: Northeast Research Station: Macon Ridge Branch

Soil Type/Analysis: Gigger silt loam; pH: 5.8; O.M.: 1.3%

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 16

Fertilization: 135 lb N/A according to timing treatment; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 18; flooded, June 19; harvest drainage, Aug 26

Herbicides: 6.0 lb ai/A Arrosolo (molinate + propanil), June 3;
4.0 lb ai/A Stam (propanil), June 17

Insecticides: None

Fungicides: None

Harvest: Sept 15

Experimental Design: Randomized complete block with three replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading, plant height, and grain yield were significantly decreased when N was applied after permanently flooding (Table 6). Yields of all PF N treatments were similar. Kaybonnet significantly outyielded Cypress.

Table 6. Influence of N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Macon Ridge Branch, Northeast Research Station, Winnsboro, LA. 1995.

Variety	N timing[1]	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	9-day PF	90	91	6208
Cypress	6-day PF	93	90	5965
Cypress	3-day PF	92	93	6427
Cypress	0-day PF	93	92	6094
Cypress	3-day PO	86	77	5181
Cypress	6-day PO	88	78	5348
Kaybonnet	9-day PF	87	98	7330
Kaybonnet	6-day PF	89	99	7662
Kaybonnet	3-day PF	88	102	7640
Kaybonnet	0-day PF	88	104	7824
Kaybonnet	3-day PO	83	86	5931
Kaybonnet	6-day PO	83	86	6700
C.V., %		2.19	3.61	7.69
		Main Effects		
Variety:				
Cypress		90	87	5870
Kaybonnet		86	96	7181
LSD (0.05)		1	2	347
N timing:				
9-day PF		89	95	6769
6-day PF		91	94	6813
3-day PF		90	97	7033
0-day PF		91	98	6959
3-day PO		84	81	5556
6-day PO		86	82	6024
LSD (0.05)		2	4	601
Variety x N Timing		ns	ns	ns

[1] N was applied at 135 lb/A in a single application. PF = preflood, PO = postflood.

Experiment: Midseason N timing

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.2; O.M.: 1.20%; extractable nutrients (mg/kg): P-58, Na-85, K-76, Ca-1301, Mg-200, Zn-7.30, S-6.79, As-2.09, Fe-147.4

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 45 lb/A P_2O_5 and K_2O, Mar 28; 100 lb N/A PF; MS splits applied according to timing schedule; N source, urea; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10, Apr 15; permanent flood, Apr 28; harvest drainage, July 24

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18

Fungicides: None

Harvest: Aug 3

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Time of application of midseason N had no influence on plant growth and yield of Cypress and Kaybonnet (Table 1).

Table 1. Influence of midseason N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Rice Research Station, Crowley, LA. 1995.

Variety	Midseason[1] N timing	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	PI	95	79	8536
Cypress	PI + 7	95	83	8287
Cypress	PI + 14	96	82	8647
Cypress	PI + 21	95	82	8330
Cypress	PI + 28	95	82	8333
Cypress	PI + 35	96	80	8492
Kaybonnet	PI	94	95	8483
Kaybonnet	PI + 7	94	94	8547
Kaybonnet	PI + 14	94	91	8020
Kaybonnet	PI + 21	94	93	8721
Kaybonnet	PI + 28	93	94	8473
Kaybonnet	PI + 35	94	92	8641
C.V., %		.83	4.14	5.90
		Main Effects		
Variety:				
Cypress		95	81	8438
Kaybonnet		94	93	8481
LSD (0.05)		1	2	ns
Midseason N:				
PI		95	87	8510
PI + 7		95	89	8417
PI + 14		95	86	8333
PI + 21		95	87	8525
PI + 28		94	88	8403
PI + 35		95	86	8567
LSD (0.05)		ns	ns	ns
PP N x MS N		ns	ns	ns

[1] PI = panicle initiation with 50 lb N/A applied beginning at PI and continuing at 7-day intervals for 35 days.

Experiment: Midseason N timing

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.6; O.M.: 2.88%; extractable nutrients (mg/kg): P-281, Na-68, K-472, Ca-6969; Mg-1424; Zn-11.11, S-10.05, As-10.12, Fe-374.1

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: 100 lb N/A PF; 50 lb N/A midseason splits applied according to timing schedule; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 23

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 25

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Days to 50% heading were influenced very little by timing of midseason N (Table 2). Yields were significantly lower when PI and PI + 35-day applications of N were made, although the yield differences were less than 500 lb/A.

Table 2. Influence of midseason N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Buford Perry Farm, East Carroll Parish, LA. 1995.

Variety	Midseason[1] N timing	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	PI	93	95	6424
Cypress	PI + 7	92	94	6950
Cypress	PI + 14	92	96	6734
Cypress	PI + 21	92	95	6625
Cypress	PI + 28	92	94	6893
Cypress	PI + 35	92	92	6374
Kaybonnet	PI	92	108	7074
Kaybonnet	PI + 7	91	109	7504
Kaybonnet	PI + 14	91	106	7334
Kaybonnet	PI + 21	91	110	7673
Kaybonnet	PI + 28	90	106	7532
Kaybonnet	PI + 35	91	105	7158
C.V., %		0.75	3.30	4.47
		Main Effects		
Variety:				
Cypress		92	95	6667
Kaybonnet		91	107	7379
LSD (0.05)		1	2	184
Midseason N:				
PI		92	102	6749
PI + 7		91	102	7227
PI + 14		91	101	7034
PI + 21		91	103	7149
PI + 28		91	100	7213
PI + 35		91	98	6766
LSD (0.05)		1	ns	319
PP N x MS N		ns	ns	ns

[1] PI = panicle initiation with 50 lb N/A applied beginning at PI and continuing at 7-day intervals for 35 days.

Experiment: Midseason N timing

Location: Rapides Parish, Will Bollich Farm

Soil Type/Analysis: Moreland clay; pH: 6.3; O.M.: 3.37%; extractable nutrients (mg/kg): P-222, Na-39, K-437, Ca-4537, Mg-1459, Zn-12.39, S-11.70, As-13.30, Fe-332.4

Variety/Seeding Rate: CPRS, KBNT, 100 lb/A

Planting Method/Date: Drill-seeded, May 26

Fertilization: 100 lb N/A PF; midseason splits according to timing schedule; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 30, June 6, June 13, June 21; flooded, July 11; harvest drainage, Sept 18

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil) + 2.5 lb ai/A Bolero (thiobencarb), June 19; 1.0 oz ai/A Londax (bensulfuron), Aug 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 24

Fungicides: 0.5 lb ai/A Rovral (iprodione), Aug 31

Harvest: Oct 9

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Time of application of midseason N had no influence on plant growth and grain yield of Cypress and Kaybonnet (Table 3).

Table 3. Influence of midseason N timing on agronomic performance of drill-seeded Cypress and Kaybonnet rice. Will Bollich Farm, Rapides Parish, LA. 1995.

Variety	Midseason[1] N timing	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	PI	93	99	5204
Cypress	PI + 7	92	96	5314
Cypress	PI + 14	92	97	5054
Cypress	PI + 21	92	94	4821
Cypress	PI + 28	92	95	5002
Cypress	PI + 35	92	98	4648
Kaybonnet	PI	91	102	4203
Kaybonnet	PI + 7	91	104	4546
Kaybonnet	PI + 14	90	101	4336
Kaybonnet	PI + 21	91	103	4231
Kaybonnet	PI + 28	91	104	4548
Kaybonnet	PI + 35	91	100	3961
C.V., %		0.98	4.64	10.02
			Main effects	
Variety:				
Cypress		92	96	5007
Kaybonnet		91	102	4304
LSD (0.05)		1	3	274
Midseason N:				
PI		92	100	4704
PI + 7		91	100	4930
PI + 14		91	99	4695
PI + 21		91	99	4526
PI + 28		91	100	4775
PI + 35		91	99	4305
LSD (0.05)		ns	ns	ns
PP N x MS N		ns	ns	ns

[1] PI = panicle initiation with 50 lb N/A applied beginning at PI and continuing at 7-day intervals for 35 days.

Experiment: Midseason N timing

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Herbert silty clay; pH: 6.1; O.M.: 2.60%; extractable nutrients (mg/kg): P-172, Na-130, K-286, Ca-2957, Mg-795, Zn-11.06, S-13.27, As-7.74, Fe-578.9

Variety/Seeding Rate: CPRS, KBNT, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 18

Fertilization: 100 lb N/A PF; midseason splits according to timing schedule; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: CPRS, May 23; KBNT, May 25

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron), June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 20

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety and N timing.

Comments: Except for a minor influence on days to 50% heading, time of midseason N had no effect on Cypress and Kaybonnet (Table 4).

Table 4. Influence of midseason N timing on agronomic performance of water-seaded Cypress and Kaybonnet rice. Kirk Zaumbrecher Farm, Morehouse Parish, LA. 1995.

Variety	Midseason[1] N timing	Days to 50% heading	Plant height	Grain yield at 12% moisture
(lb/A)			(cm)	-(lb/A)-
Cypress	PI	91	95	6705
Cypress	PI + 7	91	91	6743
Cypress	PI + 14	90	95	7301
Cypress	PI + 21	89	90	7446
Cypress	PI + 28	89	91	7499
Cypress	PI + 35	90	93	6791
Kaybonnet	PI	88	107	7482
Kaybonnet	PI + 7	88	105	7364
Kaybonnet	PI + 14	87	105	7488
Kaybonnet	PI + 21	87	104	7949
Kaybonnet	PI + 28	87	102	7459
Kaybonnet	PI + 35	87	101	7635
C.V., %		0.77	4.59	6.12
		Main Effects		
Variety:				
Cypress		90	92	7081
Kaybonnet		87	104	7563
LSD (0.05)		1	3	263
Midseason N:				
PI		90	101	7094
PI + 7		89	98	7054
PI + 14		89	100	7395
PI + 21		88	97	7697
PI + 28		88	96	7479
PI + 35		88	97	7213
LSD (0.05)		1	ns	ns
PF N x MS N		ns	ns	ns

[1] PI = panicle initiation with 50 lb N/A applied beginning at PI and continuing at 7-day intervals for 35 days.

Experiment: Silica rate

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 7.0; O.M.: 1.38%; extractable nutrients (mg/kg): P-93, Na-114, K-64, Ca-1749, Mg-196, Zn-4.29, S-12.75, As-0.00, Fe-296.8

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 17

Fertilization: 0-45-45 (N-P-K) PPI, Apr 17; variable Si rates PP; 135 lb N/A PF, May 16

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 28

Water Management: Flushed, Apr 28, May 5; flooded, May 16; harvest drainage, Aug 6

Herbicides: Arrosolo (3.0 lb ai /A molinate + 3.0 lb ai/A propanil), May 10; 0.9 oz ai/A Londax (bensulfuron), May 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: None

Harvest: Aug 16

Experimental Design: Randomized complete block with four replications

Comments: Days to 50% heading, plant height, grain yield, Y-leaf Si content, and disease were not affected by Si application (Table 1). Straw content was increased slightly, but the levels were not consistent with rate of Si application.

Table 1. Influence of silica on performance of drill-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture	Y-leaf Si[1] content	Mature straw Si content	Sheath blight[2]	
						Rating	Infection
(lb/A)		(cm)	(lb/A)	----------(%)----------		-------(%)-------	
0	88	83	7319	3.3	6.5	6.5	66
1000	87	85	7500	3.2	6.8	7.0	72
2000	88	86	7434	3.3	7.0	6.5	70
3000	87	86	7179	3.4	6.9	6.8	71
4000	88	85	7215	3.2	6.7	6.8	66
5000	87	86	7237	3.3	7.0	7.0	54
C.V.%	0.81	3.17	2.17	3.99	3.10	8.55	28.21
LSD (0.05)	ns	ns	ns	ns	0.3	ns	ns

[1] Leaf sample collected at panicle initiation.
[2] Rating based on 0-9 scale where 0 = none (immune) and 9 = maximum (very susceptible). Infection based on % tiller infection.

Experiment: Silica rate

Location: East Carroll Parish, Buford Perry Farm

Soil Type/Analysis: Sharkey clay; pH: 6.7; O.M.: 3.23%; extractable nutrients (mg/kg): P-263, Na-62, K-459, Ca-6617, Mg-1356, Zn-9.78, S-8.87, As-8.400, Fe-353.1

Variety/Seeding Rate: BNGL, 100 lb/A

Planting Method/Date: Drill-seeded, May 11

Fertilization: Variable Si rates PP; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 23

Water Management: Flushed, May 15, May 21, May 26, June 6; flooded, June 17; harvest drainage, Sept 1

Herbicides: 5.0 lb ai/A Stam (propanil) + .375 lb ai/A Facet (quinclorac) + 0.3 oz ai/A Londax (bensulfuron), June 3; 0.6 oz ai/A Londax, July 15

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: 0.75 lb ai/A Benlate (benomyl), Aug 5

Harvest: Sept 26

Experimental Design: Randomized complete block with four replications

Comments: Si application had no influence on any variable measured (Table 2).

Table 2. Influence of silica on performance of drill-seeded Bengal rice. Buford Perry Farm, East Carroll Parish, LA. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture	Y-leaf Si content[1]	Mature straw Si content
(lb/A)		(cm)	(lb/A)	----------(%)----------	
0	89	88	8061	3.0	5.8
1000	89	87	8175	3.1	5.6
2000	89	88	7979	3.0	5.5
3000	89	88	7857	3.0	6.0
4000	89	89	7981	3.0	6.0
5000	89	89	8147	3.0	5.8
C.V.%	0.64	3.28	3.60	6.65	8.31
LSD (0.05)	ns	ns	ns	ns	ns

[1] Leaf sample collected at panicle initiation.

Experiment: Silica rate

Location: Vermilion Parish, Errol Lounsberry Farm

Soil Type/Analysis: Crowley silt loam; pH: 5.4; O.M.: 1.42%; extractable nutrients (mg/kg): P-77, Na-37, K-110, Ca-1119, Mg-163, Zn-3.05, S-17.18, As-6.72, Fe-132.5

Variety/Seeding Rate: BNGL, 150 lb/A

Planting Method/Date: Water-seeded, Mar 26

Fertilization: 45 lb/A P_2O_5 and K_2O PPI, fall 1994; variable Si rates PP; 120 lb N/A PP; N source, ammonium sulfate; 0.54 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 8

Water Management: Flooded, Mar 24; drained, Apr 1; reflooded, Apr 6; harvest drainage, July 18

Herbicides: 0.9 oz ai/A Londax (bensulfuron), Apr 28; 0.38 lb ai/A Grandstand (triclopyr), May 22

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 5

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Aug 1

Experimental Design: Randomized complete block with four replications

Comments: Plant height and grain yield increased with the highest rates of Si when compared with the control (Table 3). Y- leaf content of Si significantly increased with all Si rates. Straw content was significantly higher than the control when the Si rate reached 3000 lb/A. Sheath blight and blast were not affected by Si.

Table 3. Influence of silica on performance of water-seeded Bengal rice. Errol Lounsberry Farm. Vermilion Parish. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture	Y-leaf Si[1] content	Mature straw Si content	Sheath blight[2]		Blast
						Rating	Infection	
(lb/A)		(cm)	(lb/A)	----------(%)----------			-------(%)-------	
0	74	82	5926	1.6	3.4	7.0	55	8.8
1000	74	84	6159	2.1	3.6	6.2	51	10.0
2000	74	83	6534	2.0	3.7	6.5	44	7.5
3000	75	84	6731	2.1	4.1	6.0	38	7.5
4000	75	86	6603	2.3	3.8	5.8	39	7.5
5000	74	87	6589	2.2	3.9	6.3	34	6.3
C.V.%	0.72	2.24	4.39	10.85	6.52	18.26	44.53	46.12
LSD (0.05)	ns	3	425	0.3	0.4	ns	ns	ns

[1] Leaf sample collected at panicle initiation.
[2] Rating based on 0-9 scale where 0 = none (immune) and 9 = maximum (very susceptible). Infection based on % tiller infection.

Experiment: Silica rate

Location: Rapides Parish, Will Bollich Farm

Soil Type/Analysis: Moreland clay; pH: 6.4; O.M.: 3.18%; extractable nutrients (mg/kg): P-208, Na-38, K-413, Ca-4337, Mg-1364, Zn-13.79, S-12.66, As-9.50, Fe-324.5

Variety/Seeding Rate: BNGL, 100 lb/A

Planting Method/Date: Drill-seeded, May 26

Fertilization: Variable Si rates PP; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, May 30, June 6, June 13, June 21; flooded, July 11; harvest drainage, Sept 18

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil) + 2.5 lb ai/A Bolero (thiobencarb), June 19; 1.0 oz ai/A Londax (bensulfuron), Aug 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 24

Fungicides: 0.5 lb ai/A Rovral (iprodione), Aug 31

Harvest: Oct 9

Experimental Design: Randomized complete block with four replications

Comments: Si application had no effect on any variable measured (Table 4).

Table 4. Influence of silica on performance of drill-seeded Bengal rice. Will Bollich Farm, Rapides Parish, LA. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture	Y-leaf Si content[1]	Mature straw Si content
(lb/A)		(cm)	(lb/A)	----------(%)----------	
0	87	78	3111	1.8	3.6
1000	87	79	3143	2.0	3.4
2000	87	77	3478	2.0	3.5
3000	87	76	3288	2.1	3.7
4000	88	79	3223	2.0	3.9
5000	87	78	2895	2.0	3.7
C.V.%	0.64	4.66	15.46	9.15	8.61
LSD (0.05)	ns	ns	ns	ns	ns

[1] Leaf sample collected at panicle initiation.

Experiment: Silica rate

Location: Morehouse Parish, Zaunbrecher Farm

Soil Type/Analysis: Hebert silty clay; pH: 6.1; O.M.: 2.53%; extractable nutrients (mg/kg): P-179, Na-147, K-292, Ca-3121, Mg-872, Zn-13.48, S-15.88, As-9.65, Fe-535.2

Variety/Seeding Rate: BNGL, 150 lb/A

Planting Method/Date: Water-seeded delayed flood, May 18

Fertilization: Variable Si rates PP; 135 lb N/A PF; N source, urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 23

Water Management: Flooded, May 18; drained, May 22; flushed, May 25, June 6, June 10; flooded, June 17; harvest drainage, Sept 1

Herbicides: 4.0 lb ai/A Stam (propanil) + .25 lb ai/A Facet (quinclorac) + 2 pt crop oil, June 9; 3.5 lb ai/A Ordram (molinate), June 24; 0.7 oz ai/A Londax (bensulfuron), June 29

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 7

Fungicides: None

Harvest: Sept 20

Experimental Design: Randomized complete block with four replications

Comments: Days to 50% heading, plant height, grain yield, and Si straw content were not influenced by Si application. Y-leaf Si content increased as rate increased (Table 5).

Table 5. Influence of silica on performance of water-seeded Bengal rice. Kirk Zaunbrecher Farm, Morehouse Parish, LA. 1995.

Rate (lb/A)	Days to 50% heading	Plant height (cm)	Grain yield at 12% moisture (lb/A)	Y-leaf Si content[1] (%)	Mature straw Si content (%)
0	86	86	7877	2.0	4.6
1000	86	88	8005	2.3	4.6
2000	86	89	8018	2.4	4.6
3000	86	86	7962	2.6	4.7
4000	86	90	7867	2.6	4.5
5000	86	88	8034	2.7	4.9
C.V.%	0.35	3.84	2.31	5.13	5.82
LSD (0.05)	ns	ns	ns	0.2	ns

[1] Leaf sample collected at panicle initiation.

Experiment: Silica rate

Location: Vermilion Parish, Bobby Trahan Farm (Pine Island, LA)

Soil Type/Analysis: Reclaimed marsh; pH: 5.1; O.M.: 9.05%; extractable nutrients (mg/kg): P-127, Na-97, K-200, Ca-2211, Mg-482, Zn-18.67, S-35.80, As-23.75, Fe-1045.1

Variety/Seeding Rate: BNGL, 100 lb/A

Planting Method/Date: Water-seeded, Mar 30

Fertilization: Variable Si rates PF; 60 lb N/A PF

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, Apr 8; flooded, May 5; harvest drainage, July 20

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil), May 3

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 15

Fungicides: None

Harvest: Aug 9

Experimental Design: Randomized complete block with four replications

Comments: Days to 50% heading, plant height, grain yield, and Y-leaf Si content were not affected by Si application (Table 6). Si content in the straw was significantly increased once the rate of Si reached 3000 lb/A.

Table 6. Influence of silica on performance of water-seeded Bengal rice. Bobby Trahan Farm, Vermilion Parish, LA. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture	Y-leaf Si content[1]	Mature straw Si content
(lb/A)		(cm)	(lb/A)	----------(%)----------	
0	100	82	4813	2.6	2.8
1000	100	81	4969	2.9	2.6
2000	101	82	4893	2.8	2.9
3000	101	81	5108	2.9	3.5
4000	99	83	5961	2.7	3.4
5000	99	83	5773	2.7	3.4
C.V.%	2.15	2.90	16.07	11.49	9.88
LSD (0.05)	ns	ns	ns	ns	0.5

[1] Leaf sample collected at panicle initiation.

Experiment: Foliar nutrient x fungicide

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.0; O.M.: 1.19%; extractable nutrients (mg/kg): P-57, Na-78, K-68, Ca-1159, Mg-210, Zn-3.68, S-9.92, As-2.25, Fe-102.2

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 0-45-45 (N-P-K), Mar 28; 135 lb N/A PF, Apr 26; 0.7 lb Zn/A (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10, Apr 15; flooded, Apr 28; harvest drainage, July 24

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18

Fungicides: Included as treatments

Harvest: Aug 3

Experimental Design: Randomized complete block with four replications

Comments: The test area was inoculated with sheath blight (Rhizoctonia solani) on May 31. Halt, Benlate, Cu, and S treatment combinations were applied on June 16 at the booting plant growth stage. Heading applications of Halt, Benlate, and Halt plus Benlate were applied on July 3. Days to 50% heading and plant height were not affected by any treatment (Table 1). Although disease ratings were lowest with treatments including two applications of Benlate, there were no treatment combinations significantly different from the check. Yields were similar for the Benlate and Halt plus Benlate combinations. Benlate and Halt plus Benlate treatments applied at boot and heading significantly outyielded Benlate applied only at boot. These two treatments also outyielded all other treatments containing Halt alone or Halt plus Cu and S.

Table 1. Influence of a foliar nutrient formulation (Unitec), Cu, S, and fungicide on disease development, plant growth, and grain yield of drill-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Treatment combination	Rate	Time of application	Days to 50% heading	Plant height	Grain yield at 12% moisture	Sheath Blight[1]	
						Rating	Infection
				-(cm)-	-(lb/A)-		-(%)-
Halt	16 oz	boot	93	82	7618	7.0	79
Benlate	0.5 lb	boot	93	83	7761	7.0	74
Halt	16 oz+16 oz	boot + heading	93	86	7688	7.0	80
Benlate	0.5 lb+0.5 lb	boot + heading	93	84	8312	5.8	59
Halt + Benlate	8 oz+0.5 lb	boot + heading	92	85	8377	5.3	62
Halt + Benlate	16 oz+0.5 lb	boot	93	83	8204	5.8	60
Halt	24 oz	boot	92	86	7823	6.8	84
Halt + Cu + S	16 oz+8 oz+8 oz	boot	92	83	7733	7.3	85
Check	--	----	93	87	7919	7.0	80
C.V., %			0.80	2.66	4.14	6.83	18.47
LSD (0.05)			ns	ns	480	0.7	20

[1] Rating based on a 0-9 scale where 0 = none (immune) and 9 = maximum (very susceptible); % infection based on number of tillers infected.

Experiment: Agri-Gro organic soil supplement-seed and foliar treatment

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.7; O.M.: 1.33%; extractable nutrients (mg/kg): P-97, Na-94, K-58, Ca-1354, Mg-193, Zn-6.60, S-7.44, As-2.91, Fe-261

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 17

Fertilization: 0-45-45 (N-P-K) ppi Apr 17; variable N PF, May 16

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 28

Water Management: Flushed, Apr 28, May 5; flooded, May 16; harvest drainage, Aug 6

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil), May 10; 0.9 oz ai/A Londax (bensulfuron), May 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: 0.5 lb ai/A Benlate (benomyl), July 11

Harvest: Aug 16

Experimental Design: Randomized complete block with four replications

Comments: Agri-Gro is an organic soil amendment containing nitrogen-fixing organisms. This material was evaluated as a seed treatment and was also applied with herbicide and fungicide applications. Seed was treated with a 11 oz/A rate of Agri-Gro. At the time of herbicide and fungicide applications, 24 and 16 oz/A were applied, respectively. Days to 50% heading, plant height, and grain yield were significantly increased at the 120 lb/A N rate (Table 1). Agri-Gro had no influence on these variables. Milling yields were similar among all treatments.

Table 1. Influence of an organic supplement (Agri-Gro seed and foliar treatment) on plant growth, grain yield, and milling quality of drill-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Treatment combination[1]		Days to 50% heading	Plant height	Grain yield at 12% moisture	% Milling yield
N	Agri-Gro				
-(lb/A)-	-(oz/A)-		-(cm)-	-(lb/A)-	-(head-total)-
60	--	84	75	6194	63-70
120	--	87	87	8168	64-70
60	11	83	74	6580	64-70
120	11	87	88	8034	63-70
60	11|24	84	72	6041	63-70
120	11|24	88	85	7943	63-70
60	11|24|16	83	73	6520	63-70
120	11|24|16	88	84	8173	63-70
C.V., %		1.09	4.53	4.70	1.3-0.5
LSD (0.05)		1	5	498	ns-ns

[1] N applied PF; 11 oz application of Agri-Gro applied as seed treatment; 24 oz applied with PF herbicide; 16 oz applied with fungicide.

Experiment: Agri-Gro organic soil supplement-foliar treatment

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.7; O.M.: 1.29%; extractable nutrients (mg/kg): P-103, Na-115, K-61, Ca-1422, Mg-213, Zn-9.81, S-9.05, As-1.48, Fe-236.1

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 17

Fertilization: 0-45-45 (N-P-K) ppi Apr 17; variable N PF, May 16

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 28

Water Management: Flushed, Apr 28, May 5; flooded, May 16; harvest drainage, Aug 6

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil), May 10; 0.9 oz ai/A Londax (bensulfuron), May 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: 0.5 lb ai/A Benlate (benomyl), July 11

Harvest: Aug 16

Experimental Design: Randomized complete block with four replications

Comments: Agri-Gro is an organic soil amendment containing nitrogen-fixing organisms. This material was evaluated as a foliar treatment applied to coincide with applications of fertilizer N. Single PF N applications were applied with 12 oz/A of Agri-Gro. Three-way split applications of N were applied with Agri-Gro at a rate of 16 oz/A at each N split. Days to 50% heading and plant height were influenced by rate of N (Table 2). In the three-way split treatments, there was a significant increase in plant height with three 16 oz/A applications of Agri-Gro. Grain and milling yields were not influenced by N or Agri-Gro.

Table 2. Influence of an organic supplement (Agri-Gro foliar treatment) on plant growth, grain yield, and milling quality of drill-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Treatment combination[1]		Days to 50% heading	Plant height	Grain yield at 12% moisture	% Milling yield
N	Agri-Gro				
-(lb/A)-	-(oz/A)-		-(cm)-	-(lb/A)-	-(head-total)-
90	--	85	80	8198	64-70
120	--	87	85	8292	63-70
150	--	88	92	8295	63-70
90	12	85	83	7939	64-70
120	12	87	87	8265	63-70
150	12	88	87	8538	63-70
90|30|30	--	85	82	8264	63-70
90|30|30	16|16|16	85	86	8338	63-70
C.V., %		1.24	2.72	3.52	0.9-0.5
LSD (0.05)		2	3	ns	ns-ns

[1] Single applications of N applied PF; 3-way applications applied PF\|PI\|PD; single applications of Agri-Gro applied PF; 3-way applications applied PF\|PI\|PD.

Experiment: Aggrand organic fertilizer supplement

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.7; O.M.: 1.37%; extractable nutrients (mg/kg): P-92, Na-116, K-63, Ca-1459, Mg-217, Zn-4.03, S-10.79, As-0.68, Fe-209.3

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 17

Fertilization: 0-45-45 (N-P-K) ppi Apr 17, selected treatments; 135 lb N/A PF, May 16, selected treatments

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 28

Water Management: Flushed, Apr 28, May 5; flooded, May 16; harvest drainage, Aug 6

Herbicides: Arrosolo (3.0 lb ai/A molinate + 3.0 lb ai/A propanil), May 10; 0.9 oz ai/A Londax (bensulfuron), May 24

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: None

Harvest: Aug 16

Exp. Design: Randomized complete block with four replications

Comments: Aggrand is an organic fertilizer formulated from fish solubles and sea kelp concentrate with an analysis of 4-1-1. This material was evaluated as a foliar spray. The tillering application of Aggrand was applied on May 24 after 50% canopy closure. The boot application was applied on July 3 (panicle length approximately 1 inch). Days to 50% heading, plant height, and grain yield were significantly reduced in treatments containing no inorganic fertilizer (Table 3). Aggrand alone had no influence on yield. In treatments fertilized with N-P-K, Aggrand applied at the 1-gallon rate increased grain yield by 263 lb/A. The 2-gallon rate had no effect on yield.

Table 3. Influence of a fertilizer supplement (Aggrand) on plant growth and grain yield of drill-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Treatment combination[1]		Days to 50% heading	Plant height	Grain yield at 12% moisture
N-P-K	Aggrand			
-(lb/A)-	-(gal/A)-		-(cm)-	-(lb/A)-
135-45-45	--	86	90	8343
135-45-45	1|1	87	87	8606
135-45-45	2|2	87	88	8422
--	1|1	82	59	4251
--	2|2	83	62	4136
Check	--	83	64	4195
C.V., %		0.76	4.18	2.75
LSD (0.05)		1	5	262

[1] Aggrand applied at mid-tillering (50% canopy closure) and early boot (1-inch panicle).

CULTURAL MANAGEMENT STUDIES

P.K. Bollich, D.E. Groth, G.A. Meche, R.P. Regan,
G.R. Romero, and D.M. Walker

A row spacing and arrangement study was conducted to evaluate the influence of row arrangement on plant growth, disease development, grain yields, and yield components of Cypress and Bengal. The study was drill-seeded at 75 and 100 lb seed/A for each row arrangement and variety. Rice was seeded at a constant 7-inch spacing or in a three-row arrangement alternating with a 7-inch skip. One-half of the treatment combinations was also inoculated with sheath blight.

A variety x N x water management study was conducted at the Rice Research Station to determine the influence of these factors on ratoon production. Cypress, Bengal, Jodon, and Kaybonnet were water seeded at a rate of 150 lb/A and grown in a pinpoint flood system. Variable rates of N ranging from 0 to 90 lb/A were applied after main crop harvest prior to flooding. Water management strategies included floodup immediately after harvest (3 days) and a delayed flood establishment (12 days). Days to 50% heading in the ratoon, tiller production, and grain yield were determined.

Two studies were conducted at the Rice Research Station to evaluate interactions among Bolero, fresh plant residue, and a fungal organism. The 10G and 8EC formulations were evaluated in separate tests. Plant residue was incorporated at a rate of 5 tons/A. Each Bolero formulation was applied at a rate of 4 lb ai/A. Cypress was water seeded at a rate of 150 lb/A and grown in a pinpoint flood system.

A liquid copper sulfate formulation was evaluated for its potential use as an algicide in water-seeded rice.

Experiment: Row spacing and arrangement

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.3; O.M.: 1.15%; extractable nutrients (mg/kg): P-33, Na-74, K-60, Ca-1252, Mg-218, Zn-4.55, S-7.40, As-0.72, Fe-100.8

Variety/Seeding Rate: CPRS, BNGL, 75 and 100 lb/A

Planting Method/Date: Drill-seeded, Mar 28

Fertilization: 45 lb/A P_2O_5 and K_2O, Mar 28; 135 lb N/A PF, Apr 28; 75 lb/A ratoon crop N, Aug 4; 0.75 lb/A Zn (foliar), Apr 28

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 10

Water Management: Flushed, Apr 10 and Apr 15; permanent flood, Apr 28; harvest drainage, July 24; ratoon flooded, Aug 4; harvest drainage, Oct 16

Herbicides: 3.0 lb ai/A Stam (propanil), Apr 21; 0.6 oz ai/A Londax (bensulfuron), May 16

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 18

Fungicides: None

Harvest: Aug 3, Nov 8

Experimental Design: Randomized complete block with four replications, factorial arrangement of variety, row arrangement, seeding rate, and inoculation.

Comments: Specific treatments were inoculated with Rhizoctonia solani on May 31. Main crop grain yield of Cypress was significantly lower than Bengal and was due to sheath blight (Table 1). Ratoon yields were not different, and differences in total yields were due to the main crop effects. An interaction occurred between variety and inoculation for all yields, sheath blight rating, and tiller infection. There was also an interaction between variety and seeding rate for sheath blight rating and tiller infection. Bengal was least affected by disease. Main, ratoon, and total grain yields were all significantly reduced with the 7" x 3 rows + 7" skip. An interaction also occurred between varieties and inoculation. Cypress yields were significantly reduced by sheath blight, and Bengal yields were not affected. Yield component differences were due mainly to varieties, row spacing, and inoculation (Table 2). Seeding rate had no effect except on 1000-grain weight. Even in the presence of disease, yields were significantly lower with the alternative row spacing.

Table 1. Influence of seeding rate, row spacing and arrangement, and sheath blight on agronomic performance of drill-seeded Cypress and Bengal rice. Rice Research Station, Crowley, LA. 1995.

Variety	Row orientation	Seeding rate	Inoculation	Days to 50% heading	Plant height	Grain yield at 12% moisture: Main crop	Grain yield at 12% moisture: Ratoon crop	Grain yield at 12% moisture: Total	Sheath blight[1]: Rating	Sheath blight[1]: Infection
					(cm)	--------(lb/A)--------				(%)
Cypress	7" ||||	100	+	94	85	7632	1945	9577	7.8	96
Cypress	7" x 3 rows + 7" skip ||| |||	100	+	93	85	8241	1185	7426	7.5	92
Cypress	7" ||||	75	+	93	86	7346	1353	8700	7.5	96
Cypress	7" x 3 rows + 7" skip ||| |||	75	+	94	87	6989	1580	8570	6.8	84
Bengal	7" ||||	100	+	94	82	8863	2098	10961	4.3	28
Bengal	7" x 3 rows + 7" skip ||| |||	100	+	95	84	8354	1796	10149	3.5	31
Bengal	7" ||||	75	+	94	83	8838	1933	10770	4.8	45
Bengal	7" x 3 rows + 7" skip ||| |||	75	+	96	84	8347	1801	10147	4.3	44
Cypress	7" ||||	100	-	93	84	8779	2577	11356	4.0	27
Cypress	7" x 3 rows + 7" skip ||| |||	100	-	94	86	8071	2193	10263	3.8	19
Cypress	7" ||||	75	-	94	86	8692	2639	11331	3.3	15
Cypress	7" x 3 rows + 7" skip ||| |||	75	-	95	84	8327	2247	10574	2.3	11
Bengal	7" ||||	100	-	94	83	8942	2009	10952	2.0	11
Bengal	7" x 3 rows + 7" skip ||| |||	100	-	95	85	8283	2119	10403	2.8	8
Bengal	7" ||||	75	-	95	83	8935	2104	11039	3.0	10
Bengal	7" x 3 rows + 7" skip ||| |||	75	-	96	84	8342	1919	10261	2.5	11
C.V., %				0.83	3.02	5.28	13.29	5.44	25.78	33.72
						Main effects				
Seeding rate:										
100				94	84	8146	1990	10136	4.4	39.0
75				94	85	8227	1947	10174	4.3	39.3
LSD (0.05)[2]				ns	ns	ns	ns	ns	ns	ns

Continued.

Table 1. Continued.

Variety	Row orientation	Seeding rate	Inoculation	Days to 50% heading	Plant height	Grain yield at 12% moisture: Main crop	Grain yield at 12% moisture: Ratoon crop	Grain yield at 12% moisture: Total	Sheath blight[1]: Rating	Sheath blight[1]: Infection
					(cm)	--------(lb/A)--------				(%)
Variety:										
Cypress				94	85	7760	1965	9725	5.3	55.0
Bengal				95	83	8613	1972	10585	3.4	23.3
LSD (0.05)				1	1	218	ns	278	0.6	6.6
Row:										
7"				94	84	8503	2082	10586	4.6	40.8
7" x 3 rows + 7" skip				95	85	7869	1855	9724	4.2	37.3
LSD (0.05)				1	ns	218	132	278	ns	ns
Inoculation:										
+				94	84	7826	1711	9538	6.0	64.4
-				94	84	8546	2226	10772	2.9	13.7
LSD (0.05)				ns	ns	218	132	278	0.6	6.6
Variety x Seeding rate				ns	ns	ns	ns	ns	*	*
Variety x Row				ns	ns	ns	ns	ns	ns	ns
Seeding rate x Row				ns	ns	ns	ns	*	ns	ns
Variety x Seeding rate x Row				ns	ns	ns	*	*	ns	ns
Variety x Inoculation				ns	ns	*	*	*	*	*
Seeding rate x Inoculation				ns	ns	ns	ns	ns	ns	ns
Variety x Seeding rate x Inoculation				ns	ns	ns	ns	ns	ns	ns
Row x Inoculation				ns	ns	ns	ns	ns	ns	ns
Variety x Row x Inoculation				ns	ns	ns	ns	ns	ns	ns
Seeding rate x Row x Inoculation				ns	ns	ns	*	ns	ns	ns
Variety x Seeding rate x Row x Inoculation				ns	ns	ns	ns	ns	ns	ns

[1] Rating based on 0-9 scale where 0 = none (immune) and 9 = maximum (very susceptible). Infection based on % tillers infected.
[2] ns = nonsignificant; * denotes significance at P = 0.05.

Table 2. Influence of seeding rate, row spacing and errangement, and sheath blight on yield components of drill-seeded Cypress and Bengal rice. Rice Research Station, Crowley, LA. 1995.

Variety	Row orientation	Seeding rate	Inoculation	Whole plant weight	Straw weight	Grain weight	Grain number	1000-grain weight
				----------(g/7 ft²)----------				-(g)-
Cypress	7" ||||	100	+	1020	551	470	21814	21.53
Cypress	7" x 3 rows + 7" skip ||| |||	100	+	893	509	383	18432	20.76
Cypress	7" ||||	75	+	1007	541	466	21919	21.27
Cypress	7" x 3 rows + 7" skip ||| |||	75	+	974	541	433	20703	20.94
Bengal	7" ||||	100	+	1397	842	554	21967	25.24
Bengal	7" x 3 rows + 7" skip ||| |||	100	+	1089	587	501	20892	24.01
Bengal	7" |||	75	+	1143	595	548	22832	24.04
Bengal	7" x 3 rows + 7" skip || |||	75	+	1107	589	518	21992	23.55
Cypress	7" |||	100	-	1177	594	583	26588	21.93
Cypress	7" x 3 rows + 7" skip || |||	100	-	1112	568	544	25538	21.33
Cypress	7" |||	75	-	1212	600	612	28331	21.60
Cypress	7" x 3 rows + 7" skip ||| |||	75	-	1105	561	544	25828	21.09
Bengal	7" |||	100	-	1213	631	582	23589	24.67
Bengal	7" x 3 rows + 7" skip || |||	100	-	1175	621	554	23065	24.01
Bengal	7" |||	75	-	1271	680	591	24435	24.19
Bengal	7" x 3 rows + 7" skip ||| |||	75	-	1141	604	537	21978	24.44
C.V., %				13.05	22.37	7.47	7.84	2.26
			Main Effects					
Seeding rate								
100				1134	613	521	22736	22.94
75				1120	589	531	23502	22.64
LSD (0.05)[1]				ns	ns	ns	ns	0.26
Variety:								
Cypress				1063	558	504	23644	21.31
Bengal				1192	644	548	22594	24.27
LSD (0.05)				74	68	20	912	0.26

Continued.

Table 2. Continued.

Variety	Row orientation	Seeding rate	Inoculation	Whole plant weight	Straw weight	Grain weight	Grain number	1000-grain weight
				----------(g/7 ft²)----------				-(g)-
Row:								
7"				1180	629	551	23935	23.06
7" x 3 rows + 7" skip				1075	573	502	22304	22.52
LSD (0.05)				74	ns	20	912	0.26
Inoculation:								
+				1079	594	484	21319	22.67
-				1176	808	588	24919	22.91
LSD (0.05)				74	ns	20	912	ns
Variety x Seeding rate				ns	ns	ns	ns	ns
Variety x Row				ns	ns	ns	ns	ns
Seeding rate x Row				ns	ns	ns	ns	*
Variety x Seeding rate x Row				ns	ns	ns	ns	ns
Variety x Inoculation				*	ns	*	*	ns
Seeding rate x Inoculation				ns	ns	ns	ns	ns
Variety x Seeding rate x Inoculation				ns	ns	ns	ns	*
Row x Inoculation				ns	ns	ns	ns	ns
Variety x Row x Inoculation				ns	ns	ns	ns	ns
Seeding rate x Row x Inoculation				ns	ns	ns	ns	ns
Variety x Seeding rate x Row x Inoculation				ns	ns	ns	ns	ns

[1] ns = nonsignificant; * indicates significance at P = 0.05.

Experiment: Ratoon variety x N rate x water management

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.0; O.M.: 1.39%; extractable nutrients (mg/kg): P-50, Na-95, K-62, Ca-1178, Mg-218, Zn-5.16, S-9.79, As-3.52, Fe-152.5

Variety/Seeding Rate: CPRS, BNGL, JDON, KBNT, 150 lb/A

Planting Method/Date: Water-seeded, Mar 30

Fertilization: 45 lb/A P_2O_5 and K_2O PPI + 135 lb N/A; N source, ammonium sulfate; 0.54 lb/A Zn (foliar), Apr 28; ratoon crop, variable N rates

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flooded, Mar 29; drained, Apr 3; reflooded, Apr 10; harvest drainage, July 21; ratoon crop flooded, Aug 3 (early), Aug 14, (10-day delay), and Aug 23 (20-day delay); harvest drainage, Oct 16

Herbicides: 0.9 oz ai/A Londax (bensulfuron), Apr 21

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 15

Fungicides: 0.75 lb ai/A Benlate (benomyl), June 19

Harvest: Main crop, Aug 3; ratoon crop, Nov 13

Experimental Design: Split plot in a randomized complete block with four replications, water management assigned to main plots and a factorial arrangement of varieties and N rates to subplots

Comments: Ratoon production in 1995 was much lower than normally expected. High temperatures that appear to have affected main crop yields in other studies also influenced ratoon regrowth and yield. Differences in ratoon heading were due mainly to variety (Table 1). The interaction between N rate and water management was due to the high N rate, which significantly delayed heading with early flooding. Heading differences at the other N rates were 1 to 2 days in the delayed flood regimes. An interaction between water management and variety occurred for tiller production. Tillering of Bengal and Jodon was poor in all water management treatments, and the differences in tillering were slight. Tillering of Cypress and Kaybonnet was significantly increased with early N application and early flooding. This same interaction also affected grain yields. Early N

application and flooding increased yields of Cypress, Bengal, and Kaybonnet. Jodon yield was highest with a 10-day flood delay. The major portion of ratoon growth in the early flood treatment originated from the main crop stubble. A significant percentage of the ratoon in the delayed flood treatments originated from seed that competed with the stubble and produced very little grain.

Table 1. Influence of water management and N rate on ratoon performance of water-seeded rice varieties. Rice Research Station, Crowley, LA. 1995.

		Ratoon crop Days to 50% heading			Tillers			Grain yield at 12% moisture		
Variety	N rate	Early	10-day delay	20-day delay	Early	10-day delay	20-day delay	Early	10-day delay	20-day delay
					-------(no/ft²)-------			----------(lb/A)---------		
Cypress	0	47	48	46	23	8	12	1580	950	756
Cypress	30	50	45	47	21	15	15	1794	1352	938
Cypress	60	49	50	46	26	13	4	2178	1481	677
Cypress	90	51	48	45	25	10	8	1952	1366	834
Bengal	0	48	48	49	6	2	1	986	261	140
Bengal	30	51	49	49	5	4	2	1037	430	228
Bengal	60	48	50	47	7	2	1	1071	384	164
Bengal	90	50	48	50	5	2	1	1160	360	162
Jodon	0	52	53	48	3	2	2	628	1085	1020
Jodon	30	50	51	45	4	2	1	917	1245	982
Jodon	60	52	54	50	3	1	1	1138	1368	1265
Jodon	90	55	47	49	5	4	2	1028	1418	1265
Kaybonnet	0	46	46	45	23	8	7	2047	1243	1170
Kaybonnet	30	48	46	46	22	15	11	2198	1742	1334
Kaybonnet	60	49	50	44	23	18	15	2156	1738	1325
Kaybonnet	90	50	47	45	24	10	17	2614	1919	1713
Water management (WM)		50	49	47	14	7	6	1530	1146	873
C.V., %			6.23			61.08			25.42	
LSD (0.05):[1]										
WM			ns			4			171	
Nitrogen (N) mean										
0			48			8			989	
30			48			10			1183	
60			49			9			1246	
90			49			9			1316	
LSD (0.05):			ns			ns			121	
Variety (V) mean										
Cypress			48			15			1322	
Bengal			49			3			532	
Jodon			50			3			1113	
Kaybonnet			47			16			1767	
LSD (0.05):			1			2			121	
Main effect interactions										
V x N			ns			ns			ns	
V x WM			ns			*			*	
N x WM			*			ns			ns	
V x N x WM			ns			ns			ns	

[1] ns = nonsignificant; asterisk denotes significance at P = 0.05.

Experiment: Bolero 10G x plant residue x fungus interaction

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 6.2; O.M.: 2.50%; extractable nutrients (mg/kg): P-113, Na-109, K-136, Ca-2204, Mg-632, Zn-11.06, S-7.44, As-6.33, Fe-280.5

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, June 1

Fertilization: 40 lb/A P_2O_5 and K_2O (fall 1994), 135 lb N/A (urea) ppi, May 25

Plot Size: 7.0 x 25 ft (175 ft^2)

Emergence Date: June 3

Water Management: Flooded, May 28; drained, June 3; permanent flood, June 6; harvest drainage, Sept 10

Herbicides: Bolero 10G applied May 29; 0.9 oz ai/A Londax (bensulfuron), June 19

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 3

Fungicides: None

Harvest: Sept 18

Experimental Design: Randomized complete block with four replications

Comments: The test area was prepared on May 25. Fresh plant residue (5 tons/A) and a fungal culture were incorporated with a power mulcher. Visual differences in stand density were first observed at the 4-leaf stage. Physiological symptoms consistent with previous documentation began to appear at the onset of tillering. Stand injury and loss were much greater than in 1994. Maturity delays of 1 to 2 days occurred in treatments containing Bolero 10G (Table 1). Grain yields in all Bolero treatments were significantly decreased. A combination of Bolero and plant residue and Bolero, plant residue, and fungus also decreased grain yield when compared with Bolero alone. In the absence, of Bolero there was no effect of plant residue or fungus on grain yield.

Table 1. Influence of Bolero 10G, plant residue, and fungi on water-seeded Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Treatment combination[1]			Days to 50% heading	Plant height	Grain yield at 12% moisture
Bolero	Plant residue	Fungus			
				-(cm)-	-(lb/A)-
+	-	-	83	79	1029
+	-	+	82	77	963
+	+	-	81	69	452
+	+	+	81	71	380
-	-	-	79	87	3486
-	-	+	80	83	3417
-	+	-	80	82	3467
-	+	+	79	78	3732
C.V., %			1.70	7.59	18.67
LSD (0.05)			2	9	581

[1] Treatments consist of all possible combinations of Bolero (4.0 lb ai/A), plant residue, and fungus.

Experiment: Bolero 8EC x plant residue x fungus interaction

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 6.1; O.M.: 2.35%; extractable nutrients (mg/kg): P-124, Na-114, K-155, Ca-2305, Mg-662, Zn-11.17, S-9.22, As-7.99, Fe-285.2

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, June 1

Fertilization: 40 lb/A P_2O_5 and K_2O (fall 1994), 135 lb N/A (urea) ppi, May 25

Plot Size: 7.0 x 25 ft (175 ft^2)

Emergence Date: June 3

Water Management: Flooded, May 28; drained, June 3; permanent flood, June 6; harvest drainage, Sept 10

Herbicides: Bolero 8EC applied May 25; 0.9 oz ai/A Londax (bensulfuron), June 19

Insecticides: 0.5 lb ai/A Furadan (carbofuran), July 3

Fungicides: None

Harvest: Sept 18

Expermental Design: Randomized complete block with four replications

Comments: The test area was prepared on May 25. Fresh plant residue (5 tons/A) and a fungal culture were incorporated with a power mulcher. Visual differences in stand density were first observed at the 4-leaf stage. Physiological symptoms consistent with previous documentation began to appear at the onset of tillering. Stand injury and loss was much greater than in 1994. Maturity delays of 5 to 12 days occurred in treatments containing Bolero 8EC (Table 2). Incorporation of plant residue also delayed maturity when in combination with Bolero. Grain yields in all Bolero treatments were significantly decreased. A combination of Bolero and plant residue also decreased grain yield when compared with Bolero alone. In the absence of Bolero, there was no effect of plant residue or fungus on grain yield or maturity.

Table 2. Influence of Bolero 8EC, plant residue, and fungi on water-seeded Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Treatment combination[1]			Days to 50% heading	Plant height	Grain yield at 12% moisture
Bolero	Plant residue	Fungus			
				-(cm)-	-(lb/A)-
+	-	-	83	78	1408
+	-	+	83	77	1310
+	+	-	92	84	684
+	+	+	90	79	841
-	-	-	80	87	3243
-	-	+	78	89	3408
-	+	-	79	86	3064
-	+	+	79	84	2858
C.V., %			3.26	3.83	21.92
LSD (0.05)			4	5	678

[1] Treatments consist of all possible combinations of Bolero (4.0 lb ai/A), plant residue, and fungus.

Experiment: Algicide evaluation

Location: Rice Research Station

Soil Type/Analysis: Crowley silt loam; pH: 6.8; O.M.: 0.96%; extractable nutrients (mg/kg): P-60, Na-104, K-85, Ca-1617, Mg-372, Zn-8.59, S-7.61, As-4.34, Fe-90.9

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, May 4

Fertilization: 138-72-72 (N-P-K), May 10; 32 lb N/A, June 9

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: May 7

Water Management: Flooded, May 3; drained, May 6; flooded, May 11; drained, May 15; flooded, May 16; harvest drainage, Aug 11

Herbicides: 0.9 oz ai/A Londax (bensulfuron), June 7

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: None

Harvest: Aug 22

Experimental Design: Randomized complete block with three replications

Comments: A surface application of fertilizer was applied during the initial drain to encourage algal growth. The algicide was applied after permanent flood establishment. Heavy rains 2 days after application resulted in loss of material, and the test had to be drained and retreated. Algal development was minimal after the second treatment, and there was no noticeable difference between the treated and untreated plots. The algicide had no effect on days to 50% heading, plant height, or grain yield (Table 1).

Table 1. Influence of an algicide (Earthtec) on plant growth and grain yield of water-seeded Cypress rice. Rice Research Station, Crowley, LA. 1995.

Rate	Days to 50% heading	Plant height	Grain yield at 12% moisture
-(pt/A)-		-(cm)-	-(lb/A)-
1	80	95	5141
2	80	94	5264
Check	81	93	5096
C.V., %	1.44	2.03	3.06
LSD (0.05)	ns	ns	ns

CONSERVATION TILLAGE STUDIES

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Studies relating to conservation tillage conducted in 1995 included a (1) water-seeded burndown by cover crop evaluation, (2) no-till stand establishment study, (3) variety by N by tillage study, and (4) land preparation by weed management study.

In the no-till preplant burndown by cover crop study, Roundup D-Pak (glyphosate), Gramoxone Extra (paraquat), and Liberty (glufosinate) were evaluated. Various grass and legume cover crops were established in the fall 1994. Vegetation was terminated prior to planting into a water-seeded system. The effects of cover crop and vegetation termination on rice growth and yield were determined.

The varieties Lacassine, Cypress, Bengal, and Jodon were evaluated in a variety by N by tillage study. Roundup plus 1/2% surfactant were applied 21 days prior to drill seeding. Nitrogen was applied as single applications at rates including 90, 120, 150, and 180 lb/A PF. The 150 lb N/A rate was also applied as a two-way split (100 PF + 50 PI). Days to 50% heading, plant height, lodging, and grain yield were determined.

Preplant vegetation management, water management, and varieties were evaluated in the no-till stand establishment study. Three methods of preplant vegetation management included no herbicide termination of preplant vegetation, herbicide termination of preplant vegetation (Roundup plus 2,4-D), and herbicide termination of preplant vegetation followed by grooving. Three water management practices included a pinpoint flood (flood established 4 days after initial drain), delayed pinpoint flood (flood established 10 days after initial drain), and a delayed flood (flood established 20 days after initial drain). The delayed pinpoint flood and delayed flood treatments were flushed as needed prior to permanent flood establishment. Six varieties were evaluated and included Cypress, Bengal, Jodon, Lacassine, Kaybonnet, and Jackson. Stand density was determined 21 days after planting. Days to 50% heading, plant height, and grain yield were determined.

Conventional tillage, a stale seedbed with native vegetation, and a wheat cover crop were compared in the land preparation by weed management study. This study was conducted in both water-seeded, pinpoint flood and drill-seeded cultural systems. Seedbeds for the stale seedbed and wheat cover crop treatments were established in November 1993. Four levels of weed management were evaluated in each cultural system. In the water-seeded system, weed control consisted of (1) burndown alone (Roundup plus 2,4-D), (2) burndown followed by Stam (4.0 lb ai/A) early post, (3) burndown followed by Stam (3.0 lb ai/A) early post and Ordram (3.0 lb ai/A) late post, and (4) burndown followed by Bolero (3.0 lb ai/A) preplant and Stam + Basagran (3.0 lb ai/A + 0.5 lb ai/A) late post. In the drill-seeded system, weed control consisted of (1) burndown alone (Roundup plus 2,4-D), (2) burndown followed by Stam (4.0 lb ai/A) early post, (3) burndown followed by Arrosolo (2.0 lb ai/A + 2.0 lb ai/A) early post and Stam (3.0 lb ai/A) late post, and (4) burndown followed by Bolero plus Facet (3.0 lb ai/A +

.375 lb ai/A) delayed preemergence and Stam (3.0 lb ai/A) late post. Weed control was evaluated 24 and 28 days after planting in the water- and drill-seeded cultural systems, respectively. Weed number and control were determined in each system prior to harvest. Days to 50% heading, plant height, and grain yield were also determined.

Experiment: Water-seeded no-till burndown and cover crop

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 6.1; O.M.: 1.89%; extractable nutrients (mg/kg): P-133, Na-88, K-85, Ca-1785, Mg-349, Zn-8.50, S-7.53, As-0.81, Fe-251.4

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, Apr 21

Fertilization: 40 lb/A P_2O_5 and K_2O (fall 1994); 90 lb N/A, May 16; 70 lb N/A June 7; N source urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flooded, Apr 20; drained, Apr 25; flushed, Apr 28; flooded, May 5; drained, May 14; flooded, May 16; harvest drainage, Aug 6

Herbicides: Various burndown treatments; 4.0 lb ai/A Ordram (molinate), May 31; 0.9 oz ai/A Londax (bensulfuron), June 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 31

Fungicides: None

Harvest: Aug 18

Experimental Design: Randomized complete block with four replications, factorial arrangement of herbicides and cover crops

Comments: An interaction occurred between herbicide burndown treatments and cover crops for days to 50% heading, plant height, and grain yield (Table 1). Most of this influence was due to the no herbicide burndown in combination with the berseem clover and ryegrass cover crops. Stand densities were reduced in these treatment combinations (visual assessment), which significantly delayed maturity and yield.

Table 1. Effect of preplant vegetation termination and cover crops on agronomic performance of water-seeded, no-till Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Cover crop	Preplant vegetation[1] termination	Days to 50% heading	Plant height	Grain yield at 12% moisture
			-(cm)-	-(lb/A)-
Berseem clover	Roundup	93	92	5092
Berseem clover	Gramoxone Extra	88	90	6373
Berseem clover	Liberty	89	91	5858
Berseem clover	None	98	90	2515
Ladino clover	Roundup	86	94	7964
Ladino clover	Gramoxone Extra	86	92	8029
Ladino clover	Liberty	86	94	7966
Ladino clover	None	97	91	4761
Red clover	Roundup	89	92	6875
Red clover	Gramoxone Extra	89	93	7637
Red clover	Liberty	87	93	7403
Red clover	None	99	92	3499
Rose clover	Roundup	85	93	7646
Rose clover	Gramoxone Extra	87	95	8150
Rose clover	Liberty	87	93	7871
Rose clover	None	96	92	4941
Yellow sweetclover	Roundup	87	94	7214
Yellow sweetclover	Gramoxone Extra	84	93	8036
Yellow sweetclover	Liberty	84	92	7129
Yellow sweetclover	None	90	90	6099
Cereal rye	Roundup	84	91	7594
Cereal rye	Gramoxone Extra	84	94	6934
Cereal rye	Liberty	83	91	7285
Cereal rye	None	86	87	6697
Ryegrass	Roundup	102	90	2386
Ryegrass	Gramoxone Extra	101	88	2997
Ryegrass	Liberty	101	89	3541
Ryegrass	None	104	77	888
Wheat	Roundup	83	92	7392
Wheat	Gramoxone Extra	83	89	7148
Wheat	Liberty	84	91	7451
Wheat	None	86	91	7617
Native	Roundup	86	94	7827
Native	Gramoxone Extra	87	95	7957
Native	Liberty	85	95	7752
Native	None	93	92	6397
C.V., %		2.82	2.52	14.71
Preplant vegetation termination (PVT) Mean				
Roundup		88	92	6666
Gramoxone Extra		87	92	7029
Liberty		87	92	6918
None		94	89	4824
LSD (0.05):		1	1	437
Cover Crop (CC) Mean				
Berseem clover		92	90	4960
Ladino clover		89	93	7180
Red clover		91	92	6354
Rose clover		89	93	7152
Yellow sweetclover		86	92	7120
Cereal rye		84	90	7128
Ryegrass		102	86	2453
Wheat		84	91	7402
Native		87	94	7483
LSD (0.05):		2	2	656
PVT x CC		*	*	*

[1] Application rates in ai/A: Roundup at 1.0 lb; Gramoxone Extra at 0.62 lb; Liberty at 0.75 lb.

Experiment: Water-seeded no-till stand establishment

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 5.7; O.M.: 2.13%; extractable nutrients (mg/kg): P-78, Na-103, K-110, Ca-1785, Mg-485, Zn-11.23, S-9.00, As-3.65, Fe-195.6

Variety/Seeding Rate: CPRS, BNGL, JDON, LCSN, KBNT, JKSN, 150 lb/A

Planting Method/Date: Water-seeded, Apr 20

Fertilization: 40 lb/A P_2O_5 and K_2O (fall 1994); 90 lb N/A, May 16; 70 lb N/A June 7; N source urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flooded, Apr 19; drained, Apr 25; flooded pinpoint flood and flushed delayed pinpoint and delayed flood, Apr 29; flooded delayed pinpoint and flushed delayed flood, May 5; drained pinpoint and delayed pinpoint, May 14; flooded all treatments, May 16; harvest drainage, Aug 6

Herbicides: 0.66 lb ai/A Gramoxone Extra (paraquat), Apr 15; 4.0 lb ai/A Ordram (molinate), May 31; 0.9 oz ai/A Londax (bensulfuron), June 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 31

Fungicides: None

Harvest: Aug 18

Experimental Design: Split-split plot in a randomized complete block with four replications, water management and preplant vegetation management assigned to main plots and varieties to subplots

Comments: Stand density was reduced as the postplant drainage period decreased (Table 1). Stands were significantly higher with a 20-day drainage. A significant water management x variety interaction occurred for days to 50% heading. Maturity of Cypress, Jackson, and Lacassine was delayed as the drainage period decreased. Jodon, Kaybonnet, and Bengal were less affected. Overall yields of Cypress, Jodon, and Kaybonnet were superior to those of Lacassine and Jackson. Yield of Bengal was higher than Jackson and similar to Lacassine.

Table 1. Effect preplant vegetation management, water management, and varieties on stand establishment in water-seeded rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Variety	Preplant vegetation menagement	Water management[1]															
		Stand density				Days to 50% heading				Plant height				Grain yield at 12% moisture			
		PP	DP	DF	Mean	PP	DP	DF	Mean	PP	DP	DF	Mean	PP	DP	DF	Mean
		----(plants/ft²)---								--------(cm)-------				----------(lb/A)----------			
Cypress	No burndown	13	13	17	14	90	87	87	88	93	91	93	92	7556	7958	8345	7953
Cypress	Burndown	18	17	20	18	89	87	87	87	92	90	93	92	7489	7857	8128	7825
Cypress	Burndown + Grooving	13	11	18	14	89	89	86	88	95	90	90	92	7077	7686	8322	7695
Bengal	No burndown	10	11	14	12	86	85	84	85	84	84	84	84	6529	7105	7917	7184
Bengal	Burndown	14	9	15	13	84	85	84	85	86	84	84	85	7326	6550	7625	7167
Bengal	Burndown + Grooving	12	11	15	13	84	84	84	84	87	82	85	85	7484	7132	8064	7560
Jodon	No burndown	9	10	14	11	85	84	82	84	86	90	90	89	6949	6978	8390	7439
Jodon	Burndown	8	10	14	11	85	84	82	84	89	91	90	90	7769	7019	8593	7794
Jodon	Burndown + Grooving	11	9	9	10	84	84	82	83	91	90	90	90	7632	7413	8076	7707
Lacassine	No burndown	15	17	19	17	87	86	84	86	88	86	86	86	7058	6781	7333	7057
Lacassine	Burndown	12	15	18	15	88	86	84	86	87	83	88	86	7185	6647	7492	7108
Lacassine	Burndown + Grooving	12	15	17	15	89	85	84	86	85	86	89	87	8845	6806	7712	7121
Kaybonnet	No burndown	12	11	17	13	88	88	84	87	105	103	100	102	7332	7048	7801	7394
Kaybonnet	Burndown	16	13	20	17	87	88	85	87	106	102	104	104	7560	7230	7913	7568
Kaybonnet	Burndown + Grooving	10	9	17	12	87	88	85	87	104	99	105	103	7009	7528	8483	7673
Jackson	No burndown	8	9	16	11	88	86	83	85	100	92	96	96	8020	6684	7520	6741
Jackson	Burndown	7	8	13	9	87	85	83	85	95	95	100	97	6931	6911	7733	7192
Jackson	Burndown + Grooving	6	13	12	10	87	85	83	85	98	95	95	96	6755	6839	7634	7076
Water management (WM) mean		11	12	16		87	86	84		93	91	92		7139	7121	7949	
C.V., %			25.78				1.57				3.31				6.11		
LSD (0.05):[2]																	
Water menegement			1				1				ns				ns		
Preplant vegetation msnagement (PVM) mean																	
No burndown			13				86				92				7295		
Burndown			14				86				92				7442		
Burndown + grooving			12				86				92				7472		
LSD (0.05):			ns				ns				ns				ns		

Continued.

Table 1. Continued.

Variety	Preplant vegetation management	Water management[1]											
		Stand density				Days to 50% heading				Plant height				Grain yield at 12% moisture			
		PP	DP	DF	Mean	PP	DP	DF	Mean	PP	DP	DF	Mean	PP	DP	DF	Mean
		----(plants/ft²)---								--------(cm)-------				----------(lb/A)----------			
Variety (V) mean																	
Cypress				16				88				92				7824	
Bengal				12				84				85				7303	
Jodon				10				83				90				7647	
Lacassine				16				86				86				7095	
Kaybonnet				14				87				103				7545	
Jackson				10				85				96				7003	
LSD (0.05):				2				1				2				245	
Main effect intersctions																	
WM x PVM				ns				ns				ns				ns	
WM x V				ns				*				ns				ns	
PVM x V				ns				ns				ns				ns	
WM x PVM x V				ns				ns				ns				ns	

[1] PP = pinpoint flood; DP = delayed pinpoint flood (10 day); DF = delayed flood (20 day).
[2] * denotes significance at P = 0.05; ns = nonsignificant.

Experiment: Tillage x variety x N trial

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 5.7; O.M.: 1.84%; extractable nutrients (mg/kg): P-88, Na-99, K-108, Ca-1604, Mg-409, Zn-9.96, S-11.05, As-2.92, Fe-202.5

Variety/Seeding Rate: LCSN, CPRS, BNGL, JDON, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 19

Fertilization: 40 lb/A P_2O_5 and K_2O, (fall 1994); N source urea

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Data not taken

Water Management: Flushed, Apr 28, May 5; permanent flood, May 16; harvest drainage, Aug 6

Herbicides: 0.63 lb ai/A Gramoxone Extra (paraquat), Apr 10; 6.0 lb ai/A Arrosolo (propanil + molinate), May 10; 3.0 lb ai/A Ordram (molinate), May 31; 0.9 oz ai/A Londax (bensulfuron), June 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 31

Fungicides: None

Harvest: Aug 17

Experimental Design: Randomized complete block with four replications, tillage assigned to main plots and variety x N treatments assigned to subplots

Comments: Tillage had no influence on days to 50% heading, plant height, or grain yield (Table 1). Increasing N increased maturity and plant height slightly. Grain yield was not affected. A significant interaction occurred between variety and N for grain yield. Yields of Lacassine and Cypress decreased as N increased and appeared to be due to increased sheath blight. Bengal required 120 lb N/A for optimum yield while Jodon required 150 lb/A.

Table 1. Influence of tillage and N rate on performance and grain yield of drill-seeded rice varieties. Rice Research Station, Crowley, LA. 1995.

Variety	N[1] rate	Days to 50% heading		Plant height		% Lodging/type[2]		Grain yield at 12% moisture	
		Conv	No-till	Conv	No-till	Conv	No-till	Conv	No-till
				--------(cm)--------				------(lb/A)------	
Lacassine	90	81	81	82	81	0/0	0/0	6998	7125
Lacassine	120	81	82	83	82	0/0	0/0	6924	6781
Lacassine	150	81	82	84	85	0/0	0/0	6887	6625
Lacassine	180	82	83	84	86	0/0	0/0	6597	6854
Lacassine	100|50	83	83	86	87	0/0	0/0	6423	6753
Cypress	90	81	82	84	81	0/0	0/0	7803	7440
Cypress	120	82	83	89	87	0/0	0/0	7640	7683
Cypress	150	83	83	90	88	0/0	0/0	7662	7512
Cypress	180	84	84	89	90	0/0	0/0	7235	7573
Cypress	100|50	84	85	88	92	0/0	0/0	7372	7181
Bengal	90	80	80	81	81	0/0	0/0	7793	7711
Bengal	120	81	80	82	81	0/0	0/0	8071	8143
Bengal	150	81	81	86	83	0/0	0/0	7859	7962
Bengal	180	81	81	86	85	0/0	0/0	7984	8295
Bengal	100|50	81	82	87	87	0/0	0/0	7807	7694
Jodon	90	79	78	87	87	0/0	0/0	8384	7922
Jodon	120	80	78	89	89	0/0	0/0	7833	8225
Jodon	150	80	80	92	92	0/0	0/0	8473	8575
Jodon	180	80	79	94	92	0/0	0/0	8755	8578
Jodon	100|50	79	82	91	95	0/0	0/0	8154	8531
Tillage (T) mean		81	81	87	86			7614	7674
C.V., %			1.41		2.75				5.48
LSD (0.05):[3]									
Tillage			ns		ns				ns
Nitrogen (N) mean									
90			80		83				7633
120			81		85				7663
150			81		87				7703
180			82		88				7734
100|50			82		89				7489
LSD (0.05):			1		2				ns
Variety (V) mean									
Lacassine			82		84				6803
Cypress			83		88				7510
Bengal			81		84				7932
Jodon			79		91				8332
LSD (0.05):			1		1				245
Main effect interactions									
V x N			ns		ns				*
V x T			ns		ns				ns
N x T			ns		ns				ns
V x N x T			ns		ns				ns

[1] Two-way application of 150 lb N/A applied as 100 lb preflood and 50 lb at panicle initiation.
[2] Lodging rate in percent/lodging type on a scale of 1 to 5, where 1 = leaning and 5 = complete.
[3] * denotes significance at P = 0.05; ns = nonsignificant.

Experiment: Water-seeded land preparation x weed management

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 5.9; O.M.: 2.11%; extractable nutrients (mg/kg): P-110, Na-109, K-133, Ca- 2117, Mg-551, Zn-11.55, S-8.70, As-7.51, Fe-235.2

Variety/Seeding Rate: CPRS, 150 lb/A

Planting Method/Date: Water-seeded, Apr 20

Fertilization: 40 lb/A P_2O_5 and K_2O, (fall 1994); 90 lb N/A (urea) PF, May 16; 67 lb N/A, June 7

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 25

Water Management: Flooded, Apr 19; drained, May 3; flooded, May 5; harvest drainage, Aug 6

Herbicides: Treatments applied according to growth stage

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 31

Fungicides: None

Harvest: Aug 19

Experimental Design: Split plot in a randomized complete block with four replications, land preparation assigned to main plots and herbicide treatments to subplots

Comments: Interactions occurred between tillage and herbicide for days to 50% heading, plant height, and grain yield (Table 1). The interaction was due primarily to significant injury that occurred when preplant Bolero was used in a conventional tillage seedbed. Maturity was delayed, plant height was reduced, and grain yield was significantly decreased. Weed pressure was moderate and had little influence on yield.

Table 1. Land preparation x weed management interaction effects on water-seeded Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

			Land preparation[1]																	
			Days to 50% heading				Plant height				Grain yield at 12% moisture				Ducksalad[4]				Barnyardgrass[4]			
Herbicide[2]	Time of[3] application	Rate	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean
		(lb ai/A)					--------(cm)-------				--------(lb/A)--------				----------(% control)----------							
Burndown	-	-	79	82	83	81	85	88	85	88	7543	8213	7721	7826	58	48	45	50	48	30	91	56
Burndown/Stam	EP	4.0	80	84	83	82	88	89	85	87	8192	8275	7789	8079	82	89	40	57	95	100	93	98
Burndown/Stam/Ordram	EP/LP	3.0/3.0	80	83	84	82	88	87	87	87	7820	8369	8015	8068	72	62	51	62	100	91	67	86
Burndown/Stam+Basagran/Stam	DP/LP	3.0/3.0	88	84	84	85	81	88	90	88	6231	8029	7764	7341	15	74	51	47	43	96	48	62
Tillage																						
Mean			81	83	84		85	88	87		7447	8222	7817		52	63	47		72	79	75	
C.V.%				1.88				1.98				5.70										
LSD (0.05):																						
Tillage				2				2				ns										
Herbicide				1				ns				374										
Tillage x herbicide				*				*				*										

[1] Conv = conventional tillage; NTW = no-till into wheat; SB = stale seedbed with native cover.
[2] Preplant vegetation in all treatments terminated with Gramoxone Extra (0.62 lb ai/A).
[3] EP = early post; LP = late post; DP = delayed preemergence.
[4] Ducksalad control was determined 7 weeks postplant. Redstem control was determined at harvest.

Experiment: Drill-seeded land preparation x weed management

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 5.8; O.M.: 2.10%; extractable nutrients (mg/kg): P-92, Na-97, K-115, Ca-1696, Mg-435, Zn-9.24, S-8.70, As-7.35, Fe-262.1

Variety/Seeding Rate: CPRS, 100 lb/A

Planting Method/Date: Drill-seeded, Apr 17

Fertilization: 40 lb/A P_2O_5 and K_2O, (fall 1994); 90 lb N/A (urea) PF, May 16; 67 lb N/A, June 7

Plot Size: 7 x 25 ft (175 ft^2)

Emergence Date: Apr 26

Water Management: Flushed, Apr 28, May 5; flooded, May 16; harvest drainage, Aug 6

Herbicides: Treatments applied according to growth stage

Insecticides: 0.5 lb ai/A Furadan (carbofuran), May 31

Fungicides: None

Harvest: Aug 19

Experimental Design: Split plot in a randomized complete block with four replications, land preparation assigned to main plots and herbicide treatments to subplots

Comments: Neither tillage nor herbicide combinations influenced days to 50% heading, plant height, or grain yield (Table 2). Weed pressure was minimal and had no influence on yield.

Table 2. Land preparation x weed management interaction effects on drill-seeded Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Herbicide[2]	Time of[3] application	Rate	Land preparation[1]: Days to 50% heading				Plant height				Grain yield at 12% moisture				Ducksalad[4]				Barnyardgrass[4]			
			Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean	Conv	NTW	SB	Mean
		(lb ai/A)					--------(cm)-------				--------(lb/A)--------				----------(% control)----------							
Burndown	-	-	89	87	87	88	94	92	92	93	7636	8077	8214	7976	92	96	96	95	100	85	100	95
Burndown/Stam	EP	4.0	90	87	88	88	95	95	91	94	7016	7587	8115	7573	95	99	90	95	100	100	100	100
Burndown/Arrosolo/Stam	EP/LP	3.0/3.0	90	88	88	88	94	93	93	93	7780	7777	8189	7915	94	99	96	96	100	100	100	100
Burndown/Bolero+Facet/Stam	DP/LP	3.0/3.0	89	87	88	88	96	92	93	93	7958	7664	7746	7789	87	99	97	95	100	100	100	100
Tillage Mean			89	87	88		95	93	92		7597	7776	8066		92	98	95		100	96	100	
C.V.%				1.17				1.71				6.88										
LSD (0.05):																						
Tillage				ns				ns				ns										
Herbicide				ns				ns				ns										
Tillage x herbicide				ns				ns				ns										

[1] Conv = conventional tillage; NTW = no-till into wheat; SB = stale seedbed with native cover.
[2] Preplant vegetation in all treatments terminated with Gramoxone Extra (0.62 lb ai/A).
[3] EP = early post; LP = late post; DP = delayed preemergence.
[4] Ducksalad and barnyardgrass control were determined 7 weeks postplant.

RICE WATER QUALITY STUDY

P.K. Bollich, G.A. Meche, G.R. Romero, R.P. Regan, and D.M. Walker

A water-seeded tillage study was conducted to determine the impact of various tillage methods on the quality of rice field floodwater released during the growing season. These tillage practices were also evaluated for suppression of red rice. The tillage methods closely parallel those previously established in the ASCS cost-sharing program implemented in the Mermentau River Basin. Clear water planting (dry seedbed preparation), no-till (planting into residue with no soil disturbance), and water retention for a specified period of time after mudding in (seedbed prepared under flooded conditions with no release of water for 2 weeks) were compared with the traditional mudding in (seedbed prepared under flooded conditions with water release soon after planting).

Agronomic data were collected on large, replicated plots. Stand density, days to 50% heading, plant height, grain yield, and rice grade were determined.

Experiment: Water-seeded tillage comparisons

Location: Rice Research Station, South Unit

Soil Type/Analysis: Crowley silt loam; pH: 5.6; O.M.: 2.81%; extractable nutrients (mg/kg): P-141, Na-71, K-178, Ca-1367, Mg-421, Zn-16.40, S-8.22, As-2.35, Fe-289.2

Variety/Seeding Rate: CPRS, 135 lb/A

Planting Method/Date: Water-seeded, May 1

Fertilization: 0-45-45 (N-P-K) fall 1994; 70 lb N/A 15 DAP; 70 lb N/A at midseason, June 7

Plot Size: 43 x 286 ft (12,298 ft^2)

Emergence Date: Data not taken

Water Management: Flooded mudding in with retention, Apr 21; flooded mudding in, clear water and no-till, Apr 26; drained, May 4; flooded, May 7; drained, May 29; flooded, June 3; harvest drainage, Aug 18

Herbicides: 3.0 lb ai/A Ordram (molinate), Apr 28; 0.38 lb ai/A Grandstand (triclopyr) + 0.75 lb ai/A Basagran (bentazon), June 1

Insecticides: 0.5 lb ai/A Furadan (carbofuran), June 7

Fungicides: None

Harvest: Aug 30

Experimental Design: Randomized complete block with three replications

Comments: Maturity was delayed and grain yield significantly reduced in the no-till planting (Table 1). Red rice was most severe in the clear water planting and no-till treatments (indicated by rice grade).

Table 1. Influence of tillage on agronomic performance of water-seeded Cypress rice. Rice Research Station, South Unit, Crowley, LA. 1995.

Tillage	Days to 50% heading	Plant height	Grain yield at 12% moisture	Rice grade
		(cm)	----(lb/A)----	
Conventional	82	94	4215	3
Mudding in	82	97	4339	2
Mudding in|retention	81	93	4415	2
No-till	84	94	3676	4
C.V., %	0.93	5.09	6.36	
LSD (0.05)	1	ns	529	

FOUNDATION SEED RICE PROGRAM

Lawrence M. White, III

INTRODUCTION

Foundation seed rice has been produced by the Rice Research Station for distribution to Louisiana farmers since 1949. The Station's seed rice program was instituted in response to the critical shortage of pure planting stocks which existed during and after World War II. Since its inception, the program has made available to Louisiana growers over 119,000 cwt. of pedigreed stock of 28 rice varieties.

Concurrent with the distribution of pure seed by the Rice Research Station, there developed in Louisiana an industry comprised 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 of 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 insure 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 Louisiana Agricultural Experiment Station breeding program and of established commercial varieties originating either at Crowley or at research centers in neighboring states.

In order to fulfill the objectives of the seed program, the Rice Research Station utilizes 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 Louisiana Agricultural Experiment Station 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 to an individual parish 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. 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 Agronomic Programs Division of the Louisiana Department of Agriculture. 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. In order to eliminate noxious weeds, especially red rice, which 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.

Following seedbed preparation, foundation fields are planted by means of a 16-runner grain drill. A basal application of fertilizer (14-40-40 lb/A of NPK) is made at the time of seeding. The breeder stock is planted at the rate of approximately 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.

Seedling grasses and weeds are controlled by means of commercially available herbicides applied by airplane. 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 or not 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 continuous flow drier to a moisture level of approximately 12%. During the storage period between drying and cleaning, the rice is treated with an insecticide in order 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 two sets of length grading machines, which consist of rotating, indented metal cylinders. The first set of cylinders removes stemmy rice, grains which have very long awns of which are attached to portions of the panicle. The second set removes small grains and broken or dehulled kernels of rice.

In the final phase of cleaning, the rice moves through a machine that performs diameter grading of the grain by means of rapidly oscillating perforated screens. This machine is designed to separate medium-grain and/or red rice from long-grain rice. It is also capable of removing shrivelled and other slender kernels from medium-grain rice.

From the cleaning machines, foundation and breeder seed rice are bagged, assigned a lot number, and placed in storage in the Station's seed rice warehouse where it remains until the time that it is 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 in order to prevent these impurities from contaminating the seed stocks. To that end, it is routine procedure at the Rice Research Station to partially disassemble all planting and harvesting equipment and to clean it thoroughly with water an/or compressed air before using it in the field. The drier 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 insure that foundation seed is genetically pure and free of mechanical mixtures and noxious weed seeds.

1995 ACTIVITIES

Of the 3049 cwt. of foundation seed rice sold in 1995, the varieties and quantities were as follows: Cypress, 1333 cwt.; Jodon, 909 cwt.; Bengal, 439 cwt.; Kaybonnet, 328 cwt.; and Dellrose, 40 cwt.

The Rice Research Station's foundation seed crop in 1995 consisted of 28.82 acres of Cypress, 26.46 acres of Kaybonnet, 13.56 acres of Jodon, and 7.00 acres of LA 2008, an experimental medium-grain variety, later named Lafitte.

Breeder seed was grown in 1995 as follows: Cypress, 1.00 acre; Kaybonnet, .90 acre; Jodon, 1.00 acre; Dellrose, 1.50 acres; Toro-2, .25 acre; Della, .25 acre; and Saturn, .25 acre.

Headrows of Cypress, Jodon, Bengal, Dellrose, Lacassine, and Lafitte were grown for replenishment of breeder seed stocks.

RICE PHYSIOLOGY

INTRODUCTION

Plant growth regulators (PGRs) have a significant effect on crop production because of their ability to alter plant growth and development. Therefore, studies of PGR modifications to plant growth and development that improve rice production were conducted.

In greenhouse and small plot trials, emergence has been improved with PGRs that cause mesocotyl, coleoptile and leaf elongation. The mesocotyl and coleoptile are short in semidwarf cultivars, and seeding more than 1 inch below the soil surface can result in poor stands. In addition, seedling height of semidwarf rice increases slowly, resulting in poor seedling vigor. Small plot studies were conducted to evaluate the effects of PGRs on seedling vigor of new varieties and experimental lines under different management practices, including early planting, early flooding, drill and water seeding, conservation tillage and herbicide use.

At present, PGRs have been identified that can modify internode elongation and modification of internode elongation can be beneficial. The reduction of internode elongation of select internodes can prevent exsertion of panicles. Studies of this particular response to properly timed applications of PGRs reduce seed production in red rice. In that respect, PGRs offer the first control measure for established red rice in commercial rice production. Another effect of reducing seed production is a stimulation in vegetative growth. In crawfish production, amount and persistence of vegetative growth and minimal reproductive growth can be beneficial. To address the red rice problem in rice and to improve vegetative biomass of rice for crawfish, studies with PGRs that inhibit panicle exsertion and reduce seed production were conducted.

Some PGRs are reported to increase grain yield directly. Several of those materials were evaluated.

To address the objectives of emergence and seedling vigor improvement of semidwarf cultivars, red rice seed elimination, rice biomass improvement for crawfish and rice yield enhancement, PGRs were tested for their effects on rice growth and development.

SEEDLING VIGOR STUDIES - SEED TREATMENT

R.T. Dunand, P.K. Bollich, R.R. Dilly, Jr., G.A. Meche,
R.R. Regan, and G.R. Romero

Experiment: Gibberellic Acid and Minimum Till in Surface-Seeded Drilled Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: See Treatments

Seeding Rate: 100 lb/A

Planting Depth: 0 inches (Sown on soil surface)

Planting Date: 17 Apr 95

Row Spacing: 7-inch

Fertilizer: 0-20-20 at 225 lb/A by airplane, fall incorporated, 12 Nov 94; urea (46% N) at 200 lb/A by airplane, 16 May; urea (46% N) at 150 lb/A by airplane, 7 June

Water Management: Flushed, 28 Apr and 5 May

Plot Size: 175 ft^2 - 7 (12 rows) x 25 ft

Treated Area: 175 ft^2 - 7 (12 rows) x 25 ft

Treatment(s): **Varieties**

Bengal, Cypress, Lemont, Mars

Plant Growth Regulator

Release (0.35 oz/cwt)

Timing

Seed treatment, 13 Apr

Sprayer: Not applicable

Pertinent Rainfall: 0.2 inches, 20 Apr; 3.5 inches, 23 Apr; 1.5 inches, 8 May

Herbicide(s): Gramoxone (1 qt/A) by ATV sprayer, 19 Apr
Arrosolo (4 qt/A) by ATV sprayer, 15 May

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May

Fungicide(s): Dithane (4 oz/cwt), 3 Apr

Emergence: 25 Apr

Permanent Flood: 17 May

Harvest Date: 18 Aug

Harvested Area: 175 ft^2 - 7 x 25 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (4 varieties x 2 plant growth regulator rates).

Comments:

Seedling Vigor

Stand was unaffected by Release seed treatment (Table 1). At 14 days after planting (DAP), approximately 50% emergence, stands averaged 9 plants/ft^2, regardless of seed treatment. At 21 DAP, final stand was 15 plants/ft^2 in the control and 13 plants/ft^2 for Release treated seed. With surface seeding and adequate moisture from rainfall and flushing, Release effects are minimized. There were no differences in varietal response to Release seed treatment (Table 2).

Lemont had significantly lower stands compared with the other three varieties, and Cypress, Bengal and Mars had similar stands (Table 1). At 14 DAP, stands were 4, 11, 10 and 11 plants/ft^2 for Lemont, Cypress, Bengal and Mars, respectively. At 21 DAP, stands were 8, 17, 14 and 17 plants/ft^2. There were no differences in varietal response to Release seed treatment (Table 2).

Mature Plant Development and Crop Production

Seed treatment with Release had no effect on maturity, plant height, yield or lodging (Table 1). Averaged across the four varieties, there were 83 days to heading, regardless of seed treatment, plant heights were 98 and 97 cm, grain moistures at harvest were 19.3 and 19.7%, grain yields were 7304 and 7076 lb/A, amounts of lodging were 19 and 11% for the control and Release treatment, and degree of lodging was 2, regardless of seed treatment. Amount of lodging is the percentage of plot area with leaning or fallen plants, and degree of lodging ranges evaluates the amount of leaning. Degree of lodging ranges between 1 (plants vertical) and 5 (plants horizontal). There were no differences in varietal response to Release seed treatment (Table 2).

Significant varietal differences in maturity, plant height, yield and lodging were noted (Table 1). Averaged across seed treatment for Lemont, Cypress, Bengal and Mars, respectively, (1) days to heading were 87, 84, 81 and 81; (2) plant heights were 88, 100, 91, 112 cm; (3) grain moistures were 19.0, 19.9, 19.8 and 19.2%; (4) grain yields were 6575, 8026, 7516 and 6642 lb/A; (5) lodging ratings were 0, 0, 0 and 60; and (6) degrees of lodging were 1, 1, 1 and 5. There were no differences in varietal response to Release seed treatment (Table 2).

Table 1. The main effects of plant growth regulator seed treatment on varietal seedling vigor and crop production in minimum tillage rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Stand (plants\ sq ft) 14 DAP	Stand (plants\ sq ft) 21 DAP	Heading (DAP)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb\A)	Lodging (%)	Lodging (%)
					TABLE OF R MEANS					
Replicate 1			10	14	82	97	19.2	7212	11	2
Replicate 2			11	16	82	98	19.1	7211	21	2
Replicate 3			8	13	84	98	20.3	7151	18	2
Replicate 4			8	13	84	97	19.3	7185	10	2
					TABLE OF A MEANS					
Control			9	15	83	98	19.3	7304	19	2
Release	0.35	seed	9	13	83	97	19.7	7076	11	2
					TABLE OF B MEANS					
Lemont			4a	8a	87a	88a	19.0	6575a	0a	1a
Cypress			11b	17b	84b	100b	19.9	8026b	0a	1a
Bengal			10b	14b	81c	91a	19.8	7516b	0a	1a
Mars			11b	17b	81c	112c	19.2	6642a	60b	5b

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of plant growth regulator seed treatment on varietal seedling vigor and crop production in minimum tillage rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants\ sq ft) 14 DAP	Stand (plants\ sq ft) 21 DAP	Heading (DAP)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb\A)	Lodging (%)	Lodging (%)
Control Lemont				4b	9cd	87a	89cd	19.0b	6766bc	0c	1b
Release Lemont		0.35	seed	5b	8d	87a	87d	19.0b	6385c	0c	1b
Control Cypress				12a	17ab	64b	100b	19.8ab	7897a	0c	1b
Release Cypress		0.35	seed	11a	17ab	84b	99b	20.0ab	8155a	0c	1b
Control Bengal				9a	15ab	81c	93c	19.0b	7557ab	0c	1b
Release Bengal		0.35	seed	10a	13bc	81c	90cd	20.6a	7474ab	0c	1b
Control Mars				11a	18a	81c	112a	19.4ab	6995bc	75a	5a
Release Mars		0.35	seed	12a	17ab	81c	113a	19.0b	6289c	45b	4a
LSD (.05)	=			3	4	2	4	1.4	791	22	1
Standard Dev.	=			2.2536	2.96	1.1319	3.0386	.96825	537.98	14.679	.7071
CV	=			24.95	21.14	1.36	3.11	4.97	7.48	97.86	37.71

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED TREATMENT

R.T. Dunand, P.K. Bollich, R.R. Dilly, Jr., G.A. Meche,
R.R. Regan, and G.R. Romero

Experiment: Gibberellic Acid and Minimum Till in Shallow-Seeded Drilled Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: See Treatments

Seeding Rate: 100 lb/A

Planting Depth: Ranged between 0 and 1 inch

Planting Date: 18 Apr 95

Row Spacing: 7-inch

Fertilizer: 0-20-20 at 225 lb/A fall incorporated by airplane, 12 Nov 94; urea (46%N) at 200 lb/A by airplane, 16 May; urea (46% N) at 150 lb/A by airplane, 7 June

Water Management: Flushed, 28 Apr and 5 May

Plot Size: 150 ft^2 - 7 (12 rows) x 25 ft

Treated Area: 150 ft^2 - 7 (12 rows) x 25 ft

Treatment(s):

Varieties

Bengal, Cypress, Lemont, Mars

Plant Growth Regulator

Release (0.35 oz/cwt)

Timing

Seed treatment, 13 Apr

Sprayer: Not applicable

Pertinent Rainfall: 0.2 inches, 20 Apr; 3.5 inches, 23 Apr; 1.5 inches, 8 May

Herbicide(s): Gramoxone (1 qt/A) by ATV sprayer, 19 Apr
Arrosolo (4 qt/A) by ATV sprayer, 15 May

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May

Fungicide(s): Dithane (4 oz/cwt), 3 Apr

Emergence: 25 Apr

Permanent Flood: 17 May

Harvest Date: 18 Aug

Harvested Area: 150 ft^2 - 7 x 25 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (4 varieties growth regulator rates)

Comments:

Seedling Vigor

Stand was unaffected by Release seed treatment (Table 1). At 14 days after planting (DAP), approximately 50% emergence, stands averaged 9 plants/ft^2 regardless of seed treatment. At 21 DAP, final stand was 15 plants/ft^2 in the control and 13 plants/ft^2 for Release treated seed. With surface seeding and adequate moisture from rainfall and flushing Release effects are minimized. There were no differences in varietal response to Release seed treatment (Table 2).

Lemont had significantly lower stands compared with the other three varieties, and Cypress, Bengal and Mars had similar stands (Table 1). At 14 DAP stands were 4, 11, 10 and 11 plants/ft^2 for Lemont, Cypress, Bengal and Mars, respectively. At 21 DAP stands were 8, 17, 14 and 17 plants/ft^2. There were no differences in varietal response to Release seed treatment (Table 2).

Mature Plant Development and Crop Production

Seed treatment with Release had no effect on maturity, plant height, yield or lodging (Table 1). Averaged across the four varieties, there were 83 days to heading regardless of seed treatment, plant heights were 98 and 97 cm, grain moistures at harvest were 19.3 and 19.7%, grain yields were 7304 and 7076 lb/A, amounts of lodging were 19 and 11% for the control and Release treatment, and degree of lodging was 2 regardless of seed treatment. Amount of lodging is the percentage of plot area with leaning or fallen plants, and degree of lodging ranges evaluates the amount of leaning. Degree of lodging ranges between 1 (plants vertical) and 5 (plants horizontal). There were no differences in varietal response to Release seed treatment (Table 2).

Table 2. The simple effects of plant growth regulator seed treatment on varietal seedling vigor and crop production in minimum tillage rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants\ sq ft) 10 DAP	Stand (plants\ sq ft) 13 DAP	Stand (plants\ sq ft) 20 DAP	Vigor Ratings 16 DAP	Heading (DAP)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb/A)
Control Lemont				0c	6bc	8bc	8a	88a	85e	19.0bc	7303c
Release Lemont		0.35	seed	1bc	5c	6c	7ab	88a	84e	19.3b	7563bc
Control Cypress				2bc	11ab	15a	4cd	84b	97b	20.2a	9279a
Release Cypress		0.35	seed	5a	11ab	13ab	4cd	86b	94bc	20.2a	8632ab
Control Bengal				0c	13a	14a	5bc	81c	91cd	19.0bc	8647ab
Release Bengal		0.35	seed	3abc	10ab	12ab	6abc	82c	87de	19.3b	7681bc
Control Mars				4ab	13a	14a	2d	82c	113a	18.8bc	8138abc
Release Mars		0.35	seed	3ab	12a	13ab	2d	81c	112a	18.4c	8266abc
LSD (.05)	=			3	5	5	2	2	4	0.6	1125
Standard Dev.	=			1.7614	3.5433	3.3665	1.5197	1.1681	2.976	.40859	754.08
CV	=			79.39	35.10	28.65	33.77	1.39	3.12	2.12	9.21

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Gibberellic Acid and Seeding Rate in Drilled-Seeded Rice

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: Cypress

Seeding Rate: See treatments

Planting Depth: 3 inches

Planting Date: 3 May 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc at 300 lb/A drilled preplant, 2 May; urea (46% N) at 200 lb/A by airplane, 24 May; ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June

Water Management: None

Plot Size: 105 ft^2 - 3.5 (7 rows) x 30 ft

Treated Area: 105 ft^2 - 3.5 (7 rows) x 30 ft

Treatment(s): **Seeding Rates**

25, 50, 75 and 100 lb/A

Plant Growth Regulator

Release (0.35 oz/cwt)

Timing

Seed treatment, 13 Apr

Sprayer: Not applicable

Pertinent Rainfall: 1.5 inches, 8 May; 0.1 inches, 11 May; 3.6 inches, 12 May; 1.5 inches, 18 May

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 21 July

Fungicide(s): Dithane (4 oz/cwt), 3 Apr
Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: 9 May

Permanent Flood: 26 May

Harvest Date: 29 Aug

Harvested Area: 105 ft^2 - 3.5 x 30 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (4 seeding rates x 2 plant growth regulator rates)

Comments:

Seedling Vigor

Stand was unaffected by Release seed treatment and increased with each increase in seeding rate (Table 1). Stands averaged 12 plants/ft^2 regardless of seed treatment. On average, stand increased proportionately with each 25 lb/A increase in seeding rate from 5 plants/ft^2 at the 25 lb/A seeding rate to 18 plants/ft^2 at the 100 lb/A seeding rate. There were no interactions between seed treatment and seeding rate (Table 2). Moderate to heavy (1- to 3-inch) and numerous, timely rainfall events during the first two weeks after planting provided ideal conditions for emergence. Soil was compacted by the rainfall, and effective planting depth was 2 inches or less.

Mature Plant Development

Plant height and lodging evaluations showed the highest seeding rate (100 lb/A) had shorter plants and more lodging than the other seeding rates (Table 1). Release had no affect on plant height, and there was an interaction between seed treatment and seeding rate on lodging (Table 2). Lodging was unaffected at the lower seeding rates of 25 and 50 lb/A by Release, and at the higher seeding rates of 75 and 100 lb/A, lodging was higher in the Release treatments.

Disease Reaction

Panicle blight was observed in the study, and a simple evaluation of percentage of panicles affected was made (Table 1). Number of panicles affected by panicle blight ranged from 13 to 42% and was inversely related to seeding rate with the highest seeding rate having the lowest panicle blight.

Crop Production

Grain moisture was affected by seed treatment, and grain yield was affected by seeding rate (Table 1). There were no interactions between seed treatment and seeding rate (Table 2). On average, Release treated seed had grain moisture of 18.7%, which was 1% higher than untreated seed produced. Grain yields were similar for the 50 through 100 lb/A seeding rates, ranging between 5520 and 5563 lb/A. At the lowest seeding rate of 25 lb/A, grain yield was significantly lower at 4872 lb/A.

Table 1. The main effects of plant growth regulator seed treatment and seeding rate on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants\ ft²) 3 WAP	Plant Height (cm)	Lodging (%)	Panicle Blight (%)	Grain Moisture (%)	Grain Yield (lb/A)
TABLE OF R MEANS									
Replicate 1				12	113	24	14	19.0	5438
Replicate 2				14	113	30	20	18.7	5488
Replicate 3				11	114	25	37	18.9	5161
Replicate 4				11	111	0	33	16.3	5404
TABLE OF A MEANS									
Control				12	113	11	27	17.7a	5426
Release	sp	0.35	seed	12	113	29	26	18.7b	5319
TABLE OF B MEANS									
25 lb/A				5a	113a	0	42a	17.9	4872a
50 lb/A				10b	113a	1	26b	17.4	5563b
75 lb/A				15c	113a	29	24b	18.7	5535b
100 lb/A				18d	111b	48	13c	18.9	5520b

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effect of plant growth regulator seed treatment and seeding rate on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants\ ft²) 3 WAP	Plant Height (cm)	Lodging (%)	Panicle Blight (%)	Grain Moisture (%)	Grain Yield (lb/A)
Control 25 lb/A				5e	113a	0b	45a	17.5bc	4869b
Control 50 lb/A				10d	113a	3b	25bc	17.2c	5455ab
Control 75 lb/A				15bc	113a	4b	25bc	18.1abc	5683a
Control 100 lb/A				19a	112a	36a	11c	18.1abc	5698a
Release 25 lb/A	sp	0.35	seed	5e	113a	0b	39ab	18.2abc	4875b
Release 50 lb/A	sp	0.35	seed	10d	113a	0b	26bc	17.5bc	5671a
Release 75 lb/A	sp	0.35	seed	14c	113a	55a	23c	19.4ab	5388ab
Release 100 lb/A	sp	0.35	seed	17ab	111a	60a	15c	19.7a	5343ab
LSD (.05)	=			2	2	29	14	1.8	616
Standard Dev.	=			1.6819	1.232	19.764	9.4116	1.1914	418.76
CV	=			13.98	1.09	100.39	36.07	6.54	7.79

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Gibberellic Acid and Seeding Depth in Drilled-Seeded Rice

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: Cypress

Seeding Rate: 100 lb/A

Planting Date: 3 May 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc at 300 lb/A drilled preplant, 2 May; urea (46% N) at 200 lb/A by airplane, 24 May; ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June

Water Management: None

Plot Size: 105 ft^2 - 3.5 (7 rows) x 30 ft

Treated Area: 105 ft^2 - 3.5 (7 rows) x 30 ft

Treatment(s): **Planting Depth**

1-inch
3-inch

Plant Growth Regulator

Release (0.35 oz/cwt)

Timing

Seed treatment, 13 Apr

Sprayer: Not applicable

Pertinent Rainfall: 1.5 inches, 8 May; 0.1 inches, 11 May; 3.6 inches, 12 May; 1.5 inches, 18 May

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 21 July

Fungicide(s): Dithane (4 oz/cwt), 3 Apr
Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: Deep planted, 9 May; shallow planted, 14 May

Permanent Flood: 26 May

Harvest Date: 29 Aug

Harvested Area: 105 ft^2 - 3.5 x 30 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (2 planting depths x 2 plant growth regulator rates)

Comments:

Seedling Vigor

Stand was unaffected by Release seed treatment or planting depth (Table 1). Stands averaged 20 to 22 plants/ft^2, regardless of seed treatment or planting depth. There were no interactions between seed treatment and seeding depth (Table 2). Moderate to heavy (1- to 3-inch) and numerous, timely rainfall events during the first 2 weeks after planting provided ideal conditions for emergence. Soil was compacted by the rainfall, and effective planting depth was 2 inches or less. Planting deep into moisture allowed earlier emergence than in the shallow planted treatments due to earlier germination.

Mature Plant Development

Plant height and lodging evaluations showed deep planting increased mature plant height by 2 cm (Table 1). Release had no affect on plant height, and neither seed treatment nor planting depth influenced lodging. There was no interaction between seed treatment and seeding depth (Table 2).

Disease Reaction

Panicle blight was observed in the study, and a simple evaluation of percentage of panicles affected was made (Table 1). Number of panicles affected by panicle blight was slightly less than 10%, and amount of panicle blight was independent of seed treatment and planting depth.

Crop Production

Grain moisture and yield were not affected by seed treatment or planting depth (Table 1). There were no interactions between seed treatment and planting depth (Table 2). Grain moisture ranged between 16.5 and 17.8%, and a 1.4% difference was necessary for significance. Grain yield ranged between 5727 and 6145 lb/A, and a 823 lb/A difference was necessary for significance.

Table 1. The main effects of plant growth regulator seed treatment and planting depth on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Stand (plants\ ft²) 3 WAP	Plant Height (cm)	Lodging (%)	Panicle Blight (%)	Grain Moisture (%)	Grain Yield (lb/A)
				TABLE OF R MEANS				
Replicate 1			21	111	0	4	17.4	6686
Replicate 2			23	111	13	5	18.3	6206
Replicate 3			21	109	0	16	16.9	4842
Replicate 4			19	109	0	8	16.2	5966
				TABLE OF A MEANS				
Control			22	110	0	8	16.8	5914
Release	sp 0.35	seed	20	110	6	9	17.6	5936
				TABLE OF B MEANS				
1 in depth			22	109b	6	9	17.4	5781
3 in depth			20	111a	0	8	17.0	6069

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of plant growth regulator seed treatment and planting depth on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Stand (plants\ ft²) 3 WAP	Plant Height (cm)	Lodging (%)	Panicle Blight (%)	Grain Moisture (%)	Grain Yield (lb/A)
Control 1 in depth			23a	109b	0a	6a	17.0a	5835a
Control 3 in depth			21a	111a	0a	9a	16.5a	5994a
Release 1 in depth	sp 0.35	seed	21a	109b	13a	11a	17.8a	5727a
Release 3 in depth	sp 0.35	seed	20a	111a	0a	6a	17.4a	6145a
LSD (.05)	=		4	2	20	11	1.4	823
Standard Dev.	=		2.2973	1.0671	12.5	6.6143	.85065	514.54
CV	=		11.07	0.97	400.00	81.41	4.95	8.68

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: RyzUp, Herbicide Rate, and Early Flooding in Dry-Seeded Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: Jodon

Seeding Rate: 100 lb/A

Planting Date: 17 Apr 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc and 2% sulfur at 300 lb/A drilled preplant, 17 Apr; urea (46% N) at 200 lb/A by motorized gandy, 15 May; urea (46% N) at 100 lb/A by airplane, 19 June

Water Management: Flushed, 27 Apr and 4 May

Plot Size: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treated Area: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treatment(s):

Herbicide(s)

Arrosolo
Stam M4

Rate(s)

1.00 gal/A
0.75 gal/A
0.50 gal/A

Plant Growth Regulator

RyzUp (1.5 oz/A)

Timing

2- to 3-leaf stage, 10 May

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: No rainfall within 24 hours after application

Herbicide(s): Londax (1.5 oz/A) by airplane, 7 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Furadan 3G (17 lb/A) by airplane, 19 June
Methyl parathion (0.5 pt/A) by airplane, 8 July
Methyl parathion (0.5 pt/A) by airplane, 18 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1.25 lb/A) by airplane, 18 July

Emergence: 27 Apr

Permanent Flood: 15 May

Harvest Date: 15 Aug

Harvested Area: 195 ft^2 - 6.5 x 30 ft

Exp. Design: Randomized complete block and four replications

Comments:

Seedling Vigor

Seedling vigor at 5 DAT (days after treatment) was increased with the addition of RyzUp to postemergence herbicide applications (Table 1). Seedlings treated with Stam M4 or Arrosolo had an average height of 22 cm. With the addition of RyzUp, average seedling height increased to 33 cm. There was no effect of herbicide rate on height.

Weed Control

At 37 DAT, weed control was relatively good with all but the lowest rate for both herbicides (Table 1). At the 1 and 0.75 gal/A rates, weed control ranged primarily between 85 and 95%. Weed control was similar for both herbicides, and RyzUp had no effect on weed control. At the 0.5 gal/A rate, weed control was improved by RyzUp. At the low rate of herbicide, weed control ratings ranged between 35 and 45%. With the addition of RyzUp, weed control ratings for the low rate increased to 75 to 80%.

At maturity, the trends in the effects of herbicide rate and RyzUp were similar to those noted at 37 DAT (Table 1). For the two highest rates of herbicide (1 and 0.75 gal/A), weed control ratings ranged mostly between 75 and 85%. Each herbicide was equally effective and the addition of RyzUp did not alter ratings. At the low rate (0.5 gal/A), weed control ratings ranged between 30 and 35% and improved to 70% with the addition of RyzUp.

Crop Production

At maturity, plant height, grain moisture, and grain yield were evaluated for herbicide rate and RyzUp effects. Small effects were noted on plant height and grain moisture, but large effects were noted on grain yield (Table 1). Plant height ranged between 91 and 96 cm, and grain moisture ranged between 18.2 and 19.2%. Grain yield, on the other hand, was significantly reduced at the low rate of each herbicide. The amount of reduction was approximately 2000 lb/A. With the addition of RyzUp, the reduction was approximately 1000 lb/A. Both the 1 and 0.75 gal/A rates of each herbicide resulted in yields between 7100 lb/A and 7600 lb/A with no effect from the addition of RyzUp. Grain yields with the low rate of each herbicide without RyzUp averaged approximately 5000 lb/A.

Table 1. The effects of RyzUp, herbicide rate, and early flooding on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Plant height (cm) 5 DAT	Weed Control (%) 37 DAT	Weed Control (%)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb/A)
Early Flood				23c	95a	85a	96ab	18.7ab	7572a
Stam M4	ec	4	lb/A						
Early Flood				23c	88a	83a	94a-d	18.7ab	7154ab
Stam M4	ec	3	lb/A						
Early Flood				22c	38b	33b	92bcd	18.6ab	4911c
Stam M4	ec	2	lb/A						
Early Flood				30b	98a	90a	94a-d	18.6ab	7381ab
Stam M4	ec	4	lb/A						
RyzUp	1	1.5	oz p/A						
Early Flood				34a	95a	85a	96a-d	18.2b	7123ab
Stam M4	ec	3	lb/A						
RyzUp	1	1.5	oz p/A						
Early Flood				33ab	80a	73a	91cd	18.8ab	6315b
Stam M4	ec	2	lb/A						
RyzUp	1	1.5	oz p/A						
Early Flood				22c	93a	88a	96abc	18.8ab	7343ab
Arrosolo	ec	6	lb/A						
Early Flood				23c	85a	70a	98a	18.7ab	7172ab
Arrosolo	ec	4.5	lb/A						
Early Flood				22c	45b	30b	91d	18.4ab	5217c
Arrosolo	ec	3	lb/A						
Early Flood				33ab	96a	75a	91d	19.2a	6812ab
Arrosolo	ec	6	lb/A						
RyzUp	1	1.5	oz p/A						
Early Flood				34a	98a	88a	96a-d	18.5ab	7704a
Arrosolo	ec	4.5	lb/A						
RyzUp	1	1.5	oz p/A						
Early Flood				33ab	75a	68a	96abc	18.8ab	6645ab
Arrosolo	ec	3	lb/A						
RyzUp	1	1.5	oz p/A						
LSD (.05) =				3	20	23	4	0.7	1020
Standard Dev.=				1.9854	14.154	15.835	3.0781	.4636	706.37
CV =				7.23	17.27	21.97	3.27	2.48	10.42

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: RyzUp and Phytotoxic Herbicide Applications in Dry-Seeded Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: Jodon

Seeding Rate: 100 lb/A

Planting Date: 18 Apr 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc and 2% sulfur at 300 lb/A drilled preplant, 18 Apr; urea (46% N) at 200 lb/A by airplane, 16 May; urea (46% N) at 100 lb/A by airplane, 19 June

Water Management: Flushed, 27 Apr

Plot Size: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treated Area: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treatment(s): **Herbicide(s)**

Stam M4 (4 and 5 qt/A)
Stam M4+Bolero 8EC (3+3 qt/A)

Plant Growth Regulator

RyzUp (1.5 oz/A)

Timing

3- to 4-leaf stage, 16 May

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: No rainfall within 24 hours after application

Herbicide(s): Londax (1.5 oz/A) by airplane, 7 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 24 May
Methyl parathion (0.5 pt/A) by airplane, 8 July
Methyl parathion (0.5 pt/A) by airplane, 18 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1.25 lb/A) by airplane, 18 July

Emergence: 27 Apr

Permanent Flood: 19 May

Harvest Date: 15 Aug

Harvested Area: 195 ft^2 - 6.5 x 30 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (3 herbicides x plant growth regulator rates)

Comments:

Seedling Vigor

Seedling vigor was increased with the addition of plant growth regulator to postemergence herbicide applications (Table 1). At 7 days after treatment (DAT), seedlings treated with herbicides alone averaged 12 inches in height. With the addition of RyzUp, average seedling height increased to 17 inches, regardless of herbicide application. There was no effect of herbicide treatment on height. Including RyzUp combinations, Stam M4 (4 qt/A), Stam M4 (5 qt/A), and Stam M4+Bolero, on average, had seedlings ranging from 14 to 16 inches in height. There were no interactions between herbicide and plant growth regulator (Table 2).

Weed Control

At 7 DAT, weed control was excellent with all herbicides (Table 1). Weed control ratings showed 100% weed control, and RyzUp had no effect on weed control. There were no interactions between herbicide and plant growth regulator (Table 2).

Crop Production

At maturity, plant height, grain moisture, and grain yield were evaluated for herbicide and plant growth regulator effects (Table 1). Mature plant height was unaffected by herbicide or plant growth regulator. Maturity was delayed by Stam M4+Bolero as evidenced by the higher grain moisture at harvest, and grain yield was decreased by Stam M4+Bolero. Both the standard rate of Stam M4 (4 qt/A) and the high rate of Stam M4 (5 qt/A) had significantly lower grain moisture and higher yields compared with Stam M4+Bolero. There was no difference in the effects of rate of Stam M4 on maturity or grain yield. Responses of maturity and grain yield to herbicide treatments were unaffected by mixing RyzUp with the herbicides (Table 2).

Table 1. The main effects of herbicide injury and plant growth regulator on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Plant Height (in.) 7 DAT	Injury (%) 7 DAT	Control (%)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb/A)
TABLE OF R MEANS									
Replicate 1				15	17	100	92	17.5	7205
Replicate 2				15	12	100	97	19.0	8136
Replicate 3				15	20	100	99	19.6	8145
Replicate 4				14	37	100	96	19.6	7869
TABLE OF A MEANS									
Stam M4	ec	4	3-4L	16	5a	100	98	18.6a	7998a
Stam M4	ec	5	3-4L	15	19b	100	95	18.7a	8049a
Stam M4	ec	4	3-4L	14	40c	100	96	19.5b	7470b
Bolero 8EC	ec	3	3-4L						
TABLE OF B MEANS									
RyzUp	l	0	3-4L	12a	22	100	95	18.8	7919
RyzUp	l	1.5	3-4L	17b	21	100	97	19.1	7759

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of herbicide injury and plant growth regulator on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Plant Height (in.) 7 DAT	Injury (%) 7 DAT	Control (%)	Plant Height (cm)	Grain Moisture (%)	Grain Yield (lb/A)
Stam M4	ec	4	3-4L	13c	5c	100a	97a	18.6bc	7986a
RyzUp	l	0	3-4L						
Stam M4	ec	4	3-4L	19a	5c	100a	98a	18.7bc	8009a
RyzUp	l	1.5	3-4L						
Stam M4	ec	5	3-4L	12c	20b	100a	95a	18.5c	8170a
RyzUp	l	0	3-4L						
Stam M4	ec	5	3-4L	17ab	18b	100a	96a	18.9bc	7928a
RyzUp	l	1.5	3-4L						
Stam M4	ec	4	3-4L	12c	40a	100a	95a	19.3ab	7600ab
Bolero 8EC	ec	3	3-4L						
RyzUp	l	0	3-4L						
Stam M4	ec	4	3-4L	16b	40a	100a	97a	19.8a	7339b
Bolero 8EC	ec	3	3-4L						
RyzUp	l	1.5	3-4L						
LSD (.05)	=			2	11	0	4	0.7	532
Standard Dev.	=			1.1665	7.1297	0	2.3734	.43161	353.09
CV	=			7.82	33.55	0	2.47	2.28	4.50

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: RyzUp and Ratoon Cropping in Dry-Seeded Rice

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: Jodon

Seeding Rate: 100 lb/A

Planting Date: 2 May 95

Row Spacing: 7-inch

Fertilizer: First Crop 7-21-21 with 3.5% zinc and 2% sulfur at 300 lb/A drilled preplant, 2 May; urea (46% N) at 200 lb/A by airplane, 24 May; ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June
Second Crop urea (46% N) at 100 lb/A by airplane, 30 Aug

Water Management: Flushed, 5 May

Plot Size: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treated Area: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treatment(s): **Plant Growth Regulator**

RyzUp (3 and 5 oz/A)

Timing

3 weeks before first crop heading, 5 July, and 3 weeks before first crop harvest, 31 July (3 WBH)
3 weeks after first crop harvest, 11 Sept (3 WAH)

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: 1.5 inches, 8 May; 3.5 inches, 12 May; 1.0, 31 July (3 hours after application); No rainfall within 24 hours after 11 Sept application

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1.0 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (0.5 pt/A) by airplane, 8 July
Methyl parathion (0.5 pt/A) by airplane, 21 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: 12 May

Permanent Flood: 3 June, first crop; 1 Sept, second crop

Harvest Date: 23 Aug

Harvested Area: 195 ft^2 - 6.5 x 30 ft

Exp. Design: Randomized complete block and four replications

Comments:

First Crop

Treatments with RyzUp applied 3 weeks before heading (3 WBHd) and again 3 weeks before harvest (3 WBHt) of the first crop increased plant height (Table 1). The main effect on plant height was from the 3 WBHd treatment since plant height is fixed at heading and the subsequent 3 WBHt treatment would have no effect. Untreated plants [the control and 3 weeks after first crop harvest (WAHt) treatments] had heights ranging from 96 to 99 cm. Treatments with RyzUp applied 3 WBHd produced plant heights ranging from 107 to 119 cm. Response to RyzUp was rate dependent. The lower rate of RyzUp (3 fl oz/A) produced an average height of 108 cm, and the higher rate of RyzUp produced an average height of 116 cm.

RyzUp had no significant effect on grain moisture, grain yield and milling yield (Table 1). For all treatments, grain moisture ranged between 20.0 and 21.2%. Grain yield ranged between 7276 and 7658 lb/A for the control and 3 WAHt treatments. Grain yields were higher for the 3 WBHd treatments, ranging between 7941 and 8083 lb/A. On average, this was a 500 lb/A increase. Total milling yields for all treatments ranged between 65 and 66%, and whole milling yields ranged between 50 and 52%.

Second Crop

Harvest of the first crop was relatively uniform. Stubble height in the second crop for all treatments ranged between 45 and 49 cm (Table 2). This shows there were equal amounts of stubble for ratoon growth in each treatment.

Applications of RyzUp to the second crop 3 WAHt increased ratoon growth (Table 2). At 9 days after treatment (DAT), the true control and relative controls (treatments applied to the first crop at 3 WBHd) had ratoon plant heights ranging from 69 to 71 cm. Treatments of RyzUp applied 3 WAHt, when adequate ratoon growth was noticeable, had heights ranging from 72 to 76 cm. The effect tended to be rate dependent. The lower rate of RyzUp (3 fl oz/A) averaged 73 cm and the higher rate of RyzUp (5 fl oz/A) averaged 76 cm.

RyzUp application to first and second crop growth had no effect on ratoon crop grain production (Table 2). Grain yield differences between treatments were less than 200 lb/A. Grain yield tended to be lower when RyzUp was applied to the first crop (3 WBHd and 3 WBHt treatments). These were the same treatments that tended to give higher first crop yields. This type of inverse relationship (high first crop yield with low ratoon crop yield and vice versa) is common in rice. The end result was that total crop yield (first and second combined) was not significantly affected by RyzUp applications on the first or second crop (Table 2). In general, total grain yield was increased by 300 lb/A with the application of RyzUp on the first crop. This is a reflection of the 500 lb/A yield increase in the first crop and the 200 lb/A lower yield in the ratoon crop.

Table 1. The effect of pre and post heading plant growth regulator foliar treatment on first crop rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Plant Height (cm) 8 DAT	Grain Moisture (%)	Grain Yield (lb/A)	Total Milling Yield (%)	Whole Milling Yield (%)
Control				96c	20.0b	7658ab	66ab	51ab
RyzUp	1	3	3WBHd	107b	21.2a	7941ab	65ab	51ab
RyzUp	1	3	3WBHt					
RyzUp	1	5	3WBHd	114a	20.1b	7910ab	65b	50b
RyzUp	1	5	3WBHt					
RyzUp	1	3	3WAHt	97c	20.3b	7276b	66a	52a
RyzUp	1	5	3WAHt	99c	20.0b	7343ab	65ab	51ab
RyzUp	1	3	3WBHd	108b	20.1b	7958ab	66ab	51ab
RyzUp	1	3	3WBHt					
RyzUp	1	3	3WAHt					
RyzUp	1	5	3WBHd	119a	20.6ab	8083a	66ab	51ab
RyzUp	1	5	3WBHt					
RyzUp	1	5	3WAHt					
LSD (.05)	=			6	0.8	688	1	1
Standard Dev.	=			3.939	.57078	463.02	.6359	.9611
CV	=			3.73	2.81	5.98	0.97	1.89

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The effect of pre and post heading and post harvest plant growth regulator foliar treatments on ratoon and total crop production in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Pm Ds	Rate	Grow Stg	Stubble Height (cm)	Ratoon Plant Height (cm) 9 DAT	Ratoon Yield (lb/A)	Total Yield (lb/A)
Control				45a	71cd	1208ab	8866a
RyzUp	1	3	3WBHd	46a	69d	1061ab	9002a
RyzUp	1	3	3WBHt				
RyzUp	1	5	3WBHd	46a	69d	1088ab	8998a
RyzUp	1	5	3WBHt				
RyzUp	1	3	3WAHt	48a	74abc	1237ab	8513a
RyzUp	1	5	3WAHt	46a	75ab	1327a	8671a
RyzUp	1	3	3WBHd	49a	72bcd	1103ab	9060a
RyzUp	1	3	3WBHt				
RyzUp	1	3	3WAHt				
RyzUp	1	5	3WBHd	46a	76a	1011b	9094a
RyzUp	1	5	3WBHt				
RyzUp	1	5	3WAHt				
LSD (.05)	=			5	3	261	698
Standard Dev.	=			3.2348	2.1957	175.45	470.13
CV	=			6.97	3.04	15.29	5.29

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED AND FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Gibberellic Acid and Seedling Vigor in Rice - February Planting Date

Location: Rice Research Station, Crowley, LA (Blast Nursery)

Variety: See treatments

Seeding Rate: 40 seed/2 row ft

Planting Date: 24 Feb 95

Row Spacing: 2-inch

Planting Depth: 1-inch

Fertilizer: 20-10-10 with 2% zinc at 300 lb/A topdress, 15 Feb

Water Management: Not applicable

Plot Size: 0.33 ft^2 - 2 inches x 2 ft

Treated Area: 0.33 ft^2 - 2 inches x 2 ft

Treatment(s): **Varieties**

Bengal	Jackson	Kaybonnet	Maybelle
Cypress	Jodon	Lemont	

Plant Growth Regulator(s)

Seed Treatment
Gibberellic acid (22, 44 ppm) - GibGro (0.17 and 0.35 oz/cwt)
RELEASE (0.35 and 0.7 oz/cwt)

Foliar Treatment
Gibberellic acid (2 g/A) - RyzUp (2 fl. oz./A) applied with Stam M4 (3 qt/A) by CO_2 sprayer

Timing

Seed treatment, 17 Feb
Foliar treatment (2- to 3-leaf), 3 Apr

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: **Seed treatment** - 1.3 inches, 28 Feb; 0.5 inches, 6 Mar; 2.0 inches, 7 Mar; 4.7 inches, 13 Mar; 0.5 inches, 14 Mar; 0.4 inches, 28 Mar; 3.2 inches, 29 Mar

Foliar treatment - 0.8 inches, 4 Apr; 0.4 inches, 6 Apr; 1.2 inches, 10 Apr; 0.6 inches, 16 Apr

Herbicide(s): See foliar treatment

Insecticide(s): Not applicable

Fungicide(s): Dithane (4 fl. oz./cwt), 17 Feb

Emergence: 14 Mar

Permanent Flood: Not applicable

Harvest Date: Not applicable

Harvested Area: Not applicable

Exp. Design: Each variety was planted in a three row group (one row had untreated seed, one had GibGro treated seed and one had RELEASE treated seed). All groupings were blocked and replicated four times. Half of each row was sprayed with RyzUp.

Comments: **Seed Treatment - Plant Population**

Evaluations of stand were made between 19 and 35 days after planting (DAP). In the early emergence evaluations at 19 and 21 DAP, all varieties exhibited a significant response to gibberellic acid (GA_3) seed treatment (Table 1, B Means). The response was independent of GA_3 formulation and rate. Emergence was 1.5 to 2 fold greater with GA_3 seed treatment. In general, there were 3 and 8 plants/row without GA_3 seed treatment and 7 and 12 plants/row with the seed treatment at 19 and 21 DAP, respectively.

The most vigorous varieties were Bengal and Cypress. At 19 and 21 DAP, Bengal and Cypress, regardless of seed treatment, averaged 10 and 15 plants in the untreated compared with less than eight and less than 11 plants for Jackson, Jodon, Lemont, Maybelle and Kaybonnet, respectively (Table 1, A Means).

All varieties responded equally well to GA_3 seed treatment at 19 and 21 DAP. There was no significant interaction between variety and seed treatment (Table 2). At 23, 25 and 27 DAP, the variety by seed treatment interaction was significant. During that time period, only Lemont stand was significantly increased by GA_3 seed treatment. By 35 DAP, there was no significant effect of GA_3 seed treatment on stand of any variety. Bengal, Cypress and Jodon had the highest final stands with 25 plants.

Emergence results were affected by soil temperature. During the period from planting to first evaluation (19 DAP), daily average soil temperatures for the 19-day period averaged 60°F. Between 19 DAP and final stand (35 DAP), daily average soil temperatures had warmed markedly and for the 16-day period averaged 67°F.

Foliar Treatment - Seedling Height

During the seedling stages, RyzUp was applied to determine response to a foliar application of GA_3. All varieties responded equally well. At 8 days after treatment (DAT), plant height of all varieties was increased by RyzUp (Table 3, C Means). On average, the plant height differential was 3 cm. At this time (46 DAP), the GA_3 seed treatments had no residual effects on seedling growth. Seedlings from treated and untreated seed that were not treated with RyzUp exhibited no difference in height (Table 3, B Means). Inherent differences between varieties showed Bengal and Kaybonnet were slightly taller than the other varieties. Degree of response is related to air temperature. The average daily air temperature for the 8-day period after application of RyzUp was 68°F.

Table 1. The main effect of plant growth regulator seed treatment on seedling vigor of rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 19 DAP	Stand (Plants\ 40 seed) 21 DAP	Stand (Plants\ 40 seed) 23 DAP	Stand (Plants\ 40 seed) 25 DAP	Stand (Plants\ 40 seed) 27 DAP	Stand (Plants\ 40 seed) 35 DAP
TABLE OF R MEANS									
Replicate 1				6	10	16	16	17	18
Replicate 2				4	6	12	12	14	18
Replicate 3				4	13	14	14	16	18
Replicate 4				10	13	20	20	21	22
TABLE OF A MEANS									
Bengal				10a	16a	21	21	22	25a
Cypress				10a	15ab	20	20	22	24a
Jackson				4b	6d	9	9	10	10d
Jodon				4b	11bc	18	18	21	25a
Lemont				4b	8cd	11	11	12	15c
Maybelle				8a	11bc	15	15	15	15c
Kaybonnet				3b	7d	14	14	17	18bc
TABLE OF B MEANS									
Control				3a	8a	14	14	16	20
GibGro	sp	0.17	seed	7b	12b	16	16	18	18
Release	sp	0.35	seed	8b	12b	16	16	17	19

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P = .05).

Table 2. The simple effects of plant growth regulator seed treatment on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 19 DAP	Stand (Plants\ 40 seed) 21 DAP	Stand (Plants\ 40 seed) 23 DAP	Stand (Plants\ 40 seed) 25 DAP	Stand (Plants\ 40 seed) 27 DAP	Stand (Plants\ 40 seed) 35 DAP
Bengal Control				4def	12bcd	19a-d	20a-d	22abc	25a
Bengal GibGro	sp	0.17	seed	11abc	19ab	21ab	21ab	24a	24a
Bengal Release	sp	0.35	seed	14a	18ab	21ab	21ab	22ab	25a
Cypress Control				5def	11b-f	18a-d	18a-e	20a-e	24a
Cypress GibGro	sp	0.17	seed	13a	20a	23a	23a	25a	25a
Cypress Release	sp	0.35	seed	12ab	15abc	20abc	20a-d	21a-d	25a
Jackson Control				4def	5def	8ef	8fg	9fg	11de

Continued.

Table 2. Continued.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 19 DAP	Stand (Plants\ 40 seed) 21 DAP	Stand (Plants\ 40 seed) 23 DAP	Stand (Plants\ 40 seed) 25 DAP	Stand (Plants\ 40 seed) 27 DAP	Stand (Plants\ 40 seed) 35 DAP
Jackson GibGro	sp	0.17	seed	3ef	4ef	7f	7g	7g	7e
Jackson Release	sp	0.35	seed	6def	10b-f	14cde	14c-f	14ef	13cde
Jodon Control				1f	8c-f	16bcd	17b-e	22ab	26a
Jodon GibGro	sp	0.17	seed	6c-f	12b-e	19a-d	19a-e	20a-e	25a
Jodon Release	sp	0.35	seed	5def	12b-e	19abc	20abc	21abc	24a
Lemont Control				2f	3f	5f	5g	7g	15cd
Lemont GibGro	sp	0.17	seed	3ef	10b-f	15bcd	15b-e	16b-e	16cd
Lemont Release	sp	0.35	seed	6b-f	10b-f	13cde	13def	14def	13cde
Maybelle Control				6def	11b-f	15bcd	16b-e	17b-e	17bc
Maybelle GibGro	sp	0.17	seed	8a-e	11b-e	15cd	15cde	15cde	13cd
Maybelle Release	sp	0.35	seed	9a-d	12b-e	14cd	14c-f	15def	15cd
Kaybonnet Control				3ef	7c-f	15bcd	15b-e	19a-e	22ab
Kaybonnet GibGro	sp	0.17	seed	3ef	8c-f	14cd	14c-f	17b-e	18bc
Kaybonnet Release	sp	0.35	seed	4def	6def	13de	13ef	15cde	15cd
LSD (.05)	=			5	7	6	6	6	5
Standard Dev.	=			3.4148	4.9653	3.9171	3.952	3.9027	3.7869
CV	=			57.48	47.08	25.57	25.52	22.83	20.07

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 3. The main effect of plant growth regulator foliar treatment on seedling vigor of rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 8 DAT
TABLE OF R MEANS					
Replicate 1					13
Replicate 2					14
Replicate 3					15
Replicate 4					14
TABLE OF A MEANS					
Bengal					16a
Cypress					13c
Jackson					14bc
Jodon					14bc
Lemont					13c
Maybelle					14bc
Kaybonnet					15a
TABLE OF B MEANS					
Control				seed	14
GibGro		0.17	lb/A	seed	14
Release		0.35	lb/A	seed	14
TABLE OF C MEANS					
Control				2-3L	13a
RyzUp	1	2	oz p/A	2-3L	16b

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 4. The simple effects of plant growth regulator foliar treatment on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 8 DAT
Bengal					14d-k
Control				seed	
Control				2-3L	
Bengal					16a-d
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Bengal					14c-j
GibGro		0.17	lb/A	seed	
Control				2-3L	
Bengal					18a
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Bengal					15c-i
Release		0.35	lb/A	seed	
Control				2-3L	
Bengal					18ab
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Cypress					12kl
Control				seed	
Control				2-3L	
Cypress					15c-i
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Cypress					13g-l
GibGro		0.17	lb/A	seed	
Control				2-3L	
Cypress					15c-g
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Cypress					12jkl
Release		0.35	lb/A	seed	
Control				2-3L	
Cypress					16a-e
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Jackson					12h-l
Control				seed	
Control				2-3L	
Jackson					16a-e
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Jackson					12h-l
GibGro		0.17	lb/A	seed	
Control				2-3L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 8 DAT
Jackson					14c-j
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Jackson					13f-l
Release		0.35	lb/A	seed	
Control				2-3L	
Jackson					16a-d
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Jodon					12i-l
Control				seed	
Control				2-3L	
Jodon					16a-d
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Jodon					13f-l
GibGro		0.17	lb/A	seed	
Control				2-3L	
Jodon					16a-d
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Jodon					13f-l
Release		0.35	lb/A	seed	
Control				2-3L	
Jodon					16a-d
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Lemont					11l
Control				seed	
Control				2-3L	
Lemont					13e-k
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Lemont					13g-l
GibGro		0.17	lb/A	seed	
Control				2-3L	
Lemont					14d-k
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Lemont					12jkl
Release		0.35	lb/A	seed	
Control				2-3L	
Lemont					14c-j
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 8 DAT
Maybelle					12jkl
Control				seed	
Control				2-3L	
Maybelle					16a-d
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Maybelle					13f-l
GibGro		0.17	lb/A	seed	
Control				2-3L	
Maybelle					15c-h
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Maybelle					13f-l
Release		0.35	lb/A	seed	
Control				2-3L	
Maybelle					15b-f
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Kaybonnet					13f-l
Control				seed	
Control				2-3L	
Kaybonnet					17a-d
Control				seed	
RyzUp	1	2	oz p/A	2-3L	
Kaybonnet					13e-k
GibGro		0.17	lb/A	seed	
Control				2-3L	
Kaybonnet					17a-d
GibGro		0.17	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	
Kaybonnet					12h-l
Release		0.35	lb/A	seed	
Control				2-3L	
Kaybonnet					17abc
Release		0.35	lb/A	seed	
RyzUp	1	2	oz p/A	2-3L	

LSD (.05) =	2
Standard Dev.=	1.4651
CV =	10.41

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED AND FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Gibberellic Acid and Seedling Vigor in Rice - March Planting Date

Location: Rice Research Station, Crowley, LA (Blast Nursery)

Variety: See treatments

Seeding Rate: 40 seed/2 row ft

Planting Date: 16 Mar 95

Row Spacing: 2-inch

Planting Depth: 1-inch

Fertilizer: 20-10-10 with 2% zinc at 300 lb/A topdress, 15 Feb

Water Management: Not applicable

Plot Size: 0.33 ft^2 - 2 inches x 2ft

Treated Area: 0.33 ft^2 - 2 inches x 2 ft

Treatment(s): **Varieties**

Bengal	Jodon	Maybelle
Cypress	Kaybonnet	
Jackson	Lemont	

Plant Growth Regulator(s)

Seed Treatment
Gibberellic acid (22, 44 ppm) - GibGro (0.17 and 0.35 oz/cwt)
RELEASE (0.35 and 0.7 oz/cwt)

Foliar Treatment
Gibberellic acid (2 g/A) - RyzUp (2 fl. oz./A) applied with Stam M4 (3 qt/A) by CO_2 sprayer

Timing

Seed treatment, 17 Feb
Foliar treatment (2- to 3-leaf), 12 Apr

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: **Seed treatment** - 0.4 inches, 28 Mar; 3.2 inches, 29 Mar; 0.4 inches, 4 Apr; 0.4 inches, 6 Apr

Foliar treatment - None

Herbicide(s): See foliar treatment

Insecticide(s): Not applicable

Fungicide(s): Dithane (4 fl. oz./cwt), 17 Feb

Emergence: 24 Mar

Permanent Flood: Not applicable

Harvest Date: Not applicable

Harvested Area: Not applicable

Exp. Design: Each variety was planted in a three row group (one row had untreated seed, one had GibGro treated seed and one had RELEASE treated seed). All groupings were blocked and replicated four times. Half of each row was sprayed with RyzUp.

Comments: **Seed Treatment - Plant Population**

Evaluations of stand were made between 9 and 22 days after planting (DAP). In the early emergence evaluations at 9 and 11 DAP, all varieties exhibited a significant response to gibberellic acid (GA_3) seed treatment (Table 1, B Means). The response was independent of GA_3 formulation and rate. Emergence was 1.2- to 2-fold greater with GA_3 seed treatment. In general, there were 3 and 19 plants/row without GA_3 seed treatment and 6 and 22 plants/row with the seed treatment at 19 and 21 DAP, respectively.

The most vigorous varieties were Bengal and Cypress. At 11 DAP, Bengal and Cypress, regardless of seed treatment, averaged 26 and 28 plants compared with less than 23 plants for Jackson, Jodon, Lemont, Maybelle and Kaybonnet, respectively (Table 1, A Means).

All varieties responded equally well to GA_3 seed treatment at 9 and 11 DAP. There were no significant interactions between variety and seed treatment (Table 2). At 13 DAP, the variety by seed treatment interaction was significant. At that time, Lemont stand was

unexplainably, significantly increased by Release seed treatment. By 15 DAP, there was no significant effect of GA_3 seed treatment on stand of any variety. Bengal and Cypress had the highest final stands with 34 and 30 plants, respectively.

Emergence results were affected by soil temperature. During the period from planting to first evaluation (9 DAP), daily average soil temperatures for the 9-day period averaged 69°F. Between 9 DAP and final stand (22 DAP), temperatures dropped resulting in daily average soil temperatures of 65°F for the 13-day period. Emergence was approaching maximum at 13 DAP, and the cool temperatures had little effect on emergence.

Foliar Treatment - Seedling Height

During the seedling stages, RyzUp was applied to determine response to a foliar application of GA_3. All varieties responded equally well. At 5 and 7 days after treatment (DAT), plant heights of all varieties were increased by RyzUp (Table 3, C Means). On average, the plant height differentials were 4 and 8 cm, respectively. At this time (35 DAP). the GA_3 seed treatments had no residual effects on seedling growth. Seedlings from treated and untreated seed that were not treated with RyzUp exhibited no difference in height (Table 3, B Means). There were small inherent differences between varieties at 7 DAT. Jodon had the tallest seedlings, and Lemont and Cypress had the shortest seedlings. The difference between Jodon and Cypress or Lemont was 2 cm. Degree of response is related to air temperature. The average daily air temperature for the 7-day period after application of RyzUp was 71°F.

Table 1. The mein effect of plant growth regulator seed treatment on seedling vigor of rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 9 DAP	Stand (Plants\ 40 seed) 11 DAP	Stand (Plants\ 40 seed) 13 DAP	Stand (Plants\ 40 seed) 15 DAP	Stand (Plants\ 40 seed) 22 DAP
TABLE OF R MEANS								
Replicate 1				4	26	30	31	31
Replicate 2				6	22	27	29	27
Replicate 3				6	22	27	30	29
Replicate 4				3	14	18	23	23
TABLE OF A MEANS								
Bengal				7a	28a	31	34a	34a
Cypress				6a	26a	29	32a	30b
Jackson				5a	16c	20	23d	20e
Jodon				3b	19bc	23	26c	27c
Lemont				5a	17c	21	25cd	24d
Maybelle				6a	22b	26	29b	29bc
Kaybonnet				3b	22b	26	29b	29bc
TABLE OF B MEANS								
Control				3a	19a	25	28	28
GibGro	sp	0.17	seed	6b	23b	26	28	27
Release	sp	0.35	seed	6b	22b	25	28	27

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of plant growth regulator seed treatment on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 9 DAP	Stand (Plants\ 40 seed) 11 DAP	Stand (Plants\ 40 seed) 13 DAP	Stand (Plants\ 40 seed) 15 DAP	Stand (Plants\ 40 seed) 22 DAP
Bengal Control				5a-e	28a	33a	34a	36a
Bengal GibGro	sp	0.17	seed	7a-d	28a	31ab	34a	33ab
Bengal Release	sp	0.35	seed	8ab	28a	30ab	34a	32abc
Cypress Control				3cde	24a-e	29a-e	32ab	30bcd
Cypress GibGro	sp	0.17	seed	7a-d	27ab	30abc	32ab	30b-e
Cypress Release	sp	0.35	seed	7abc	26abc	30a-d	32ab	30b-e
Jackson Control				4cde	18e-h	24e-h	25cd	23g
Jackson GibGro	sp	0.17	seed	7abc	19d-g	21ghi	24de	21g

Continued.

Table 2. Continued.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (Plants\ 40 seed) 9 DAP	Stand (Plants\ 40 seed) 11 DAP	Stand (Plants\ 40 seed) 13 DAP	Stand (Plants\ 40 seed) 15 DAP	Stand (Plants\ 40 seed) 22 DAP
Jackson Release	sp	0.35	seed	4cde	12hi	16j	20e	17h
Jodon Control				1e	16ghi	21hij	25cd	26d-g
Jodon GibGro	sp	0.17	seed	3de	20c-g	24d-h	26cd	26d-g
Jodon Release	sp	0.35	seed	5b-e	20c-g	23e-i	28bcd	28b-f
Lemont Control				1e	12i	18ij	24de	24fg
Lemont GibGro	sp	0.17	seed	7abc	20d-g	23e-i	26cd	25efg
Lemont Release	sp	0.35	seed	6a-d	20b-g	23e-i	25cd	24fg
Maybelle Control				4cde	21b-g	26b-h	30abc	30bcd
Maybelle GibGro	sp	0.17	seed	7a-d	21b-g	25c-h	28bcd	28c-f
Maybelle Release	sp	0.35	seed	9a	24a-e	28a-f	29bcd	29b-e
Kaybonnet Control				2e	18fgh	23f-i	27bcd	29b-e
Kaybonnet GibGro	sp	0.17	seed	4b-e	25a-d	28a-f	29abc	29b-f
Kaybonnet Release	sp	0.35	seed	4cde	23a-f	27b-g	32ab	30bcd
LSD (.05) =				3	5	5	4	4
Standard Dev.=				2.4008	3.8587	3.3925	3.1013	3.0616
CV =				48.83	18.19	13.45	11.00	11.14

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 3. The main effect of plant growth regulator foliar treatment on seedling vigor of rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 5 DAT	Plant Height (cm) 7 DAT
TABLE OF R MEANS						
Replicate 1					13	15
Replicate 2					13	15
Replicate 3					13	15
Replicate 4					13	15
TABLE OF A MEANS						
Bengal					13a	15b
Cypress					13a	14c
Jackson					13a	15b
Jodon					13a	16a
Lemont					12b	14c
Maybelle					13a	15b
Kaybonnet					13a	15b
TABLE OF B MEANS						
Control				seed	13	15
GibGro		0.17	lb/A	seed	13	15
Release		0.35	lb/A	seed	13	15
TABLE OF C MEANS						
Control				2-3L	11a	11a
RyzUp	1	2	oz p/A	2-3L	15b	19b

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 4. The simple effects of plant growth regulator foliar treatment on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Pm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 5 DAT	Plant Height (cm) 7 DAT
Bengal					12d-h	11f
Control				seed		
Control				2-3L		
Bengal					15abc	20abc
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Bengal					12f-i	12f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Bengal					14a-d	19b-e
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Bengal					11ghi	11f
Release		0.35	lb/A	seed		
Control				2-3L		
Bengal					15abc	20a-d
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Cypress					11hi	9f
Control				seed		
Control				2-3L		
Cypress					15abc	17cde
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Cypress					12f-i	10f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Cypress					16a	19b-e
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Cypress					11hi	10f
Release		0.35	lb/A	seed		
Control				2-3L		
Cypress					16a	20a-e
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Jackson					11hi	11f
Control				seed		
Control				2-3L		
Jackson					13c-g	16e
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Jackson					11hi	12f
GibGro		0.17	lb/A	seed		
Control				2-3L		

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 5 DAT	Plant Height (cm) 7 DAT
Jackson					16ab	21abc
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Jackson					12f-i	12f
Release		0.35	lb/A	seed		
Control				2-3L		
Jackson					15abc	19b-e
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Jodon					11hi	12f
Control				seed		
Control				2-3L		
Jodon					16abc	22ab
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Jodon					12f-i	11f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Jodon					15abc	20abc
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Jodon					11hi	11f
Release		0.35	lb/A	seed		
Control				2-3L		
Jodon					16a	23a
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Lemont					10hi	9f
Control				seed		
Control				2-3L		
Lemont					14a-e	16de
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Lemont					10hi	10f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Lemont					14b-f	18b-e
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Lemont					10i	9f
Release		0.35	lb/A	seed		
Control				2-3L		
Lemont					15abc	20a-e
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Plant Height (cm) 5 DAT	Plant Height (cm) 7 DAT
Maybelle					11ghi	11f
Control				seed		
Control				2-3L		
Maybelle					15abc	20a-e
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Maybelle					11hi	11f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Maybelle					15abc	20a-e
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Maybelle					12f-i	11f
Release		0.35	lb/A	seed		
Control				2-3L		
Maybelle					15abc	19b-e
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Kaybonnet					11hi	11f
Control				seed		
Control				2-3L		
Kaybonnet					15abc	20abc
Control				seed		
RyzUp	1	2	oz p/A	2-3L		
Kaybonnet					12f-i	11f
GibGro		0.17	lb/A	seed		
Control				2-3L		
Kaybonnet					15abc	19a-e
GibGro		0.17	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
Kaybonnet					12e-i	11f
Release		0.35	lb/A	seed		
Control				2-3L		
Kaybonnet					16a	19a-e
Release		0.35	lb/A	seed		
RyzUp	1	2	oz p/A	2-3L		
LSD (.05) =					2	3
Standard Dev.=					1.3338	2.2422
CV =					10.26	14.94

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDLING VIGOR STUDIES - SEED AND FOLIAR TREATMENT

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Gibberellic Acid and Seedling Vigor in Rice - May Planting Date

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: See treatments

Seeding Rate: 100 lb/A

Planting Date: 2 May 95

Row Spacing: 7-inch

Planting Depth: 3 inches

Fertilizer: 7-21-21 with 3.5% zinc at 300 lb/A drilled at planting, 2 May; urea (46% N) at 200 lb/A by airplane, 24 May; ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June

Water Management: Not applicable

Plot Size: 17.4 ft^2 - 0.58 (1 row) x 30 ft

Treated Area: 17.4 ft^2 - 0.58 (1 row) x 30 ft

Treatment(s): **Varieties/Experimental Lines**

AB647	Jackson	AR1176	AB869
Jodon	TX3006	Adair	Kaybonnet
TX3009	Bengal	LaGrue	9302008
Cypress	Lemont	9302065	Dellrose
Maybelle	9302106		

Plant Growth Regulator(s)

Seed Treatment
Gibberellic acid (22 ppm) - GibGro (0.17 oz/cwt)
- RELEASE (0.35 oz/cwt)

Foliar Treatment (tank mixed with 0.25% Tween 20)
Gibberellic acid (1.0 g/A) - RyzUp (1.0 fl. oz./A)

Timing

Seed treatment, 17 Feb
Foliar treatment (2- to 3-leaf), 24 May

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: Seed treatment - 1.5 inches, 8 May
0.1 inches, 11 May
3.6 inches, 12 May
1.5 inches, 18 May

Foliar treatment - 1.4 inches, 29 May
0.2 inches, 30 May
1.1 inches, 1 June

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 21 July

Fungicide(s): Dithane (4 oz/cwt), 17 Feb
Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: 8 May

Permanent Flood: Not applicable

Harvest Date: Not applicable

Harvested Area: Not applicable

Exp. Design: Randomized complete block design and four replications. A given plot contained a different variety or experimental line in each row. There were three such plots. Each contained six rows in accommodating 18 varieties and experimental lines. The position of a variety or experimental line within a given plot was constant. Each given plot was planted in triplicate in each replicate. Of each triplicate, one plot had untreated seed, one plot had seed treated with GibGro, and one plot had seed treated with RELEASE according to the randomization of plots.

Comments: **Seed Treatment - Plant Population**

Gibberellic acid had no effect on final stand of rice (Table 1). Across all varieties, the average stand was 16 plants/ft^2 at 16 days after planting (DAP). For these same varieties treating with GibGro and Release seed treatments produced 17 and 16 plants/ft^2, respectively. Moderate to heavy (1- to 3-inch) and numerous, timely rainfall events during the first 2 weeks after planting provided ideal conditions for emergence. Soil was compacted by the rainfall and effective planting depth was 2 inches or less.

Differences in final stand at 16 DAP between varieties and experimental lines were small (Table 1). Varieties with good to excellent stands (over 15 plants/ft^2) were AB869, Bengal, Cypress, Kaybonnet, LaGrue, Lemont, Maybelle, AR1176, 932008, and 9302065. Varieties with moderate stands (10 to 15 plants/ft^2) were AB647, Adair, Dellrose, Jackson, Jodon, TX3006, TX3009, and 9302106. There was no interaction between seed treatment and variety (Table 2).

Seed Treatment - Seedling Height

Seed treatment with gibberellic acid had no effect on seedling height at 29 DAP (Table 1). Whether seed was treated with GibGro, Release or had no plant growth regulator seed treatment, seedling height in all cases was 32 cm. Seed treatment effects on seedling height usually disappear after 21 DAP.

There was an 8-cm difference in plant height between varieties (Table 1). The tallest varieties, exceeding 35 cm in height, were Adair and Bengal. Most varieties had heights ranging from 30 to 34 cm. This group included AB647, AB869, Cypress, Jackson, Jodon, Kaybonnet, LaGrue, Lemont, Maybelle, AR1176, 9302008, 9302065, and 9302106. The shortest varieties with heights between 25 and 29 cm were Dellrose, TX3006, and TX3009. There was no interaction between seed treatment and variety (Table 2).

Foliar Treatment - Seedling Height

Overspraying each plot with RyzUp at the 2- to 3-leaf stage resulted in a significant increase in seedling height of all varieties and experimental lines (Table 3). The average increase in seedling height at 7 days after treatment (DAT) with RyzUp was 10 cm. Height increases for the various varieties and experimental lines ranged between 4 and 14 cm. Release seed treatment did not predispose seedlings to RyzUp as noted by similar responses to RyzUp, regardless of seed treatment. There were no interactions between seed treatment, RyzUp, and varieties/experimental lines (Table 4).

Table 1. The main effects of plant growth regulator seed treatment and variety/ experimental line on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Stand (plants/ ft²) 16 DAP	Plant Height (cm) 29 DAP
TABLE OF R MEANS				
Replicate 1			17	34
Replicate 2			17	34
Replicate 3			15	31
Replicate 4			15	29
TABLE OF A MEANS				
AB647			14efg	30ef
AB869			16de	34bcd
Adair			13fg	35abc
Bengal			19bc	37a
Cypress			19bc	34bcd
Dellrose			12gh	29f
Jackson			13fg	33cd
Jodon			14efg	34bcd
Kaybonnet			22a	34bcd
Lagrue			19bc	32de
Lemont			17cd	30ef
Maybelle			21ab	32de
AR1176			20ab	33cd
TX3006			10h	26g
TX3009			13fg	29f
9302008			16de	30ef
9302065			21ab	33cd
9302106			12gh	32de
TABLE OF B MEANS				
Control			16	32
GibGro	sp	0.17 seed	17	32
RELEASE	sp	0.35 seed	16	32

Means within a table followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of plant growth regulator seed treatment and variety/ experimental line on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants/ ft^2) 16 DAP	Plant Height (cm) 29 DAP
AB647 Control				12opq	30m-s
AB647 GibGro	sp	0.17	seed	16e-m	30i-r
AB647 RELEASE	sp	0.35	seed	14k-p	29o-s
AB869 Control				16f-n	33b-k
AB869 GibGro	sp	0.17	seed	16f-n	35b-e
AB869 RELEASE	sp	0.35	seed	17d-l	33c-o
Adair Control				12m-p	36abc
Adair GibGro	sp	0.17	seed	14j-p	36bcd
Adair RELEASE	sp	0.35	seed	12nop	33b-m
Bengal Control				21a-d	39a
Bengal GibGro	sp	0.17	seed	18b-j	36a-d
Bengal RELEASE	sp	0.35	seed	18b-j	36ab
Cypress Control				22abc	34b-g
Cypress GibGro	sp	0.17	seed	20a-f	34b-h
Cypress RELEASE	sp	0.35	seed	15g-o	33b-m
Dellrose Control				11pq	29o-s
Dellrose GibGro	sp	0.17	seed	14k-p	28rst
Dellrose RELEASE	sp	0.35	seed	13l-p	28q-t
Jackson Control				13l-p	33b-k

Continued.

Table 2. Continued.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants/ ft^2) 16 DAP	Plant Height (cm) 29 DAP
Jackson GibGro	sp	0.17	seed	12nop	33b-n
Jackson RELEASE	sp	0.35	seed	131-p	32c-o
Jodon Control				131-p	33b-l
Jodon GibGro	sp	0.17	seed	14k-p	34b-j
Jodon RELEASE	sp	0.35	seed	15h-o	34b-g
Kaybonnet Control				23a	35b-f
Kaybonnet GibGro	sp	0.17	seed	23ab	34b-j
Kaybonnet RELEASE	sp	0.35	seed	21a-e	33b-l
Lagrue Control				19b-i	32f-r
Lagrue GibGro	sp	0.17	seed	18c-k	31g-r
Lagrue RELEASE	sp	0.35	seed	21a-e	33c-o
Lemont Control				15i-p	301-s
Lemont GibGro	sp	0.17	seed	18c-k	31g-r
Lemont RELEASE	sp	0.35	seed	18b-j	31h-r
Maybelle Control				22ab	33b-m
Maybelle GibGro	sp	0.17	seed	21a-d	33b-m
Maybelle RELEASE	sp	0.35	seed	21a-e	32f-q
AR1176 Control				19a-h	35b-f
AR1176 GibGro	sp	0.17	seed	22ab	32e-p
AR1176 RELEASE	sp	0.35	seed	20a-f	34b-i
TX3006 Control				8q	24u

Continued.

Table 2. Continued.

Treatment Name	Fm Ds	Rate	Grow Stg	Stand (plants/ ft²) 16 DAP	Plant Height (cm) 29 DAP
TX3006 GibGro	sp	0.17	seed	12op	27stu
TX3006 RELEASE	sp	0.35	seed	12m-p	26tu
TX3009 Control				12m-p	29n-s
TX3009 GibGro	sp	0.17	seed	131-p	28q-t
TX3009 RELEASE	sp	0.35	seed	131-p	30j-s
9302008 Control				15h-o	29p-t
9302008 GibGro	sp	0.17	seed	16f-o	30k-s
9302008 RELEASE	sp	0.35	seed	16f-o	31g-r
9302065 Control				20a-f	34b-j
9302065 GibGro	sp	0.17	seed	22ab	31f-r
9302065 RELEASE	sp	0.35	seed	20a-g	33b-m
9302106 Control				12m-p	32e-p
9302106 GibGro	sp	0.17	seed	12op	32c-o
9302106 RELEASE	sp	0.35	seed	12m-p	32d-o
LSD (.05) =				4	3
Standard Dev.=				2.5839	2.0026
CV =				16.07	6.27

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 3. The main effect of plant growth regulator foliar treatment and variety/experimental line on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Seedling Height (cm) 7 DAT
TABLE OF R MEANS					
Replicate 1					39
Replicate 2					38
Replicate 3					35
Replicate 4					36
TABLE OF A MEANS					
Release		0	lb/A	seed	37
Release		0.35	oz p/A	seed	37
TABLE OF B MEANS					
RyzUp	1	0	oz p/A	3-4L	32a
RyzUp	1	1	oz p/A	3-4L	42b
TABLE OF C MEANS					
AB647					35c
AB869					39ab
Adair					37bcd
Bengal					40a
Cypress					38ab
Dellrose					34d
Jackson					38ab
Jodon					39ab
Kaybonnet					40a
Lagrue					37bcd
Lemont					34d
Maybelle					37bcd
AR1176					39ab
TX3006					31e
TX3009					35c
9302008					35c
9302065					39ab
9303106					37bcd

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 4. The simple effect of plant growth regulator foliar treatment and variety/ experimental line on seedling vigor in rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Seedling Height (cm) 7 DAT
Release		0	lb/A	seed	30u-z
RyzUp AB647	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	33p-w
RyzUp AB869	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	35m-s
RyzUp Adair	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	39g-n
RyzUp Bengal	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	34o-t
RyzUp Cypress	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	29v-z
RyzUp Dellrose	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	33p-w
RyzUp Jackson	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	33p-x
RyzUp Jodon	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	35m-t
RyzUp Kaybonnet	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	32s-y
RyzUp Lagrue	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	30u-z
RyzUp Lemont	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	33p-x
RyzUp Maybelle	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	35n-t
RyzUp AR1176	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	24{A
RyzUp TX3006	1	0	oz p/A	3-4L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Seedling Height (cm) 7 DAT
Release		0	lb/A	seed	29v-z
RyzUp TX3009	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	29xyz
RyzUp 9302008	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	34p-v
RyzUp 9302065	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	32r-y
RyzUp 9303106	1	0	oz p/A	3-4L	
Release		0	lb/A	seed	41d-k
RyzUp AB647	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	42b-i
RyzUp AB869	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	39g-m
RyzUp Adair	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	43a-g
RyzUp Bengal	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	43a-g
RyzUp Cypress	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	40f-l
RyzUp Dellrose	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	42b-i
RyzUp Jackson	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	43a-g
RyzUp Jodon	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	45a-e
RyzUp Kaybonnet	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	41b-j
RyzUp Lagrue	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	38i-o
RyzUp Lemont	1	1	oz p/A	3-4L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Rate Unit	Grow Stg	Seedling Height (cm) 7 DAT
Release		0	lb/A	seed	42b-i
RyzUp Maybelle	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	43a-g
RyzUp AR1176	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	37k-q
RyzUp TX3006	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	41d-k
RyzUp TX3009	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	40e-l
RyzUp 9302008	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	44a-f
RyzUp 9302065	1	1	oz p/A	3-4L	
Release		0	lb/A	seed	41d-k
RyzUp 9303106	1	1	oz p/A	3-4L	
Release		0.35	oz p/A	seed	29w-z
RyzUp AB647	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	32q-y
RyzUp AB869	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	33p-x
RyzUp Adair	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	36l-r
RyzUp Bengal	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	33p-x
RyzUp Cypress	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	28yz
RyzUp Dellrose	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	32q-y
RyzUp Jackson	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	34o-t
RyzUp Jodon	1	0	oz p/A	3-4L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Unit	Grow Stg	Seedling Height (cm) 7 DAT
Release		0.35	oz p/A	seed	33p-x
RyzUp Kaybonnet	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	33q-y
RyzUp Lagrue	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	31t-y
RyzUp Lemont	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	32r-y
RyzUp Maybelle	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	34p-u
RyzUp AR1176	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	26zA
RyzUp TX3006	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	30t-y
RyzUp TX3009	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	31s-y
RyzUp 9302008	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	33p-x
RyzUp 9302065	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	32q-y
RyzUp 9303106	1	0	oz p/A	3-4L	
Release		0.35	oz p/A	seed	41c-j
RyzUp AB647	1	1	oz p/A	3-4L	
Release		0.35	oz p/A	seed	47a
RyzUp AB869	1	1	oz p/A	3-4L	
Release		0.35	oz p/A	seed	43a-h
RyzUp Adair	1	1	oz p/A	3-4L	
Release		0.35	oz p/A	seed	44a-f
RyzUp Bengal	1	1	oz p/A	3-4L	
Release		0.35	oz p/A	seed	43a-g
RyzUp Cypress	1	1	oz p/A	3-4L	

Continued.

Table 4. Continued.

Treatment Name	Fm Ds	Rate	Unit	Grow Stg	Seedling Height (cm) 7 DAT
Release RyzUp Dellrose	1	0.35 1	oz p/A oz p/A	seed 3-4L	40f-l
Release RyzUp Jackson	1	0.35 1	oz p/A oz p/A	seed 3-4L	45a-d
Release RyzUp Jodon	1	0.35 1	oz p/A oz p/A	seed 3-4L	47a
Release RyzUp Kaybonnet	1	0.35 1	oz p/A oz p/A	seed 3-4L	46ab
Release RyzUp Lagrue	1	0.35 1	oz p/A oz p/A	seed 3-4L	44a-f
Release RyzUp Lemont	1	0.35 1	oz p/A oz p/A	seed 3-4L	39g-n
Release RyzUp Maybelle	1	0.35 1	oz p/A oz p/A	seed 3-4L	42b-i
Release RyzUp AR1176	1	0.35 1	oz p/A oz p/A	seed 3-4L	44a-f
Release RyzUp TX3006	1	0.35 1	oz p/A oz p/A	seed 3-4L	37j-p
Release RyzUp TX3009	1	0.35 1	oz p/A oz p/A	seed 3-4L	38h-o
Release RyzUp 9302008	1	0.35 1	oz p/A oz p/A	seed 3-4L	41d-k
Release RyzUp 9302065	1	0.35 1	oz p/A oz p/A	seed 3-4L	45abc
Release RyzUp 9303106	1	0.35 1	oz p/A oz p/A	seed 3-4L	42b-i
LSD (.05) =					4
Standard Dev.=					2.5796
CV =					6.98

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

YIELD ENHANCEMENT STUDIES

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Chitosan and Yield Enhancement in Drill-Seeded Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: Cypress

Seeding Rate: 100 lb/A

Planting Date: 20 Apr 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc and 2% sulfur at 300 lb/A drilled preplant, 20 Apr; urea (46% N) at 200 lb/A by airplane, 26 May; urea (46% N) at 100 lb/A by airplane, 19 June

Water Management: Flushed, 27 Apr

Plot Size: 162.5 ft^2 - 6.5 (11 rows) x 25 ft

Treated Area: 162.5 ft^2 - 6.5 (11 rows) x 25 ft

Treatment(s):

Polymer Seed Treatment Types

Carboxymethylcellulose (CMC)
420 chitosan
561 chitosan
X chitosan
Y chitosan

Polymer Foliar Treatment Types

Carboxymethylcellulose
420 chitosan

Chitosan Salts

Acetic acid
Glutamic acid

Fungicide (4 oz dithane/cwt)

Water (tap water, same source of water used in polymer solutions)

Seed Treatment Methodology

Dry, seed treatment applied 1 week before planting

Wet, seed treatment applied 1 day before planting

Low volume, seed treatment applied in a total volume equivalent to 18 oz/cwt

If no volume specified, seed treatment applied in a total volume equivalent to 186 oz/cwt

Foliar Treatment Timings

Panicle initiation (PI), 14 June
Panicle differentiation (PD), 21 June
50% heading (HD), 13 July

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: 0.4 inches, 21 Apr; 3.6 inches, 23 Apr; No rainfall for 24 hours post foliar application

Herbicide(s): Stam M4 (1 gal/A) by airplane, 4 May
Stam M4 (3 qt/A) by airplane, 16 May
Londax (1.5 oz/A) by airplane, 1 June
Ordram 15G (25 lb/A) by airplane, 9 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 24 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 18 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 18 July

Emergence: 27 Apr

Permanent Flood: 19 May

Harvest Date: 17 Aug

Harvested Area: 162.5 ft^2 - 6.5 x 25 ft

Exp. Design: Randomized complete block and 12 replications

Comments: There were no significant effects of seed or foliar treatments on grain moisture or grain yield (Table 1). Grain moisture ranged from 17.4 to 18.0% across all treatments. The standard fungicide seed treatment had a grain yield of 10,152 lb/A. Grain yields of the other seed treatments and seed and foliar treatment combinations ranged from 9867 to 10,157 lb/A. A yield difference of 324 lb/A was necessary for a significant difference.

Seed treatment volume had no effect on chitosan activity (Table 1). Treating seed with a high volume of 420 chitosan glutamic acid (186 oz/cwt) produced an equivalent yield compared with treating seed with a low or standard volume (18 oz/cwt).

The type of chitosan salt also had little effect on chitosan activity (Table 1). Whether the salt was acetic acid or glutamic acid, the yields were very similar. There was a trend for slightly higher yields with the glutamic salt compared with the acetic salt.

Three foliar applications of polymers during the reproductive phase of growth produced no differences in the effects of carboxymethylcellulose and 420 chitosan on grain yield (Table 1). There was also no difference in the effects of the acetic and glutamic acids of the two foliarly applied polymers on grain yield.

The CV (coefficient of variation) for this experiment was 4% (Table 1). This is a very low variation and gives a preliminary indication that there is better than a 95% certainty that a significant 10% yield increase, if it had occurred, would have been detected.

Table 1. The effect of chitosan seed and foliar treatment on rice production in drill-seeded rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Grow Stage	Grain Moisture (%)	Grain Yield at 12% Moisture (lb/A)
Dry, fungicide Low volume	seed	17.9a	10152a
Dry 420 chitosan/glutamic acid	seed	17.7a	9946a
Dry 420 chitosan/glutamic acid Low volume	seed	17.7a	10049a
Wet Water	seed	17.7a	10015a
Wet 420 chitosan/glutamic acid	seed	17.7a	9861a
Wet 420 chitosan/acetic acid	seed	17.4a	10034a
Wet 561 chitosan/glutamic acid	seed	17.7a	9893a
Wet 561 chitosan/acetic acid	seed	17.5a	9944a
Wet X chitosan/glutamic acid	seed	18.0a	9867a
Wet X chitosan/acetic acid	seed	17.4a	10157a
Wet Y chitosan/acetic acid	seed	17.4a	10123a
Wet CMC/glutamic acid CMC/glutamic acid CMC/glutamic acid CMC/glutamic acid	seed PI PD HD	17.8a	9964a
Wet CMC/acetic acid CMC/acetic acid CMC/acetic acid CMC/acetic acid	seed PI PD HD	17.9a	9988a
Wet 420 chitosan/glutamic acid 420 chitosan/glutamic acid 420 chitosan/glutamic acid 420 chitosan/glutamic acid	seed PI PD HD	17.9a	9911a
Wet 420 chitosan/acetic acid 420 chitosan/acetic acid 420 chitosan/acetic acid 420 chitosan/acetic acid	seed PI PD HD	18.2a	9937a
LSD (.05) =		0.7	324
Standard Dev.=		.90556	400.35
CV =		5.11	4.01

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

YIELD ENHANCEMENT STUDIES

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Chitosan and Yield Enhancement in Continuous Flood Rice

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: See treatments

Seeding Rate: 140 lb/A

Planting Date: 25 Apr 95

Row Spacing: Broadcast

Fertilizer: 23-12-12 with 3.5% zinc and 2% sulfur at 300 lb/A drilled preplant, 19 Apr; urea (46%N) at 100 lb/A by airplane, 19 June

Water Management: Flooded for seeding (1 to 3 inches), 24 Apr; flood maintained until drained for harvest

Plot Size: 150 ft^2 - 5 x 30 ft

Treated Area: 150 ft^2 - 5 x 30 ft

Treatment(s):

Variety

Cypress
Lemont

Polymer Seed Treatment Types

Carboxymethylcellulose (CMC)
420 chitosan
561 chitosan
X chitosan

Chitosan Salts

Acetic acid
Glutamic acid

Water (tap water, same source of water used in polymer solutions)

Seed Treatment Methodology

Soak, seed germinated prior to planting by soaking in water for 12 hours, removing the water and allowing the water soaked seed to stand for 12 hours

Untreated, seed had no seed treatment

Wet, seed treatment applied 1 day before planting in a total volume equivalent to 186 oz/cwt

Sprayer: N/A

Pertinent Rainfall: None

Herbicide(s): Stam M4 (3 qt/A) + Basagran (1.5pt/A) + Londax (2 oz/A) and Ordram (25 lb/A) by airplane, 24 May
Basagran + Prime Oil (2 + 1 pt/A) by airplane, 1 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Furadan 3G (17 lb/A) by airplane, 19 June
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 18 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 18 July

Emergence: 29 Apr

Permanent Flood: 24 Apr

Harvest Date: 16 Aug

Harvested Area: 150 ft^2 - 5 x 30 ft

Exp. Design: Randomized complete block and 12 replications

Comments: Significant differences in grain moisture and grain yield were noted primarily between varieties (Table 1). On average, Cypress had higher grain moisture compared with Lemont, although there was some variability between treatments. Grain moistures for the Cypress treatments ranged between 18.1 and 19.3%, and grain moistures for the Lemont treatments ranged between 17.4 and 18.4%. All Lemont treatments had significantly lower grain yields than the Cypress treatments. Grain yields of the Lemont treatments ranged between 7689 and 8017 lb/A, and grain yields of the Cypress treatments ranged between 9147 and 9797 lb/A.

A yield differential of 517 lb/A (LSD) was necessary for a significant difference (Table 1). The range in grain yields for the Lemont treatments was less than 500 lb/A, showing no effect between the Lemont seed treatments. The range in grain yields for the Cypress seed treatments exceeded 517 lb/A, and there were significant differences. The significant differences in Cypress grain yields (greater than 517 lb/A) were between seed treated with 561 chitosan glutamic acid and seed with no treatment or seed treated with either X chitosan salt. Grain yields for 561 chitosan glutamic acid, untreated seed, X chitosan acetic acid, and X chitosan glutamic acid were 9797, 9147, 9182, and 9196 lb/A. These results show the 561 chitosan glutamic acid treatment gave over a 600 lb/A yield increase compared with untreated seed and seed treated with X chitosan. Cypress seed treated with water alone (186 oz/cwt), carboxymethylcellulose acetic acid, 561 chitosan acetic acid, and either 420 chitosan salt had grain yields ranging from 9320 to 9717 lb/A. These yields were comparable and not significantly different from the grain yield of seed treated with 561 chitosan glutamic acid.

The CV (coefficient of variation) for this experiment was 7.22% (Table 1). This is an intermediate variation and gives a preliminary indication that there is better than a 90% certainty that a significant 10% yield increase, if it had occurred, would have been detected.

Table 1. The effect of chitosan on rice production in continuous flood rice. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Grain Moisture (%)	Grain Yield at 12% Moisture (lb/A)
Lemont Untreated	18.3cde	7689c
Lemont, wet Water	18.0ef	7901c
Lemont, wet Soak	17.4f	8017c
Lemont, wet CMC/glutamic acid	18.4a-e	7782c
Lemont, wet 420 chitosan/glutamic acid	18.3b-e	7923c
Cypress Untreated	18.7a-e	9147b
Cypress, wet Water	19.0abc	9717ab
Cypress, wet CMC/acetic acid	18.1def	9608ab
Cypress, wet 420 chitosan/acetic acid	18.9a-e	9487ab
Cypress, wet 420 chitosan/glutamic acid	19.3ab	9320ab
Cypress, wet 561 chitosan/acetic acid	19.0a-d	9448ab
Cypress, wet 561 chitosan/glutamic acid	19.3ab	9797a
Cypress, wet X chitosan/acetic acid	19.0a-d	9182b
Cypress, wet X chitosan/glutamic acid	19.3a	9196b
LSD (.05) =	0.8	517
Standard Dev.=	1.0128	640.17
CV =	5.44	7.22

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDHEAD SUPPRESSANT STUDIES - MALEIC HYDRAZIDE TOLERANCE

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Maleic Hydrazide and Variety Tolerance in Drilled-Seeded Rice

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: See Treatments

Seeding Rate: 100 lb/A

Planting Date: 2 May 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc at 300 lb/A drilled preplant, 2 May;
urea (46% N) at 200 lb/A by airplane, 24 May;
ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June

Water Management: Flushed, 5 May

Plot Size: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treated Area: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treatment(s): **Variety(s)**

Jackson
Jodon
Maybelle

Plant Growth Regulator

Royal MH 30 SG (2.5 lb/A)

Timing

Milk to dough stage - Maybelle, 26 July
Jodon, 3 Aug
Jackson, 7 Aug

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: No rainfall within 24 hours after application

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 21 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: 13 May

Permanent Flood: 26 May

Harvest Date: 23 Aug

Harvested Area: 195 ft^2 - 6.5 x 30 ft

Exp. Design: Randomized complete block and four replications. Factorial arrangement of treatments (3 varieties x 2 plant growth regulator rates)

Comments: **First Crop**

Royal MH 30 SG (MH) had no effect on partially developed panicles (Table 1). Partially developed panicles (partial panicles) had florets on the upper half of the panicle that produced grain and florets on the lower half of the panicle that did not produce grain. The controls for all three varieties averaged 6% partial panicles compared with 7% in the MH treatments. There were varietal differences. Jackson and Jodon with 8 and 9% partial panicles had more partial panicles than Maybelle, which had 3% partial panicles. There were no sterile panicles that produced no grain.

Similar trends were noted in grain moisture (Table 1). MH had no effect on maturity as measured by grain moisture. On average, grain moisture was 18.8 and 18.6% for the controls and MH treatments, respectively. There were varietal differences. Maybelle is inherently earlier maturing than Jackson and Jodon, and the grain moisture results reflect this difference. Grain moistures were 17.6, 19.2, and 19.4% for Maybelle, Jackson, and Jodon, respectively.

Even though MH had no significant effect on panicle development, MH did cause a significant general reduction in grain yield of about 5%. On average, grain yields were 7798 and 7454 lb/A for the controls and MH treatments, respectively (Table 1). There was an indication of varietal intolerance to MH (Table 2). The grain yield of Jackson was unaffected by MH. Jackson with and without MH treatment yielded 7853 and 7735 lb/A,

respectively. The grain yield of Jodon was reduced by 5%. Jodon with and without MH treatment yielded 7378 and 7784 lb/A, respectively. The grain yield of Maybelle was reduced more than the yield of Jodon, and the reduction was 10%. Maybelle with and without MH treatment yielded 7133 and 7875 lb/A, respectively. These results indicate there may be some varietal sensitivity to MH.

Total and whole milling yields were different between varieties, and MH caused a slight increase in total milling yield (Table 1). Total milling yield was highest for Maybelle, intermediate for Jackson, and lowest for Jodon. A different trend was noted for whole milling yield. Whole milling yield was highest for Jackson, intermediate for Jodon, and lowest for Maybelle. Total milling yield averaged 1% higher with MH across all varieties (Table 1).

Second Crop

Harvest of the first crop was relatively uniform. Stubble height in the second crop for all plots ranged between 39 and 48 cm (Table 2). This shows there were equal amounts of stubble for ratoon growth in each treatment.

Ratoon crop grain yields were significantly increased by MH application in the first crop (Table 3). On average, the varieties yielded 1346 lb/A. With the application of MH, the average yield was 1528 lb/A. There was no variety by MH interaction (Table 4). Jackson was the least productive variety with 861 lb/A, and Jodon and Maybelle had comparable yields with 1692 and 1759 lb/A, respectively.

Total Crop

Total grain production from the first and second crop was not affected by MH (Table 3). Grain yields for the three varieties averaged 9144 and 8983 lb/A for controls and MH treatments, respectively. There was no variety by MH interaction (Table 4). Jackson was the least productive variety with 8654 lb/A, and Jodon and Maybelle had comparable yields with 9272 and 9263 lb/A, respectively.

Table 1. The main effect of a first crop post heading plant growth regulator application on varietal sensitivity in first crop rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Partial panicles (%)	Sterile panicles (%)	Grain Moisture (%)	Grain Yield (lb/A)	Total Milling Yield (%)	Whole Milling Yield (%)
TABLE OF R MEANS									
Replicate 1				6	0	19.2	7338	67	52
Replicate 2				7	0	18.4	7522	68	51
Replicate 3				7	0	18.6	7827	68	50
Replicate 4				7	0	18.7	7817	68	51
TABLE OF A MEANS									
Royal MH 30 SG	df	0		6	0	18.8	7798a	67a	51
Royal MH 30 SG	df	1.5	MS	7	0	18.6	7454b	68b	51
TABLE OF B MEANS									
Jackson				8a	0	19.2a	7794	68b	55a
Jodon				9a	0	19.4a	7581	66c	51b
Maybelle				3b	0	17.6b	7504	69a	47c

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effect of a first crop post heading plant growth regulator application on varietal sensitivity in first crop rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds	Rate	Grow Stg	Partial panicles (%)	Sterile panicles (%)	Grain Moisture (%)	Grain Yield (lb/A)	Total Milling Yield (%)	Whole Milling Yield (%)
Royal MH 30 SG Jackson	df	0		6ab	0a	19.3a	7735a	67c	55a
Royal MH 30 SG Jackson	df	1.5	MS	8a	0a	19.2a	7853a	68bc	56a
Royal MH 30 SG Jodon	df	0		10a	0a	19.4a	7784a	66e	50b
Royal MH 30 SG Jodon	df	1.5	MS	8ab	0a	19.3a	7378ab	66d	51b
Royal MH 30 SG Maybelle	df	0		2c	0a	17.8b	7875a	69ab	48bc
Royal MH 30 SG Maybelle	df	1.5	MS	4bc	0a	17.4b	7133b	69a	47c
LSD (.05) =				4	0	0.7	538	1	3
Standard Dev.=				2.3915	0	.46295	356.97	.5662	2.156
CV =				36.56	0	2.47	4.68	0.84	4.22

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 3. The main effect of a first crop post heading plant growth regulator application on varietal sensitivity in ratoon and total crop rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Pm Ds Rate	Grow Stg	Stubble Height (cm)	Ratoon Yield (lb/A)	Total Yield (lb/A)
		TABLE OF R MEANS			
Replicate 1			45	1265	8603
Replicate 2			43	1695	9217
Replicate 3			43	1508	9336
Replicate 4			44	1281	9098
		TABLE OF A MEANS			
Royal MH 30 SG df	0		43	1346a	9144
Royal MH 30 SG df	1.5	MS	44	1528b	8983
		TABLE OF B MEANS			
Jackson			48	861a	8654a
Jodon			44	1692b	9272b
Maybelle			39	1759b	9263b

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 4. The simple effect of a first crop post heading plant growth regulator application on varietal sensitivity in ratoon and total crop rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Pm Ds Rate	Grow Stg	Stubble Height (cm)	Ratoon Yield (lb/A)	Total Yield (lb/A)
Royal MH 30 SG df Jackson	0		48a	877c	8611c
Royal MH 30 SG df Jodon	0		47a	1550b	9333a
Royal MH 30 SG df Maybelle	0		42a	1613ab	9488a
Royal MH 30 SG df Jackson	1.5	MS	45a	845c	8698bc
Royal MH 30 SG df Jodon	1.5	MS	38a	1834ab	9212ab
Royal MH 30 SG df Maybelle	1.5	MS	41a	1906a	9039abc
LSD (.05) =			9	303	507
Standard Dev.=			6.2064	201.12	336.36
CV =			14.25	13.99	3.71

Means followed by the same letter do not significantly differ (Duncan's multiple range test, P=.05).

SEEDHEAD SUPPRESSANT STUDIES - MALEIC HYDRAZIDE TOLERANCE

R.T. Dunand and R.R. Dilly, Jr.

Experiment: Maleic Hydrazide and Time of Application on Drilled-Seeded Rice

Location: Rice Research Station, Crowley, LA (North Unit)

Variety: Cypress

Seeding Rate: 100 lb/A

Planting Date: 2 May 95

Row Spacing: 7-inch

Fertilizer: 7-21-21 with 3.5% zinc at 300 lb/A drilled preplant, 2 May; urea (46% N) at 200 lb/A by airplane, 24 May; ammonium sulfate (21% N) at 150 lb/A by airplane, 22 June

Water Management: Flushed, 5 May

Plot Size: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treated Area: 195 ft^2 - 6.5 (11 rows) x 30 ft

Treatment(s): **Plant Growth Regulator**

Royal MH 30 SG (2.5 lb/A)

Timing

100% headed, 01 Aug
Milk stage, 10 Aug
Dough stage, 15 Aug
Physiological maturity, 21 Aug

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: No rainfall within 24 hours after application

Herbicide(s): Stam M4 (3 qt/A) by airplane, 16 May
Stam M4 (3 qt/A) by airplane, 24 May
Londax (1.5 oz/A) by airplane, 7 June
Londax (1 oz/A) by airplane, 19 June

Insecticide(s): Furadan 3G (17 lb/A) by airplane, 31 May
Methyl parathion (.5 pt/A) by airplane, 8 July
Methyl parathion (.5 pt/A) by airplane, 21 July

Fungicide(s): Benlate (1 lb/A) by airplane, 8 July
Benlate (1 lb/A) by airplane, 21 July

Emergence: 13 May

Permanent Flood: 26 May

Harvest Date: 28 Aug

Harvested Area: 195 ft^2 - 6.5 x 30 ft

Exp. Design: Randomized complete block and four replications

Comments: **First Crop**

At harvest maturity, mainly evaluations of reproductive development were made. These included panicle density, panicle development (infertile and partially developed panicles), plant height, grain moisture, and grain yield. Panicle development and yield were the more significantly affected parameters measured (Table 1).

Panicle Development

Since applications of Royal MH 30 SG (MH) were made after heading, panicle density was unaffected by time of application (Table 1). Panicle densities ranged between 40 and 47 panicles/ft^2. Under most growing conditions, rice averages 30 to 50 panicles/ft^2.

Panicle development was significantly affected by time of application of MH (Table 1). The occurrence of sterile panicles or panicles producing no grain and remaining erect at harvest was greatest for the heading time of application. The control and milk stage (MS), dough stage (DS) and physiological maturity (PM) times of application resulted in less than 2% sterile panicles. The heading application had 6% sterile panicles and was significantly higher compared with the other treatments.

Similar results were noted for partially developed panicles (partial panicles) on which florets on the upper half of the panicle produced grain and florets on the lower half of the panicle did not produce grain (Table 1). For the control, MS, DS and PM timings partial panicles accounted for between 7 and 18% of all panicles. For the heading timing, 47% of the panicles were partially filled. Of the total number of panicles that did not develop completely (sterile + partial panicles combined), over half of the panicles in the heading timing were incompletely developed compared with approximately 10 to 20% in the other treatments. The difference was significant.

Grain Production

The effects of MH timing on panicle development directly impacted grain production (Table 1). Applying MH at heading significantly reduced grain yield and was the only treatment to do so. Grain yield in the control was 7023 lb/A. In the heading treatment, grain yield was 5805 lb/A, approximately a 1200 lb/A yield decrease. Applications of MH from MS to PM resulted in yields that ranged from 6768 to 7167 lb/A.

Plant Stature and Crop Maturity

Mature plant height and grain moisture were not significantly affected by time of MH application (Table 1). Plant height ranged between 106 and 108 cm, and grain moisture ranged between 18.4 and 19.3% for all treatments.

Milling Yield

Evaluations of total and whole milling yields showed a reduction in whole milling yield by the heading application of MH (Table 1). Whole milling yield was reduced 1% by the heading application and was 55%. Whole milling yields for the control, MS, DS and PM applications ranged between 56 and 57%. Total milling yields for all times of applications ranged between 68 and 69% and were not significantly different.

Table 1. The effect of post booting timing of Royal MH 30 SG on rice production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Sterile Panicles (%)	Partial Panicles (%)	Grain Yield (lb/A)	Plant Height (cm)	Grain Moisture (%)	Total Milling Yield (%)	Whole Milling Yield (%)
Royal MH 30 SG df	0		0b	9b	7023ab	108a	18.6a	68ab	56a
Royal MH 30 SG df	1.5	HD	6a	47a	5805c	107a	19.3a	68b	55b
Royal MH 30 SG df	1.5	MS	1b	18b	6768b	107a	18.6a	68ab	57a
Royal MH 30 SG df	1.5	DS	0b	7b	7046ab	106a	18.7a	69a	57a
Royal MH 30 SG df	1.5	PM	0b	13b	7167a	106a	18.4a	68ab	57a
LSD (.05) =			2	15	322	3	0.9	0	1
Standard Dev.=			1.3038	9.9582	209.24	1.7865	.60924	.32131	.79851
CV =			104.31	52.97	3.09	1.67	3.25	0.47	1.41

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Second Crop

Evaluations of ratoon crop growth were made on regrowth from first crop stubble and at maturity. At approximately 3 weeks after harvest of the first crop, ratoon growth was measured and rated. At maturity, grain production was measured.

Regrowth Production

At 23 days after first crop harvest (23 DAH), ratoon height and visual rating were highest in the heading treatment (Table 2). Ratoon height was 70 cm for the heading treatment and ranged between 52 and 61 cm for the other times of application. Visual rating included area of plot with ratoon growth and general volume and appearance of the ratoon growth. Since there were four treatments and a control, the ratings were made relative and a value between 1 and 5 assigned. Within each replication, each plot was rated with a different value from the other four plots. A rating of 1 meant a plot had the best ratoon growth compared with the other four plots in a replicate. The heading treatment had a rating of 1 and the other treatments had average ratings between 3 and 4. The differences in height and rating between the heading application and the other timings and control were significant.

Grain Production

Ratoon crop yield was significantly affected by time of application of MH to the first crop (Table 2). Grain yield of the heading application was approximately twice that of the other times of application and control. Grain yield of the heading application was 1374 lb/A compared with between 608 and 723 lb/A for the control and applications made after heading.

Total Crop Production

Total crop yield was significantly decreased when MH was applied at heading of the first crop (Table 2). The large reduction in first crop yield by the heading application was not offset by the significant increase in ratoon crop yield. Total crop yield for the control and post heading applications of MH ranged between 7491 and 7775 lb/A compared with 7179 lb/A for the heading application.

Table 2. The effect of post booting timing of Royal MH 30 SG in the first crop on ratoon and total crop production in rice. Rice Research Station, Crowley, LA. 1985.

Treatment Name	Fm Ds Rate	Grow Stg	Ratoon Height (cm) 23 DAH	Rating 23 DAH	Ratoon Yield (lb/A)	Total Yield (lb/A)
Royal MH 30 SG df	0		53b	4ab	655b	7678a
Royal MH 30 SG df	1.5	HD	70a	1c	1374a	7179b
Royal MH 30 SG df	1.5	MS	61b	3ab	723b	7491ab
Royal MH 30 SG df	1.5	DS	57b	3b	649b	7695a
Royal MH 30 SG df	1.5	PM	52b	4a	608b	7775a
LSD (.05) =			8	1	171	354
Standard Dev.=			5.3236	.96176	111.29	229.6
CV =			9.08	32.60	13.88	3.04

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

WEED CONTROL STUDIES

WATER BERMUDAGRASS CONTROL STUDIES

Michael Braverman

Water Bermudagrass Control: Preplant Burndown Studies

Two types of perennial paspalum "water bermudagrass" were investigated in these studies. They included mudbank paspalum on Mr. Clarence Burken's farm near Thornwell and brooks paspalum on Mr. Jimmy Hoppe's farm near Fenton.

Treatments included Roundup at 20, 40, and 60 oz/A plus 0.5% by volume X-77 surfactant, the same treatments plus ammonium sulfate, sequential treatments of 15 or 20 oz of Roundup plus surfactant and ammonium sulfate applied 2 weeks apart, 85 oz/A of Touchdown plus surfactant, 3 pt/A Gramoxone plus surfactant, Ignite at 1.0 lb ai/A, and a non-treated check.

The data shown (Figure 1) indicate the control of each paspalum at 4 weeks after treatment. In these studies, mudbank paspalum was controlled 90 to 97% with all treatments. Brooks paspalum was much more difficult to control than the mudbank paspalum. Most treatments provided 60 to 80% control. Roundup at 60 oz/a plus surfactant and ammonium sulfate and Touchdown at 85 oz/A both provided 90% control, while Ignite at 1.0 lb ai/A provided 98% control of brooks paspalum.

Water Bermudagrass Control Postemergence in Rice

Postemergence control of mudbank paspalum was also investigated on Mr. Jimmy Hoppe's farm and the farm of Mr. Roger Zaunbrecher, near Lake Arthur.

Rice was in the 2-leaf stage and drained at the time of application. At 1 week after treatment, Arrosolo at 1 gal or Facet at 0.75 lb/a + COC at 1 qt/A alone provided only 43 and 22% control, respectively, and maintained similar levels of control at 4 weeks after treatment (Figure 2). The combination of Arrosolo at 1 gal + Facet at 0.75 lb controlled mudbank paspalum 78%, which was superior to either herbicide alone. However, even this treatment only provided 50% control after 4 weeks. Whip had only 12 and 8% activity at 1 and 4 weeks after treatment, respectively. When splitting the treatments of 0.75 lb Facet at the 2-leaf stage of rice, followed by 27 lb Ordram at the 4-leaf rice stage (postflood), control was only 21% at 1 week after treatment but improved slightly to 30% at 4 weeks after treatment.

Figure 1. Water Bermudagrass Preplant Burndown

Mudbank and Brooks Paspalum

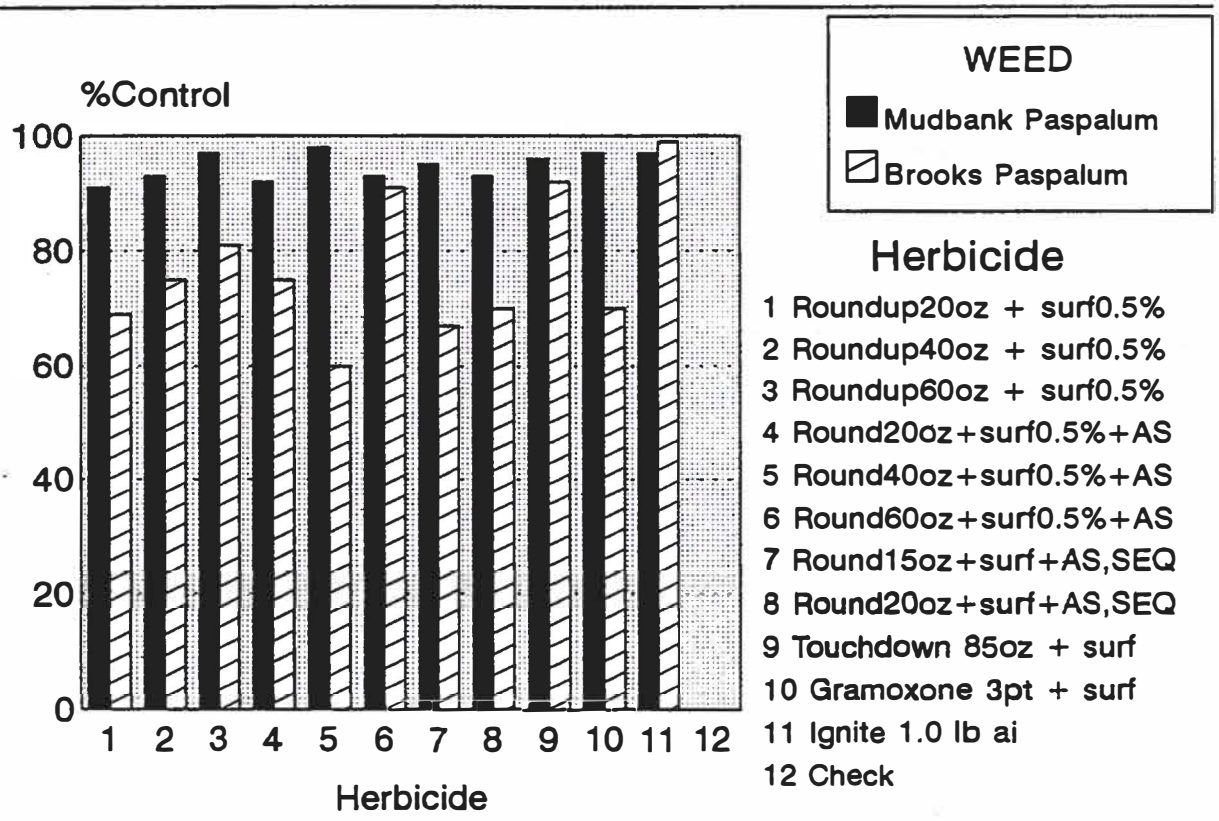
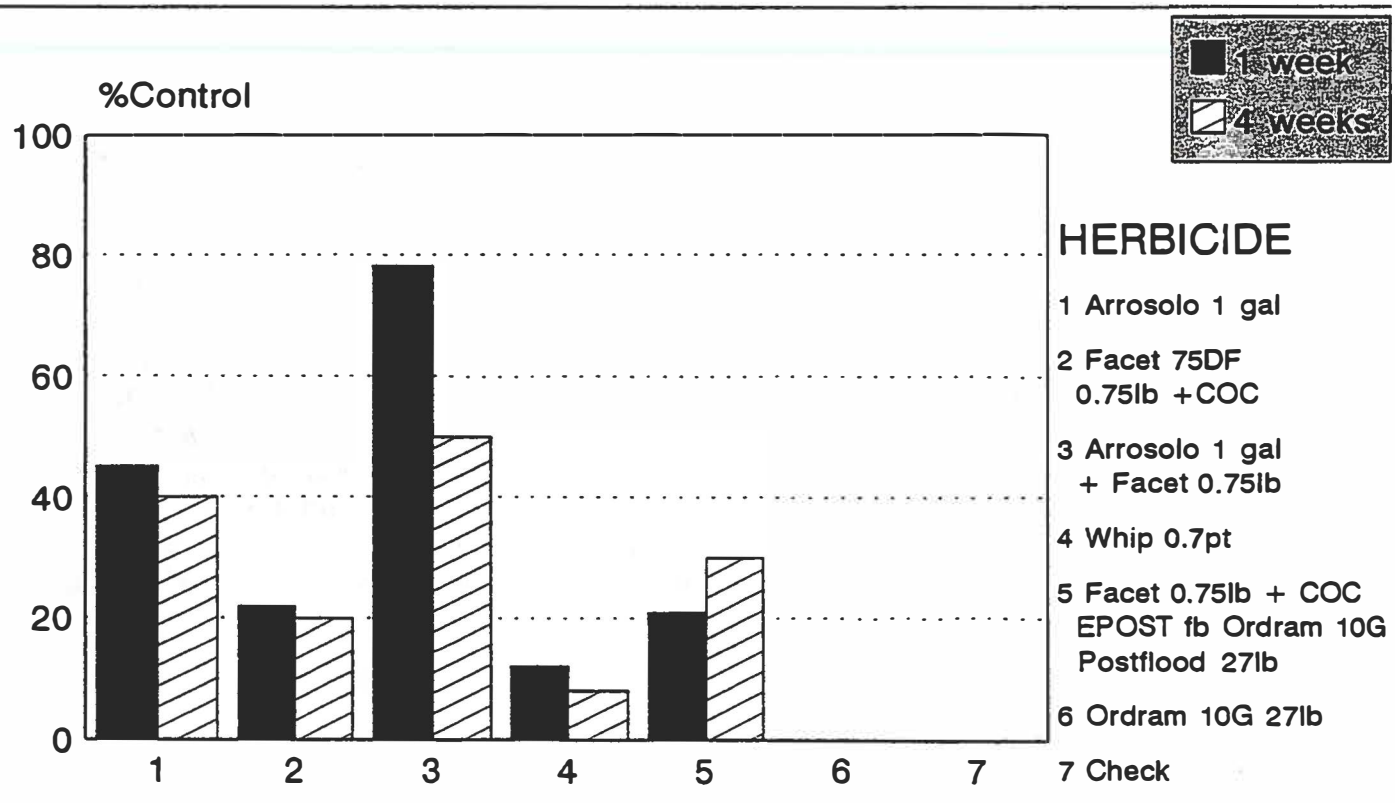


Figure 2. Water Bermudagrass Postemergence

Mudbank Paspalum



SOIL PREPARATION - SOIL CLOD STUDIES

Michael Braverman and Wei Zhang

Soil preparation is an important phase of rice production. Soils subject to untimely rainfall or heavy clay soils that are slow to dry may be difficult to work smoothly. In these situations, soil clods may be present at the time of planting and herbicide application. Herbicide labels often state that when soil clods are present at the time of application, subsequent rainfall, flooding, or flushing may cause soil clods to break up and expose untreated soil. This untreated soil from the clods may contain weed seed that can germinate and result in poor weed control. The purpose of this study was to compare three herbicides and three clod sizes on the ability to control weeds.

Plastic shoeboxes approximately 31 X 16 cm (12 X 6 1/2 inches) were filled with sieved soil and then covered with a single layer of clods. Clods were approximately 2, 3, or 4 cm (3/4, 1 1/8, or 1 1/2 inches) in diameter. Bolero, Prowl, and Facet were applied at 3, 0.75, or 0.66 lb ai/A. Soil was irrigated after treatment and soil clods dissolved. The primary broadleaf weeds were Indian jointvetch, pigweed, and dayflower. The primary grasses were junglerice, broadleaf signalgrass, and crabgrass.

The effect of clod size and herbicide on the number of broadleaf weeds is in Figure 3. The number of broadleaf weeds were significantly less than the untreated check with all herbicides when 2- or 3-cm clods were present. When no clods or 4-cm clods were present, the number of broadleaf weeds were less and were similar to the untreated check. There were no significant differences among herbicides, but there was a tendency towards greater weed populations with Bolero. Among the non-treated checks, the 2-cm clods had the most broadleaf weeds.

The effect of clod size and herbicide on the number of grass weeds is in Figure 4. The number of grasses was significantly less than the untreated check with all herbicides applied regardless of clod size. As with the broadleaf weeds, the 2-cm clods produced the greatest number of grass weeds. When no clods were present, Bolero, Prowl, and Facet controlled grasses equally. When 2-, 3-, or 4-cm clods were present, Bolero provided poorer grass control than Prowl or Facet.

Figure 3. Clod size - Broadleaf number

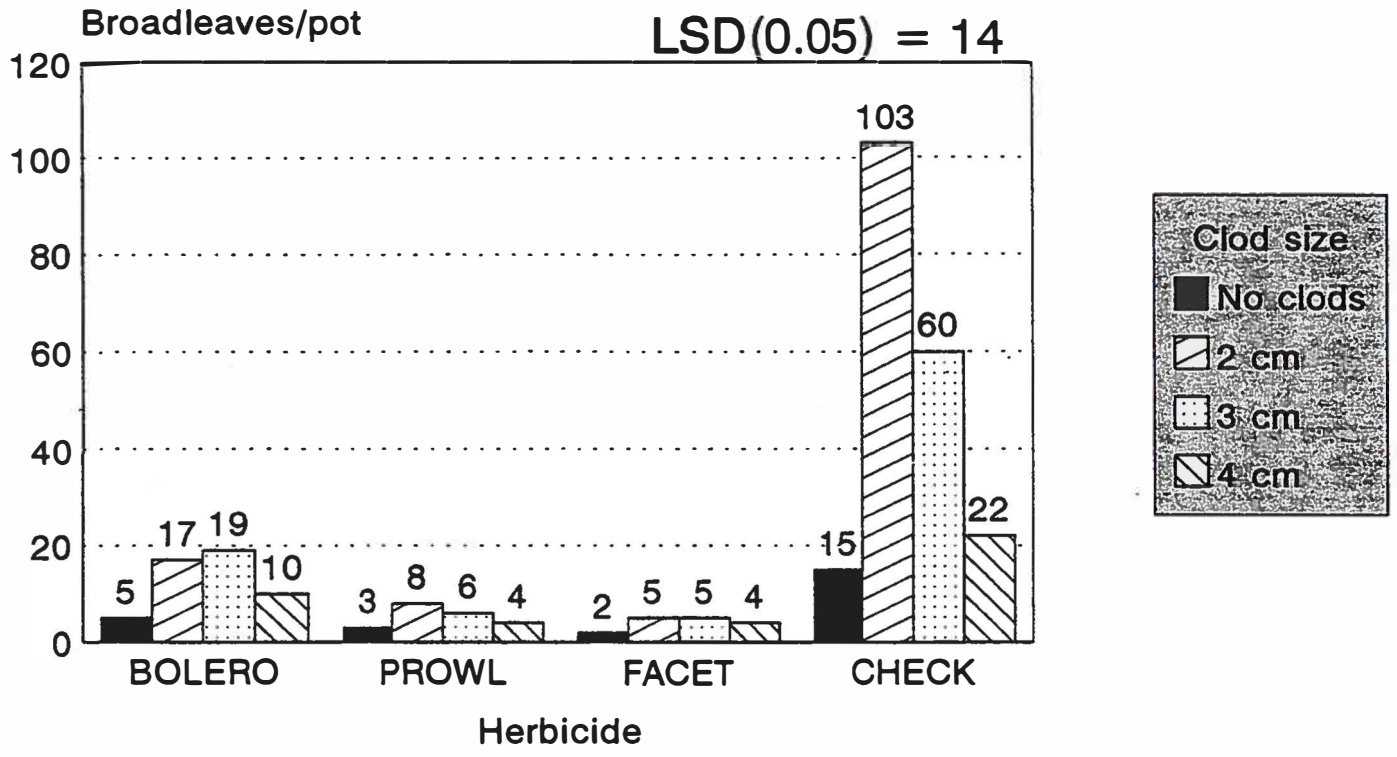
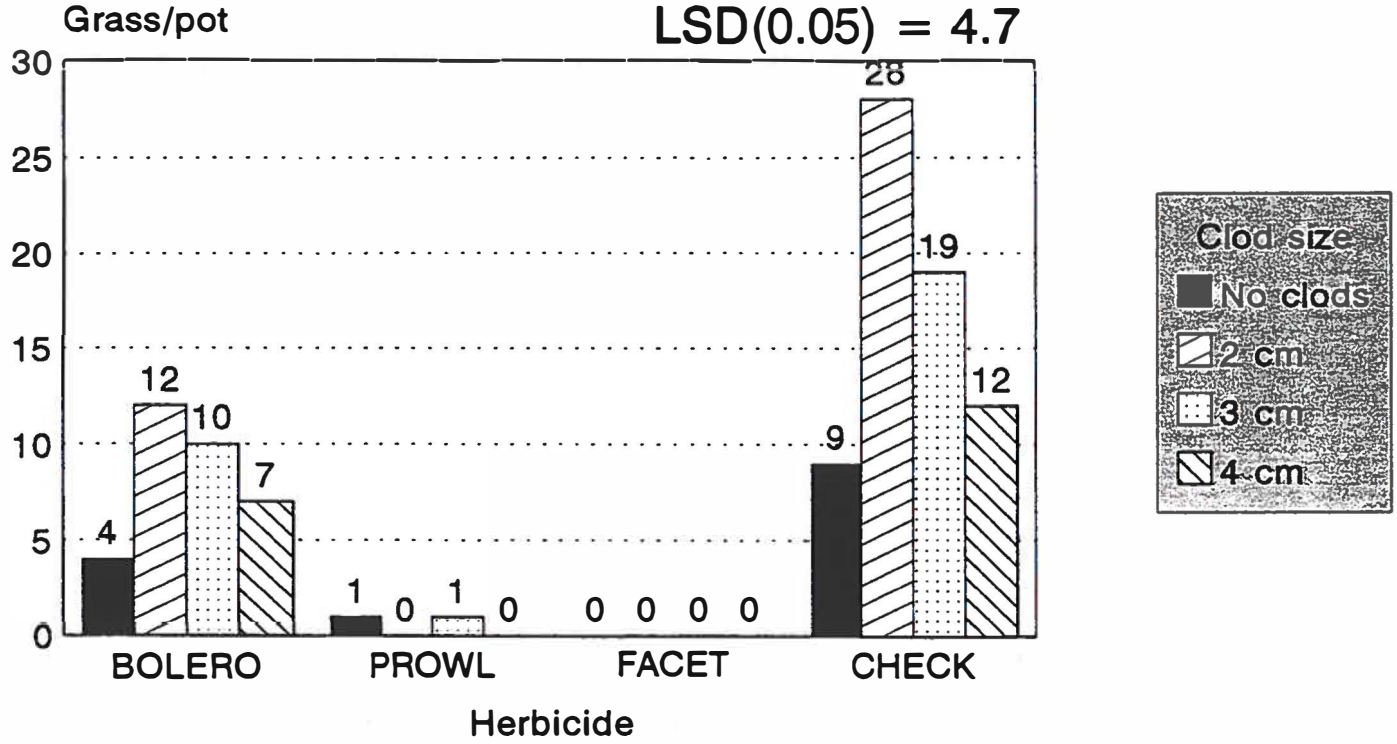


Figure 4. Clod size - Grass Number



COMPARISON OF BOLERO FORMULATIONS FOR RED RICE CONTROL

Randy Wilde and Michael Braverman

In 1995, a field study was conducted at Rice Research Station at Crowley, Louisiana, to evaluate Bolero formulation and application method on red rice (Oryza sativa). In this study, some red rice had started to emerge and there was a lot of red rice about to emerge at the time of treatment. Bolero was applied at 4 lb ai/A as Bolero 10G, Bolero 8 EC, and Bolero 8 EC on 250 lb of 7-21-21 fertilizer. To insure treatment integrity, 29-inch square metal rings were placed around each plot. Sprays were applied on May 9, 1995, and granular treatments were applied into flooded plots on May 11, 1995. Data collected on plots consisted of visual ratings, rice height, and harvest weights. At 14, 28, and 42 days after treatment (DAT), Bolero 8 EC applied as spray resulted in greater percent control than Bolero 8 EC coated on fertilizer or Bolero 10 G applied as a granular (Figures 1-3). For 14, 28, and 42 DAT, red rice height for Bolero 8 EC applied as a spray was significantly shorter than the control (Figures 4-6). There were no significant differences in red rice dry weight (data not shown). The difference in the control is probably attributed to application timing. The Bolero from the spray application prior to flooding was probably able to be available in the floodwater solution more rapidly than the Bolero, which had to come from the 10 G granule or fertilizer coating.

Figure 1. Red rice control 14 DAT

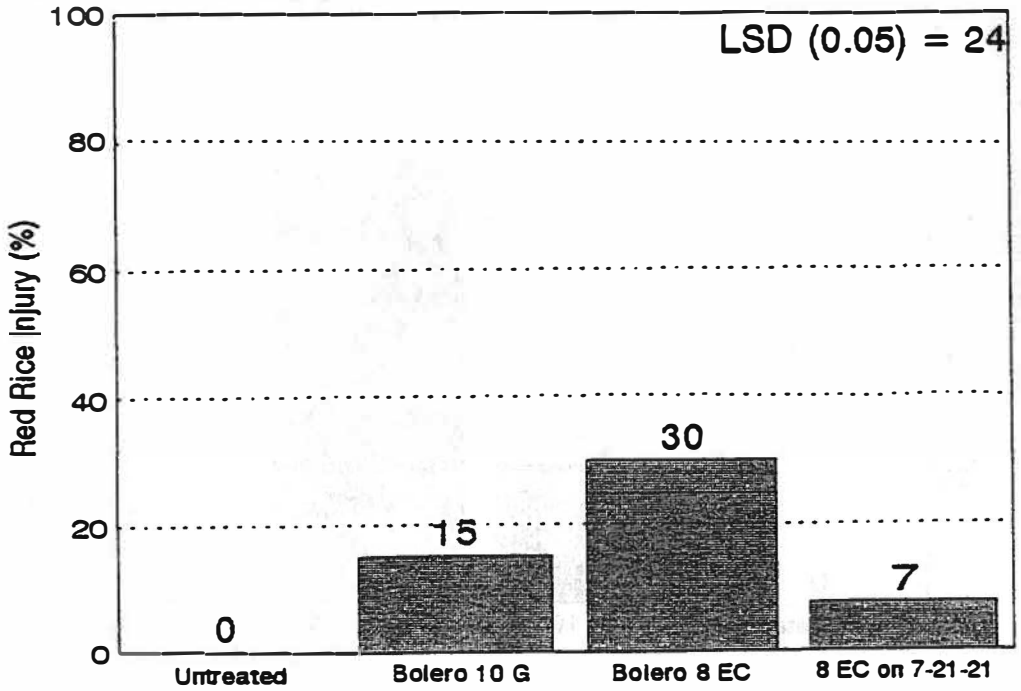


Figure 2. Red rice control 28 DAT

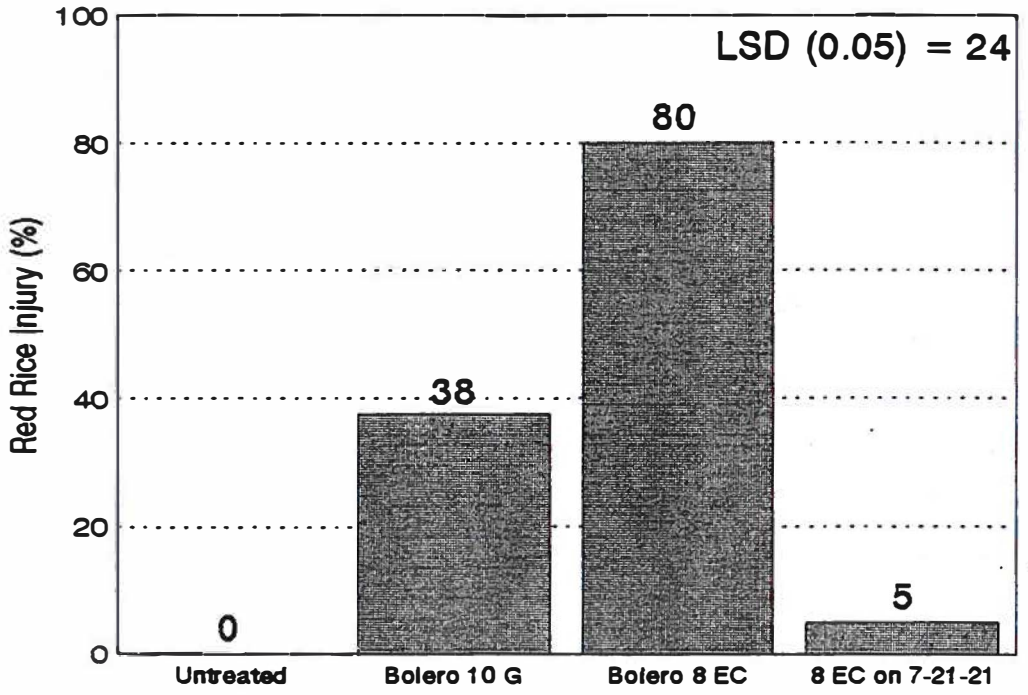


Figure 3. Red rice control 42 DAT

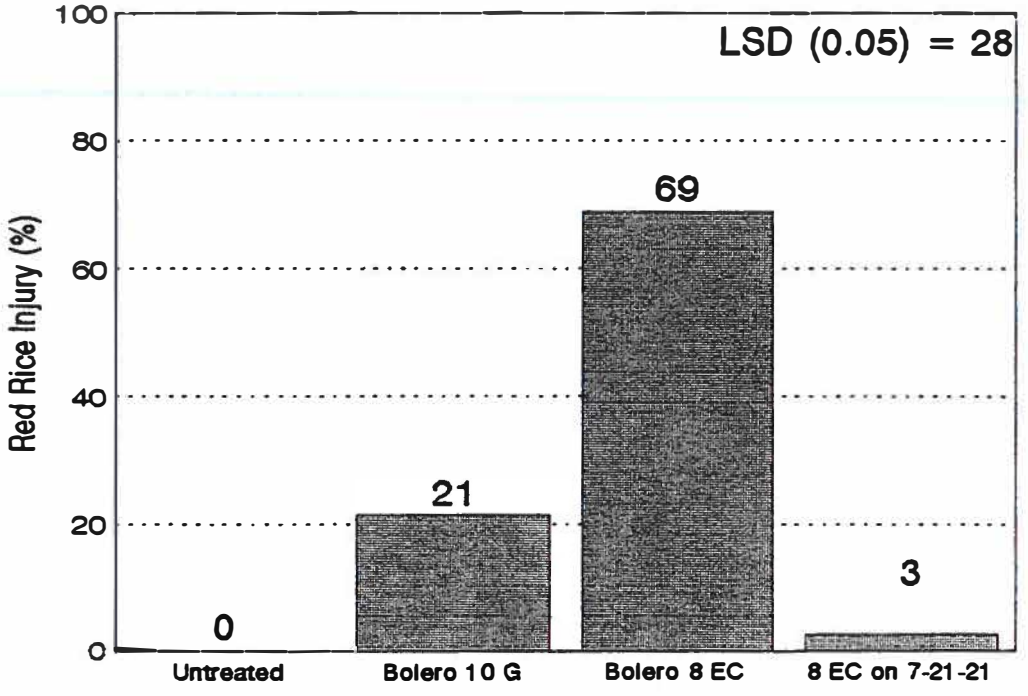


Figure 4. Red rice height 14 DAT

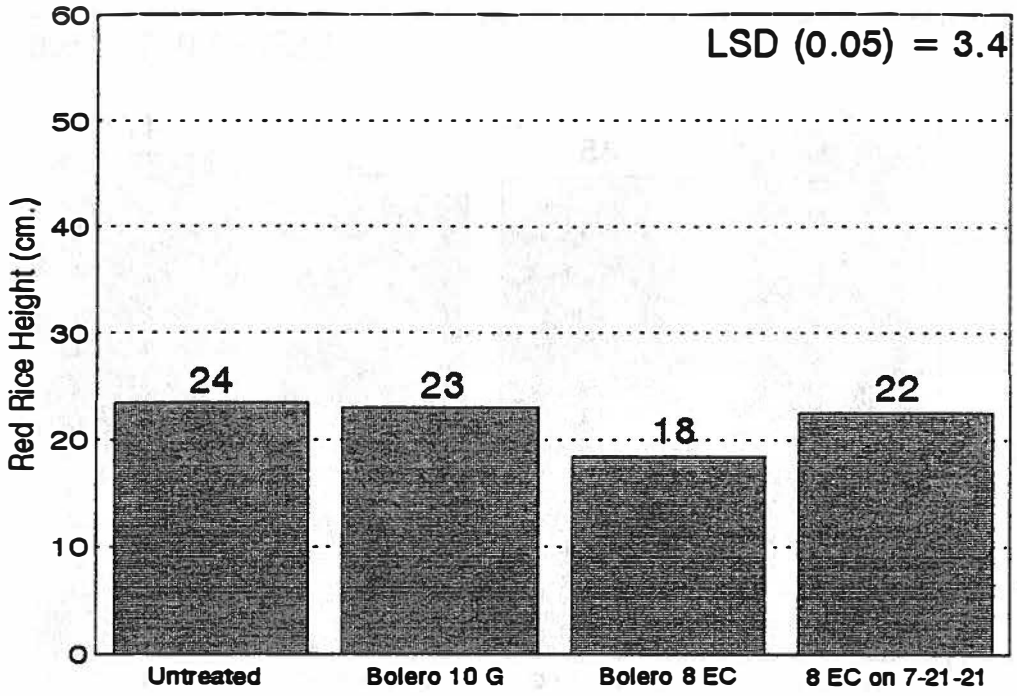


Figure 5. Red rice height 28 DAT

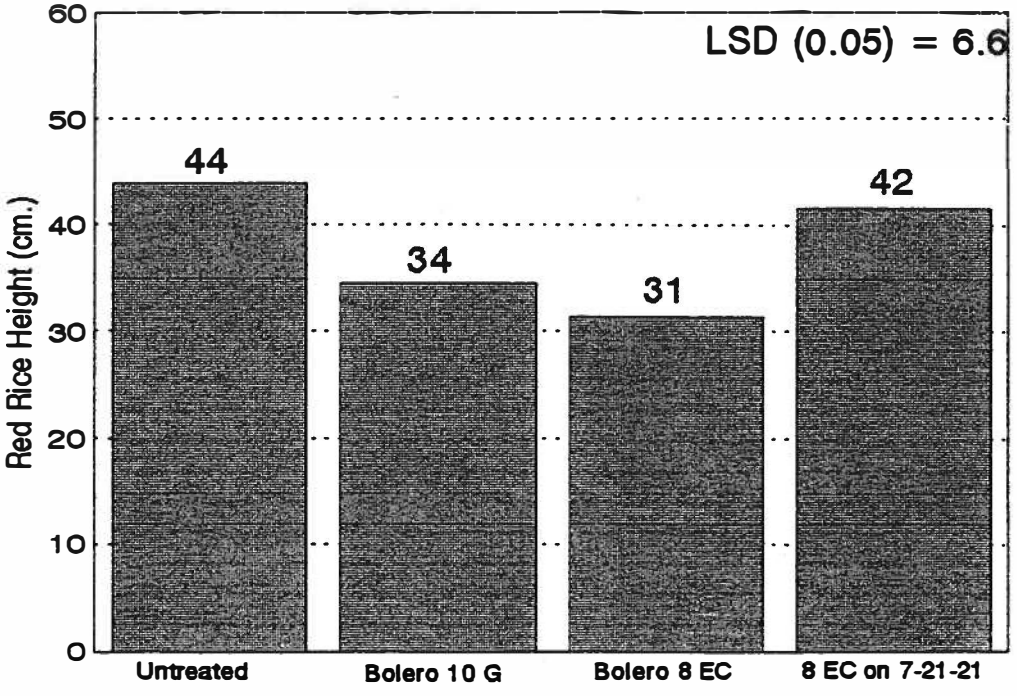
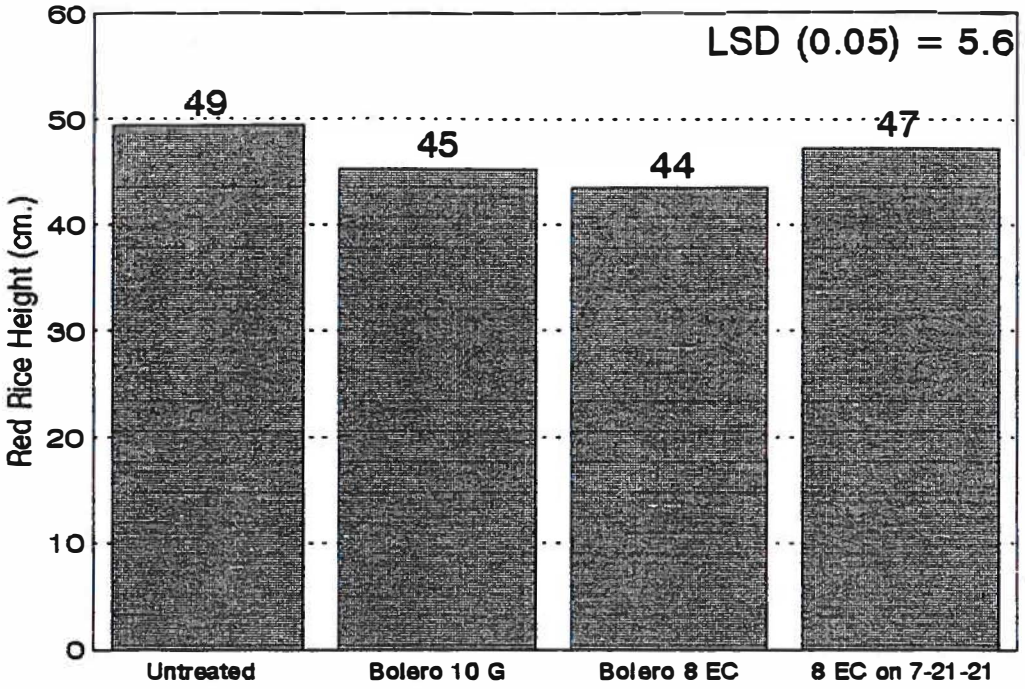


Figure 6. Red rice height 42 DAT



ALLELOPATHIC POTENTIAL OF SEVERAL WEEDS ON RICE (*Oryza sativa* L.) SEEDLING GROWTH

R.D. Mendt, M.P. Braverman, and T.L. Wendt

No-till water-seeded rice production is becoming more important in Louisiana. Weeds represent one of the main problems, and allelopathy may be causing reduced seedling rice populations observed under this production system.

Weed samples were collected in 1995 at the Rice Research Station at Crowley, Louisiana. Weeds were identified as annual bluegrass (*Poa annua* L.), Carolina foxtail (*Alopecurus carolinianus* Walt.), hairy buttercup (*Ranunculus sardous* Crantz), cressleaf groundsel (*Senecio glabellus* Poir.), curly dock (*Rumex crispus* L.), common sowthistle (*Sonchus oleraceus* L.), cursed buttercup (*Ranunculus sceleratus* L.), alligatorweed (*Alternathera philoxeroides* (Mart.) Griseb., white clover (*Trifolium repens* L.), persian clover (*Trifolium resupinatum* L.), timothy canarygrass (*Phalaris angusta* Nees ex Trin.), toad rush (*Juncus bufonius* L.), blue-eyed grass (*Sisyrinchium rotulatum* L.), and low spearwort (*Ranunculus pusillus* L.). Weight and moisture content were determined, and an extract was prepared from 200 g of each weed (fresh weight basis of aerial part) mixed with 1 L of distilled water and 0.05% (v/v) of dimethyl sulfoxide (DMSO). Air was bubbled through the solution to maintain adequate oxygenation. After 48 h, crude extracts were filtered through two thicknesses of cheese cloth. Oxygen content and pH were measured in each weed extract. Five ml of the extract solutions were poured into a sterile 9-cm Petri dish with 20 pregerminated 'Maybelle' rice seeds on a sheet of Whatman No. 3 filter paper. After 2 days in the dark at 32°C, the growth of the primary root was measured, and percent inhibition was compared with a distilled water control. Root and shoot length were measured, cut, and dry weight determined.

Further chemical characterization of the cressleaf groundsel (*Senecio glabellus*) compounds potentially responsible for the inhibitory effects on rice were attempted by thin layer chromatography (TLC). The aqueous extracts were partitioned by liquid-liquid extraction with dichloromethane (CH_2Cl_2) in a separatory funnel. The organic and aqueous phases were concentrated and separated by preparative thin layer chromatography to pre-coated Silica gel plates. The extract portions were spotted across the base of the plate, developed with chloroform:methanol:ammonia (50:10:1) as the developing solvent, and examined under UV light to locate the zones separated by the TLC procedure. The bands noted under UV light were individually scraped from the TLC plates and redissolved in 5% ethanol. The individual fractions were then bioassayed for rice seedling inhibition.

Weeds had an effect on the pH of the weed extract solution (Figure 1). The weed extract oxygen content ranged from 4.2 mg/L for *Ranunculus sceleratus* and *Alternathera philoxeroides* to 7.2 mg/L for *Poa annua* (data not shown). The water content in the weeds tissue ranged from 72% for *Ranunculus pusillus* to 83% for *Ranunculus sceleratus* (data not shown). Weed dry weight of *Senecio glabellus*, *Ranunculus sceleratus*, and

Ranuculus sardous were 93, 15 and 210 kg/ha, respectively [2.3, 0.4, and 5.3%, respectively of the total weed biomass (4,000 kg/ha) dry weight]. From the weed extracts evaluated, the number of rice seedlings with a radicle was reduced by *Ranunculus sceleratus* and *Ranunculus pusillus* by 95 and 20%, respectively (Figure 2). Rice radicle dry weight was reduced more than 80% by extracts of *Ranunculus sceleratus* and *Senecio glabellus* (Figure 3). *Ranunculus pusillus*, *Poa annua*, and *Rumex crispus* caused more than 50% reduction in rice radicle dry weight. *Alternathera philoxeroides* extract reduced the rice radicle dry weight 25%. Rice radicle length was reduced more than 95 and 80%,respectively by *Ranunculus sceleratus* and *Senecio glabellus* (Figure 4). Rice seedling shoot length and dry weight also showed reductions caused by the weed extracts of *Ranunculus sceleratus* (Figures 5 and 6). Some of the individual chemical fractions obtained from the cressleaf groundsel extracts separated through thin layer chromatography, caused inhibition of the rice shoot and radicle growth (data not shown).

In conclusion, the reduction of rice radicle number and the decreased dry weight and length of rice seedlings radicles and shoots may play a factor in the reduction of rice populations observed in the field, under a no-till rice production system.

Figure 1. Weed Extract pH.

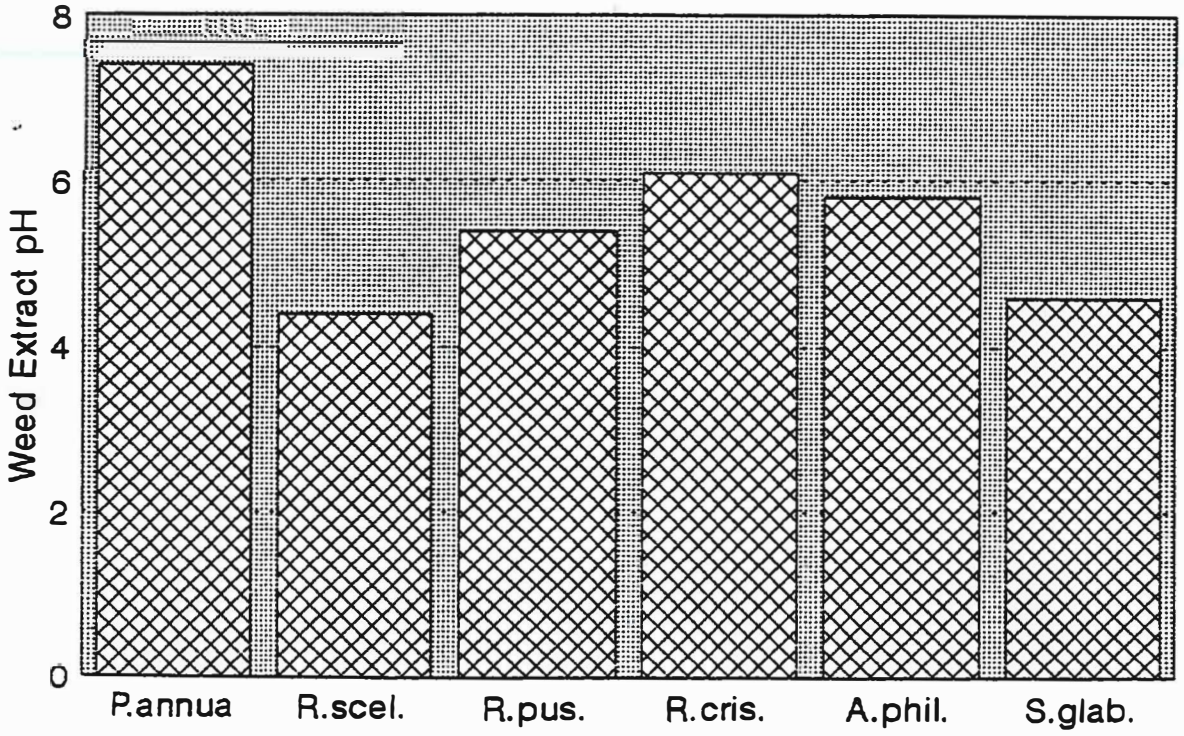


Figure 2. Rice Seedlings with Radicle.

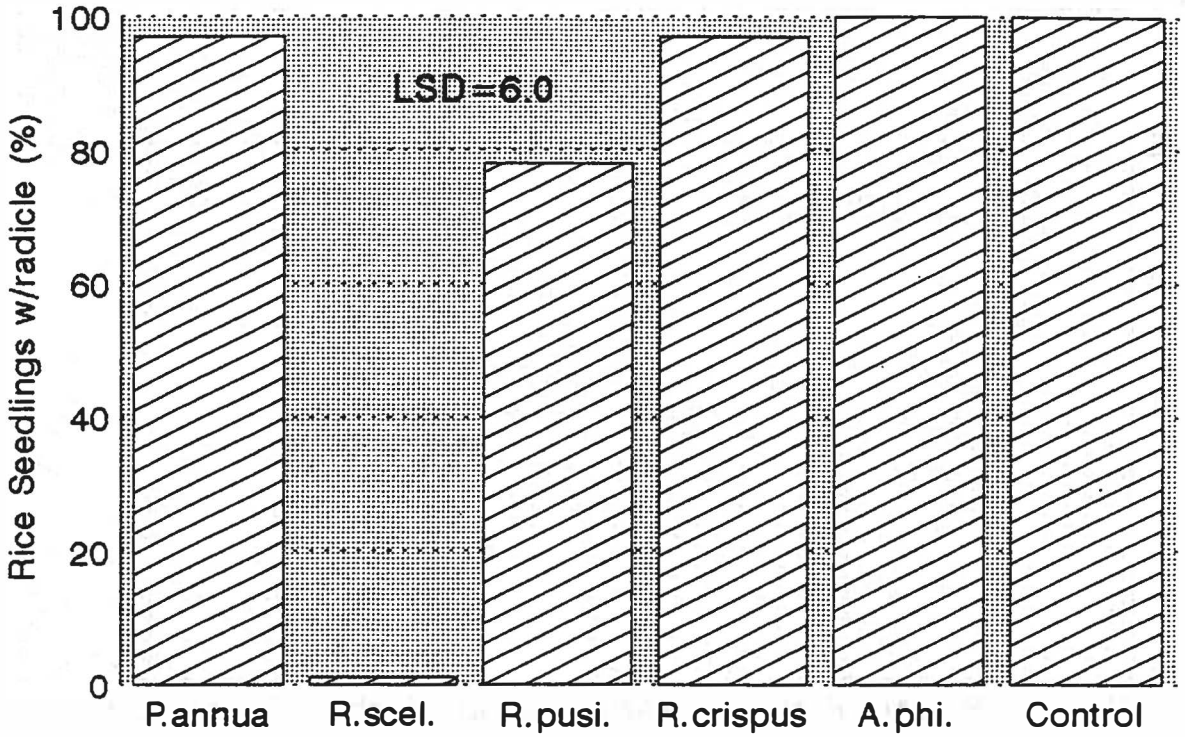


Figure 3. Rice Radicle Dry Weight

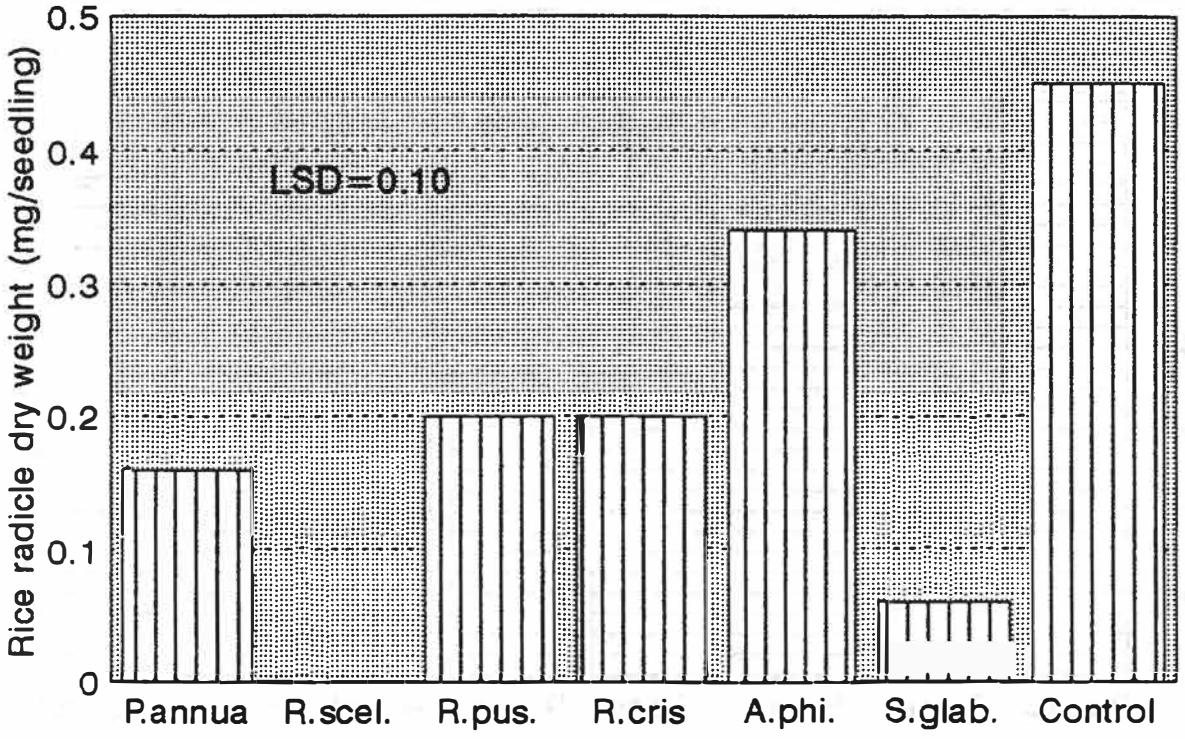


Figure 4. Rice Radicle Length

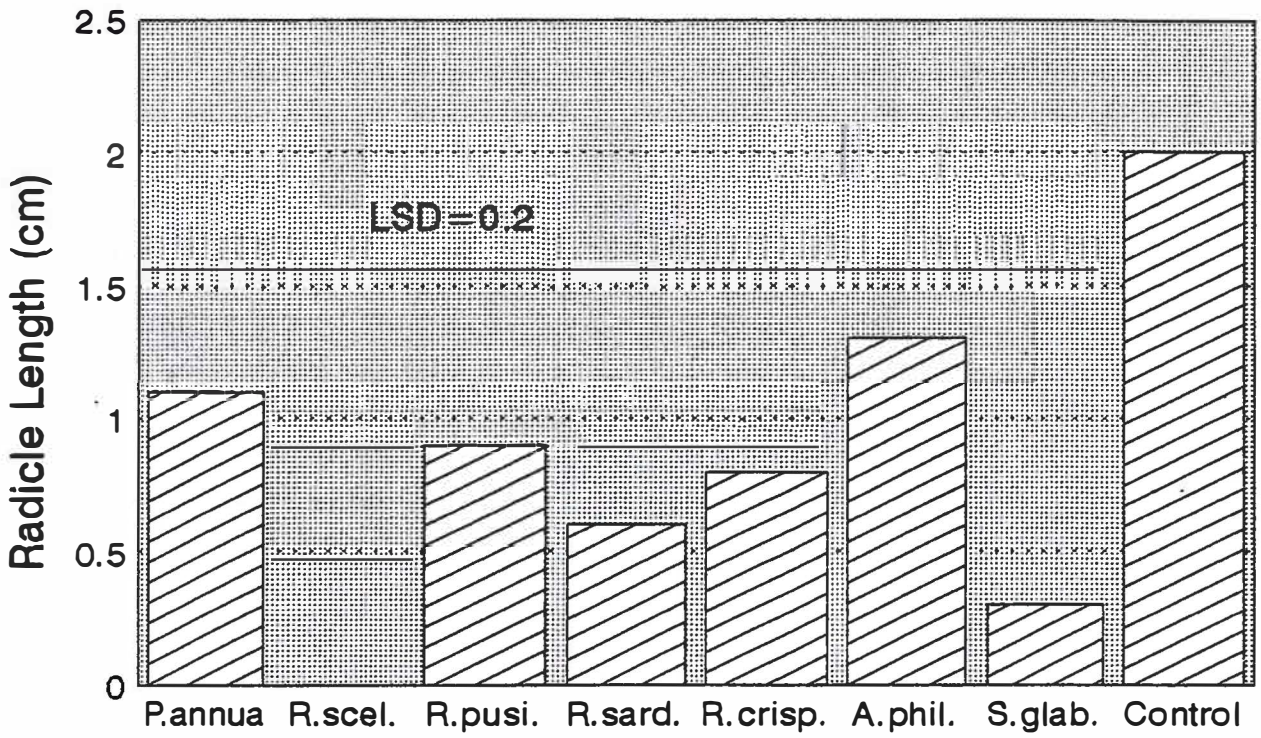


Figure 5. Rice Shoot Length.

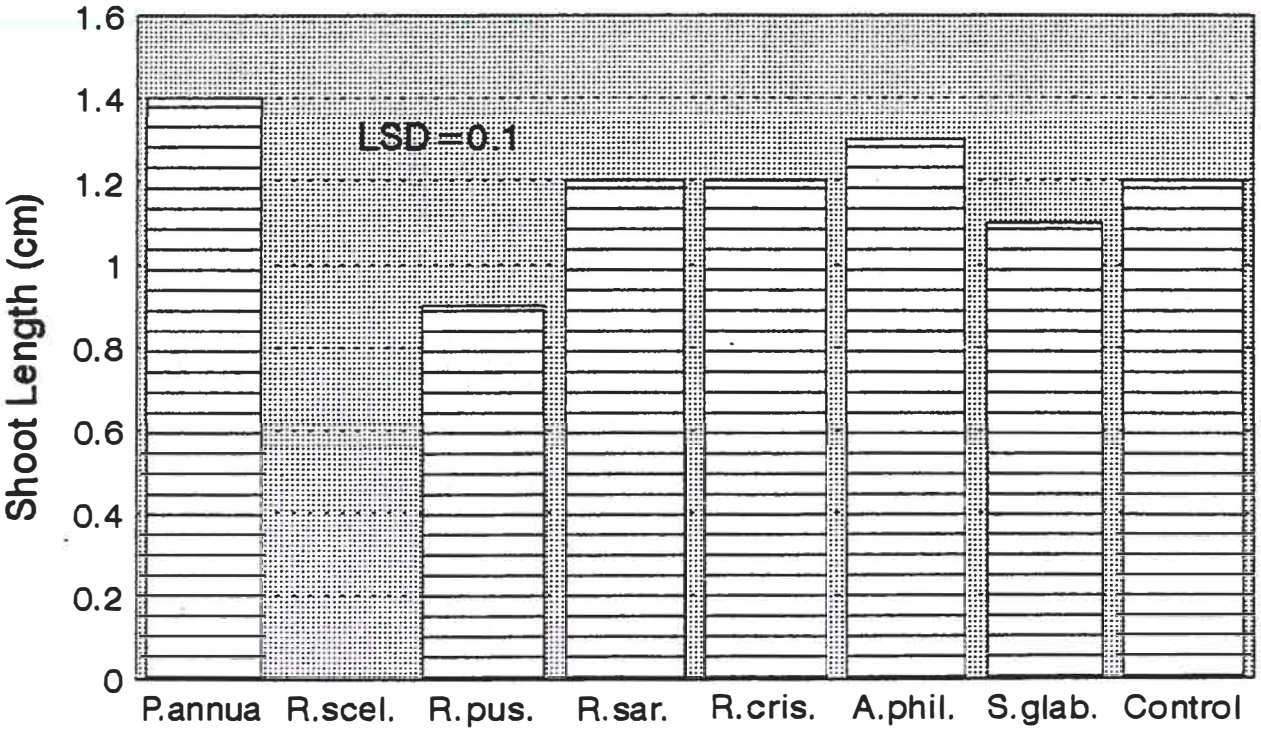
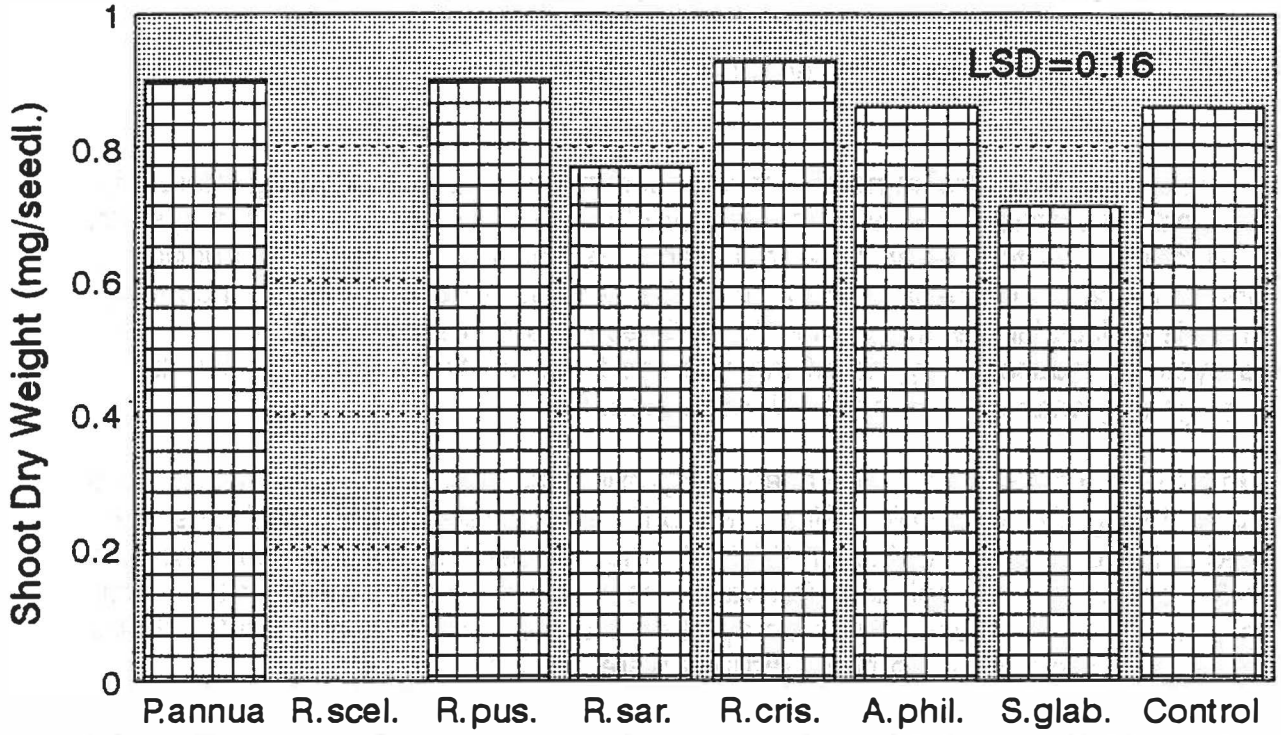


Figure 6. Rice Shoot Dry Weight



EFFECTS OF HERBICIDE RESIDUES FROM NO-TILL WEED CONTROL ON DRILL- AND WATER-SEEDED RICE

Roland D. Mendt and M. P. Braverman

Preplant weed control in no-till rice is becoming an area of increasing interest for growers and researchers. In addition to burndown herbicides used in this system, additional herbicides for better broadleaf weed control are required. In addition, a reduction of the weed biomass at the time of rice seeding is needed. In reduced tillage systems, it is difficult for the rice seed in the drill-seeded system to emerge. In the water-seeded system, reduced pegging of the rice seedlings on the soil may occur due to seedlings getting entangled in the dead weed biomass.

In greenhouse studies, rice variety 'Maybelle' was seeded in 0.5 L plastic cups containing 420 g Crowley soil. Simulated drill- and water-seeded conditions were evaluated twice during the spring of 1995. In the drill-seeded system, rice seed was planted 2.5 cm deep in the soil and afterwards the herbicides were applied; in the water-seeded system, the herbicides were sprayed on the soil surface, a shallow flood was applied, and the pregerminated rice seedlings were seeded.

Herbicides used were quinclorac (Facet), 2,4-D, triclopyr (Grandstand), oxyfluorfen (Goal), and thifensulfuron + tribenuron (Harmony Extra). The herbicide rates used were 1, 1/2, 1/4, 1/8, and 1/16th of their commercial recommendations, including quinclorac 0.43, 2,4-D, 0.56, triclopyr 0.43, oxyfluorfen 0.56 kg ai/ha, and thifensulfuron + tribenuron at 37 g ai/ha plus a weed free control. Rice was grown under weed free conditions with all treatments.

A randomized complete block experimental design with a factorial arrangement of treatments replicated four times was used. Factor one was the herbicides and factor two was the herbicide rates. Rice plant injury at 2 and 4 weeks after seeding was determined using a visual scale where 0 percent was no injury and 100 percent equaled death of the rice plants. Rice plant height was measured at 4 weeks after seeding, and rice plants were harvested and dried at 60°C to constant weight. Data were analyzed using ANOVA, and Fisher's protected LSD method was used for the different herbicide treatment mean separation. A regression analysis was performed for the different herbicide rates used. From the regression analysis, the rate required to cause 20% injury and the 95% confidence intervals were determined.

Table 1 lists the values of half-life known for the herbicides used in this experiments. In Table 2, the herbicide rates to cause 20% rice injury are presented. The value of 20% rice plant injury was considered as the non acceptable injury level. 2,4-D and oxyfluorfen caused 20% injury with the lowest rates under the water-seeded system, while for the drill-seeded system, it was triclopyr. Table 3 has the data expressed as percent herbicide remaining in soil that caused 20% rice injury. With only 11 and 14% of the X rates, of 2,4-D and oxyfluorfen still caused 20% injury under the water-seeded

system, while only 16% of the X rate of triclopyr in the drill-seeded system caused the same amount of injury. With the known half-lives of the herbicides and the rates causing 20% rice injury, the predicted number of half-lives required to reach 20% rice injury were calculated, as shown in Table 4. For the water-seeded system, 2,4-D and oxyfluorfen required the most number of half-lives with 3.1 and 2.9, respectively, while for the drill-seeded system, 2,4-D and triclopyr required the most half-lives with 2.6 and 2.8, respectively. Quinclorac required only 0.4 and 1.6 half-lives for the water- and drill-seeded systems, respectively, while thifensulfuron + tribenuron only required 1.7 and 0.9 half-lives values, respectively. Tables 5 and 6 list the predicted number of days required for each herbicide to reach 20% rice plant injury level for the drill- and water-seeded system, respectively. Oxyfluorfen required the longest waiting period after being sprayed before rice could be planted, with 102 days under the water-seeded system, while for drill-seeded system, triclopyr had the longest waiting period with 84 days. Harmony Extra had the shortest waiting period for both water- and drill-seeded system with 5 and 10 days, respectively.

Rice plant height (Graphs 1 and 2) and dry weight (Graphs 3 and 4) followed the same trend as rice plant injury for the different herbicides being evaluated.

In conclusion, oxyfluorfen, 2,4-D and triclopyr had the most injurious effect on rice under water-seeded system, while triclopyr and 2,4-D were the most injurious in the drill-seeded system. Quinclorac and thifensulfuron + tribenuron were the least injurious to rice under both seeding systems.

Table 1. Half-life of Herbicides.

Herbicide	Half-life (days)
Quinclorac	N. A.
2,4-D	10
Triclopyr	30
Oxyfluorfen	35
Thifen. +tribe.	6

Table 2. Herbicide Rate to cause 20% Rice Injury (kg ai/ha).

Herbicide	Water Seeded	Drill Seeded
Quinclorac	0.34 ± 0.06	0.18 ± 0.03
2,4-D	0.06 ± 0.02	0.14 ± 0.04
Triclopyr	0.16 ± 0.04	0.07 ± 0.02
Oxyfluorfen	0.08 ± 0.02	0.17 ± 0.04
Thifen. +tribe.	0.013 ± 0.003	0.02 ± 0.008

Table 3. Percent Herbicide Remaining in Soil that Caused 20% Rice Injury.

Herbicide	Water Seeded	Drill Seeded
Quinclorac	79 ± 14	42 ± 7
2,4-D	11 ± 4	25 ± 7
Triclopyr	37 ± 9	16 ± 4
Oxyfluorfen	14 ± 4	30 ± 7
Thifen. +tribe.	36 ± 8	54 ± 21

Table 4. Number of Half-lives Required to Reach 20% Rice Injury.

Herbicide	Water Seeded	Drill Seeded
Quinclorac	0.4 ± 0.3	1.6 ± 0.2
2,4-D	3.1 ± 0.1	2.6 ± 0.2
Triclopyr	1.7 ± 0.2	2.8 ± 0.2
Oxyfluorfen	2.9 ± 0.1	1.9 ± 0.2
Thifen.+tribe.	1.7 ± 0.2	0.9 ± 0.4

Table 5. Number of Half-lives and Predicted Number of Days Required to Reach 20% Rice Injury (Drill Seeded).

Herbicide	Half-lives	Days
Quinclorac	1.6 ± 0.2	N . A.
2,4-D	2.6 ± 0.2	26 ± 2
Triclopyr	2.8 ± 0.2	84 ± 6
Oxyfluorfen	1.9 ± 0.2	67 ± 7
Thifen.+tribe.	0.9 ± 0.4	5 ± 2

Table 6. Number of Half-lives and Predicted Number of Days Required to Reach 20% Rice Injury. (Water Seeded).

Herbicide	Half-lives	Days
Quinclorac	0.4 ± 0.3	N . A.
2,4-D	3.1 ± 0.1	31 ± 2
Triclopyr	1.7 ± 0.2	51 ± 6
Oxyfluorfen	2.9 ± 0.1	102 ± 4
Thifen.+tribe.	1.7 ± 0.2	10 ± 1

Figure 1. Rice Height vs. Herbicide Rate.

Water Seeded

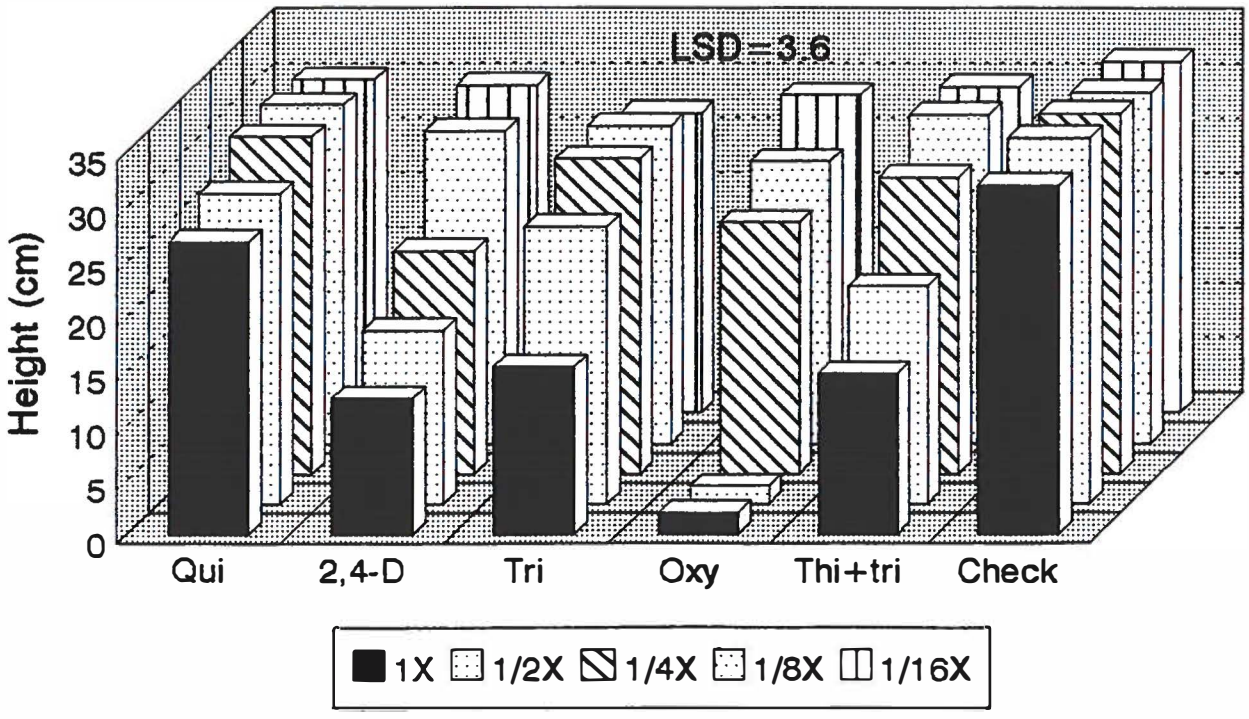


Figure 2. Rice Height vs. Herbicide Rate
Drill Seeded

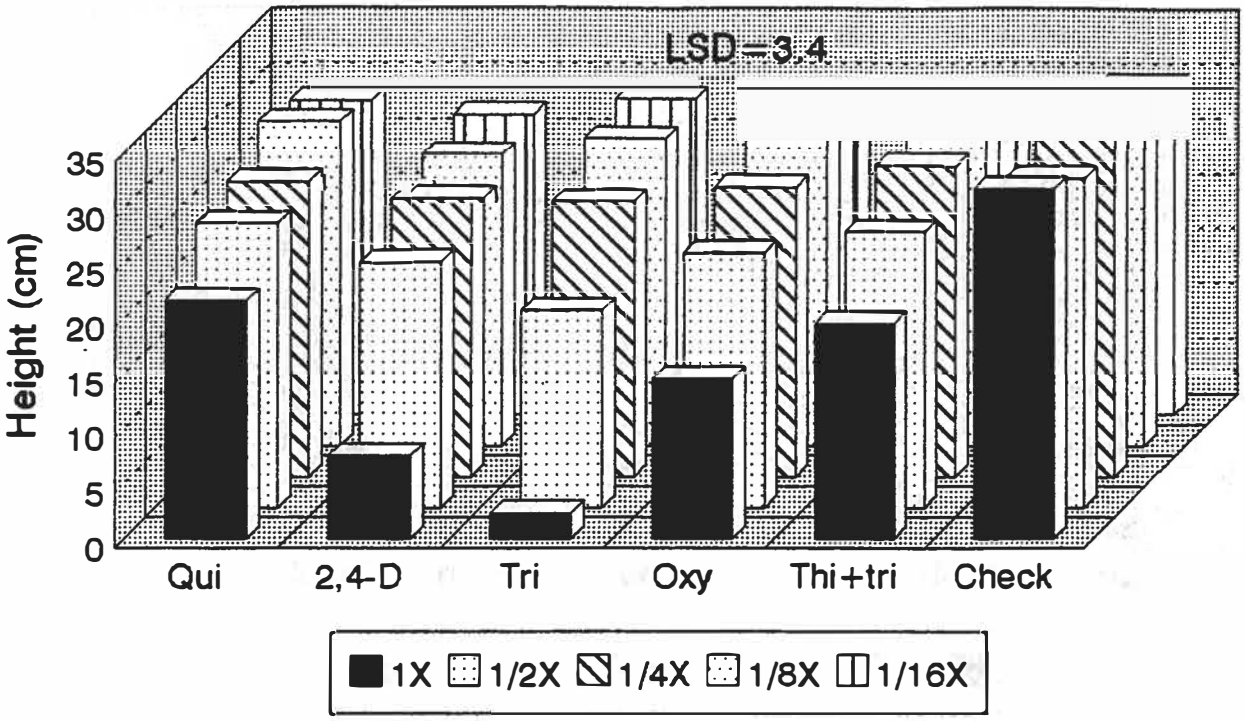


Figure 3. Rice Dry Weight vs. Herbicide Rate.
Water Seeded

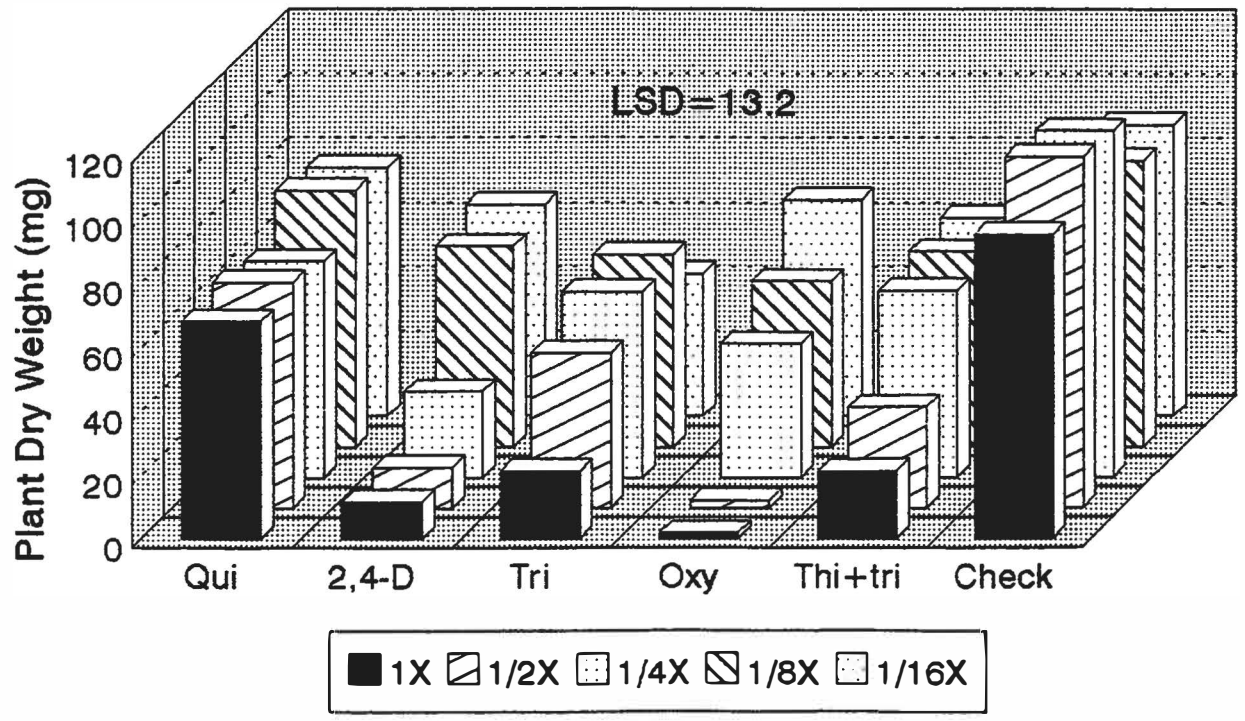
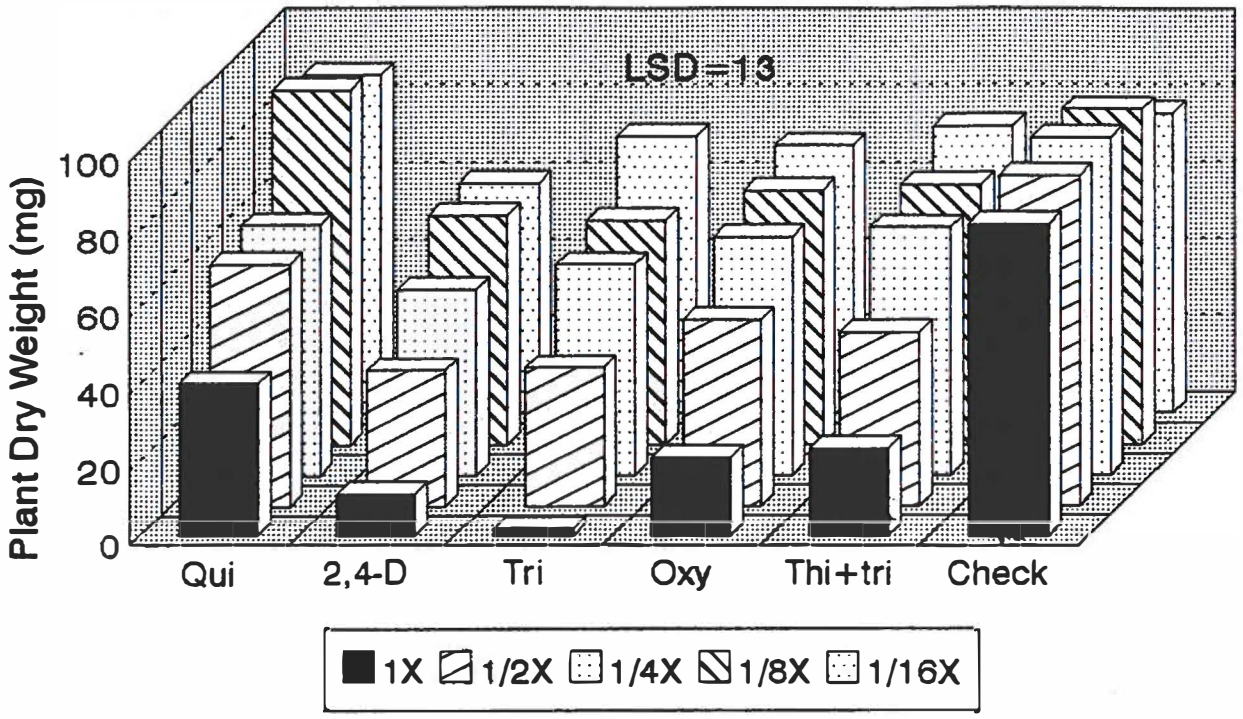


Figure 4. Rice Dry Weight vs. Herbicide Rate

Drill Seeded



INFLUENCE OF WEED BIOMASS, TILLAGE, AND RICE SEEDING RATES ON NO-TILL WATER-SEEDED RICE (*Oryza sativa* L.)

R.D. Mendt and M.P. Braverman

No-till water-seeded rice production is becoming more popular in southwest Louisiana. However, reductions in seedling rice populations in that system remain a problem. Rice seed can get entangled in the dead weed biomass and are not able to root in the soil, causing death of the seedling. Field experiments were conducted in 1995 at the Rice Research Station at Crowley, Louisiana, to evaluate this problem.

A randomized complete block design with a factorial arrangement of treatments and four replications was used. Factor one, weed density under no-till conditions, was adjusted to 0, 25, 50, 75, and 100% of the weeds present in the field. Weeds in the field were removed in alternate strips with a gas powered weed eater to the preestablished values. Three days after cutting the strips, paraquat was applied at 1.41 kg/ha + surfactant (X-77) at 0.25% as a burndown treatment. The other treatment was a conventional tilled plot. The field was flooded 3 weeks before seeding the rice. Factor two was the rice seeding rate at 112, 224, and 336 kg/ha. The rice variety was 'Maybelle.' Rice seedling stand counts were determined 2 weeks after seeding. Counts were determined using a 30 x 30 cm wire frame, so that a percent equivalent to the weed biomass pressure level being evaluated was covered, and the rest of the frame covered area was weed free. Water oxygen content was measured at 2 weeks after seeding. At rice seeding and 1 week after seeding, pH of the water was also measured. Rice yield data of the main effects seeding rate were analyzed using ANOVA, and LSD was used for mean separation.

Weed biomass levels did not affect water pH or oxygen content. Rice seedling population at 2 weeks after seeding increased as rice seeding rate increased. Weed biomass levels of 0, 25, 50, 75, and 100% did not affect rice yield when compared with conventional tillage. In conclusion in these studies, weed biomass did not affect rice yield under no-till water-seeded conditions.

Figure 1. Water pH 1WAS vs. Weed Biomass

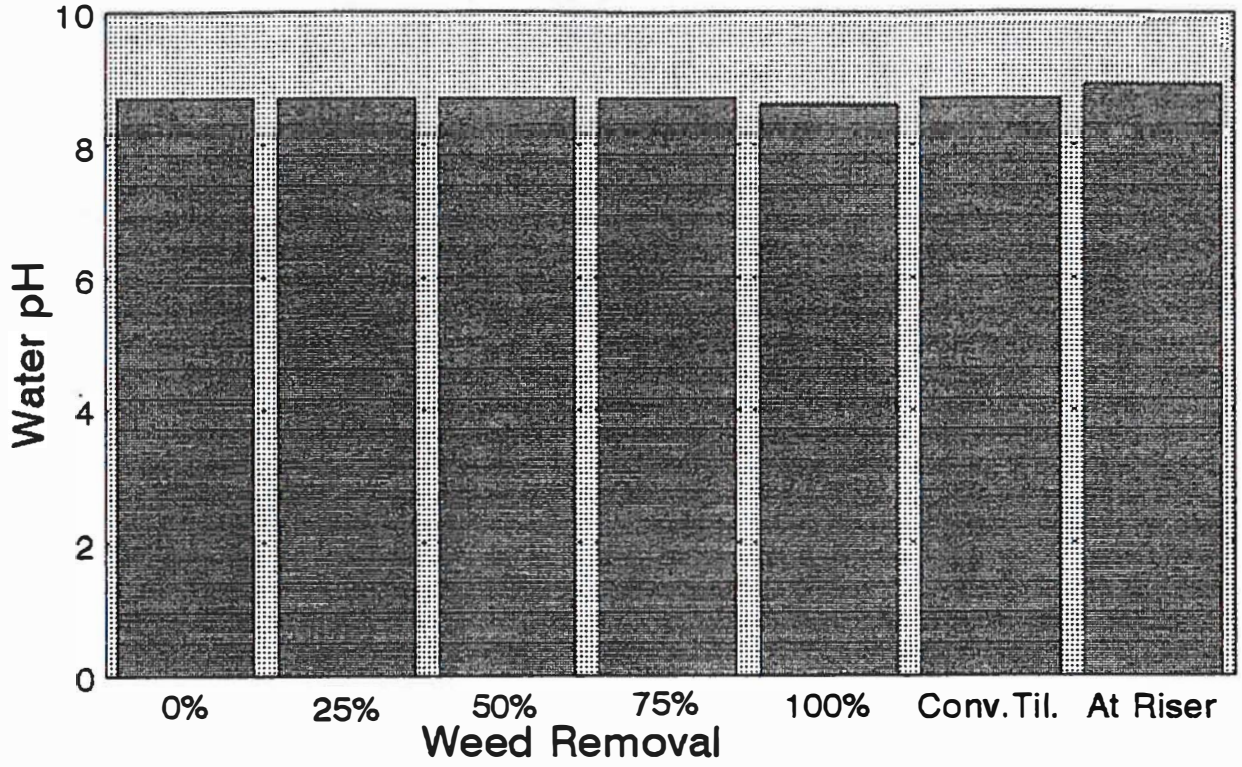


Figure 2. Water Oxygen Content vs. Weed Biomass 2WAS

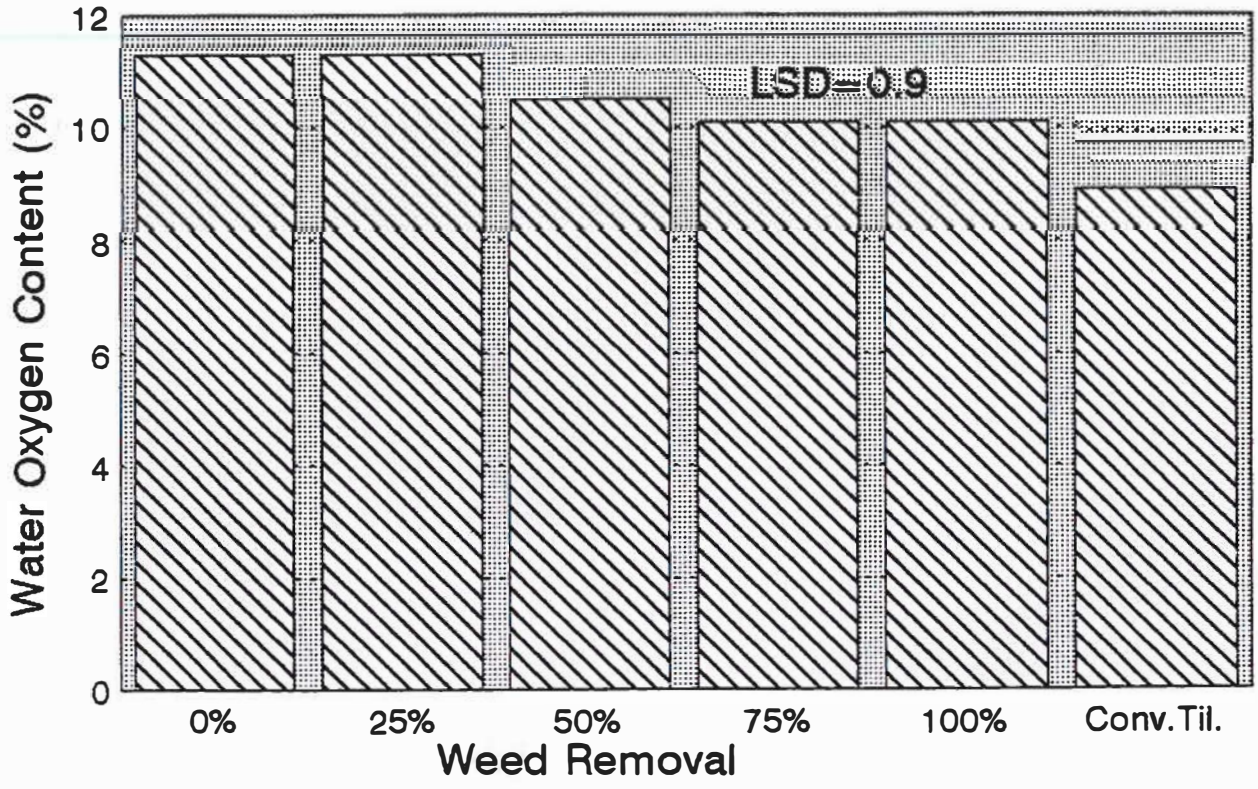


Figure 3. Rice Density vs. Weed Biomass 2WAS.

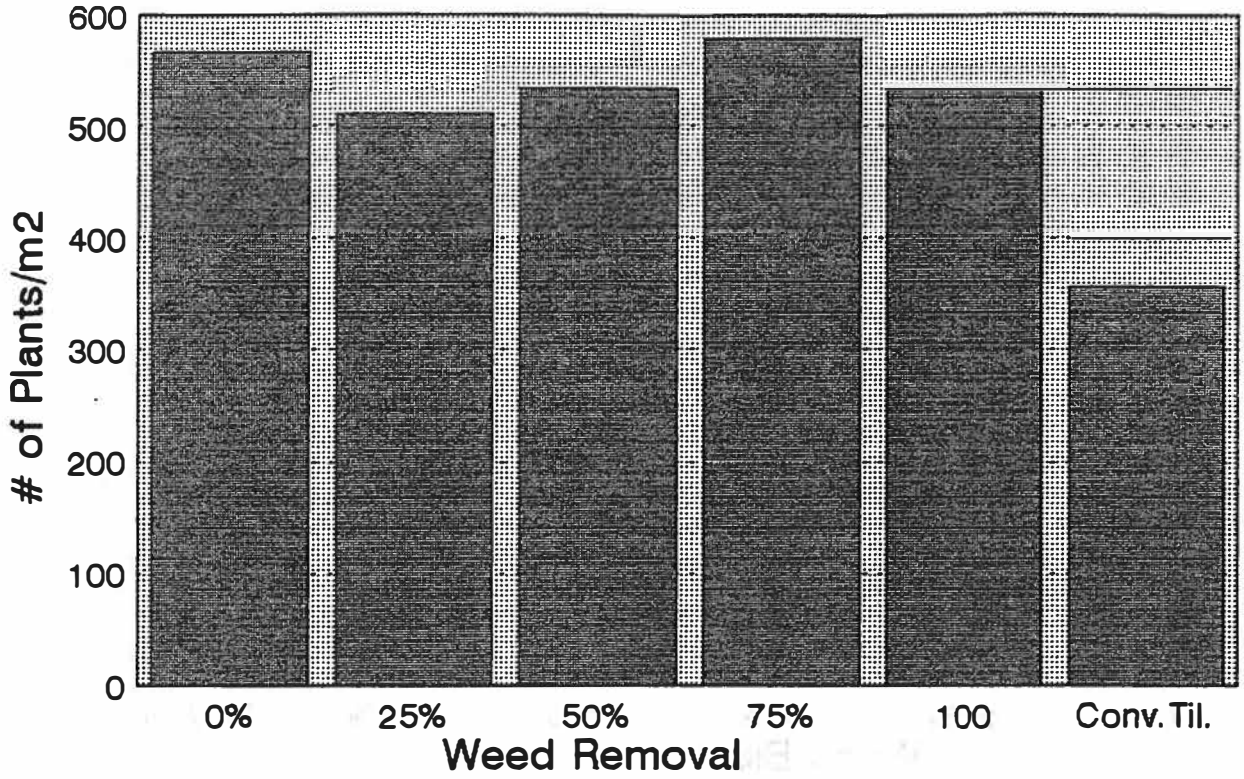


Figure 4. Rice Density vs. Seeding Rate 2WAS

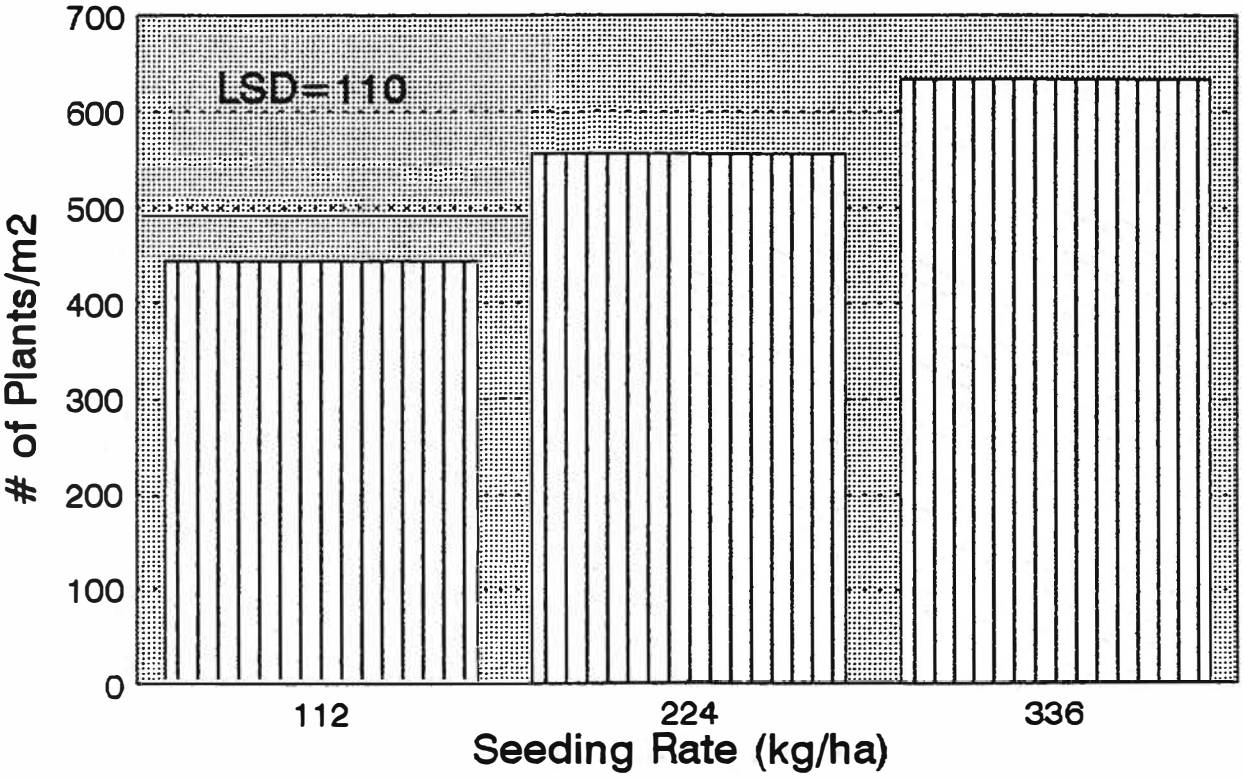


Figure 5. Rice Yield and Weed Biomass.

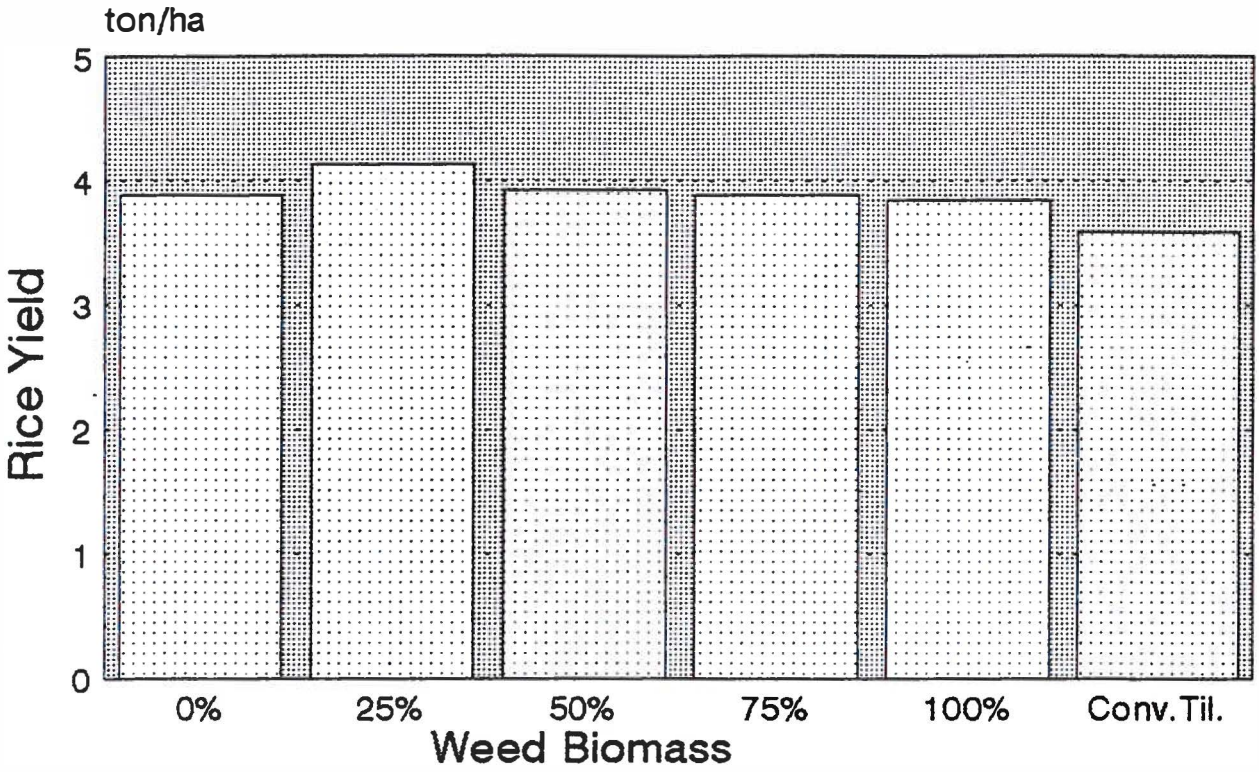
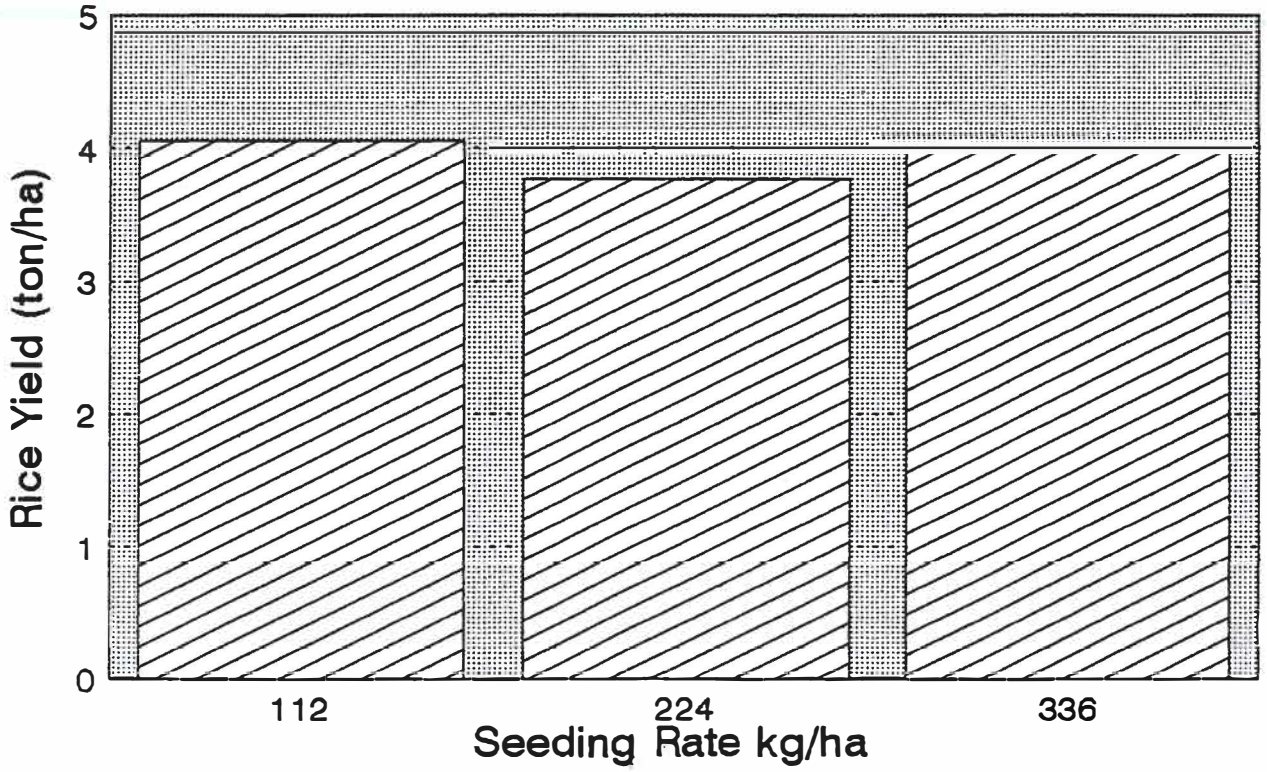


Figure 6. Rice Yield and Seeding Rate.



HERBICIDE RESIDUE STUDIES

Wei Zhang and Michael Braverman

Effects of Simulated Rotational Herbicide Residues on Drill- and Water-Seeded Rice

Greenhouse experiments were conducted to evaluate the effects of simulated herbicide residues on the emergence and growth of rice under water- and drill-seeded conditions. Cotoran, Pursuit, Dual, and Zorial at 1/2, 1/4, 1/8, and 1/16 times labeled rates were applied in soil to simulate different levels of residue. Treatments were evaluated for their effect on rice emergence and foliar injury. The application rates and resulting soil concentrations are listed in Table 1.

Dual significantly reduced percent emergence of rice in a drill- more than in a water-seeded system at all rates (Fig. 1). Dual also injured rice at all rates under both seeding conditions 2 weeks after planting (WAP); however, at 1/4, 1/8, and 1/16X rates, injury on water-seeded rice was significantly less than that on drill-seeded rice (Fig. 2). Zorial had no effect on percent emergence of rice under both seeding conditions (Fig. 3). Although Zorial did not affect rice emergence, it greatly injured rice 2 WAP, regardless of rates and seeding methods (Fig. 4). Cotoran injured rice at 1/2 and 1/4X rates under both seeding conditions 2 WAP; however, less injury was found in water-seeded at 1/2X rate (Fig. 5). Pursuit did not injure water-seeded rice but injured drill-seeded rice at 1/2, 1/4, and 1/8X rates (Fig. 6).

In summary, rice emergence problems caused by Dual can be reduced by water seeding. Water seeding is also effective in reducing potential injury from Cotoran, Pursuit, and Dual.

Rotational Herbicide Residue - Rice Herbicide Interaction Test

This experiment was conducted in the field to evaluate the effects of simulated rotational herbicide residues on rice as affected by rice herbicides. The experimental design was a split-plot with four rotational herbicides, Cotoran, Pursuit, Dual, and Zorial at 1/2, 1/4, 1/8, and 1/16 times the labeled rates (Table 1) as main plot, and rice herbicides, Bolero (4 lb/A), Facet (0.38 lb/A), Ordram (4 lb/A), and a non-treated control (no rice herbicide) as a split plot. All treatments were replicated four times.

Visual ratings of rice injury were made at 2 weeks after treatment (WAT). Rice injury from Dual at 1/2X rate was significantly reduced by applying Ordram preplant incorporated (PPI). However, rice injury from Dual at 1/4, 1/8, and 1/16X rates increased when Bolero was applied PPI (Fig. 7). Rice injury from Pursuit at 1/8X rate was reduced by applying Ordram PPI or by applying Facet Post at the 2-leaf rice stage (Fig. 8). Applying Bolero PPI increased rice injury from Zorial at 1/16X rate (Fig. 9).

In summary, applying Bolero at labeled rate PPI could increase rice injury from Dual and Zorial at the lower residue concentrations 2 WAT. Rice injury caused by Dual and Pursuit could be reduced by applying Ordram at labeled rate PPI.

Table 1. Herbicide Concentration

Herbicide	1/2X	1/4X	1/8X	1/16X
	ppmw			
Cotoran	1.28	0.64	0.32	0.16
Pursuit	0.24	0.12	0.06	0.03
Dual	2.48	1.24	0.62	0.31
Zorial	1.62	0.81	0.41	0.21

Fig. 1. Effect of Dual Herbicide on Rice Emergence (Water and Drill Seeding)

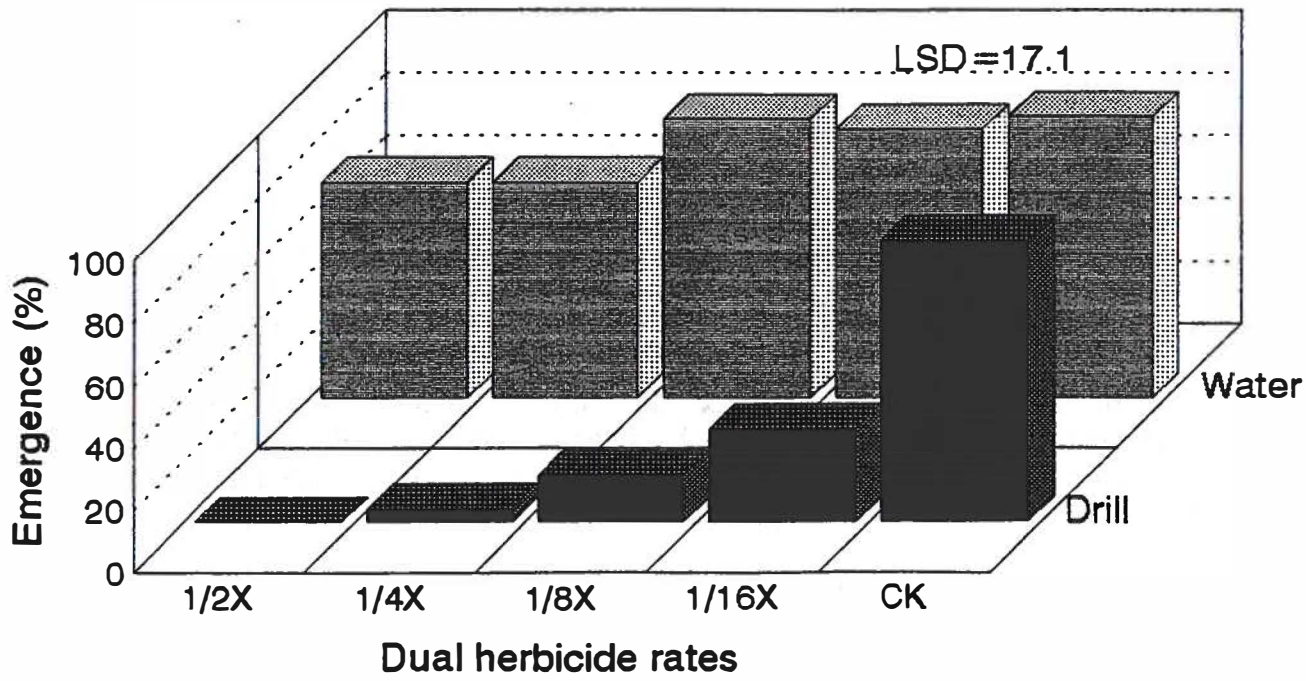


Fig. 2. Rice Injury from Dual Herbicide 2WAP (Water and Drill Seeding)

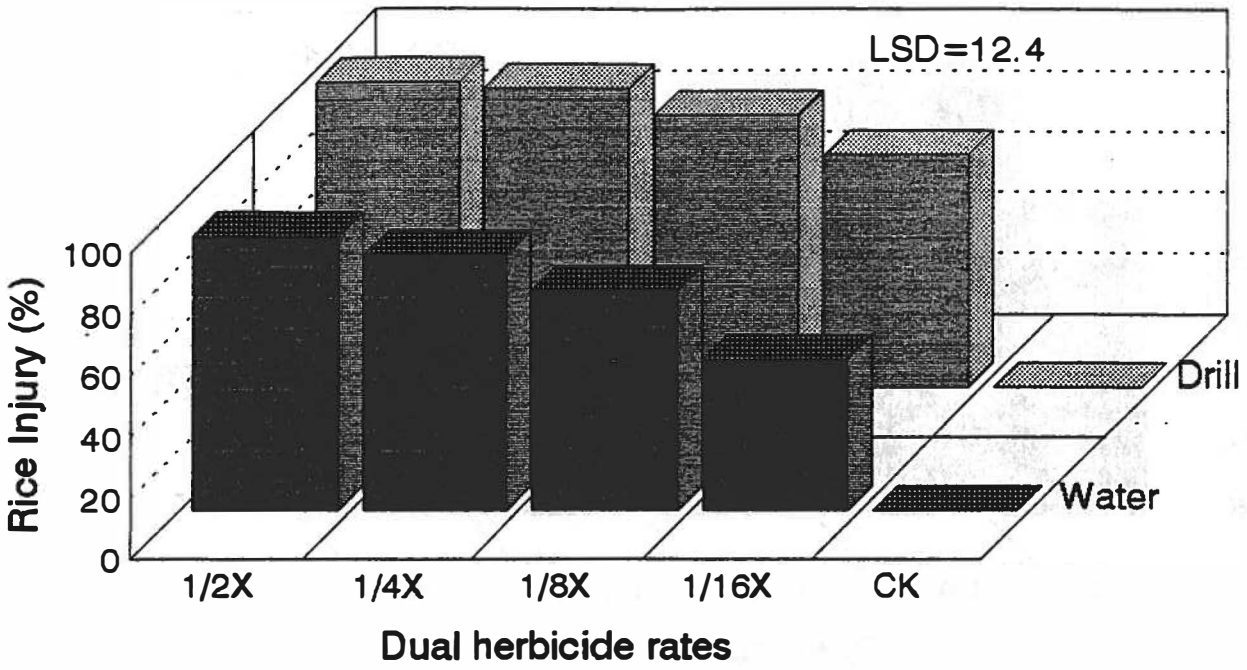


Fig. 3. Effect of Zorial on Rice Emergence (Water and Drill Seeding)

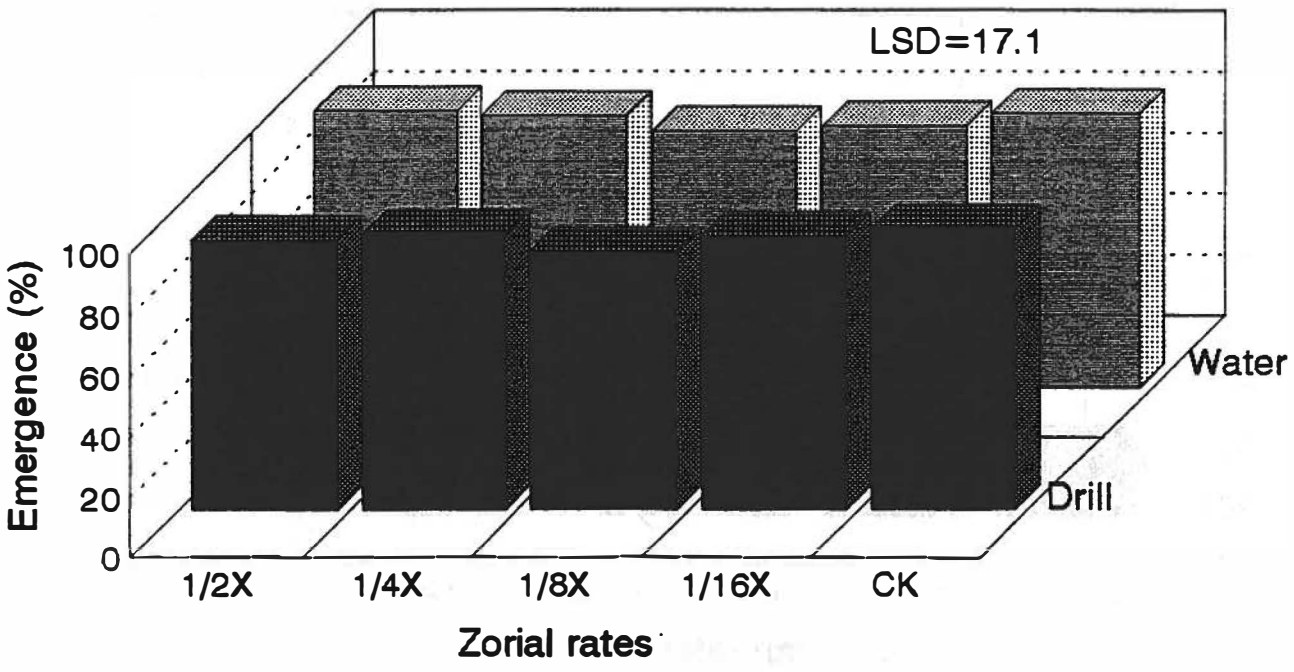


Fig. 4. Rice Injury from Zorial 2WAP (Water and Drill Seeding)

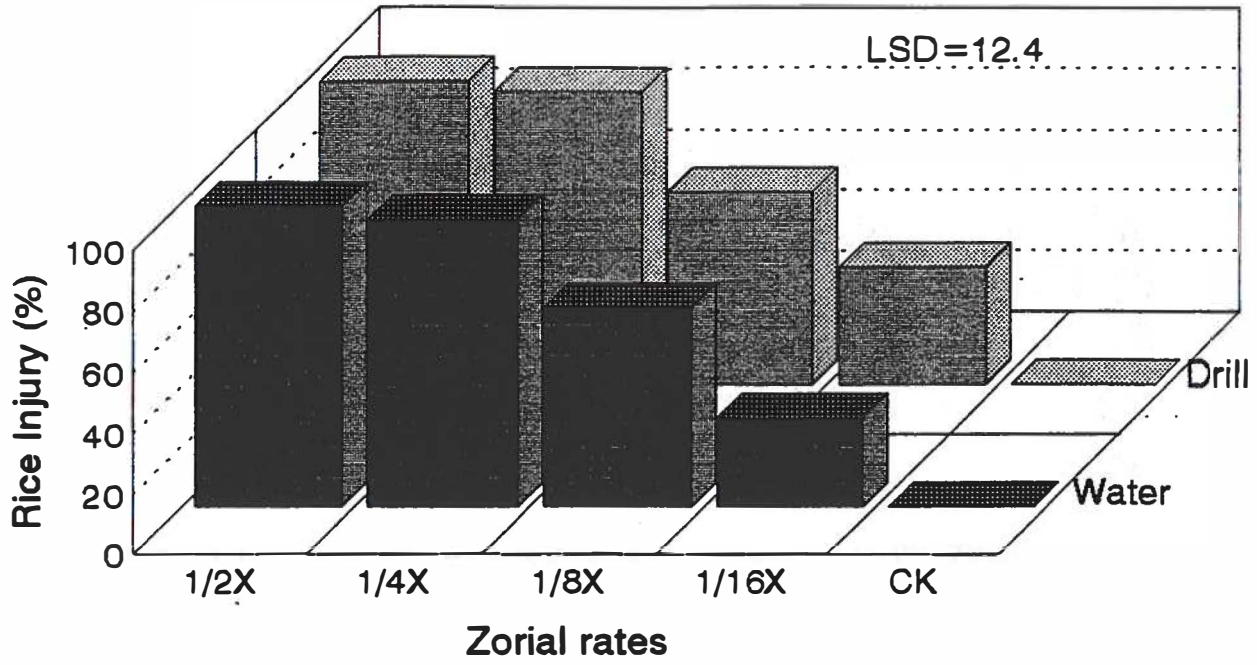


Fig. 5. Rice Injury from Cotoran 2WAP (Water and Drill Seeding)

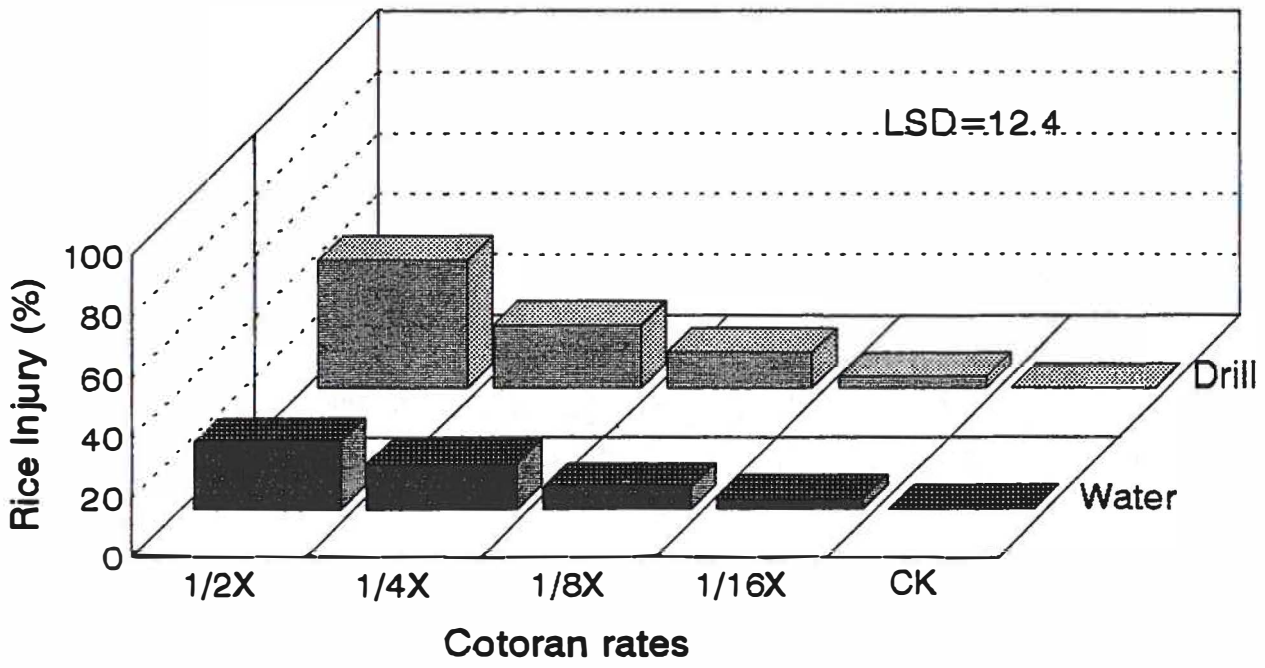


Fig. 6. Rice Injury from Pursuit 2WAP (Water and Drill Seeding)

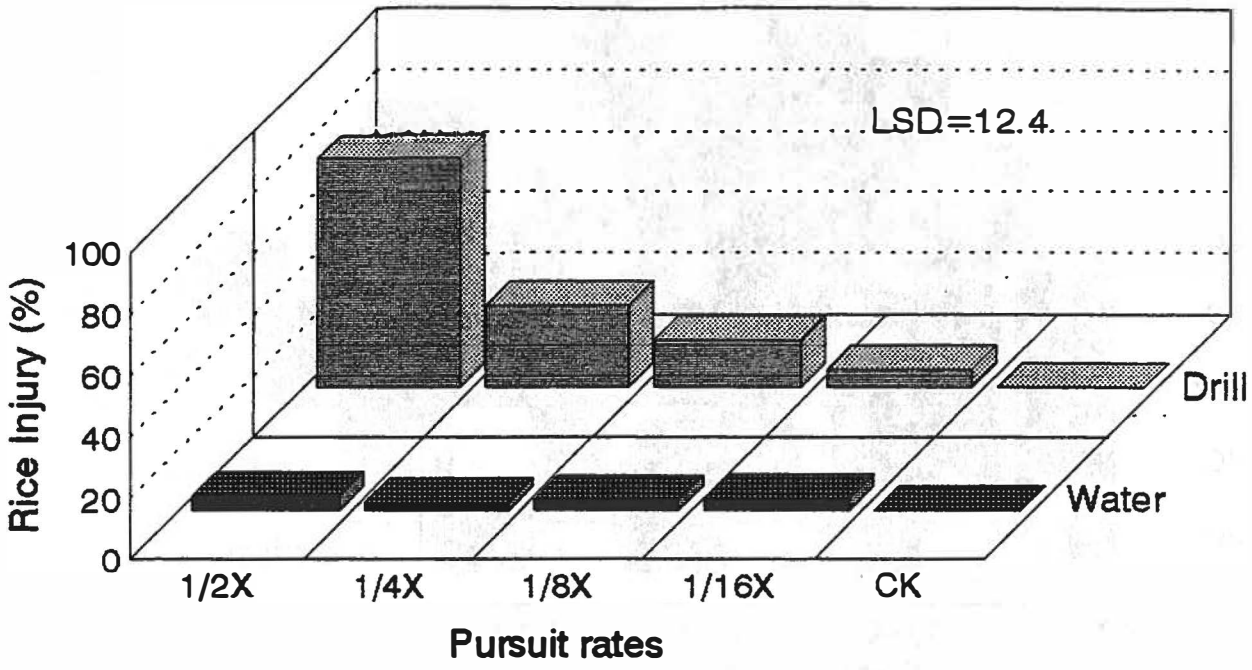


Fig. 7. Rice Injury from Dual as Affected by Rice Herbicides, 2WAT

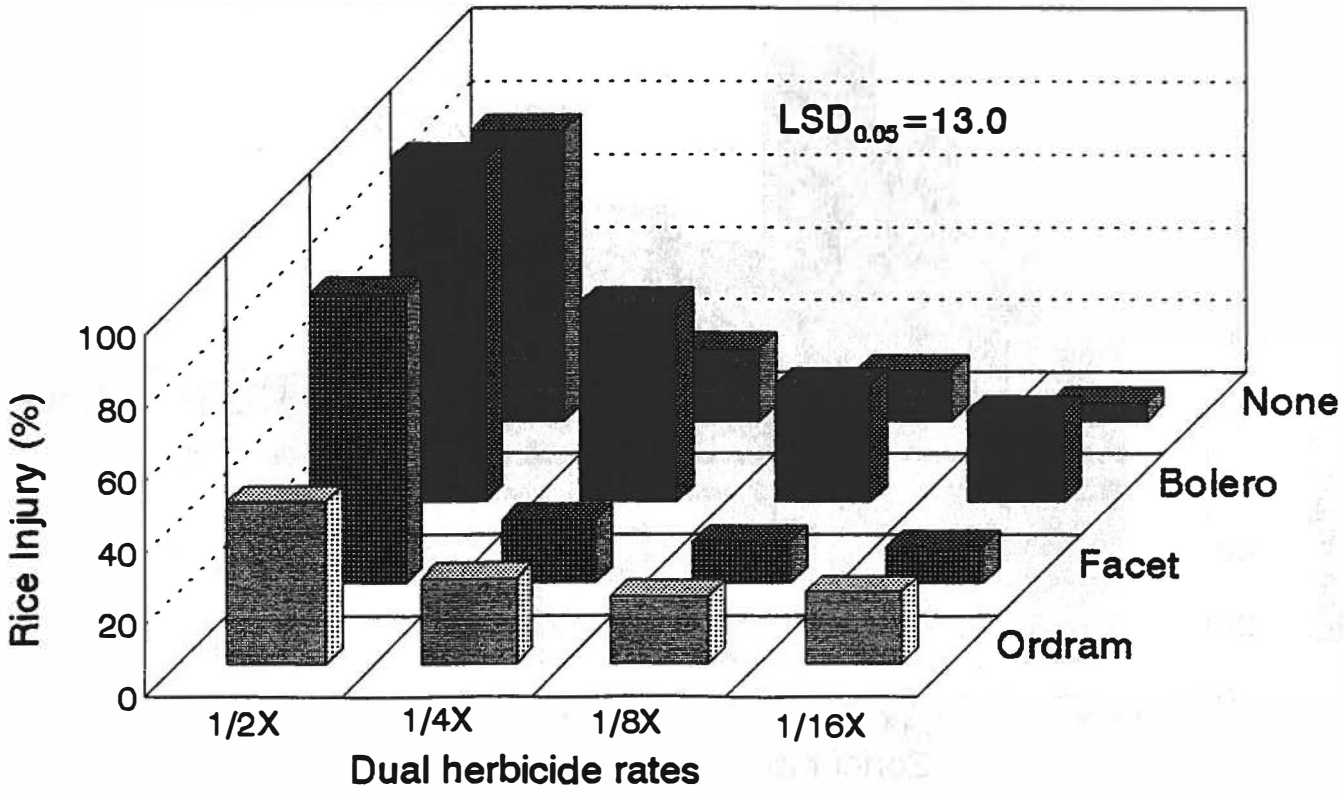


Fig. 8. Rice Injury from Pursuit as Affected by Rice Herbicides, 2WAT

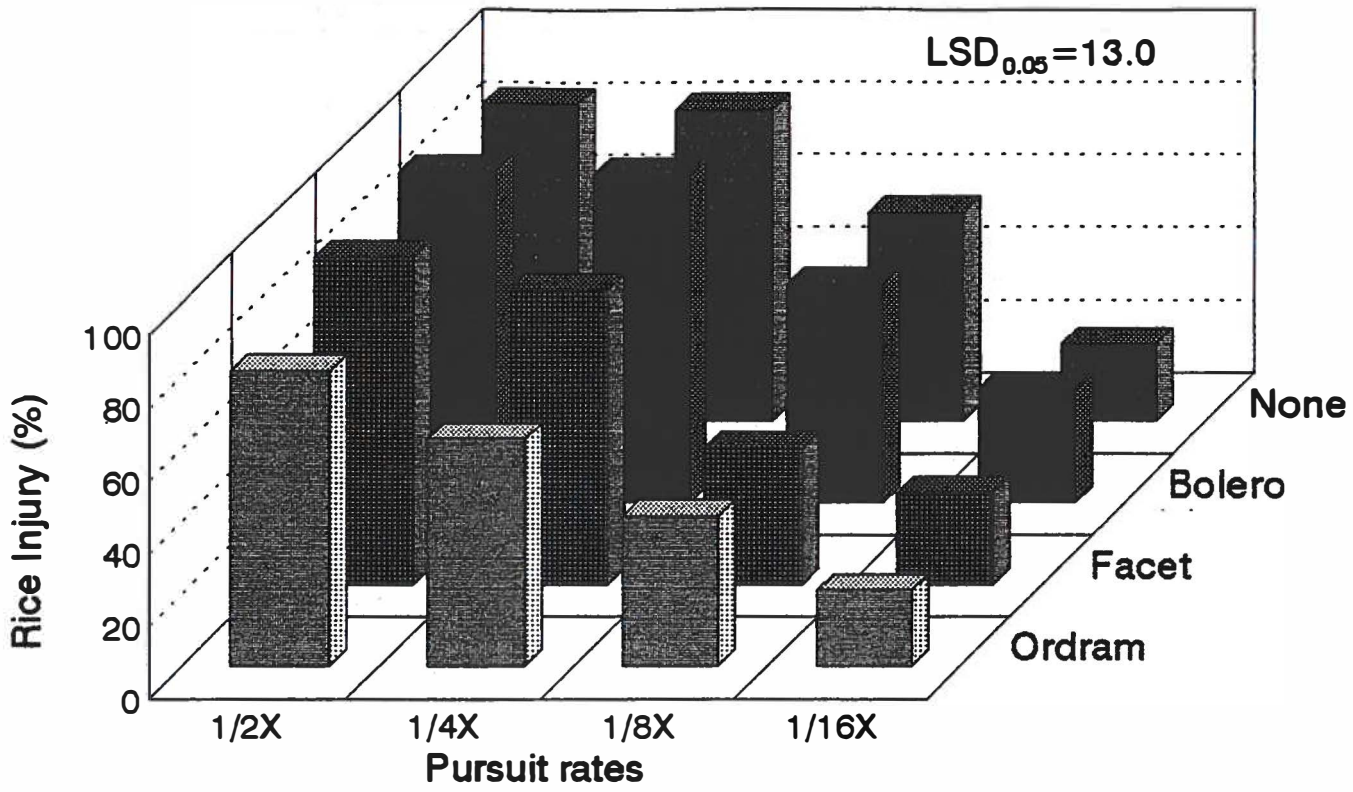
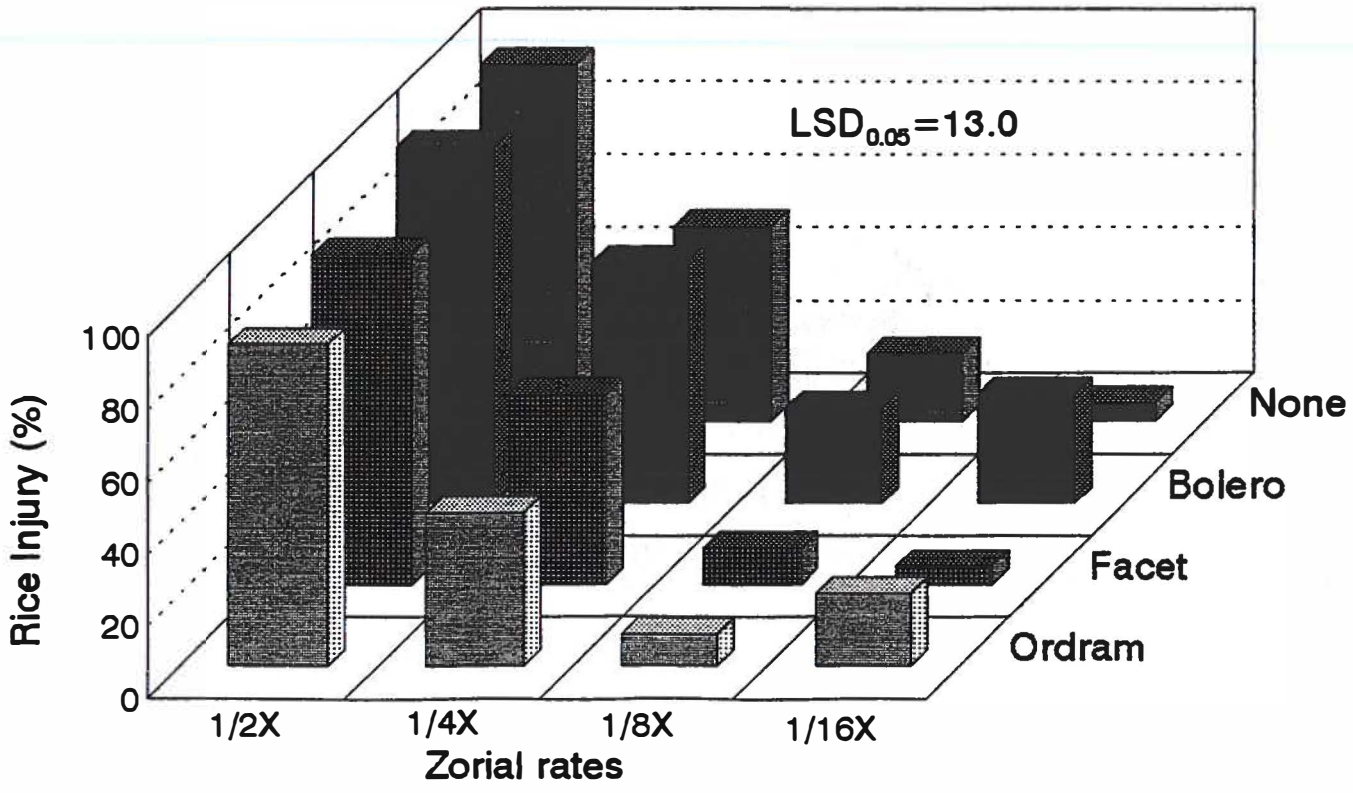


Fig. 9. Rice Injury from Zorial as Affected by Rice Herbicides, 2WAT



RICE DISEASE CONTROL STUDIES, 1995[1]

D.E. Groth, M. Frey, J. Nugent, P.K. Bollich, and S.D. Linscombe

Data from research tests suggest that rice diseases annually cause at least an average range of 12 - 15% loss in yield in the South. With present production costs and price of rice, this average yield loss translates into an average 33 - 40% loss in potential net return due to 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 diseases blast, caused by Pyricularia grisea; sheath blight, caused by Thanatephorus cucumeris (Rhizoctonia solani); 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. 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 are 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.

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[1] This research is supported in part by funds provided by rice producers through the Louisiana Rice Research Board and various agricultural chemical companies.

1995 WATER MANAGEMENT X SOIL FUNGICIDE X VARIETY STUDY

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, Orion, Bengal, Maybelle, Jodon, and Lemont, 150 lb/A

Planting Method/Date: Water-seeded, Apr 4

Fertilization: Continuous flood and pinpoint flood, preplant 105-54-54, Apr 4; delayed flood, preplant 16-50-50, Apr 4; preflood 90-0-0, May 1; Topdressed 46-0-0, May 24

Plot Size: 4.75 x 20 ft

Experimental Design: Factorial in a split-split block design with four replications

Water Management: Flooded, Apr 3; pinpoint and delayed flood treatments drained, Apr 7, pinpoint flood reflooded, Apr 10 delayed flood reflooded, Apr 17; all treatments drained, Apr 26 (for herbicide application); reflooded, May 1

Herbicides: 4 qt Arrosolo/A, Apr 28; Londax 1.5 oz/A + 0.5 lb/A zinc, May 3

Insecticides: 17 lb/A Furadan, May 24

Fungicides (Soil): Granular Ridomil 0.25 lb ai/A, Apr 5

Application Equipment: Hand applied

Drained: July 18

Harvest: Aug 1

Disease Ratings: Visual water mold signs were noted Apr 15; seedling counts, Apr 27; Lodging data, July 31

Results: See Tables 1, 2, and 3.

Comments: Water mold (Pythium spp. and Achylia spp.) severity was low to moderate. Stand densities were in the high range. Other diseases were low in severity.

Table 1. The effect of water management, soil applied fungicide and variety on plant stand densities, agronomic characters, and yield. Rice Research Station, Crowley, LA. 1995.

Variety	Plants/ft²	Days to heading	Lodging (%)	Yield (lb/A)
	Continuous flood			
Untreated soil				
1 Cypress	23.5 b-h	75.0 g	0.0 f	6005.5 e-l
2 Lemont	21.3 d-h	78.8 def	0.0 f	5324.3 k-o
3 Orion	22.0 c-h	84.0 c	77.5 ab	6654.5 a-e
4 Bengal	23.5 b-h	84.5 bc	13.8 c-f	7261.0 a
5 Maybelle	26.0 a-h	65.0 i	11.3 c-f	4859.8 op
6 Jodon	20.8 e-h	69.8 h	1.3 ef	6188.5 d-j
Ridomil treated soil				
7 Cypress	24.0 b-h	75.8 g	0.0 f	6350.5 b-h
8 Lemont	19.5 fgh	79.3 de	0.0 f	5464.5 j-o
9 Orion	18.5 gh	85.5 bc	86.3 ab	6499.3 a-f
10 Bengal	26.8 a-g	84.8 bc	26.3 c	6451.3 b-f
11 Maybelle	25.0 a-h	64.5 i	22.5 c-f	5029.5 nop
12 Jodon	19.0 gh	69.8 h	11.3 c-f	5678.3 g-n
	Pinpoint flood			
Untreated soil				
13 Cypress	23.5 b-h	76.5 fg	21.3 c-f	5968.0 e-l
14 Lemont	28.3 a-e	80.3 d	0.0 f	5467.0 i-o
15 Orion	21.3 d-h	86.3 abc	68.8 b	6232.0 c-i
16 Bengal	22.5 c-h	86.0 abc	20.5 c-f	6689.3 a-e
17 Maybelle	26.0 a-h	65.8 i	25.0 cd	4459.3 p
18 Jodon	24.3 a-h	69.5 h	1.3 ef	5465.8 j-o
Ridomil treated soil				
19 Cypress	27.5 a-f	77.5 efg	1.3 ef	6062.5 e-k
20 Lemont	23.0 b-h	79.5 de	0.5 f	5242.0 l-o
21 Orion	22.3 c-h	85.8 abc	86.3 ab	7075.5 ab
22 Bengal	18.8 gh	86.8 ab	8.0 c-f	6918.8 a-d
23 Maybelle	25.5 a-h	65.3 i	13.8 c-f	5115.8 m-p
24 Jodon	22.5 c-h	69.8 h	3.0 def	5606.5 h-o
	Delayed flood			
Untreated soil				
25 Cypress	31.0 ab	84.5 bc	15.0 c-f	6307.3 c-h
26 Lemont	23.8 b-h	86.5 abc	5.0 c-f	6165.0 d-j
27 Orion	18.5 gh	86.8 ab	87.5 ab	6720.8 a-e
28 Bengal	20.0 e-h	88.3 a	13.0 c-f	6991.0 abc
29 Maybelle	26.5 a-g	71.3 h	23.8 cde	6157.5 d-j
30 Jodon	18.0 h	80.8 d	8.0 c-f	6156.3 d-j
Ridomil treated soil				
31 Cypress	30.0 abc	84.5 bc	10.0 c-f	6403.5 b-g
32 Lemont	32.5 a	86.3 abc	5.0 c-f	5978.0 e-l
33 Orion	20.3 e-h	87.0 ab	92.5 a	6671.8 a-e
34 Bengal	19.8 fgh	88.3 a	26.3 c	6682.8 a-e
35 Maybelle	29.3 a-d	71.0 h	20.0 c-f	5846.0 f-m
36 Jodon	29.8 abc	84.0 c	15.0 c-f	6422.8 b-g
LSD (.05) =	7.8	2.5	21.5	710.8
Standard Dev.=	5.57	1.79	15.38	507.7
CV =	23.50	2.27	67.48	8.36

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 2. Factorial analysis of the effect of water management, soil applied fungicide and variety on plant stand densities, agronomic characters, and rice yield. Rice Research Station, Crowley, LA. 1995.

Factor			Plants/ft²	Days to heading	Lodging (%)	Yield (lb/A)
			TABLE OF R MEANS			
Replicate 1			23.1	79.0	23.6	5846.6
Replicate 2			22.4	79.1	23.6	6197.3
Replicate 3			24.1	79.3	26.1	6133.5
Replicate 4			25.3	78.6	17.8	6108.3
			TABLE OF A MEANS			
1 Continuous flood			22.5	76.4	20.8	5980.6
2 Pinpoint flood			23.8	77.4	20.8	5858.5
3 Delayed flood			24.9	83.3	26.8	6375.2
			TABLE OF B MEANS			
1 Untreated			23.4	78.8	21.8	6059.6
2 Ridomil	2 EC 1.0	Preplant	24.1	79.2	23.8	6083.3
			TABLE OF C MEANS			
1 Cypress			26.6	79.0	7.9	6182.9
2 Lemont			24.7	81.8	1.8	5606.8
3 Orion			20.5	85.9	83.1	6642.3
4 Bengal			21.9	86.4	18.0	6832.3
5 Maybelle			26.4	67.1	19.4	5244.6
6 Jodon			22.4	73.9	6.6	5919.7
			TABLE OF AB MEANS			
1 Continuous flood 1 Untreated			22.8	76.2	17.3	6048.9
2 Pinpoint flood 1 Untreated			24.3	77.4	22.8	5713.5
3 Delayed flood 1 Untreated			23.0	83.0	25.4	6416.3
1 Continuous flood 2 Ridomil	2 EC 1.0	Preplant	22.1	76.6	24.4	5912.2
2 Pinpoint flood 2 Ridomil	2 EC 1.0	Preplant	23.3	77.4	18.8	6003.5
3 Delayed flood 2 Ridomil	2 EC 1.0	Preplant	26.9	83.5	28.1	6334.1
			TABLE OF AC MEANS			
1 Continuous flood 1 Cypress			23.8	75.4	0.0	6178.0
2 Pinpoint flood 1 Cypress			25.5	77.0	11.3	6015.3
3 Delayed flood 1 Cypress			30.5	84.5	12.5	6355.4
1 Continuous flood 2 Lemont			20.4	79.0	0.0	5394.4
2 Pinpoint flood 2 Lemont			25.6	79.9	0.3	5354.5
3 Delayed flood 2 Lemont			28.1	86.4	5.0	6071.5
1 Continuous flood 3 Orion			20.3	84.8	81.9	6576.9
2 Pinpoint flood 3 Orion			21.8	86.0	77.5	6653.8

Continued.

Table 2. Continued.

Factor			Plants/ft²	Days to heading	Lodging (%)	Yield (lb/A)
			TABLE OF AC MEANS (continued)			
3 Delayed flood 3 Orion			19.4	86.9	90.0	6696.3
1 Continuous flood 4 Bengal			25.1	84.6	20.0	6856.1
2 Pinpoint flood 4 Bengal			20.6	86.4	14.3	6804.0
3 Delayed flood 4 Bengal			19.9	88.3	19.6	6836.9
1 Continuous flood 5 Maybelle			25.5	64.8	16.9	4944.6
2 Pinpoint flood 5 Maybelle			25.8	65.5	19.4	4787.5
3 Delayed flood 5 Maybelle			27.9	71.1	21.9	6001.8
1 Continuous flood 6 Jodon			19.9	69.8	6.3	5933.4
2 Pinpoint flood 6 Jodon			23.4	69.6	2.1	5536.1
3 Delayed flood 6 Jodon			23.9	82.4	11.5	6289.5
			TABLE OF BC MEANS			
1 Untreated 1 Cypress			26.0	78.7	12.1	6093.6
2 Ridomil 1 Cypress	2 EC 1.0	Preplant	27.2	79.3	3.8	6272.2
1 Untreated 2 Lemont			24.4	81.8	1.7	5652.1
2 Ridomil 2 Lemont	2 EC 1.0	Preplant	25.0	81.7	1.8	5561.5
1 Untreated 3 Orion			20.6	85.7	77.9	6535.8
2 Ridomil 3 Orion	2 EC 1.0	Preplant	20.3	86.1	88.3	6748.8
1 Untreated 4 Bengal			22.0	86.3	15.8	6980.4
2 Ridomil 4 Bengal	2 EC 1.0	Preplant	21.8	86.6	20.2	6684.3
1 Untreated 5 Maybelle			26.2	67.3	20.0	5158.8
2 Ridomil 5 Maybelle	2 EC 1.0	Preplant	26.6	66.9	18.8	5330.4
1 Untreated 6 Jodon			21.0	73.3	3.5	5936.8
2 Ridomil 6 Jodon	2 EC 1.0	Preplant	23.8	74.5	9.8	5902.5

Table 3. Factorial/split plot ANOVA for the effects of water management, soil applied fungicide, variety and interactions on plant stand densities, agronomic characters, and rice yield. Rice Research Station, Crowley, LA. 1995.

Source	df	Plants/ft^2	Days to heading	Lodging (%)	Yield (lb/A)
Replication	3	0.1129	0.6389	0.3166	0.0010
Man	2	0.0009	0.0012	0.0001	0.0022
Error A	6				
Fungicide	1	0.1570	0.9627	0.3432	0.1915
Man X Fung	2	0.9868	0.4764	0.6404	0.9216
Error B	9				
Variety	5	0.0001	0.0001	0.0001	0.0001
Man X Var	10	0.2092	0.6887	0.1585	0.0001
Fung X Var	5	0.0064	0.9019	0.0782	0.6830
M X F X V	10	0.4546	0.8495	0.1950	0.9523
Error C	90				

1995 RICE SEED PROTECTANT TEST

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Lemont, 100 seeds/plot

Planting Method/Date: Water-planted by hand, Apr 6; second planting: water-seeded, June 14

Fertilization: First planting water-seeded, preplant 90-42-42, Apr 5; second planting water-seeded, preplant 90-42-42, June 13; first planting topdressed 46-0-0, May 24; second planting topdressed 46-0-0, June 19

Plot Size: 2.5 ft dia rings (water seeded)

Experimental Design: Randomized complete block design with four replications

Herbicides: N/A

Insecticides: N/A

Fungicides: Applied to seeds (See Table 4 for rates)

Application Equipment: Rolling jar mixer

Harvest: N/A

Stand counts: Apr 22 and June 2

Results: See Table 4.

Comments: Water mold pressure was low to moderate in water-seeded rice.

Table 4. Effect of seed-protectant fungicides on percent (%) germination in water-seeded rice. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Germination (%)			
		First planting		Second planting	
		Soaked seed	Dry seed	Soaked seed	Dry seed
1 Untreated check		32.0 ab	18.8 b	23.8 de	32.8 a-d
2 Vitavax 200	4	28.0 bc	21.5 ab	19.8 e	28.3 d
3 Vitavax 200	3	31.3 abc	25.8 ab	36.5 ab	30.0 bcd
FA12	0.1				
4 Vitavax 200	3	31.5 abc	28.0 a	39.8 a	33.5 a-d
Apron	1				
5 Thiram 42S	2	32.5 ab	25.0 ab	37.0 ab	27.8 d
FA12	0.1				
6 LS016	2.5	30.5 abc	27.8 a	37.3 ab	35.5 ab
7 WE0101041	1.33	25.5 c	20.5 ab	26.3 cde	35.0 abc
8 WE0101041	1.33	29.3 bc	22.8 ab	22.8 de	30.0 bcd
NU-FLOW Z-KOTE	1				
9 WE0101041	1.33	32.3 ab	25.0 ab	23.5 de	29.0 cd
Apron FL	0.1				
10 WE0101041	1.33	28.8 bc	23.8 ab	25.3 cde	36.0 ab
Apron FL	0.1				
WE0821110	1.0				
11 WE0101041	1.33	31.0 abc	25.0 ab	28.0 cd	30.8 bcd
Apron FL	0.1				
Dividend	0.5				
12 Dithane 75DF	6.0	36.0 a	26.8 ab	37.8 ab	31.8 a-d
Apron FL	0.1				
13 Benlate SP	8.0	27.3 bc	25.0 ab	32.3 bc	37.5 a
LSD (.05) =		5.8	8.1	7.0	5.8
Standard Dev.=		4.04	5.61	4.84	4.01
CV =		13.29	23.15	16.17	12.49

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

1995 OFF-STATION SHEATH BLIGHT YIELD LOSS EVALUATION

Location: Errol Lounsberry Farm, Lake Arthur, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, Lafitte, Bengal, 9302065, 150 lb/A

Planting Method/Date: Water-seeded, Mar 29

Emergence Date: Apr 7

Fertilization: 90-0-0 preplant, Mar 25; 0.5 lb/A Zn, Apr 21;
Second crop: 75-0-0, July 29

Plot Size: 8 x 25 ft

Experimental Design: Randomized complete block with four replications

Water Management: Flooded, Mar 26; drained, Apr 3; reflooded, Apr 8

Herbicides: 0.9 oz Londax/A, Mar 28

Insecticides: Furadan 17 lb/A, May 11

Fungicides: See Table 5

Application Equipment: CO_2 backpack sprayer, 8002 tip, 15 gal/A

Inoculation Dates: Inoculated for sheath blight, May 20 (300 ml/plot)

Drained: July 11; Second crop, Oct 8

Harvest: July 28; Second crop, Oct 31

Disease Ratings: Tiller counts (% SB) and sheath blight ratings (0-9), July 19

Results: See Table 5

Comments: Sheath blight severity was high in inoculated plots. Some natural disease developed in uninoculated plots.

Table 5. Evaluation of the rice varieties and line 9302065 using inoculated and uninoculated plots as compared with fungicide-treated plots. Errol Lounsberry Farm, Lake Arthur, LA. 1995.

Variety/ Inoculation	Sheath blight Severity[1] (0-9)	Sheath blight Incidence[2] (%)	Neck blast (%)	Yield (lb/A)
		Cypress		
Unsprayed/Uninoculated	6.8 abc	52.0 bc	1.0 d	5694 cd
Unsprayed/Inoculated	7.8 a	74.0 a	1.8 d	5536 de
Tilt 3.6 EC 10 oz pr/A Early Boot Benlate 50 WP 1 lb pr/A Heading	5.3 de	34.5 cd	0.5 d	6117 bc
ICIA5504 80 DF 0.2 lb ai/A Boot + Heading	3.8 fgh	22.5 de	0.0 d	6245 b
		Lafitte		
Unsprayed/Uninoculated	4.8 efg	19.0 de	1.0 d	7040 a
Unsprayed/Inoculated	4.8 efg	20.0 de	0.5 d	7372 a
Tilt 3.6 EC 10 oz pr/A Early Boot Benlate 50 WP 1 lb pr/A Heading	4.5 efg	17.5 de	0.5 d	7252 a
ICIA5504 80 DF 0.2 lb ai/A Boot + Heading	2.8 h	8.5 e	0.0 d	7171 a
		Bengal		
Unsprayed/Uninoculated	5.0 def	25.5 de	12.5 b	5305 de
Unsprayed/Inoculated	5.5 cde	26.5 de	17.5 a	4748 f
Tilt 3.6 EC 10 oz pr/A Early Boot Benlate 50 WP 1 lb pr/A Heading	5.0 def	21.5 de	10.5 b	5202 ef
ICIA5504 80 DF 0.2 lb ai/A Boot + Heading	3.5 gh	10.0 e	5.5 c	5682 cd
		2065		
Unsprayed/Uninoculated	7.5 ab	60.5 ab	1.0 d	5606 de
Unsprayed/Inoculated	8.0 a	80.5 a	1.0 d	5399 de
Tilt 3.6 EC 10 oz pr/A Early Boot Benlate 50 WP 1 lb pr/A Heading	6.3 bcd	36.5 cd	0.0 d	6194 b
ICIA5504 80 DF 0.2 lb ai/A Boot + Heading	3.0 h	10.0 e	0.0 d	6229 b
LSD (.05) =	1.4	19.9	3.0	454
Standard Dev.=	.977526	13.9250	2.09140	317.713
CV =	18.62	42.93	62.84	5.25

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).
[1] Severity was rated using a 0-9 scale where 0 indicated no disease and 9 indicated plants dead and collapsed.
[2] Sheath blight incidence was the percent tillers infected with sheath blight.

1995 VARIETY TRIAL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Various varieties and breeding lines, 4 gm/4 ft row

Planting Method/Date: Hege tray planter (drill-seeded), Apr 19

Emergence Date: Apr 28

Fertilization: Preplant 16-48-48, Apr 19; 120-0-0 preflood, May 15; 46-0-0, June 19

Plot Size: 4 ft rows

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 27; permanent flood, May 17

Herbicides: 4 qt Propanil/A, May 16; 1.5 oz/A Londax, May 24 and June 19

Insecticides: 17 lb/A Furadan, May 24

Fungicides: None

Application Equipment: N/A

Inoculation Dates: Inoculated for sheath blight, May 31 (10-15 ml/row) - Broadcast

Drained: Aug 30

Harvest: N/A

Disease Ratings: Sheath blight, blast, and foliar disease data taken Aug 1-5

Results: See Table 8.

Comments: Sheath blight severity was very high; other diseases were moderate in severity.

Table 8. Reaction of rice varieties to sheath blight, leaf smut, brown spot, narrow brown spot, and blast. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight[1] (0-9)	Brown Spot[1] (0-9)	Narrow Brown[1] (0-9)	Leaf Smut[1] (0-9)	Rottenneck Blast[2] (0-9)
1 Jodon	7.3 bcd	1.5 d-h	1.0 f-i	3.3 def	7.5 i-n
2 Jackson	7.5 bc	1.3 e-h	1.5 d-i	4.5 bc	6.8 i-n
3 Alan	6.8 c-f	2.3 b-g	2.8 b-e	3.8 bcd	21.3 ef
4 RT 7015	7.5 bc	2.3 b-g	1.5 d-i	3.0 def	26.3 de
5 Maybelle	8.8 a	3.8 ab	3.8 ab	5.8 a	41.3 b
6 Tebonnet	6.3 efg	2.5 a-f	3.0 a-d	3.0 def	8.0 h-n
7 Millie	6.3 efg	3.8 ab	0.5 ghi	0.5 ij	17.5 fg
8 L202	7.5 bc	1.3 e-h	1.5 d-i	3.5 cde	50.0 a
9 Rosemont	8.0 ab	1.3 e-h	1.0 f-i	3.5 cde	36.3 bc
10 Texmont	---	---	---	---	----
11 Adair	6.5 d-g	2.0 c-g	2.5 b-f	0.3 j	13.8 f-j
12 LaGrue	6.5 d-g	0.8 gh	2.0 c-g	0.0 j	16.3 fgh
13 Kaybonnet	6.0 fgh	3.3 abc	3.0 a-d	1.0 hij	2.3 mn
14 Cypress	7.3 bcd	2.5 a-f	1.0 f-i	0.8 hij	6.3 j-n
15 Katy	5.3 hi	2.0 c-g	0.5 ghi	0.0 j	0.5 n
16 Lacassine	7.0 cde	1.0 fgh	1.8 c-h	1.5 ghi	12.5 g-k
17 Lemont	7.5 bc	4.0 a	2.8 b-e	3.8 bcd	9.5 g-m
18 Gulfmont	8.0 ab	3.5 abc	1.6 c-h	3.3 def	12.5 g-k
19 Newbonnet	6.5 d-g	3.5 abc	1.0 f-i	1.0 hij	15.0 f-i
20 Rico 1	5.3 hi	3.3 abc	1.0 f-i	0.3 j	0.5 n
21 Bengal	5.8 gh	2.3 b-g	0.0 i	0.0 j	12.5 g-k
22 Orion	4.5 ijk	0.3 h	2.0 c-g	0.0 j	3.0 lmn
23 Mars	4.5 ijk	3.0 a-d	1.0 f-i	0.0 j	13.8 f-j
24 Mercury	6.0 fgh	3.0 a-d	2.0 c-g	0.0 j	32.5 cd
25 Saturn	5.3 hi	0.3 h	4.5 a	1.8 gh	11.3 g-l
26 9402048	8.0 ab	3.0 a-d	0.0 i	2.3 fg	5.0 k-n
27 Toro-2	3.8 k	0.3 h	2.0 c-g	0.8 hij	3.8 lmn
28 Dellmont	7.3 bcd	2.5 a-f	1.3 e-i	2.5 efg	3.8 lmn
29 Della	4.8 ij	3.5 abc	2.8 b-e	0.0 j	3.8 lmn
30 Dellrose	6.5 d-g	3.3 abc	3.3 abc	2.3 fg	11.3 g-l
31 9302008	5.8 gh	3.5 abc	0.5 ghi	0.0 j	1.3 mn
32 9302065	7.3 bcd	0.8 gh	0.3 hi	4.0 bcd	0.5 n
33 9202071	4.3 jk	1.0 fgh	1.8 c-h	0.3 j	0.5 n
34 9502106	8.5 a	2.8 abc	1.3 efg	4.8 ab	6.8 ijk
LSD (.05) =	0.9	1.5	1.5	1.1	7.8
Standard Dev.=	0.63	1.06	1.05	0.75	5.55
CV =	9.74	47.01	62.13	41.08	44.35

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).
[1] Ratings based on 0-9 scale where 0 = no disease (immune) and 9 = maximum disease (very susceptible).
[2] Ratings based on % heads infected with rotten neck blast.

1995 UNIFORM DISEASE NURSERY

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Various varieties and breeding lines, 4 gm/4 ft row

Planting Method/Date: Hege tray planter (drill-seeded), Apr 19

Emergence Date: Apr 28

Fertilization: Preplant 16-48-48, Apr 19; 120-0-0 preflood, May 15; 46-0-0, June 19

Plot Size: 4 ft row

Experimental Design: Randomized complete block with two to four replications

Water Management: Flushed, Apr 27; permanent flood, May 17

Herbicides: 4 qt Propanil/A, May 16; 1.5 oz/A Londax, May 24 and June 19

Insecticides: 17 lb/A Furadan, May 24

Fungicides: None

Application Equipment: N/A

Inoculation Dates: Inoculated for sheath blight, May 31 (10-15 ml/row) - Broadcast

Drained: Aug 30

Harvest: N/A

Disease Ratings: Sheath blight and foliar disease data taken Aug 1-5

Results: See Tables 7-13.

Comments: Sheath blight and blast severities were very high; other diseases were moderate in severity.

Table 7. Disease reactions of 1995 uniform rice nursery (URN), Group 1. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	leaf Smut (0-9)	Neck Blast (0-9)
1 URN Entry 1	6.5 d-g	4.3 a	4.5 ab	5.0 a	15.0 cde
2 2	6.5 d-g	2.5 b	3.0 cd	4.8 ab	0.0 f
3 3	5.5 ghi	2.0 bcd	0.0 i	1.3 ghi	0.0 f
4 4	6.8 c-g	0.5 ef	0.3 hi	3.3 cd	17.5 bc
5 5	8.5 ab	1.0 c-f	3.8 bc	2.3 d-g	21.3 bc
6 6	4.5 hi	0.8 def	2.3 d-g	0.0 i	2.5 f
7 7	7.0 c-f	1.3 b-f	3.8 bc	1.8 e-h	6.3 ef
8 8	7.0 c-f	0.0 f	3.0 cd	0.8 hi	15.0 cde
9 9	7.0 c-f	0.0 f	0.0 i	2.8 def	0.0 f
10 10	7.0 c-f	2.3 bc	1.3 f-i	3.0 cde	25.0 b
11 11	8.0 abc	1.0 c-f	1.5 e-h	2.8 def	25.0 b
12 12	5.8 fgh	1.3 b-f	2.8 cde	3.5 bcd	2.5 f
13 13	6.5 d-g	0.0 f	2.5 c-f	4.3 abc	6.3 ef
14 14	4.3 i	0.0 f	0.3 hi	1.5 fgh	0.0 f
15 15	5.5 ghi	0.3 ef	3.5 bcd	3.3 cd	3.8 f
16 16	6.3 efg	2.3 bc	3.3 bcd	4.3 abc	16.3 bcd
17 17	9.0 a	3.8 a	5.8 a	3.5 bcd	40.0 a
18 18	7.8 a-d	0.5 ef	3.8 bc	2.8 def	17.5 bc
19 19	5.8 fgh	1.5 b-e	1.0 ghi	1.5 fgh	5.0 f
20 20	7.3 b-e	0.0 f	3.8 bc	1.8 e-h	7.5 def
LSD (.05) =	1.2	1.2	1.3	1.4	8.8
Standard Dev.=	0.87	0.84	0.94	0.95	6.25
CV =	13.23	67.27	37.96	35.65	55.26

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 8. Disease reactions of 1995 uniform rice nursery (URN), Group 2. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 URN Entry 21	7.0 abc	1.8 abc	1.0 ef	2.3 a-d	13.8 ab
2 22	5.0 fgh	1.8 abc	0.0 f	2.0 bcd	2.5 cd
3 23	8.0 a	1.5 abc	3.5 ab	1.5 cde	18.8 a
4 24	6.8 a-d	0.0 e	3.5 ab	3.8 a	13.8 ab
5 25	5.8 c-h	0.3 de	0.0 f	3.3 ab	3.8 cd
6 26	6.5 b-e	0.0 e	0.8 ef	0.0 e	2.5 cd
7 27	6.8 a-d	0.0 e	4.5 a	3.8 a	3.8 cd
8 28	4.8 gh	0.0 e	0.0 f	1.0 de	0.0 d
9 29	5.3 e-h	0.0 e	2.3 cd	0.3 e	2.5 cd
10 30	7.0 abc	2.5 a	4.0 ab	3.3 ab	2.5 cd
11 31	5.5 d-h	1.0 cde	0.0 f	2.0 bcd	0.0 d
12 32	6.3 c-f	1.0 cde	3.3 bc	0.8 de	3.8 cd
13 33	7.8 ab	2.3 ab	3.8 ab	2.8 abc	20.0 a
14 34	3.3 i	1.0 cde	0.0 f	0.0 e	6.3 bcd
15 35	4.8 gh	0.8 cde	0.5 ef	0.0 e	1.3 cd
16 36	5.8 c-h	0.8 cde	0.3 ef	1.3 cde	3.8 cd
17 37	4.8 gh	0.0 e	0.0 f	2.0 bcd	0.0 d
18 38	6.0 c-g	0.0 e	0.0 f	1.5 cde	6.3 bcd
19 39	4.5 h	1.5 abc	0.5 ef	2.3 a-d	2.5 cd
20 40	5.8 c-h	1.3 bcd	1.3 de	1.0 de	8.8 bc
LSD (.05) =	1.2	1.1	1.1	1.5	7.2
Standard Dev.=	0.85	0.79	0.75	1.04	5.10
CV =	14.59	92.29	52.32	60.58	87.75

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 9. Disease reactions of 1995 uniform rice nursery (URN), Group 3. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 URN Entry 41	7.0 abc	1.3 abc	2.0 bcd	1.0 cde	16.3 a
2 42	6.8 a-d	0.0 c	2.8 abc	0.0 e	0.0 e
3 43	6.5 bcd	0.8 bc	1.0 d-g	0.5 de	0.0 e
4 44	6.3 b-e	1.3 abc	0.8 efg	2.8 ab	0.0 e
5 45	6.8 a-d	0.0 c	2.8 abc	0.0 e	8.8 bcd
6 46	7.8 a	1.0 bc	3.0 ab	1.0 cde	12.5 ab
7 47	6.8 a-d	0.0 c	0.0 g	1.0 cde	8.8 bcd
8 48	7.8 a	1.3 abc	2.5 bc	1.8 bcd	10.0 abc
9 49	5.8 def	0.0 c	0.3 fg	0.0 e	1.3 e
10 50	6.3 b-e	2.3 ab	0.5 fg	1.5 bcd	2.5 de
11 51	5.0 f	2.3 ab	0.0 g	0.0 e	0.0 e
12 52	6.5 bcd	1.5 abc	1.8 cde	1.3 cde	11.3 abc
14 53	5.8 def	0.8 bc	0.3 fg	3.5 a	1.3 e
15 54	5.3 ef	1.8 ab	0.0 g	0.0 e	2.5 de
16 55	5.3 ef	1.3 abc	0.0 g	0.0 e	0.0 e
17 56	7.8 a	0.0 c	3.8 a	2.3 abc	8.8 bcd
18 57	6.0 c-f	2.8 a	1.3 def	1.0 cde	0.0 e
19 58	7.3 ab	0.0 c	2.5 bc	2.8 ab	5.0 cde
20 59	7.3 ab	0.8 bc	2.0 bcd	1.0 cde	2.5 de
LSD (.05) =	1.1	1.4	1.1	1.4	6.4
Standard Dev.=	0.74	1.01	0.74	0.95	4.55
CV =	11.51	103.05	52.77	85.74	93.81

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 10. Disease reactions of 1995 uniform rice nursery (URN), Group 4. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 61	7.8 a	1.0 bcd	3.3 b-f	6.5 ab	12.5 cde
2 62	7.3 abc	3.8 a	3.8 a-d	3.5 efg	35.0 a
3 63	7.5 ab	1.5 bcd	4.3 abc	4.3 c-g	27.5 ab
4 64	6.0 de	0.5 cd	1.8 f-i	5.8 bc	20.0 bc
5 65	4.8 f	1.5 bcd	2.5 d-g	5.5 bc	1.3 ef
6 66	7.0 a-d	2.3 abc	3.0 c-f	4.3 c-g	15.0 cd
7 67	7.3 abc	2.8 ab	3.8 a-d	4.3 c-g	22.5 bc
8 68	5.8 ef	1.5 bcd	1.3 ghi	5.8 bc	2.5 ef
9 69	7.3 abc	1.8 bcd	5.0 a	5.0 b-e	15.0 cd
10 70	7.5 ab	0.8 cd	4.8 ab	7.5 a	35.0 a
11 71	6.0 de	3.8 a	2.0 e-h	4.5 c-g	5.0 def
12 72	8.0 a	1.5 bcd	5.0 a	5.5 bc	35.0 a
13 73	6.3 cde	1.3 bcd	4.5 abc	3.3 fg	20.0 bc
14 74	4.8 f	3.8 a	3.5 a-e	4.3 c-g	5.0 def
15 75	7.8 a	2.0 a-d	4.5 abc	4.8 c-f	20.0 bc
16 76	7.8 a	2.3 abc	3.8 a-d	4.8 c-f	20.0 bc
17 77	6.3 cde	2.3 abc	4.3 abc	4.3 c-g	15.0 cd
18 78	7.5 ab	1.5 bcd	0.3 i	3.0 g	2.5 ef
19 79	5.8 ef	3.8 a	2.0 e-h	5.3 bcd	0.0 f
20 80	6.5 b-e	0.3 d	0.5 hi	3.8 d-g	15.0 cd
LSD (.05) =	1.2	1.8	1.5	1.5	10.9
Standard Dev.=	0.82	1.28	1.08	1.02	7.72
CV =	12.29	65.18	34.16	21.51	47.75

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 11. Disease reactions of 1995 uniform rice nursery (URN), Group 5. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 81	6.5 b-e	0.5 cd	5.5 a	2.5 a-e	5.0 cde
2 82	8.0 ab	0.5 cd	4.5 ab	1.0 cde	10.0 a-e
3 83	7.0 a-d	1.5 a-d	3.0 a-e	3.0 a-d	10.0 a-e
4 84	6.5 b-e	1.0 bcd	4.5 ab	2.5 a-e	0.0 e
5 85	7.5 abc	0.0 d	3.0 a-e	0.5 de	2.5 de
6 86	6.0 b-f	0.5 cd	0.5 ef	0.5 de	0.0 e
7 87	5.0 def	2.5 ab	0.5 ef	2.5 a-e	17.5 abc
8 88	7.5 abc	0.0 d	1.5 c-f	1.5 b-e	17.5 abc
9 89	6.5 b-e	0.0 d	0.0 f	2.5 a-e	2.5 de
10 90	4.5 ef	1.5 a-d	0.0 f	1.5 b-e	10.0 a-e
11 91	7.0 a-d	0.0 d	2.0 b-f	1.0 cde	0.0 e
12 92	7.5 abc	2.0 abc	2.5 b-f	0.5 de	15.0 a-d
13 93	7.0 a-d	1.0 bcd	0.5 ef	3.5 abc	20.0 ab
14 94	7.0 a-d	0.0 d	3.5 a-d	3.0 a-d	5.0 cde
15 95	8.0 ab	0.0 d	3.0 a-e	1.0 cde	22.5 a
16 96	5.0 def	3.0 a	0.0 f	4.0 ab	2.5 de
17 97	7.0 a-d	1.0 bcd	1.0 def	0.5 de	5.0 cde
18 98	4.0 f	1.0 bcd	1.5 c-f	0.0 e	0.0 e
19 99	---	---	---	---	---
20 100	5.5 c-f	0.0 d	1.0 def	0.0 e	5.0 cde
21 101	7.5 abc	2.5 ab	0.0 f	1.5 b-e	22.5 a
22 102	---	---	---	---	---
23 103	4.0 f	0.0 d	0.0 f	0.0 e	0.0 e
24 104	7.0 a-d	0.0 d	4.0 abc	0.0 e	0.0 e
25 105	---	---	---	---	---
26 106	8.0 ab	1.0 bcd	5.5 a	3.0 a-d	17.5 abc
27 107	4.0 f	0.0 d	2.5 b-f	0.5 de	5.0 cde
28 108	---	---	---	---	---
29 109	8.0 ab	1.0 bcd	3.0 a-e	1.5 b-e	12.5 a-e
30 110	6.5 b-e	0.0 d	2.0 b-f	2.0 a-e	5.0 cde
31 111	---	---	---	---	---
32 112	6.5 b-e	0.0 d	2.5 b-f	1.0 cde	10.0 a-e
33 113	7.0 a-d	1.5 a-d	0.5 ef	1.0 cde	5.0 cde
34 114	5.5 c-f	0.0 d	1.5 c-f	1.0 cde	7.5 b-e
35 115	5.5 c-f	2.5 ab	4.0 abc	3.0 a-d	5.0 cde
36 116	8.0 ab	0.0 d	4.0 abc	2.0 abc	12.5 abc
37 117	8.0 ab	0.0 d	3.5 abc	3.5 abc	15.0 abc
38 118	9.0 a	0.0 d	3.5 abc	4.5 a	15.0 abc
39 119	8.0 ab	1.5 abc	3.0 abc	1.0 cde	15.0 abc
40 120	6.0 bcd	0.0 d	2.0 bcd	3.5 abc	7.5 bcd
LSD (.05) =	2.0	1.7	2.4	2.5	13.0
Standard Dev.=	0.97	0.85	1.17	1.23	6.38
CV =	14.78	114.90	51.92	71.60	73.30

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Table 12. Disease reactions of 1995 uniform rice nursery (URN), Group 6. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 121	7.5 ab	3.5 a-d	6.0 a	3.5 c-f	5 c
2 122	7.0 ab	1.0 cde	2.5 c-f	2.0 f-i	30 ab
3 123	7.0 ab	3.5 a-d	0.5 fg	0.5 ij	0 c
4 124	7.5 ab	0.0 e	5.5 ab	3.5 c-f	10 bc
5 125	7.5 ab	0.5 de	3.0 cde	3.5 c-f	0 c
6 126	6.5 abc	2.0 b-e	3.0 cde	3.0 d-g	15 bc
7 127	7.0 ab	3.5 a-d	0.0 g	1.0 hij	5 c
8 128	5.0 cde	3.5 a-d	0.0 g	4.5 a-d	15 bc
9 129	7.5 ab	2.5 b-e	4.0 abc	0.0 j	10 bc
10 130	7.0 ab	0.5 de	2.0 c-g	3.0 d-g	20 abc
11 131	5.0 cde	3.0 a-e	1.5 d-g	4.5 a-d	0 c
12 132	8.0 a	1.0 cde	3.5 bcd	3.0 d-g	20 abc
13 133	6.0 bcd	4.0 abc	4.0 abc	5.5 ab	5 c
14 134	6.0 bcd	1.5 b-e	1.0 efg	4.0 b-e	0 c
15 135	8.0 a	3.0 a-e	3.5 bcd	2.0 f-i	5 c
16 136	7.5 ab	2.0 b-e	3.0 cde	2.5 e-h	0 c
17 137	5.0 cde	2.0 b-e	0.0 g	1.5 g-j	20 abc
18 138	6.0 bcd	0.5 de	1.0 efg	1.0 hij	0 c
19 139	7.5 ab	3.0 a-e	4.0 abc	1.5 g-j	5 c
20 140	6.0 bcd	4.0 abc	0.0 g	1.5 g-j	0 c
21 141	6.5 abc	3.5 a-d	0.0 g	2.5 e-h	15 bc
22 142	7.5 ab	1.5 b-e	3.5 bcd	6.0 a	5 c
23 143	7.5 ab	1.5 b-e	1.0 efg	0.0 j	0 c
24 144	5.0 cde	4.0 abc	0.0 g	3.0 d-g	0 c
25 145	7.0 ab	3.5 a-d	2.0 c-g	2.5 e-h	0 c
26 146	4.5 de	4.5 ab	0.0 g	0.0 j	0 c
27 147	6.5 abc	2.5 b-e	1.5 d-g	3.0 d-g	0 c
28 148	6.0 bcd	1.0 cde	0.0 g	0.5 ij	10 bc
29 149	6.0 bcd	0.0 e	0.0 g	5.0 abc	0 c
30 150	8.0 a	3.0 a-e	2.5 c-f	1.5 g-j	0 c
31 151	---	---	---	---	--
32 152	4.5 de	1.5 b-e	1.0 efg	3.5 c-f	5 c
33 153	5.0 cde	0.5 de	0.0 g	0.0 j	0 c
34 154	6.0 bcd	1.5 b-e	3.5 bcd	0.0 j	40 a
35 155	3.5 e	3.0 a-e	0.0 g	2.5 e-h	0 c
38 156	6.5 abc	0.0 e	2.0 c-g	3.0 d-g	15 bc
37 157	7.5 ab	3.5 a-d	3.5 bcd	2.5 e-h	15 bc
38 158	7.0 ab	0.0 e	2.0 c-g	3.0 d-g	40 a
39 159	4.0 e	6.0 a	0.0 g	2.5 e-h	0 c
40 160	7.0 ab	0.0 e	2.5 cde	0.5 ij	10 bc
LSD (.05) =	1.8	2.8	1.9	1.8	19
Standard Dev.=	0.88	1.40	0.94	0.89	9.38
CV =	13.81	64.16	50.38	37.36	114.41

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test.)

Table 13. Disease reactions of 1995 uniform rice nursery (URN), Group 7. Rice Research Station, Crowley, LA. 1995.

URN No.	Sheath Blight (0-9)	Brown Spot (0-9)	Narrow Brown (0-9)	Leaf Smut (0-9)	Neck Blast (0-9)
1 161	8.0 ab	0.0 g	5.5 ab	4.5 a-e	12.5 c-g
2 162	5.5 d-g	2.0 d-g	3.0 def	2.5 e-h	15.0 c-g
3 163	8.0 ab	1.5 efg	4.5 a-d	3.5 c-f	25.0 a-e
4 164	7.0 a-d	1.0 efg	6.0 a	4.5 a-e	35.0 ab
5 165	6.0 c-f	0.0 g	2.0 fgh	7.0 a	20.0 b-f
6 166	7.5 abc	3.0 b-g	5.0 abc	4.0 b-e	40.0 a
7 167	8.0 ab	1.5 efg	3.0 def	6.0 abc	10.0 d-g
8 168	6.0 c-f	2.5 c-g	2.0 fgh	6.5 ab	20.0 b-f
9 169	6.0 c-f	2.0 d-g	3.0 def	6.5 ab	10.0 d-g
10 170	7.5 abc	2.5 c-g	3.5 c-f	6.0 abc	5.0 fg
11 171	7.0 a-d	5.5 abc	0.0 i	4.5 a-e	20.0 b-f
12 172	7.5 abc	2.5 c-g	0.0 i	3.0 d-g	20.0 b-f
13 173	7.0 a-d	3.0 b-g	5.0 abc	5.5 a-d	15.0 c-g
14 174	5.5 d-g	2.5 c-g	3.0 def	5.0 a-e	7.5 efg
15 175	4.5 fg	2.5 c-g	0.5 hi	4.0 b-e	0.0 g
16 176	7.0 a-d	0.0 g	5.0 abc	4.0 b-e	20.0 b-f
17 177	---	---	---	---	-----
18 178	7.5 abc	0.0 g	3.5 c-f	6.0 abc	35.0 ab
19 179	6.5 b-e	1.0 efg	5.5 ab	3.0 d-g	25.0 a-e
20 180	7.0 a-d	5.0 a-d	6.0 a	3.0 d-g	35.0 ab
21 181	4.0 gh	2.5 c-g	0.5 hi	0.5 gh	0.0 g
22 182	6.0 c-f	4.0 a-e	4.0 b-e	5.0 a-e	10.0 d-g
23 183	5.5 d-g	2.0 d-g	3.0 def	6.5 ab	7.5 efg
24 184	8.0 ab	2.0 d-g	6.0 a	5.0 a-e	30.0 abc
25 185	6.0 c-f	1.0 efg	4.0 b-e	3.5 c-f	5.0 fg
26 186	5.0 efg	3.0 b-g	2.0 fgh	5.0 a-e	17.5 b-g
27 187	8.0 ab	1.0 efg	5.5 ab	4.5 a-e	35.0 ab
28 188	---	---	---	---	-----
29 189	6.5 b-e	2.0 d-g	2.5 efg	6.5 ab	7.5 efg
30 190	8.5 a	1.0 efg	4.0 b-e	1.0 fgh	20.0 b-f
31 191	6.0 c-f	3.5 a-f	3.0 def	3.5 c-f	7.5 efg
32 192	5.5 d-g	2.0 d-g	2.5 efg	6.0 abc	2.5 fg
33 193	6.5 b-e	1.5 efg	1.0 ghi	4.5 a-e	30.0 abc
34 194	6.5 b-e	0.0 g	5.5 ab	5.5 a-d	20.0 b-f
35 195	7.5 abc	4.0 a-e	1.0 ghi	5.5 a-d	27.5 a-d
36 196	7.5 abc	0.5 fg	5.0 abc	3.5 c-f	10.0 d-g
37 197	6.5 b-e	0.0 g	4.5 a-d	5.5 a-d	15.0 c-g
38 198	6.5 b-e	6.0 ab	2.5 efg	1.0 fgh	40.0 a
39 199	7.0 abc	6.5 a	5.5 ab	4.5 abc	30.0 abc
40 200	2.5 h	3.0 bcd	0.0 i	0.0 h	0.0 g
LSD (.05) =	1.6	2.9	1.8	2.4	18.9
Standard Dev.=	0.80	1.41	0.88	1.17	9.37
CV =	12.29	64.48	26.19	26.99	51.98

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

1995 MUTATION SELECTION STUDY

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Lemont, Lacassine, Cypress and mutation lines, 4 gm/4 ft row

Planting Method/Date: Hege tray planter (drill-seeded), Apr 19

Emergence Date: Apr 26

Fertilization: Preplant 16-48-48, Apr 19; 120-0-0 preflood, May 15; 46-0-0, June 19

Plot Size: Six - 4 ft rows

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 27; permanent flood, May 17

Herbicides: 4 qt Propanil/A, May 16; 1.5 oz/A Londax, May 24 and June 19

Insecticides: 17 lb/A Furadan, May 24

Fungicides: None

Application Equipment: N/A

Inoculation Dates: Inoculated for sheath blight, May 31 (10-15 ml/row); June 28 (4-5 ml/rows)

Drained: Aug 30

Harvest: Sept 15

Disease Ratings: Sheath blight and foliar disease data taken Aug 2 and Sept 1

Results: See Table 14.

Comments: Sheath blight severity was very high in inoculated plots; little sheath blight developed in the uninoculated plots. Other diseases were moderate in severity.

Table 14. Effect of severe sheath blight pressure on mutation selections. Rice Research Station, Crowley, LA. 1995.

	Sheath blight ratings			
	Aug 2	Sept 1	% Tillers	Yield (lb/A)
Lacassine	3.3 d	6.0 c	61.3 bcd	4591.3 d
Lacassine Inoc	6.5 ab	8.5 a	96.3 a	3800.5 e
LC 13	2.8 d	4.5 d	41.3 de	5293.0 bc
LC 13 Inoc	5.3 c	5.8 c	53.8 cde	4890.3 cd
Cypress	2.5 d	6.0 c	62.5 bcd	6057.5 a
Cypress	6.8 a	7.3 b	81.3 ab	5765.3 ab
CP 3	2.8 d	5.0 cd	43.8 cde	6104.5 a
CP 3 Inoc	5.5 bc	6.0 c	66.3 bc	5816.0 a
CP 4	3.0 d	4.3 d	32.5 e	4896.3 cd
CP 4 Inoc	5.0 c	5.8 c	55.0 cde	4903.3 cd
LSD (.05) =	1.2	1.0	21.9	477.2
Standard Dev. =	0.82	0.68	15.06	328.90
CV =	19.13	11.58	25.37	6.31

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

1995 SHEATH BLIGHT FUNGICIDE TRIAL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), Apr 10

Emergence Date: Apr 18

Fertilization: 16-48-48, Apr 10, preplant; 120-0-0, May 11, preflood; 46-0-0, June 19

Plot Size: 4 x 16 ft

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 13, 17, 27; permanent flood, May 12

Herbicides: 4 qt Propanil, May 10; 1.5 oz/A Londax, May 30

Insecticides: Furadan 17 lb/A, May 24

Fungicides: Applied at panicle differentiation (PD), June 15; PD + 14 days, July 3; boot (B), June 23; and 70% heading (H), July 11

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Inoculation Dates: Inoculated for sheath blight, May 31 (150 ml/plot)

Drained: Aug 1

Harvest: Aug 10

Disease Ratings: Sheath blight severity (0-9), July 25 (milk) and Aug 9 (maturity); infestation levels (percent tillers infected), Aug 2; Lodging, Jul 31

Results: See Table 15.

Comments: Sheath blight severity was high; other diseases were low in severity and lodging was moderate. The uninoculated check plots had little natural disease in them, and they yielded 2400 lb/A more than the inoculated check. Treatments with Tilt in them had the best control, especially when applied later in the season. Most of the fungicides significantly reduced the number of tillers infected with sheath blight except Rovral at Boot, Rovral with the high rate of Sylguard, and the Topsin M treatments. These same four treatments and the Halt treatment did not give significant yield increases.

Table 15. Effects of rice foliar fungicides on sheath blight control and rice yield and milling. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Timing[1]	Sheath blight Severity (0-9)[2] July 25	Sheath blight Severity (0-9)[2] Aug 9	Sheath blight Tillers[3] infected (%)	Yield lb/A	Yield increase lb/A	Milling whole (%)	Milling total (%)
1 Inoculated ck			6.8 a	7.8 a-d	96.5 a	5669.5 h	-0.0 h	58.5 cde	66.6 bc
2 Uninoculated ck			3.5 f	4.3 h	41.5 e	8050.5 a	2381.0 a	59.7 abc	67.4 a
3 Tilt 428CC	0.28 lb ai/A	B	5.0 e	6.0 fg	46.0 de	7283.3 bcd	1613.0 bcd	60.1 a	67.4 a
4 Rovral 4 SC	0.5 lb ai/A	B	6.8 a	8.5 ab	90.3 ab	6133.8 e-h	464.0 e-h	59.0 a-e	67.2 ab
5 EXP252280	lb ai/A	B	5.5 cde	7.8 a-d	55.5 cde	7070.5 bcd	1401.0 bcd	59.0 a-e	66.9 abc
6 EXP189421	lb ai/A	B	5.5 cde	6.5 d-g	55.0 cde	6869.8 cde	1200.0 cde	58.0 de	66.4 c
7 EXP252421	lb ai/A	B	5.3 de	7.0 c-g	58.0 cde	7264.3 bcd	1594.0 bcd	59.8 ab	67.5 a
8 Rovral 4 SC	0.5 lb ai/A	B & H	6.0 a-d	7.5 a-e	64.0 b-e	6756.5 c-f	1087.0 c-f	59.2 abc	66.8 abc
9 Rovral 4 SC + Sylguard 309	0.5 lb ai/A 0.062 % v/v	B & H	6.0 a-d	7.3 b-f	59.0 cde	6581.8 d-g	912.0 d-g	59.4 abc	67.3 ab
10 Rovral 4 SC + Sylguard 309	0.5 lb ai/A 0.126 % v/v	B & H	6.5 ab	8.0 abc	72.0 a-d	6278.3 e-h	608.0 e-h	59.1 a-d	67.5 a
11 Tilt 428C	0.17 lb ai/A	PD & 14 Days	5.0 e	6.3 efg	58.0 cde	7722.3 ab	2052.0 ab	59.4 abc	67.0 abc
12 Tilt 428C + Sylguard 309	0.17 lb ai/A 0.062 % v/v	PD & 14 Days	5.5 cde	6.5 d-g	53.0 cde	7347.8 abc	1678.0 abc	59.3 abc	67.0 abc
13 Tilt 428C + Sylguard 309	0.17 lb ai/A 0.125 % v/v	PD & 14 Days	5.3 de	7.0 c-g	64.0 b-e	7338.8 abc	1669.0 abc	59.2 a-d	66.9 abc
14 Topsin M 70 WP	0.525 lb ai/A	B & H	6.8 a	8.8 a	92.0 ab	5585.5 h	-84.0 h	57.8 e	66.9 abc
15 Topsin M 70 WP	0.7 lb ai/A	B & H	6.3 abc	8.3 abc	78.0 abc	5928.0 gh	258.0 gh	59.2 abc	66.8 abc
16 Benlate 50 WP	0.5 lb ai/A	B & H	5.8 b-e	7.3 b-f	56.0 cde	6836.0 cde	1166.0 cde	59.8 ab	67.3 ab
17 Halt	10 oz pr/A	B & H	6.8 a	7.0 c-g	66.0 b-e	6073.3 fgh	403.0 fgh	58.8 b-e	66.9 abc
18 Tilt 428C / Benlate 50 WP	0.28 lb ai/A 0.5 lb ai/A	B / H	5.0 e	5.8 g	59.0 cde	7180.0 bcd	1506.0 bcd	59.0 a-e	66.6 bc
LSD (.05) =			0.9	1.2	28.4	704.2		1.1	0.7
Standard Dev.=			0.63	0.84	19.8	492.7		0.80	0.46
CV =			11.1	11.9	30.7	7.2		1.35	0.69

[1] PD = Panicle differentiation, B = Boot, H = Heading, and PD & 14 days = PD and 14 days after PD.
[2] Severity was rated using a 0-9 scale where 0 indicated no disease and 9 indicated plants dead and collapsed.
[3] Tillers infected was the percent tillers infected with sheath blight.

1995 EXPERIMENTAL SHEATH BLIGHT FUNGICIDE TRIAL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), Apr 10

Emergence Date: Apr 18

Fertilization: 16-48-48, Apr 10, preplant; 120-0-0, May 11, preflood; 46-0-0, June 19

Plot Size: 4 x 16 ft

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 13, 17, 27; permanent flood, May 12

Herbicides: 4 qt Propanil, May 10; 1.5 oz/A Londax, May 30

Insecticides: Furadan 17 lb/A, May 24

Fungicides: Applied at panicle differentiation (PD), June 15; PD + 5; Jun 20, PD + 10, June 26, PD + 15 days, July 3; boot (B), June 23; PD + 20, July 8, and 70% heading (H), July 11

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Inoculation Dates: Inoculated for sheath blight, May 31 (150 ml/plot)

Drained: Aug 1

Harvest: Aug 10

Disease Ratings: Sheath blight severity (0-9), July 25 and Aug 9 (maturity); infestation levels (percent tillers infected), Aug 2; Lodging, Jul 31

Results: See Table 16.

Comments: Sheath blight severity was high; other diseases were low in severity and lodging was moderate. All of the fungicide treatments reduced sheath blight severity and infection levels and substantially increased yields. High yield increases were due to severe lodging, caused by sheath blight, in the inoculated-unsprayed check. Early applications of ICIA5504 had the best sheath blight activity. Infection threshold (10% tillers infected) was reached at PD growth stage, but an extended dry period stopped sheath blight development until late in the season. The tank mixes of Moncut plus Methyl Parathion and Moncut plus Blazer showed 5 - 10 % phytotoxicity expressed as tan necrotic lesions or defuse brown spot, respectively.

Table 16. Effects of rice foliar fungicides on sheath blight control and rice yield and milling. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Timing[1]	Sheath blight Severity (0-9)[2] July 20	Sheath blight Severity (0-9)[2] Aug 15	Tillers[3] infected (%)	Yield lb/A	Yield increase lb/A	Milling whole (%)	Milling total (%)
1 Unsprayed ck			7.0 a	8.8 a	93.0 a	5564.8 g	-0.2 g	58.1 c	66.9 ab
2 ICIA5504 80 WG	0.1 lb ai/A	PD & PD+10	2.0 j	4.0 hi	31.0 e	8593.8 a	3028.8 a	59.3 ab	66.9 ab
3 ICIA5504 80 WG	0.2 lb ai/A	PD	2.8 hij	4.5 ghi	33.5 de	8511.0 a	2946.0 a	59.8 ab	67.2 ab
4 ICIA5504 80 WG	0.2 lb ai/A	PD+5	3.0 ghi	4.8 f-i	43.0 cde	8508.8 a	2943.8 a	58.8 bc	66.5 b
5 ICIA5504 80 WG	0.2 lb ai/A	PD+10 (Boot)	2.8 hij	3.8 i	28.0 e	8659.8 a	3094.8 a	59.3 b	66.7 ab
6 ICIA5504 80 WG	0.2 lb ai/A	PD+15 (5%H)	2.5 ij	4.5 ghi	38.0 cde	8093.0 a-d	2528.0 a-d	59.7 ab	67.1 ab
7 ICIA5504 80 WG	0.2 lb ai/A	PD+20 (50%H)	4.0 ef	5.0 e-h	56.0 bcd	8084.5 a-d	2519.5 a-d	58.9 bc	66.6 ab
8 Rovral 4 SC	0.5 lb ai/A	PD & PD+10	5.0 cd	6.3 bcd	57.0 bc	7902.0 a-e	2337.0 a-e	59.8 ab	67.2 ab
9 Moncut 70 WP	0.35 lb ai/A	PD	4.0 ef	5.3 d-g	48.0 cde	7904.8 a-e	2339.8 a-e	59.7 ab	67.1 ab
10 Moncut 70 WP	0.50 lb ai/A	PD	3.8 efg	5.8 c-f	36.0 cde	8072.5 a-d	2507.5 a-d	59.5 ab	67.1 ab
11 Moncut 70 WP + Benlate 50 WP	0.35 lb ai/A 0.5 lb ai/A	PD	4.5 de	6.0 b-e	36.5 cde	8216.8 abc	2651.8 abc	59.6 ab	67.3 a
12 Moncut 70 WP / Benlate 50 WP	0.35 lb ai/A 0.5 lb ai/A	PD H	3.5 fgh	4.8 f-i	34.0 cde	8559.8 a	2994.8 a	59.4 ab	66.9 ab
13 Moncut 70 WP + Methyl Parathion	0.35 lb ai/A	H 0.5 lb ai/A	6.0 b	6.0 b-e	77.0 ab	7459.3 c-f	1894.3 c-f	59.4 ab	67.0 ab
14 Moncut 70 WP + Blazer 2 EC	0.35 lb ai/A 0.25 lb ai/A	PD	4.5 de	6.3 bcd	38.5 cde	7682.5 b-f	2117.5 b-f	60.4 a	67.2 ab
15 Tilt 428C + Benlate 50 WP	6 oz pr/A 0.75 lb pr/A	B	5.8 bc	7.0 b	44.0 cde	7449.3 def	1884.3 def	59.0 bc	66.8 ab
LSD (.05) =			0.8	1.1	21.9	722.7		1.0	NS
Standard Dev.=			0.58	0.75	15.30	505.6		0.69	0.48
CV =			13.83	13.74	32.7	6.41		1.17	0.72

Treatment 1 is the standard/comparison treatment

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

[1] PD = Panicle Differentiation, PD+14 = 14 days after PD, B = Boot, and H = Heading.

[2] Severity was rated using a 0-9 scale where 0 indicated no disease and 9 indicated plants dead and collapsed.

[3] Tillers infected was the percent tillers infected with sheath blight.

1995 SHEATH BLIGHT FUNGICIDE - GA INTERACTION TRIAL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), Apr 10

Emergence Date: Apr 18

Fertilization: 16-48-48, Apr 10, preplant; 120-0-0, May 11, preflood; 46-0-0, June 19

Plot Size: 4 x 16 ft

Experimental Design: Randomized complete block design with four replications

Water Management: Flushed, Apr 13, 17, 27; permanent flood, May 12

Herbicides: 4 qt Propanil, May 10; 1.5 oz/A Londax, May 30

Insecticides: Furadan 17 lb/A, May 24

Fungicides: Applied boot (B), June 23; and 70% heading (H), July 11

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Inoculation Dates: Inoculated for sheath blight, May 31 (150 ml/plot)

Drained: Aug 1

Harvest: Aug 10

Disease Ratings: Sheath blight severity (0-9), July 25 and Aug 9 (maturity); infestation levels (percent tillers infected), Aug 2; Lodging, July 31

Results: See Table 15.

Comments: Sheath blight severity was high; other diseases were low in severity and lodging was severe especially in the GA treated plots.

Table 17. Effects of rice foliar fungicides on sheath blight control and rice yield and milling. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Timing[1]	Sheath blight Severity (0-9)[2] July 20	Sheath blight Severity (0-9)[2] Aug 15	Tillers[3] infected (%)	Yield lb/A	Plant height cm	Milling whole (%)	Milling total (%)
				Fungicide Means					
Unsprayed ck			6.0	8.5	89.3	4891	101.0	57.8	66.8
Rovral 4 SC	0.5 lb ai/A	B + H	4.8	7.0	60.3	6816	104.4	59.1	67.0
Benlate 50 WP	0.5 lb ai/A	B + H	4.8	7.2	64.8	6450	105.0	59.3	67.2
				GA Means					
No GA			5.7	7.6	76.8	6135	99.0	59.2	67.1
GA3 4 EC	3 oz pr/A	B + H	5.1	7.7	73.9	6220	104.2	58.5	66.9
GA3 4 EC	6 oz pr/A	B + H	4.8	7.4	63.6	5801	107.2	58.5	67.0
				Fungicide X GA Means					
Unsprayed ck			6.5	8.5	97.0	5048	99.5	58.0	66.6
Rovral 4 SC	0.5 lb ai/A	B + H	5.4	7.4	70.5	6618	98.4	59.4	67.3
Benlate 50 WP	0.5 lb ai/A	B + H	5.3	7.0	63.0	6738	99.1	60.1	67.4
Unsprayed ck GA3 4 EC	 3 oz pr/A	 B + H	5.8	8.6	88.0	5211	100.9	57.7	66.7
Rovral 4 SC GA3 4 EC	0.5 lb ai/A 3 oz pr/A	B + H B + H	4.8	6.9	64.0	7047	106.4	59.1	66.9
Benlate 50 WP GA3 4 EC	0.5 lb ai/A 3 oz pr/A	B + H B + H	4.9	7.5	69.8	6402	105.4	58.9	67.1
Unsprayed ck GA3 4 EC	 6 oz pr/A	 B + H	5.9	8.4	82.8	4412	102.5	57.8	67.0
Rovral 4 SC GA3 4 EC	0.5 lb ai/A 6 oz pr/A	B + H B + H	4.3	6.9	46.5	6783	108.5	58.8	66.8
Benlate 50 WP GA3 4 EC	0.5 lb ai/A 6 oz pr/A	B + H B + H	4.1	7.0	61.5	6209	110.5	58.9	67.1
LSD (.05) =			0.6	1.0	18.0	1162	2.9	NS	NS
Standard Dev.=			0.63	1.02	18.04	1162.1	2.89	1.86	0.63
CV =			12.28	13.49	25.26	19.20	2.80	3.17	0.95

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).
[1] B = Boot and H = Heading.
[2] Severity was rated using a 0-9 scale where 0 indicated no disease and 9 indicated plants dead and collapsed.
[3] Tillers infected was the percent tillers infected with sheath blight.

1995 BLAST FUNGICIDE TRIAL ON L203

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: L203, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), May 2

Emergence Date: May 9

Fertilization: Preplant 16-48-48, May 2; preflood 90-0-0, May 22

Plot Size: 4 x 16 ft

Experimental Design: Randomized block design with four replications

Water Management: Flushed, May 5; permanent flood, May 26

Herbicides: 4 qt Propanil/A, May 24; 30 lb Ordram, May 31; 1.5 oz/A Londax, May 31

Insecticides: Furadan 17 lb/A, June 15

Fungicides: Tillering, June 15; Boot (B), June 29; 75% heading (H), July 11; H + 5 days, July 17; H + 10 days, July 22

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Drained: July 29

Harvest: Aug 9

Disease Ratings: Blast data taken, July 24

Results: See Table 18.

Comments: Blast severity was high; other disease severities were low. ICIA5504 disease control was significantly better than the other treatments. Benlate applied at either tillering or 10 days after heading did not significantly reduce rotten neck blast. Double applications of fungicides were significantly better than single applications. Yield potential was low due to severe blast development. Most fungicides produced a significant yield increase except Benlate at tillering or 10 days after heading, and the juvinator treatment at heading.

Table 18. Effect of fungicides on rotten neck blast control, rice yield, and milling rice yield on the variety L203. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Timing[1]	Rotten Neck blast[3] (%)	Yield (lb/A)	Change from Check (lb/A)	Milling Whole (%)	Milling Total (%)
1 Unsprayed ck			87.0 a	2443 gh	-0 gh	24.7 kl	56.1 ij
2 Benlate 50 WP	0.5 lb ai/A	B & H	55.0 efg	3992 bc	1549 bc	36.5 ab	61.7 ab
3 ICIA5504 80 WG	0.2 lb ai/A	B & H	26.5 i	5072 a	2629 a	38.7 a	63.1 a
4 Benlate 50 WP	0.5 lb ai/A	Tillering	82.0 ab	2790 fg	347 fg	26.2 ijk	57.4 g-j
5 Benlate 50 WP	0.5 lb ai/A	H	59.0 def	3660 cd	1217 cd	33.3 cde	60.8 a-d
6 Benlate 50 WP	0.75 lb ai/A	H	52.0 fg	3368 de	925 de	30.7 e-h	59.0 c-h
7 Benlate 50 WP	1.0 lb ai/A	H	53.0 fg	3588 cd	1145 cd	35.5 bc	61.3 abc
8 Benlate 50 WP	0.5 lb ai/A	B	73.5 bc	3025 ef	582 ef	27.9 hij	58.2 e-j
9 Benlate 50 WP	0.5 lb ai/A	H + 5 Days	72.5 bc	2909 f	466 f	32.2 def	58.6 d-i
10 Benlate 50 WP	0.5 lb ai/A	H + 10 Days	82.5 ab	2502 gh	59 gh	28.9 ghi	57.7 f-j
11 Benlate 50 WP	0.75 lb ai/A	B & H	46.0 gh	4324 b	1881 b	36.8 ab	61.7 ab
12 Benlate 50 WP + Sylguard 309	0.5 lb ai/A 0.062 % v/v	B & H B & H	47.0 gh	4210 b	1767 b	35.2 bc	61.5 abc
13 Benlate 50 WP + Sylguard 309	0.5 lb ai/A 0.126 % v/v	B & H B & H	40.5 h	4294 b	1851 b	34.9 bcd	61.9 ab
14 Topsin M 70 WP	0.5 lb ai/A	B & H	67.0 cd	3416 de	973 de	31.3 efg	60.4 b-e
15 Topsin M 70 WP	0.7 lb ai/A	B & H	64.5 cde	3385 de	942 de	30.1 fgh	59.5 b-g
16 Juvinator	2 pt pr/A	H	74.0 bc	2707 fgh	264 fgh	24.1 kl	56.4 ij
LSD (.05) =			10.0	392		2.9	2.4
Standard Dev. =			7.10	276.9		2.05	1.72
CV =			10.68	8.50		6.81	2.91

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).
Treatment 1 is the standard/comparison treatment.

[1] B = Boot, H = 75% Heading, H + 5 and H+10 = 5 and 10 days after Heading, respectively.

[2] Sterility was rated using a 0-9 scale where 0 indicated no sterile seeds and 9 indicated 90-100% of the seeds sterile.

[3] Rotten neck blast was the percent of the heads with rotten neck blast.

[4] Severity was rated using a 0-9 scale where 0 indicated no blast and 9 indicated 90-100% of the plant tissues in the plots completely was dead.

1995 BLAST FUNGICIDE TRIAL ON BENGAL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Bengal, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), May 2

Emergence Date: May 9

Fertilization: Preplant 16-48-48, May 2; preflood 90-0-0, May 22

Plot Size: 4 x 16 ft

Experimental Design: Randomized block design with four replications

Water Management: Flushed, May 5; permanent flood, May 26

Herbicides: 4 qt Propanil/A, May 24; 30 lb Ordram, May 31; 1.5 oz/A Londax, May 31

Insecticides: Furadan 17 lb/A, June 15

Fungicides: Tillering, June 15; Boot (B), July 7; 5% heading (5% H), July 11; 50% heading, July 19; 95% headed (95% H), July 21, H + 5 days, July 28;

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Drained: July 29

Harvest: Aug 28

Disease Ratings: Blast data taken, Aug 2

Results: See Table 19.

Comments: Blast severity was moderate while other disease severities were low. All fungicides significantly reduced rotten neck blast except Juvinator, Halt, and the single Benlate applications at either tillering or 5 days after heading. Yield levels were higher in this test as compared with the other blast tests because of lower levels of blast development. Most fungicide treatments significantly increased yield except several of the single Benlate applications, Halt, and Juvinator treatments.

Table 19. Effect of fungicides on rotten neck blast control and rice yield on the variety Bengal. Rice Research Station, Crowley, LA. 1995.

Treatment	Rate	Timing[1]	Rotten neck blast[2] (%)	Yield (lb/A)	Change from Check (lb/A)	Milling Whole (%)	Milling Total (%)
1 Unsprayed ck			25.5 a	5282.3 ghi	0.3 ghi	52.1 bcd	66.2 a-f
2 Benlate 50 WP	0.5 lb ai/A	B & H	11.5 efg	6180.0 bcd	898.0 bcd	54.3 ab	66.8 abc
3 Benlate 50 WP Sylguard 309	0.5 lb ai/A 0.625 % v/v	B & H	10.5 efg	6139.0 bcd	857.0 bcd	55.0 a	67.0 a
4 Benlate 50 WP Sylguard 309	0.5 lb ai/A 1.25 % v/v	B & H	10.5 efg	6305.0 a-d	1023.0 a-d	54.3 ab	67.0 a
5 Juvinator	2 pt pr/A	B	23.0 ab	5001.3 i	-280.7 i	52.5 bcd	66.1 b-f
6 ICIA5504 80 WG	0.2 lb ai/A	B & 50%H	8.5 fg	6326.5 a-d	1044.5 a-d	52.8 a-d	60.0 def
7 ICIA5504 80 WG	0.2 lb ai/A	B & H	6.5 g	6414.5 abc	1132.5 abc	53.0 a-d	66.3 a-f
8 ICIA5504 80 WG	0.2 lb ai/A	5%H & 50%H	7.3 g	6760.8 a	1478.8 a	53.4 a-d	66.4 a-f
9 ICIA5504 80 WG	0.2 lb ai/A	5%H & H	6.5 g	6612.0 ab	1330.0 ab	53.4 abc	66.9 ab
10 ICIA5504 80 WG	0.3 lb ai/A	5%H	10.0 efg	5962.5 cde	680.5 cde	52.7 bcd	66.3 a-f
11 ICIA5504 80 WG	0.3 lb ai/A	50%H	10.0 efg	6141.8 bcd	859.8 bcd	53.5 a-d	66.1 c-f
12 Benlate 50 WP	0.5 lb ai/A	H	14.0 def	5526.3 e-i	244.3 e-i	53.5 a-d	66.3 a-f
13 Benlate 50 WP	0.75 lb ai/A	H	17.5 bcd	5832.0 d-g	550.0 d-g	53.3 a-d	66.8 abc
14 Benlate 50 WP	1.0 lb ai/A	H	15.0 cde	5853.8 def	574.3 def	52.2 bcd	66.6 a-e
15 Benlate 50 WP	0.5 lb ai/A	B	18.5 bcd	5797.8 d-g	515.8 d-g	54.2 ab	66.7 a-d
16 Benlate 50 WP	0.5 lb ai/A	5%H	15.0 cde	5562.0 e-h	280.0 e-h	53.5 a-d	66.7 a-d
17 Halt	32 oz pr/A	B & H	21.5 ab	5030.0 hi	-252.0 hi	51.4 d	65.7 f
18 Benlate 50 WP	0.5 lb ai/A	Tillering	20.0 abc	5335.0 f-i	53.0 f-i	51.6 cd	66.1 bf
19 Benlate 50 WP	0.5 lb ai/A	H + 5	26.0 a	4951.0 i	-331.3 i	----	----
LSD (.05) =			5.5	518.1		2.1	0.7
Standard Dev.=			3.90	366.3		1.52	0.52
CV =			28.20	6.21		2.86	0.79

Treatment 1 is the standard/comparison treatment.
Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).
[1] B = Boot, H = (90%) Heading, 5%H = Early (5%) Heading, 50%H = 50% heading, and H + 5 = 5 days after H.
[2] Rotten neck blast was the percent of the heads with rotten neck blast.

1995 BLAST FUNGICIDE TRIAL ON M201

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: M201, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), May 2

Emergence Date: May 9

Fertilization: Preplant 16-48-48, May 2; preflood 90-0-0, May 22

Plot Size: 4 x 16 ft

Experimental Design: Randomized block design with four replications

Water Management: Flushed, May 5; permanent flood, May 26

Herbicides: 4 qt Propanil/A, May 24; 30 lb/A Ordram, May 31; 1.5 oz/A Londax, May 31

Insecticides: Furadan 17 lb/A, June 15

Fungicides: Boot (B), June 29; 50% heading (50% H), July 11; 100% heading (100% H), July 17; A single Benlate treatment was applied, June 15

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Drained: July 29

Harvest: Aug 9

Disease Ratings: Blast data taken, Aug 8

Results: See Table 20.

Comments: Blast severity was extremely high; other diseases were low. Leaf blast killed some rice plants before any fungicides were applied. Yield potential was low due to severe blast.

Table 20. Effect of various fungicides and application timings on rotten neck blast control, rice yield, and milling on the variety M201. Rice Research Station, Crowley, La, 1995.

Treatment	Rate	Timing[1]	Leaf blast[2] (0-9)	Neck blast[3] (%)	Yield (lb/A)	Change Check (lb/A)	Milling Whole (%)	Milling Total (%)
1 Unsprayed ck			6.3 a	78.0 a	1374.5 e	-0.5 e	41.7 g	61.5 h
2 Benlate 50 WP	0.5 lb ai/A	B & H	5.8 ab	39.5 bcd	1604.3 de	229.3 de	51.3 cd	64.8 abc
3 ICIA5504 80 WG	0.2 lb ai/A	B & H	5.3 abc	25.0 ef	1656.5 cde	281.5 cde	53.3 bc	65.3 abc
4 Benlate 50 WP	0.5 lb ai/A	Tillering	5.5 abc	70.5 a	1624.8 de	249.8 de	43.3 fg	62.1 gh
5 Benlate 50 WP	0.5 lb ai/A	H	5.3 abc	45.0 bc	1489.8 de	114.8 de	50.4 cde	64.1 cde
6 Benlate 50 WP	0.75 lb ai/A	H	5.3 abc	37.0 cde	1823.5 a-e	448.5 a-e	51.3 cd	64.3 b-e
7 Benlate 50 WP	1.0 lb ai/A	H	5.3 abc	35.5 cde	1970.0 a-e	595.0 a-e	53.2 bc	65.1 abc
8 Benlate 50 WP	0.5 lb ai/A	B	5.8 ab	65.5 a	1620.5 de	245.5 de	43.9 fg	62.4 fgh
9 Benlate 50 WP	0.5 lb ai/A	H + 5 Days	6.3 a	67.5 a	1262.3 e	-112.7 e	47.1 e	62.2 gh
10 Benlate 50 WP	0.5 lb ai/A	H + 10 Days	6.0 ab	66.5 a	1390.8 e	15.8 e	44.9 ef	61.4 h
11 Benlate 50 WP	0.75 lb ai/A	B & H	5.5 abc	28.0 def	2244.8 a-d	869.8 a-d	51.9 bcd	65.0 abc
12 Benlate 50 WP Sylguard 309	0.5 lb ai/A 0.062 % v/v	B & H B & H	4.8 bc	29.5 de	2488.0 abc	1113.0 abc	52.0 bcd	64.5 bcd
13 Benlate 50 WP Sylguard 309	0.5 lb ai/A 0.126 % v/v	B & H B & H	5.0 abc	28.5 de	2646.3 a	1271.3 a	53.9 abc	65.5 bcd
14 Topsin M 70 WP	0.525 lb ai/A	B & H	5.5 abc	50.5 b	1712.5 cde	337.5 cde	47.0 e	63.3 efg
15 Topsin M 70 WP	0.7 lb ai/A	B & H	5.8 ab	47.0 bc	1797.5 b-e	422.5 b-e	47.0 e	63.5 def
LSD (.05) =			1.4	12.1	795.1		2.5	1.2
Standard Dev. =			0.973	8.577	562.190		1.79	0.82
CV =			17.90	20.24	30.18		3.59	1.28

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test). Treatment 1 is the standard/comparison treatment.

[1] B = Boot, and # H = Percent Heading growth stages.

[2] Severity was rated using a 0-9 scale where 0 indicated no blast and 9 indicated plant tissue in the plots was completely dead.

[3] Rotten neck blast was the percent of heads with rotten neck blast.

1995 HOST RESISTANCE VS FUNGICIDE TRIAL FOR SHEATH BLIGHT AND BLAST CONTROL

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Cypress, Rosemont, Kaybonnet, 2008, 2065, 2071, Lemont, Bengal, 120 lb/A

Planting Method/Date: Kincaid cone planter (drill-seeded), Apr 19

Emergence Date: Apr 26

Fertilization: Preplant 31-94-94, Apr 19; preflood 120-0-0, May 15; 46-0-0, June 19

Plot Size: 4 x 16 ft

Water Management: Flushed, Apr 27, May 4; permanent flood, May 17

Herbicides: 4 qt Arrosolo, May 16; 1.5 oz/A Londax, May 24, June 19

Insecticides: Furadan 17 lb/A, May 24

Fungicides: Boot (B), July 3; 80% heading (H), July 12

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Inoculation Dates: Inoculated for sheath blight, June 2 (100 ml/plot); a second inoculation for sheath blight, June 21 (100 ml/plot)

Drained: Aug 4

Harvest: Aug 24

Experimental Design: Randomized block design with four replications

Disease Ratings: Sheath blight severity (0-9), (maturity); infestation levels (% tillers infected), Blast % rotten neck blast (RNB), Aug 4

Results: See Table 21

Comments: Sheath blight severity was high, especially early in the season. Blast was very severe, with over 75% of the heads with rotten neck blast in the unsprayed check. Narrow brown spot and leaf smut were both moderate in severity.

Table 21. Effects of rice foliar fungicides on sheath blight, leaf smut, narrow brown leaf spot and rotten neck blast control. Rice Research Station, Crowley, LA. 1995.

Treatment/Rate/Timing[1]	Sheath blight[2] (0-9)	Tillers infected[3] (%)	Neck blast[4] (%)	Yield (lb/A)	Milling whole (%)	Milling total (%)
		Cypress				
Uninoculated/Unsprayed	4.0 i-m	39.0 e-j	6.0 d-g	7201 def	60.2 abc	69.3 a-d
Inoculated/Unsprayed	7.8 ab	83.0 a	6.0 d-g	6079 hi	56.1 a-d	68.9 a-f
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	6.5 c-f	63.0 bcd	4.5 d-g	6439 ghi	55.8 bcd	69.1 a-f
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.5 k-n	27.5 i-m	1.5 efg	7633 b-e	60.9 ab	69.7 a
		Lemont				
Uninoculated	4.3 i-l	22.0 j-m	22.5 c	5758 i-l	38.5 jk	68.8 d-h
Inoculated Unsprayed	7.0 a-e	48.5 c-g	20.5 c	4865 m	28.9 l	68.1 g-j
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	6.0 efg	28.8 h-m	7.5 de	5823 ijk	36.3 k	68.9 b-g
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.8 j-m	16.0 lm	4.5 d-g	6623 fgh	44.2 hi	69.6 abc
		Bengal				
Uninoculated/Unsprayed	3.3 l-o	23.5 j-m	21.5 c	6218 hi	59.3 abc	68.8 c-h
Inoculated/Unsprayed	6.5 c-f	37.0 e-k	18.5 c	6217 hi	59.8 abc	69.1 a-f
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	4.8 hij	19.5 klm	11.0 d	7069 efg	60.9 ab	69.7 ab
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.0 m-p	16.5 lm	5.0 d-g	7420 b-e	60.7 ab	69.3 a-e
		Rosemont				
Uninoculated/Unsprayed	5.0 ghi	29.5 g-m	93.0 a	2442 no	36.6 jk	61.7 m
Inoculated/Unsprayed	8.0 a	81.5 ab	94.5 a	2017 o	37.2 jk	63.8 l
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	7.3 a-d	59.0 cd	74.5 b	2953 n	36.7 jk	65.2 k
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	4.8 hij	25.5 i-m	24.0 c	5196 j-m	49.1 fgh	67.9 ij
		Kaybonnet				
Uninoculated/Unsprayed	2.3 op	22.5 j-m	1.5 efg	7713 b-e	50.2 efg	69.1 a-f
Inoculated/Unsprayed	6.3 def	54.5 cde	3.0 efg	6249 hi	45.6 ghi	68.9 b-g
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	4.8 hij	51.0 c-f	1.0 efg	7490 b-e	50.3 efg	69.3 a-e
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.3 l-o	15.5 lm	1.0 efg	8118 ab	49.1 fgh	68.9 a-f

Continued.

Table 21. Continued.

Treatment/Rate/Timing[1]	Sheath blight[2] (0-9)	Tillers infected[3] (%)	Neck blast[4] (%)	Yield (lb/A)	Milling whole (%)	Milling total (%)
		2071				
Uninoculated/Unsprayed	2.0 p	15.0 m	2.5 efg	7281 c-f	53.7 def	67.8 j
Inoculated/Unsprayed	6.3 def	44.0 d-i	1.0 efg	7286 c-f	52.0 def	68.0 ij
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	5.5 fgh	47.5 c-h	0.0 g	7372 b-f	53.0 def	68.0 hij
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	2.5 nop	14.5 m	1.5 efg	7928 bcd	54.8 cde	68.0 ij
		Lafitte				
Uninoculated/Unsprayed	3.3 l-o	18.5 klm	3.5 efg	7894 bcd	60.4 ab	68.7 d-i
Inoculated/Unsprayed	4.5 h-k	20.0 j-m	3.0 efg	7767 b-e	59.5 abc	68.5 e-j
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	4.0 i-m	17.5 lm	3.0 efg	8043 abc	61.5 a	69.1 a-f
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.3 l-o	19.5 klm	2.0 efg	8757 a	61.4 a	68.8 c-g
		9302065				
Uninoculated/Unsprayed	3.5 k-n	34.5 f-l	6.0 d-g	5897 hij	52.9 def	69.0 a-f
Inoculated/Unsprayed	7.5 abc	66.5 abc	7.0 def	5019 lm	42.1 ij	68.4 f-j
Inoculated Tilt 3.6 EC 10 oz pr/A B Benlate 50 WP 1 lb pr/A H	6.8 b-e	59.0 cd	3.5 efg	5116 klm	40.9 ijk	68.6 d-j
Inoculated ICIA5504 80 DF .2 oz ai/A B+H	3.8 j-m	21.5 j-m	0.5 fg	5913 hij	54.8 cde	69.3
LSD (.05) =	1.2	17.9	6.3	719	5.1	0.7
Standard Dev.=	.828549	12.8030	4.46958	513.238	3.64	0.52
CV =	17.16	35.90	31.43	8.06	7.17	0.77

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).
Treatment 1 is the standard/comparison treatment.

[1] PI = Panicle Initiation, PI+# = # days after PI, B = Boot, and H = Heading growth stages.

[2] Severity was rated using a 0-9 scale where 0 indicated no disease and 9 indicated plants dead and collapsed.

[3] Tillers infected was the percent tillers infected with sheath blight.

[4] Neck blast was the percent of heads infected with rotten neck blast.

1995 FUNGUS X HERBICIDE INTERACTION

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety/Seed Rate: Mars, 120 lb/A

Planting Method/Date: Water-seeded, May 22

Fertilization: Preplant 92-48-48, Apr 19; top dress 46-0-0, June 19

Plot Size: 2 ft x 9 inches

Water Management: Flooded, May 19, permanent flood, May 25

Herbicides: Londax 1.5 oz/A, May 30; Bolero (liquid), May 18

Application Equipment: CO_2 backpack sprayer, 8002 tips, 15 gal/A

Insecticides: 17 lb/A Furadan, June 3

Fungicides: Applied Benlate, Rovral, and Dithane to moist soil, May 9

Drained: May 23

Harvest: None

Experimental Design: Factorial with four replications

Data Collected: Plant heights, Aug 10; plant stands, Aug 10

Fungus: Applied P. chrysosporium, May 18 (50 ml/plot)

Results: See Table 22.

Comments: Stands were very thin due to hot weather during seedling establishment. Most damage was confined to the center of the plots. Many of the plants that showed "fish-hook" tillering died and were not included in percent stunted plants and average plant heights.

Table 22. The effect of Bolero herbicide and soil applied fungus on plant stand densities, agronomic characters and yield. Rice Research Station, Crowley, LA. 1995.

Treatment	Stand (pl/ft^2)	Plant height (cm)	Percent stunted plants	Yield (lb/A)
Untreated Check	6.5 ab	72 a	1.3 b	2315 a
Fungus Applied to soil	7.0 a	74 a	2.5 b	2716 a
Bolero 8 EC 2 qt/A	5.8 ab	72 a	7.5 ab	1556 b
Bolero 8 EC + Fungus	4.3 b	70 a	16.3 a	1679 b
LSD (0.05) =	1.9	NS	10.4	630
Standard Dev. =	1.2	4.7	6.5	394.1
CV =	20.7	6.5	94.7	19.1

DEVELOPMENT OF SHEATH BLIGHT RESISTANCE IN RICE[1]

M.C. Rush, X.B. Pan, X.Y. Sha, S.D. Linscombe, Q.J. Xie, and S.R. Erwin

INTRODUCTION

The sheath blight resistant somaclone derived elite lines LSBR-5 and LSBR-33 were used in crosses with the long-grain cultivars Labelle and Lemont (LMNT) in the late 1980s (4). Panicle rows from these crosses were evaluated through the F_8 generation for sheath blight resistance, agronomic acceptability, and yield potential. Selected lines were passed on to the Rice Breeding Program at the Rice Research Station, Crowley, LA, for yield testing and further selection. Selected lines from these crosses were crossed with commercial varieties and other sources of sheath blight resistance (2). In 1993, crosses included several other variety sources of high levels of partial resistance to sheath blight (3). The intent of the current program is to determine the inheritance of high levels of partial resistance to sheath blight in selected varieties and lines, to transfer genes conferring partial resistance to lines typical of American long-grain types; and where major genes giving additive effects are involved, to combine through a modified recurrent selection program these resistance genes into lines with acceptable quality and yield potential. These lines will be further tested in the Rice Breeding Program for use as resistance sources.

Additional research under this project includes identification of specific genes for sheath blight resistance, transformation of resistance sources with marker genes to make transfer of resistance more efficient, development of improved sheath blight inoculation procedures for inheritance and screening tests, and development of a red rice source of resistance to narrow brown leaf spot through use of direct *in vivo* screening of progeny with the toxin cercosporin.

All lines field-tested have also been screened for rice blast resistance through the use of blast spreader rows throughout the plot area.

METHODS

Sheath Blight Resistance

Development of resistant lines. The resistance sources presently being used include those listed in Table 1 and numerous lines derived from past crosses with LSBR-5, LSBR-33, and H4/CODF. The sheath blight reactions of selected resistance sources and commercial varieties are given in Table 2.

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

A total of 5,191 F_4 rows from 25 crosses made in 1993 were field evaluated in 1995. Panicle selections were advanced for the 1996 season from 104 rows. From 95 F_2 populations from crosses made in 1994, 7,896 F_3 rows were grown in the field for selection in 1995. F_2 populations from 148 additional crosses were planted in 1995 in 2,900 rows. A total of 18,000 rows were planted in 1995 for various evaluations.

About 90 crosses were made in 1995 (Table 3). F_2 populations from these crosses will be evaluated in 1996.

Sheath blight ratings of F_4 panicle rows selected for advancement to 1996 tests are shown in Table 4. Ratings for variety checks are also shown.

All panicle rows were planted in tiers of 3- or 8-foot rows with a 10-inch spacing between rows with a Hege 90 Series Drill Planter using 12-cell magazines. All plot areas were treated with herbicide (propanil and Londax) and carbofuran insecticide (Furadan). Plot areas were fertilized with a preplant application of 14-42-42 (N-P_2O_5-K_2O) and topdressings of 200 lb/A urea to provide an additional 40-45 lb N/A at the first stem elongation (green ring) stage of growth.

An autoclaved 1:2 rice grain:rice hull mixture inoculated with *Rhizoctonia solani* Kühn (LR 172) was used as inoculum in all test plots. The rows were inoculated at the late tillering/green ring stages of growth with 25 ml inoculum per row applied by hand.

Inheritance of sheath blight resistance. Crosses made in 1995 to study sheath blight resistance included nine resistant cultivars and lines (LSBR-5, LSBR-33, Jasmine 85 [JSMN], Teqing [TQNG], Rice-Grass, LB86-30344, Yangdao (YD-4), Taducan [TDCN], and H4/CODF) crossed with LMNT and with each other. F_2 populations from these crosses will be field tested in 1996. Several hundred single panicle F_3 lines from F_2 plants collected from the crosses TQNG/CPRS, MBLE/TQNG, JSMN/MBLE, and JSMN/TQNG in 1994 were planted and evaluated for sheath blight resistance in 1995. These crosses were remade in 1994-95, and the new F_2 populations were also evaluated in 1995 field plantings.

Evaluation of parents, F_1, F_2, F_3, and the backcross F_1 generations of crosses between the sheath blight resistant parents JSMN and TQNG and the susceptible varieties Maybelle (MBLE) and Cypress (CPRS) was conducted in 2 years of field testing. All plants/lines were inoculated about 50 days after seeding with an autoclaved, inoculated (*R. solani*) 1:2 rice grain:rice hull mixture incubated for about 20 days. Two independently generated segregating F_2 populations were produced by crossing the resistant and susceptible parents in 1993 and 1994. Disease ratings were made 30-35 days after heading using the 0-9 rating scale (1). Data on segregating populations were analyzed using a Chi-square test. Selections were made to advance panicle rows to the 1996 field tests based on sheath blight and blast resistance, plant height, maturity, and grain size and shape.

LB86-30344, a somaclonal line derived from the sheath blight susceptible rice variety Labelle, was found to have a high level of sheath blight resistance. Research was conducted to determine the inheritance of sheath blight resistance in this line and to determine if there was allelism with the dominant resistance genes of JSMN and TQNG. In 1994, reciprocal crosses were made between LB86-30344 and both the susceptible variety LMNT and the resistant varieties JSMN and TQNG. In 1995, parents, F_1s, and F_2 populations were planted at the Rice Research Station. All the plants were inoculated with *R. solani* growing on a 1:2 rice grain:rice hull mixture. Plants were evaluated individually 30 days after heading using the standard 0 - 9 rating scale.

In addition to the above studies, reciprocal crosses were made between LMNT and the sheath blight resistance sources YD-4, JSMN, TQNG, H4/CODF, Rice-Grass, and TDCN to study inheritance of their resistances. Preliminary evaluations of segregating populations from several crosses were made in 1995. These crosses will be studied further in 1996.

Additional Studies In 1995

Transformation with the *bar* gene. Data from transformation studies are shown as a separate report in 1995.

Inoculation tests. A field test was conducted at the Rice Research Station to compare several procedures for inoculating plants and lines with *R. solani* to establish a standard system for use in genetic studies on sheath blight resistance. The varieties used included Tetep, TDCN, JSMN, TQNG, H4/CODF, and LB86-30344 (resistant); Gui Chao, Rax Clear, Pecos, Bengal, Rice-Grass (moderately susceptible); and MBLE, CPRS, and LMNT (susceptible).

The inoculation methods used in 1995 included the standard 1:2 rice grain:rice hull mixture scattered over plants, rice stem pieces infested with *R. solani* in the center of tillers pulled together with a rubber band, *R. solani* infested toothpicks placed behind the leaf collar, and *R. solani* infested brown rice grains placed behind the leaf collar. Evaluation criteria include the standard 0 - 9 rating scale, a 0 - 5 rating scale, and lesion length (cm) measurements.

The design was a split-split plot design with variety as main plot, inoculation method as a subplot, and evaluation date as the second split plot. Treatments were replicated three times. Evaluation criteria were applied across the treatments.

RESULTS

Sheath Blight Resistance

Panicle rows. Bulked collections were made from F_3 rows for advancement to the 1996 tests. Also, panicle selections were advanced from 338 rows representing 65 of the 95 crosses from which single panicle F_3 rows were planted in 1995.

Crosses from which F_4 selections were made to be advanced to the 1996 tests are shown in Table 4. The range and means of sheath blight ratings for these selections and the ratings for variety checks are also given.

In 1995, 21 F_3 and F_4 panicle rows were given to the Rice Breeding Program for further evaluation. The pedigrees and sheath blight ratings of these rows are shown in Table 5. Five selections had red bran and may have been from plants from floating seeds from a cross with H4/CODF, which has a red bran.

Inheritance of sheath blight resistance. Segregating F_2 populations from the crosses MBLE/TQNG, MBLE/JSMN, and TQNG/CPRS in 1994 and 1995 showed ratios of 3 resistant: 1 susceptible plant (Figures 1, 2, and 3, respectively). In 1995 tests, F_1 plants from the 1993 crosses were resistant; F_3 lines from each cross showed a phenotypic ratio of 1 homozygous resistant: 2 segregating: 1 homozygous susceptible plant, and F_2 populations from F_1s backcrossed to susceptible parents showed a ratio of 1 resistant: 1 susceptible plant in 1995. These results suggested that each resistant parent possessed a single major dominant resistance gene. Comparison of F_3 phenotypes to F_2 genotypes indicated that both resistance genes were contributing effects equal to a 2.2 - 4.0 rating on the 0 - 9 scale based on comparisons between the averages of the F_2 genotype distributions in each cross. With the cross JSMN/TQNG, the F_2 populations showed a ratio of 9 highly resistant: 6 moderately resistant: 1 susceptible (Figure 4). F_3 families from this cross grown in 1995 showed a three-group ratio of 7 homozygous resistant: 8 segregating: 1 homozygous susceptible or a two-group ratio of 15 resistant: 1 susceptible. The results suggested that the two resistant parents each possessed a nonallelic dominant major resistance gene that segregated independently. Major gene resistance to sheath blight is vital for breeding rice varieties resistant to sheath blight, presently the most important disease of rice in Louisiana and the second most important fungal disease worldwide.

All F_1 plants from the reciprocal resistance/susceptible crosses involving LB86-30344 exhibited resistance, which indicated that the resistance of this somaclone was a dominant character. The F_2 segregation ratio for resistance: susceptible in the LMNT/LB86-30344 cross was 511:172 ($X^2_{3:1}$ = 0.0122, P = 0.95-0.90), and 531:151 ($X^2_{3:1}$ = 2.9736, P = 0.10-0.05) for the reciprocal cross LB86-30344/LMNT (Figure 5). The results suggested that the sheath blight resistance of LB86-30344 was controlled by a single dominant gene. The segregation ratios of F_2 plants from the LB86-30344/JSMN and TQNG/LB86-30344 crosses were 710:0 and 662:49 ($X^2_{15:1}$ = 0.4636, P = 0.50-0.25), respectively. The ratios suggested that the resistance gene in LB86-30344 was allelic to the dominant sheath blight resistance gene of JSMN and that it segregated independently from the resistance gene of TQNG.

Additional studies in 1995

Inoculation tests. Based on the standard 0 - 9 rating system and the rice grain:rice hull inoculation method, sheath blight resistance of the test varieties in the inoculation method study was TDCN (2.4) > H4/CODF (2.5) > Tetep (2.9) > LB86-30344 (3.1) > Jasmine 85 (3.6) > Teqing (4.0) > Gui Chao (4.1) > Pecos (4.3) > Rax Clear (4.7) > Rice-Grass (5.7) > Bengal (6.5) > CPRS (7.3) > MBLE (8.6).

Sheath blight ratings derived using the different inoculation method/evaluation criteria combinations were positively correlated ($P<0.05$), indicating that each combination gave similar estimates of sheath blight resistance for the test varieties.

The time to evaluation was critical for each inoculation method. The best differentiation of varietal resistance with the brown rice grain/lesion length combination was 10 days after inoculation. There was no difference in differentiation with the toothpick/lesion length method between 10 and 20 days. The grain:hull and straw piece evaluations required longer times (about 30 days) to give maximum separations among the test varieties.

These and other evaluation methods will be further tested in 1996. Over-the-top application appears to be easier in the inoculation phase but takes longer to evaluation. This method is more applicable to rows or plots and less useful for individual plants or tillers. Inoculation of individual tillers, toothpick and brown rice methods, takes longer, but the time to evaluation is greatly reduced.

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Table 1. Sources of partial resistance to the rice sheath blight disease.

Source	Inheritance of Resistance
Tetep	quantitative
Taducan	?
LSBR-5	single recessive gene
LSBR-33	two recessive genes
Rax Clear	?
Rice-Grass	?
H4/CODF	?
Jasmine 85	single dominant gene
Teqing	single dominant gene plus modifying genes
LB86-30344 (resistant Labelle somaclone)	single dominant gene
Yangdao 4	?
Leah	?

Table 2. Disease reactions of major cultivars and resistance sources.

Source	Disease Rating (0-9)	Infection Cushions per cm^2	Lobate Appressoria per cm^2
LMNT *	7.8	45	697
MBLE *	7.5	31	239
CPRS *	7.3	25	594
JODN *	7.0	47	537
KATY *	5.0	23	492
BNGL *	4.5	--	---
RXCL *	4.0	17	188
YD-4 **	4.0	--	---
TQNG *	3.8	3	53
LSBR-5 *	3.3	18	100
JSMN *	3.0	4	36
H4/CODF *	3.0	--	---
TDCN ***	1.6	0	54
TTEP ***	1.7	0	52

* Data from 1994 tests conducted by X. B. Pan.

** Chinese variety with high yield potential and long-grain type. Resistance data from 1995 tests.

*** Data from tests conducted 1978-79 (Marshall, D. S. and M. C. Rush. 1980. Relation between infection by *Rhizoctonia solani* and *R. oryzae* and disease severity in rice. Phytopathology 70:941:946).

Table 3. Crosses among sheath blight resistance sources and commercial varieties made in 1995.

Cross No.	Parent Female	Parent Male	Date of Cross	Number of Seeds
I. Crosses with F_3 lines:				
506	BNGL	95-03044	7/26/95	5
507	BNGL	95-03067	7/24/95	15
508	BNGL	95-03113	7/24/95	32
509	BNGL	95-08669	7/26/95	1
510	BNGL	95-13674	7/26/95	1
511	CPRS	95-00459	7/26/95	5
512	CPRS	95-03044	7/26/95	2
513	CPRS	95-03067	7/26/95	1
514	CPRS	95-03098	7/24/95	15
515	CPRS	95-03113	7/24/95	6
516	CPRS	95-08669	7/24/95	20
517	CPRS	95-13674	7/24/95	10
518	CPRS	95-13859	7/24/95	5
519	CPRS	95-13997	7/26/95	1
520	KATY	95-00459	7/24/95	15
521	KATY	95-03044	7/24/95	26
522	KATY	95-03067	7/24/95	27
523	KATY	95-03098	7/24/95	48
524	KATY	95-03113	7/24/95	21
525	KATY	95-08669	7/24/95	23
526	KATY	95-13674	7/24/95	1
527	KATY	95-13859	7/24/95	5
II. Miscellaneous crosses:				
528	CPRS	KATY	8/04/95	33
529	CPRS	91PY685	8/04/95	26
530	KATY	YD-4	8/10/95	4
531	YD-4	CPRS	8/18/95	50
532	YD-4	KATY	8/13/95	34
533	YD-4	KBNT	8/13/95	20
534	YD-4	LCSN	8/08/95	15
535	YD-4	LMNT	8/13/95	36
536	YD-4	RSMT	8/13/95	71

Continued.

Table 3. Continued.

Cross No.	Parent Female	Parent Male	Date of Cross	Number of Seeds
III. Repeated crosses (same as those made in 1994):				
490	JSMN	LMNT	8/17/95	2
491	LMNT	JSMN	8/18/95	2
498	LMNT	TQNG	8/17/95	11
500	LMNT	LB86-30344	8/18/95	6
504	LB86-30344	JSMN	8/24/95	10
505	LB86-30344	TQNG	8/23/95	15
IV. Genetic studies:				
537	LB86-30344	H4/CODF	8/24/95	46
538	LB86-30344	LSBR-5	8/17/95	10
539	LB86-30344	RICE-GRASS	8/17/95	1
540	LB86-30344	TDCN	8/23/95	19
541	LB86-30344	YD-4	8/17/95	12
542	H4/CODF	LB86-30344	8/18/95	2
543	H4/CODF	JSMN(white)	8/04/95	31
544	H4/CODF	JSMN(red)	8/04/95	59
545	H4/CODF	LMNT	8/13/95	106
546	H4/CODF	LSBR-5	8/23/95	3
547	H4/CODF	LSBR-33	8/04/95	28
548	H4/CODF	RICE-GRASS	8/23/95	40
549	H4/CODF	TDCN	8/18/95	28
550	H4/CODF	TQNG	8/23/95	46
551	H4/CODF	YD-4	8/13/95	11
552	JSMN	LSBR-5	8/04/95	3
553	JSMN	RICE-GRASS	8/17/95	4
554	JSMN	TDCN	8/17/95	5
555	JSMN	YD-4	8/17/95	8
556	LMNT	H4/CODF	8/17/95	4
557	LMNT	LMNT/JSMN	8/13/95	10
558	LMNT	LMNT/TQNG	8/17/95	27
559	LMNT	RICE-GRASS	8/18/95	21
560	LMNT	TDCN	8/17/95	16
561	LMNT	YD-4	8/13/95	20
562	LMNT/JSMN	JSMN	8/14/95	3
563	LMNT/JSMN	LMNT	8/09/95	107
564	LSBR-5	LB86-30344	8/21/95	1

Continued.

Table 3. Continued.

Cross No.	Parent Female	Parent Male	Date of Cross	Number of Seeds
IV. Genetic studies (continued):				
565	LSBR-5	GCHW	8/09/95	13
566	LSBR-5	H4/CODF	8/09/95	8
567	LSBR-5	JSMN	8/17/95	13
568	LSBR-5	LSBR-33	8/17/95	7
569	LSBR-5	RICE-GRASS	8/21/95	9
570	LSBR-5	RXCL	8/17/95	39
571	LSBR-5	TDCN	8/21/95	15
572	LSBR-5	TQNG	8/09/95	24
573	LSBR-33	LSBR-5	8/07/95	15
574	RICE-GRASS	LB86-30344	8/14/95	4
575	RICE-GRASS	LMNT	8/24/95	32
576	RICE-GRASS	LSBR-5	8/21/95	13
577	RICE-GRASS	TDCN	8/21/95	18
578	RXCL	LSBR-33	8/04/95	10
579	TDCN	LMNT	8/24/95	2
580	TDCN	LSBR-5	8/18/95	2
581	TQNG	H4/CODF	8/21/95	9
582	TQNG	LMNT/TQNG	8/17/95	3
583	TQNG	LSBR-5	8/04/95	40
584	TQNG	LSBR-33	8/04/95	13
585	TQNG	RICE-GRASS	8/17/95	22
586	TQNG	TDCN	8/17/95	15
587	TQNG	YD-4	8/17/95	44
588	YD-4	RICE-GRASS	8/14/95	3
589	YD-4	TDCN	8/18/95	27

91PY685 = Entry #685 in Paul Seilhan's 1994 field test.

LB86-30344 = The second sheath blight resistant somaclone from Labelle. We are just beginning to study its resistance.

F_3 plants used in crosses are indicated by giving the number of the source row -- example: 95-03044 means row 3044 in the 1995 planting at the Rice Research Station, Crowley, LA.

Table 4. Sheath blight ratings for F_4 lines to be advanced in our program and check varieties in 1995 field plots at the Rice Research Station, Crowley, LA.

Cross No.	Pedigree	No. of Rows Advanced	Sheath Blight Rating (0-9) Range	Mean
1	LSBR-5/LMNT//LMNT	19	1 - 5	3.4
2	LSBR-5/LMNT//LCSN	17	2 - 6	4.1
3	LSBR-5/LMNT//TDCN/STBN	2	2 - 4	3.0
4	TDCN/STBN//LSBR-5/LMNT	7	1 - 4	2.0
5	LBLE/LSBR-33//LMNT	1	4	NA
7	LMNT//LSBR-5/LMNT	2	5 - 6	5.5
12	TDCN/STBN//LSBR-5/LMNT	6	1 - 4	2.4
15	LSBR-5/LMNT//CPRS	17	0 - 6	3.2
17	LSBR-5/LMNT//LBLE/LSBR-33	9	1 - 4	3.3
23&24	LMNT//LBLE/LSBR-33	3	4	4.0
27	LSBR-5/LMNT//LMNT	3	3 - 5	4.0
31	RICE-GRASS//LSBR-5/LMNT	13	1 - 4	2.5
32	RICE-GRASS//LMNT	15	1 - 3	2.1
33	RICE-GRASS//LBLE/LSBR-33	19	1 - 3	1.9
35	RICE-GRASS//LMNT	1	4	NA
40&41	LSBR-5/LMNT//LMNT/LSBR-5	6	2 - 4	3.0
44	CPRS//LBLE/LSBR-33	8	2 - 6	4.0
45	CPRS//LBLE/LSBR-33	16	1 - 5	2.9
--	LSBR-33		1 - 4	2.7
--	LSBR-5		2 - 6	3.2
--	JSMN		1 - 4	2.8
--	TQNG		2 - 4	2.8
--	KATY		2 - 6	4.5
--	RXCL		1 - 7	4.3
--	CPRS		5 - 9	8.0
--	JODN		5 - 9	6.2
--	KBNT		3 - 9	5.9
--	LMNT		6 - 9	8.4
--	LCSN		6 - 9	7.4
--	YD-4		4	NA

Table 5. F_4 and F_3 panicle rows given to the Rice Breeding Program for testing in 1996.

Line	Pedigree	Sheath Blight Rating (0-9)
I. F_4 lines:		
95-00056	LSBR-5/LMNT//LMNT	-
95-00322	LSBR-5/LMNT//LMNT	2
95-00458	LSBR-5/LMNT//LCSN	5
95-00459	LSBR-5/LMNT//LCSN	5
95-01514	LMNT//LSBR-5/LMNT	5
95-01662	TDCN/STBN//LSBR-5/LMNT	2
95-01833 (red) *	LSBR-5/LMNT//CPRS	2
95-01961	LSBR-5/LMNT//CPRS	4
95-01963 (red) *	LSBR-5/LMNT//CPRS	1
95-01965 (red) *	LSBR-5/LMNT//CPRS	2
95-01998 (red) *	LSBR-5/LMNT//CPRS	1
95-02121	LSBR-5/LMNT//LBLE/LSBR-33	1
95-02461	LMNT//LBLE/LSBR-33	4
95-03199 (red) *	RICE/GRASS//LSBR-5/LMNT	-
95-03521	RICE/GRASS//LBLE/LSBR-33	1
II. F_3 lines:		
95-10813	LSBR-5/LMNT//TQNG	3
95-10929	LSBR-5/LMNT//TQNG	1
95-11092	KATY/CPRS//KATY	3
95-11098	KATY/CPRS//KATY	3
95-11196	KATY//KATY/CPRS	2
95-11201	KATY//KATY/CPRS	1

* These lines were from panicles from lines of the pedigrees listed, but the red character was not expected from these pedigrees. These panicles may have been selected from plants from drifted seeds of a line with H4/CODF in the pedigree.

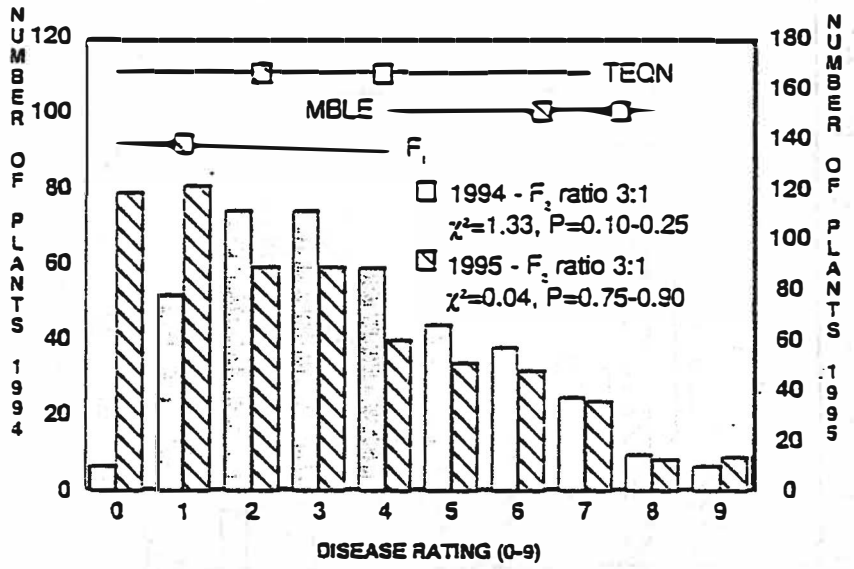


Figure 1. Distribution of sheath blight ratings, based on the 0 - 9 scale for sheath blight resistance, of F_2 plants in two independently generated populations from the cross Maybelle (MBLE)/Teqing (TQNG). The ranges of parent and F_1 distributions are shown with the means indicated.

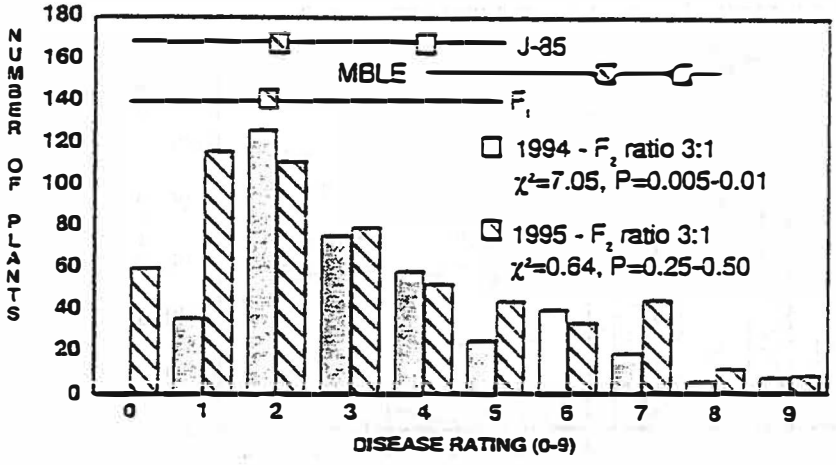


Figure 2. Distribution of sheath blight ratings, based on the 0 - 9 scale for sheath blight resistance, of F_2 plants in two independently generated populations from the cross Maybelle (MBLE)/Jasmine 85 (JSMN). The ranges of parent and F_1 distributions are shown with the means indicated.

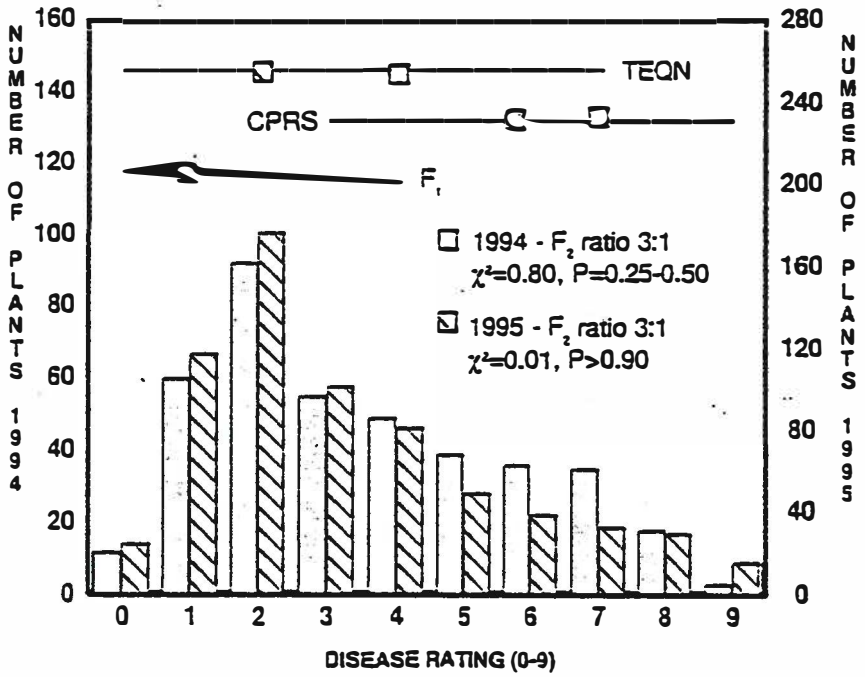


Figure 3. Distribution of sheath blight ratings, based on the 0 - 9 scale for sheath blight resistance, of F_2 plants in two independently generated populations from the cross Teqing (TQNG)/Cypress (CPRS). The ranges of parent and F_1 distributions are shown with the means indicated.

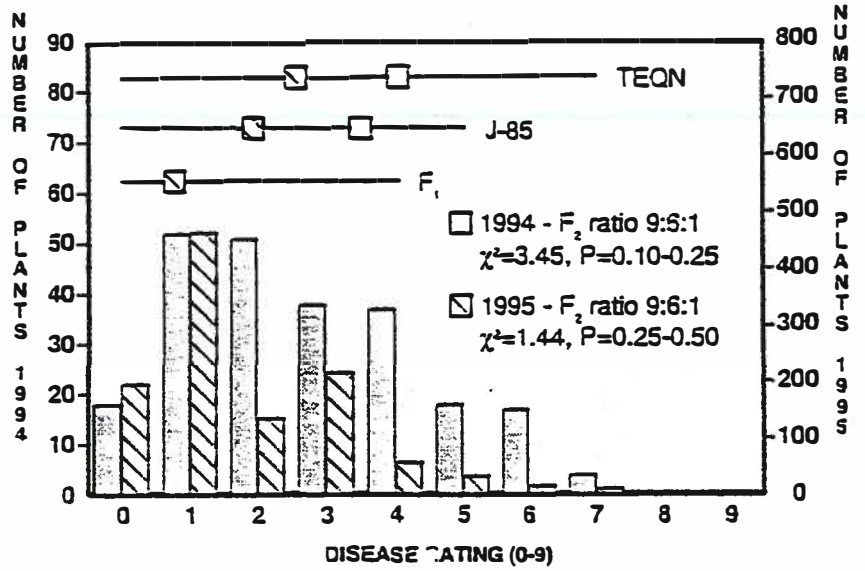


Figure 4. Distribution of sheath blight ratings, based on the 0 - 9 scale for sheath blight resistance, of F_2 plants in two independently generated populations from the cross of the resistant varieties Jasmine 85 (JSMN)/Teqing (TQNG). The ranges of parent and F_1 distributions are shown with the means indicated.

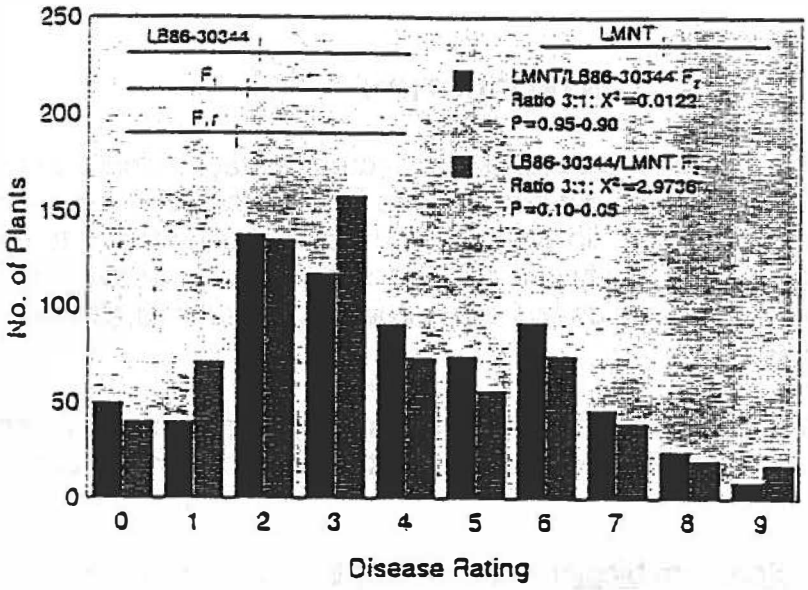


Figure 5. Distribution of sheath blight ratings, based on the 0 - 9 scale for sheath blight resistance, of F_2 plants from the cross Lemont (LMNT)/LB86-30344 and the reciprocal cross LB86-30344/LMNT. The ranges of parent, F_1, and F_1r distributions are shown with the means indicated.

ROTATIONAL CROPS[1]

R.J. Habetz

INTRODUCTION

In 1995, soybean [Glycine max (L.) Merr.] acreage stayed about the same with yields decreasing slightly. Disease did not seem to be as prominent this year but early wet and late season dry conditions did seem to be the contributing factor to the reduced yields. Research is needed to identify varieties affected by water, disease, and possibly drought conditions and improve yields by better production practices, planting methods, or less susceptible varieties.

Weed control in soybeans is a major factor in soybean production. Weed research is ongoing in the areas of herbicide-resistant varieties, reduced rates, cultivation, and planting methods.

Grain sorghum [Sorghum bicolor (L.) Moench] is an alternative crop to soybeans in rotation with rice. Soybean and grain sorghum differ in their adaptability to soil types and climatic conditions. Consequently, variety trials are conducted at locations throughout the state to aid producers in selecting varieties best adapted to their area. Studies are conducted at the Rice Research Station each year to compare performance of newly released and established soybeans and grain sorghum varieties in cooperation with the Louisiana Agricultural Experiment Station.

All pertinent data from these crops are presented on the following pages.

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[1] This research is partially supported by funds provided by the Louisiana Soybean and Grain Research and Promotion Board.

SOYBEAN VARIETY TEST

R.J. Habetz, B.G. Harville, and W. Hall

Location: Rice Research Station

Soil Type: Crowley silt loam

Seeding Rate: 10 seed/row ft

Planting Date: Group IV, Apr 28, 1995; Groups V, VI, VII, May 26, 1995

Row Spacing: 32 inches

Fertilizer: 0-80-80 (N-P_2O_5-K_2O) banded at planting

Plot Size: 4 rows x 30 ft

Herbicide: 2.0 pt/A Detail broadcast at planting

Rainfall: Group IV - 1st week, 0.0; 2nd week, 0.0; 3rd week, 0.1
Groups V, VI, VII - 1st week, 3.3; 2nd week, 0.0; 3rd week, 0.0

Harvested: At maturity for each variety

Experimental Design: Randomized complete block with four replications

Comments: More than adequate rainfall caused replanting of all but the Group IV soybeans. Early planting is one of the advantages of this group. Even after replanting, stands were reduced from rainfall. Very little aerial blight, a disease which affects yield severely, was seen, which may account for the adequate yields. Group VI showed the highest average yield (Table 1), but Group IV again showed that it is comparable or better as in previous years.

Table 1. Performance of commercial soybean varieties grown on a Crowley silt loam soil at the Rice Research Station South Unit, Crowley, LA. 1995.

Maturity group and variety/brand	Yield 1995	1994	1993	1994-1995	Plant height	Maturity date
	----------(bu/A)----------				-(in)-	
Group IV						
Vernal	67.2	58.6	----	62.9	31	09/18
HyPerformer HY 498	61.8	64.4	----	63.1	30	-----
Deltapine DP 3499	57.3	64.8	----	61.1	30	09/07
Hornbeck HBK 49	56.8	64.5	----	60.7	34	08/30
Riverside RVS 499	55.8	64.8	----	60.3	31	09/10
Dyna-Gro 3495	55.2	63.3	----	59.3	32	09/05
F91-2420	53.2	----	----	----	26	09/25
Northrup King RA 452	53.1	57.8	----	55.5	25	09/06
F91-1419	48.8	----	----	----	19	09/07
Pioneer® variety 9501	48.2	72.3	----	60.3	26	09/07
Northrup King S48-84	47.9	62.8	----	55.4	24	09/04
Hartz variety H4994	45.4	56.7	----	51.1	20	09/02
Deltapine DP 3478	44.5	69.3	----	56.9	24	09/04
Terral TVX 4990	43.1	52.9	----	48.0	24	09/08
F91-3076	42.8	----	----	----	25	09/09
Deltapine DP 3456	42.6	64.7	----	53.7	22	08/30
AgraTech FFR 493	41.2	----	----	----	23	09/11
Dixie 478	39.3	----	----	----	24	09/08
Asgrow A4922	39.2	----	----	----	22	09/11
Terral TVX 4596	38.8	----	----	----	25	09/02
Pioneer® variety 9472	38.5	56.5	----	47.5	20	09/05
Terral 4792	38.3	----	----	----	19	09/11
Terral TVX 4479	35.8	----	----	----	15	09/11
Pioneer® variety 9481	35.1	----	----	----	20	09/05
Terral TVX 4570	31.1	----	----	----	19	09/11
F91-1577B	30.1	----	----	----	21	09/13
Terral TVX 4452	28.5	49.2	----	38.9	19	09/13
DeKalb CX469c	27.6	52.4	----	40.0	21	09/13
DeKalb CX499c	27.6	----	----	----	26	09/14
Mean[1]	44.0	57.4	----	51.5	25.1	09/09
L.S.D. (0.1)	6.3	----	----	----	----	-----
C.V. (%)	8.8	----	----	----	----	-----
Group V						
Terral TVX 5893	53.6	----	----	----	31	09/27
Riverside RVS 529	50.4	----	----	----	36	09/23
Hartz variety H5088 RR®	47.9	59.7	----	53.8	24	09/26
Hornbeck HBK 58	44.6	46.9	----	45.8	24	09/26
Kunkle KSC 517	43.3	52.0	----	47.7	22	09/24
Pioneer® variety 9592	42.8	66.0	----	54.4	22	09/27
Hartz variety HX510298	42.8	----	----	----	24	09/24
HyPerformer HSC 591	42.6	54.2	----	48.4	26	09/29
Hartz variety H5488	42.3	----	----	----	21	09/29
Terra-Vig 5452	41.7	48.9	----	45.3	20	09/25
Asgrow A5885	40.9	50.3	----	45.6	23	09/22
Pioneer® variety 9584	40.8	61.3	----	51.1	27	09/26
CN46002J	40.7	----	----	----	23	09/17
Hartz variety H5050	40.3	----	----	----	35	09/23
Terral TV5495	40.0	----	----	----	32	09/24
Deltapine DP 3588	39.4	61.9	----	50.7	25	10/02
Deltapine 105	39.0	57.7	----	48.4	15	09/27
Hartz variety H5545	39.0	45.2	----	42.1	23	09/27
Delta King 5850	38.9	51.2	----	45.1	24	09/27
Northrup King S59-60	38.8	57.1	----	48.0	26	09/29
Hornbeck HBK 54	38.4	51.7	----	45.1	23	09/27
Terral TV5797	38.3	----	----	----	27	09/27
Hartz variety HX517452	38.1	----	----	----	21	09/24

Continued.

Table 1. Continued.

Maturity group and variety/brand	Yield 1995	1994	1993	1994-1995	Plant height	Maturity date
	(bu/A)				-(in)-	
Group V Continued						
Riverside RVS 77	37.7	46.7	----	42.2	20	10/01
Delta King 5475	37.6	52.0	----	44.8	23	09/23
Hartz variety H5454	37.5	54.6	----	46.1	28	09/26
Dixie 544	37.3	----	----	----	25	09/26
Pioneer® variety 9593	37.0	61.5	----	49.3	27	09/25
HyPerformer HY 574	37.0	57.9	----	47.5	19	09/29
CN45002J	37.0	----	----	----	26	09/16
Riverside RVS 549	36.9	49.4	----	43.2	20	09/25
Hartz variety HX510151	36.6	58.8	----	47.7	20	-----
Buckshot 55	36.4	58.5	----	47.5	24	09/27
Deltapine 415	35.8	49.8	----	42.8	16	09/20
Hartz variety HX512175	35.3	----	----	----	19	09/27
Asgrow A5843	35.0	54.7	----	44.9	23	09/27
Dyna-Gro 3576	34.7	52.8	----	43.8	21	09/24
Hartz variety H5266	34.6	----	----	----	23	09/27
Hutcheson	34.6	55.2	----	44.9	20	09/24
Terra-Vig 5555	34.2	48.2	----	41.2	24	10/03
Northrup King S57-11	33.7	48.3	----	41.0	23	09/27
AgraTech FFR 514	33.3	----	----	----	19	09/20
Asgrow A5403	32.8	----	----	----	20	09/18
Hartz variety H5164 RR®	32.8	----	----	----	14	09/25
Terra-Vig 5693	32.7	46.6	----	39.7	20	09/22
Deltapine DP 3589	32.0	64.3	----	48.2	26	09/29
Hartz variety HX525419	30.9	----	----	----	22	09/26
AgraTech AT 555	30.7	45.7	----	38.2	21	09/23
Asgrow A5979	29.8	----	----	----	18	09/24
Buckshot EK 58	29.3	53.6	----	41.5	24	10/04
Hartz variety H5566 RR®	28.4	58.5	----	43.5	20	09/27
LA88-29004	25.6	----	----	----	23	10/02
LA88-29016	21.1	----	----	----	19	10/01
Mean	37.2	53.9	----	45.7	23.4	09/26
LSD (0.1)	5.2	----	----	----	----	-----
CV (%)	8.6	----	----	----	----	-----
Group VI						
Pioneer® variety 9611	55.6	----	----	----	27	09/27
Deltapine DP 3627	53.3	57.6	----	55.5	31	09/29
Terra-Vig 6792	51.2	50.1	----	50.6	33	10/06
Hartz 6200	50.4	54.9	----	52.7	25	09/27
Vernal	49.7	----	----	----	31	10/02
Pioneer® variety 9692	49.4	46.8	----	48.1	26	10/11
Riverside RVS 93-44	48.1	59.3	----	53.7	25	10/08
Kunkle KSC-617	47.4	----	----	----	25	10/08
Asgrow A6785	46.7	----	----	----	26	10/03
Hartz variety H6255	45.9	48.1	----	47.0	25	10/08
AgraTech 41345	45.9	----	----	----	19	10/12
Deltapine DP3606	45.9	51.8	----	48.9	27	09/27
Asgrow A6961	45.7	56.8	----	51.3	27	10/17
Terra TV6565	45.4	38.4	----	41.9	29	10/05
Riverside RVS 699	45.3	39.3	----	42.3	27	10/13
Northrup King S62-66	45.1	50.0	----	47.6	25	09/27
Buckshot 66	45.0	64.9	----	55.0	29	10/17
Terra TVX 6696	44.8	----	----	----	19	10/16
Hornbeck HBK 67	44.3	54.6	----	49.5	27	10/15
Deltapine DP 3682	44.1	45.7	----	44.9	28	10/10
Hartz variety H6464	44.0	59.1	----	51.6	26	10/10
AgraTech AT 655	43.9	59.7	----	51.8	25	10/13
Hartz variety H6886 RR®	43.3	54.6	----	49.0	25	10/16

Continued.

Table 1. Continued.

Maturity group and variety/brand	Yield 1995	1994	1993	1994-1995	Plant height	Maturity date
	----------(bu/A)----------				-(in)-	
Group VI Continued						
Deltapine DPX 3640	43.1	----	----	----	28	10/05
Riverside RVS 93-36	42.3	54.3	----	48.3	27	10/11
Brim	42.1	45.3	----	43.7	23	10/04
Hartz variety H6062	42.0	----	----	----	23	10/15
Pioneer® variety 9641	41.9	40.6	----	41.3	29	09/29
Kunkle KSC-615	41.7	49.1	----	45.4	23	10/11
Hartz variety HX625978	41.0	----	----	----	16	10/19
Kunkle KSC-607	40.8	42.0	----	41.4	22	10/10
Hartz variety H6567	40.2	----	----	----	24	10/13
Terra-Vig 6653	40.1	43.5	----	41.8	22	10/17
Deltapine DPX 3681	39.0	----	----	----	27	10/17
Kunkle KSC-811	38.8	45.5	----	42.2	24	09/29
Northrup King S86-90	38.2	43.2	----	40.7	20	10/09
HyPerformer HY 677	36.5	37.7	----	37.2	22	10/09
Terra-Vig 6253	35.7	53.4	----	44.6	25	10/06
Asgrow A6711	34.7	48.0	----	41.4	25	10/16
Mean	44.7	47.7	----	45.1	25.9	10/09
LSD (0.1)	5.6	----	----	----	----	-----
CV (%)	9.7	----	----	----	----	-----

Group VII	1995	1994	1993	94-95	93-95	Pl. Ht.	Mat. Date
LA88-26173	47.2	----	----	----	----	31	10/26
Northrup King S75-55	46.8	37.0	33.4	41.9	39.1	24	10/18
LA88-96939	44.5	----	----	----	----	29	10/27
Hartz variety HX622055	43.7	----	----	----	----	32	10/21
Pioneer® variety 9761	43.5	34.8	39.0	39.2	39.1	27	10/17
Hartz variety H7190	43.1	41.8	48.2	42.5	44.4	22	10/25
Stonewall	43.0	31.5	33.0	37.3	35.8	23	10/14
Riverside RVS 757	40.7	35.5	36.6	38.1	37.6	29	10/23
Hartz variety HX617905	40.1	----	----	----	----	26	10/01
HyPerformer HY798	38.9	34.1	33.0	36.5	35.3	25	10/17
Buckshot 723	38.8	33.3	36.2	36.1	36.1	28	10/24
HyPerformer HSC 721	37.8	32.3	44.2	35.1	38.1	23	10/22
Dyna-Gro 3682	37.3	32.4	39.1	34.9	36.3	22	10/14
Hornbeck HBK 79	37.0	37.7	31.5	37.4	35.4	27	10/25
Deltapine DP 3733	36.5	35.4	36.3	36.0	36.1	23	10/16
Hartz variety H7550 RR®	35.4	42.3	41.9	38.9	39.9	26	10/27
HyPerformer HSC 741	35.0	33.1	25.4	34.1	31.2	24	10/23
Mean	40.5	35.5	36.8	37.5	37.3	25.9	10/20
LSD (0.1)	2.7	----	----	----	----	----	-----
CV (%)	6.4	----	----	----	----	----	-----

[1] Represents only means of entries in this table, not means of all entries grown that year.
[2] Hartz varieties containing RR® gene have only been yield tested in 1995.

GRAIN SORGHUM VARIETY TEST

R.J. Habetz and M.J. Kang

Location: Rice Research Station South Unit

Soil Type: Crowley silt loam

Planting Date: April 28, 1995

Row Spacing: 32 inches

Fertilizer: 28-84-84 (N-P_2O_5-K_2O) banded at planting; 80-0-0 (21%), topdress

Plot Size: 4 rows x 30 ft

Treated: 3 pt/A atrazine applied broadcast at planting

Rainfall: Adequate

Harvested: Sept 5

Experimental Design: Randomized complete block with four replications

Comments: In the early-medium varieties, the test mean was 2717 lb/A (Table 1). The highest yield was Terral TV 9421 (3216 lb/A); however, differences among hybrids were not significant in 1995. The full-season maturity test mean was 2309 lb/A, with a CV of 16.2% (Table 2). The highest yield was for Asgrow hybrid A570 (2612 lb/A); also differences among hybrids were not significant. The 3-year averages for hybrids for which recommended varieties are released, Cherokee and Pioneer 8118, showed the highest average yield.

Table 1. Performance of early-medium maturity grain sorghum hybrids at the Rice Research Station South Unit, Crowley, LA. 1995.

Company/Brand	Hybrid	Mean yield			Grain moisture	Plant height
		1995	2-yr	3-yr		
		lb/A			%	in
Terral-Norris Seed	Terral TV9421	3216	2869	2755	12.9	43
Terral-Norris Seed	Terral TV900	3014	3222	2911	12.4	38
DeKalb Genetics	DK55	2937	2664	—	12.7	50
HyPerformer Seed	Cherokee	2934	3399	3190	12.7	48
Cargill	575	2832	—	—	12.5	46
DeKalb Genetics	DK54	2826	2514	2530	12.7	53
Pioneer Hi-Bred	8282	2816	—	—	13.7	46
Terral-Norris Seed	Terral TV1050	2811	2825	2666	13.0	42
Cargill	737	2809	—	—	12.9	44
Pioneer Hi-Bred	XS243	2805	—	—	12.6	47
Pioneer Hi-Bred	8310	2731	3135	2960	13.1	46
HyPerformer Seed	EX9660	2718	—	—	13.2	43
Pioneer Hi-Bred	8305	2647	2779	2685	13.0	42
DeKalb Genetics	DK56	2629	2872	2747	12.8	49
Mycogen Plant Sci.	444E	2623	2985	—	12.5	43
Pioneer Hi-Bred	8212Y	2568	2777	2755	12.9	42
Pioneer Hi-Bred	XS243	2567	—	—	13.9	45
Terral-Norris Seed	Terral TV960	2558	3032	2932	13.2	43
DeKalb Genetics	X-166	2547	—	—	13.1	42
Delta & Pine Land	Deltapine 1552	2527	2322	2321	12.6	43
Cargill	X19225	2524	—	—	13.2	43
Delta & Pine Land	Deltapine G522DR	2427	2845	2852	12.7	44
HyPerformer Seed	HSC893	2426	—	—	13.2	40
Mean		2717	—	—	12.9	44
CV (%)		14.8	—	—	3.6	NA
LSD (.10)		NS	—	—	0.6	NA

Table 2. Performance of full-season grain sorghum hybrids at the Rice Research Station South Unit, Crowley, LA. 1995.

Company/Brand	Hybrid	Mean yield			Grain moisture	Plant height
		1995	2-yr	3-yr		
		lb/A			%	in
Asgrow	A570	2612	3169	—	12.9	44
Pioneer Hi-Bred	8118	2597	2975	2868	13.0	54
Northrup King	KS735	2447	3152	—	13.2	44
Triump	TR82-G	2357	2683	—	13.1	47
Asgrow	A531 (XP5312)	2343	—	—	12.9	42
Cargill	837	2342	—	—	12.9	44
HyPerformer Seed	AP9850 (HY1320)	2259	2428	2630	12.9	44
Cargill	X12287	2192	—	—	13.3	42
Northrup King	KS710	2090	2856	2860	13.0	38
HyPerformer Seed	HSC Wings	2084	2370	2371	12.8	39
Capehart Seed	Champion	2073	2577	2412	13.6	44
Mean		2309	—	—	13.0	44
CV (%)		16.2	—	—	4.3	NA
LSD (.10)		NS	—	—	NS	NA

SCREENING SOYBEAN VARIETIES FOR WATER TOLERANCE

R.J. Habetz

Location: Rice Research Station South Unit

Soil Type: Crowley silt loam

Row Spacing: 32 inches

Seeding Rate: 10 seed/row ft

Planting Date: May 23, 1995

Plot Size: 4 rows x 30 ft

Herbicide(s): 2.0 pt/A Detail applied broadcast at planting

Fertilizer: 0-80-80 (N-P_2O_5-K_2O) banded at planting

Water Treatment(s): applied June 23, plants 4 inches tall

Rated: July 10

Temperature at Time of Flooding: 72 to 95°F

Rainfall: .2 inches during 10-day flush; adequate during the rest of the growing period

Natural: No floodwater added to plots; only moisture came from rainfall

Flood: Soybean plants 4 inches tall, flood covered plants completed, held on for 24 hr then lowered to 2 inches for another 3 days and drained

Flush: Soybean plants 4 inches tall, water held on for 10 days at a 2-inch depth then drained

Experimental Design: Randomized sub-plots with four replications

Comments: With excessive moisture being one of the major problems in growing soybeans in southwest Louisiana, research has shown that soybean varieties respond differently to this problem. Data have shown that Riverside 499 has shown an excellent yield response under both flooding and flushing conditions (Table 1). Deltapine 105, Vernal, Buckshot 66, and Hartz 6200 all showed a favorable response (Tables 2 and 3).

Pioneer 9501, Hutcheson, and Ring Around 452 are very good varieties under natural conditions; however, these did not show very good yield potential under high moisture conditions.

Our objective to evaluate varieties under simulated weather conditions was accomplished but other data, such as disease response and its effect on yield, were not realized due to the fact that no measurable amount of disease was observed this year. Other data, such as plant height, showed a definite difference. With the exception of Riverside 499, regrowth response was seen in groups 5 and 6, which possibly shows that the longer the regrowth time, the higher yields could be.

Preliminary data show that this screening method has the ability to be an excellent method of giving another indicator of the full potential of soybean varieties. Some modifications of this test needs to be made, such as the saturated treatment that had an overpopulation of weeds (mostly rice related) that could be a problem due to the continuous flooding.

Table 1. Screening Group IV soybean varieties for effect of excessive moisture. Rice Research Station South Unit, Crowley, LA. 1995.

Variety	Natural		Flood		
	Yield	Plant height	Yield	Plant height	Tolerance rating[1]
	(bu/A)	(in)	(bu/A)	(in)	(1-5)
Riverside 499	60.3	36.0	37.3	29.8	1.8
Pioneer 9501	52.6	33.3	23.2	20.0	2.8
Dyna-Gro 3495	56.4	37.0	27.2	25.5	2.3
Hartz 4994	58.1	28.5	20.8	16.8	2.0
Deltapine 3456	50.3	30.8	22.7	19.5	3.0
Ring Around 452	53.1	33.3	23.9	20.8	3.0
LSD (.05)	2.93	12.3	8.1	2.8	1.1
CV (%)	8.42	24.64	20.76	8.29	30.55

Variety	Flush			Saturated	
	Yield	Plant height	Tolerance rating[1]	Yield	Plant height
	(bu/A)	(in)	(1-5)	(bu/A)	(in)
Riverside 499	42.0	26.8	2.3	32.7	34.8
Pioneer 9501	18.6	18.8	3.8	26.5	24.8
Dyna-Gro 3495	25.3	19.8	3.8	33.6	31.8
Hartz 4994	20.4	14.8	2.8	28.3	20.0
Deltapine 3456	21.7	18.8	3.0	28.4	22.0
Ring Around 452	21.3	19.0	3.0	29.8	27.0
LSD (.05)	12.2	3.8	1.5	4.7	3.2
CV (%)	32.48	12.82	31.89	10.40	7.98

[1] Tolerance rating: 1 = no injury; 5 = all plants dead.

Table 2. Screening Group V soybean varieties for effect of excessive moisture. Rice Research Station South Unit, Crowley, LA. 1995.

Variety	Natural		Flood		
	Yield	Plant height	Yield	Plant height	Tolerance rating[1]
	(bu/A)	(in)	(bu/A)	(in)	(1-5)
Deltapine 105	56.8	27.8	25.1	19.3	2.3
Pioneer 9592	51.2	28.3	22.7	20.3	3.3
Hutcheson	44.3	21.3	17.8	15.0	3.0
Terra Vig 5693	49.8	23.5	22.8	17.8	2.8
LA88-25723	25.3	25.8	18.0	19.5	2.8
Hyperformer 574	53.6	24.5	20.4	18.0	2.3
LSD (.05)	7.8	3.6	6.1	4.7	1.2
CV (%)	11.01	9.51	19.21	17.06	30.08

Variety	Flush			Saturated	
	Yield	Plant height	Tolerance rating[1]	Yield	Plant height
	(bu/A)	(in)	(1-5)	(bu/A)	(in)
Deltapine 105	25.5	19.3	1.5	22.8	22.5
Pioneer 9592	24.4	20.0	2.5	24.6	23.0
Hutcheson	18.1	13.8	3.0	18.7	19.0
Terra Vig 5693	23.6	15.5	2.0	22.5	18.3
LA88-25723	18.8	16.0	3.8	11.7	15.5
Hyperformer 574	23.8	17.3	2.0	19.6	15.5
LSD (.05)	4.9	2.6	1.4	3.6	2.1
CV (%)	14.49	10.30	37.81	12.09	7.41

[1] Tolerance rating: 1 = no injury; 5 = all plants dead.

Table 3. Screening Group VI soybean varieties for effect of excessive moisture. Rice Research Station South Unit, Crowley, LA. 1995.

Variety	Natural		Flood		
	Yield	Plant height	Yield	Plant height	Tolerance rating[1]
	(bu/A)	(in)	(bu/A)	(in)	(1-5)
Hartz 6200	51.8	30.5	27.9	21.3	2.5
Vernal	61.3	39.0	29.5	20.8	2.8
Buckshot 66	54.5	33.5	31.0	22.5	2.0
Asgrow 6297	40.0	22.0	17.9	17.3	3.3
NK S62-66	54.6	25.8	22.9	18.5	3.3
Agratech 602	57.8	30.5	26.8	19.0	2.5
LSD (.05)	12.1	2.4	6.4	3.0	1.3
CV (%)	15.11	5.27	16.45	9.99	31.80

Variety	Flush			Saturated	
	Yield	Plant height	Tolerance rating[1]	Yield	Plant height
	(bu/A)	(in)	(1-5)	(bu/A)	(in)
Hartz 6200	28.0	22.8	1.5	28.5	20.3
Vernal	27.7	21.8	2.0	19.7	20.3
Buckshot 66	27.5	21.0	2.0	31.1	24.5
Asgrow 6297	22.9	15.5	2.0	24.7	16.5
NK S62-66	22.5	19.0	1.8	21.4	19.8
Agratech 602	25.0	19.3	2.0	29.0	21.3
LSD (.05)	5.9	2.9	1.4	6.5	1.8
CV (%)	15.23	9.76	50.20	16.69	5.73

[1] Tolerance rating: 1 = no injury; 5 = all plants dead.

OFF-STATION CULTURAL PRACTICE TEST

R.J. Habetz

Location: Ed Freeland Farm, Wright, LA

Variety: Hartz 6200

Seeding Rate: Drill, 85 lb/A; Row, 50 lb/A

Planting Date: June 13

Row Spacing: Drill, 7-inch; Row, 30-inch

Plot Size: 10 x 30 ft

Treated: PRE at planting; POT, July 5

Weed Size: Red rice, 2-leaf; redweed, 3-inch

Sprayer: Tractor compressed air, 25 psi, 20 GPA

Experimental Design: Randomized complete block with three replications

Comments: This study showed that different methods of planting did not have a major effect on controlling red rice and redweed, but a comparison of half rates applied preemerge or overtop showed the post overtop gave better control. Scepter applied following a preemerge treatment and another treatment at a full rate of Fusilade 2000 plus Reflex, gave the best overall control (Table 1).

Table 1. Controlling red rice and broadleaf weeds with multiple cultural practice methods. Ed Freeland Farm, Wright, LA. 1995.

Treatment	Rate of application	Rate of application	Weed Control (7/21/95) RR	Weed Control (7/21/95) RW	Yield
	(lb ai/A)		----------(%)----------		(bu/A)
Drill- Dual + Sencor	2.0 + .38	PRE	91.7	91.3	33.7
Drill- Dual + Sencor Scepter	2.0 + .38 .125	PRE POT	91.7	93.3	33.7
Drill- Fusilade 2000 + Reflex	.06 + .188	POT	83.3	85.7	33.1
Drill- Fusilade 2000 + Reflex	.125 + .375	POT	86.7	88.3	35.6
Flat Row- Dual + Sencor	2.0 + .38	PRE	89.7	90.7	30.2
Flat Row- Dual + Sencor Scepter	2.0 + .38 .125	PRE POT	97.0	97.0	32.4
Flat Row- Fusilade 2000 + Reflex	.06 + .188	POT	80.7	84.0	32.3
Flat Row- Fusilade 2000 + Reflex	.125 + .375	POT	92.3	93.3	32.3
Flat Row- Dual + Sencor Cultivate	2.0 + .38	PRE	81.3	81.0	29.3
Flat Row- Fusilade 2000 + Reflex Cultivate	.06 + .188	POT	79.0	83.3	31.1
Bedded Row- Dual + Sencor	2.0 + .38	PRE	85.3	85.0	27.5
Bedded Row- Dual + Sencor Scepter	2.0 + .38 .125	PRE POT	92.7	91.7	27.1
Bedded Row- Fusilade 2000+Reflex	.06 + .188	POT	81.7	81.3	29.9
Bedded Row- Fusilade 2000+Reflex	.125+.375	POT	85.0	85.7	31.9
Bedded Row- Dual + Sencor Cultivate	1.0 + .19	PRE	74.3	75.0	23.9
Bedded Row- Fusilade 2000+Reflex Cultivate	.06 + .188	POT	86.0	86.0	29.6
LSD (.05)			10.6	11.3	5.6
CV (%)			7.35	7.79	10.81

YIELD ENHANCEMENT STUDIES

R.T. Dunand, R.J. Habetz, and R.R. Dilly, Jr.

Experiment: Chitosan and Yield Enhancement in Row Planted Soybeans

Location: Rice Research Station, Crowley, LA (South Unit)

Variety: See treatments

Seeding Rate: 10 seed/row ft (~1.5 bu/A)

Planting Date: 6 June 95

Row Spacing: 32-inch

Fertilizer: 0-20-20 at 400 lb/A banded at planting, 6 June

Water Management: Not applicable

Plot Size: 322.5 ft^2 - 10.75 (4 rows) x 30 ft

Treated Area: 322.5 ft^2 - 10.75 (4 rows) x 30 ft

Treatment(s): **Seed Treatment**

Yeah (20 oz/cwt)

Variety(s)

Deltapine 105
Hartz 6200
Hyperformer 574
Pioneer 9592

Sprayer: Not applicable

Pertinent Rainfall: 0.6 inches, 30 June; 0.5 inches, 1 July; 3.2 inches, 5 July; 1.8 inches, 13 July; 0.4 inches, 15 July; 0.5 inches, 18 July; 0.9 inches, 28 July; 0.5 inches, 29 July; 1.0 inch, July 31; 1.5 inches, 6 Aug; 0.8 inches, 13 Aug; 1.0 inch, 18 Aug; 0.5 inches, 20 Aug; 0.3 inches, 21 Aug; 0.4 inches, 22 Aug; 1.7 inches, 17 Sept; 1.5 inches, 21 Sept

Herbicide(s): Dual (2 pt/A) + Scepter (0.66 pt/A) by tractor sprayer, 6 June

Insecticide(s): None

Fungicide(s): None

Emergence: 10 June

Permanent Flood: Not applicable

Harvest Date: 16 Oct

Harvested Area: 322.5 ft^2 - 10.75 (4 rows) x 30 ft

Exp. Design: Randomized complete block and eight replications. Factorial arrangement of treatments (4 varieties x 2 plant growth regulator rates)

Comments: Soybean yields differed significantly between varieties (Table 1, A means). On average (regardless of seed treatment), the varieties segregated into two groups based on yield. Deltapine 105 and Pioneer 9592 had good yields of just under 40 bu/A. The average yields (with and without seed treatment) were 38.9 and 39.3 bu/A, respectively. Hyperformer 576 and Hartz 6200 had very good yields in the area of 45 bu/A. The average yields were 43.7 and 46.3 bu/A, respectively. The average yield of soybeans in Louisiana is 25 bu/A, and the highest yields range in the vicinity of 50 bu/A.

The effect of chitosan seed treatment was significant across varieties (Table 1, B means). On average (all varieties included), untreated seed produced a yield of 41 bu/A compared with 44 bu/A for chitosan treated seed. This represents approximately a 7% yield increase on relatively high yielding soybeans grown under the environmental conditions of 1995.

Although a statistically valid average yield increase of 3 bu/A across all varieties from chitosan seed treatment is shown (Table 1), there were numerical differences in response noted between varieties (Table 2). On a variety basis, the numerical yield increases from chitosan seed treatment were 2.5 bu/A for Deltapine 105 (37.7 vs 40.2 bu/A), 5.1 bu/A for Pioneer 9592 (36.7 vs 41.8 bu/A), 3.4 bu/A for Hyperformer 574 (43.2 vs 46.6 bu/A) and 0.8 bu/A for Hartz 6200 (46.5 vs 47.3 bu/A). The yield differences were relatively consistent for Deltapine 105, Pioneer 9592 and Hyperformer 574, ranging from 2.5 to 5.1 bu/A. The yield difference for Hartz 6200 was less than 1 bu/A, indicating it may be a less responsive variety or was approaching maximum yield potential. As soybeans or other crops approach the upper limits of maximum yield potential, the ability to respond to chitosan or other yield enhancing factors is limited.

Hartz 6200 was the highest yielding of the four varieties tested and, in comparison to results from 1994, may have been the only variety of the four that was nearing maximum yield potential. In 1994, yields in the soybean variety trial at the Rice Research Station were excellent and some of the highest ever obtained at that site. Soybean yields for Deltapine 105, Pioneer 9592, Hyperformer 574 and Hartz 6200 were 57.7, 66, 57.9 and 54.9 bu/A, respectively. Comparing results from 1995 with 1994, yields were lower in 1995 by -20 bu/A for Deltapine 105, -29.3 bu/A for Pioneer 9592, -14.7 bu/A for Hyperformer 574 and -8.4 bu/A for Hartz 6200. These results show that the variety with

the lowest yield difference (Hartz 6200 at -8.4 bu/A) also had the lowest response to chitosan (0.8 bu/A increase). These results indicate Hartz 6200 was nearing its maximum yield potential, and this could explain the reduced response to chitosan. The other three varieties with yield increases from chitosan between 2.5 and 5.1 bu/A appear to have been much further from maximum yields than Hartz 6200. Additional testing will determine the ability of soybean varieties to respond to chitosan seed treatment.

The CV (coefficient of variation) for this experiment was 13.8% (Table 2) and falls in the limit of acceptability. Typically, in soybean yield trials of this type, CV's that exceed 20% indicate the variability of the data is too high for valid conclusions.

Table 1. The main effects of variety response and plant growth regulator seed treatment on soybean production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Yield (bu/A)
TABLE OF R MEANS			
Replicate 1			37.2
Replicate 2			44.0
Replicate 3			42.5
Replicate 4			44.2
Replicate 5			44.2
Replicate 6			43.8
Replicate 7			44.8
Replicate 8			39.2
TABLE OF A MEANS			
Deltapine 105			38.9a
Pioneer 9592			39.3a
Hyperformer 574			44.9b
Hartz 6200			46.9b
TABLE OF B MEANS			
Control			41.0a
Chitosan			44.0b

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 2. The simple effects of variety response and plant growth regulator seed treatment on soybean production. Rice Research Station, Crowley, LA. 1995.

Treatment Name	Fm Ds Rate	Grow Stg	Yield (bu/A)
Deltapine 105 Control			37.7c
Deltapine 105 Chitosan			40.2bc
Pioneer 9592 Control			36.7c
Pioneer 9592 Chitosan			41.8abc
Hyperformer 574 Control			43.2abc
Hyperformer 574 Chitosan			46.6ab
Hartz 6200 Control			46.5ab
Hartz 6200 Chitosan			47.3a
LSD (.05) =			5.9
Standard Dev.=			5.8725
CV =			13.82

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

SOYBEAN WEED CONTROL RESEARCH

R.J. Habetz and J.L. Griffin

INTRODUCTION

With much interest in Roundup Ready soybeans and its impact on weed control, much emphasis in research was directed on major weeds in the rice producing area using Roundup and other weed control herbicides.

A study applying Roundup at different growth stages of red rice using different rates gave data of major importance (Table 1). As far as red rice leaf stage is concerned, applying Roundup at the 9-leaf stage gave excellent control when using as low as 1.0 pt/A, and 2.0 pt/A applied at the 3-leaf stage gave good control. Assure II, an excellent red rice herbicide, gave good control at the 9-leaf stage but only gave fair control at the 3-leaf stage. There was little difference in yield between the 3- and 9-leaf stage using 1.0, 1.5, or 2.0 pt/A. Barnyardgrass and redweed were best controlled at the 3- to 7-inch and 3- to 5-inch stages of growth, respectively.

In a red rice preemergence test, the preplant incorporated treatments seerned to give better control then the preemergence plots (Table 2). A little better control was found when Scepter was added to Dual II.

A post overtop study using Fusion, Select, and Assure II all gave poor control of red rice (Table 3). In this study, Classic and Reflex gave excellent control of jointvetch when added to the grass herbicides. Scepter, Storm, Reflex, and Classic all gave excellent control of eclipta.

In an off-station test, Roundup, when applied early, gave an excellent control of Mexicanweed (texasweed), a major weed problem in soybeans (Table 4). The same treatment of Roundup applied at a later growth stage did not give as good of control. Scepter, Scepter + Classic, and Cobra + Classic also gave good to excellent control.

Specific information for each experiment is individually presented followed by a table of results.

Weed control ratings for all experiments are based on a scale of 0 to 100% where 0 equals no control and 100 equals complete control.

Experiment: Weed Control in Roundup Ready Soybeans

Location: Rice Research Station (South Unit)

Soil Type: Crowley silt loam

Variety: Roundup Ready Hartz 5088

Row Spacing: 30-inch

Fertilizer: 0-60-60

Plot Size: 2 rows x 20 ft

Planting Date: May 25

Harvest Date: Oct 23

Treated: POT 1, June 12; POT 2, June 26; POT 3, July 10

Weed Size: POT 1: red rice, 2-3 leaf; redweed, 1 in; eclipta, 1 in
POT 2: red rice, 4-7 leaf; redweed, 1-2 in; eclipta, 1-2 in, barnyardgrass 2-5 in
POT 3: red rice, 9-12 leaf; redweed, 3-5 in; eclipta, 3-5 in; barnyardgrass, 3-7 in

Sprayer: CO_2-pressurized backpack sprayer, 15 GPA

Rated: POT 1, June 26; POT 2, July 13; POT 3, July 26

Experimental Design: Randomized complete block with three replications

KEY: BYG - Barnyardgrass
JV - Jointvetch
MW - Mexicanweed
RR - Red rice
RW - Redweed

Table 1. Controlling weeds in Roundup Ready soybeans. Rice Research Station South Unit, Crowley, LA. 1995.

Treatment	Rate of application	Growth stage	Weed control (7/26/95) RR	BYG	RW	EC	Yield
			(%)				(bu/A)
Roundup	1 pt/A	POST 1	68.3 bc	76.7 bc	71.7 ab	85.0 ab	22.6
Roundup	1 pt/A	POST 2	65.0 bc	78.3 bc	90.0 a	93.3 a	16.9
Roundup	1 pt/A	POST 3	92.7 a	95.0 a	76.7 ab	88.3 ab	18.6
Roundup	1.5 pt/A	POST 1	66.7 bc	75.0 c	76.7 ab	91.7 ab	21.3
Roundup	1.5 pt/A	POST 2	68.3 bc	76.7 bc	83.3 ab	86.7 ab	15.2
Roundup	1.5 pt/A	POST 3	95.0 a	95.0 a	93.3 a	63.3 b	20.6
Roundup	2 pt/A	POST 1	75.0 b	83.3 abc	65.0 b	86.7 ab	23.1
Roundup	2 pt/A	POST 2	66.7 bc	83.3 abc	90.0 a	91.7 ab	20.0
Roundup	2 pt/A	POST 3	95.0 a	95.0 a	95.0 a	95.0 a	22.2
Assure II	9 oz/A	POST 1	60.0 c	91.7 ab	0.0 c	0.0 c	18.5
Assure II	9 oz/A	POST 2	45.0 d	85.0 abc	0.0 c	0.0 c	17.2
Assure II	9 oz/A	POST 3	76.7 b	81.7 abc	0.0 c	0.0 c	16.6
Select	4 oz/A	Boot stage					12.8
Roundup	.025 pt/A	Boot stage					14.9
Roundup	.5 pt/A	Boot stage					10.2
Roundup	1 pt/A	Boot stage					14.1
Weedy check			0.0 e	0.0 d	0.0 c	0.0 c	13.2
LSD (.05)			12.7	13.1	21.5	26.1	5.6
CV (%)			11.17	9.94	22.37	25.77	19.13

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Experiment: Red Rice Preemergence Test

Location: Rice Research Station South Unit

Soil Type: Crowley silt loam

Variety: Hutcheson

Row Spacing: 30-inch

Fertilizer: None

Plot Size: 2 rows x 25 ft

Planting Date: May 25, replanted June 5

Treated: May 25

Sprayer: CO_2-pressurized backpack sprayer, 15 GPA

Rated: June 26, July 26

Experimental Design: Randomized complete block with four replications

Table 2. Controlling red rice with preemergence herbicides. Rice Research Station South Unit, Crowley, LA. 1995.

Treatment	Rate of application	Time of application	Red rice 6/26/95	Red rice 7/26/95
			---------(%)---------	
Detail	2 pt/A	PPI	85.0 ab	60.8 d-h
Dual II Scepter	2.0 lb ai/A 0.125 lb ai/A	PPI PPI	92.5 a	78.8 a
Dual II	2.5 lb ai/A	PPI	90.8 a	77.5 ab
Dual II Treflan	1.5 lb ai/A 0.75 lb ai/A	PPI PPI	87.3 ab	64.0 c-g
Detail	2 pt/A	PRE	74.0 cd	46.3 i
Dual II Scepter	2.0 lb ai/A 0.125 lb ai/A	PRE PRE	85.0 ab	68.8 a-d
Dual II	2.5 lb ai/A	PRE	84.0 ab	68.3 a-e
Dual Sencor	2.0 lb ai/A 0.375 lb ai/A	PRE PRE	85.0 ab	65.0 b-f
Freedom	4.5 qt/A	PPI	86.8 ab	53.8 f-i
Frontier	20 oz/A	PPI	87.5 ab	52.0 f-i
Frontier Frontier	10 oz/A 10 oz/A	PPI PRE	83.8 ab	50.8 ghi
Detail Frontier	1.5 pt/A 4 oz/A	PRE PPI	84.0 ab	55.0 e-i
Detail Frontier	1.5 pt/A 8 oz/A	PRE PPI	86.5 ab	55.0 e-i
Freedom Scepter	3 qt/A 0.092 lb ai/A	PPI PPI	80.8 bc	50.0 hi
Dual II Scepter	2.0 lb ai/A 0.092 lb ai/A	PRE PPI	88.5 ab	75.0 abc
Squadron	3 pt/A	PPI	71.3 d	46.3 i
Nontreated			0.0 e	0.0 j
LSD (.05) =			7.4	12.0
Standard Dev.=			5.18547	8.43131
CV (%) =			6.52	14.82

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Experiment: Post Overtop Herbicide Test

Location: Rice Research Station (South Unit)

Soil Type: Crowley silt loam

Variety: Hutcheson

Row Spacing: 30-inch

Fertilizer: None

Plot Size: 2 rows x 25 ft

Planting Date: May 25; replanted, June 5

Treated: June 12

Weed Size: Red rice, 2-3 leaf; eclipta, 1-2 in; jointvetch, 2-3 in

Sprayer: CO_2-pressurized backpack sprayer, 15 GPA

Rated: June 26

Experimental Design: Randomized complete block with four replications

Table 3. Controlling red rice and broadleaf weeds with post overtop herbicides. Rice Research Station South Unit, Crowley, LA. 1995.

Treatment	Rate of application	Weed control (06/26/95) RR	EC	JV
		----------(%)----------		
Fusion Agridex	10 oz/A 1% v/v	26.3 bc	0.0 c	0.0 c
Fusion Reflex Agridex	10 oz/A 0.38 lb ai/A 1% v/v	25.0 bc	93.8 b	87.5 a
Fusion Storm Agridex	10 oz/A 0.75 lb ai/A 1% v/v	26.3 bc	97.5 ab	70.0 b
Fusion Classic Agridex	10 oz/A 0.008 lb ai/A 1% v/v	20.0 cd	98.8 a	93.8 a
Fusion Scepter Agridex	10 oz/A 0.125 lb ai/A 1% v/v	30.0 b	96.3 ab	72.5 b
Assure II Agridex	9 oz/A 1% v/v	51.3 a	0.0 c	0.0 c
Assure II Classic Agridex	9 oz/A 0.008 lb ai/A 1% v/v	13.8 d	98.8 a	95.0 a
Select Agridex	0.125 lb ai/A 1% v/v	27.5 bc	0.0 c	0.0 c
Nontreated		0.0 e	0.0 c	0.0 c
LSD (.05)		8.3	4.0	12.3
CV (%)		23.37	5.05	18.15

Means followed by same letter do not significantly differ (P=.05, Duncan's multiple range test).

Experiment: Post Overtop Mexicanweed (birdeye) Test

Location: Bradley Duhon Farm, Lafayette, LA

Row Spacing: Drill, 7-inch

Plot Size: 5 x 20 ft

Treated: June 23: mexicanweed, 1-2 in; July 5: mexicanweed, 4-5 in

Rated: July 10; July 20

Sprayer: CO_2-pressurized backpack sprayer, 15 GPA

Experimental Design: Randomized complete block with three replications

Table 4. Comparison of post overtop broadleaf herbicides for mexicanweed control. Bradley Duhon Farm, Lafayette, LA. 1995.

Treatment	Rate of application	Growth stage	Weed control (7/10/95) MW	Injury
		-(in)-	---------(%)---------	
Storm	1.5 pt/A	2	25.0	5.7
Blazer	1.5 pt/A	2	35.0	10.0
Basagran	2.0 pt/A	2	26.7	5.0
Reflex	1.5 pt/A	2	56.7	5.0
Scepter OT	1.0 pt/A	2	73.3	6.7
Scepter	.66 pt/A	2	86.7	10.0
Classic	.5 oz/A	2	66.7	20.0
Cobra	12.8 pt/A	2	58.3	10.0
Cobra + Classic	9.6 pt/A + .5 oz/A	2	85.0	11.7
Roundup	1.0 pt/A	2	93.3	83.3
Roundup	1.5 pt/A	2	95.0	88.3
Roundup	2.0 pt/A	2	98.0	93.3
Classic	1.25 oz/A	2	93.3	36.7
Classic + Scepter	.5 oz/A + .5 pt/A	2	91.7	6.7
Scepter	.66 pt/A	4	80.0	6.7[1]
Roundup	1.0 pt/A	4	73.3	63.3[1]
Roundup	1.5 pt/A	4	71.7	93.3[1]
Roundup	2.0 pt/A	4	80.0	86.7[1]
Check	---	-	----	----
LSD (.05)			20.3	13.3
CV (%)			17.91	23.62

[1] Rated July 20.

INTERNATIONAL RICE TRAINING PROGRAM

Joseph A. Musick

The Rice Research Station has cooperated for a number of years with the Foreign Training Division of the International Agricultural Development Service by providing an information training program for international leaders, government officials, farmers, students, and others interested in the production, processing, and marketing of rice.

Data regarding the classification of visitors according to countries are presented in Table 1. A total of 94 participants, representing 14 countries, were guests at the Rice Research Station in 1995. This was an increase of 14 participants compared with 1994. Australia provided the largest number of visitors (47) this year.

Table 1. Number of participants by country. Rice Research Station, Crowley, LA. 1995.

Country	Number of participants
Argentina	12
Australia	47
Brazil	3
China	7
Ecuador	2
Germany	2
Japan	3
Malaysia	3
Nicaragua	6
Portugal	2
Senegal	6
Uruguay	1
Vietnam	1
West Indies	4
TOTAL	94

Table 2 presents information regarding the number of participants according to sponsoring organizations. The largest number of visitors was not sponsored (47).

Subject matter of interest to the participants varied from general rice production practices to specific interests, such as plant breeding, water management, processing, marketing, and control of rice diseases, insects, and weeds. There was also interest in crawfish, soybeans, biotechnology, rice genetics, milling, and grading.

Table 2. Number of visitors by sponsoring organizations. Rice Research Station, Crowley, LA. 1995.

Sponsoring organization	Number sponsored
AACRGA	13
Governments (Foreign)	16
LSU Agricultural Center	3
Private Companies	11
Self	47
USDA	4
TOTAL	94

FORAGE CROPS BIOTECHNOLOGY RESEARCH

S.S. Croughan

Cooperators: G.J. Cuomo, J.L. Hafley, and B.C. Venuto

Dallisgrass germplasm is being produced through tissue culture to provide new and unique genotypes for cultivar improvement. Immature inflorescences are used to produce somaclonal variants from different ecotypes of dallisgrass. Somaclones are grown in the greenhouse and split when large enough, to make duplicate sets for field testing at two locations. A cooperative research project is underway in which approximately 1000 new somaclones are developed and field tested each year. A number of parameters are used to identify potentially improved plants. Seed is collected from the selected somaclones and used in seed germination tests to identify lines with improved seed viability. Seedlings that germinate are used in replicated field tests the following year.

Dallisgrass somaclonal variants planted in 1994 at the Louisiana Agricultural Experiment Station's (LAES) Central Research Station in Baton Rouge, LA, and at the Iberia Research Station in Jeanerette, LA, were evaluated for a number of characteristics during 1995. At the Iberia Research Station, plants that regrew in the spring were grazed by cattle during the month of August. Plants were rated for amount of grazing on September 7 and rated for regrowth on October 6. Grazing was scored on a scale of 0 to 10, with 0 = no grazing and 10 = completely grazed. Regrowth was scored on a scale of 0 to 5, with 0 = poor and 5 = excellent. See Table 1 for results of the evaluation of somaclones planted in 1994. Data are the averages of the 1994 and 1995 ratings taken at the Iberia Research Station.

At the Central Research Station, somaclones planted in 1994 were harvested twice during the 1995 growing season, percentage dry matter was determined, and samples were sent to the LAES Forage Quality Laboratory for nutrient analysis. Data are presented in the Louisiana State University Agronomy Department annual report.

Seed collected from somaclones when they were in the greenhouse and seed harvested from selected somaclones at the Central Research Station were used in seed germination tests. Seed was weighed and equal amounts put in glass petri dishes. Approximately 250 seeds, weighing 0.16 grams, was used in each dish with five replications per somaclone. The petri dishes contained filter paper moisten with a solution of 0.3% potassium nitrate and fungicide. Distilled water was added as needed to maintain the germinating seeds for approximately 28 days. The germinating seeds were incubated at 29▪C, 12 hours light and 21▪C, 12 hours dark. As seeds germinated, the seedlings were removed and grown in Oasis® wedge growth media in a incubator at 27▪C, 16:8 L:D photoperiod until large enough to be transplanted into 4-inch pots. Seeds that did not germinate were checked for the presence of an endosperm. Germination rates varied between 0 and 30 %. Overall, seed germination rates were low due to the large amount of immature seeds.

Selected somaclonal variants were also identified for use as explant material for the production of new somaclonal variants. Immature inflorescences were harvested during the growing season, surfaced sterilized, cut into 2 to 4 mm sections and plated onto callus induction medium. Callus was transferred to differentiation media for plantlet formation. Regenerated plants will be split and transferred to the two field areas in the spring of 1996. See Table 2 for regeneration data to date.

Approximately 750 new somaclones were planted at the two research stations during the spring of 1995 for field evaluations. Plants at the Iberia Research Station were grazed during August and evaluated for amount of grazing and regrowth in September and October. Plants surviving the winter of 1995/1996 at the Central Research Station will undergo evaluations during 1996.

Table 1. Averages (± standard error) of 1994 and 1995 grazing and regrowth evaluations of somaclones planted at the Iberia Research Station, Jeanerette, LA, in 1994.

ID#	grazing[1]	regrowth[2]	ID#	grazing[1]	regrowth[2]
162	10.0 ± 0	0.0 ± 0	122	9.5 ± 0.5	0.5 ± 0.5
171	10.0 ± 0	0.0 ± 0	125	9.5 ± 0.5	0.0 ± 0
182	10.0 ± 0	0.0 ± 0	126	9.5 ± 0.5	1.0 ± 1.0
191	10.0 ± 0	0.5 ± 0.5	137	9.5 ± 0.5	0.0 ± 0
221	10.0 ± 0	0.0 ± 0	138	9.5 ± 0.5	0.0 ± 0
222	10.0 ± 0	0.0 ± 0	143	9.5 ± 0.5	2.0 ± 0
229	10.0 ± 0	0.0 ± 0	147	9.5 ± 0.5	0.5 ± 0.5
263	10.0 ± 0	0.0 ± 0	148	9.5 ± 0.5	0.0 ± 0
284	10.0 ± 0	0.0 ± 0	152	9.5 ± 0.5	0.0 ± 0
286	10.0 ± 0	0.0 ± 0	176	9.5 ± 0.5	0.0 ± 0
289	10.0 ± 0	0.0 ± 0	188	9.5 ± 0.5	1.5 ± 1.5
294	10.0 ± 0	2.0 ± 2.0	213	9.5 ± 0.5	0.0 ± 0
317	10.0 ± 0	1.0 ± 1.0	244	9.5 ± 0.5	3.0 ± 0
324	10.0 ± 0	0.0 ± 0	246	9.5 ± 0.5	0.5 ± 0.5
339	10.0 ± 0	0.0 ± 0	428	9.5 ± 0.5	1.0 ± 0
378	10.0 ± 0	0.0 ± 0	131	9.5 ± 0.5	1.0 ± 1.0
388	10.0 ± 0	0.0 ± 0	116	9.0 ± 1.0	1.5 ± 1.5
422	10.0 ± 0	0.0 ± 0	119	9.0 ± 1.0	2.0 ± 1.0
429	10.0 ± 0	1.0 ± 1.0	123	9.0 ± 1.0	0.0 ± 0
103	9.5 ± 0.5	1.0 ± 1.0	128	9.0 ± 1.0	2.0 ± 1.0
110	9.5 ± 0.5	0.5 ± 0.5	139	9.0 ± 1.0	1.0 ± 1.0
112	9.5 ± 0.5	0.5 ± 0.5	141	9.0 ± 1.0	0.0 ± 0
115	9.5 ± 0.5	1.5 ± 1.5	145	9.0 ± 1.0	0.0 ± 0
118	9.5 ± 0.5	1.5 ± 1.5	156	9.0 ± 1.0	0.0 ± 0
121	9.5 ± 0.5	1.5 ± 1.5	175	9.0 ± 1.0	1.0 ± 1.0

ID#	grazing[1]	regrowth[2]
201	9.0 ± 1.0	2.5 ± 1.5
204	9.0 ± 1.0	1.0 ± 1.0
231	9.0 ± 1.0	1.0 ± 1.0
243	9.0 ± 1.0	3.0 ± 0
270	9.0 ± 1.0	1.5 ± 1.5
279	9.0 ± 1.0	3.5 ± 0.5
304	9.0 ± 1.0	2.0 ± 2.0
331	9.0 ± 1.0	2.0 ± 1.0
337	9.0 ± 1.0	2.5 ± 0.5
390	9.0 ± 1.0	2.5 ± 0.5
406	9.0 ± 1.0	1.0 ± 1.0
424	9.0 ± 1.0	2.0 ± 1.0
100	9.0 ± 0	1.5 ± 0.5
117	9.0 ± 0	0.5 ± 0.5
149	9.0 ± 0	2.5 ± 0.5
186	8.5 ± 1.5	4.0 ± 1.0
223	8.5 ± 1.5	0.5 ± 0.5
236	8.5 ± 1.5	1.0 ± 1.0
252	8.5 ± 1.5	2.0 ± 1.0
269	8.5 ± 1.5	1.5 ± 1.5
285	8.5 ± 1.5	1.0 ± 1.0
293	8.5 ± 1.5	0.0 ± 0
299	8.5 ± 1.5	2.5 ± 0.5
302	8.5 ± 1.5	3.0 ± 1.0
319	8.5 ± 1.5	1.0 ± 1.0
349	8.5 ± 1.5	1.5 ± 1.5
352	8.5 ± 1.5	1.5 ± 0.5
359	8.5 ± 1.5	2.5 ± 1.5
397	8.5 ± 1.5	2.0 ± 2.0
399	8.5 ± 1.5	0.0 ± 0
94	8.5 ± 0.5	1.5 ± 0.5
96	8.5 ± 0.5	2.0 ± 1.0
150	8.5 ± 0.5	3.5 ± 0.5
151	8.5 ± 0.5	1.5 ± 0.5
153	8.5 ± 0.5	1.0 ± 1.0
209	8.5 ± 0.5	3.0 ± 0
242	8.5 ± 0.5	2.0 ± 1.0
251	8.5 ± 0.5	2.5 ± 0.5
295	8.5 ± 0.5	3.0 ± 1.0
130	8.0 ± 1.0	3.0 ± 0
142	8.0 ± 1.0	2.0 ± 0
146	8.0 ± 1.0	3.0 ± 0
155	8.0 ± 1.0	3.0 ± 1.0
166	8.0 ± 1.0	3.0 ± 0
173	8.0 ± 1.0	2.5 ± 0.5
207	8.0 ± 1.0	3.0 ± 0
292	8.0 ± 1.0	2.0 ± 1.0
298	8.0 ± 1.0	2.5 ± 1.5
334	8.0 ± 1.0	2.0 ± 0
409	8.0 ± 1.0	3.0 ± 1.0
95	8.0 ± 0	3.0 ± 0
97	8.0 ± 0	2.0 ± 1.0
99	8.0 ± 0	3.5 ± 0.5
106	8.0 ± 0	3.0 ± 0
120	8.0 ± 0	3.5 ± 0.5
132	8.0 ± 0	4.0 ± 0
134	8.0 ± 0	2.0 ± 1.0
144	8.0 ± 0	2.0 ± 1.0
157	8.0 ± 0	2.5 ± 0.5
165	8.0 ± 0	3.5 ± 0.5
217	8.0 ± 0	2.5 ± 0.5
248	8.0 ± 0	4.5 ± 0.5
250	8.0 ± 0	3.5 ± 0.5
287	8.0 ± 0	3.0 ± 1.0
340	8.0 ± 0	3.0 ± 1.0
348	8.0 ± 0	3.0 ± 0
376	8.0 ± 0	2.5 ± 1.5
426	8.0 ± 0	2.0 ± 0
301	8.0 ± 0	3.0 ± 1.0
211	7.5 ± 2.5	2.0 ± 2.0
104	7.5 ± 1.5	4.0 ± 1.0
114	7.5 ± 1.5	2.5 ± 0.5
135	7.5 ± 1.5	2.5 ± 0.5
178	7.5 ± 1.5	3.0 ± 1.0
105	7.5 ± 0.5	2.0 ± 0
107	7.5 ± 0.5	4.5 ± 0.5
189	7.5 ± 0.5	2.5 ± 0.5
199	7.5 ± 0.5	3.5 ± 0.5
205	7.5 ± 0.5	3.5 ± 1.5
208	7.5 ± 0.5	4.0 ± 1.0
219	7.5 ± 0.5	4.0 ± 1.0
254	7.5 ± 0.5	3.5 ± 0.5
262	7.5 ± 0.5	3.5 ± 1.5
271	7.5 ± 0.5	3.5 ± 1.5
272	7.5 ± 0.5	4.0 ± 0
351	7.5 ± 0.5	3.0 ± 1.0

ID#	grazing[1]	regrowth[2]
423	7.5 ± 0.5	3.0 ± 1.0
430	7.5 ± 0.5	3.0 ± 0
432	7.5 ± 0.5	3.0 ± 0
98	7.0 ± 2.0	3.5 ± 0.5
154	7.0 ± 2.0	4.0 ± 1.0
177	7.0 ± 2.0	3.5 ± 0.5
93	7.0 ± 1.0	3.0 ± 1.0
111	7.0 ± 1.0	2.5 ± 1.5
133	7.0 ± 1.0	4.0 ± 0
241	7.0 ± 1.0	4.0 ± 1.0
245	7.0 ± 1.0	3.5 ± 1.5
261	7.0 ± 1.0	4.0 ± 1.0
296	7.0 ± 1.0	3.0 ± 0
160	7.0 ± 0	4.5 ± 0.5
195	7.0 ± 0	4.0 ± 1.0
322	7.0 ± 0	2.5 ± 2.5
421	7.0 ± 0	3.5 ± 0.5
136	6.5 ± 2.5	2.0 ± 1.0
92	6.5 ± 1.5	4.0 ± 1.0
101	6.5 ± 1.5	4.0 ± 1.0
109	6.5 ± 1.5	4.0 ± 1.0
140	6.5 ± 1.5	2.0 ± 2.0
163	6.5 ± 1.5	4.0 ± 1.0
169	6.5 ± 1.5	3.0 ± 1.0
190	6.5 ± 1.5	3.5 ± 1.5
198	6.5 ± 1.5	4.0 ± 1.0
202	6.5 ± 1.5	4.0 ± 1.0
206	6.5 ± 1.5	4.0 ± 1.0
328	6.5 ± 1.5	4.0 ± 1.0
108	6.0 ± 3.0	4.0 ± 1.0
200	6.0 ± 2.0	2.5 ± 2.5
226	6.0 ± 2.0	3.0 ± 2.0
316	6.0 ± 2.0	4.0 ± 1.0
396	6.0 ± 2.0	3.0 ± 2.0
303	6.0 ± 1.0	3.0 ± 1.0
336	6.0 ± 1.0	3.5 ± 1.5
193	5.5 ± 1.5	4.0 ± 1.0
227	5.5 ± 1.5	3.5 ± 0.5
90	5.0 ± 3.0	4.5 ± 0.5
253	5.0 ± 3.0	2.5 ± 2.5
305	5.0 ± 2.0	3.5 ± 0.5
179	4.5 ± 2.5	3.5 ± 0.5

[1] Grazing scored on a scale of 0 to 10, with 0 = no grazing and 10 = completely grazed.
[2] Regrowth scored on a scale of 0 to 5, with 0 = poor and 5 = excellent.

Table 2. Number of inflorescences cultured and number of dallisgrass plants regenerated to date.

ID code	genotype[1]	parent[2]	# inflorescence plated	# plants regenerated
A	G396	HEX460	23	40
B	G102	COMMON	19	3
C	COMMON	....	4	6
D	G109	HEX426	13	247
E	G223	COMMON	19	0
F	G376	HEX460	20	67

ID code	*genotype*[1]	*parent*[2]	*# inflorescence plated*	*# plants regenerated*
G	G287	HEX426	18	219
H	HEX 460	....	6	36
I	HEX 426	....	5	0
J	G110	HEX426	5	3
K	G117	HEX426	9	119
L	G165	HEX460	9	24
M	G250	HEX426	4	0
N	G295	HEX460	9	39
O	G324	HEX460	6	8
P	G302	COMMON	12	48
Q	G160	HEX426	15	13
R	G263	HEX426	9	0
S	G156	HEX426	10	46
T	HEX426	....	6	4
U	G90	COMMON	7	0
V	YELLOW	....	8	5
W	G147	HEX426	11	0
X	HEX460	....	16	2
Y	G245	COMMON	10	2
Z	G248	HEX426	10	0
AA	G93	COMMON	3	0
BB	HEX544	....	4	0
DD	G349	HEX460	3	0
EE	G378	HEX460	10	0
FF	G340	HEX460	10	0
GG	G351	HEX460	4	0
HH	G261	HEX460	2	0
II	G271	HEX460	2	0
JJ	G252	HEX426	2	0

[1] Genotype is the somaclone (G#) or ecotype (common, yellow, or HEX) that the inflorescences were collected from. 'Yellow' is a yellow-anther ecotype.
[2] Parent is the ecotype that the somaclone was derived from.

SOYBEAN BIOTECHNOLOGY RESEARCH[1]

S.S. Croughan

Cooperators: D.J. Boethel, R.J. Habetz, B.G. Harville, S. Yao, and G. Zhao

Somaclonal variants continued to be tested for identification of new and useful germplasm. Fifty-one soybean somaclones, grown at the Louisiana Agricultural Experiment Station's St. Gabriel Research Station, were rated for the amount of defoliation due to natural infestation of velvetbean caterpillar. At the R5 stage of development, leaves were removed from the somaclones and fed to soybean loopers in laboratory tests to determine the level of resistance. See following report.

Approximately 90 somaclones were planted at the Central Research Station in Baton Rouge to be evaluated for levels of resistance to naturally occurring infestation of aerial blight. Insufficient disease symptoms occurred for evaluation. Seed was collected for future testing in 1996.

Research was also continued on the development of a doubled haploid system for soybeans. Microscopic examination confirmed that callus was derived from pollen, and not anther tissue. Embryo formation from callus occurs, however, the rate of conversion into plants is still low.

Evaluation of soybean somaclones for resistance to insect pests

R. Marcaremhar, M. Boyd, D. Boethel, and S. Croughan

Laboratory: Methods for screening somaclone lines in the laboratory followed those used by Rufener et al. 1987. Two soybean leaflets were collected from somaclone plots at St. Gabriel on September 12 and 20, and placed in filter paper-lined petri dishes labeled with plot numbers. Filter paper was kept moist throughout the feeding period. Ten neonate soybean looper (*Pseudoplusia incudens*) larvae were placed, with a moistened camel hair brush, on leaflets in petri dishes. Dishes were placed in a rearing room and incubated at 24 ± 2▪C, 75% RH, and 14:10 L:D photoperiod. After 7 days, larvae were checked for mortality and development. A point value was assigned to each larva based on its condition or instar: dead larvae = 0; first and second instars = 1; third and fourth instars = 2. The cumulative value for each petri dish was then calculated, with a maximum value of 30 possible for each petri dish. Cumulative scores for each test date are listed in Table 1.

Field: Visual observations of the level of somaclone resistance to a heavy infestation of naturally occurring velvetbean caterpillar (*Antacarsia gemmatalis*) were taken. Plots were rated according to the amount of defoliation they received. Rating

[1] This research is supported in part by funds provided by Louisiana producers through the Louisiana Soybean and Grain Research and Promotion Board, and a grant from Pioneer Hi-Bred International, Inc.

categories ranged from susceptible (S) to moderate (M) to resistant (R). Rating scores for each somaclone plot are listed in Table 1.

While differences were observed in levels of resistance, no somaclones had significantly higher levels of resistance than current cultivars.

Table 1: Cumulative scores for laboratory-tested somaclone resistance to soybean looper and field-tested somaclone resistance to velvetbean caterpillar.

Somaclone ID #	Field rating velvetbean caterpillar	1st Lab test soybean looper	2nd Lab test soybean looper
286	M	9	
290	M	6	
292	S	7	
294	M	2	
299	S	6	
320	S	5	
326	M	6	
328	S	10	
336	S	5	
337	S	5	
339	S	8	
349	S	2	
368	S	5	
371	M	7	
374	S	8	
376	S	2	
378	S	8	
385	S	5	
394	M	6	
400	S	8	
408	M	5	
415	S	5	
419	S	8	
421	S	9	
427	S	7	8
439	S	7	
443	S	7	
472	S	4	
585	S	8	
744	S	2	

Continued.....

Table 1. Continued.

Somaclone ID #	Field rating velvetbean caterpillar	1st Lab test soybean looper	2nd Lab test soybean looper
761	M	13	
803	S	1	8.5
804	M	5	
805	M	5	
815	R	11	
817	M	11	
818	M	3	
820	R	1	8.5
821	M	7	8
822	M	1	10
825	S	9	5
831	M	1	8
848	M	7	
862	S	1	
863	S	5	
868	R	8	
847	S	6	
879	S	6	
901	M	5	
923	M	7	6
1008	S	2	

AQUACULTURE RESEARCH

Annual Summary of Environmental Conditions and Crawfish Production

W.R. McClain, K.R. Taylor, and J. J. Sonnier

Following (Table 1) is the average weekly data for environmental conditions and crawfish catch, 1994-95 season, crawfish research project, Rice Research Station, Crowley, LA. The production summary is composed of averages across all experimental plots and management conditions. Research was funded in part by the USDA Special Grants - Aquaculture program.

Pond History: Ponds were out of production one season prior to the 1994/95 season and were planted with rice in early spring of 1994. A relay/re-harvest intercropping study was conducted prior to the rice harvest. The stubble was managed for regrowth, and ponds were flooded and managed as typical fall/winter/spring production ponds.

Soil Type: Crowley silt loam

Water Source: Well water that traveled through 3600 feet of earthen canals prior to its entrance to crawfish ponds

Pond Area: Nineteen 0.5-acre ponds

Forage Crops: Rice ratoon crop ('Orion')

Permanent Flood Date: 5 Oct 1994

Crawfish Harvest: 1 Mar - 31 May 1995, 26 traps/A, total of 50 trap days (1,300 total trap sets/A)

Crawfish Grades: All crawfish harvested were subjected to a grader (passive, water type) and sorted into four size-grade categories as follows: "Jumbo" - ≤ 15 count/lb, "Large" - 16-20 count/lb, "Medium" - 21-28 count/lb, and "Peeler" - > 28 count/lb

Trap Type: 3-funnel pyramid

Bait Used: Manufactured bait (Purina, Purina Mills, Inc., St. Louis, MO)

Table 1. Annual summary of average weekly environmental conditions and crawfish production. Rice Research Station, Crowley, LA. 1995.

Weeks	Soil Temp.[1] Min.	Soil Temp.[1] Max.	Air Temp. Min.	Air Temp. Max.	Water Temp. Min.	Water Temp. Max.	Average D.O. (mg/l)	Forage Biomass (g/m^2)	Water Pumped (gal/A)	Total Rainfall (inches)	Large Crawfish Count (#/trap)	Juvenile Crawfish Count (#/dip)	Crawfish Harvest (lb/A)	Crawfish Size (cnt/lb)	Total Trapsets (#/A)
	deg. F														
Jun 1-7	76.1	86.6	72.3	85.1						0.60					
Jun 8-14	79.0	91.9	72.9	87.9						4.10					
Jun 15-21	80.9	94.7	73.6	90.1											
Jun 22-28	79.6	94.4	74.1	88.3						1.35					
Jun 29-Jul 5	82.1	97.0	74.7	90.9											
Jul 6-12	79.6	88.4	73.7	86.0						2.30					
Jul 13-19	78.4	89.1	73.6	88.7						2.00					
Jul 20-26	79.3	92.7	73.9	90.0						1.85					
Jul 27-Aug 2	77.0	90.0	69.9	86.4						0.10					
Aug 3-9	77.9	91.3	71.1	87.6						1.80					
Aug 10-16	78.4	91.9	72.3	90.1						0.45					
Aug 17-23	80.0	94.7	72.1	89.3						0.60					
Aug 24-30	79.7	96.0	72.9	90.9						0.35					
Aug 31-Sep 6	79.1	92.6	73.3	89.1						2.30					
Sep 7-13	76.7	89.6	71.6	87.3						3.80					
Sep 14-20	75.3	88.1	68.4	85.4						0.30					
Sep 21-27	70.7	87.3	57.6	82.7					76,098						
Sep 28-Oct 4	73.4	92.5	62.8	90.8					56,098	0.10					
Oct 5-11	68.6	82.6	60.0	79.4				748.93	185,854	0.80					
Oct 12-18	64.9	69.9	60.3	70.6	69.8	73.0	1.8	747.34	94,390	0.30		0.1			
Oct 19-25	70.3	82.4	66.1	84.0	69.6	77.2	0.9		193,171	2.15	0.2	0.1			
Oct 26-Nov 1	60.4	75.6	51.0	75.3	58.1	70.7	1.2		153,659		0.3	0.1			
Nov 2-8	64.4	79.7	58.3	79.6	61.9	72.3	1.0		147,341		0.2	0.2			
Nov 9-15	64.0	74.4	56.3	74.3	64.0	71.2	1.3	769.71	187,317	0.10	0.3	0.3			
Nov 16-22	63.3	75.0	54.7	74.9	61.9	70.3	1.3		86,098		0.3	0.3			
Nov 23-29	59.4	67.6	46.3	70.7	54.8	67.7	2.3		51,463	1.20	0.6	0.3			
Nov 30-Dec 6	54.1	63.7	47.7	65.4	50.0	62.6	2.5		30,732	3.30	0.8	0.2			

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.	Average D.O. (mg/l)	Forage Biomass (g/m^2)	Water Pumped (gal/A)	Total Rainfall (inches)	Large Crawfish Count (#/trap)	Juvenile Crawfish Count (#/dip)	Crawfish Harvest (lb/A)	Crawfish Size (cnt/lb)	Total Trapsets (#/A)
	deg. F														
Dec 7-13	56.3	69.4	48.3	67.1	53.1	66.2	2.7		61,463		1.6	0.2			
Dec 14-20	51.7	62.1	47.9	64.9	50.4	59.0	3.1	679.88	29,024	1.95	0.7	0.1			
Dec 21-27	48.5	60.7	39.0	62.5	51.8	59.5	2.2		97,024		0.9	0.2			
Dec 28-Jan 3	51.4	56.3	44.7	58.1	42.8	59.0	6.1			2.00	1.1	0.2			
Jan 4-10	45.0	55.7	37.6	60.0	43.7	53.1	5.9	586.72	37,317	0.30	1.3	0.2			
Jan 11-17	54.1	63.4	49.4	67.1	54.1	64.9	2.8			1.60	3.0	0.1			
Jan 18-24	48.1	61.6	39.0	63.7	46.6	60.8	4.7		24,390	1.15	2.6	0.1			
Jan 25-31	50.9	60.7	44.7	62.6	47.3	57.9	4.6			2.30	1.5	0.2			
Feb 1-7	49.1	62.7	41.1	68.0	46.9	60.1	3.2		37,561		1.5	0.2			
Feb 8-14	46.6	57.4	39.0	59.3	41.5	55.0	5.7	441.59		0.70	1.0	0.1			
Feb 15-21	54.0	62.6	48.6	66.1	51.4	62.6	4.0		34,146	0.80	2.7	0.4			
Feb 22-28	54.7	66.6	47.7	72.7	51.4	66.7	2.3		68,293			0.4			
Mar 1-7	54.6	62.0	49.3	62.0	48.0	63.3	4.9			2.30		0.1	19.97	19.6	78
Mar 8-14	50.7	64.7	47.4	68.0	44.9	66.2	7.2	282.35		7.70		0.4			
Mar 15-21	61.7	72.3	56.3	74.7	62.8	73.6	2.1		98,537	0.20		0.1	31.98	17.5	78
Mar 22-28	67.3	76.6	63.6	79.0	68.0	77.7	1.6					0.3	63.13	15.9	78
Mar 29-Apr 4	56.3	68.1	51.0	67.6	55.6	71.4	3.5		69,756	4.25		0.4	53.78	15.0	78
Apr 5-11	64.4	76.6	60.4	77.0	64.0	77.5	1.7		73,171	2.60		0.4	99.23	14.4	104
Apr 12-18	64.3	82.4	58.1	79.3	57.8	81.8	1.8	80.82	37,561			0.4	135.01	14.3	104
Apr 19-25	69.1	81.6	62.1	78.3	64.4	80.6	3.2		19,512	4.00		0.3	166.98	14.0	104
Apr 26-May 2	66.6	84.9	60.3	80.6	60.1	83.5	2.6		37,561			0.4	171.37	13.7	130
May 3-9	73.7	88.1	67.1	84.0	64.9	88.3	3.6		72,537			0.5	182.68	14.1	130
May 10-16	76.1	89.1	71.4	87.3	78.6	91.4	2.3			0.10			206.43	14.4	104
May 17-23	73.4	92.3	64.3	84.7	69.5	95.9	4.4	0.00	120,000	2.90			113.94	15.2	156
May 24-31	79.0	93.0	71.9	86.8	75.0	93.4	3.6		81,951	2.45			85.31	14.9	156
Total									2,262,024	67.15			1330		1300

[1] Soil temperature was measured at a depth of 4 inches.
[2] Dissolved oxygen readings were taken about 8:00 a.m.

Effects of Density Reduction on the Production of Large Crawfish

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

INTRODUCTION

Recent marketing developments in the Louisiana crawfish industry have caused a major shift in production priorities. Prior to the late 1980s, there was no established pricing system based on a graded and sized product. Pricing was influenced largely by supply and demand with little regard to crawfish size, above the minimum acceptable size of about 12 g or 38 crawfish to the pound. Therefore, the principal emphasis of management for the crawfish producer was to maximize total production of harvestable crawfish. However, a major export initiative in 1987 swayed the crawfish industry to establish grading practices, which subsequently influenced the production and marketing of crawfish.

A decline in the supply of crawfish in Europe opened markets for Louisiana crawfish during the late 1980s. The export market (mostly to Sweden) was a lucrative market that demanded only select crawfish of the largest size. To effectively segregate crawfish for this market, the industry devised various grading processes. The establishment of grading in the industry allowed not only the segregation of crawfish for export but allowed greater developments in the domestic markets, and grading according to size has become a standard industry practice. Crawfish are now routinely graded into three or four size categories. The largest are used mostly for export, the smallest are used for processing of the tail meat, and the medium size(s) are sold mainly as live, ready-to-cook product to restaurants and directly to consumers. Grade category classifications vary depending on geographic region and time of the year; however, the export size category nearly always excludes crawfish smaller than 30 g or about 15 crawfish/lb. Price differentials favor the larger sizes. A 1993 survey showed prices paid to Louisiana producers for graded crawfish ranged from $.79 - 1.02/lb for large, $.41 - .56/lb for medium, and $.20 - .42/lb for small crawfish. Also indicated by the survey was that only 27% of the farm production fell into the largest size category, with 32% grading as medium and 41% grading as small (based on 1.5 million pounds of crawfish harvested). The percentage of small crawfish in the catch can often be much greater for individual producers.

Prior to about 1987, there was little economic incentive for producers to manage for the production of large crawfish. Managers typically focused on maximizing total yields with little regard to harvest size. Likewise, research efforts were directed towards increasing total production. Consequently, the predominance of small crawfish was often associated with high production. Currently, excess production of small, low-value crawfish is a major industry problem and can be economically devastating to individual producers. With the recent establishment of grading practices and market prices proportionally higher for the larger animals, there has been a major shift in production (and research) priority -- to increase production of large, high-valued crawfish.

Although not thoroughly characterized, some of the factors affecting crawfish growth or size-at-harvest are thought to be caused by harvesting strategy, certain water conditions, food availability and quality, population density, genetic influences, or combinations of these factors. Little information exists of pure genetic influences on growth or size-at-maturity, but most data indicated that environmental factors are more important than genetic effects. It was once thought that the overwhelming factor causing the excessive production of small/stunted crawfish in production ponds was food deficiency. Supplemental feeding has produced increased yields in some studies but not in others; however, feeding practices frequently proved uneconomical, and positive results were often inconsistent and difficult to repeat. Moreover, supplemental feeds have generally not been effective in inducing a significant growth response in crawfish when used in forage-based ponds, even after forage depletion. It has been clearly demonstrated that crawfish exhibit density-dependent growth in which final size is inversely proportional to density. Although overcrowding can lead to premature forage depletion and food shortages, high density apparently inhibits growth even without bringing nutritional limitations into prominence.

Since high population density has been identified as the single most limiting factor affecting crawfish growth and harvest size, managing for proper density should be a top priority in production of large crawfish. Sound management strategies required for the predictable production of large crawfish are currently lacking. Actions taken to reduce crawfish densities within a current production season, if overcrowding is ascertained, should probably occur after peak recruitment but before ponds warm to near optimum temperatures in the spring. Reductions before peak recruitment in the fall may not be adequate if large numbers of subsequent recruits appear. Reductions too late in the spring may accompany food shortages and reduced opportunity for maximum growth.

Few research efforts have been directed towards reduction of populations to effect a growth response within a current season. However, one such study (See "Effects of Density Reduction on the Production of Large Crawfish", 86th Annual Research Report, Rice Research Station, 1994) revealed how high densities can affect size-at-harvest and that significant increases in crawfish size within a current production season could be achieved by sufficiently reducing crawfish numbers at the appropriate time. The most effective method in that study was not cost effective, but another method (temporary draining of the pond) appeared worthy of further evaluation. Refinements in a midseason draining practice may provide an effective and feasible method for reducing crowding in overpopulated ponds. Thus, this study evaluated a 2-day drain (in lieu of 5 days used in 1994) in December, January, and February as a means of reducing crawfish population to affect an increase in subsequent crawfish size. A non-drained group of ponds were maintained as the control for comparative purposes. Additionally, in another group of ponds, onset of the permanent flood was delayed to decrease crawfish recruitment.

Pond Area: Nineteen 0.5-acre ponds

Forage Crop: Rice ratoon crop ('Orion') planted at 150 lb/A

Rice Harvest Date: 18 - 19 Aug 1994

Fertilizer (Ratoon Crop): 46-0-0 at 100 lb/A (topdress), 23 Aug;
23-12-12+2 Zn at 200 lb/A, 30 Sept 1994

Herbicide: None

Insecticide: None

Permanent Flood: 5 Oct 1994 (except Late Flood treatment)

Crawfish Harvest: Trap harvest: 1 Mar - 31 May 1995, total of 50 trap-days (1,300 total trap sets/A)
Net harvest: Hoop nets (3/4" square mesh) were placed over the drain pipes during the midseason drain to retain any harvest-size crawfish.

Trap Type and Density: 3-funnel pyramid at 26 traps/A

Crawfish Grades: All crawfish harvested were subjected to a grader (passive, water type), and sorted into four grade categories as follows: "Jumbo" - ≤ 15 count/lb, "Large" - 16-20 count/lb, "Medium" - 21-28 count/lb, "Peeler" - > 28 count/lb

Feed: None

Exp. Design: Randomized complete block (four replications, except late flood with three replications)

Treatments: 1) A control whereby no density reduction method was implemented; 2) Partial drain in Dec for 2 days (20 and 21 Dec); 3) Partial drain in Jan for 2 days (18 and 19 Jan); 4) Partial drain in Feb for 2 days (15 and 16 Feb); 5) Late Flood -- permanent flood was implemented 22 Dec. [**Note**: Approximately 20% of pond bottoms retained some amount of water during the drain period]

Parameters: Crawfish density estimates, crawfish yield, crawfish size, proportional yields according to size, forage persistence

Statistical Analysis: Analysis of variance; means separated by Duncan's multiple range test

Comments: Density reduction measures were not effective in significantly increasing crawfish size-at-harvest in this study. All indicators suggest that ponds were not overpopulated to begin with (Table 1). This would explain the lack of significant differences in crawfish size due to treatment (Table 2). Further evidence of non-crowding was that 59% of harvested crawfish in the control group graded in the Jumbo category. This number would normally be much lower in harvests from overcrowded ponds. Although not statistically significant, there appeared to be a slight trend of increased crawfish size with time of drain; the later the drain, the greater the percent of large crawfish. This needs further evaluation under more crowded conditions.

Even though production occurred late in the season (Table 3), total yields were very good. Yields for early flooded ponds averaged over 1,300 lb/A, well over the state average of 500 - 600 lb/A. Total yield was significantly decreased for late flooded ponds; although, proportional yields according to size grade were similar to those for other ponds. Partial draining of ponds for 2 days during midseason apparently did not significantly reduce the total yield. There were slight reductions in yields of drained ponds with trap harvest, but when the catch from net harvests were included, the total production was similar; in fact, total production was slightly increased in the February drain treatment.

It was of interest to see that nets placed over the drains during the water discharge period were at least partially effective (Table 4). Crawfish were retrieved that would have otherwise been lost. Prices during the midseason drain period are usually very good and probably would justify the effort. The catch by nets increased with the later drain dates. These results contradict findings from other studies. Attempts at harvest during the draining period at other times of the year have not been very effective (See the following report "Comparison of Traditional and Drain Harvest Methods for Retrieving Crawfish Relayed into a Rice Crop"). This methodology deserves further investigation.

In summary, results of a partial drain during midseason on crawfish harvest size were inconclusive because overcrowded conditions did not exists. However, partial draining (with use of nets at the drain site) appeared not to have adversely affected overall crawfish production. Furthermore, the results of this study showed that very good yields are possible even though crawfish density remains low. Additionally, the study gives evidence that it is possible to achieve high percentages of large crawfish even at total yields exceeding 1,000 lb/A.

Table 1. Average crawfish relative density estimates using three sampling techniques. Rice Research Station, Crowley, LA. 1995.

	Drop Sampler Counts[1] (#crawfish / m^2)							
Treatment	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**
Control	0.00	2.11	3.60	1.73	2.24	4.90	6.00	6.24
Drain-Dec	0.67	1.25	1.25	0.60	0.86	4.00	4.53	5.53
Drain-Jan	0.33	2.24	1.83	0.91	1.33	4.47	5.83	3.71
Drain-Feb	0.67	1.76	1.80	1.23	2.33	3.06	5.30	3.60

	Dip Counts (#crawfish / dip net sweep)							
Treatment	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**
Control	0.23	0.28	0.50	0.18	0.33	0.25	0.50	0.45
Drain-Dec	0.03	0.38	0.20	0.08	0.43	0.18	0.35	0.45
Drain-Jan	0.07	0.03	0.07	0.10	0.25	0.13	0.33	0.40
Drain-Feb	0.10	0.15	0.13	0.22	0.23	0.23	0.38	0.25
Late Flood	-	-	-	0.09	0.18	0.14	0.28	0.27

	Trap Catches (#crawfish / trap set)							
Treatment	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**
Control	0.50	0.30	0.69	1.56	1.42	6.88	18.51	17.77
Drain-Dec	0.00	0.25	0.50	1.21	1.50	6.67	19.06	17.47
Drain-Jan	0.38	0.40	0.75	1.25	0.75	5.62	17.19	17.90
Drain-Feb	0.13	0.30	0.50	1.58	1.50	4.14	15.74	17.66
Late Flood				0.46	0.83	3.80	14.02	15.95

[1]Drop sampler counts were obtained from only one replica of each treatment.

Table 2. Average total crawfish yields (lb/A) and size (g) according to size grade. Totals include crawfish harvested via traps plus those harvested by nets during the temporary drain. Grade categories 1, 2, 3, and 4 represent jumbo, large, medium, and peeler grades, respectively. Averages followed by the same letter within a column were not significantly different ($P \geq 0.05$); * indicates no significant differences. Rice Research Station, Crowley, LA. 1995.

		Combined Yields -- Drain Harvest (via net) + Trap Harvest											
		Grade 1			Grade 2			Grade 3			Grade 4		
Treatment	Total Yield	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb
Control	1336[A]	787[A]	58.9	11.6	375*	28.1	16.4	137*	10.2	22.0	38*	2.8	33.3
Drain-Dec	1328[A]	759[A]	57.2	11.6	376*	28.3	16.5	150*	11.3	22.4	43*	3.2	33.4
Drain-Jan	1377[A]	797[A]	57.9	11.4	369*	26.8	16.6	162*	11.7	24.0	50*	3.6	35.5
Drain-Feb	1355[A]	809[A]	59.7	11.4	344*	25.4	17.2	149*	11.0	24.6	53*	3.9	36.9
LateFld	1087[B]	632[B]	58.1	11.4	312*	28.7	16.2	113*	10.4	22.0	30*	2.8	33.5
Average			58.4	11.5		27.5	16.6		10.9	23.0		3.3	34.5

Table 3. Average crawfish production (lb/A) by grade category by month. Grade categories G#1, G#2, G#3, and G#4 represent jumbo, large, medium, and peeler grades, respectively. Rice Research Station, Crowley, LA. 1995.

	March					April					May				
Treatment	G#1	G#2	G#3	G#4	Total	G#1	G#2	G#3	G#4	Total	G#1	G#2	G#3	G#4	Total
Control	68	43	19	7	137	297	140	46	14	497	421	191	72	17	701
Drain-Dec	60	42	22	6	130	289	144	54	15	502	407	187	71	18	683
Drain-Jan	47	36	21	5	109	281	126	45	14	466	460	186	63	18	727
Drain-Feb	35	25	16	4	80	259	118	40	12	429	496	162	55	19	732
Late Flood	21	23	20	4	68	214	114	37	11	376	397	174	58	15	644
Overall Average					105					454					697
% of Total					8.3					36.2					55.5

Table 4. Average crawfish catch (lb/A) by net harvest during the water discharge period of the temporary drain and average crawfish size (g). Grade categories 1, 2, 3, and 4 represent jumbo, large, medium, and peeler grades, respectively. Averages followed by the same letter within a column were not significantly different ($P \geq 0.05$). Rice Research Station , Crowley, LA. 1995.

		Grade 1			Grade 2			Grade 3			Grade 4		
Treatment	Total Yield	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb	Yield	% of Total	Count/lb
Dec-Drain	12[C]	2	16.7	17.4	2	16.7	20.5	4	33.3	25.1	4	33.3	32.8
Jan-Drain	75[B]	9	12.0	16.9	21	28.0	21.3	33	44.0	30.6	14	18.7	40.9
Feb-Drain	114[A]	19	16.7	16.2	39	34.2	23.5	38	33.3	32.1	18	15.8	44.0
Average			15.1	16.8		26.3	21.8		36.9	29.3		22.6	39.2

Comparison of Traditional and Drain Harvest Methods for Retrieving Crawfish Relayed into a Rice Crop

W.R. McClain, K.R. Taylor, and J.J. Sonnier

INTRODUCTION

Research at this facility has shown that "relaying" small stunted crawfish from ponds at the end of a typical season into the improved environment of a growing rice crop can yield further growth of crawfish and substantially increase market value. Average size at harvest was more than doubled and market value was increased up to three-fold in a substantial proportion of the retrieved crawfish. Moreover, results indicate that it is possible to achieve very favorable rice yields after crawfish have been reharvested. Integrating crawfish and rice as an intercropping approach in this nontraditional manner may have very favorable economic impacts to farming systems, which are already somewhat integrated. Producers who have the ability to or who are already culturing rice and crawfish would likely benefit from such integration.

Past results from this research have been very consistent and generally very encouraging. Previous research investigated outcomes when crawfish were stocked at rates ranging from 250 - 1,000 lb/A and reharvested by traditional trap harvest. Although crawfish returns were good and rice yields acceptable, trap harvesting is costly, time consuming, and necessitates destruction of some rice (in trapping lanes) that adversely affects grain yield. A different approach of harvesting relayed crawfish was examined during 1994. Since all water is routinely discharged from rice fields in preparation for the rice harvest, that research investigated the use of hoop nets placed over the drain as a means of harvesting the crawfish. Retrieving the relayed crawfish during the draining process, in lieu of the traditional trapping practice, would eliminate much of the costs associated with the traditional trap harvest and would spare that portion of the rice crop destroyed by the use of trapping lanes (approximately 15%). Results of the first attempt of using the alternative harvesting strategy was disappointing. Crawfish did not seem to move with the discharge water; therefore, the net harvest was poor.

Because of the potential benefit from this alternative strategy, the net harvesting approach during water discharge was reevaluated during 1995. Crawfish and rice yields were examined at two crawfish stocking rates (250 and 750 lb/A). Control fields without crawfish were managed as typical rice fields.

Field Area: Twelve 0.5-acre fields

Forage Crop: Rice ('Orion')

Planting Date: 19 Apr 1995

Seeding Rate: 150 lb/A

Seeding Method: Broadcast then lightly covered

Fertilizer: 23-12-12 at 250 lb/A preplant incorporated, 46-0-0 at 200 lb/A (topdress), 18 May

Herbicide: Arrosolo 1 gal/A, 10 May

Insecticide: None

Permanent Flood: 20 May (8-10 inches)

Relay: 24 May - 2 June (250 or 750 lb/A)

Relay Crawfish: Average size - 33.6 crawfish/lb, purchased from a commercial operation

Rice Stage at Relaying: Tillering

Enclosures: Cylindrical small-mesh (5 mm) wire, 0.5 m^2 surface area, placed over rice forage in fields (stocked at same rate as treatment, used for mortality estimates)

Crawfish Harvest: Trap Harvest: 5 July - 26 July (total of 16 trap-days) 32 traps/A
Drain Harvest: Via hoop nets (3/4" mesh) placed over drain pipes 1 Aug - 4 Aug

Crawfish Grades: All crawfish harvested were subjected to a grader (passive, water type), and sorted into four grade categories as follows: "Jumbo"- < 15 count/lb, "Large" - 15-19 count/lb, "Medium"- 20-26 count/lb, "Peeler"- > 26 count/lb

Feed: None

Bait: Manufactured (Purina, Purina Mills, Inc., St. Louis, MO)

Rice Harvest: 18 - 19 Aug

Exp. Design: Completely randomized design (four replications per treatment)

Treatments: Conventionally harvested fields: low stocking rate (250 lb/A);
Drain harvested fields: low stocking rate (250 lb/A), high stocking rate (750 lb/A);
Rice control fields

Parameters: Crawfish mortality, production, and harvest size; rice production

Statistical Analysis: Analysis of variance; means separated by Duncan's multiple range test

Comments: Results of this experiment were very consistent with previous studies. The practice of intercropping crawfish in a rice crop and reharvesting them with conventional traps was again very effective. The alternate strategy of harvesting the relayed crawfish with hoop nets during draining was ineffective for a second time.

Mortality from handling and transferring appeared low and was estimated to be only 2.3% during the first 24 hr after transferring with an additional 9% over the next 6 days. Crawfish were reharvested with either baited traps prior to drainage or with nets during the water discharge period. On average, 100% of the crawfish stocked (by weight) were retrieved by trap harvest (Table 1). Average crawfish size in this study more than doubled; 63% of those retrieved (by trapping) graded into the largest size category. Unfortunately, crawfish movement was poorly related to water outflow, and harvest by nets at the drain site during the water discharge period was not very effective. Retrieval rates were only 11% and 6% of the total weight stocked for the low and high stocking rates, respectively. Crawfish appeared to migrate in the opposite direction of the water flow and, therefore, were not effectively harvested. However, similar size trends were observed in the net harvested crawfish with the majority falling in the largest size class. The low retrieval rates would prevent this practice from being economical, and these results (consistent with results observed in 1994) would, therefore, suggest that this alternative harvesting strategy is not a viable option under the conditions used in this test.

Rice yields averaged 6,458 lb/A for the control fields and 5,401 lb/A for fields where crawfish were removed by trap harvest. This reduction was attributed mainly to the presence of trapping lanes. Fields containing crawfish, but no traps, yielded an average of 6,348 lb of rice/A for the low stocked fields and 6,300 lb/A for the high stocked fields. Higher crawfish densities did not significantly affect rice yields in this study.

Table 1. Average total yields, proportional percentages, and size-at-harvest of crawfish trap harvested from rice fields stocked at 250 lb/A (low rate) and crawfish net harvested from rice fields stocked at 250 (low rate) and 750 lb/A (high rate) and average rice yield for each treatment. Averages followed by the same letter within a row were not significantly different ($P \geq 0.05$). Rice Research Station, Crowley, LA. 1995.

	Low stocking/ Trap harvest			Low stocking/ Drain harvest			High stocking/ Drain harvest			
		% of			% of			% of		
Grade	Yield	Total	Count/lb	Yield	Total	Count/lb	Yield	Total	Count/lb	Rice Only
Jumbo	157	63	11.8	20	74	11.9	23	54	13.7	-
Large	72	29	14.9	6	24	14.3	16	38	15.9	-
Medium	18	7	23.5	1	2	26.2	3	8	21.2	-
Small	3	1	27.9	0	0	-	0	0	-	-
Total Yields										
Crawfish	250[A]			27[B]			42[B]			-
Rice	5401[B]			6348[A]			6300[A]			6458[A]

Effects of Water Source on Crawfish Mortality During Purging

W.R. McClain, K.R. Taylor, and J.J. Sonnier

INTRODUCTION

Approximately 60% of Louisiana crawfish production is sold in live form, and the majority of these are marketed through private households and restaurants as boiled whole product. Crawfish are sometimes held in purging systems (where feed is withheld) for 24–48 hours prior to being sold or consumed. Most of these systems are of a flow-through type composed of a water-filled tank or canal with suspended wire-mesh baskets that hold crawfish off of the bottom and in the water column. Good water quality is maintained with either supplemental aeration and/or by high volumes of oxygenated water replacement. The purging procedure eliminates or greatly reduces the contents of the gut, which is exposed when the tail is peeled for consumption. The process also washes the outer surface and gill area, which results in more sanitary conditions during the cooking process when crawfish are boiled whole. Overall, purging renders a cleaner, more attractive product with better consumer appeal. Improved quality, resulting from purging, is a major contributor to repeat sales and historic loyalty to certain producers or restaurants.

Crawfish loss during the purging process is highly variable and can be substantial. Mortalities during purging ranged from 2.4 - 32% in previous studies. Several factors can affect mortality losses, such as loading rates, stresses, and physiological stage of crawfish. Little is known of the effects of water source on crawfish losses during this process. Therefore, this study compared crawfish mortalities after 24 hours in a simulated purge system when pond water or well water was used. Crawfish were randomly taken from the daily harvest during the test period, which extended from February to May. They were placed in replicated aquaria containing either pond water or well water. Water was supplied to clean aquaria 2 days prior to the introduction of crawfish and allowed to equilibrate to room temperature. Profuse supplemental aeration was supplied and water remained static.

Culture Conditions: Typical rice-forage crawfish ponds

Crawfish Harvest: From baited pyramid traps, approximately 5,247 individual crawfish were subjected to the study

Purge System: Eight aquaria (10-gal) filled with water and provided with profuse supplemental aeration. Purge environment was static water (no water exchange)

Purge Time: 24 hours

Water Source: Water was furnished to aquaria 2 days prior to the inclusion of crawfish to allow temperature to equilibrate to room temperature.

Pond water: taken directly from earthen canal system that was filled with well and rain water and allowed to age under natural processes.
Well water: well water that was passed through a commercial water softener.

Water Temperature: 64 - 75° F

Loading Rates: 2.8 lb crawfish/ft² of aquarium bottom

Test Dates: 2/23, 3/1, 3/9, 3/15, 3/22, 3/29, 4/5, 4/12, 4/27, 5/3, 5/24 - 1995

Treatments: Crawfish held for 24-h in simulated purge systems filled with either well water or pond water

Parameters: Crawfish mortality (%) during purging; water quality

Statistical Analysis: Analysis of variance; means separated by Duncan's multiple range test

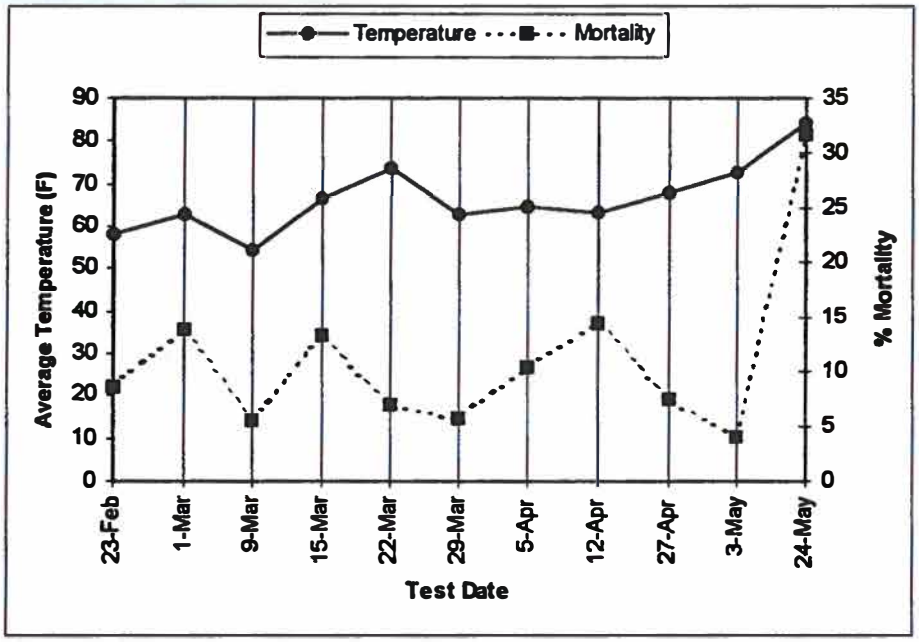
Comments: Average crawfish mortality during the purging process ranged from 4 to 32% over the test period but was not related to water source (Table 1). Average seasonal mortality was approximately 11%, similar to results from other studies (See "Effects Of Water Source On Crawfish Mortality During Purging", 86th Annual Research Report, Rice Research Station, 1994). Pervious studies found high correlation of death during purging to stage of maturity of the crawfish. Immature crawfish are more susceptible to death due to purging. Maturity data were not collected in this study but could have been a major factor. Molt stage of crawfish at the time of purging and method of handling are other likely causes for varied mortalities over time. No obvious correlation was found between water chemical variables and crawfish mortality. Although total ammonia levels were significantly raised during purging, un-ionized ammonia levels did not appear to surpass the critical level for acute toxicity.

There appeared to be a general correlation between the relative increase or decrease in crawfish mortality with the relative increase or decrease in average water temperature at harvest (Figure 1). In other words, as pond temperature increased, crawfish mortality seemed to increase and as temperature decreased, mortality usually decreased. Only at four test dates was this trend not consistent (22 Mar, 12 Apr, 27 Apr, and 3 May). A number of other variables could confound this trend. A seasonal average of 11% mortality seems reasonable considering the relative high loading rates and lack of water exchange in this study. Future focus should probably be directed to stress factors of the animal as a result of harvest and handling after the harvest in order to minimize mortality during purging.

Table 1. Average water quality characteristics of pond and well water used for purging crawfish and average crawfish mortality after a 24-hour purge. Parameters were measured immediately prior to the introduction of crawfish (Influent measurements) and after a 24-hour purging process (Effluent measurements). Averages followed by the same letter within a row by category were not significantly different (P≥0.05). Rice Research Station, Crowley, LA. 1995.

Parameter	Influent Water		Effluent Water	
	Pond	Well	Pond	Well
Temperature (°F)	---	---	67.1^{A}	67.1^{A}
Dissolved Oxygen (mg/L)	9.2^{A}	9.1^{A}	5.0^{A}	4.6^{A}
Total Ammonia (mg N/L)	0.33^{B}	1.14^{A}	4.66^{A}	5.04^{A}
Nitrite (mg N/L)	0.033^{A}	0.008^{A}	0.139^{A}	0.036^{B}
Total Iron (mg/L)	0.09^{A}	0.15^{A}	0.31^{B}	0.41^{A}
pH	8.57^{A}	8.63^{A}	7.60^{A}	7.68^{A}
Crawfish Mortality (%)	---	---	10.71^{A}	11.41^{A}

Figure 1. Average crawfish mortalities (%) after purging and corresponding pond water temperatures (°F) for each test date. Temperatures represent the median water temperature (from minimum and maximum values) recorded the day of harvest. Rice Research Station, Crowley, LA. 1995.



Determination of Crawfish Condition in Burrows Prior to Flood-Up

W.R. McClain, K.R. Taylor, and J.J. Sonnier

INTRODUCTION

Unlike many forms of aquaculture that stock known numbers of juveniles for grow-out, crawfish culture depends on natural recruitment from residual broodstock in the pond. Producers currently have little control over the reproductive aspects of pond culture. In fact, producers are often not thoroughly apprised of the spawning success until well into the season. Management is hampered by the relative poor assessment of crawfish population dynamics early in the season. Yield potentials and profits are difficult to predict making many management decisions less effective. It has recently been documented that crawfish population density is the single most important factor affecting crawfish size at harvest. Since grading has become a standard practice in the Louisiana crawfish industry and large price differentials exist based on crawfish size, it is imperative that producers be able to exert more control over population structure in ponds to maximize profits.

Burrow ecology is an area that has received little attention from the research community. Additional information in this area would aid in the understanding of the "big picture" and help to provide tools from which to formulate management plans. For this reason, this study was conducted to provide additional baseline information on general reproductive aspects of crawfish in burrows.

Location: Rice Research Station, Crowley, LA (South Unit)

Sample Area: Interior side of permanent levee at visible burrow entrances

Soil Classification: Crowley silt loam

Previous Timetable: Fields were managed as typical fall/winter/spring crawfish ponds, drained in May 1994, and received only rainfall during the summer

Sample Dates: 13, 15, and 21 Sept 1994

Burrow Temperature: Average = 78.5 °F at time of sampling

Excavation Method: By hand with shovel

Parameters: Burrow occupants, crawfish sex, reproductive stage of females

Comments: Although only a limited number of crawfish burrows were excavated during this study, it is likely that an accurate picture of burrow ecology was determined for the specific location and environmental parameters. Approximately 61 burrows were excavated during September 1994, 14 - 16 weeks after the draining of ponds. Fifty-nine crawfish were examined, of which 93% were alive. Of the live crawfish examined, 39 (71%) were females. Fifty-nine percent of those had recently spawned and 38.5% were in the late ovarian stage of development as determined by large ovary size and dark coloration. Only 2.5% of the females examined showed no obvious signs of advancing ovarian development (small, white coloration). The majority of the burrows contained only one crawfish and most of those were females. Although not quantified, no crawfish were found in some (estimated 10) burrows. A few burrows were occupied by both male and female crawfish. Only one burrow contained more than two crawfish and it contained crawfish that were found dead.

Table 1. Summary of findings from burrow excavation during September 1994 prior to initiation of the permanent flood in crawfish ponds. Rice Research Station, Crowley, LA. 1995.

	Number of Burrow Occupants					
	3	2 (1Male & 1Female)	1 (Female)	1 (Male)	1	0
No. of Burrows	1	6	33	10	1	10
Notes	Dead, sex unknown				Dead, sex unknown	Estimated

	Ovarian Development Stage		
	Early (White)	Late (Dark)	Spawned
	2.5%	38.5%	59%

Factors Affecting Crawfish Spawning Success in Artificial Burrows

W.R. McClain, K.R. Taylor, and J.J. Sonnier

INTRODUCTION

Production of crawfish from commercial ponds in Louisiana is mostly dependent on recruitment of young-of-the-year (YOY) crawfish from broodstock that burrowed the previous spring/early summer. Recruitment of YOY is unpredictable and is often highly variable. This results in uncertain annual harvests of crawfish with far ranging economical consequences. Low annual yields with small (or negative) returns frequently result from too few YOY. Recruitment of too many YOY causes an over-crowded condition which results in the production of small, often stunted, crawfish that are of low-value or sub-marketable.

The number of YOY crawfish is dependent mainly on the number of broodstock surviving in burrows, the spawning success, and survival of the young. Little is known of the "normal" values for these parameters or to what extent they can be affected by management conditions prior to the reproductive period. A more thorough understanding of the reproductive biology of crawfish is needed before management practices can be implemented to optimize numbers of YOY.

This study used artificial burrows maintained in the laboratory to evaluated the reproductive performance of crawfish exposed to various management practices prior to initiation of the burrow period. Female crawfish, estimated to be sexually mature, were collected from traditional fall/winter/spring ponds at a typical drain date (1 June) and from rice fields used in experimental intercropping strategies. Crawfish from the rice/crawfish intercropping fields were collected at three intervals: (1) at the time trapping commenced, (2) at the time trapping ceased, and (3) after crawfish were net harvested during water discharge.

Although not recommended, crawfish broodstock are sometimes held on ice or in a cooler prior to their release in ponds. Little is known of broodstock survival and spawning success after exposure to such conditions. Therefore, as an additional treatment, crawfish collected from traditional ponds at the end of the season were exposed to a cooler for 24 hours prior to placement in artificial burrows. Reproductive success of crawfish held in artificial burrows has typically not been very high, regardless of treatment, at least in this laboratory. It is not known whether previous results obtained from laboratory studies were representative of survival and spawning success experienced by crawfish in natural burrows. This study examined two types of artificial burrow systems to determine if differences exists in their effects on spawning success.

Collection Date: Traditional Ponds: 1 June 1995
Intercropping Ponds: 11 July, 25 July, and 3 Aug 1995.

Missing or dead crawfish in artificial burrows were replaced only within 24 hours of initial placement.

Artificial Burrows: Group System: 3" W X 4" H PVC cylinders that housed individual crawfish but shared a common water bath.
Individual System: 3.5"W X 5"H plastic cups that housed crawfish and water in individual containment.
Systems were placed adjacent to one another in the laboratory and were maintained under constant temperature and subdued light. Disturbance was kept to a minimum and systems were checked once per week after observance of the first spawn.

Temperature: Spawning room was maintained at 82 ± 4°F; cooler was maintained at 39 ± 4°F

Water: Well water (passed through a commercial water softener) was maintained at a 1/2-inch depth in artificial burrows. Water was changed as needed (approximately 8-10 times during the experiment).

Experimental Design: 4 X 2 X 2 incomplete factorial design with 44 replications per treatment combination (except 22 replications per intercropping treatment combination)

Feed: None

Spawning Period: First Spawn: Observed 23 Aug 1995; Last Spawn: Observed 15 Nov 1995

Terminated: 11 Dec 1995 and all non-spawned crawfish were dissected for determination of condition indices.

Treatment Factors: Traditional or Intercropping pond (Intercropping pond, three collection dates); Field collected crawfish or crawfish held in cooler (Traditional pond only); Group or individual artificial burrow system

Parameters: Crawfish weight at collection, weight loss after spawning (or termination), survival of brood females, spawning success, fungal infection of eggs, number of young hatched, hepatopancreas and abdominal muscle moisture and ratio as percent of body weight after spawning (or at termination).

Statistical Analysis: Analysis of variance; means separated by Duncan's multiple range test

Comments: Spawning success and fecundity of crawfish housed in artificial burrows in the laboratory was low, regardless of treatment factor or combination of factors (Table 1). The best spawning rate was only 34%, and the best average number of juveniles reared to stage 3 was only 191. It has commonly been observed that crawfish (of the size tested) spawning naturally generally have in excess of 300 - 400 young. Although not well documented, it is also probable that higher spawning rates are the norm under most commercial production conditions. In the previous report (Determination of Crawfish Condition in Burrows Prior to Flood-Up), 59% of the live crawfish excavated from burrows had spawned and an additional 38% had sufficient ovarian development that indicated spawning was near. Albeit, conditions were not the same as for this experiment, and that survey did not indicate the percent survival or spawning success from the

pool of crawfish available at the end of the season. It is highly likely that reproductive success is compromised by the laboratory conditions. Nonetheless, some relative comparisons from this study may be appropriate.

A few trends appear pertinent from the data. Crawfish exposed to cooler conditions prior to placement in the simulated burrows had lower survival, lower rate of spawn, and produced, on average, fewer offspring. From these results, it appears that one should avoid broodstock that had been chilled prior to stocking. There appeared to be a trend of lower survival, lower spawning rates, higher incidence of fungus on the egg mass, and lower offspring in relation to collection time of the relayed crawfish. The later the collection, the lower the reproductive success. The cause for this trend is unclear, but this phenomenon may not indicate good potentials for late summer production. There were little differences when comparing relayed crawfish as a whole to crawfish collected from traditional ponds at water draw-down. Also, little differences existed between the two artificial burrow systems. Apparent differences or similarities in reproductive success can not be easily explained by the physiological data (Table 2).

Table 1. Average reproductive success of female crawfish from various treatments and housed in artificial burrows in a laboratory. Rice Research Station, Crowley, LA. 1995.

Treatment	(N[1])	Survival (%[2])	Spawned (%[2])	No Fungus (%[3])	Partial Fungus (%[3])	Full Fungus (%[3])	Number Juveniles Hatched
Traditional Ponds	88	67.0	15.9	14.3	14.3	71.4	191.5
Intercropping Ponds	130	56.1	22.3	37.9	13.8	48.3	134.7
Intercropping Early	44	68.2	34.1	33.3	13.3	53.4	162.2
Intercropping Middle	42	57.1	23.8	60.0	0	40.0	134.5
Intercropping Late	44	43.2	9.1	0	50.0	50.0	66.5
Cooler Exposure	81	51.8	7.4	16.7	0	83.3	71.0
Field Run	88	67.0	15.9	14.3	14.3	71.4	191.5
Group System	98	63.3	22.4	36.4	9.1	63.6	101.0
Individual System	120	58.3	17.5	33.4	19.0	47.6	182.4

[1] Number of individual animals examined per treatment factor.
[2] As percent of initial crawfish examined.
[3] As percent of crawfish spawning.

Table 2. Average physiological condition of female crawfish from various treatments housed in artificial burrows in a laboratory. Designations "s" or "ns" below subcategories by column indicates significant (s) or no significant (ns) differences (Alpha = 0.05) due to treatment. Rice Research Station, Crowley, LA. 1995.

			Spawned Group					Non-Spawned Group				
		Initial	Wt[2]	Tissue ratio[3]		Tissue moisture		Wt[2]	Tissue ratio[3]		Tissue moisture	
Treatment	(N[1])	Wt. (g)	Loss (%)	Hep	Tail	Hep (%)	Tail (%)	Loss (%)	Hep.	Tail	Hep (%)	Tail (%)
Traditional Ponds	88	40.1	4.5	.56	.51	84.2	88.4	4.8	.49	.86	87.2	86.1
Intercropping Ponds	130	32.5	3.7	.76	.91	81.0	85.7	3.2	.59	1.11	85.1	84.8
----------		ns	ns	ns	s	ns	s	s	s	s	s	s
Intercropping Early	44	31.3[B]	3.9	.79	.97	80.3	85.5	3.0	.70	1.22	82.7	84.2
Intercropping Middle	42	30.7[B]	3.3	.55	.74	85.3	86.7	4.0	.54	1.09	86.7	85.8
Intercropping Late	44	35.4[A]	3.8	1.03	1.00	75.9	84.4	3.0	.51	1.00	86.2	84.3
----------		s	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Cooler Exposure	81	39.4	4.5	.91	.99	78.3	85.6	4.3	.53	.93	85.7	85.8
Field Run	88	40.1	4.5	.56	.51	84.2	88.4	4.8	.49	.86	87.2	86.1
----------		ns	ns	s	s	ns	s	ns	ns	ns	s	ns
Group System	98	36.5	3.0	.71	.64	81.6	87.3	3.7	.53	.91	86.3	86.1
Individual System	120	34.8	5.0	.66	.90	82.8	86.0	4.3	.54	1.05	86.0	84.9
		ns	s	ns	s	ns	ns	ns	ns	ns	ns	s

[1] Number of individual animals examined per treatment factor.

[2] Percentage weight loss from time of collection to release of young (or termination of study).

[3] Dry hepatopancreas or abdominal muscle (tail) weight as percentage of wet body weight.

MALEIC HYDRAZIDE AND RATOON RICE BIOMASS PRODUCTION AND PERSISTENCE FOR CRAWFISH

R.T. Dunand, W.R. McClain, R.R. Dilly, Jr., K.R. Taylor, and J.J. Sonnier

Location: Rice Research Station, Crowley, LA (South Unit)

First Crop Management

Variety/ Seeding Rate: Orion, 150 lb/A

Planting Date: 5 Apr 94

Seeding Method: Broadcast then lightly covered

Fertilizer: 23-12-12 at 200 lb/A preplant incorporated
46-0-0 at 200 lb/A (topdress), 10 May

Herbicide: Stam + Basagran (4 qt + 2 pt/A), 27 Apr

Insecticide: None

Permanent Flood: 13 May (8-10 inches)

Harvest: 15 Aug

Second Crop Management

Fertilizer: Urea (46% N) at 100 lb/A by airplane, 23 Aug; 23-12-12 with 2% Zn at 200 lb/A by airplane, 30 Sept

Water Management: Flushed, 24 Aug and 26 Sept

Plot Size: 540 ft^2 - 6 x 90 ft

Treated Area: 540 ft^2 - 6 x 90 ft

Treatment(s): **Plant Growth Regulator**

Maleic Hydrazide (0.75 and 1.5 lb/A) -
Royal MH 30 SG (1.25 and 2.5 lb/A)

Single Timing

30 days after maturity of the first crop (DAM), 7 Sept
40 DAM, 15 Sept
First heading, 19 Sept
50 DAM, 27 Sept

Multiple Timing (Three applications)

First application, 9 Sept
Second application, 22 Sept
Third application, 6 Oct

Sprayer: CO_2-driven, hand-held, 32 psi, 15 GPA, 8002 nozzles

Pertinent Rainfall: No rainfall within 24 hours of application

Permanent Flood: 6 Oct

Harvest Date: Biomass sampling - 25 Oct 94, 6 Dec 94, 18 Jan 95, 2 Mar 95, 10 Apr 95

Harvested Area: 6 ft^2 - 2 x 3 ft

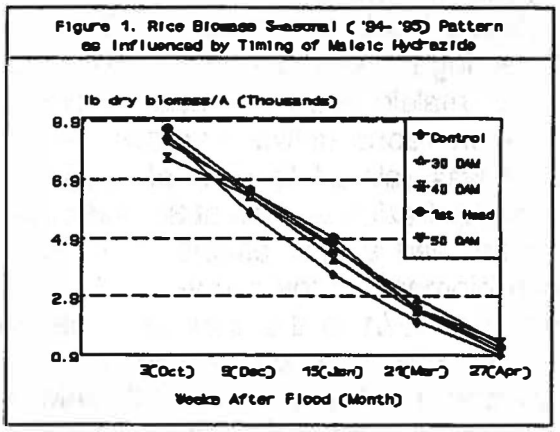
Exp. Design: Randomized complete block and four replications

Comments: Amount and persistence of vegetative growth and minimal reproductive growth of rice can be beneficial in crawfish production. Sufficient biomass and biomass persistence provide an adequate, long-term food source during the 6-month pond crawfishing season. Minimal grain production reduces the chances of large, concentrated amounts of biomass from entering the flood and causing dramatic reductions in dissolved oxygen, which can be detrimental to crawfish growth. To improve vegetative biomass and decrease reproductive growth, a plant growth regulator that has been shown to inhibit panicle exsertion and reduce seed production in red rice was evaluated to determine its effects in crawfish production.

Ratoon rice biomass (first crop stubble and ratoon growth) was monitored on a 6-week basis from October 1994 through April 1995. Biomass evaluations were made on total dry weight, vegetative (leaves and stems) dry weight, and reproductive (grain) dry weight. Dry weight determinations were made after drying tissue in a forced-air oven at 70°C for 48 to 72 hours.

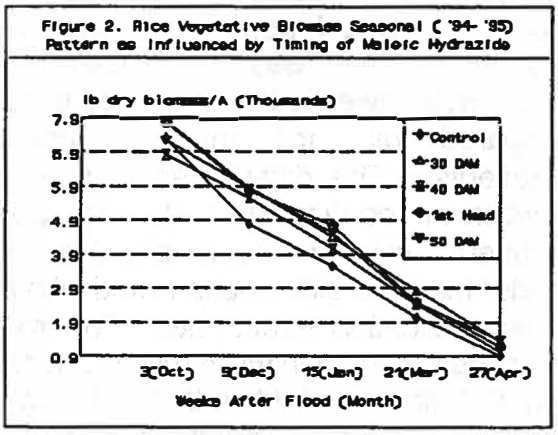
Time of Application - Single Timings

Total Dry Weight. Changes in rice biomass during the crawfish season were observed, and time of application of maleic hydrazide influenced rice biomass (Figure 1). Regardless of treatment, rice biomass declined steadily from October 1994 through April 1995. The only consistent trend occurred during the period from December 1994 through April 1995. During this period, all maleic hydrazide treatments from 30 days after maturity of the first crop (DAM) through 50 DAM, including an application at first heading in the second crop (FH), produced consistently higher biomass compared with the untreated control. For example, the increases in biomass over the control from the 30 DAM treatment were 544, 896, 784, and 400 lb/A at 9, 15, 21, and 27 weeks after flood (WAF).



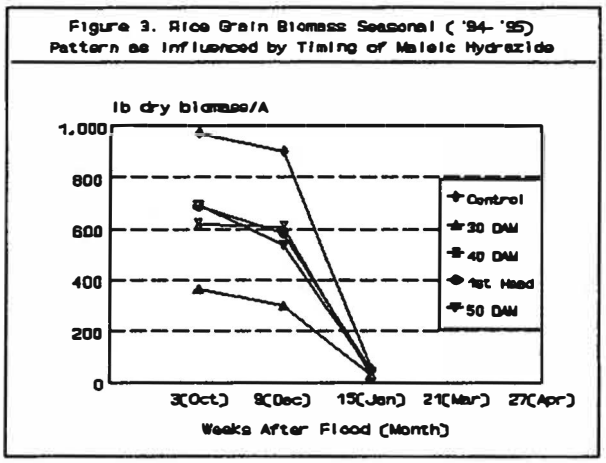
In general, there were small differences in biomass between times of application. The only consistent difference occurred during the first half of the season from October 1994 through January 1995. During this period, maleic hydrazide applied at FH had the highest biomass.

Vegetative Dry Weight. The pattern of vegetative biomass during the crawfish season was similar to the total biomass pattern (Figure 2). Vegetative biomass declined steadily from October 1994 through April 1995, and the untreated control had lower biomass than the maleic hydrazide treatments beginning at 9 WAF.



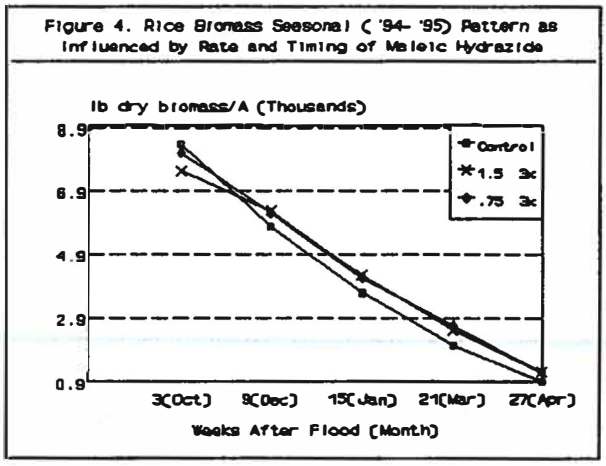
The differences in biomass between the control and maleic hydrazide treatments were similar to those previously noted for total biomass with one exception. The increase in vegetative biomass from maleic hydrazide application was greater at 9 WAF than the increase noted in total biomass. For example, the increases in vegetative biomass over the control from the 30 DAM treatment were 1056, 848, 784, and 400 lb/A at 9, 15, 21, and 27 WAF. The differences between the untreated control and maleic hydrazide treatments in total and vegetative biomasses at 15, 21, and 27 WAF are neglible since the contribution of grain biomass to total biomass during that period is very small. Vegetative biomass comprises essentially all of the biomass following 9 WAF.

Grain Dry Weight. Reproductive biomass remained relatively constant from October through December 1994 and decreased to negligible levels by January 1995 (Figure 3). During the October through December period, maleic hydrazide had a significant effect on reproductive biomass, and this effect was related to time of application. Maleic hydrazide applied at 30 and 40 DAM and FH had similar effects and reduced grain biomass in the range of 35 to 40% (from 973 lb/A in the control to between 620 and 693 lb/A, depending on time of application). Application at 50 DAM was the most effective treatment and reduced grain biomass by more than 60%.



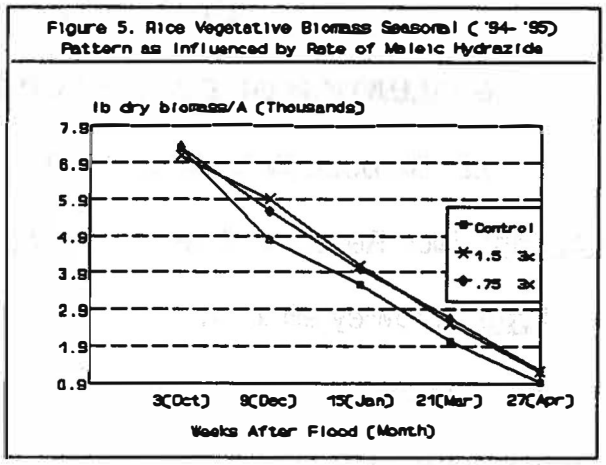
Time of Application - Multiple Timing

Total Dry Weight. Multiple applications of two rates of maleic hydrazide showed similar responses in total biomass as the single application treatments (Figure 4). Rice biomass declined continuously from October 1994 through April 1995, and during the period from December 1994 through April 1995, biomass was consistently lower in the untreated control compared with the maleic hydrazide treatments. The differences in biomass between the control and maleic hydrazide treatments were relatively constant and smaller than the differences noted with the single application treatments. For example, the differences in biomass between the untreated control and three multiple applications of 1.5 lb/A of maleic hydrazide were 480, 544, 480, and 272 lb/A at 9, 15, 21, and 27 WAF. Both rates of maleic hydrazide (0.75 and 1.5 lb/A) produced similar results.

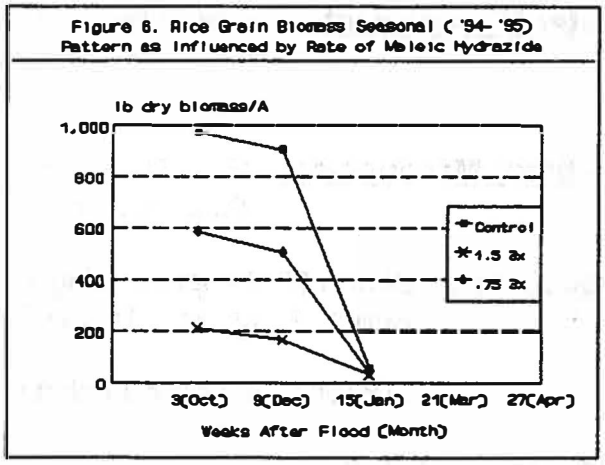


Vegetative Dry Weight. The pattern of vegetative biomass during the crawfish season was similar to the total biomass pattern (Figure 5). Vegetative biomass declined steadily from October 1994 through April 1995, and the untreated control had lower biomass than the maleic hydrazide treatments beginning at 9 WAF.

The differences in biomass between the control and maleic hydrazide treatments were similar to those previously noted for total biomass with one exception. The increase in vegetative biomass from maleic hydrazide application was greater at 9 WAF than the increase noted in total biomass. For example, the increases in vegetative biomass over the control from the 1.5 lb/A treatment were 1120, 528, 480, and 272 lb/A at 9, 15, 21, and 27 WAF. The differences between the untreated control and maleic hydrazide treatments in total and vegetative biomasses at 15, 21, and 27 WAF are negligible since the contribution of grain biomass to total biomass during that period is very small. Vegetative biomass comprises essentially all of the biomass following 9 WAF.



Grain Dry Weight. Reproductive biomass remained relatively constant from October through December 1994 and decreased to negligible levels by January 1995 (Figure 6). During the October through December period, maleic hydrazide had a significant effect on reproductive biomass, and this effect was related to rate of application. Maleic hydrazide at the rate of 0.75 lb/A reduced grain biomass by approximately 50%. This reduction increased to approximately 80% with the increase in rate of maleic hydrazide to 1.5 lb/A.



Overall, maleic hydrazide had a significant effect on rice biomass production and persistence in a crawfish pond culture. Application of maleic hydrazide during the heading stages of ratooning rice decreased grain production substantially while increasing vegetative biomass and biomass persistence. A single application of maleic hydrazide at 1.5 lb/A was more effective than multiple applications at 0.75 and 1.5 lb/A.

The ability of maleic hydrazide to increase vegetative biomass amount and persistence and limit reproductive growth in rice can improve crawfish production. Vegetative biomass degrades more slowly than reproductive biomass (grain) and provides a steady supply of forage in crawfish ponds. Grain, on the other hand, is a concentrated source of biomass and provides a more massive influx of biomass upon breakdown. When this high influx of biomass begins degrading in the water, oxygen levels can be reduced and negatively affect crawfish growth. The application of maleic hydrazide minimizes this problem by suppressing grain production while at the same time optimizing vegetative biomass production.

RICE INSECTS RESEARCH

EVALUATION OF DIMILIN FOR RICE WATER WEEVIL CONTROL

J.D. Barbour, W.C. Rice, M.A. Muegge, G.B. Trahan, and P.A. Bollich

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 138 lb/A

Planting Method: Water seeded using pre-soaked seed

Planting Date: May 31, 1995

Water Management: Pinpoint flood: Planting flood established May 29
Planting flood drained June 2
Permanent flood established June 8

Fertilizer Management: 90 lb N/A (N:P:K = 13:13:13) applied by hand on June 6
50 lb N/A (N:P:K = 21:0:0) applied by hand on June 28

Insecticides: Dimilin 25W applied using a CO_2 powered backpack sprayer delivering 15 gpa at 16 psi with TeeJet 80015VS Flat Spray nozzles

Furadan 3G applied using hand-held shaker jars

Plot size: 5 x 18 ft

Treatments:
1. Dimilin 25W applied at 0.250 lb ai/A 2 days preflood
2. Dimilin 25W applied at 0.125 lb ai/A 2 & 4 days postflood
3. Dimilin 25W applied at 0.125 lb ai/A 2 & 7 days postflood
4. Furadan applied at 0.60 lb ai/A at rice water weevil (RWW) threshold
5. Untreated check

Experimental Design: Randomized complete block with four replicates

Evaluation Criteria: Number of RWW eggs/five plants evaluated weekly from permanent flood until RWW threshold.

Number of plants, out of five, with feeding scars on the newest unfurled leaf evaluated weekly from permanent flood until RWW threshold

Number of RWW larvae per core evaluated weekly for three consecutive weeks after Furadan application

Rough rice yield (lb/A) evaluated at harvest from one hand-harvested 3 ft^2 sample per plot

Harvested: Water removed, Sept 7; harvested, Sept 19

Comments: The number of RWW larvae per core not did not differ significantly between Dimilin-treated and untreated plots for any of the sample dates. The number of RWW larvae per core was significantly lower in Furadan-treated plots than in untreated plots 15 days but not 0 and 7 days after applying Furadan (Fig. 1). The number of RWW eggs per plant in untreated plots and plots treated 1 and 4 days postflood with Dimilin did not differ significantly. However, the number of eggs per plant in these plots was significantly lower than that in Furadan-treated plots and plots treated with Dimilin 1 and 7 days postflood (Fig. 2). The numbers of plants with RWW feeding scars did not differ significantly between treated and untreated plots for any sample date (Fig. 3). Yield was significantly higher in the Furadan-treated plots than the untreated control plots and plots treated with Dimilin 2 days preflood and Dimilin 1 and 7 days postflood but not plots treated with Dimilin 1 and 4 days postflood (Fig. 4).

Although a few statistically significant differences were found between untreated and Dimilin-treated plots, two observations are worth note. First, the number of eggs per plant 10 and 17 days after flood in plots treated 1 and 4 days postflood with Dimilin was low compared with that of the other treatments. Second, RWW oviposition is usually expected to begin immediately after flood, and the number of eggs per plant is expected to reach maximum numbers during the first week after flood. In these experiments, oviposition was delayed, with peak egg numbers occurring about 10 days after flood (Fig. 2). Timing of the Dimilin applications may have been too early, with respect to numbers of ovipositing weevils, to be effective. In this case, the 1- and 4-day Dimilin split application would be the only treatment to have any chance of affecting egg or larvae numbers. This appears to be the case: the number of larvae per core in the 1- and 4-day Dimilin split was lowest 18 days after flood and then increased in numbers 25 and 33 days after flood. This is what is expected given the low number of eggs per plant in this treatment. Additionally, yield from plots treated with Dimilin 1 and 4 days postflood did not differ significantly from the highest yielding Furadan-treated plots. Neither Dimilin or Furadan appeared to negatively effect feeding activity of adult weevils.

Figure 1. Mean Number of Rice Water Weevil Larvae per Core

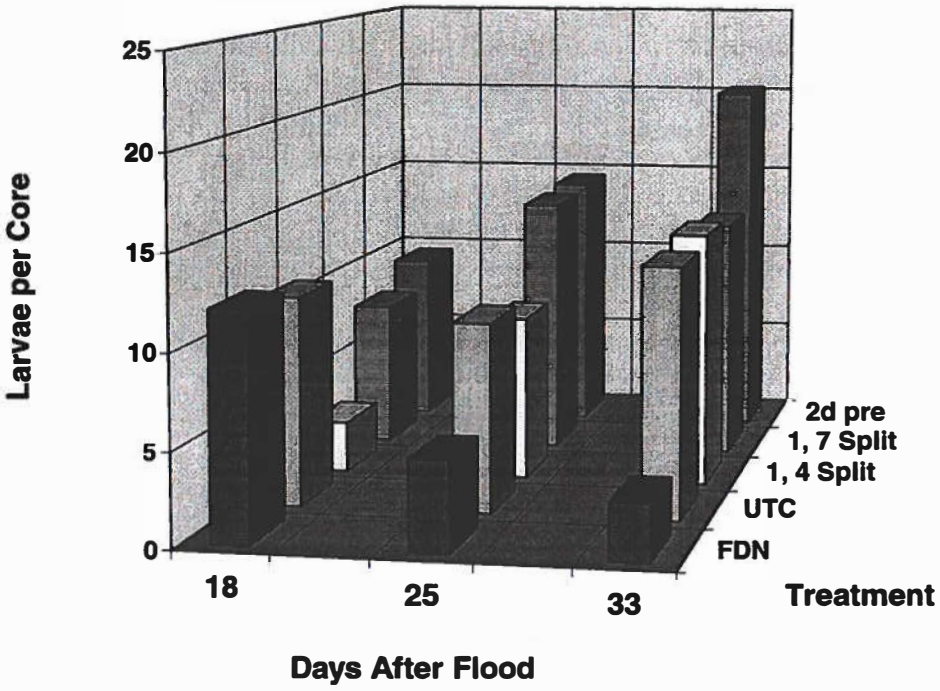


Figure 2. Mean Number of Rice Water Weevil Eggs per Plant

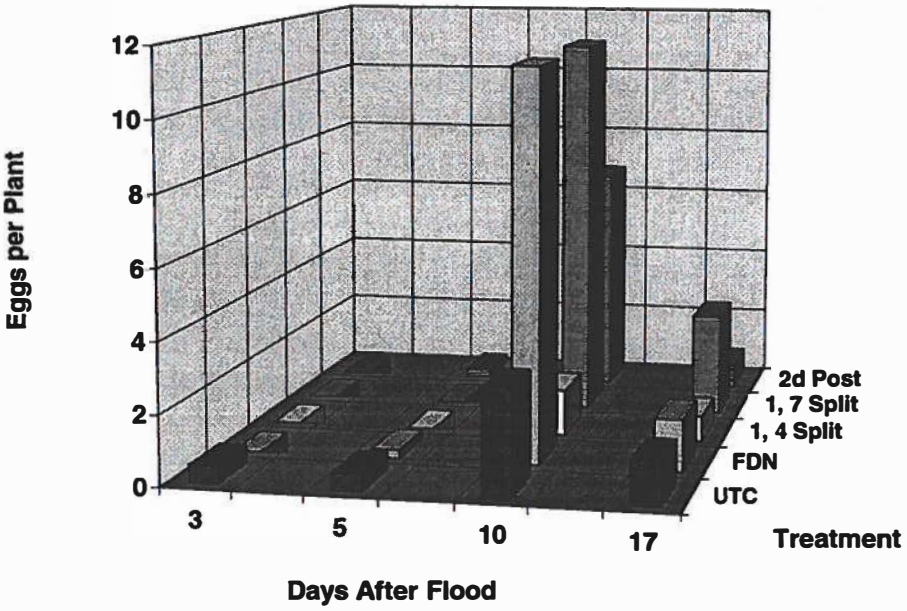


Figure 3. Mean Number of Plants, out of Five, with Feeding Scars on the Newest Unfurled Leaf

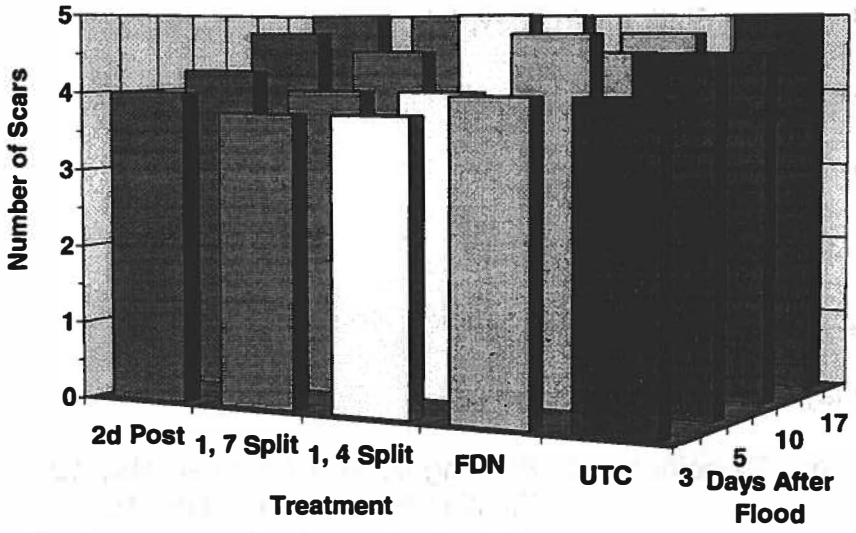
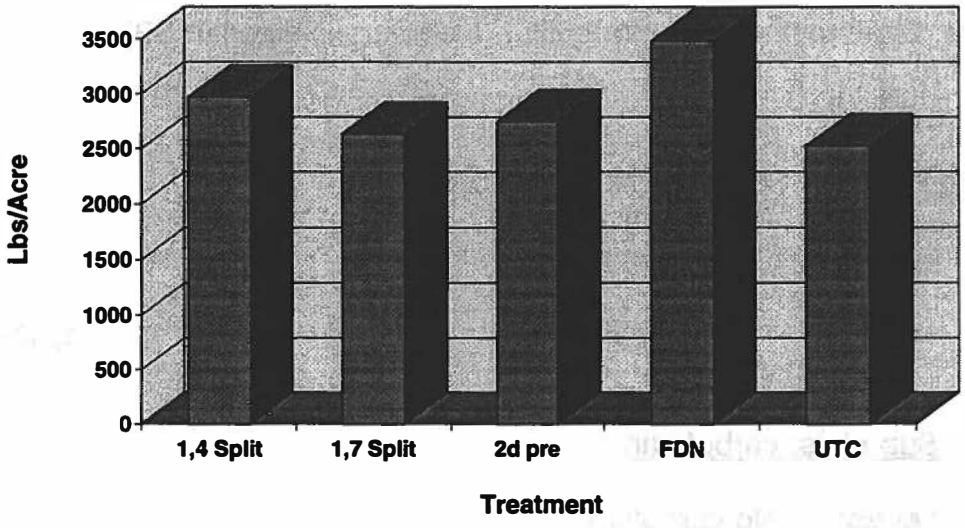


Figure 4. Rough Rice Yield



STUDIES ON THE RELATIONSHIP BETWEEN RICE WATER WEEVIL LARVAL DENSITY AND RICE YIELD IN WATER-SEEDED RICE

J.D. Barbour and D. Ring

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 135 lb/A

Planting Method: Water seeded using pre-soaked seed

Planting Date: May 13, 1995

Water Management: Pinpoint flood: Planting flood established May 12
Planting flood drained May 15
Permanent flood established May 29

Fertilizer Management: 90 lb N/A (N:P:K = 13:13:13) applied by hand on May 23
50 lb N/A (N:P:K = 21:0:0) applied by hand on June 28

Herbicides: Propanil applied at 4 lb ai/A on May 23

Fungicides: None

Insecticides: Cypermethrin (Ammo 2.5EC), carbofuran (Furadan 3G)

Plot Size: 5 x 24 ft

Experimental Design: Split-plot with four replicates

Treatments: Main plots; cypermethrin

Levels: 1. treated; 0.25 lb ai/A weekly for 6 weeks beginning June 1
2. untreated

Sub plots; carbofuran

Levels: 1. No carbofuran
2. Carbofuran: 0.20 lb ai/A June 1
3. Carbofuran: 0.40 lb ai/A June 1
4. Carbofuran: 0.60 lb ai/A June 1
5. Carbofuran: 0.80 lb ai/A June 1

Evaluation Criteria: Number of rice water weevil (RWW) larvae per core evaluated weekly for four consecutive weeks beginning June 6

Standardized rough rice yield

Harvested: By hand, Sept 6

Comments: The objective of the study was to estimate the yield loss attributable to RWW damage to water-seeded rice. The existing economic threshold for RWW in Louisiana (five larvae per core sample) is an empirical threshold not based on damage relationship data. Economic thresholds based on damage relationship data are more accurate and less general than those based on empirical data. These thresholds may differ from empirical thresholds and are likely to differ for different crop varieties and crop management practices.

Materials and Methods. Cypermethrin was applied to reduce densities of RWW to near zero. This allowed the examination of the effect of carbofuran on rice yield. Different rates of carbofuran were applied to subplots in the main plots to obtain varying densities of RWW larvae. Permanent flood was applied on 29 May. Rice water weevils were sampled weekly 1 to 4 weeks after permanent flood: 6, 13, 20, and 27 June. Three cores were sampled per plot, and the number of larvae was determined for each core. Rice plots were harvested 6 September, and yield determined from three 1 yd^2 areas per plot. Yields were adjusted to 12% moisture.

The effect of carbofuran on rice yields was examined by regressing standardized yield on carbofuran rate using data from the cypermethrin-treated subplots. Standardized yield was calculated as yield of a subplot divided by the mean yield of subplots treated with cypermethrin within each replication. The effect of carbofuran on RWW density was examined by regressing larval densities from each sample on the carbofuran rate for subplots not treated with cypermethrin. Since few larvae were recovered from the June 6 samples, data from this sample were not used in the analyses of the of carbofuran effects on larval densities on standardized yield. Standardized yield is expected to be one when larval density equals zero. Thus, t-tests comparing the intercept with one were run on models with one independent variable and intercepts were restricted to one for models with more than one independent variable. Mallows' *Cp*, r^2, *MSE*, significance of parameters at $\alpha=0.10$, and plots of residuals as independent variables were used in evaluating how well models predicted the data. Economic injury levels were calculated using regression models, current market values, and management costs.

Results and Discussion. Carbofuran rate was not found to influence standardized yield (Fig. 1). Thus, yields were not adjusted for carbofuran rate. Densities of RWW larvae decreased with increasing rate of carbofuran on 13 and 20 June, but not on 27 June (Table 1, Fig. 2). The model best predicting standardized yield using average larval densities included average larval density and the square of average larval density as independent variables (Table 1). In contrast, the model best predicting standardized yield

using larval densities for each sample did not include the square of larval density (Table 1). Compensation was observed when average larval density was regressed on standardized yield (Fig. 3), but only a linear response was observed when larval density for each sample was regressed on standardized yield (Fig. 4).

Carbofuran was not found to have a phytostimulatory effect on rice yields at the rates used in this experiment. The observed reduction in numbers of RWW on 13 and 20 June indicates that using varying rates of carbofuran was useful in obtaining different densities of RWW. The failure of carbofuran to effect numbers of RWW on the 27 June sample suggested that carbofuran was no longer reducing RWW larval densities 26 days after application.

The relationship between rice yields and RWW larval densities was found to include compensation at low densities and a section of linear yield reduction at greater densities. One larva per core resulted in a yield loss of approximately 80 lb/A. The relationship between rice yields and RWW densities on each sample was linear. One RWW larva per core represented a 2.2 and 1.2% reduction in yield on 13 June and 20 June, respectively. Greater losses were observed when younger plants were injured. Economic injury levels based on the relationship between standardized yield and RWW densities obtained in this study, management costs and market values, ranged from three to seven larvae per core compared with the current economic threshold of five larvae per core (Table 2).

Table 1. Parameters and statistics for models predicting A.) larval density using rates of carbofuran or B.) standardized yield using mean larval density of rice water weevils. Rice Research Station, Crowley, LA, 1995.

Sample	Equation	b_o	b_1	P	MSE	r^2 or R^2	Cp
	A. Larval Density and Rate of Carbofuran						
13 June	$D = b_o + b_1C$	7.07	-8.33	0.0020	8.26	0.42	0.82
20 June	$D = b_o + b_1C$	16.53	-11.58	0.0013	14.86	0.45	0.68
27 June	$D = b_o + b_1C$	.	.	>0.4400	68.18	0.03	1.28
	B. Standardized Yield and Larval Density						
13 June	$Y = b_o + b_1D$	0.9480	-0.0226	<0.0001	0.0065	0.4546	142.79
20 June	$Y = b_o + b_1D$	0.9815	-0.0125	<0.0001	0.0042	0.6495	78.90
27 June	$Y = b_o + b_1D$	0.9900	-0.0089	<0.0001	0.0023	0.8104	26.16
Average	$Y = b_o + b_1D + b_2D^2$ (b_2 = -0.0004; P = 0.0745)	1.0	-0.0101	0.0042	0.0015	0.8727	2.07

C = rate of Carbofuran; D = larval Density; Y = Standardized Yield; b_o = Parameter Estimate of the Intercept; b_1 and b_2 = Parameter Estimate of Slopes; Cp = Mallows' Cp; MSE = Mean Square Error; P = Probability of a Type I Error in Rejecting $Ho : b=0$ Using a t-test; r^2 = Coefficient of Determination; R^2 = Coefficient of Multiple Determination.

Table 2. Economic injury levels in number of rice water weevil larvae per core calculated from the relationship between standardized yield and mean rice water weevil larvae densities, management costs and market values. Rice Research Station, Crowley, LA, 1995.

	Management Costs				
Market Value	*50*	*55*	*60*	*65*	*70*
750	6	6	7	7	7
1000	5	5	5	6	6
1250	4	4	5	5	5
1500	3	4	4	4	4
1750	3	3	3	4	4
2000	3	3	3	3	4

Market values and management costs in dollars per hectare.

Figure1. Influence of carbofuran on rice yield.

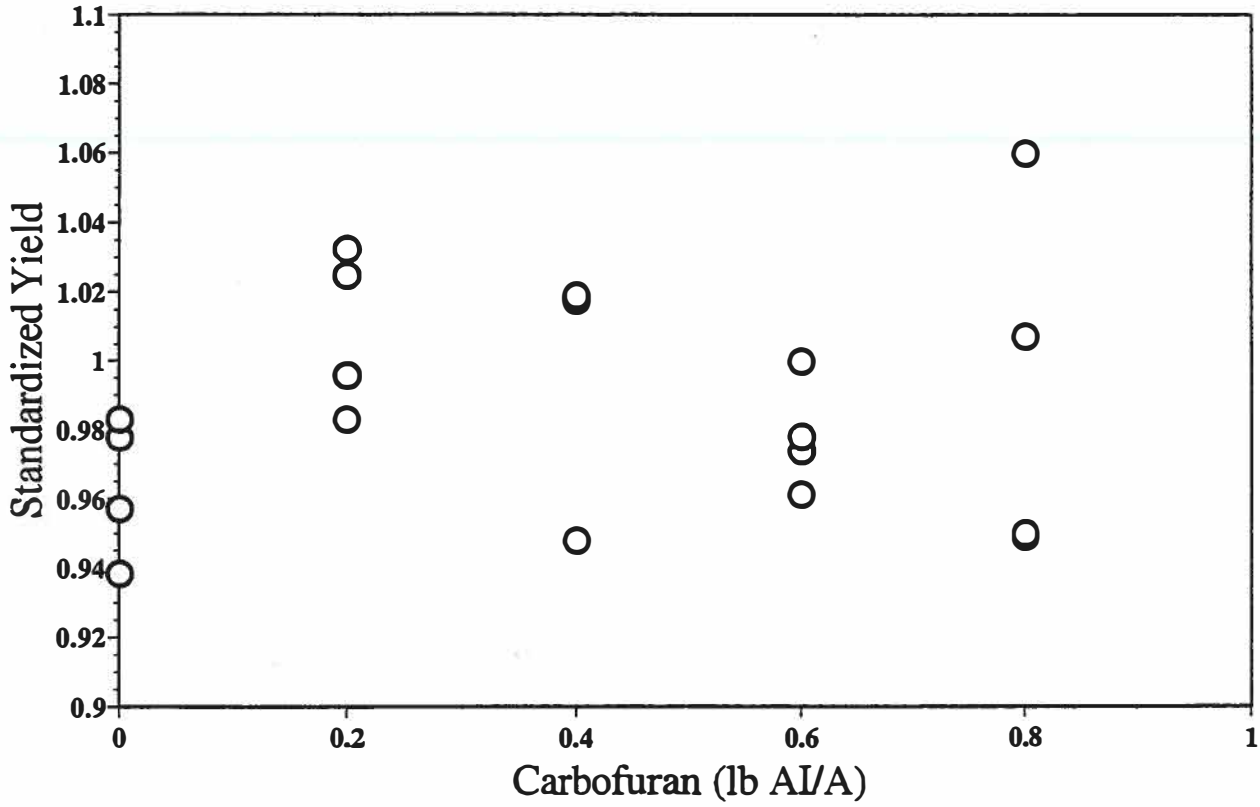


Figure 2. Influence of carbofuran on density rice water weevil larvae.

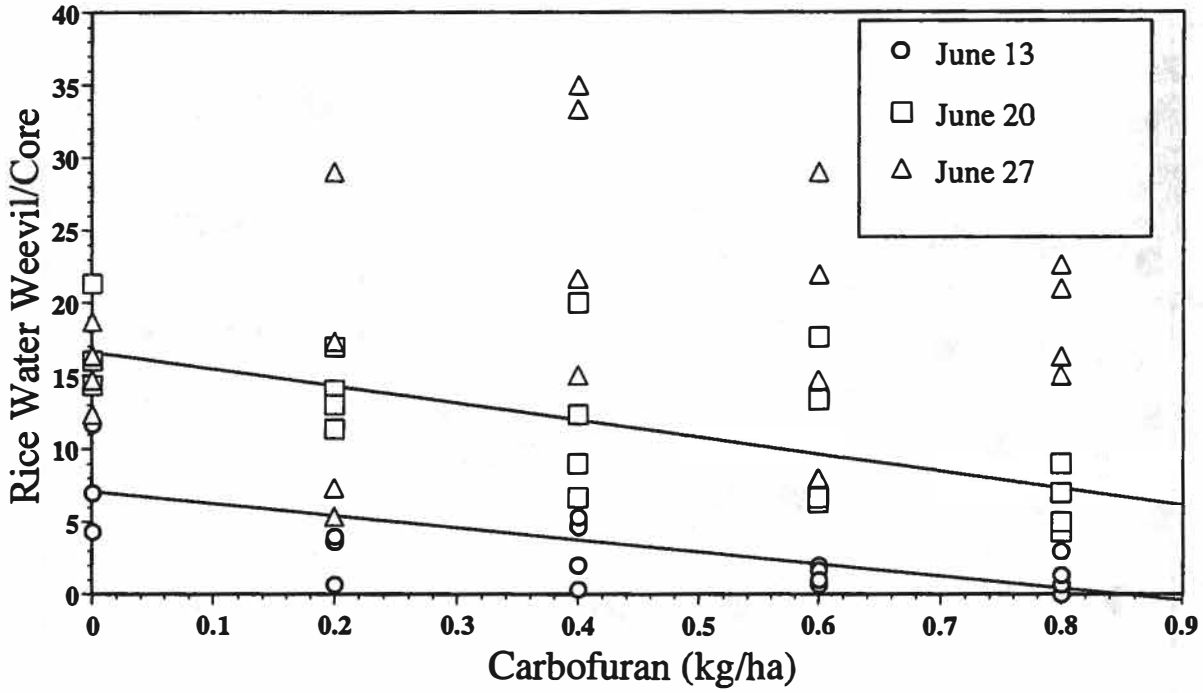


Figure 3. Influence of mean number of rice water weevil larvae per core on rice yield.

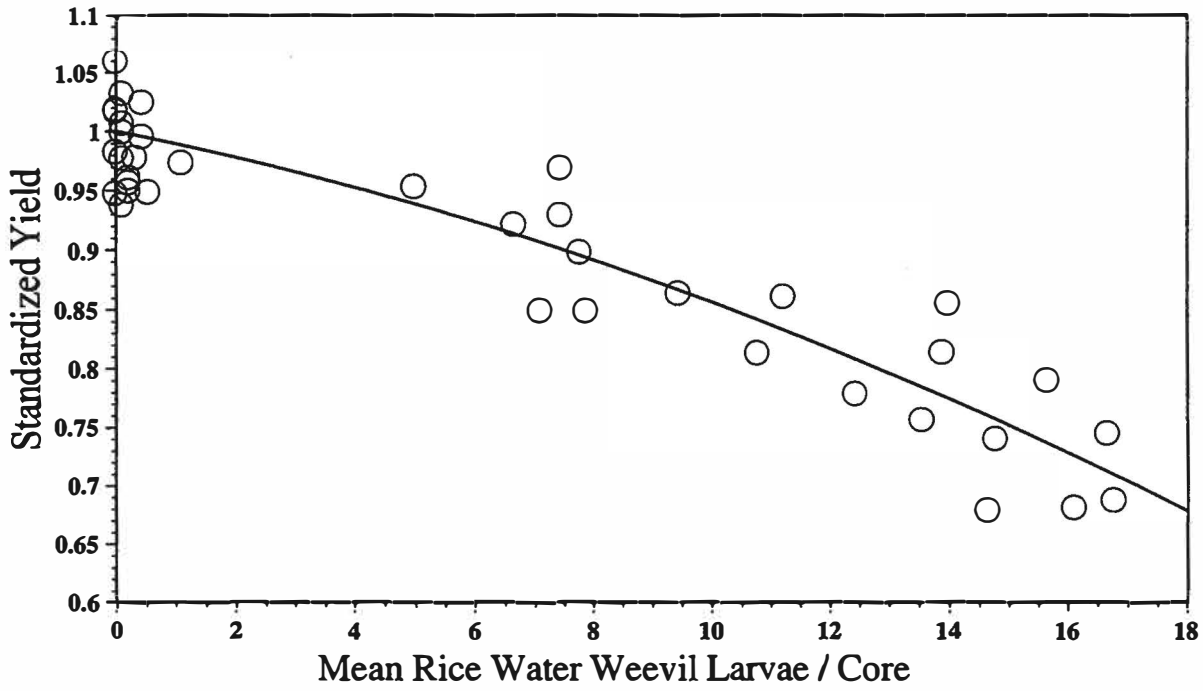
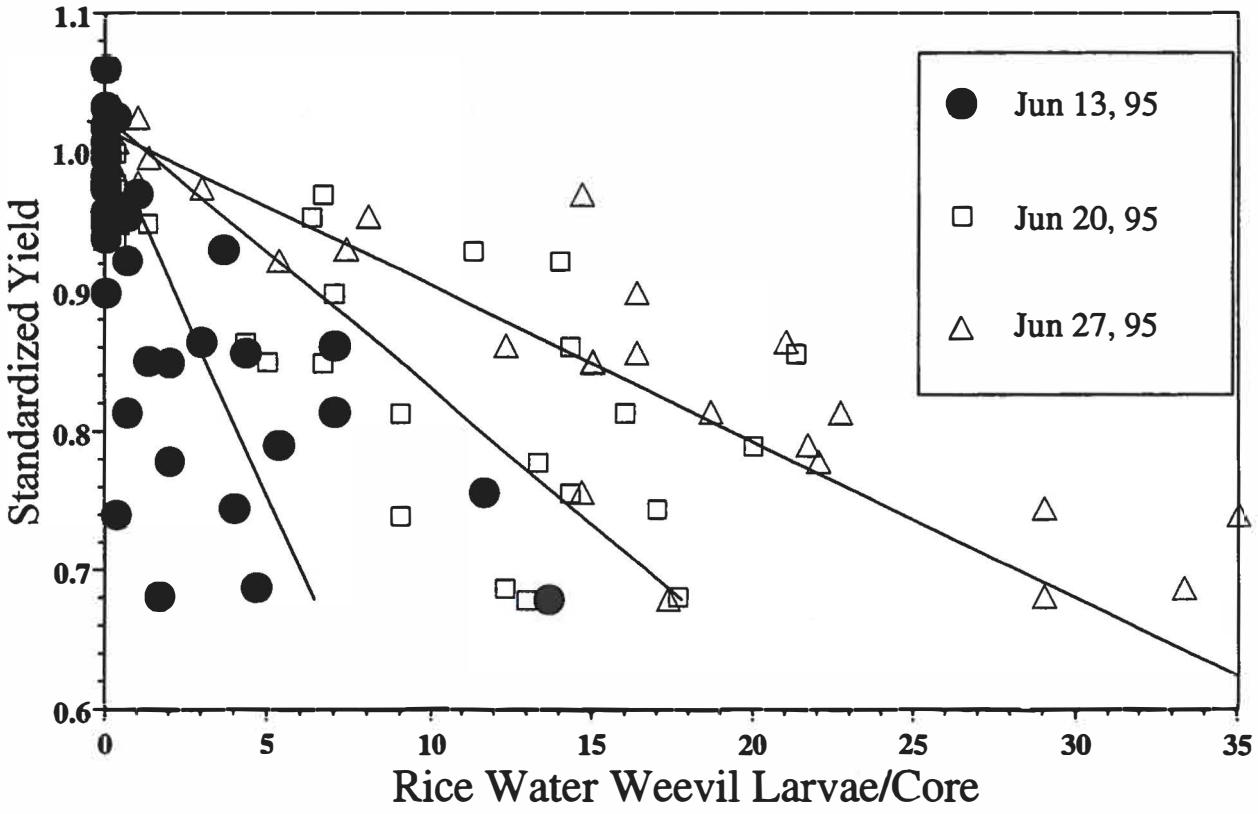


Figure 4. Influence of mean rice water weevil density per core on rough rice yield for three sample periods.



EVALUATION OF FIPRONIL FOR RICE WATER WEEVIL CONTROL

J.D. Barbour, W.C. Rice, M.A. Muegge G.B. Trahan, and P.A. Bollich

Location: Northeast Research Station, Macon Ridge Location, Winnsboro, LA

Soil Type: Gigger silt loam

Variety: Cypress

Seeding Rate: 90 lb/A

Planting Method: Drill seeded using a cone planter with 8-inch row spacing

Planting Date: May 19, 1995

Water Management: Delay flood: Permanent flood established June 20

Fertilizer Management: 47.5 lb N/A (N:P:K = 119:19:19) applied by hand on May 18 to treatments # 1-8 and # 10-11

47.5 lb N/A (N:P:K = 119:19:19) applied by hand on June 19 to treatment # 9

60 lb N/A (N:P:K = 21:0:0) applied by hand on July 10 to all treatments

Herbicides: Arrosolo 3-3E applied at 6 lb ai/A preflood on June 10

Fungicides: None

Insecticides: Fipronil seed treatments applied at-plant using a cone planter

Regent 80 WG applied using a CO_2 powered backpack sprayer delivering 15 gpa at 16 psi with TeeJet 80015VS Flat Spray nozzles

Regent 1.65 G applied by hand-held shaker jars

Furadan 3G applied July 10 using hand-held shaker jars

Plot Size: 5.3 x 12 ft

Treatments:

1. Untreated control
2. Regent 80 WG applied at 0.0325 lb ai/A preplant incorporated*
3. Regent 1.65 G applied at 0.0325 lb ai/A preplant incorporated
4. Fipronil impregnated on granular fertilizer applied at 0.0325 lb ai/A preplant incorporated
5. Fipronil seed treatment formulation #1 applied at 0.015 lb ai/A at plant
6. Fipronil seed treatment formulation #1 applied at 0.0325 lb ai/A at plant
7. Fipronil seed treatment formulation #1 applied at 0.050 lb ai/A at plant
8. Fipronil seed treatment formulation #2 applied at 0.0325 lb ai/A at plant
9. Fipronil impregnated on granular fertilizer applied at 0.0325 lb ai/A preflood
10. Regent 80 WG applied at 0.0325 lb ai/A plus Propanil 4EC applied at 4.0 lb ai/A preflood
11. Furadan 3G applied at 0.60 lb ai/A postflood

* treatments were incorporated using a tractor-drawn tillovator set to a depth of 1"

Experimental Design: Randomized complete block with four replicates

Evaluation Criteria: Number of rice water weevil (RWW) larvae per core evaluated weekly for five consecutive weeks after Furadan application

Plant height and tiller number evaluated 7 weeks after planting and at harvest.

Rough rice yield (lb/A) evaluated at harvest

Harvested: Water removed, Sept 7
Whole plots harvested, Sept 19 using a combine

Comments: Numbers of RWW larvae per core 21 days after flood were significantly higher in untreated and Furadan-treated plots than in fipronil-treated and Regent-treated plots (Fig. 1). There were no significant differences in numbers of RWW per core between fipronil- and Regent-treated plots. Numbers of RWW per core were significantly higher in untreated plots than in fipronil-, Regent-, and Furadan-treated plots 28 days after flood. There were no significant differences in the number of RWW larvae per core among insecticide-treated plots. There were no significant differences among insecticide-treated and untreated plots 34, 42, or 49 days after flood.

Tiller number ranged from 1.1 to 2.1 tillers per core 7 weeks after planting but did not differ significantly among treated and untreated plots (Fig. 2). Plant height, 7 weeks after planting, varied from 18.3 to 21.2 inches but did not differ significantly among treated and untreated plots (Fig. 3). Rough rice yield ranged from 4883 to 5798 lb/A, but there were no statistically significant differences in yield among treated and untreated plots (Fig. 4).

Figure 1. Mean Number of Rice Water Weevil Larvae per Core

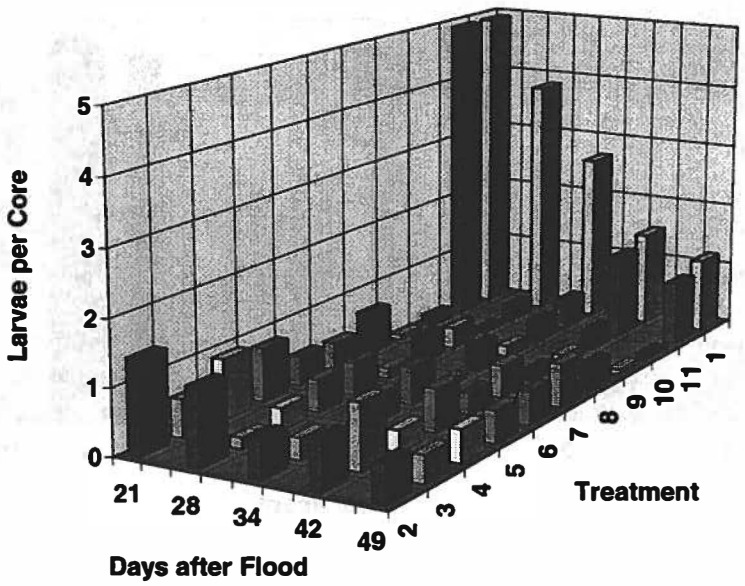


Figure 2. Mean Number of Tillers per Plant

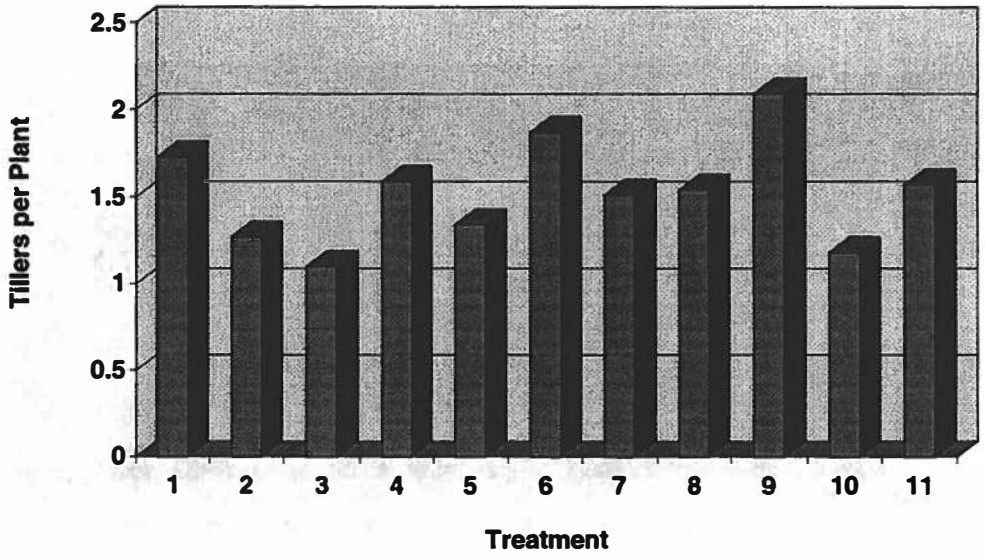


Figure 3. Mean Plant Height Seven Weeks after Planting

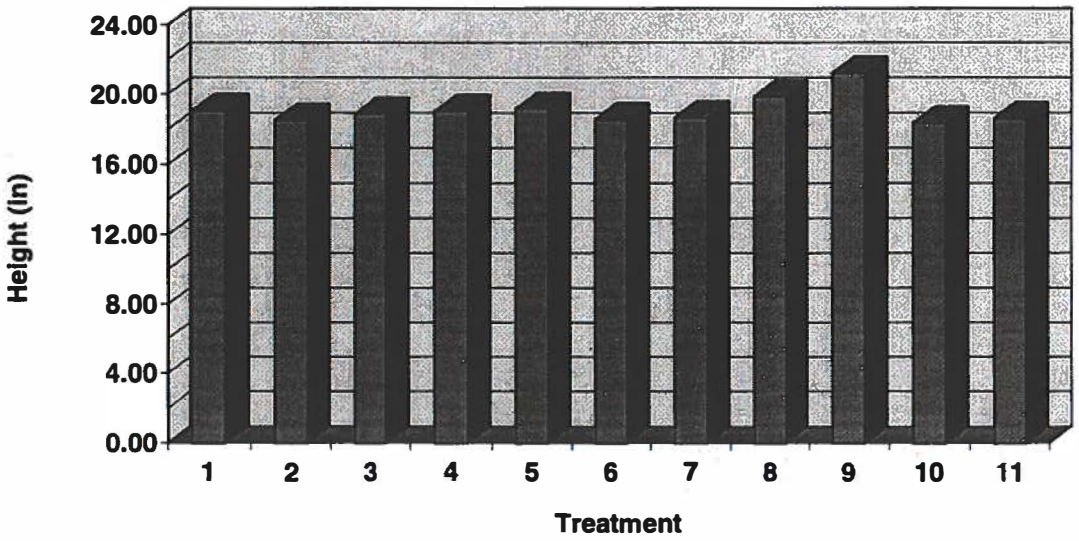
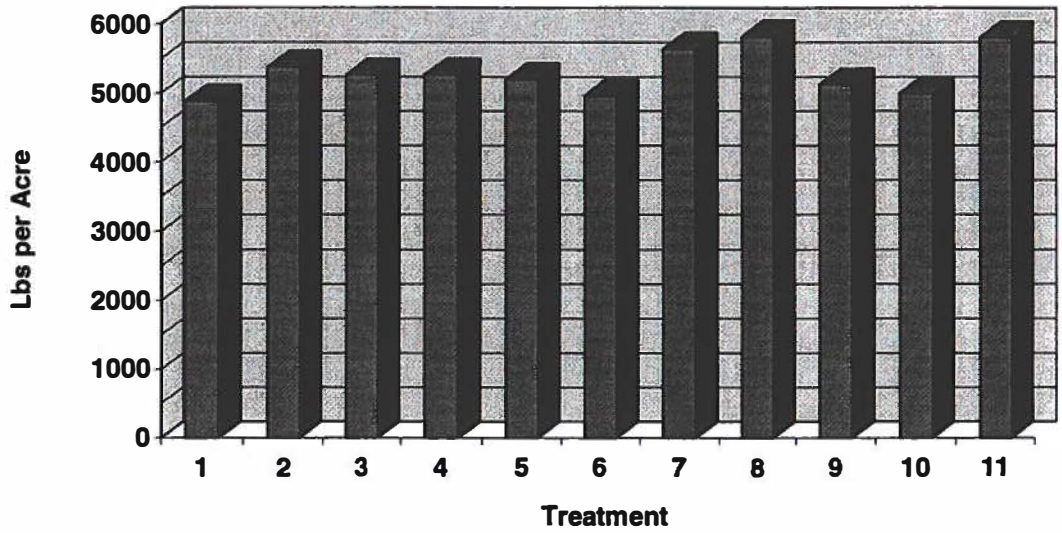


Figure 4. Mean Rough Rice Yield



EVALUATION OF GUARDIAN FOR RICE WATER WEEVIL CONTROL

J.D. Barbour, W.C. Rice, M.A. Muegge, G.B. Trahan, and P.A. Bollich

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 138 lb/A

Planting Method: Water seeded using pre-soaked seed

Planting Date: May 31, 1995

Water Management: Pinpoint flood: Planting flood established May 29
Planting flood drained June 2
Permanent flood established June 8

Fertilizer Management: 90 lb N/A (N:P:K = 13:13:13) applied by hand on June 6
50 lb N/A (N:P:K = 21:0:0) applied by hand on June 28

Insecticides: Guardian spray applied using a CO_2 powered backpack sprayer delivering 15 gpa at 16 psi with TeeJet 80015VS Flat spray nozzles

Furadan 3G applied using hand-held shaker jars

Plot Size: 5 x 18 ft

Treatments:
1. Guardian spray applied at 14.5 oz formulation/A 2 days preflood
2. Guardian spray applied at 14.5 oz formulation/A 1 day postflood
3. Furadan applied at 0.60 lb ai/A at rice water weevil (RWW) threshold
4. Untreated check

Experimental Design: Randomized complete block with four replicates

Evaluation Criteria: Number of RWW eggs/five plants evaluated weekly from permanent flood until RWW threshold.

Number of plants, out of five, with feeding scars on the newest unfurled leaf evaluated weekly from permanent flood until RWW threshold

Number of RWW larvae per core evaluated weekly for 3 consecutive weeks after Furadan application

Rough rice yield (lb/A) evaluated at harvest from one hand-harvested 3 ft^2 sample per plot

Harvested: Water removed Sept 7
Harvested Sept 19

Comments: Guardian spray applied 2 days preflood or 1 day postflood did not reduce the number of RWW larvae per core below that of plants in untreated plots (Fig. 1). Guardian spray did not reduce the number of feeding scars below that in untreated plots (Fig. 2). Guardian spray did not significantly reduce the number of eggs per plant below that of plants in untreated plots (Fig. 3). Guardian spray did not significantly increase rice yield above that of the untreated control plots or the Furadan-treated plots (Fig. 4).

Figure 1. Mean Number of Rice Water Weevil Larvae per Core

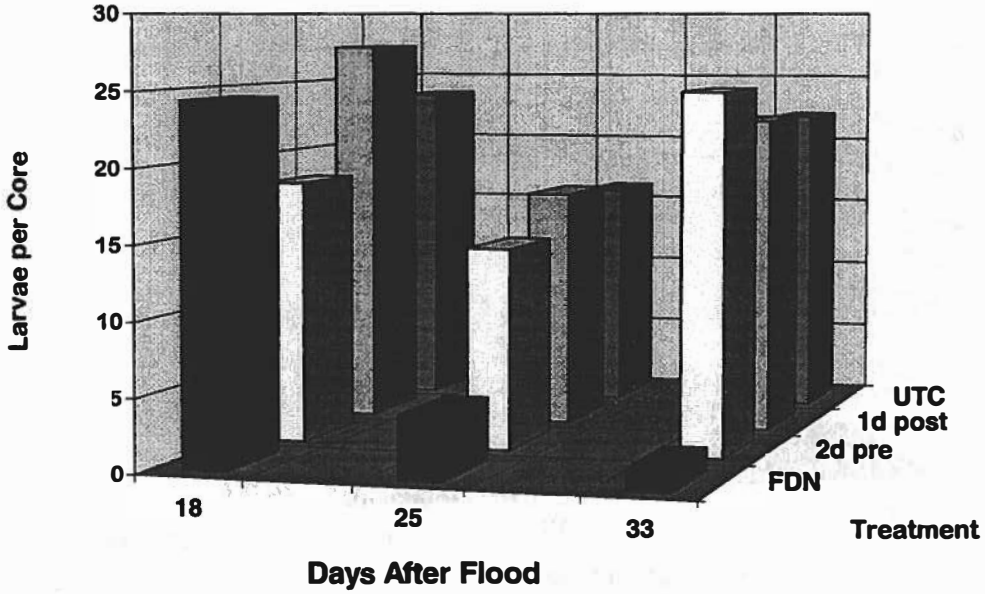


Figure 2. Mean Number of Plants, out of five, with Feeding Scars on the Newest Unfurled Leaf

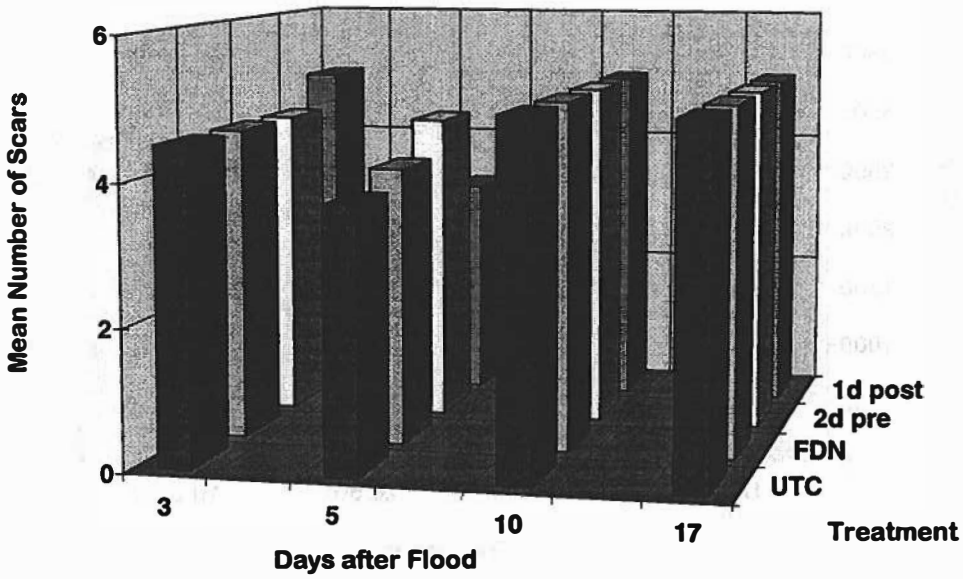


Figure 3. Mean Number of Eggs per Plant

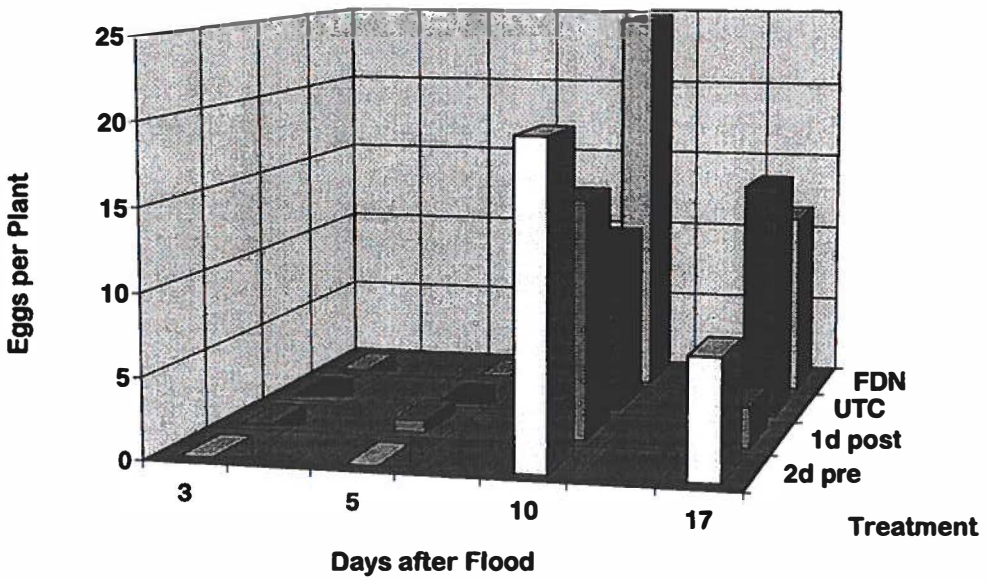
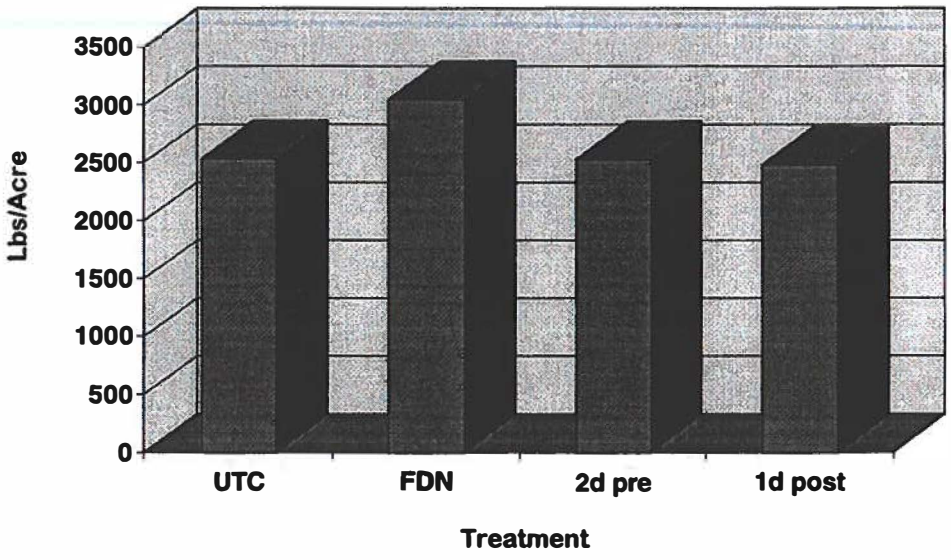


Figure 4. Mean Rough Rice Yield



RICE WATER WEEVIL DEVELOPMENT IN RICE DURING 1994 AND 1995

J.D. Barbour and M.A. Muegge

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 1994, 106 lb/A; 1995, 90 lb/A

Planting Method: Drill seeded with 7-inch row spacing

Planting Date: April 9, 1994; May 24, 1995

Water Management: Approximated a pinpoint flood

Fertilizer Management: 100 lb N/A (N:P:K = 119:19:19) preflood
47.5 lb N/A (N:P:K = 119:19:19) postflood

Herbicides: Propanil applied at 4 lb ai/A preflood

Fungicides: None

Insecticides: None

Plot size: No plots, field size was 80 x 25 ft in 1994; 75 x 80 ft in 1995

Treatments: None

Experimental Design: None, a stratified sampling plan was used in both years

Evaluation Criteria: Number of rice water weevil (RWW) eggs per plant.
Number of RWW larvae per core

Harvested: Not harvested

Comments: The specific objectives of the present study were to 1) generate development curves for first generation RWW in water-seeded rice in Louisiana and 2) evaluate current management recommendations and suggest new management approaches based on the developmental patterns obtained.

Material and Methods. Although rice was drill-seeded, water management, in both years of the study, approximated a pinpoint flood used in water-seeded systems. Fields were flushed as necessary to maintain adequate soil moisture for germination of rice

seeds. Permanent flood was established when seedlings were 2 to 3 inches tall. Water level was raised as seedlings grew until a depth of 4 to 6 inches was reached. This water management strategy was used to insure that RWW would be present in fields as early as possible. Other agronomic practices were standard for water-seeded rice in Louisiana.

A stratified sampling plan was used to sample RWW eggs, larvae, and pupae in both years. The field was divided into 400, 1 ft^2 quadrates in 1994. A 4 x 4 in (ht X dia) core sampler was used to remove a single core of plants and soil from a randomly site in each quadrate. Soil was washed from roots through a 40-mesh sieve, the sieve placed in a saturated NaCl solution, and larvae and pupae floating to the surface collected and placed into scintillation vials containing 70% EtOH. Vials were taken to the laboratory where larvae were sorted into life stage by head capsule size and larvae and pupae counted. Plants from each core sample were taken to the laboratory, the roots and leaves trimmed to within 1 and 4 inches of the crown, respectively, and stored in 70% EtOH to preserve RWW eggs and clear plant tissue of chlorophyll. Leaf sheathes were removed from cleared plants, examined microscopically, and the number of RWW eggs in each plant was counted. Core samples were taken at 1-week intervals for 5 consecutive weeks, beginning 7 days after establishment of permanent flood (DAF). Sampling was similar in 1995 except that the field was divided into 12, 5 x 80 ft strips, 10 cores were removed from each strip, the sampling interval was shortened during the first 3 weeks after flood, and egg and larvae were sampled independently. Larvae were sampled as in 1994 at 2- to 4-day intervals for 28 DAF and 5- to 7-day intervals 28 to 40 DAF. Eggs were sampled at 1- to 3-day intervals for 28 DAF by collecting a single plant from 30 randomly selected sites in each of the 12 strips. Plants were processed and eggs counted as described for 1994 samples.

Results: 1994 (Fig. 1). Peak numbers of RWW eggs (3.7/plant) occurred 9 DAF, then declined steadily to 0.2/plant by 23 DAF. Numbers of first and second instar larvae peaked at 7 and 14 DAF at 1.7/core and 3.9/core, respectively. Third instar larvae first appeared 14 DAF (4.1/core), reached peak numbers (9.8/core) 21 DAF, and declined to 0.6/core by 35 DAF. Fourth instar larvae also first appeared 14 DAF (0.4/core). Numbers of fourth instar were highest 28 DAF (16.5/core) and declined to 6.1/core by 35 DAF. Pupae were first observed 21 DAF (0.1/core) and reached 4.9/core at 35 DAF. Total number of RWW larvae (Fig. 2) was lowest 7 DAF (no larvae), peaked 21 DAF at 29.1/core, and decreased to 7.3 larvae/core by 35 DAF.

Results: 1995 (Fig. 3). RWW eggs and larvae peaks were bimodal in 1995. Egg numbers increased from 0.5/plant 1 DAF to a peak of 3.8 eggs/plant 5 DAF. Numbers of eggs then decreased to 0.9 eggs/plant 9 DAF before increasing to 2.9 eggs/plant 19 DAF and finally dropping to 0.3 eggs/plant by 28 DAF. The two peaks in egg numbers were separated by 14 days. Peak numbers of first and second instar were coincident 16 and 28 DAF with 1.9 and 3.5 larvae/core and 1.1 and 4.2 larvae/core, respectively. Peak numbers of third and fourth instar larvae were also coincident 19 and 35 DAF at 6.0 and 10.6 larvae/core and 6.9 and 13.1 larvae/core, respectively. Total number of RWW larvae was (Fig. 4) lowest on the first collection date 7 DAF when no larvae were found. Peak numbers of 20.1 and 24.7 larvae/core occurred 19 and 28 DAF respectively, before declining to 15.7 larvae/core at the end of the sampling period 40 DAF.

Results: Both Years (Fig. 5). When data from 1994 and 1995 are plotted together on the same time scale, developmental curves for the two years are similar except that development in 1995 is delayed ca. 7 days compared with development in 1994. Also, much of the detail of RWW development in 1995 is lost when viewed as if RWW was sampled once weekly.

Discussion. The data presented indicate at least two significant implications in terms of RWW management strategies. First, development curves for RWW larvae show lower numbers of early (first and second) than later (third and fourth) instar larvae. A normal development curve would show higher numbers of individuals in the earliest life stage. Stage specific mortality would then decrease the numbers of individuals in subsequent life stages. Our data demonstrate an obvious sampling bias favoring recovery of late (third and fourth) instar larvae. The size of this bias can be roughly estimated by examining the ratio of late: early instar larvae at their respective peaks or the ratio of early: total larvae at their respective peaks (Table 1). This indicates that the number of small larvae recovered represents about 23% of the total larvae or about 27% of the large larvae.

In the absence of significant mortality from natural factors or from human intervention, the maximum number of large larvae or total larvae at their respective peaks will be higher than the peak number of small larvae occurring ca. a week earlier and can be estimated by the size of the sampling bias. This is likely to be the case for RWW larvae because their habit of feeding on roots of flooded rice plants provides them protection from many natural mortality factors: there are no known arthropod parasites of RWW larvae and only a few arthropod predators (e.g. immature dragonflies) causing insignificant mortality under natural conditions. This bias may be larger when sampling grower fields under hot, humid conditions using muddy field water than when sampling as described above in a shaded shed using salt-saturated water.

The second interesting piece of information bearing on RWW management is the relatively narrow window in which oviposition occurs. The overwhelming majority of eggs was found during the first 14 DAF in both years of the study. This is significant since registration of carbofuran, which is targeted at larvae, for RWW control is being canceled in 1997. Carbofuran is the only insecticide labeled for RWW control in US-grown rice. Alternative control strategies are urgently needed. Perhaps, strategies directed at reducing ovipositon or preventing larval emergence from eggs should be investigated.

Table 1. Numbers of small (instars 1 & 2), large (instars 3 & 4) and total (instars 1-4) larvae at peak and small larvae as a percentage of large and total larvae for 1994 and 1995. Rice Research Station, Crowley, LA.

Year	Peak	Instar No.			Small (1st & 2nd) as a % of:	
		1st & 2nd	3rd & 4th	Total	Large	Total
1994	1	5.6	25.4	29.1	22	19
1995	1	5.4	16.5	20.6	33	26
	2	5.3	19.9	23.5	27	23
Mean		**5.4**	**20.6**	**24.4**	**27**	**23**
(± Std. Err.)		± 0.2	± 4.5	± 4.3	± 3.2	± 2.1

Figure 1. Number of rice water weevil eggs per plant and larvae per core for each instar in 1994.

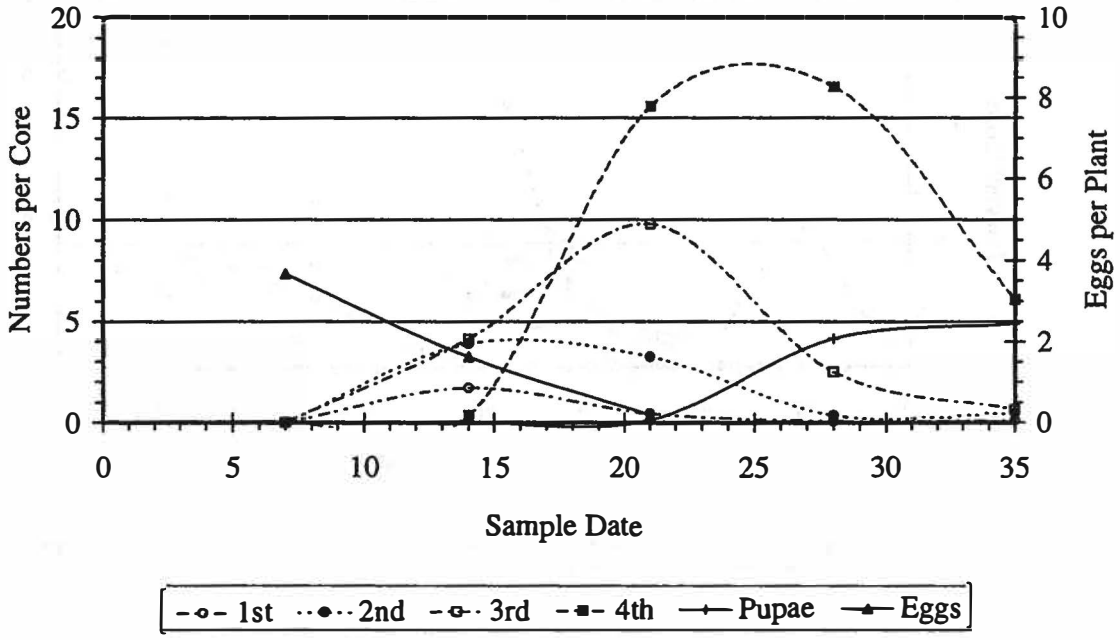


Figure 2. Total number of rice water weevil per core in 1994.

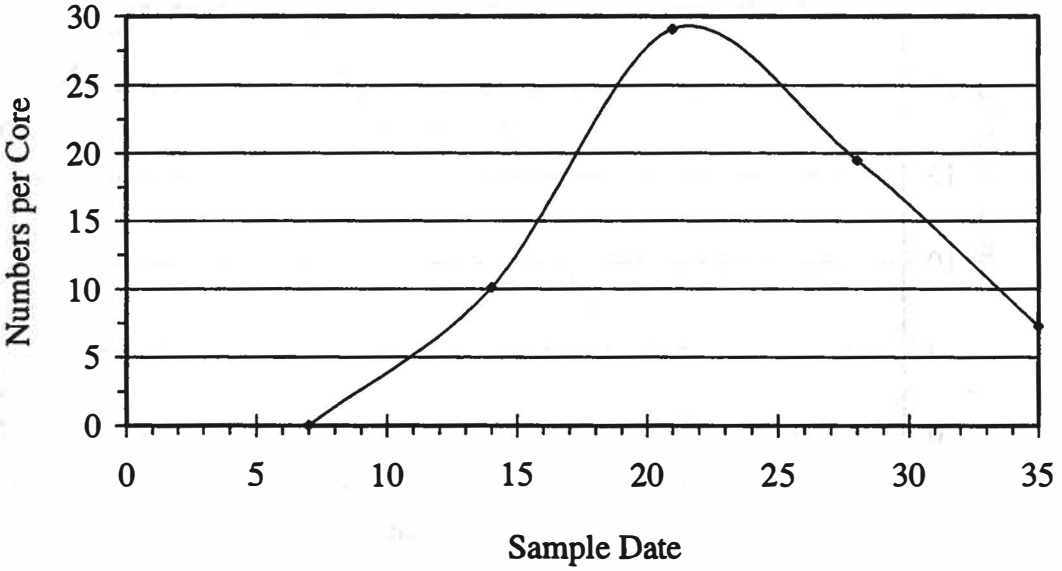


Figure 3. Number of rice water weevil eggs per plant and larvae per core for each instar in 1995.

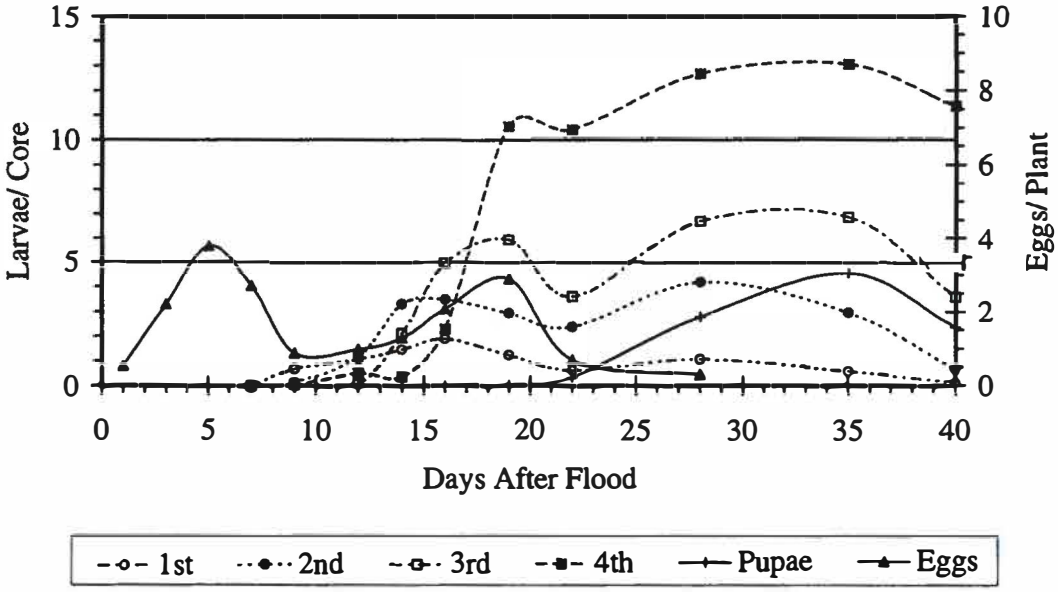


Figure 4. Total number of rice water weevil per core in 1995.

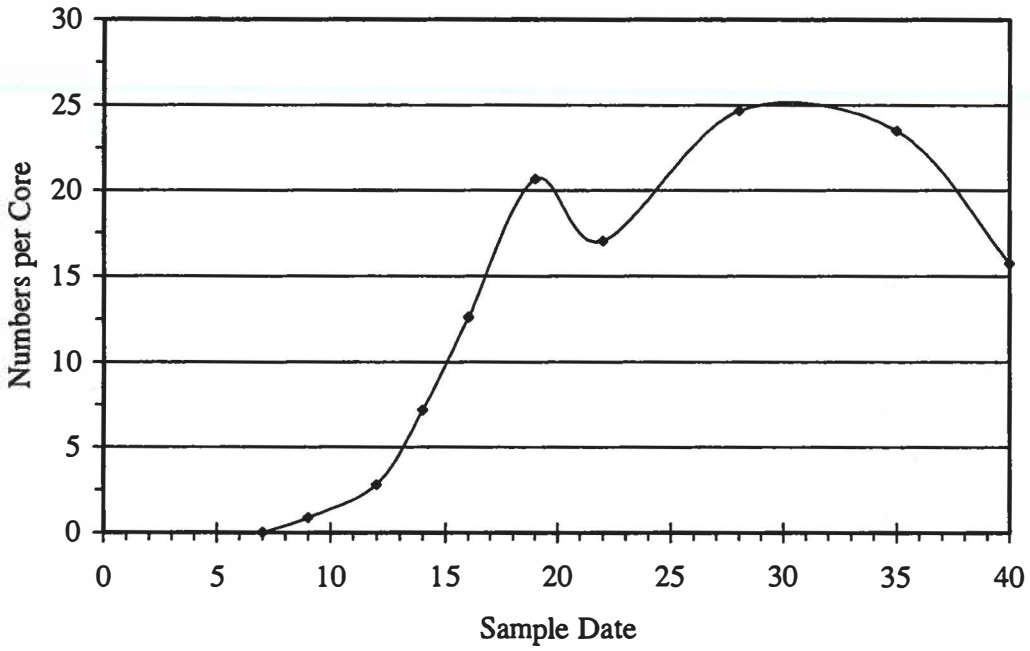


Figure 5. Number of rice water weevil eggs and early (1st & 2nd) and late (3rd & 4th) instar larvae vs. days after permanent flood. plotted on the same time scale for comparison.

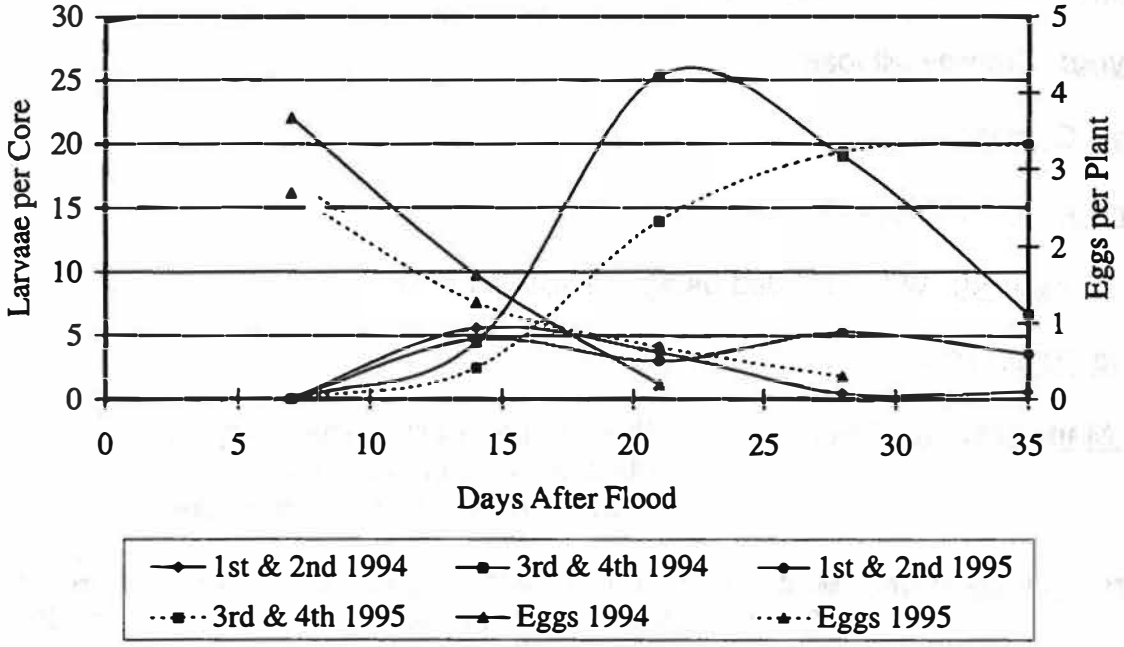


Table 1. Numbers of small (instars 1 & 2), large (instars 3 & 4) and total (instars 1-4) larvae at peak and small larvae as a percentage of large and total larvae for 1994 and 1995. Rice Research Station, Crowley, LA.

		Instar No.			Small(1st & 2nd) as a % of:	
Year	Peak	1st & 2nd	3rd & 4th	Total	Large	Total
1994	1	5.6	25.4	29.1	22	19
1995	1	5.4	16.5	20.6	33	26
	2	5.3	19.9	23.5	27	23
Mean		**5.4**	**20.6**	**24.4**	**27**	**23**
(± Std. Err.)		± 0.2	± 4.5	± 4.3	± 3.2	± 2.1

EVALUATION OF KARATE FOR RICE WATER WEEVIL CONTROL

J.D. Barbour, M.A. Muegge, W.C. Rice, G.B. Trahan, and P.A. Bollich

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 138 lb/A

Planting Method: Water seeded using pre-soaked seed

Planting Date: May 31, 1995

Water Management: Pinpoint flood: Planting flood established May 29
Planting flood drained June 2
Permanent flood established June 8

Fertilizer Management: 90 lb N/A (N:P:K = 13:13:13) applied by hand on June 6
50 lb N/A (N:P:K = 21:0:0) applied by hand on June 28

Insecticides: Karate 1EC applied using a CO_2 powered backpack sprayer delivering 15 gpa at 16 psi with TeeJet 80015VS Flat Spray nozzles

Furadan 3G applied using hand-held shaker jars

Plot Size: 5 x 18 ft

Treatments
1. Karate 1EC applied at 0.03 lb ai/A 2 days preflood
2. Karate 1EC applied at 0.03 lb ai/A 1 day postflood
3. Karate 1EC applied at 0.03 lb ai/A 5 days postflood
4. Karate 1EC applied at 0.03 lb ai/A 10 days postflood
5. Furadan applied at 0.60 lb ai/A at rice water weevil (RWW) threshold
6. Untreated check

Experimental Design: Randomized complete block with four replicates

Evaluation Criteria: Number of RWW eggs/five plants evaluated weekly from permanent flood until RWW threshold.

Number of plants, out of five, with feeding scars on the newest unfurled leaf evaluated weekly from permanent flood until RWW threshold

Number of RWW larvae per core evaluated weekly for 3 consecutive weeks after Furadan application

Rough rice yield (lb/A) evaluated at harvest from one hand-harvested 3 ft^2 sample per plot

Harvested: Water removed, Sept 7; harvested, Sept 19

Comments: There were some instances where numbers of RWW per core were numerically lower in some treatments (i. e. Karate applied 2 days preflood and sampled 18 days postflood; Furadan sampled 33 days postflood) than others. However, there were no statistically significant differences in the number of RWW larvae per core between treated and untreated plots on any sample date (Fig. 1), and there were no statistically significant differences in the number of RWW eggs per plant in treated and untreated plots for any sample date (Fig. 2).

Three and 5 days after flood, the number of plants with RWW feeding scars on the newest unfurled leaf was significantly lower in plots treated 2 days preflood and 1 day postflood with Karate than in other treated and untreated plots (Fig. 3). Ten days after flood, the number of plants with feeding scars on the newest unfurled leaf was significantly lower in plots treated 5 days postflood with Karate than in plots treated 10 days after flood with Karate or in Furadan-treated plots. There were no differences in the number of plants with feeding scars on the newest unfurled leaf between treated and untreated plots in 17 days after flood. There were no significant differences in yield between treated and untreated plots (Fig. 4)

Few statistically significant differences were found in the evaluation criteria between untreated and Karate-treated plots. However, RWW oviposition is usually expected to begin immediately after flood, and the number of eggs per plant is usually expected to reach maximum numbers during the first week after flood. In these experiments, oviposition was delayed, with peak egg numbers occurring about 10 days after flood (Fig. 2). Timing of the Karate applications may have been too early, with respect to numbers of ovipositing RWW, to be effective. Karate treatments appeared to have a negative effect the feeding activity of adult RWW (Fig. 3).

Figure 1. Mean Number of Rice Water Weevil Larvae per Core

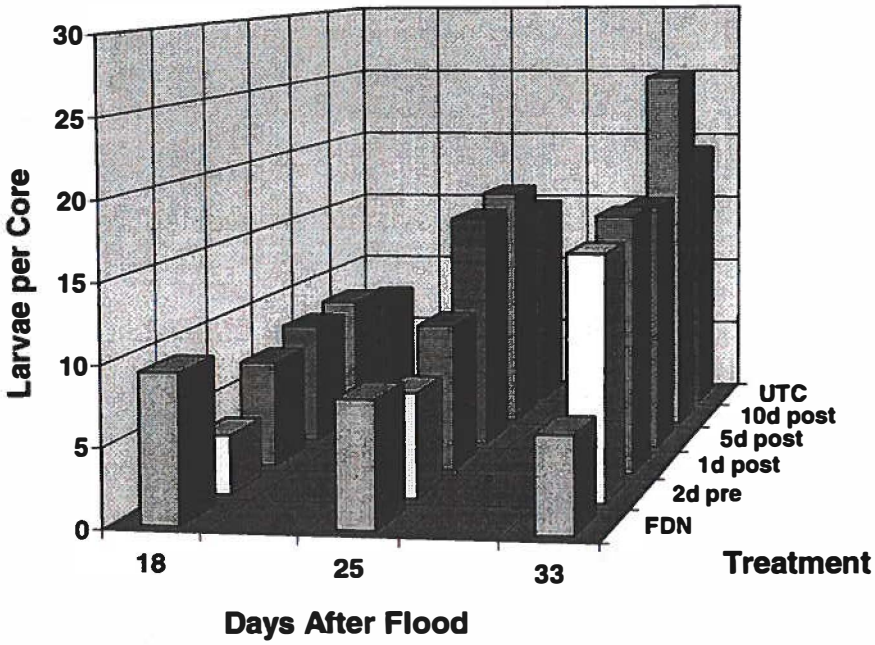


Figure 2. Mean Number of Eggs per Plant

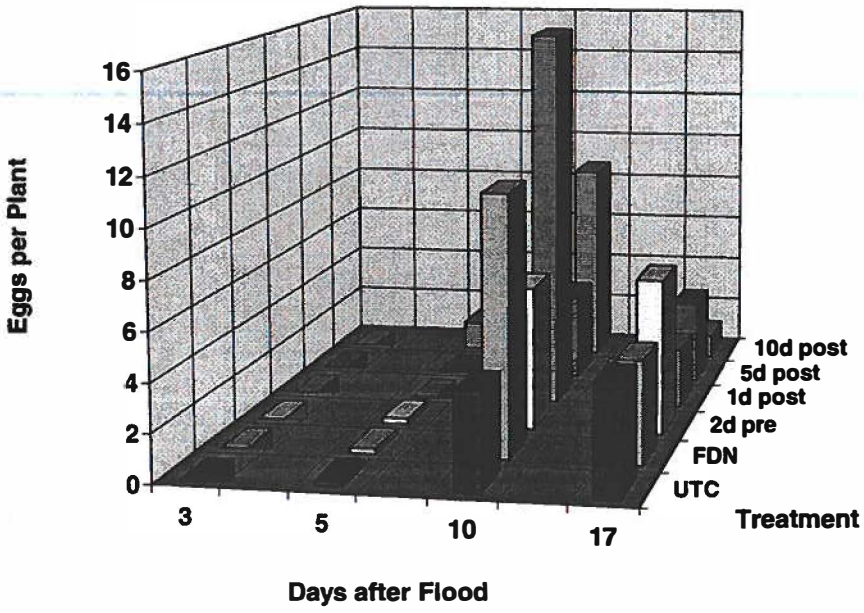


Figure 3. Mean Number of Plants, out of 5, with Feeding Scars on the Newest Unfurled Leaf

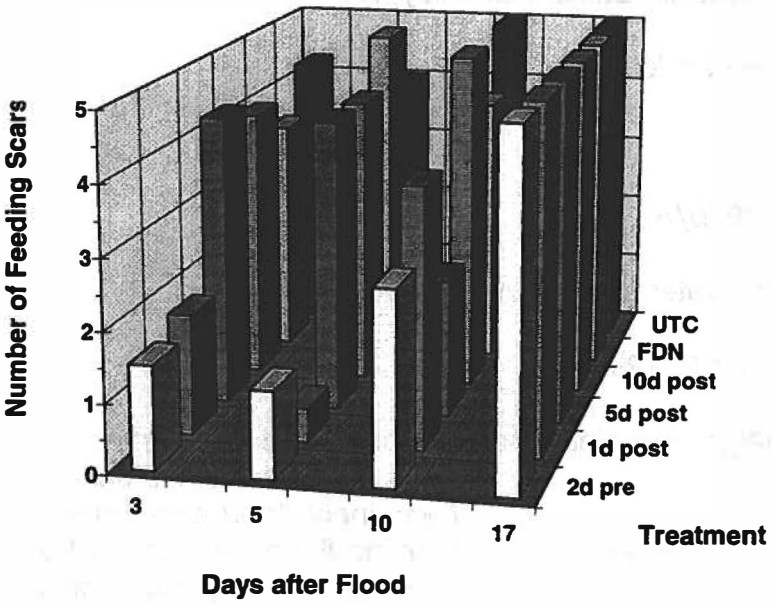
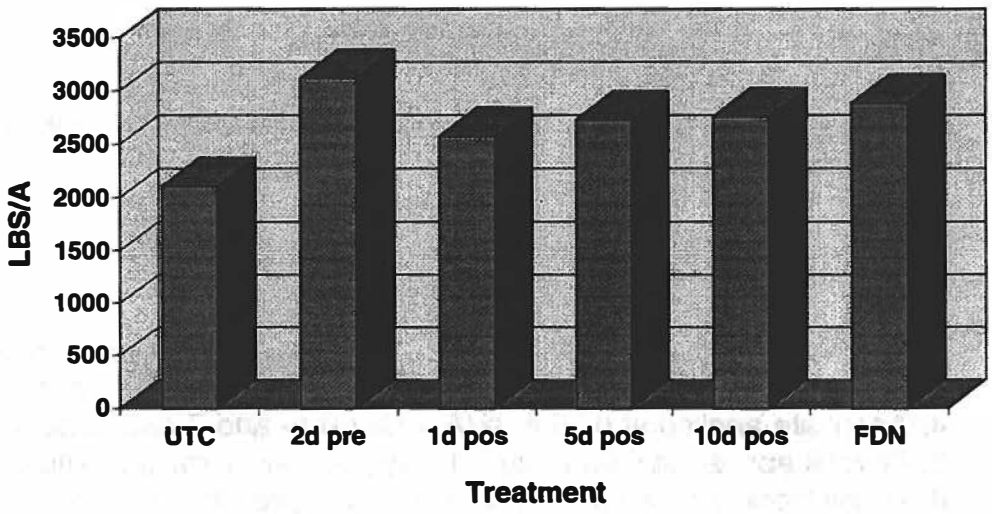


Figure 4. Rough Rice Yield



EVALUATION OF INSECTICIDES AND WATER MANAGEMENT FOR RICE WATER WEEVIL CONTROL

J.D. Barbour and M.A. Muegge

Location: Rice Research Station, Crowley, LA

Soil Type: Crowley silt loam

Variety: Cypress

Seeding Rate: 138 lb/A

Planting Method: Water seeded using pre-soaked seed

Planting Date: June 2, 1995

Water Management: Pinpoint flood: Planting flood established May 31
Planting flood drained June 4
Permanent flood established June 9
Delay flood: Planting flood established May 31
Planting flood drained June 4
Permanent flood established June 12

Fertilizer Management: 90 lb N/A (N:P:K = 13:13:13) applied by hand on June 8
50 lb N/A (N:P:K = 21:0:0) applied by hand on June 28

Herbicides: None

Fungicides: None

Insecticides: Spinosad, azidiractin (Azatin), acephate (Orthene 75S), fipronil (Regent), Imadicloprid (Admire)

Plot Size: 5 x 18 ft

Treatments
1. UTC
2. Spinosad applied at 0.25 lb ai/A 1 day pre- and 7 days postflood
3. Azidiractin applied at 0.03 lb ai/A 1 day pre- and 7 days postflood
4. Acephate applied at 0.75 lb ai/A 1 day pre- and 7 days postflood
5. Fipronil applied at 0.05 lb ai/A 1 day pre- and 7 days postflood
6. Imadicloprid applied at 0.25 lb ai/A 1 day pre- and 7 days postflood
7. Rice water weevil (RWW) threshold drain: Drain, June 21; reflood, June 28
8. Pre-RWW threshold drain: Drain, June 16; reflood, June 23
9. Delay flood: Flush as necessary; flood, July 12

Experimental Design: Randomized complete block with four replicates

Evaluation Criteria: Number of RWW larvae per core evaluated weekly for 3 consecutive weeks after Furadan application

Harvested: Not harvested

Comments: The objective of the study was to evaluate the efficacy of several pesticides and water management regimes for control of RWW. Although the economic threshold drain treatment may cause some increase in mortality of RWW larvae, the major target of the treatments in this study was adult RWW. Therefore, statistically significant treatment effects were assumed to result from increased mortality of and/or reduced oviposition by RWW adults. Results are presented in relation to the economic threshold for RWW, an average of five larvae per core sample.

In pesticide-treated plots, only imadicloprid significantly ($P \leq 0.05$) reduced numbers of RWW larvae below numbers found in untreated control plots (Fig. 1). Numbers of RWW larvae in acephate- and fipronil-treated plots were numerically, but not statistically, lower than those in control plots. In water management plots (Fig. 2), numbers of RWW larvae in pre-economic threshold drain plots and delay flood plots were numerically lower than those in control plots. However, only the delay flood plots had statistically lower numbers of RWW than control plots. The number of RWW larvae in this study was low, just reaching threshold levels in control plots. Statistical separations may be better with higher numbers of larvae.

Figure 1. Mean number of Rice Water Weevil Larvae per Core in Pesticide Plots

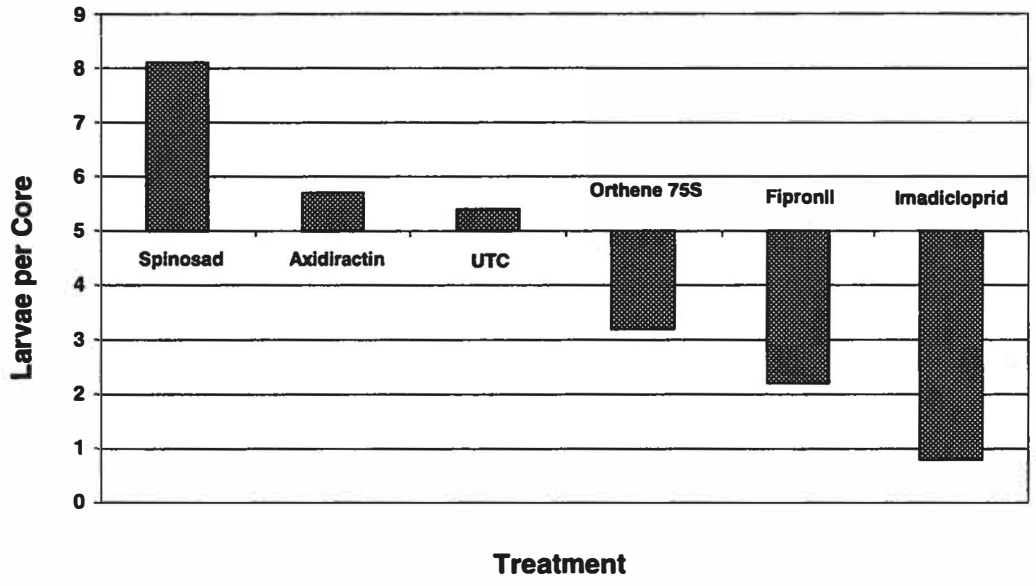
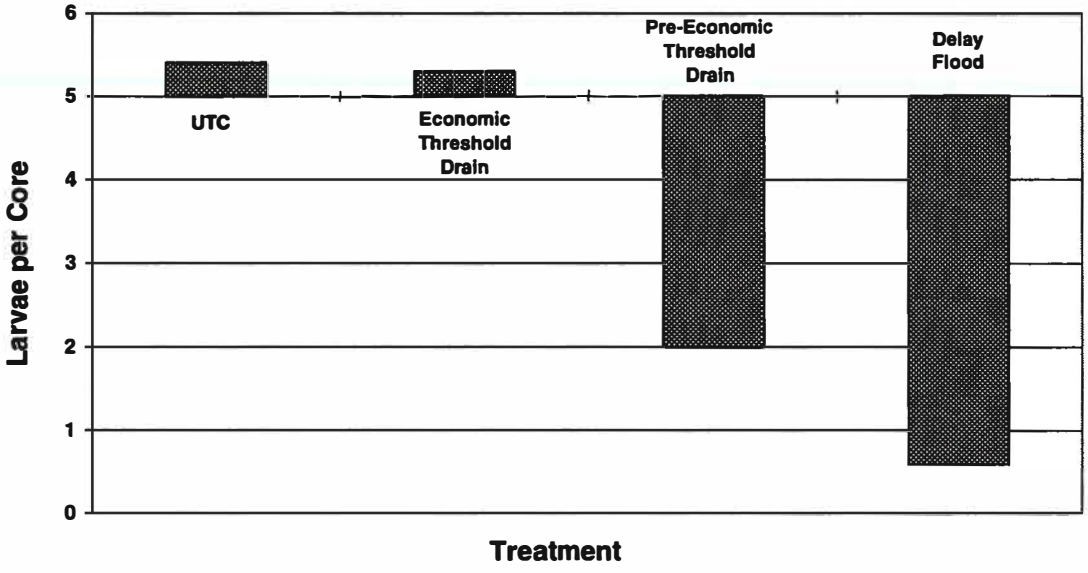


Figure 2. Mean Number of Rice Water Weevil Larvae per Core in Water Management Plots



ASSESSMENT OF IMIDAZOLINONE-RESISTANT RICE

T.P. Croughan, H.S. Utomo, D.E. Sanders, and M.P. Braverman

INTRODUCTION

A total of five tests were conducted during the summer of 1995 with an Imidazolinone-resistant rice line (Imi-rice). Two tests were conducted on the Main Station and three on the South Farm Unit of the Rice Research Station. The Main Station tests involved application at either the 1-leaf stage of rice maturity (3 days after emergence) or at the 3- to 4-leaf stage (17 days after emergence) to rice planted at 125 lb/A. The South Farm tests consisted of three studies in a research area very heavily infested with red rice. A total of 15 drill strips of Imi-rice was planted the length of the field at 90 lb/A. The drill strips were then divided into three equal sections for the three tests. The first study conducted was a true pre-emergence test, in which herbicide treatments were applied to the dry soil surface before flushing to initiate germination the following day. Herbicide applications for the second and third tests in the field were applied 19 days later to rice at the 3-leaf stage of development. One of these post-emergence tests (identified as Test 2) entailed the same treatments applied in the pre-emergence study. This should allow a direct comparison between pre- and post-emergence herbicide applications. The third study (Test 3) was treated on the same date with a variety of additional mixtures of different Imidazolinones and combinations of Imidazolinones with propanil and Prowl.

The two tests on the Main Station, which is red rice-free, were conducted using plots of Imi-rice and comparison plots of the rice variety Bengal to simulate red rice. Bengal has the same maturity as red rice. Injury ratings were collected on several dates for each variety, barnyardgrass control was determined, and yield information was collected on these plots. Plots in these tests were 7 rows wide by 30 feet long, with three replicate plots per treatment, whereas plots on the South Farm were 15 feet in length and 9 rows wide. Herbicide treatments for both the Main Station and the South Farm tests were applied with a backpack sprayer calibrated to deliver 10 gpa through 8001VS nozzles at 32 psi. Injury ratings and red rice control data were collected from these plots.

Results from all treatments, along with statistical analyses, are included (Table 1-15). The following section summarizes the results with each herbicide across the different tests.

PURSUIT

Summary: Overall, control of red rice at the South Farm red rice area using Pursuit was excellent, with 3-rep averages as high as 93%. Control ratings for Bengal rice on the Main Station were as high as 98%. Injury ratings for Imi-rice treated with Pursuit were statistically the same as the untreated checks, though the actual numbers were frequently lower. Yields do not appear to be reduced by Pursuit. Treatment at the 0.063 lb ai/A rate produced the highest yield in one of the two Main Station tests. The Pursuit + Prowl treatment yielded more than the check, and treatment with Pursuit at 0.094 lb ai/A alone

did not significantly affect yield. Tests in the red rice area indicate that adding Prowl and propanil to Pursuit generally increase red rice control activity at the 0.063 lb ai/A Pursuit rate, without concurrently increasing injury to the Imi-rice.

Pursuit consistently performed well in the tests, with respect to both red rice control and level of tolerance by the Imi-rice. In the Main Station test in which treatments were applied at the 1-leaf stage, Pursuit at 0.063 lb ai/A provided 93% control of Bengal with an injury rating to the Imi-rice of 8% at 51 DAT. This injury level was not statistically different from the control (which was 5%), and yields for this treatment were the highest in this test. The Pursuit treatment of 0.094 lb ai/A in the test caused more injury initially, but the 51 DAT rating was again 8% and the yield was only slightly below and statistically the same as the check.

In the 3- to 4-leaf stage test, Pursuit at 0.063 lb ai/A provided 97% control of Bengal at 37 DAT (the last rating taken, when the Imi-rice line was starting to flower). Injury to the Imi-rice was 0%. Yields were reduced slightly but not statistically different from the check.

Combining Pursuit with Prowl worked well. In the 3- to 4-leaf stage test, this yielded higher than Pursuit alone, averaging 7100 lb/A compared with the check yield of 7252 lb/A, which were not statistically different. Control of Bengal was 100%, and injury to the Imi-rice was 0%. In the 1-leaf stage test, this treatment yielded slightly more than the check and injury was 2%.

Pursuit also worked well in the red rice area tests. The pre-emergence test included Pursuit treatments of 0.032, 0.063, 0.094, and 0.125 lb ai/A. The lowest rate of Pursuit applied pre-emergence does not appear to give satisfactory red rice control. Averaging the values of the four ratings made from 20 DAT to 56 DAT indicates red rice control of 74% and injury to the Imi-rice of 7% (same as untreated check) for 0.063 lb ai/A; 81% red rice control and 6% injury for 0.094 lb ai/A; and 86% red rice control and 1% injury for 0.125 lb ai/A. The mixture of Pursuit at 0.063 lb ai/A + Prowl at 1.0 lb ai/A gave pre-emergence red rice control that averaged 85% with 5% injury.

The two post-emergence tests in the red rice area indicated that Pursuit applied alone may be somewhat more effective applied post- rather than pre-emergence. Averaging the three ratings taken at 16, 30, and 37 DAT, red rice control and injury to the Imi-rice were 78 and 5%, respectively, for the 0.063 lb ai/A treatment. At both the 0.094 and 0.125 lb ai/A rates, red rice control averaged 89% and Imi-rice injury 8%. The check plots in this test averaged 6% injury. The mixture of 0.063 lb ai/A Pursuit + 1 lb ai/A Prowl gave red rice control of 83% and Imi-rice injury of 7%.

Test 3 in the red rice area indicated that mixing propanil with Pursuit or with the mixture of Pursuit + Prowl is beneficial. Adding propanil at 3 lb ai/A to Pursuit at 0.063 lb ai/A increased average red rice control from 78% for Pursuit alone to 88% for the mixture with propanil. Injury to the Imi-rice was also slightly reduced to 4%. Adding propanil to Pursuit + Prowl also improved red rice control from 83 to 88%, with a reduction of Imi-rice injury from 7 to 3% (check plots in this test averaged 5% injury).

SCEPTER

Summary: Overall, Scepter gave excellent red rice control and appears to be the Imidazolinone to which the Imi-rice is most tolerant. A Scepter and Prowl mix (0.125 and 1 lb ai/A, respectively) was the highest yielding treatment in the Main Station tests, yielding 6% more than the check. In the red rice area tests, Scepter applied pre-emergence at 0.063, 0.125, 0.188, and 0.250 lb ai/A gave essentially the same red rice control and low injury to the Imi-rice line as Pursuit. Post-emergence applications generally gave about 5% higher red rice control than pre-emergence applications at the same rate, without increased injury to the Imi-rice. At the final rating date of 37 DAT, injury values for all four rates of Scepter were the same or lower than the unsprayed check. Adding propanil to Scepter (0.125 lb ai/A Scepter + 3 lb ai/A propanil) increased red rice control from an average of 77% for post-emergence Scepter alone to 88% for the mixture. Adding 1 lb ai/A Prowl to this mixture gave 89% control of red rice with 4% injury to the Imi-rice. Increasing the Scepter rate to 0.188 lb ai/A in the Scepter + Propanil mixture gave 91% control of red rice with only 3% injury to the Imi-rice. The injury rating for the untreated checks in this test (Test 3) was 5%.

Scepter essentially performed as well as, and in some cases better than, Pursuit in these tests. While Pursuit at 0.063 lb ai/A produced the highest yields in the 1-leaf test on the Main Station, plots treated with Scepter at 0.125 lb ai/A averaged only 19 lb/A less (7173 vs. 7154 lb/A). In the 3- to 4-leaf test, Scepter + Prowl was the highest yielding treatment, and between the two yield tests conducted, was the highest yielding treatment overall. In the 3- to 4-leaf test, the Scepter + Prowl plots averaged 7662 lbs/A, compared with the check yield of 7252 lb/A. Scepter at 0.125 lb ai/A gave an average of 90% control of Bengal rice with 0% injury to the Imi-rice. Scepter + Prowl gave 88% control of Bengal, again with 0% injury.

In the pre-emergence test in the red rice area on the South Farm, rates of Scepter evaluated were 0.063, 0.125, 0.188, and 0.250 lb ai/A. At 0.063 lb ai/A, the average across the four ratings made were 57% for red rice control and 9% for injury to the Imi-rice line. At 0.125 lb ai/A, red rice control was 73% and Imi-rice injury 3%; at 0.188 lb ai/A, red rice control was 81% and Imi-rice injury 2%; and at 0.250 lb ai/A red rice control averaged 86% and Imi-rice injury averaged 10%. Injury to the untreated check averaged 7% in this test. The mixture of Prowl (1 lb ai/A) and Scepter (0.125 lb ai/A) gave average red rice control of 81% and Imi-rice injury of 10%.

Application of Scepter at the 3-leaf stage gave somewhat higher rates of red rice control. At 0.125 lb ai/A, control increased from 73 to 77%, and Imi-rice injury was 3%. At 0.188 lb ai/A, red rice control was 88% and Imi-rice injury was 7%. At 0.250 lb ai/A, red rice control averaged 89% and Imi-rice injury averaged 10%. Average injury ratings for the check in this test were 6%.

As with Pursuit, adding propanil to the Scepter treatments increased red rice control with application to 3-leaf rice. The tank mix of Scepter + propanil (0.125 + 3 lb ai/A) increased red rice control with Scepter alone from 77 to 88% with 7% injury to the Imi-rice line (the check averaged 5% injury in this test). Scepter at 0.188 lb ai/A mixed

with propanil at 3 lb ai/A gave 91% red rice control with 3% injury to the Imi-rice line. The mixture of Scepter + Propanil + Prowl (0.125 + 3.0 + 1.0 lb ai/A) gave 89% control of red rice with 4% injury to the Imi-rice line.

CADRE

Summary: Overall, Cadre provided excellent post-emergence red rice control but was more injurious to the Imi-rice line than either Pursuit or Scepter. Yields were reduced by the Cadre treatments, though yields were not significantly different from the check at the 0.024 and 0.032 lb ai/A rates in the 3- to 4-leaf test and 0.032 and 0.048 lb ai/A rates in the 1-leaf test. Cadre applied pre-emergence was less injurious to the Imi-rice line but gave marginal red rice control. Mixing Prowl with Cadre improved pre-emergence red rice control and reduced injury, and at the 0.048 lb ai/A rate, this mixture gave average red rice control of 82% with injury well below the unsprayed check. Mixing propanil with Cadre at 0.024 and 0.032 lb ai/A gave post-emergence red rice control, averaging 84 and 89% with 5 and 7% injury to the Imi-rice, respectively. Average injury ratings for the check in this test (Test 3) were 5%.

ARSENAL

Summary: Overall, Arsenal provided poor red rice control when applied pre-emergence. Good red rice and Bengal check rice control was obtained when Arsenal was applied post-emergence at the 3- or 3- to 4-leaf stage, but this caused significant injury and reduction in yield to the Imi-rice line. The exception to this situation was the application of Arsenal at 0.032 lb ai/A to Imi-rice at the 1-leaf stage. This treatment out-yielded the Imi-rice check and gave Bengal control, averaging 87%. In general, across the various tests, Pursuit and Scepter did a better job of red rice control with considerably less injury to the Imi-rice. Also, in contrast, adding propanil to Arsenal appeared to reduce its activity on red rice while increasing Imi-rice injury.

Table 1. Assessment of imidazolinone weed control and crop tolerance in postemergence application to rice at the 3- to 4-leaf stage of maturity. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name		Rate (lb ai/A)	Plot No.	RICE % INJURY 6-12-95 18 DAT	BRNYDGRA CONTROL % 6-12-95 18 DAT	RICE % INJURY 6-30-95 36 DAT	YIELD IN LB/A 7-28-95
1	PROPANIL	BENGAL	1.0	101	0	95	0	3320
1	PROWL 3.3 EC		1	218	0	85	5	5511
				320	0	85	15	4956
				Mean =	0	88	7	4596
2	PROPANIL	93AS3510	1.0	102	0	100	0	6733
2	PROWL 3.3 EC		1	215	0	95	0	7671
				307	0	100	0	7353
				Mean =	0	98	0	7252
3	PURSUIT	BENGAL	.063	103	100	90	100	0
				212	100	90	90	0
				322	95	100	100	0
				Mean =	98	93	97	0
4	PURSUIT	93AS3510	.063	104	0	100	0	6706
				217	5	100	0	7019
				306	5	100	0	7025
				Mean =	3	100	0	6917
5	AC 299,263	BENGAL	.063	105	95	100	90	0
				221	95	100	90	0
				323	100	100	100	0
				Mean =	97	100	93	0
6	AC 299,263	93AS3510	.063	106	40	100	50	3668
				207	30	100	50	4458
				302	50	100	60	3415
				Mean =	40	100	53	3847
7	SCEPTER	BENGAL	.125	107	95	75	95	0
				223	90	95	90	0
				305	95	95	95	0
				Mean =	93	88	93	0
8	SCEPTER	93AS3510	.125	108	0	100	0	7348
				205	0	100	0	7342
				316	0	100	0	6395
				Mean =	0	100	0	7028
9	ARSENAL	BENGAL	.032	109	95	100	95	0
				224	95	100	90	0
				313	95	100	100	0
				Mean =	95	100	95	0

Continued.

Table 1. Continued.

Trt No	Treatment Name		Rate (lb ai/A)	Plot No.	RICE % INJURY % 6-12-95 18 DAT	BRNYDGRA CONTROL % 6-12-95 18 DAT	RICE % INJURY % 6-30-95 36 DAT	YIELD IN LB/A 7-28-95
10	ARSENAL	93AS3510	.032	110	5	100	5	6385
				220	15	100	15	6302
				303	15	100	10	5921
				Mean =	12	100	10	6203
11	CADRE	BENGAL	.024	111	95	100	95	0
				211	100	95	100	0
				308	90	95	100	0
				Mean =	95	97	98	0
12	CADRE	93AS3510	.024	112	0	100	0	7378
				206	0	100	0	7099
				319	15	100	5	6220
				Mean =	5	100	2	6899
13	CADRE	BENGAL	.032	113	90	95	90	0
				214	90	100	85	0
				312	95	95	95	0
				Mean =	92	97	90	0
14	CADRE	93AS3510	.032	114	0	100	0	6987
				203	10	100	0	6329
				311	10	100	10	6077
				Mean =	7	100	3	6464
15	CADRE	BENGAL	.048	115	100	70	100	0
				222	100	100	100	0
				309	95	95	90	0
				Mean =	98	88	97	0
16	CADRE	93AS3510	.048	116	10	100	10	6306
				210	15	100	5	6232
				317	20	100	0	5485
				Mean =	15	100	5	6008
17	CADRE	BENGAL	.063	117	100	100	100	0
				202	95	100	90	0
				304	99	95	99	0
				Mean =	98	98	96	0
18	CADRE	93AS3510	.063	118	15	100	25	5643
				209	10	100	10	5711
				318	25	100	10	4787
				Mean =	17	100	15	5380
19	PURSUIT	BENGAL	.063	119	95	100	98	0
19	PROWL 3.3		1.0	208	90	100	85	0
				324	98	95	98	0
				Mean =	94	98	94	0

Continued.

Table 1. Continued.

Trt No	Treatment Name		Rate (lb ai/A)	Plot No.	RICE % INJURY % 6-12-95 18 DAT	BRNYDGRA CONTROL % 6-12-95 18 DAT	RICE % INJURY % 6-30-95 36 DAT	YIELD IN LB/A 7-28-95
20	PURSUIT	93AS3510	.063	120	5	100	0	7402
20	PROWL 3.3		1.0	201	0	100	0	7038
				314	0	100	0	6861
				Mean =	2	100	0	7100
21	SCEPTER	BENGAL	.125	121	95	90	95	0
21	PROWL 3.3		1.0	219	95	75	95	0
				321	85	80	90	0
				Mean =	92	82	93	0
22	SCEPTER	93AS3510	.125	122	0	100	0	7283
22	PROWL 3.3		1.0	213	0	100	0	7604
				301	0	100	0	8099
				Mean =	0	100	0	7662
23	CADRE	BENGAL	.048	123	100	95	95	0
23	PROWL 3.3		1.0	204	90	100	85	0
				315	98	100	100	0
				Mean =	96	98	93	0
24	CADRE	93AS3510	.048	124	10	100	5	6160
24	PROWL 3.3		1.0	216	15	100	5	6715
				310	10	100	10	6112
				Mean =	12	100	7	6329

Table 2. Statistical analyses of imidazolinone weed control and crop tolerance in postemergence application to rice at the 3- to 4-leaf stage of maturity. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name		Rate	RICE % INJURY % 6-12-95 18 DAT	BRNYDGRA CONTROL % 6-12-95 18 DAT	RICE % INJURY % 6-30-95 36 DAT	YIELD IN LB/A 7-28-95
1	PROPANIL	BENGAL	1.0	0e	88bc	7de	4596g
1	PROWL 3.3 EC		1				
2	PROPANIL	93AS3510	1.0	0e	98a	0e	7252ab
2	PROWL 3.3 EC		1				
3	PURSUIT	BENGAL	.063	98a	93ab	97a	0i
4	PURSUIT	93AS3510	.063	3e	100a	0e	6917bcd
5	AC 299,263	BENGAL	.063	97a	100a	93a	0i
8	AC 299,263	93AS3510	.063	40b	100a	53b	3847h
7	SCEPTER	BENGAL	.125	93a	88bc	93a	0i
8	SCEPTER	93AS3510	.125	0e	100a	0e	7028abc
9	ARSENAL	BENGAL	.032	95a	100a	95a	0i
10	ARSENAL	93AS3510	.032	12cd	100a	10cd	6203e
11	CADRE	BENGAL	.024	95a	97ab	98a	0i
12	CADRE	93AS3510	.024	5de	100a	2de	6899bcd
13	CADRE	BENGAL	.032	92a	97ab	90a	0i
14	CADRE	93AS3510	.032	7de	100a	3de	6464cde
15	CADRE	BENGAL	.048	98a	88bc	97a	0i
16	CADRE	93AS3510	.048	15c	100a	5de	6008e
17	CADRE	BENGAL	.063	98a	98a	96a	0i
18	CADRE	93AS3510	.063	17c	100a	15c	5380f
19	PURSUIT	BENGAL	.063	94a	98a	94a	0i
19	PROWL 3.3		1.0				
20	PURSUIT	93AS3510	.063	2e	100a	0e	7100abc
20	PROWL 3.3		1.0				
21	SCEPTER	BENGAL	.125	92a	82c	93a	0i
21	PROWL 3.3		1.0				
22	SCEPTER	93AS3510	.125	0e	100a	0e	7662a
22	PROWL 3.3		1.0				
23	CADRE	BENGAL	.048	96a	98a	93a	0i
23	PROWL 3.3		1.0				
24	CADRE	93AS3510	.048	12cd	100a	7de	6329de
24	PROWL 3.3		1.0				
LSD (.05)	=			7	8	8	616
Standard Dev.	=			4.4856	4.9254	4.6034	373.6
C.V., %	=			9.28	5.08	9.68	10.98

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 3. Statistical tables of imidazolinone weed control and crop tolerance in postemergence application to rice at the 3- to 4-leaf stage of maturity. Rice Research Station, Crowley, LA. 1995.

ANALYSIS OF VARIANCE FOR RICE, % INJURY, %, 6-12-95, 18 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	140084.000000			
BLOCK	2	77.083333	38.541667	1.915	0.1588
TREATMENT	23	139081.333333	6047.014493	300.527	0.0001
ERROR	46	925.583333	20.121377		

ANALYSIS OF VARIANCE FOR ERNYDGRA, CONTROL, %, 6-12-95, 18 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	2927.777778			
BLOCK	2	17.361111	8.680556	0.358	0.7011
TREATMENT	23	1794.444444	78.019324	3.216	0.0004
ERROR	46	1115.972222	24.260266		

ANALYSIS OF VARIANCE FOR RICE, % INJURY, %, 6-30-95, 36 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	143283.652778			
BLOCK	2	198.527778	99.263889	4.684	0.0141
TREATMENT	23	142110.319444	6178.709541	291.566	0.0001
ERROR	46	974.805556	21.191425		

ANALYSIS OF VARIANCE FOR YIELD IN LBS/A, 7-28-95

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	756684175.777778			
BLOCK	2	841838.027778	420919.013889	3.016	0.0588
TREATMENT	23	749421663.777778	32583550.599034	233.440	0.0001
ERROR	46	6420673.972222	139579.868961		

Table 4. Assessment of imidazolinone weed control and crop tolerance in postemergence application at 1-leaf stage of rice. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name		Rate	Plot No.	Rice % injury 15 DAT	Rice % injury 33 DAT	Brnydgra control % 33 DAT	Rice % injury 6-30-95 51 DAT	Yield in lb/A
1	FACET 50WP	BENGAL	1.0	101	0	0	100	0	6398
1	PROWL 3.3 EC		1	221	40	40	100	40	870
				317	20	25	100	15	4760
				Mean =	20	22	100	18	4009
2	FACET 50WP	93AS3510	1.0	102	3	0	100	0	7310
2	PROWL 3.3 EC		1	212	8	0	100	10	6458
				302	17	0	100	5	6714
				Mean =	9	0	100	5	6827
3	PURSUIT	BENGAL	.063	103	99	99	100	99	0
				217	99	100	100	100	0
				324	99	90	100	90	0
				Mean =	99	96	100	96	0
4	PURSUIT	93AS3510	.063	104	20	0	100	10	7564
				219	20	0	100	10	6692
				311	20	0	100	5	7263
				Mean =	20	0	100	8	7173
5	AC 299,263	BENGAL	.063	105	100	100	95	95	0
				223	100	100	100	100	0
				301	97	95	100	90	0
				Mean =	99	98	98	95	0
6	AC 299,263	93AS3510	.063	106	73	75	100	50	4631
				201	75	75	100	60	3982
				305	60	35	100	30	4801
				Mean =	69	62	100	47	4471
7	SCEPTER	BENGAL	.125	107	97	95	100	90	0
				224	99	99	100	99	0
				307	99	99	90	99	0
				Mean =	98	98	97	96	0
8	SCEPTER	93AS3510	.125	108	25	0	100	5	7535
				216	12	0	100	0	6474
				319	10	0	100	0	7454
				Mean =	16	0	100	2	7154
9	ARSENAL	BENGAL	.032	109	99	99	100	99	0
				208	95	85	100	75	0
				316	97	95	100	95	0
				Mean =	97	93	100	90	0

Continued.

Table 4. Continued.

Trt No	Treatment Name		Rate	Plot No.	Rice % injury 15 DAT	Rice % injury 33 DAT	Brnydgra control % 33 DAT	Rice % injury 6-30-95 51 DAT	Yield in lb/A
10	ARSENAL	93AS3510	.032	110	33	10	100	5	7262
				218	27	5	100	5	6578
				312	25	0	100	5	7007
				Mean =	28	5	100	5	6949
11	PURSUIT	BENGAL	.094	111	100	95	95	95	0
				222	99	99	90	99	0
				321	99	99	100	99	0
				Mean =	99	98	95	98	0
12	PURSUIT	93AS3510	.094	112	35	15	100	5	7133
				215	32	15	100	15	6098
				310	30	10	100	5	6989
				Mean =	32	13	100	8	6740
13	CADRE	BENGAL	.032	113	97	95	100	90	0
				210	97	90	100	85	0
				314	99	100	100	99	0
				Mean =	98	95	100	91	0
14	CADRE	93AS3510	.032	114	33	15	100	10	5783
				204	28	0	100	10	7332
				313	47	15	100	15	5663
				Mean =	36	10	100	12	6259
15	CADRE	BENGAL	.048	115	97	95	100	90	0
				220	100	100	100	95	0
				323	97	90	100	90	0
				Mean =	98	95	100	92	0
16	CADRE	93AS3510	.048	116	42	10	100	10	6444
				207	48	20	100	5	6672
				320	53	15	100	20	6284
				Mean =	48	15	100	12	6467
17	CADRE	BENGAL	.063	117	100	100	100	100	0
				214	100	95	100	90	0
				322	100	100	100	100	0
				Mean =	100	98	100	97	0
18	CADRE	93AS3510	.063	118	50	15	100	15	5351
				209	65	35	100	15	6063
				308	80	70	100	60	4136
				Mean =	65	40	100	30	5183
19	PURSUIT	BENGAL	.063	119	100	100	100	100	0
19	PROWL 3.3		1.0	203	97	100	100	100	0
				303	99	99	100	99	0
				Mean =	99	100	100	100	0

Continued.

Table 4. Continued.

Trt No	Treatment Name		Rate	Plot No.	Rice % injury 15 DAT	Rice % injury 33 DAT	Brnydgra control % 33 DAT	Rice % injury 6-30-95 51 DAT	Yield in lb/A
20	PURSUIT	93AS3510	.063	120	3	0	100	0	6773
20	PROWL 3.3		1.0	213	0	0	100	0	7350
				306	25	5	100	5	6419
				Mean =	9	2	100	2	6847
21	SCEPTER	BENGAL	.125	121	100	100	100	100	0
21	PROWL 3.3		1.0	202	100	90	95	90	0
				309	99	99	100	99	0
				Mean =	100	96	98	96	0
22	SCEPTER	93AS3510	.125	122	18	0	100	0	6522
22	PROWL 3.3		1.0	211	20	5	100	5	5560
				318	15	0	100	0	7237
				Mean =	18	2	100	2	6440
23	CADRE	BENGAL	.048	123	100	100	100	100	0
23	PROWL 3.3		1.0	205	100	100	100	100	0
				304	100	99	100	99	0
				Mean =	100	100	100	100	0
24	CADRE	93AS3510	.048	124	63	25	100	30	5964
24	PROWL 3.3		1.0	206	60	15	100	10	6187
				315	55	25	100	15	5687
				Mean =	59	22	100	18	5946

Table 5. Statistical analyses of imidazolinone weed control and crop tolerance in postemergence application at 1-leaf stage of rice. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name		Rate	Rice % injury 15 DAT	Rice % injury 33 DAT	Brnydgra control % 33 DAT	Rice % injury 6-30-95 51 DAT	Yield in lb/A
1	FACET 50WP	BENGAL	1.0	20fg	22d	100a	18cd	4009c
1	PROWL 3.3 EC		1					
2	FACET 50WP	93AS3510	1.0	9g	0e	100a	5d	6827a
2	PROWL 3.3 EC		1					
3	PURSUIT	BENGAL	.063	99a	96a	100a	96a	0d
4	PURSUIT	93AS3510	.063	20fg	0e	100a	8d	7173a
5	AC 299,263	BENGAL	.063	99a	98a	98a	95a	0d
6	AC 299,263	93AS3510	.063	69b	62b	100a	47b	4471c
7	SCEPTER	BENGAL	.125	98a	98a	97ab	96a	0d
8	SCEPTER	93AS3510	.125	16fg	0e	100a	2d	7154a
9	ARSENAL	BENGAL	.032	97a	93a	100a	90a	0d
10	ARSENAL	93AS3510	.032	28ef	5de	100a	5d	6949a
11	PURSUIT	BENGAL	.094	99a	98a	95b	98a	0d
12	PURSUIT	93AS3510	.094	32e	13de	100a	8d	6740a
13	CADRE	BENGAL	.032	98a	95a	100a	91a	0d
14	CADRE	93AS3510	.032	36de	10de	100a	12d	6259ab
15	CADRE	BENGAL	.048	98a	95a	100a	92a	0d
16	CADRE	93AS3510	.048	48cd	15de	100a	12d	6467ab
17	CADRE	BENGAL	.063	100a	98a	100a	97a	0d
18	CADRE	93AS3510	.063	65b	40c	100a	30c	5183bc
19	PURSUIT	BENGAL	.063	99a	100a	100a	100a	0d
19	PROWL 3.3		1.0					
20	PURSUIT	93AS3510	.063	9g	2e	100a	2d	6847a
20	PROWL 3.3		1.0					
21	SCEPTER	BENGAL	.125	100a	96a	98a	96a	0d
21	PROWL 3.3		1.0					
22	SCEPTER	93AS3510	.125	18fg	2e	100a	2d	6440ab
22	PROWL 3.3		1.0					
23	CADRE	BENGAL	.048	100a	100a	100a	100a	0d
23	PROWL 3.3		1.0					
24	CADRE	93AS3510	.048	59bc	22d	100a	18cd	5946ab
24	PROWL 3.3		1.0					
LSD (.05) =				12	16	3	15	1169
Standard Dev.=				7.0758	9.5163	1.8016	9.1884	708.26
C.V., % =				11.20	18.15	1.81	18.10	21.12

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 6. Statistical tables of imidazolinone weed control and crop tolerance in postemergence application at 1-leaf stage of rice. Rice Research Station, Crowley, LA. 1995.

ANALYSIS OF VARIANCE FOR rice, % injury, 15 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	95411.277778			
BLOCK	2	64.194444	32.097222	0.641	0.5314
TREATMENT	23	93043.944444	4045.388889	80.798	0.0001
ERROR	46	2303.138889	50.068237		

ANALYSIS OF VARIANCE FOR rice, % injury, 33 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	137403.777778			
BLOCK	2	15.527778	7.763889	0.086	0.9180
TREATMENT	23	133222.444444	5792.280193	63.960	0.0001
ERROR	46	4165.805556	90.560990		

ANALYSIS OF VARIANCE FOR brnydgra, control, %, 33 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	257.986111			
BLOCK	2	0.694444	0.347222	0.107	0.8988
TREATMENT	23	107.986111	4.695048	1.447	0.1416
ERROR	46	149.305556	3.245773		

ANALYSIS OF VARIANCE FOR rice, % injury, 6-30-95, 51 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	132042.986111			
BLOCK	2	35.027778	17.513889	0.207	0.8134
TREATMENT	23	128124.319444	5570.622585	65.982	0.0001
ERROR	46	3883.638889	84.426932		

ANALYSIS OF VARIANCE FOR YIELD IN LB/A

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	71	746989432.444444			
BLOCK	2	1454117.444444	727058.722222	1.449	0.2452
TREATMENT	23	722459976.444444	31411303.323672	62.617	0.0001
ERROR	46	23075338.555556	501637.794686		

Table 7. Assessment of imidazolinone weed control and crop tolerance in pre-emergence applications with additional treatments conducted in red rice area. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Appl Rate	Plot No.	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
1	UNSPRAYED CHECK		101	0	0	0	0	0	0	0	0
			229	15	5	0	0	20	0	20	0
			316	5	0	10	0	0	0	10	0
			Mean =	7	2	3	0	7	0	10	0
2	PURSUIT	0.032	102	5	40	10	15	0	10	0	20
			213	5	30	0	65	0	60	0	65
			320	10	20	0	45	10	20	15	65
			Mean =	7	30	3	42	3	30	5	50
3	PURSUIT	0.063	103	5	60	10	70	0	85	0	60
			224	10	90	10	85	20	90	15	90
			313	0	50	0	70	10	75	0	60
			Mean =	5	67	7	75	10	83	5	70
4	PURSUIT	0.094	104	5	65	0	75	25	80	25	65
			215	5	85	0	85	0	95	0	85
			306	5	75	0	85	5	95	0	85
			Mean =	5	75	0	82	10	90	8	78
5	PURSUIT	0.125	105	0	75	0	85	0	90	0	70
			218	5	90	0	90	0	95	0	90
			327	0	95	0	80	5	95	0	80
			Mean =	2	87	0	85	2	93	0	80
6	AC 299,263	0.016	106	0	20	0	0	0	0	0	0
			217	0	5	0	15	20	0	0	0
			301	5	0	0	50	30	0	10	25
			Mean =	2	8	0	22	17	0	3	8
7	AC 299,263	0.032	107	0	20	0	20	0	5	5	0
			202	0	40	0	30	0	0	0	15
			321	0	25	0	45	10	25	0	45
			Mean =	0	28	0	32	3	10	2	20

Continued.

Table 7. Continued.

Trt No	Treatment Name	Appl Rate	Plot No.	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
8	AC 299,263	0.063	108	25	65	5	50	10	30	0	30
			227	0	85	0	70	0	75	0	70
			319	10	50	0	65	0	50	15	65
			Mean =	12	67	2	62	3	52	5	55
9	SCEPTER	0.063	109	20	75	5	65	10	30	15	50
			230	5	75	0	50	0	80	0	80
			305	10	30	0	60	30	20	10	65
			Mean =	12	60	2	58	13	43	8	65
10	SCEPTER	0.125	110	10	85	0	80	0	75	10	40
			207	10	95	0	80	0	50	0	50
			312	0	95	0	70	0	85	0	70
			Mean =	7	92	0	77	0	70	3	53
11	SCEPTER	0.188	111	5	80	0	75	0	85	0	65
			205	10	85	0	70	0	75	0	80
			328	5	95	0	80	0	95	5	85
			Mean =	7	87	0	75	0	85	2	77
12	SCEPTER	0.250	112	10	90	5	70	0	90	0	80
			204	40	90	10	80	10	90	10	75
			309	5	95	5	90	10	90	10	95
			Mean =	18	92	7	80	7	90	7	83
13	ARSENAL	0.012	113	5	70	0	10	0	10	0	20
			210	0	50	0	75	0	50	0	80
			308	0	20	0	30	20	10	0	20
			Mean =	2	47	0	38	7	23	0	40
14	ARSENAL	0.022	114	5	60	0	20	0	10	5	20
			216	10	20	5	40	40	0	0	15
			329	20	20	0	45	0	0	15	45
			Mean =	12	33	2	35	13	3	7	27

Continued.

Table 7. Continued.

Trt No	Treatment Name	Appl Rate	Plot No.	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 8-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
15	ARSENAL	0.032	115	5	50	0	40	0	50	0	40
			209	5	90	0	85	0	70	0	85
			324	10	40	0	45	20	10	20	55
			Mean =	7	60	0	57	7	43	7	60
16	ARSENAL	0.042	116	5	20	0	70	0	0	0	15
			211	0	40	0	65	0	50	0	70
			303	0	25	0	35	20	30	0	15
			Mean =	2	28	0	57	7	27	0	33
17	CADRE	0.016	117	0	0	0	20	0	0	0	0
			212	0	20	0	50	0	50	0	75
			322	0	50	0	50	10	30	0	50
			Mean =	0	23	0	40	3	27	0	42
18	CADRE	0.032	118	5	45	0	60	10	20	5	60
			228	5	50	0	60	0	75	0	75
			317	0	50	0	65	0	20	0	45
			Mean =	3	48	0	62	3	38	2	60
19	CADRE	0.048	119	25	50	10	70	40	30	15	50
			225	0	90	0	80	0	90	0	85
			315	0	90	0	80	0	80	0	80
			Mean =	8	77	3	77	13	67	5	72
20	CADRE	0.063	120	10	60	0	65	10	50	0	60
			220	5	60	5	70	20	80	0	65
			302	5	60	0	75	5	90	0	75
			Mean =	7	60	2	70	12	73	0	87
21	PURSUIT	0.032	121	20	50	0	30	10	10	0	25
21	PROWL 3.3	1.0	223	0	75	0	70	10	70	0	65
			323	10	50	0	55	10	30	0	50
			Mean =	10	58	0	52	10	37	0	47

Continued.

Table 7. Continued.

Trt No	Treatment Name	Appl Rate	Plot No.	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
22	PURSUIT	0.063	122	10	80	0	75	10	80	0	80
22	PROWL 3.3	1.0	208	0	95	0	90	0	90	0	90
			307	0	90	0	80	10	90	5	80
			Mean =	3	88	0	82	7	87	2	83
23	SCEPTER	0.063	123	10	80	10	80	20	70	10	75
23	PROWL 3.3	1.0	219	25	25	0	50	30	50	10	55
			325	0	75	0	60	0	60	0	60
			Mean =	12	60	3	63	17	60	7	63
24	SCEPTER	0.125	124	10	80	15	90	20	80	20	90
24	PROWL 3.3	1.0	201	15	65	0	70	0	90	5	70
			326	5	95	0	70	10	90	10	80
			Mean =	10	80	5	77	10	87	12	80
25	CADRE	0.024	125	0	90	0	85	0	75	0	65
25	PROWL 3.3	1.0	222	5	85	5	70	10	70	5	60
			330	5	60	0	50	0	70	5	70
			Mean =	3	78	2	68	3	72	3	65
26	CADRE	0.048	126	10	85	0	80	0	95	0	75
26	PROWL 3.3	1.0	221	10	80	5	80	5	80	5	80
			311	5	95	0	75	0	85	5	75
			Mean =	8	87	2	78	2	87	3	77
27	SCEPTER	0.063	127	0	85	0	85	0	95	0	85
27	ARSENAL	0.012	206	10	70	0	50	0	30	0	25
			304	10	30	10	60	40	20	20	50
			Mean =	7	62	3	65	13	48	7	53
28	PURSUIT	0.032	128	0	75	0	70	0	60	0	75
28	ARSENAL	0.012	214	20	10	10	60	40	40	30	70
			310	5	80	0	65	0	10	0	60
			Mean =	8	55	3	65	13	37	10	68

Continued.

Table 7. Continued.

Trt No	Treatment Name	Appl Rate	Plot No.	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
29	CADRE	0.016	129	5	65	10	45	40	60	40	65
29	ARSENAL	0.012	226	5	50	0	65	10	60	10	65
			318	5	40	0	70	0	20	0	30
			Mean =	5	58	3	60	17	47	17	53
30	SCEPTER	0.063	130	0	75	0	85	5	80	5	75
30	PURSUIT	0032	203	20	50	0	60	0	50	20	40
			314	40	60	20	70	50	85	35	55
			Mean =	20	62	7	72	18	72	20	57

Table 8. Statistical analyses of imidazolinone weed control and crop tolerance in pre-emergence applications with additional treatments conducted in red rice area. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Appl Rate	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
1	UNSPRAYED CHECK		7abc	2f	3a	0h	7a	0j	10ab	0i
2	PURSUIT	0.032	7abc	30def	3a	42c-g	3a	30f-j	5ab	50a-g
3	PURSUIT	0.063	5abc	67abc	7a	75ab	10a	83a-d	5ab	70a-d
4	PURSUIT	0.094	5abc	75ab	0a	82a	10a	90ab	8ab	78ab
5	PURSUIT	0.125	2c	87a	0a	85a	2a	93a	0b	80ab
6	AC 299,263	0.016	2c	8f	0a	22gh	17a	0j	3ab	8hi
7	AC 299,263	0.032	0c	28def	0a	32fg	3a	10hij	2b	20ghi
8	AC 299,263	0.063	12abc	67abc	2a	62a-e	3a	52b-g	5ab	55a-f
9	SCEPTER	0.063	12abc	60a-d	2a	58a-f	13a	43e-h	8ab	65a-e
10	SCEPTER	0.125	7abc	92a	0a	77ab	0a	70a-e	3ab	53a-g
11	SCEPTER	0.188	7abc	87a	0a	75ab	0a	85a-d	2b	77abc
12	SCEPTER	0.250	18ab	92a	7a	80ab	7a	90ab	7ab	83a
13	ARSENAL	0.012	2c	47b-e	0a	38d-g	7a	23g-j	0b	40d-h
14	ARSENAL	0.022	12abc	33c-f	2a	35efg	13a	3ij	7ab	27f-i
15	ARSENAL	0.032	7abc	60a-d	0a	57a-f	7a	43e-h	7ab	60a-f
16	ARSENAL	0.042	2c	28def	0a	57a-f	7a	27g-j	0b	33e-h
17	CADRE	0.016	0c	23ef	0a	40d-g	3a	27g-j	0b	42c-g
18	CADRE	0.032	3bc	48b-e	0a	62a-e	3a	38e-i	2b	60a-f
19	CADRE	0.048	8abc	77ab	3a	77ab	13a	67a-f	5ab	72a-d
20	CADRE	0.063	7abc	60a-d	2a	70ab	12a	73a-e	0b	67a-e
21	PURSUIT	0.032	10abc	58a-e	0a	52b-f	10a	37e-j	0b	47b-g
21	PROWL 3.3	1.0								

Continued.

Table 8. Continued.

Trt No	Treatment Name	Appl Rate	RICE INJURY % 6-15-95 20 DAT	RED RICE CONTROL % 6-15-95 20 DAT	RICE INJURY % 6-30-95 35 DAT	RED RICE CONTROL % 6-30-95 35 DAT	RICE INJURY % 7-14-95 49 DAT	RED RICE CONTROL % 7-14-95 49 DAT	RICE INJURY % 7-21-95 56 DAT	RED RICE CONTROL % 7-21-95 56 DAT
22	PURSUIT	0.063	3bc	88a	0a	82a	7a	87abc	2b	83a
22	PROWL 3.3	1.0								
23	SCEPTER	0.063	12abc	60a-d	3a	63a-d	17a	60a-g	7ab	63a-e
23	PROWL 3.3	1.0								
24	SCEPTER	0.125	10abc	80ab	5a	77ab	10a	87abc	12ab	80ab
24	PROWL 3.3	1.0								
25	CADRE	0.024	3bc	78ab	2a	68abc	3a	72a-e	3ab	65a-e
25	PROWL 3.3	1.0								
26	CADRE	0.048	8abc	87a	2a	78ab	2a	87abc	3ab	77abc
26	PROWL 3.3	1.0								
27	SCEPTER	0.063	7abc	62a-d	3a	65a-d	13a	48c-h	7ab	53a-g
27	ARSENAL	0.012								
28	PURSUIT	0.032	8abc	55a-e	3a	65a-d	13a	37e-j	10ab	68a-e
28	ARSENAL	0.012								
29	CADRE	0.016	5abc	58a-e	3a	60a-e	17a	47d-h	17ab	53a-g
29	ARSENAL	0.012								
30	SCEPTER	0.063	20a	62a-d	7a	72ab	18a	72a-e	20a	57a-f
30	PURSUIT	0032								
LSD (.05) =			13	30	7	23	22	32	14	29
Standard Dev.=			8.0366	18.326	4.2401	14.3	13.383	19.743	8.6331	17.671
C.V., % =			115.73	31.27	218.07	23.77	160.60	37.49	163.57	31.43

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 9. Statistical tables of imidazolinone weed control and crop tolerance in pre-emergence applications with additional treatments conducted in red rice area. Rice Research Station, Crowley, LA. 1995.

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 6-15-95, 20 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	5834.722222			
BLOCK	2	70.555556	35.277778	0.546	0.5821
TREATMENT	29	2018.055556	69.588123	1.077	0.3946
ERROR	58	3746.111111	64.588123		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 6-15-95, 20 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	72751.388889			
BLOCK	2	487.222222	243.611111	0.725	0.4885
TREATMENT	29	52784.722222	1820.162835	5.420	0.0001
ERROR	58	19479.444444	335.852490		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 6-30-95, 35 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	1484.722222			
BLOCK	2	23.888889	11.944444	0.664	0.5185
TREATMENT	29	418.055556	14.415709	0.802	0.7382
ERROR	58	1042.777778	17.978927		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 6-30-95, 35 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	47972.500000			
BLOCK	2	855.000000	427.500000	2.090	0.1329
TREATMENT	29	35255.833333	1215.718391	5.944	0.0001
ERROR	58	11861.666667	204.511494		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-14-95, 49 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	13100.000000			
BLOCK	2	161.666667	80.833333	0.451	0.6390
TREATMENT	29	2550.000000	87.931034	0.491	0.9804
ERROR	58	10388.333333	179.109195		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-14-95, 49 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	100360.000000			
BLOCK	2	2541.666667	1270.833333	3.260	0.0455
TREATMENT	29	75210.000000	2593.448276	6.653	0.0001
ERROR	58	22608.333333	389.798851		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-21-95, 56 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	6468.055556			
BLOCK	2	60.555556	30.277778	0.406	0.6680
TREATMENT	29	2084.722222	71.886973	0.965	0.5301
ERROR	58	4322.777778	74.530651		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-21-95, 56 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	62015.555556			
BLOCK	2	2987.222222	1493.611111	4.783	0.0120
TREATMENT	29	40915.555556	1410.881226	4.518	0.0001
ERROR	58	18112.777778	312.289272		

Table 10. Assessment of imidazolinone weed control and crop tolerance in postemergence applications conducted in red rice infested area - Test 2. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
1	UNSPRAYED CHECK		101	0	0	10	0	10	5
			229	0	0	10	5	5	0
			316	0	0	10	0	10	5
			Mean =	0	0	10	2	8	3
2	PURSUIT	0.032	102	10	65	10	20	5	55
			213	0	55	0	50	0	60
			320	0	70	25	75	5	75
			Mean =	3	63	12	48	3	63
3	PURSUIT	0.063	103	10	75	0	85	0	70
			224	0	75	30	75	10	90
			313	0	70	0	80	0	80
			Mean =	3	73	10	80	3	80
4	PURSUIT	0.094	104	10	90	15	95	20	95
			215	0	80	0	95	0	90
			306	0	80	20	90	5	90
			Mean =	3	83	12	93	8	92
5	PURSUIT	0.125	105	10	85	15	95	15	90
			218	0	80	10	95	5	95
			327	5	80	10	90	5	95
			Mean =	5	82	12	93	8	93
6	AC 299,263	0.016	106	0	60	20	50	5	35
			217	0	55	0	40	0	50
			301	10	70	30	60	10	70
			Mean =	3	62	17	50	5	52
7	AC 299,263	0.032	107	0	70	20	75	15	75
			202	0	60	20	30	10	80
			321	0	65	0	85	0	80
			Mean =	0	65	13	63	8	78
8	AC 299,263	0.063	108	15	75	40	90	20	70
			227	15	70	20	90	20	95
			319	10	80	35	95	20	85
			Mean =	13	75	32	92	20	83
9	SCEPTER	0.063	109	0	50	30	20	10	50
			230	0	50	10	50	5	50
			305	10	60	10	30	5	50
			Mean =	3	53	17	33	7	50

Continued.

Table 10. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
10	SCEPTER	0.125	110	0	65	10	80	0	80
			207	0	70	10	80	5	70
			312	0	75	0	95	0	80
			Mean =	0	70	7	85	2	77
11	SCEPTER	0.188	111	0	75	0	95	0	85
			205	5	80	10	95	5	90
			328	10	85	20	95	10	90
			Mean =	5	80	10	95	5	88
12	SCEPTER	0.250	112	5	85	10	95	10	90
			204	0	85	20	95	10	90
			309	10	80	20	90	5	95
			Mean =	5	83	17	93	8	92
13	ARSENAL	0.012	113	0	50	20	40	0	40
			210	0	30	0	20	0	25
			308	0	45	0	50	10	55
			Mean =	0	42	7	37	3	40
14	ARSENAL	0.022	114	60	70	70	80	30	70
			216	20	70	40	85	40	70
			329	10	65	40	80	10	70
			Mean =	30	68	50	82	27	70
15	ARSENAL	0.032	115	15	85	5	95	15	95
			209	10	80	25	85	20	80
			324	25	85	20	85	10	80
			Mean =	17	83	17	88	15	85
16	ARSENAL	0.042	116	30	85	25	95	45	90
			211	30	85	30	95	25	85
			303	25	80	15	95	20	90
			Mean =	28	83	23	95	30	88
17	CADRE	0.016	117	0	75	10	30	0	50
			212	0	70	10	70	5	70
			322	0	70	25	75	15	70
			Mean =	0	72	15	58	7	63
18	CADRE	0.032	118	5	80	15	95	10	75
			228	5	60	0	85	15	75
			317	15	85	10	90	0	80
			Mean =	8	75	8	90	8	77
19	CADRE	0.048	119	20	80	50	95	15	90
			225	15	75	10	90	10	90
			315	10	80	30	85	20	90
			Mean =	15	78	30	90	15	90

Continued.

Table 10. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
20	CADRE	0.063	120	10	75	50	95	30	85
			220	25	80	20	90	25	90
			302	25	85	20	90	15	90
			Mean =	20	80	30	92	23	88
21	PURSUIT	0.032	121	0	60	0	50	0	40
21	PROWL 3.3	1.0	223	0	75	20	60	0	80
			323	0	80	0	75	0	75
			Mean =	0	72	7	62	0	65
22	PURSUIT	0.063	122	0	80	0	75	10	80
22	PROWL 3.3	1.0	208	5	85	5	80	0	95
			307	5	80	30	85	5	90
			Mean =	3	82	12	80	5	88
23	SCEPTER	0.063	123	0	70	0	50	0	70
23	PROWL 3.3	1.0	219	0	60	0	50	10	40
			325	0	70	5	70	0	50
			Mean =	0	67	2	57	3	53
24	SCEPTER	0.125	124	0	80	10	85	10	80
24	PROWL 3.3	1.0	201	0	90	60	95	40	95
			326	5	80	10	85	5	85
			Mean =	2	83	27	88	18	87
25	CADRE	0.024	125	0	70	10	75	5	85
25	PROWL 3.3	1.0	222	10	80	5	75	5	85
			330	0	75	5	90	5	80
			Mean =	3	75	7	80	5	83
26	CADRE	0.048	126	10	80	20	95	20	90
26	PROWL 3.3	1.0	221	10	80	15	85	15	85
			311	15	85	20	75	15	90
			Mean =	12	82	18	85	17	88
27	SCEPTER	0.063	127	5	70	10	90	10	80
27	ARSENAL	0.012	206	0	75	10	95	5	80
			304	5	85	5	70	10	80
			Mean =	3	77	8	85	8	80
28	PURSUIT	0.032	128	0	70	10	85	5	90
28	ARSENAL	0.012	214	15	80	60	75	40	80
			310	5	70	10	85	5	80
			Mean =	7	73	27	82	17	83
29	CADRE	0.016	129	10	75	40	95	30	85
29	ARSENAL	0.012	226	10	70	10	85	5	85
			318	10	80	0	95	10	85
			Mean =	10	75	17	92	15	85

Continued.

Table 10. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
30	SCEPTER	0.063	130	0	70	0	70	0	80
30	PURSUIT	0.032	203	0	75	10	60	0	85
			314	5	75	20	90	5	75
			Mean =	2	73	10	73	2	80

Table 11. Statistical analyses of imidazolinone weed control and crop tolerance in postemergence applications conducted in red rice infested area - Test 2. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Rate	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
1	UNSPRAYED CHECK		0f	0k	10bc	2h	8b-f	3h
2	PURSUIT	0.032	3def	63gh	12bc	48efg	3def	63ef
3	PURSUIT	0.063	3def	73a-g	10bc	80abc	3def	80a-d
4	PURSUIT	0.094	3def	83a	12bc	93a	8b-f	92ab
5	PURSUIT	0.125	5c-f	82ab	12bc	93a	8b-f	93a
6	AC 299,263	0.016	3def	62hi	17bc	50efg	5c-f	52fg
7	AC 299,263	0.032	0f	65fgh	13bc	63b-e	8b-f	78a-e
8	AC 299,263	0.063	13b-e	75a-f	32ab	92a	20abc	83abc
9	SCEPTER	0.063	3def	53i	17bc	33g	7c-f	50fg
10	SCEPTER	0.125	0f	70c-h	7bc	85a	2ef	77b-e
11	SCEPTER	0.188	5c-f	80abc	10bc	95a	5c-f	88ab
12	SCEPTER	0.250	5c-f	83a	17bc	93a	8b-f	92ab
13	ARSENAL	0.012	0f	42j	7bc	37fg	3def	40g
14	ARSENAL	0.022	30a	68d-h	50a	82abc	27a	70cde
15	ARSENAL	0.032	17bc	83a	17bc	88a	15a-f	85abc
16	ARSENAL	0.042	28a	83a	23bc	95a	30a	88ab
17	CADRE	0.016	0f	72b-h	15bc	58de	7c-f	63ef
18	CADRE	0.032	8b-f	75a-f	8bc	90a	8b-f	77b-e
19	CADRE	0.048	15bcd	78a-d	30ab	90a	15a-f	90ab
20	CADRE	0.063	20ab	80abc	30ab	92a	23ab	88ab

Continued.

Table 11. Continued.

Trt No	Treatment Name	Rate	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
21	PURSUIT	0.032	0f	72b-h	7bc	62cde	0f	65def
21	PROWL 3.3	1.0						
22	PURSUIT	0.063	3def	82ab	12bc	80abc	5c-f	88ab
22	PROWL 3.3	1.0						
23	SCEPTER	0.063	0f	67e-h	2c	57def	3def	53fg
23	PROWL 3.3	1.0						
24	SCEPTER	0.125	2ef	83a	27abc	88a	18a-d	87ab
24	PROWL 3.3	1.0						
25	CADRE	0.024	3def	75a-f	7bc	80abc	5c-f	83abc
25	PROWL 3.3	1.0						
26	CADRE	0.048	12b-f	82ab	18bc	85ab	17a-e	88ab
26	PROWL 3.3	1.0						
27	SCEPTER	0.063	3def	77a-e	8bc	85a	8b-f	80a-d
27	ARSENAL	0.012						
28	PURSUIT	0.032	7c-f	73a-g	27abc	82abc	17a-e	83abc
28	ARSENAL	0.012						
29	CADRE	0.016	10b-f	75a-f	17bc	92a	15a-f	85abc
29	ARSENAL	0.012						
30	SCEPTER	0.063	2ef	73a-g	10bc	73a-d	2ef	80a-d
30	PURSUIT	0.032						
LSD (.05) =			11	9	22	18	13	13
Standard Dev.=			6.5915	5.5605	13.585	11.325	8.08	8.2274
C.V., % =			96.46	7.83	84.91	15.15	79.48	10.99

Means followed by same letter do not significantly differ (Duncan's multiple range test, P=.05).

Table 12. Statistical differences of assessment of Imidazolinones and crop tolerance in postemergence applications conducted in red rice infested area - Test 2. Rice Research Station, Crowley, LA. 1995.

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 6-30-95, 16 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	8272.500000			
BLOCK	2	46.666667	23.333333	0.537	0.5874
TREATMENT	29	5705.833333	196.752874	4.528	0.0001
ERROR	58	2520.000000	43.448276		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 6-30-95, 16 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	25560.000000			
BLOCK	2	206.666667	103.333333	3.342	0.0423
TREATMENT	29	23560.000000	812.413793	26.275	0.0001
ERROR	58	1793.333333	30.919540		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-14-95, 30 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	19760.000000			
BLOCK	2	111.666667	55.833333	0.303	0.7401
TREATMENT	29	8943.333333	308.390805	1.671	0.0484
ERROR	58	10705.000000	184.568966		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-14-95, 30 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	52345.555556			
BLOCK	2	627.222222	313.611111	2.445	0.0956
TREATMENT	29	44278.888889	1526.858238	11.904	0.0001
ERROR	58	7439.444444	128.266284		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-21-95, 37 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	9272.500000			
BLOCK	2	246.666667	123.333333	1.889	0.1604
TREATMENT	29	5239.166667	180.660920	2.767	0.0005
ERROR	58	3786.666667	65.287356		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-21-95, 37 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	37348.888889			
BLOCK	2	307.222222	153.611111	2.269	0.1125
TREATMENT	29	33115.555556	1141.915709	16.869	0.0001
ERROR	58	3926.111111	67.691571		

Table 13. Assessment of imidazolinone weed control and crop tolerance in postemergence applications, conducted in red rice area - Test 3. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
1	PROPANIL	3.0	101	0	0	10	5	5	5
1	PROWL 3.3 EC	1	229	0	0	0	0	10	5
			316	0	0	10	5	10	5
			Mean =	0	0	7	3	8	5
2	PURSUIT	0.063	102	0	80	10	95	5	80
2	PROPANIL	3.0	213	5	85	10	90	5	90
			320	0	90	5	90	0	90
			Mean =	2	85	8	92	3	87
3	AC 299,263	0.048	103	10	85	20	95	15	90
3	PROPANIL	1	224	5	80	20	90	25	90
			313	5	85	15	95	15	95
			Mean =	7	83	18	93	18	92
4	SCEPTER	0.125	104	0	85	20	90	5	90
4	PROPANIL	3.0	215	10	95	0	90	5	85
			306	0	85	15	90	5	85
			Mean =	3	88	12	90	5	87
5	SCEPTER	0.188	105	5	90	5	95	10	90
5	PROPANIL	3.0	218	0	90	0	95	0	90
			327	0	85	0	95	5	90
			Mean =	2	88	2	95	5	90
6	ARSENAL	0.022	106	0	65	30	60	10	75
6	PROPANIL	3.0	217	0	70	10	60	5	40
			301	0	85	70	85	50	70
			Mean =	0	73	37	68	22	62
7	ARSENAL	0.032	107	10	70	40	70	20	75
7	PROPANIL	3.0	202	0	70	10	70	5	65
			321	15	75	20	85	10	80
			Mean =	8	72	23	75	12	73
8	CADRE	0.024	108	0	85	0	90	10	85
8	PROPANIL	3.0	227	0	80	15	80	5	80
			319	0	85	5	90	5	80
			Mean =	0	83	7	87	7	82

Continued.

Table 13. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
9	CADRE	0.032	109	5	90	10	85	5	95
9	PROPANIL	3.0	230	5	85	10	90	10	85
			305	5	90	10	90	5	95
			Mean =	5	88	10	88	7	92
10	CADRE	0.048	110	10	85	20	85	5	95
10	PROPANIL	3.0	207	5	85	50	95	20	85
			312	5	80	5	95	10	90
			Mean =	7	83	25	92	12	90
11	PURSUIT	0.063	111	0	75	5	95	5	90
11	PROWL 3.3	1.0	205	0	85	0	85	5	90
11	PROPANIL	3.0	328	0	80	5	95	5	95
			Mean =	0	80	3	92	5	92
12	SCEPTER	0.125	112	0	90	10	85	0	90
12	PROWL 3.3	1.0	204	0	85	10	95	0	90
12	PROPANIL	3.0	309	0	90	10	85	5	90
			Mean =	0	88	10	88	2	90
13	CADRE	0.048	113	15	85	25	90	15	80
13	PROWL 3.3	1.0	210	0	85	10	95	10	90
13	PROPANIL	3.0	308	5	85	15	90	5	90
			Mean =	7	85	17	92	10	87
14	SCEPTER	0.125	114	5	80	10	95	5	80
14	ARSENAL	0.012	216	0	85	15	90	10	75
			329	5	80	10	80	5	85
			Mean =	3	82	12	88	7	80
15	PURSUIT	0.063	115	5	80	5	95	10	90
15	ARSENAL	0.012	209	20	90	30	95	25	95
			324	5	85	15	90	10	90
			Mean =	10	85	17	93	15	92
16	CADRE	0.024	116	5	80	15	95	15	80
16	ARSENAL	0.012	211	5	80	25	85	15	80
			303	0	85	5	85	15	80
			Mean =	3	82	15	88	15	80

Continued.

Table 13. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
17	PURSUIT	0.032	117	0	65	0	10	0	20
17	SCEPTER	0.063	212	0	75	0	75	0	60
			322	0	75	0	90	0	70
			Mean =	0	72	0	58	0	50
18	SCEPTER	0.125	118	0	80	10	90	5	85
18	PURSUIT	0.063	228	0	80	20	85	20	90
			317	0	85	5	85	5	90
			Mean =	0	82	12	87	10	88
19	SCEPTER	0.125	119	0	85	20	85	5	80
19	CADRE	0.024	225	0	80	5	95	5	85
			315	0	90	10	85	10	90
			Mean =	0	85	12	88	7	85
20	PURSUIT	0.063	120	5	85	30	85	15	90
20	CADRE	0.024	220	10	90	20	80	15	85
			302	0	80	0	90	0	75
			Mean =	5	85	17	85	10	83
21	ARSENAL	0.024	121	5	80	25	85	15	85
21	CADRE	0.024	223	0	80	5	95	15	85
			323	15	70	5	90	5	85
			Mean =	7	77	12	90	12	85
22	ROUNDUP	0.25	122	100	70	75	75	100	65
			208	95	80	95	95	100	80
			307	90	85	85	85	95	80
			Mean =	95	78	85	85	98	75
23	ROUNDUP	0.50	123	100	80	85	95	100	75
			219	100	90	95	95	100	90
			325	100	80	95	95	100	90
			Mean =	100	83	92	95	100	85
24	ROUNDUP	0.75	124	100	85	85	95	100	80
			201	100	90	95	95	100	85
			326	100	80	95	95	100	85
			Mean =	100	85	92	95	100	83

Continued.

Table 13. Continued.

Trt No	Treatment Name	Rate	Plot No.	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
25	SCEPTER	0.125	125	90	95	95	95	80	90
25	ROUNDUP	0.25	222	85	90	85	95	80	85
			330	90	100	95	95	95	95
			Mean =	88	95	92	95	85	90
26	PURSUIT	0.063	126	90	95	95	95	85	95
26	ROUNDUP	0.25	221	90	95	95	95	80	90
			311	90	95	95	95	90	90
			Mean =	90	95	95	95	85	92
27	CADRE	0.024	127	90	90	95	95	75	95
27	ROUNDUP	0.25	206	90	90	95	95	100	80
			304	85	90	95	95	80	85
			Mean =	88	90	95	95	85	87
28	UNTREATED FOR H.S.		128	0	0	0	0	0	10
			214	0	0	0	10	10	5
			310	0	0	0	0	0	0
			Mean =	0	0	0	3	3	5
29	UNTREATED FOR H.S.		129	0	0	10	10	10	10
			226	0	0	0	0	0	0
			318	0	0	0	5	0	5
			Mean =	0	0	3	5	3	5
30	UNTREATED FOR H.S.		130	0	0	0	0	0	0
			203	0	0	0	0	0	0
			314	0	0	0	0	0	0
			Mean =	0	0	0	0	0	0

Table 14. Statistical analyses of imidazolinone weed control and crop tolerance in postemergence applications conducted in red rice area - Test 3. Rice Research Station, Crowley, LA. 1995.

Trt No	Treatment Name	Rate	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
1	PROPANIL	3.0	0f	0g	7cde	3e	8c-f	5f
1	PROWL 3.3 EC	1						
2	PURSUIT	0.063	2ef	85bcd	8cde	92ab	3ef	87abc
2	PROPANIL	3.0						
3	AC 299,263	0.048	7def	83bcd	18cde	93ab	18cd	92a
3	PROPANIL	1						
4	SCEPTER	0.125	3def	88abc	12cde	90ab	5def	87abc
4	PROPANIL	3.0						
5	SCEPTER	0.188	2ef	88abc	2e	95a	5def	90a
5	PROPANIL	3.0						
6	ARSENAL	0.022	0f	73ef	37b	68cd	22c	62de
6	PROPANIL	3.0						
7	ARSENAL	0.032	8de	72f	23bcd	75bc	12c-f	73cd
7	PROPANIL	3.0						
8	CADRE	0.024	0f	83bcd	7cde	87ab	7def	82abc
8	PROPANIL	3.0						
9	CADRE	0.032	5def	88abc	10cde	88ab	7def	92a
9	PROPANIL	3.0						
10	CADRE	0.048	7def	83bcd	25bc	92ab	12c-f	90a
10	PROPANIL	3.0						
11	PURSUIT	0.063	0f	80cde	3de	92ab	5def	92a
11	PROWL 3.3	1.0						
11	PROPANIL	3.0						
12	SCEPTER	0.125	0f	88abc	10cde	88ab	2ef	90a
12	PROWL 3.3	1.0						
12	PROPANIL	3.0						
13	CADRE	0.048	7def	85bcd	17cde	92ab	10c-f	87abc
13	PROWL 3.3	1.0						
13	PROPANIL	3.0						
14	SCEPTER	0.125	3def	82bcd	12cde	88ab	7def	80abc
14	ARSENAL	0.012						
15	PURSUIT	0.063	10d	85bcd	17cde	93ab	15cde	92a
15	ARSENAL	0.012						
16	CADRE	0.024	3def	82bcd	15cde	88ab	15cde	80abc
16	ARSENAL	0.012						
17	PURSUIT	0.032	0f	72f	0e	58d	0f	50e
17	SCEPTER	0.063						
18	SCEPTER	0.125	0f	82bcd	12cde	87ab	10c-f	88ab
18	PURSUIT	0.063						
19	SCEPTER	0.125	0f	85bcd	12cde	88ab	7def	85abc
19	CADRE	0.024						

Continued.

Table 14. Continued.

Trt No	Treatment Name	Rate	RICE INJURY % 6-30-95 16 DAT	RED RICE CONTROL % 6-30-95 16 DAT	RICE INJURY % 7-14-95 30 DAT	RED RICE CONTROL % 7-14-95 30 DAT	RICE INJURY % 7-21-95 37 DAT	RED RICE CONTROL % 7-21-95 37 DAT
20	PURSUIT	0.063	5def	85bcd	17cde	85ab	10c-f	83abc
20	CADRE	0.024						
21	ARSENAL	0.024	7def	77def	12cde	90ab	12c-f	85abc
21	CADRE	0.024						
22	ROUNDUP	0.25	95ab	78def	85a	85ab	98a	75bc
23	ROUNDUP	0.50	100a	83bcd	92a	95a	100a	85abc
24	ROUNDUP	0.75	100a	85bcd	92a	95a	100a	83abc
25	SCEPTER	0.125	88c	95a	92a	95a	85b	90a
25	ROUNDUP	0.25						
26	PURSUIT	0.063	90bc	95a	95a	95a	85b	92a
26	ROUNDUP	0.25						
27	CADRE	0.024	88c	90ab	95a	95a	85b	87abc
27	ROUNDUP	0.25						
28	UNTREATED FOR H.S.		0f	0g	0e	3e	3ef	5f
29	UNTREATED FOR H.S.		0f	0g	3de	5e	3ef	5f
30	UNTREATED FOR H.S.		0f	0g	0e	0e	0f	0f
LSD (.05) =			6	7	16	15	12	12
Standard Dev.=			3.6632	4.2401	10.053	9.3058	7.0751	7.458
C.V., % =			17.44	5.85	36.49	12.13	28.30	10.21

Means followed by same letter do not significantly differ (Duncan's Multiple Range Test, P=.05).

Table 15. Statistical tables of imidazolinone weed control and crop tolerance in postemergence applications conducted in red rice area - Test 3. Rice Research Station, Crowley, LA. 1995.

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 6-30-95, 16 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	120610.000000			
BLOCK	2	21.666667	10.833333	0.807	0.4510
TREATMENT	29	119810.000000	4131.379310	307.863	0.0001
ERROR	58	778.333333	13.419540		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 6-30-95, 16 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	76462.222222			
BLOCK	2	73.888889	36.944444	2.055	0.1373
TREATMENT	29	75345.555556	2598.122605	144.509	0.0001
ERROR	58	1042.777778	17.978927		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-14-95, 30 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	103962.222222			
BLOCK	2	70.555556	35.277778	0.349	0.7069
TREATMENT	29	98028.888889	3380.306513	33.441	0.0001
ERROR	58	5862.777778	101.082375		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-14-95, 30 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	86308.055556			
BLOCK	2	210.555556	105.277778	1.216	0.3039
TREATMENT	29	81074.722222	2795.680077	32.283	0.0001
ERROR	58	5022.777778	86.599617		

ANALYSIS OF VARIANCE FOR RICE, INJURY, %, 7-21-95, 37 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	107700.000000			
BLOCK	2	46.666667	23.333333	0.466	0.6298
TREATMENT	29	104750.000000	3612.068966	72.158	0.0001
ERROR	58	2903.333333	50.057471		

ANALYSIS OF VARIANCE FOR RED RICE, CONTROL, %, 7-21-95, 37 DAT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F	P(F)
TOTAL	89	77084.722222			
BLOCK	2	173.888889	86.944444	1.563	0.2182
TREATMENT	29	73684.722222	2540.852490	45.680	0.0001
ERROR	58	3226.111111	55.622605		

RICE PRODUCTION ECONOMICS RESEARCH

ECONOMICS OF ENTERPRISE SELECTION AND WHOLE FARM DECISION MAKING IN THE LOUISIANA RICE GROWING AREAS AND STATEWIDE IMPACT ASSESSMENT OF ALTERNATIVE RICE PROGRAM POLICIES[1]

M.E. Salassi, H.O. Zapata, and G. G. Giesler

Enterprise budget projections for 1996 were developed for rice, soybeans, milo, corn, wheat, and wheat-soybean double cropping systems. A summary of the enterprise budgeting analysis for rice in Louisiana is presented in Table 1. Budgeting results for the other enterprises in southwest Louisiana are shown in Table 2. Owner-operator and tenant-operator situations were budgeted for each enterprise, and output from all enterprises were valued solely at a projected market price. Rice income was calculated by estimating market returns as the product of the projected market price of $8.50 per hundredweight and the actual yield, then subtracting the checkoff of $0.06 per hundredweight. Due to the proposed changes in the farm bill for rice, as well as for other crops, no government program payments were included in the projected budgets for rice. In order to estimate total income to rice production, deficiency/transition payments plus marketing loan payments would need to be added to rice market returns.

Direct rice production expenses per planted acre were projected to increase approximately 2 percent in southwest Louisiana in 1996, with smaller changes projected in the northeast and central rice areas. Direct expenditures were defined to be seed, fuel, fertilizer, labor, chemicals, maintenance on equipment, and interest on operating capital. Projected direct costs for owner-operators ranged from $5.19/cwt. for drill-planted rice in northeast Louisiana to $7.51/cwt. for water-planted rice in Southwest Louisiana. Tenant-operators in these areas had projected direct costs of $7.36/cwt. and $8.27/cwt., respectively. Total specified expenses include direct expenditures, the annualized cost of replacing capital assets, and interest on non-operating capital. Estimated total specified costs for water-planted rice in southwest Louisiana was $9.26/cwt. for owner-operators and $10.07/cwt. for tenant-operators. Drill-planted rice in northeast Louisiana showed projected total costs of $6.52/cwt. for owners and $8.83/cwt. for tenants. It should be noted that total specified expenses do not include an estimation of per acre overhead costs. Detailed enterprise budgets and supporting data were published in A.E.A. Information Series Number 140, January, 1996 (Dept. of Agricultural Economics and Agribusiness, Louisiana Agricultural Experiment Station, L.S.U. Agricultural Center).

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

Work continued within the Department of Agricultural Economics and Agribusiness in 1995 to develop farm simulation models that would provide the capability of analyzing the impacts of alternative rice program policies on resource allocation and financial viability of representative Louisiana rice farming situations. The Resource Allocation and Agricultural Policy Simulator (RAAPSIM) project is a coordinated, multistate, multiyear research project that has as its goal the development of a user friendly, menu driven, fully integrated PC based modeling system that would allow analysts in individual rice states to conduct relatively straightforward analyses on a wide range of regional and statewide questions concerning the impact of various policy initiatives as the need arises. The policy initiatives RAAPSIM will be capable of analyzing in the near future include national, as well as local/regional, policies that are of concern to U.S. rice producers.

Progress made in 1995 on the RAAPSIM project included the development of a 5-year rice farm financial policy simulator, which is capable of analyzing the impacts of changes in farm program policy provisions on the financial structure of representative rice farms. The input coefficients and model formulation of a one-period resource allocation model have been developed for southwest and northeast Louisiana rice farms in GAMS (General Algebraic Modeling System) and are currently being evaluated.

Considerable work in 1995 was devoted to the evaluation of alternative farm program proposals as part of the 1995 farm bill debate. Analyses of proposed rice program provisions, as part of a new farm bill, were conducted for (1) the Rice Advisory Committee of the Louisiana Farm Bureau; (2) the Louisiana Rice Growers Association; (3) the Louisiana Farm Bureau Farm Bill Study Committee; (4) the U.S. Rice Producers Group; (5) the USA Rice Federation; and (6) the offices of Senators John Breaux and J. Bennett Johnston. Results from some of this analysis are shown in Tables 3-5. Table 3 presents estimated breakeven yields required per planted acre of rice (with a 25% ratoon crop) under alternative proposals to reduce rice program funding. The proposals analyzed here maintained the 1995 rice program but made reductions in program payments either by reducing target price or increasing nonpaid base acreage. Table 4 compares payment rates and estimated gross returns per acre from farm bills originally passed by the House and Senate in the fall of 1995. The Senate proposal maintained the previous program and made adjustments in payment acreage and maximum deficiency payment levels. The House bill (Freedom to Farm) proposed decoupled, guaranteed payments on 100 percent of base acreage. Table 5 compares net returns for rice above variable costs for alternative percents of base acreage planted to rice under payment rates passed under the original Conference Committee farm bill. These payment rates assumed a decoupled rice program with no minimum planting requirement. Payments were to be made on 85 percent of eligible rice base acreage.

Table 1. A Summary of Projected Costs and Returns per Acre for Rice Production in Louisiana, 1996.

Crop Description	Yield Per Acre	Unit	Total Income	Direct Expenses	Returns Over Direct Expenses	Fixed Expenses	Total Expenses	Returns Over Total Expenses
			---------- Dollars per Acre ----------					
Rice Enterprises: a/								
SOUTHWEST LOUISIANA								
Water Plant, Owner b/	48.00	cwt.	405.12	360.57	44.55	83.74	444.31	-39.19
Water Plant, Tenant c/	28.80	cwt.	243.07	238.22	4.85	51.67	289.89	-46.82
Water Plant, "No Till", Owner b/	48.00	cwt.	405.12	361.26	43.86	83.26	444.52	-39.40
Water Plant, Stale Seedbed, Owner b/	48.00	cwt.	405.12	363.50	41.62	84.94	448.44	-43.32
Drill Plant, Owner b/	51.00	cwt.	430.44	344.74	85.70	86.58	431.32	-.88
Drill Plant, Tenant c/	30.60	cwt.	258.26	225.31	32.95	55.38	280.69	-22.43
Drill Plant, "No Till", Owner b/	51.00	cwt.	430.44	351.49	78.95	88.07	439.56	-9.12
Drill Plant, Stale Seedbed, Owner b/	51.00	cwt.	430.44	356.51	73.93	89.21	445.72	-15.28
Second Cutting, Owner b/	16.00	cwt.	135.04	74.34	60.70	19.09	93.43	41.61
Second Cutting, Tenant c/	9.60	cwt.	81.02	46.18	34.84	19.09	65.27	15.75
NORTHEAST LOUISIANA								
Water Plant, Owner b/	54.50	cwt.	459.98	287.00	172.98	67.44	354.44	105.54
Water Plant, Tenant c/	32.70	cwt.	275.99	238.05	37.94	52.23	290.28	-14.29
Drill Plant, Owner b/	54.50	cwt.	459.98	282.74	177.24	72.78	355.52	104.46
Drill Plant, Tenant c/	32.70	cwt.	275.99	231.93	44.06	56.94	288.87	-12.88
CENTRAL LOUISIANA								
Water Plant, Owner b/	50.00	cwt.	422.00	309.82	112.18	64.51	374.33	47.67

* Returns over total expenses do not include estimated overhead costs.

a/ Income for rice was calculated as the product of the projected 1996 market price of $8.50 per hundredweight and the actual yields in the budgets. Government payments were excluded from total income estimates due to changes in the farm program provisions for rice.

b/ Land costs are not included for owner-operators.

c/ Rental arrangements for rice in southwest Louisiana were 1/5 crop share for land and 1/5 crop share for water with both landlord and waterlord paying 1/5 of fertilizer, chemicals, and drying and storage costs and the waterlord paying all of the irrigation fuel. Rental arrangements for rice in northeast Louisiana were 1/5 crop share for land and 1/5 crop share for water with the waterlord paying all irrigation fuel costs and both the landlord and waterlord paying 1/5 of the drying and storage costs.

Table 2. A Summary of Projected Costs and Returns per Acre for Soybean, Corn, Milo, Wheat, and Wheat-Soybean Double Crop Production, Southwest Louisiana, 1996 a/

Crop Description	Yield Per Acre	Unit	Total Income	Direct Expenses	Returns Over Direct Expenses	Fixed Expenses	Total Expenses	Returns Over Total Expenses
			---------- Dollars per Acre ----------					
Soybean Enterprises:								
6-Row, Owner b/	25.50	bu.	159.38	121.18	38.20	36.43	157.61	1.77
6-Row, Tenant c/	20.40	bu.	127.50	119.70	7.80	36.43	156.13	-28.63
Drill Plant, Owner b/	28.00	bu.	175.00	129.07	45.93	35.58	164.65	10.35
Drill Plant, Tenant c/	22.40	bu.	140.00	127.44	12.56	35.58	163.02	-23.02
Drill Plant, No Till, Owner b/	28.00	bu.	175.00	124.63	50.37	28.43	153.06	21.94
Corn Enterprises:								
6-Row, Owner b/	100.00	bu.	280.00	182.37	97.63	43.22	225.59	54.41
6-Row, Tenant c/	80.00	bu.	224.00	178.54	45.46	43.22	221.76	2.24
Milo Enterprises:								
Drill Plant, Owner b/	37.00	cwt.	148.00	120.52	27.48	31.71	152.23	-4.23
Drill Plant, Tenant c/	29.60	cwt.	118.40	120.52	-2.12	31.71	152.23	-33.83
Wheat Enterprises:								
Drill Plant, Owner b/	34.00	bu.	136.00	97.98	38.02	29.67	127.65	8.35
Drill Plant, Tenant c/	27.20	bu.	108.80	97.98	10.82	29.67	127.65	-18.85
Wheat-Soybean Double Crop:								
Wheat-Soybean, Owner b/	34+26	bu.	298.50	193.10	105.40	54.36	247.46	51.04
Wheat-Soybean, Tenant c/	27.2+20.8	bu.	238.80	193.10	45.70	54.36	247.46	-8.66

* Returns over total expenses do not include estimated overhead costs.

a/ Crop prices used were $6.25 per bushel for soybeans, $2.80 per bushel for corn, $4.00 per hundredweight for milo and $4.00 per bushel for wheat.

b/ Land costs are not included for owner operators.

c/ Rental arrangements for soybeans, corn, milo, and wheat were 1/5 crop share for land with the landlord paying 1/5 of any drying and storage costs.

Table 3. Breakeven yields required to cover total production costs per rice base acre under alternative farm program scenarios, 1996-2000.

Rice program scenario	Breakeven yields to cover total production costs per base acre[1] 1996	1997	1998	1999	2000
			(Cwt./acre)		
(a) 1995 rice program	59.99	61.10	63.54	67.26	70.80
(b) 3% annual decrease in rice target price	61.94	64.89	69.05	74.43	79.59
(c) $150 million reduction in rice program funding[2]	65.93	66.92	69.20	72.98	76.47
(d) $200 million reduction in rice program funding[2]	67.81	68.76	71.12	74.34	77.94
(e) $250 million reduction in rice program funding[2]	69.83	70.75	72.92	76.73	80.16

[1] Tenant-operator situation in southwest Louisiana with full base planted in rice, plus a 25% ratoon crop.
[2] $150-$250 million annual reduction in rice program funding taken as reductions in target price and increases in nonpayment acreage.
Source: Salassi, Michael E., Analysis of Alternative Reductions in Rice Program Payments for the Major U.S. Rice-producing States, 1995-2000, analysis conducted for U.S. Rice Producers' Group, USA Rice Federation, (May 1995).

Table 4. Comparison of rice gross returns under original "Freedom to Farm" (House bill) and Senate farm bill proposals.

Farm bill proposal[1]	1996	1997	1998	1999	2000	2001	2002
Freedom to Farm (House bill):							
Estimated transition payment/cwt.	4.10	3.98	4.26	4.13	3.80	3.12	3.04
Gross returns/planted acre ($)	549	554	592	598	589	566	571
Gross returns/base acre ($)	384	388	415	418	412	396	399
Senate bill[2]:							
Estimated deficiency payment/cwt.	4.21	4.06	3.61	3.34	3.11	2.76	2.56
Gross returns/planted acre ($)	529	533	521	512	503	496	497
Gross returns/base acre ($)	370	373	365	359	352	347	348

[1] Gross returns for southwest Louisiana rice farm with actual yield of 48.0 cwt/acre and a program yield of 41.3 cwt/acre; based on CBO projected market prices and 70% planted base acreage. (October 1995).
[2] Rice provisions in the originally passed Senate farm bill were the same as the 1995 rice program with nonpayment acreage increased to 30% of base and declining capped deficiency payments per cwt. of $4.21, $4.19, $3.86, $3.48, $3.23, $2.89, and $2.66.

Table 5. Comparison of rice net returns above variable costs for alternative rice plantings under the conference farm bill, 1996-2002.

Conference bill[1]	1996	1997	1998	1999	2000	2001	2002
1989-94 avg. market price ($6.89/cwt):							
85% base planted to rice	0.80	22.02	19.70	9.97	(3.71)	(23.82)	(33.50)
70% base planted to rice	8.86	36.06	34.81	24.63	9.72	(12.94)	(22.91)
50% base planted to rice	27.17	68.15	69.30	58.02	40.20	11.60	0.89
Projected market price ($7.50/cwt):							
85% base planted to rice	18.38	39.60	37.28	27.56	13.88	(6.23)	(15.91)
70% base planted to rice	26.39	53.60	52.35	42.17	27.36	4.60	(5.37)
50% base planted to rice	44.74	85.71	86.87	75.59	57.76	29.17	18.46

[1] Net returns above variable costs per planted acre for southwest Louisiana rice farm with actual yield of 48.0 cwt/acre and a program yield of 41.3 cwt/acre; based on CBO projected market prices and rice transition payment rates of $1.52, $2.66, $2.86, $2.77, $2.53, $2.04, and $1.98 per cwt. over the 1996-2002 period. (December 1995).

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The Rice Research Station is especially indebted to Mr. H.F. Morris, Jr., Herman E. Wilson Feed and Fertilizer Laboratory, for the chemical analyses of research samples. Dr. L. LaMotte, Department of Experiment Statistics, and his staff aided in the research program through their help in the planning and statistical analyses of research data.