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Estimated Furrow Irrigated Rice Crop Budgets for Northeast Louisiana

A Farm Management Planning Tool

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Furrow irrigated rice (FIR) has spread in popularity across the Mississippi River Delta Region in recent years. Much of this popularity is driven by the attractive yield potential, reduced input usage (e.g., labor), and efficient use of water. In the Delta Region, much attention for alternative rice irrigation practices rests on the potential for reduced groundwater withdrawal. Furrow irrigated rice is expected to increase significantly across the Mid-South this spring given the increased focus on farming sustainability and the announcement of furrow irrigated rice being covered by crop insurance.

In order to estimate the cost of producing furrow irrigated rice in northeast Louisiana, economic information was obtained through demonstration fields within the LSU Agricultural Center's Rice Research Verification Program in addition to conversations with grower cooperators and rice consultants. Rice enterprise budgets are presented in Tables 1-4 to provide a per-acre estimate of the direct and total cost of growing furrow irrigated rice. These direct cost estimates are projections and are not intended to be interpreted as a recommended average cost of production. It is, however, an attempt to estimate an initial per-acre cost for furrow irrigated rice in Northeast Louisiana as there are no official recommendations for this production practice.

Budget categories include chemical costs reflective of both a Clearfield and non-Clearfield hybrid rice production system, respectively. Common to each FIR production system, nitrogen (N) fertilizer was applied via four applications. Hauling and drying expenses are a function of actual field yield (cwt). It is assumed that rice will be dried down to a moisture level of 12% and that the field yield is 80 cwt per acre. Irrigation costs are based on six applications of three, three, five, five, five, and five acre-inches.

The total direct production costs for a Clearfield hybrid variety FIR system in Table 1 is estimated to be $712.76 per acre. This cost estimate does not include herbicide and herbicide application fees. Information presented in Table 2 attempts to reflect the expected weed control measures that a producer in northeastern Louisiana would need to plan for in a FIR system. These herbicide costs should be interpreted as a representative upper bound on what the realized weed control costs could be, their overall purpose is to serve as a conservative estimate for this particular expenditure in FIR. Individual producers' herbicide costs will vary given weed pressure, environmental conditions present for a producer's specific region/field(s), and cost structure/discounts available from their local chemical supplier.

Table 1. Estimated cost of producing FIR Clearfield hybrid rice production in Louisiana, 2025.

DIRECT EXPENSES	UNIT	PRICE	QTY	AMOUNT
CUSTOM SPRAY				
GPS Fee	acre	$0.25	7.00	$1.75
DRYING				
Drying Fee	cwt	$0.90	88.00	$79.20
FERTILIZERS				
N	lb	$0.52	200.00	$104.00
P	lb	$0.79	60.00	$47.40
K	lb	$0.38	40.00	$15.20
FUNGICIDES				
Stratego	pt	$22.50	0.70	$15.75
INSECTICIDES				
Karate Z	oz	$1.41	4.00	$5.64
SEED				
Clearfield Hybrid	acre	$190.00	1.00	$190.00
SERVICE FEE				
Digital Ag Fee	acre	$10.00	1.00	$10.00
Soil Test	acre	$10.00	.33	$3.30
CUSTOM FERT				
Aerial App. Fee	app	$13.60	4.00	$54.40
CUSTOM HAUL				
Haul	cwt	$0.30	80.00	$24.00
LABOR-HAND				
Implements	hour	$14.83	0.09	$1.33
LABOR-OPERATOR				
Self-Propelled	hour	$18.69	0.33	$6.17
LABOR-HIRED				
Tractors	hour	$14.83	0.49	$7.32
LABOR IRRIGATION				
Irrg. System	hour	$14.83	0.44	$6.47
DIESEL FUEL PRICE				
Tractors Self	gal	$2.80	6.76	$18.93
Self-Propelled	gal	$2.80	2.58	$7.22
Irrigation System	gal	$2.80	23.90	$66.92
REPAIR & MAINTENANCE	acre	$30.45	1.00	$30.45
INTEREST ON CAPITAL	acre	$17.30	1.00	$17.30
TOTAL DIRECT EXPENSES LESS HERB.	acre			$712.75

Table 2. Estimated herbicide prescription for Clearfield hybrid furrow irrigated rice in Louisiana.

HERBICIDES (Alternative A- CL Hybrid)				
DIRECT EXPENSES	UNIT	PRICE	QTY	AMOUNT
Sharpen	oz	$7.46	2.0	$14.92
Command	pt	$14.95	1.0	$14.95
Roundup	pt	$2.73	4.0	$10.92
Rice One	oz	$0.47	45.0	$21.15
Clearpath	lb	$71.36	0.6	$42.83
CUSTOM SPRAY				
Aerial App. Fee	app	$13.60	6.00	$81.60
TOTAL DIRECT EXPENSES	acre			$899.11

Based on conversations with agricultural professionals in the region, the use of Sharpen, Command, Roundup, Rice One, and Clearpath were recommended as representative herbicide control treatments for both pre and post emergence. The estimated total (to include application fees) is $186.36 per acre, a substantial outlay on a per-acre basis. Therefore, the total direct costs per acre are estimated to be $899.11 but will most likely vary with weed pressure intensity.

Total direct production costs for a non-Clearfield hybrid variety FIR system in Table 3 are estimated to be $685.75 per acre. The main structural cost differential in this system is the reduced seed cost for a non-Clearfield hybrid rice seed. Again, these cost estimates in Table 3 do not include herbicide and herbicide application fees.

Information presented in Table 4 attempts to reflect the expected weed control measures associated with FIR in northeastern Louisiana. Based on conversations with agricultural professionals in the region, the use of Sharpen, Command, Roundup, Rice One, Stam, Permit, and Facet could represent the pre and post emergence herbicide control measures necessary to in a FIR system. The estimated total (to include application fees) is $230.24 per acre. The stated herbicide prescription in Table 4 exceeds the herbicide program identified in Table 2 due to amount (count) of herbicides includes. These herbicide costs should be interpreted as a representative upper bound on what the realized weed control costs could be. Individual producers' herbicide costs will vary given weed pressure, environmental conditions present for a producer's specific region/field(s), and cost structure/discounts available from their local chemical supplier.

The information in Tables 1 through 4 provides the cost structure of FIR which, in turn, incorporates additional aerial application fees for herbicides, additional nitrogen fertilizer, as well as additional herbicide prescriptions employing Command, and Regiment specific to burndown and post-emergent weed control practices commonly encountered in FIR. Total direct costs per acre are estimated to be $916.00 but will most likely vary with weed pressure intensity.

Table 3. Estimated cost of producing FIR non-Clearfield hybrid rice production in Louisiana, 2025.

DIRECT EXPENSES	UNIT	PRICE	QTY	AMOUNT
CUSTOM SPRAY				
GPS Fee	acre	$0.25	7.00	$1.75
DRYING				
Drying Fee	cwt	$0.90	88.00	$79.20
FERTILIZERS				
N	lb	$0.52	200.00	$104.00
P	lb	$0.79	60.00	$47.40
K	lb	$0.38	40.00	$15.20
FUNGICIDES				
Stratego	pt	$22.50	0.70	$15.75
INSECTICIDES				
Karate Z	oz	$1.41	4.00	$5.64
SEED				
Non-CL Hybrid	acre	$163.00	1.00	$163.00
SERVICE FEE				
Digital Ag Fee	acre	$10.00	1.00	$10.00
Soil Test Fee	acre	$10.00	.33	$3.30
CUSTOM FERT				
Aerial App. Fee	app	$13.60	4.00	$54.40
CUSTOM HAUL				
Haul	cwt	$0.30	80.00	$24.00
LABOR-HAND				
Implements	hour	$14.83	0.09	$1.33
LABOR-OPERATOR				
Self-Propelled	hour	$18.69	0.33	$6.17
LABOR-HIRED				
Tractors	hour	$14.83	0.49	$7.32
LABOR IRRIGATION				
Irrg. System	hour	$14.83	0.44	$6.47
DIESEL FUEL PRICE				
Tractors Self	gal	$2.80	6.76	$18.93
Self-Propelled	gal	$2.80	2.58	$7.22
Irrigation System	gal	$2.80	23.90	$66.92
REPAIR & MAINTENANCE	acre	$30.45	1.00	$30.45
INTEREST ON CAPITAL	acre	$17.30	1.00	$17.30
TOTAL DIRECT EXPENSES LESS HERB.	acre			$685.75

Table 4. Estimated herbicide prescription for hybrid furrow irrigated rice in Louisiana.

HERBICIDES (Alternative B- non-CL Hybrid)				
DIRECT EXPENSES	UNIT	PRICE	QTY	AMOUNT
Sharpen	oz	$7.46	2.0	$14.92
Command	pt	$14.95	1.0	$14.95
Roundup	pt	$2.73	4.0	$10.92
Rice One	oz	$0.47	45.0	$21.15
Stam	qt	$8.00	3.0	$24.00
Permit	oz	$23.42	0.75	$17.57
Facet	pt	$17.36	2.6	$45.14
CUSTOM SPRAY				
Aerial App. Fee	app	$13.60	6.00	$81.60
TOTAL DIRECT EXPENSES	acre			$910.30

Prior to furrow irrigated rice adoption, growers need to consider their anticipated costs and returns. Likely, furrow irrigated rice will be produced in conjunction with corn, soybeans, and even cotton on northeastern Louisiana farms. Net returns above variable production cost is the appropriate metric one may use in making production decision comparisons among crops in the short run period of one crop year. Net returns above variable production costs (including land rent) are calculated and the differences between these values gives an estimate of the net return advantage of one crop over the other at assumed levels of cost, yield and price. Through funding provided by the Louisiana Rice Research Board, a farm management decision tool was developed to calculate net returns above variable costs and land rent for furrow irrigated rice, soybeans, and corn to show the differences between the net returns for two competing crops in tabular format

The Furrow Irrigated Rice, Corn, and Soybean Net Return Comparison Decision Aid is a spreadsheet-based decision tool developed to assist producers in Louisiana in making production decisions based on expected net return comparisons between production of furrow irrigated rice, corn and soybeans, using alternative expectations related to variable production costs, expected crop yields and expected crop market prices. The decision tool contains Excel worksheets which compares net returns above variable production costs for two alternative sets of furrow irrigated rice crop production choices.

Net returns above variable production costs are the appropriate values to use in making production decision comparisons among crops in the short run period of one crop year. For a given crop production year, fixed production expenses, including primarily equipment depreciation and interest, would not change as a result of which crops are produced in that year. Variable production costs are defined as those production expenses which would change based upon which crops are planted for production in that year. Land rent, if applicable, would also be included as a production cost in the net return calculation, due to the fact the many of the cropland leases are on a crop share basis and would change in value based upon the level of crop yield and market price. Therefore, net returns above variable production costs and land rent charges are calculated and the differences between these values gives an estimate of the net return advantage of one crop over the other at assumed levels of cost, yield and price.

Information required to be entered by the user for each crop includes: (a) variable production cost per acre, (b) expected crop yield per acre, and (c) crop share rent percentage or cash rent payment per acre. Data values which can be entered/changed by the user are in blue text. In addition, the user can change the range of rice prices, rice yields, corn prices, and soybean prices evaluated by changing the first value (highlighted in blue) listed for each crop in the worksheet. The worksheet calculates net returns above variable costs and land rent for each crop and shows the difference between the two net returns in the table. Therefore, the values shown in the table can be interpreted as the advantage in net returns per acre for one crop (whose market prices are listed along the left side of the table) compared to the other crop (whose market prices are listed along the top of the table. For the range of market price combinations for which the crop on the left has a net return advantage over the other crop, those cell values with positive net return differences will be shaded in yellow. As values for variable cost, yield and rent are changed, the corresponding net return differences and highlighted cells with a net return advantage will change accordingly.

Figure 1 provides a net return comparison between row rice and soybeans. Production costs for rice that appear in the table represent the variable costs for a row rice system and are expressed in a single dollar amount per acre. The net return advantage (disadvantage) of rice is presented over a range of expected price and yield combinations. Farm program payments are not included in the table. Land rent is set at a 20% share, although, the option to enter a cash rent exists.

Figure 1. Net return comparison of rice to soybean production, under a range of rice prices and yields.

Rice Net Return Advantage Compared to Soybean Net Returns

		Soybean Price =	$10.10 per bushel
Rice Variable Costs =	$899 per acre	Soybean Variable Costs =	$450 per acre
		Soybean Expected Yield =	57 bushels per acre
Rice Share Rent =	20% crop share	Soybean Share Rent =	20% crop share
Rice Cash Rent =	$0 per acre	Soybean Cash Rent =	$0 per acre

Rice Yield (lbs/acre)

Rice Price ($/lb)	8,600	8,650	8,700	8,750	8,800	8,850	8,900	8,950	9,000
$0.1200	-84	-79	-74	-70	-65	-60	-55	-50	-46
$0.1225	-67	-62	-57	-52	-47	-42	-37	-32	-28
$0.1250	-50	-45	-40	-35	-30	-25	-20	-15	-10
$0.1275	-32	-27	-22	-17	-12	-7	-2	$3	$8
$0.1300	-15	-10	-5	$0	$6	$11	$16	$21	$26
$0.1325	$2	$7	$13	$18	$23	$29	$34	$39	$44
$0.1350	$19	$25	$30	$35	$41	$46	$52	$57	$62
$0.1375	$36	$42	$47	$53	$58	$64	$69	$75	$80
$0.1400	$54	$59	$65	$70	$76	$82	$87	$93	$98
$0.1425	$71	$77	$82	$88	$94	$99	$105	$111	$116
$0.1450	$88	$94	$100	$105	$111	$117	$123	$129	$134
$0.1475	$105	$111	$117	$123	$129	$135	$141	$147	$152
$0.1500	$122	$128	$134	$140	$146	$152	$158	$164	$170
$0.1525	$140	$146	$152	$158	$164	$170	$176	$182	$188
$0.1550	$157	$163	$169	$175	$182	$188	$194	$200	$206
$0.1575	$174	$180	$187	$193	$199	$206	$212	$218	$224

Values in table equal to rice net returns minus soybean net returns above variable costs

Figure 2 provides a net return comparison of row rice compared to a competing corn enterprise. The same methodology previously described is applied to this analysis. For each competing enterprise, production costs are entered as a fixed dollar amount so that system costs can be considered.

Figure 2. Net return comparison of rice to corn production under a range of rice prices and yields.

Rice Net Return Advantage Compared to Corn Net Returns

		Corn Price =	$4.30 per bushel
Rice Variable Costs =	$899 per acre	Corn Variable Costs =	$621 per acre
		Corn Expected Yield =	180 bushels per acre
Rice Share Rent =	20% crop share	Corn Share Rent =	20% crop share
Rice Cash Rent =	$0 per acre	Corn Cash Rent =	$0 per acre

Rice Yield (lbs/acre)

Rice Price ($/lb)	8,600	8,650	8,700	8,750	8,800	8,850	8,900	8,950	9,000
$0.1200	-72	-67	-62	-57	-52	-48	-43	-38	-33
$0.1225	-54	-50	-45	-40	-35	-30	-25	-20	-15
$0.1250	-37	-32	-27	-22	-17	-12	-7	-2	$3
$0.1275	-20	-15	-10	-5	$0	$6	$11	$16	$21
$0.1300	-3	$2	$8	$13	$18	$23	$28	$34	$39
$0.1325	$14	$20	$25	$30	$36	$41	$46	$52	$57
$0.1350	$32	$37	$42	$48	$53	$59	$64	$69	$75
$0.1375	$49	$54	$60	$65	$71	$76	$82	$87	$93
$0.1400	$66	$72	$77	$83	$88	$94	$100	$105	$111
$0.1425	$83	$89	$95	$100	$106	$112	$117	$123	$129
$0.1450	$100	$106	$112	$118	$124	$129	$135	$141	$147
$0.1475	$118	$124	$129	$135	$141	$147	$153	$159	$165
$0.1500	$135	$141	$147	$153	$159	$165	$171	$177	$183
$0.1525	$152	$158	$164	$170	$176	$183	$189	$195	$201
$0.1550	$169	$175	$182	$188	$194	$200	$206	$213	$219
$0.1575	$186	$193	$199	$205	$212	$218	$224	$231	$237

Values in table equal to rice net returns minus corn net returns above variable costs

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