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Catfish Pond Conversion Sensitivity Analysis

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Catfish Pond Conversion Sensitivity Analysis

Objective

The objective of this paper is to develop an economic analysis of the sensitivity of the decision to convert catfish production ponds in the Mississippi Delta to expected changes in row crop profitability based on relative cost of production and row crop market prices

Background

Decreased profitability of catfish production in the Mississippi due to low output prices and increased feed costs has led to a 50% decline in catfish pond acreage in the Mississippi Delta region. Higher soybean and corn prices that pushed feed prices above profitable levels has encouraged catfish producers to convert ponds back to row crop production.

Data and Methods

This study compares the expected net present value of estimated returns to land, unpaid management and profit generated by catfish production projected over the 2014-2023 time period versus the expected net present value of returns from soybean or corn production less the conversion cost of catfish ponds to land capable of row crop production. The net present value (NPV) method uses the discounting formula shown below for the non-uniform series of projected returns for row crop and catfish production to value the respective net returns at one point in time (Barry, Hopkin and Baker).

$$NPV = -INV + \sum_{n=1}^{10} \frac{P_n}{(1+i)^n}$$

where:

INV = catfish pond conversion cost per water acre,

P_n = net returns per acre to land, unpaid management and profit in year n ,

i = discount rate.

The net present value criterion directly accounts for the timing and magnitude of the investment in pond conversion and projected returns. The sign and size of each alternative's net present value determines its ranking and acceptability. For this study, all alternatives are income generating so the investment with the largest net present value is the most favored. The discount rate for a particular investment is the rate that the equity capital employed in each enterprise could return in its most favorable alternative use. Since this value would vary from producer to producer, the discount rates used in this study are parameterized over a range of 5% to 10%.

The decision support aid developed for this study is based on enterprise budgets developed by Mississippi State University Extension personnel for furrow irrigated soybeans (MSU), furrow irrigated corn (MSU) and catfish production (Hanson, Steeby and Avery). The soybean enterprise budget in this study represents a production system using Roundup Ready soybeans, stale seedbed tillage, 12 row equipment with a 30 inch row planting pattern, furrow irrigation of 9 acre inches per year with a 65 bushel per acre yield goal. The corn enterprise budget in this

study represents a production system using BtRR seed, stale seedbed tillage, furrow irrigated with 13 acre inches per year and a 185 bushel per acre yield goal (Appendix I).

The catfish enterprise budget presented in the study was updated using current input prices gathered from local suppliers in the Mississippi Delta area. This budget is based on a production system utilizing multiple-batch harvest of channel catfish in conventional ponds. The feed conversion ratio is assumed to be 2.3 to 1 with a monthly mortality rate of 1.5% and harvest weight of 1.5 pounds. Catfish prices are parameterized at \$1 .00 per pound, \$0.95 per pound and \$0.90 per pound. Catfish prices are not adjusted over the planning horizon. Catfish feed prices are initially set at \$493 per ton¹. Copper sulfate prices are set at \$98 per 50 pound bag, Diuron prices are set at \$195 per 25 pound bag and salt prices at \$113 per ton². Meter charges are set at \$18 per month with electric rates of 14.7 cents per kilowatt hour³. Gasoline prices are set at \$3.40 per gallon and diesel prices are set that \$3.50 per gallon, consistent with the 2013 MSU planning budgets (Appendix II).

The output prices and yields for soybeans and corn along with input prices for catfish, soybeans and corn are adjusted on an annual basis over the planning horizon. These adjustments are the calculated percentage changes in indices of prices paid by farmers for each item forecast in the Food and Agricultural Policy Research Institute (FAPRI) U.S. Baseline Briefing Book (Appendix III).

¹ Weighted average of monthly reported prices from March 2012 to July 2013 with the balance of feed in this cycle valued at \$430 per ton based on personal conversation with Fishbelt Feeds, Inc. personnel, Moorhead, MS., August 21, 2013.

² Based on personal conversation with Aqua Center, Inc. personnel, Leland, MS., August 20, 2013.

³ Based on personal conversation with Entergy Mississippi, Inc. personnel, August 21, 2013.

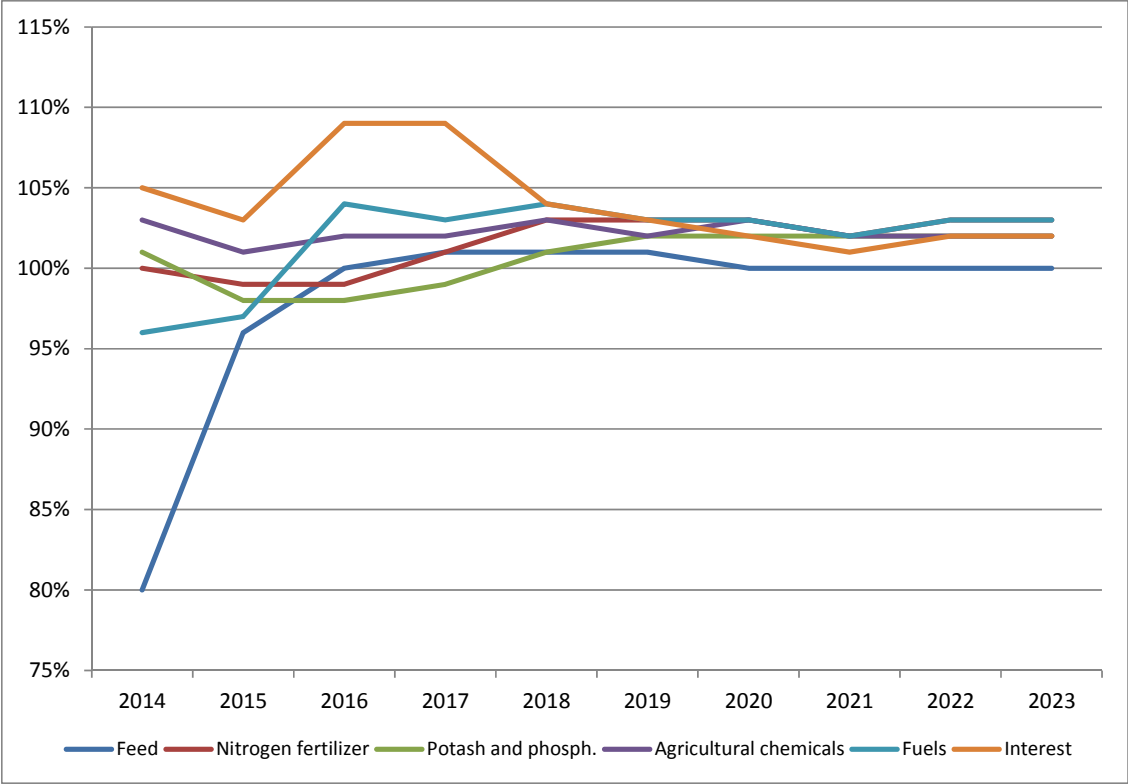


Figure 1. Projected Annual Percentage Changes in Selected Cost Components (FAPRI).

As shown in Figure 1, FAPRI projects a 20% decline in feed price in 2014 followed by a 4% reduction in 2015 in response to sharply lower feed grain prices relative to the 2013 crop year. Slight increases in feed prices are expected in the 2017 to 2019 time frame, followed by stable feed prices over the remainder of the planning horizon. Fertilizer prices are projected to remain relatively stable through the 2016 crop year, followed by annual increases of 2% over the remainder of the planning horizon. Fuel prices are projected to decrease by 4% in 2014 followed by a 3% reduction in 2015 then increasing at an annual rate of 3 to 4% per year over the remainder of the planning horizon. Agricultural chemicals are projected to increase between 2% and 3% per year over the entire planning horizon.

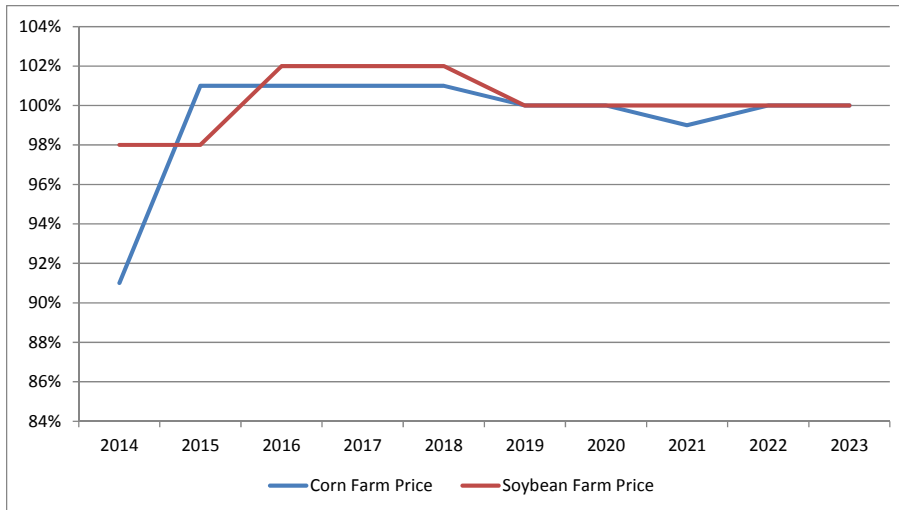


Figure 2. Projected Annual Percentage Changes in Farm Prices for Corn and Soybeans (FAPRI).

Corn prices are projected to decline 7% from 2013 levels before stabilizing over the remainder of the planning horizon. Soybean prices are projected to decline 2% from 2013 levels followed by another 2% decline in 2015. Soybean prices are expected to increase to percent annually over the 2016 to 2018 timeframe before stabilizing over the remainder of the planning horizon (Figure 2).

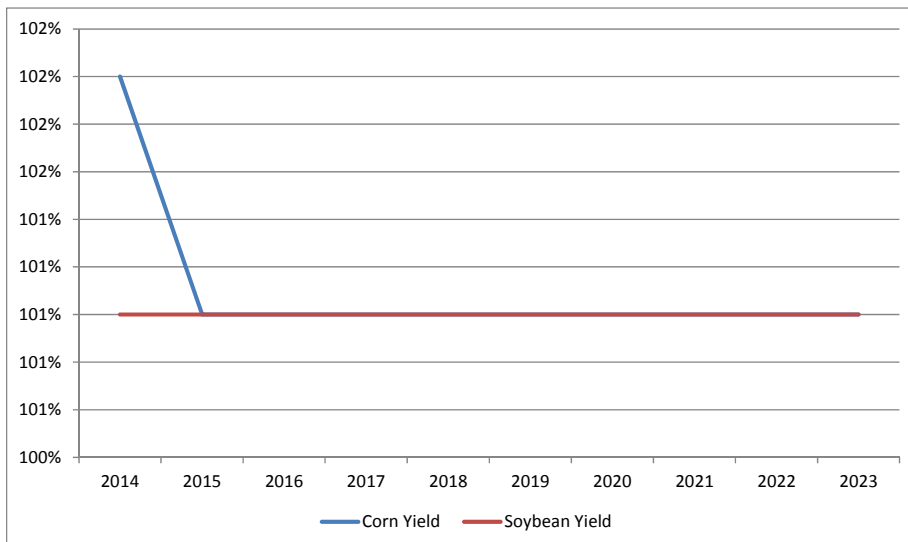


Figure 3. Projected Annual Changes in Corn and Soybean Yields (FAPRI).

Soybean yields are projected to increase at a 1% annual rate over the planning horizon. Corn yields are projected to increase by 2% for 2014, followed by 1% annual rates of increase over the remainder of the planning horizon (Figure 3).

Two pond conversion methods are examined in this analysis. The first is a partial conversion method, where the levees are shaved with pond bottoms leveled to a grade compatible with furrow irrigation. The second method is a full conversion, bringing the total land area to a grade compatible with furrow irrigation. The partial conversion cost estimate used in this study is \$1500 per acre, with a 100% water to crop acre conversion factor. The full conversion cost estimate is \$2000 per acre with a 115% water to crop acre conversion factor⁴.

Results and Discussion

The 2013 budget results for the projected costs and returns for the irrigated soybean, corn and catfish budgets are shown in Appendix II. The estimated net returns to land, unpaid management and profit over the 2014-2023 planning horizon are shown in Figure 4.

⁴ Based on personal conversation with Mr. Keith King, Dillard Farms, August 20, 2013.

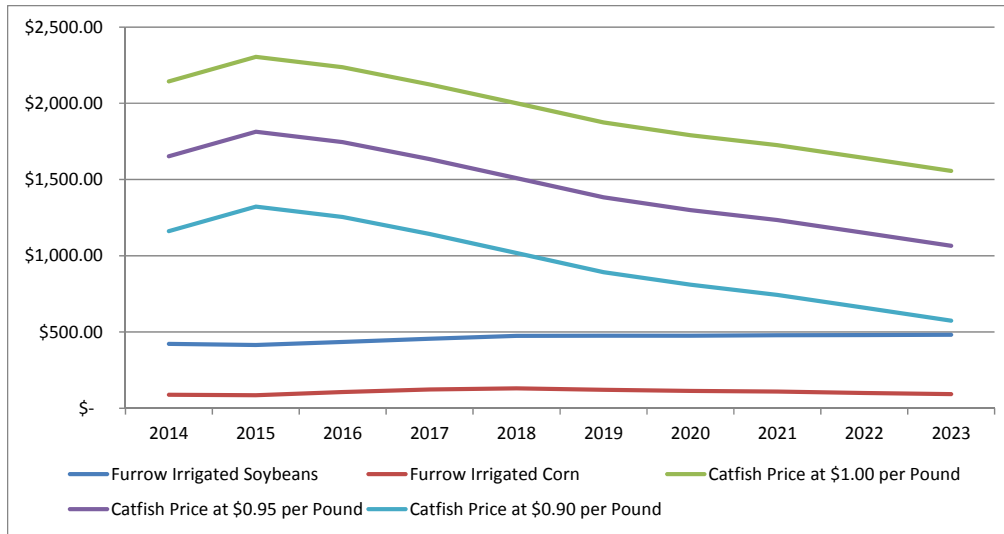


Figure 4. Estimated Net Returns to Land, Unpaid Management and Profit per Acre for Irrigated Soybeans, Irrigated Corn and Catfish at Three Alternative Price Levels.

The initial estimated price needed to cover the total specified costs in this catfish production system is \$0.89 per pound. The expected reduction in feed prices leads to improved profitability in the catfish production sector over the near term. The FAPRI forecast results in feed prices ranging from a low of \$380 per ton to slightly above \$396 per ton over the planning horizon. The projected range in feed prices is roughly equivalent to the feed prices reported for calendar year 2008 and approximately \$15 per ton below the 2008-2012 average.

The assumption that catfish production is flat at slightly over 4900 pounds per acre and stable catfish prices at the \$1 per pound, \$0.95 per pound, and \$0.90 per pound levels eventually leads to deterioration in net returns due to increasing input prices later in the planning horizon.

Net present value results for the full conversion method are shown in Table 1. The projected net returns to land, unpaid management and profit are discounted at rates ranging from 5% to 10%.

At every discount rate the catfish enterprise would be preferred to full conversion to either soybean or corn production with catfish prices stable at \$1, \$0.95 or \$0.90 per pound

Table 1. Discounted Net Present Value of Conversion Cost and Returns to Land, Unpaid Management and Profit for the Full Conversion Method per Acre.

	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
Furrow Irrigated Soybeans	\$ 2,057.63	\$ 1,862.36	\$ 1,680.82	\$ 1,511.85	\$ 1,354.34	\$ 1,207.40
Furrow Irrigated Corn	\$ (1,048.20)	\$ (1,093.72)	\$ (1,136.10)	\$ (1,175.61)	\$ (1,212.48)	\$ (1,246.96)
Catfish Price at \$1.00 per Pound	\$ 15,378.32	\$ 14,703.86	\$ 14,074.47	\$ 13,486.42	\$ 12,936.33	\$ 12,421.12
Catfish Price at \$0.95 per Pound	\$ 11,589.09	\$ 11,092.11	\$ 10,627.86	\$ 10,193.64	\$ 9,787.05	\$ 9,405.85
Catfish Price at \$0.90 per Pound	\$ 7,799.88	\$ 7,480.36	\$ 7,181.22	\$ 6,900.87	\$ 6,637.77	\$ 6,390.58

Net present value results for the partial conversion method are shown in Table 2. At discount rates above 6%, the net present values for the partial conversion to irrigated soybeans are slightly higher than those seen for the full conversion method. The smaller initial outlay for partial conversion and larger discounts applied to the projected returns more than offsets the returns from the larger number of acres in production with full conversion in those cases. At every discount rate and catfish price level the catfish enterprise would be preferred to partial conversion to either soybean or corn production.

Table 2. Discounted Net Present Value of Conversion Cost and Returns to Land, Unpaid Management and Profit for the Partial Conversion Method per Acre.

	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
Furrow Irrigated Soybeans	\$ 2,028.37	\$ 1,858.59	\$ 1,700.71	\$ 1,553.79	\$ 1,416.82	\$ 1,289.03
Furrow Irrigated Corn	\$ (672.34)	\$ (711.92)	\$ (748.77)	\$ (783.13)	\$ (815.21)	\$ (845.17)
Catfish Price at \$1.00 per Pound	\$ 15,378.32	\$ 14,703.86	\$ 14,074.47	\$ 13,486.42	\$ 12,936.33	\$ 12,421.12
Catfish Price at \$0.95 per Pound	\$ 11,589.09	\$ 11,092.11	\$ 10,627.86	\$ 10,193.64	\$ 9,787.05	\$ 9,405.85
Catfish Price at \$0.90 per Pound	\$ 7,799.88	\$ 7,480.36	\$ 7,181.22	\$ 6,900.87	\$ 6,637.77	\$ 6,390.58

Conclusions and Limitations of the Study

The results of this study indicate that with stable catfish prices at or above \$0.90 per pound, channel catfish production using multiple-harvest, conventional pond systems would be

preferable to conversion to furrow irrigated soybean or furrow irrigated corn production. These results are based on FAPRI grain, oilseed and input price forecasts for the 2014-2023 time frame. The FAPRI forecast calls for substantial reductions in feed costs over the planning horizon. Due to the lack of longer-term catfish price projections, this study was limited to using assumptions of flat output prices for catfish over the entire planning horizon, and is a limitation of the study. No rotation between soybeans and corn production is analyzed in this study. This study also assumes that the producer would not make an extra investment in row-crop production equipment, which implicitly assumes the producer is currently engaged in row crop production. This study has developed a decision support aid that would be of use to a producer considering conversion of catfish ponds to row crop production. The decision aid allows for entry of production parameters along with input and output price, conversion costs and percentage of water to crop acre conversion parameters that are specific to the decision maker's operation. The decision aid is available by contacting Larry Falconer @ falconer@ext.msstate.edu ⁵.

⁵ Dr. Jimmy L. Avery's help as a reviewer of this study is greatly appreciated. Dr. Avery is a Mississippi State University Extension Professor and the Aquaculture Program Leader.

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Appendix I

Soybeans, early-planted, RR, stale seedbed, 12R 30"				
Furrow irrigated, 9 ac-in., Delta Area, Mississippi, 2013				
ITEM	UNIT	PRICE	QUANTITY	Total Amount
INCOME				
Soybeans	bu	\$ 13.15	65	\$ 854.75
TOTAL INCOME				\$ 854.75
DIRECT EXPENSES				
<i>CUSTOM SPRAY</i>				
App by Air (5 gal)	appl	\$ 6.00	3.5	\$ 21.00
<i>HARVEST AIDS</i>				
Paraquat	oz	\$ 0.25	4	\$ 1.00
Sodium Chlorate 3L	gal	\$ 3.45	0.25	\$ 0.86
<i>FERTILIZERS</i>				
Phosphorus(46% P2O5)	cwt	\$ 29.30	0.4	\$ 11.72
Potash (60% K2O)	cwt	\$ 29.80	0.6	\$ 17.88
<i>FUNGICIDES</i>				
CruiserMaxx	oz	\$ 4.07	1.6	\$ 6.51
Quadris	oz	\$ 2.47	3	\$ 7.41
<i>HERBICIDES</i>				
Glyphosate 3lbs a.e	pt	\$ 1.79	6	\$ 10.74
2,4-D Amine 4	pt	\$ 2.54	2	\$ 5.08
Valor SX	oz	\$ 5.55	2	\$ 11.10
Prefix	pt	\$ 6.84	2	\$ 13.68
<i>INSECTICIDES</i>				
Karate Z	oz	\$ 3.15	0.96	\$ 3.02
Acephate 90SP	lb	\$ 6.56	0.75	\$ 4.92
Intrepid 2F	oz	\$ 1.81	1	\$ 1.81
<i>IRRIGATION SUPPLIES</i>				
Roll-Out Pipe	ft	\$ 0.24	33	\$ 7.92
<i>SEED/PLANTS</i>				
Soybean Seed RR2	lb	\$ 1.04	50	\$ 52.00
<i>ADJUVANTS</i>				
Surfactant	pt	\$ 3.50	0.075	\$ 0.26
<i>HAULING</i>				
Haul Soybeans/Field	bu	\$ 0.28	65	\$ 18.20
<i>CUSTOM LIME</i>				
Lime (Spread)	ton	\$ 45.00	0.2	\$ 9.00
<i>INOCULANT</i>				
Nitrastick S	lbseed	\$ 0.03	50	\$ 1.50
<i>OPERATOR LABOR</i>				
Tractors	hour	\$ 11.71	0.4785	\$ 5.60
Harvesters	hour	\$ 11.71	0.1022	\$ 1.20
<i>IRRIGATE LABOR</i>				
Special Labor	hour	\$ 9.06	0.3	\$ 2.72
Implements	hour	\$ 9.06	0.0625	\$ 0.57
<i>HAND LABOR</i>				
Implements	hour	\$ 9.06	0.1127	\$ 1.02
<i>UNALLOCATED LABOR</i>				
	hour	\$ 11.73	0.4519	\$ 5.30
<i>DIESEL FUEL</i>				
Tractors	gal	\$ 3.50	4.5545	\$ 15.94
Harvesters	gal	\$ 3.50	1.3936	\$ 4.88
Roll-Out Pipe Irr.	gal	\$ 3.50	7.3317	\$ 25.66
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$ 4.73	1	\$ 4.73
Tractors	acre	\$ 2.22	1	\$ 2.22
Harvesters	acre	\$ 2.76	1	\$ 2.76
Roll-Out Pipe Irr.	acre	\$ 5.80	1	\$ 5.80
INTEREST ON OP. CAP.	acre	\$ 6.00	1	\$ 6.00
TOTAL DIRECT EXPENSES				\$ 290.01
RETURNS ABOVE DIRECT EXPENSES				\$ 564.74
FIXED EXPENSES				
Implements	acre	\$ 10.72	1	\$ 10.72
Tractors	acre	\$ 14.14	1	\$ 14.14
Harvesters	acre	\$ 11.04	1	\$ 11.04
Roll-Out Pipe Irr.	acre	\$ 48.18	1	\$ 48.18
TOTAL FIXED EXPENSES				\$ 84.08
TOTAL SPECIFIED EXPENSES				\$ 374.09
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$ 480.66

Corn, stale seedbed, BtRR, 185 bu yield goal				
Furrow Irrigated, 13 ac-in., Delta Area, Mississippi, 2013				
ITEM	UNIT	PRICE	QUANTITY	Total Amount
INCOME				
Corn	bu	\$ 4.70	185	\$ 869.50
TOTAL INCOME				\$ 869.50
DIRECT EXPENSES				
<i>CUSTOM SPRAY</i>				
App by Air (5 gal)	appl	\$ 6.00	1	\$ 6.00
App by Air (3 gal)	appl	\$ 4.75	1	\$ 4.75
<i>FERTILIZERS</i>				
DAP	cwt	\$ 32.00	1.8	\$ 57.60
Potash (60% K2O)	cwt	\$ 29.80	1.375	\$ 40.98
Fert 10-34-0	cwt	\$ 35.00	0.5	\$ 17.50
UAN + Sulfur (28%)	cwt	\$ 20.90	3.571	\$ 74.63
UAN (32% N)	cwt	\$ 21.10	4.375	\$ 92.31
<i>HERBICIDES</i>				
Glyphosate 3lbs a.e	pt	\$ 1.79	2	\$ 3.58
Clarity	pt	\$ 10.83	0.5	\$ 5.42
Atrazine 4L	pt	\$ 1.72	4	\$ 6.88
Halex GT	pt	\$ 6.16	3.6	\$ 22.18
<i>INSECTICIDES</i>				
Intrepid 2F	oz	\$ 1.81	4	\$ 7.24
<i>IRRIGATION SUPPLIES</i>				
Roll-Out Pipe	ft	\$ 0.24	33	\$ 7.92
<i>SEED/PLANTS</i>				
Corn Seed BtRR	thous	\$ 3.34	30	\$ 100.20
<i>CUSTOM FERTILIZE</i>				
Custom Apply Fert	acre	\$ 7.00	1	\$ 7.00
<i>HAULING</i>				
Haul Corn/Field	bu	\$ 0.28	185	\$ 51.80
<i>CUSTOM LIME</i>				
Lime (Spread)	ton	\$ 45.00	0.5	\$ 22.50
<i>OPERATOR LABOR</i>				
Tractors	hour	\$ 11.71	0.4884	\$ 5.72
Harvesters	hour	\$ 11.71	0.101	\$ 1.18
<i>IRRIGATE LABOR</i>				
Special Labor	hour	\$ 9.06	0.325	\$ 2.94
Implements	hour	\$ 9.06	0.0625	\$ 0.57
<i>HAND LABOR</i>				
Implements	hour	\$ 9.06	0.1753	\$ 1.59
UNALLOCATED LABOR	hour	\$ 11.70	0.4597	\$ 5.38
<i>DIESEL FUEL</i>				
Tractors	gal	\$ 3.50	4.6506	\$ 16.28
Harvesters	gal	\$ 3.50	1.6891	\$ 5.91
Roll-Out Pipe Irr.	gal	\$ 3.50	10.5902	\$ 37.07
<i>REPAIR & MAINTENANCE</i>				
Implements	acre	\$ 6.71	1	\$ 6.71
Tractors	acre	\$ 2.26	1	\$ 2.26
Harvesters	acre	\$ 3.13	1	\$ 3.13
Roll-Out Pipe Irr.	acre	\$ 5.80	1	\$ 5.80
INTEREST ON OP. CAP.	acre	\$ 14.39	1	\$ 14.39
TOTAL DIRECT EXPENSES				\$ 637.42
RETURNS ABOVE DIRECT EXPENSES				\$ 232.08
FIXED EXPENSES				
Implements	acre	\$ 9.66	1	\$ 9.66
Tractors	acre	\$ 14.44	1	\$ 14.44
Harvesters	acre	\$ 12.55	1	\$ 12.55
Roll-Out Pipe Irr.	acre	\$ 48.18	1	\$ 48.18
TOTAL FIXED EXPENSES				\$ 84.83
TOTAL SPECIFIED EXPENSES				\$ 722.25
RETURNS ABOVE TOTAL SPECIFIED EXPENSES				\$ 147.25

Appendix II

Catfish budget for a 250-acre multiple-batch production system in the Mississippi Delta, Baseline Estimate - 08262013

Acres	250					
Final weight, lb	1.5					
Stocking rate, fingerlings/acre	8500					
Feed fed per pound of fish gain	2.30					
Price per lb of fish	1					
Price to seine harvest-sized fish,\$/lb	0.04	at this size operation on-farm labor does seining				
Price to transport harvested fish,\$/lb	0.015					
Begin weight, lb/1,000	30					
Price of feed, \$/ton	\$ 493					
Electricity cost, \$/kw-hr	\$0.140					
Interest rates:	Short-term: 5%	Intermediate: 5%	Long-term: 5%			
Hired labor rate, \$/week	\$0					
Fingerling price, \$/each	0.05					
	Weight Each	Unit	Quantity	Price or Cost / unit	Value or Cost	Per Acre Value
1. Gross Receipts						
Catfish sales	1.5 lb		2,453,604	1.00	2,453,604	9,814
2. Variable Costs						
Feed, food fish		ton	2,822	493	1,391,071	5,564
Labor						
Management		year	1	35,000	35,000	140
Hired labor, at various wages		year	7	varies	109,000	436
Fingerlings		each	2,125,000	0.050	106,250	425
Transport of harvested fish		lb	2,453,604	0.015	36,804	147
Harvest of foodsize fish		lb	2,453,604	0.035	85,876	344
Fuel & lubricants						
Diesel		gal	22,332	3.50	78,162	313
Gasoline		gal	12,392	3.40	42,133	169
Electricity						
Aeration		10-hp hr	12,596	1.186	14,936	60
Meter charges		meter-month	63	18	1,134	5
Water pumping		acre	250	71.64	17,910	72
Repairs and Maintenance		month	12	2,268	27,210	109
Bird chasing		year	1	2,000	2,000	8
Chemicals						
Salt		ton	250	113	28,250	113
Diuron, off-flavor control		6 trt/farm	1,500	12	18,000	72
Copper sulfate, trematode treat.		20 trt/farm	5,000	27	6,750	27
Copper sulfate, off-flavor control		50 lb bag	500	0	0	0
Lime, trematode treatment		ton	0	15	0	0
Miscellaneous expenses		per acre	250	25	6,250	25
Interest on Operating Capital		dol	2,006,736	0.05	75,253	301
TOTAL VARIABLE COSTS					2,081,989	8,328
3. Income Above Variable Cost					371,615	1,486
4. Fixed Cost						
Land charge (not included)		dol	240,000	0.05	0	0
Machinery depreciation		dol			41,650	167
Pond depreciation		dol			26,173	105
Taxes (land)		acre	11	250	2,758	11
Interest on Pond Construction Costs		dol.&%	215,020	0.05	10,751	43
Interest on Equipment/Mach. Purchases		dol &%	218,320	0.05	10,916	44
TOTAL FIXED COSTS					92,248	369
5. Overhead						
Telephone		month	12	208	2,500	10
Accounting/legal		year	1	2,400	2,400	10
Supplies and Administrative		year	1	600	600	2
Insurance, general liability		acre	250	6.25	1,563	6
Insurance on equipment, machinery		dol/\$	436,640	0.004	1,747	7
TOTAL OVERHEAD COSTS					8,809	35
6. Total of All Specified Expenses					2,183,046	8,732
7. Net Returns Above All Specified Expenses /1					270,558	1,082
Net Returns Per Acre:	Above Specified Variable Costs				1,486	1,486
	Above Specified Total Costs				1,082	1,082
Breakeven Price:	To Cover Specified Variable Expenses				0.85	0.85
	To Cover Specified Total Expenses				0.89	0.89
/1 Labor and Management expenses have been included, but no expense has been included for land, therefore Net Returns to Land is represented by this budget.						

Appendix III

FAPRI Projections of Indices of Prices Paid by Farmers and Select Feed Grain and Oilseed Yields and Prices.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Production items	229	234	226	224	226	229	234	240	245	249	254
Feed	261	271	217	208	209	212	215	218	218	218	217
Livestock & poultry	168	174	178	176	169	163	161	164	168	171	175
Seeds	358	372	376	371	373	380	390	401	410	419	427
Fertilizer	336	346	348	342	338	339	346	354	362	369	378
Mixed fertilizer	307	313	316	310	306	306	311	318	326	331	339
Nitrogen fertilizer	351	363	362	358	355	359	368	378	388	395	405
Potash and phosph.	381	397	402	392	385	382	387	394	402	409	417
Agricultural chemicals	153	158	163	164	168	171	176	180	185	188	192
Fuels	358	335	322	311	322	332	344	356	365	374	384
Supplies & repairs	171	176	179	183	186	190	195	199	204	208	213
Autos & trucks	118	121	123	125	127	128	130	132	133	134	136
Farm machinery	256	262	267	273	280	287	295	303	310	318	327
Building material	176	180	184	187	190	194	197	200	203	206	209
Farm services	168	171	175	177	181	185	191	196	202	207	213
Interest*	145	149	156	161	176	192	199	204	208	211	216
Taxes**	232	242	249	256	263	269	276	283	290	297	306
Wage rates	199	204	209	215	221	227	234	241	248	255	263
Corn - Farm Price	7.08	5.18	4.69	4.73	4.79	4.83	4.88	4.88	4.87	4.84	4.82
Soybeans - Farm Price	14.2	11.49	11.25	10.98	11.22	11.47	11.67	11.65	11.69	11.69	11.68
Corn Yield	123.4	161.8	164.3	166.3	168.6	170.8	172.6	174.8	176.9	178.7	180.7
Soybean Yield	39.6	43.5	44.1	44.6	45.1	45.6	46	46.5	47	47.5	47.9