
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2007

SAMPLE COSTS TO PRODUCE

RICE



DELTA REGION
OF
SAN JOAQUIN & SACRAMENTO COUNTIES
SAN JOAQUIN VALLEY - North
Two year crop rotation

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**SAMPLE COSTS TO PRODUCE RICE (Multiple Crop Rotation)
Delta Region of San Joaquin & Sacramento Counties
San Joaquin Valley – North 2007**

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Sample costs to produce rice in the northern San Joaquin and Sacramento Valley Delta region (San Joaquin and Sacramento counties) are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on those production practices considered typical for the crop and area, but will not apply to every farm. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 2 and 3 is provided to enter your farming costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or your local UC Cooperative Extension office.

Sample Cost of Production Studies are available for many commodities. All current and some archived studies can be downloaded from the Agricultural and Resource Economics website at UC Davis <http://coststudies.ucdavis.edu>. These studies as well as other archived studies not on the website can be requested through the department by calling (530) 752-1517.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to produce rice in the northern San Joaquin Valley and Sacramento Valley Delta region (San Joaquin and Sacramento counties). The cultural practices described represent production operations and materials considered typical for a well managed farm in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, insect and disease pressure. The study is intended as a guide only. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.**

Farm. The study is based on a hypothetical non-contiguous 1,500 acre farm of which 300 acres are annually planted to rice on a two year rotation with potatoes. Other farmed crops are asparagus, tomatoes, corn and wheat. 100 acres are farmstead, roads, rice levees, and ditches. Typically, a grower with this amount of rice acreage will have several non-adjacent fields and the cultural practices will vary among fields. The farm is located on high percent organic peat soils in the Delta region of San Joaquin and Sacramento counties. The farm is owned and managed by the grower.

Cultural Practices and Material Inputs

Field Establishment (Table 1). The rice paddies are established for two years of rice production. Tillage operations are done in the fall (October) and consist of disking twice with a heavy duty disc, laser leveled, ripped in two directions, disking once with a finish disc, levees are made with five passes and irrigation/drainage boxes installed. The rice boxes are included in the establishment costs, because they will be removed when the rice growing in the field is finished.

Field Preparation. In the spring of each year, the field is disced three times – twice with a heavy duty disk and once with a finish disk. The field is then floated or leveled (may not need to be done every year). Levees are mowed in the fall of the first year and the boxes and levees repaired in the second year. One-half the cost of these operations is allocated to the field each year. The levees are mowed in the fall during both the first and second year.

Planting. Certified seed of M104 rice is planted in April or May. M104 is a medium grain Calrose variety having cold weather tolerance. Each check or paddy is 20 acres. The rice is drilled with a 16 foot wide typical grain seeder onto the prepared seed bed at 6-inch spacing. The planting operation runs 12 hours per day, but includes lunch and downtime. The planting crew uses one tractor driver for the planter plus one person on the drill. Starter fertilizer is applied with the seed. Two tractors plus two tenders that are furnished by the fertilizer company are used to transport the seed and fertilizer from the trailers to the drill. One operator handles both of these operations. Two 30 foot belt loaders (furnished by the fertilizer company) are located at the truck to load the tenders from the bottom dump trailers.

Nutrition. At planting, 150 pounds of 11-52-0 + 1% zinc fertilizer is applied through the grain drill. In June, nitrogen (N) as 21-0-0 is applied by ground prior to flooding at the rate of 83 pounds (400 pounds of material) per acre. The field is top dressed with ammonium sulfate by air in July at 21 pounds of N (100 pounds of material) per acre.

Soil/Tissue Sampling. Soil samples are taken in March (not necessarily on an annual basis) for phosphorous (P) and potassium (K) analysis at one sample per 25 acres. Tissue samples are collected in late June for N analysis at one sample per 25 acres. All samples are collected by the PCA and the analysis is included in the grower service agreement.

Irrigation. The fields are flooded beginning in early June when the rice is six inches tall and drained in late August or September. Flooding and draining labor costs are included in the irrigator labor. It is assumed that the irrigator checks the field daily during June, July and August. The irrigator travels the fields in a pickup and based on grower data takes 0.133 hours per acre. The land is below sea level and after opening a siphon valve on the river, the water flows into the fields. Growers have riparian rights and pay a reclamation fee for water costs which are listed under Cash Overhead. In the fall after harvest, the fields are flooded and allowed to set over the winter. They are then drained in the spring (March) to prepare the field for the new season.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Pest Management Guidelines, Rice*. For more information on pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Adjuvants or surfactants may be recommended for use with some pesticides, but are not included in this study. Pesticide costs vary by location and grower volume. Pesticide costs in this study are taken from a single dealer and shown with an assumed volume discount.

Pest Control Adviser (PCA). The PCA or crop consultant monitors the field for agronomic problems including pests and nutrition, collects soil and tissue samples, and writes pesticide recommendations. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. PCA service is provided by the chemical/fertilizer company in this study.

Weeds. Broadleaf and grasses are troublesome weeds in rice fields. The first step for weed control maybe Roundup (glyphosate) ground applied to early germinating weeds before the rice emerges. After rice emergence and before flooding, Regiment and Prowl H20 are ground applied to the field for control of broadleaves and grasses. Other herbicides maybe needed for specific weed species. For each application, one person delivers the material to the applicator, while one person mixes the materials. Both work while the field applicator is spraying. Another person delivers water to the mixing area and works half the time of the mixer. The water tank and ball tank for hauling the mixture is furnished by the chemical company. The levees are mowed once (April) or twice a year (April, October), with dual rotary mowers when there is no water in the field. The October operation is shown in the tables under post harvest

Insects. Armyworms are a problem in some rice fields. In this study Warrior insecticide is applied in July by air to 20% of the acres.

Disease. No diseases assumed.

Harvest. The water is drained 7 to 10 days before harvest. The rice crop is custom harvested beginning at 22% kernel moisture (green rice) using a rice combine with a cutter-bar header. The custom harvester charges are based on green weight (94.7 cwt). The grain is dumped from the combine into the bankout wagon, furnished by the custom harvester. The rice is delivered to the grain trailers at the field edge. Once the grain trailers are full, the grain is transported at no cost to the grower's designated dryer that also has storage.

Yields. According to the Ag Commissioner's Annual Crop Report for 2003 to 2006, the average yields in the county ranged from 60 to 81 hundredweight (cwt). Yields provided by growers in the Delta Region ranged from 63 to 92 hundredweight. For this study the average field(s) yields 80 hundredweight at 12% moisture (dry weight).

Returns. The rice is sold for \$11 per hundredweight. Returns to the grower according to the Ag Commissioner's Annual Crop Report for 2003 to 2006 ranges from \$9.00 to \$11.75 per hundredweight. Government payments are not included in the income and due to their complexity are not described in the study. For more information on the programs, contact the USDA Farm Service Agency.

Assessments. Under a state marketing order a mandatory assessment is collected and administered by the California Rice research Board. The \$0.06 per dry hundredweight pays for rice research in California. In additions, the California Rice Commission assesses the grower and handler each \$0.0425 per dry hundredweight.

Drying and Storage. Drying charges increase with moisture content and most dryers use a rate schedule that reflects the loss of moisture plus other invisible losses in the system associated with immature kernels, dockage and dust. The non-moisture factor varies among dryers, but ranges from about 2% to 6%. Together, these losses are called 'shrink'. Rice is assumed to be dried to 12% moisture. The drying charge is based on the greenweight calculated above. Storage is based on the dry weight.

Post Harvest. In October, the levees are mowed with a sickle mower, the straw is shredded/mulched with a flail mower, and then the field is flooded for the winter.

Pickup. The one-half ton pickup is used by the irrigator and included in the irrigation cost. Non-irrigation pickup use for the one-half ton is listed as a separate line item. The three-quarter ton pickup used by the owner/operator is included as a line item. The mileage and times are estimated and not taken from any specific data.

Labor, Equipment, and Interest Costs

Labor. Labor rates of \$13.90 per hour for machine operators and \$11.12 for general labor includes payroll overhead of 39%. The basic hourly wages are \$10.00 for machine operators and \$8.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops (code 0171), and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2007 (personal email from California Department of Insurance, May 18, 2007, unreferenced). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.30 and \$2.80 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration 2006 monthly data. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your

income tax. The fuel, lube, and repair cost per acre for each operation in Tables 1 and 2 are determined by multiplying the total hourly operating cost in Table 7 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.00% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2007.

Risk. Risks associated with rice production are not assigned a production cost. While this study makes an effort to model a production system based on typical real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of rice production.

Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by two on a per acre basis.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.714% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,303 for the entire farm.

Office Expense. Office and business expenses are estimated at \$50 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, and legal fees for whole farm. The cost is a general estimate and not based on any actual data.

Reclamation Fee. The Reclamation District manages the main drainage canals and charges \$48 per acre. There are several districts in the region and fees vary between districts.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 6.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. An interest rate of 7.25% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2007.

Land. Land in the delta is valued at \$2,500 to \$6,000 per acre (Trends & Leases). For this study, a value of \$4,000 is assumed.

Building. The metal building(s) are on a cement slab and total approximately 5,000 square feet. The buildings are used for shops and equipment storage.

Fuel Tanks. Two 500 gallon fuel tanks are on metal stands in cement containment meeting federal and state regulations.

Shop/Field Tools. Includes shop equipment and tools and small tools and/or small hand equipment used in the field.

Field Establishment. Field costs to establish a permanent rice field are used to determine capital recovery expenses, depreciation and interest on investment for the production years. Establishment cost is the sum of the land preparation and related cash costs. The costs are amortized over the two years the field is expected to be in production.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Table 6. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS TO ESTABLISH A RICE FIELD
DELTA REGION (San Joaquin & Sacramento Counties) 2007

Operation	Operation	Cash and Labor Cost per acre				Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent		
Establishment Costs:							
Disk 2X	0.23	4	8	0	0	12	
Level Field	0.20	3	21	0	0	25	
Rip 2X	0.26	4	26	0	0	30	
Disk 1X	0.16	3	6	0	0	8	
Make Levees	0.11	2	11	0	0	12	
TOTAL ESTABLISHMENT COSTS/ACRE						125	
Interest on operating capital @ 10.00%						3	
TOTAL OPERATING COSTS/ACRE						128	
Cash Overhead:							
Office Expense						13	
Liability Insurance						0	
Reclamation Fee						12	
Property Taxes						53	
Property Insurance						6	
Investment Repairs						4	
TOTAL CASH OVERHEAD COSTS						88	
TOTAL CASH COSTS/ACRE						216	

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE RICE
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:							
Irrigation: Drain Field (winter flooding)	0.01	0.11	0.00	0.00	0.00	0	
Weed: Mow Levees 1X/2 Yrs	0.01	0.21	0.13	0.00	0.00	0	
Irrigation: Rice Box & Levee Repair 1X/2 Yrs	0.14	1.56	0.00	0.00	0.00	2	
Fertilize: Soil Samples taken by PCA	0.00	0.00	0.00	0.00	0.00	0	
Field Prep: Disk 2X (Heavy Duty Disk)	0.23	3.80	8.66	0.00	0.00	12	
Field Prep: Disk 1X (Finish Disk)	0.16	2.65	6.28	0.00	0.00	9	
Field Prep: Float/Triplane	0.16	2.70	6.85	0.00	0.00	10	
Plant/Fertilize: (Seed/11-52-0+Zn)	0.59	18.10	19.40	62.55	0.00	100	
Weed: (Roundup)	0.17	3.56	2.64	6.56	0.00	13	
Weed: (Regiment, Prowl)	0.17	3.56	2.64	51.66	0.00	58	
Fertilize: broadcast & topdress (21-0-0)	0.03	0.57	0.53	56.70	8.50	66	
Irrigate: Flood Field (Labor for checking daily)	0.27	4.44	1.35	0.00	0.00	6	
Fertilize: Leaf Samples taken by PCA	0.00	0.00	0.00	0.00	0.00	0	
Insect: Worms (Warrior) 20% of acres	0.00	0.00	0.00	2.63	2.00	5	
Irrigate: Flood & Drain Field (August)	0.13	2.22	0.68	0.00	0.00	3	
Pickup: 1/2 ton	0.13	2.22	0.68	0.00	0.00	3	
Pickup: 3/4 ton	0.10	1.67	0.73	0.00	0.00	2	
TOTAL CULTURAL COSTS/ACRE	2.30	47.37	50.57	180.10	10.50	289	
Harvest							
Combine Rice (Custom)	0.00	0.00	0.00	0.00	94.70	95	
Dry & Store Rice	0.00	0.00	0.00	0.00	128.50	129	
Assessment	0.00	0.00	0.00	8.24	0.00	8	
TOTAL HARVEST COSTS/ACRE	0.00	0.00	0.00	8.24	223.20	231	
Post Harvest:							
Weed: Mow Levees	0.03	0.42	0.27	0.00	0.00	1	
Straw: Chop/Mulch	0.34	5.74	13.50	0.00	0.00	19	
Irrigate: Flood for Winter	0.02	0.22	0.00	0.00	0.00	0	
TOTAL POSTHARVEST COSTS	0.39	6.38	13.77	0.00	0.00	20	
Interest on operating capital @ 10%						13	
TOTAL OPERATING COSTS/ACRE		53.75	64.34	188.34	233.70	553	
CASH OVERHEAD:							
Office Expense						50	
Liability Insurance						1	
Reclamation District Fees						48	
Property Taxes						45	
Property Insurance						2	
Investment Repairs						3	
TOTAL CASH OVERHEAD COSTS						148	
TOTAL CASH COSTS/ACRE						701	
NON-CASH OVERHEAD:							
		Per producing		Annual Cost			
Investment		<u>Acre</u>		<u>Capital Recovery</u>			
Land		4,286		311		311	
Buildings		114		9		9	
Fuel Tanks		7		1		1	
Tools-Shop/Field		18		2		2	
Field Establishment		216		120		120	
Equipment		230		29		29	
TOTAL NON-CASH OVERHEAD COSTS		4,871		471		471	
TOTAL COSTS/ACRE						1,172	

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE RICE
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Rice	80.00	cwt	11.00	880	
OPERATING COSTS					
Seed:					
Certified Rice Seed- M104	1.40	cwt	21.00	29	
Fertilizer:					
11-52-0 + 1% Zn	150.00	lb	0.22	33	
21-0-0-24S	105.00	lb N	0.54	57	
Herbicide:					
Roundup Ultra Max	16.00	floz	0.41	7	
Regiment CA	0.67	oz	63.50	43	
Prowl H20	2.00	pint	4.56	9	
Irrigation:					
Water (No Cost)	4.50	acft	0.00	0	
Water (Winter No Cost)	3.00	acft	0.00	0	
Insecticide:					
Warrior	1.00	floz	2.63	3	
Assessment:					
California Rice Research Board (CRRB)	80.00	cwt	0.06	5	
California Rice Commission (CRC) (\$0.043/cwt)	80.00	cwt	0.04	3	
Custom/Contract:					
Air Application - Fertilizer	1.00	acre	8.50	9	
Air Application - Insecticide (helicopter)	0.20	acre	10.00	2	
Harvest (Combine +Bankout)	94.70	cwt	1.00	95	
Rice Drying Charge	94.70	cwt	0.85	80	
Rice Storage Charge	80.00	cwt	0.60	48	
Labor (machine)	3.38	hrs	13.90	47	
Labor (non-machine)	0.61	hrs	11.12	7	
Fuel - Gas	0.53	gal	2.80	1	
Fuel – Diesel	18.13	gal	2.30	42	
Lube				6	
Machinery repair				15	
Interest on operating capital @ 10%				13	
TOTAL OPERATING COSTS/ACRE				553	
NET RETURNS ABOVE OPERATING COSTS				327	
CASH OVERHEAD COSTS:					
Office Expense				50	
Liability Insurance				1	
Reclamation District Fees				48	
Property Taxes				45	
Property Insurance				2	
Investment Repairs				3	
TOTAL CASH OVERHEAD COSTS/ACRE				148	
TOTAL CASH COSTS/ACRE				701	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Land				311	
Buildings				9	
Fuel Tanks				1	
Tools-Shop/Field				2	
Field Establishment				120	
Equipment				29	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				471	
TOTAL COSTS/ACRE				1,172	
NET RETURNS ABOVE TOTAL COSTS				-292	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE RICE
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

Beginning JAN 07 Ending DEC 07	JAN 07	FEB 07	MAR 07	APR 07	MAY 07	JUN 07	JUL 07	AUG 07	SEP 07	OCT 07	NOV 07	DEC 07	TOTAL
Cultural:													
Irrigation: Drain Field (winter flooding)			0										0
Weed: Mow Levees 1X/2 Yrs			0										0
Irrigation: Rice Box & Levee Repair 1X/2 Yrs			2										2
Fertilize: Soil Samples (collected by PCA @ no cost)			0										0
Field Prep: Disk 2X (Heavy Duty Disk)				12									12
Field Prep: Disk 1X (Finish Disk)				9									9
Field Prep: Float/Triplane				10									10
Plant/Fertilize: (Seed/11-52-0+Zn)					100								100
Weed: Prior to crop emergence (Roundup)					13								13
Weed: (Regiment, Prowl)					58								58
Fertilize: broadcast & topdress (21-0-0)					46		20						66
Irrigate: Flood Field (Labor for checking daily)						3	3						6
Fertilize: Leaf Samples (taken by PCA @ no cost)													0
Insect: Worms (Warrior) 20% of acres							5						5
Irrigate: Flood & Drain Field (August)								3					3
Pickup: 1/2 ton	0	0	0	0	0	0	0	0	0	0	0	0	3
Pickup: 3/4 ton	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CULTURAL COSTS	0	0	2	31	218	3	28	3	0	0	0	0	289
Harvest: Combine Rice (Custom)									95				95
Harvest: Dry & Store Rice									80	48			129
Harvest: Assessment										8			8
TOTAL HARVEST COSTS									175	56			231
Postharvest:													
Weed: Mow Levees										1			1
Straw: Chop/Mulch										19			19
Irrigate: Flood for Winter										0			0
TOTAL POSTHARVEST COSTS	0	0	0	0	0	0	0	0	0	20	0	0	20
Interest on operating capital @ 10%	0	0	0	0	2	2	2	2	4	-1	0	0	13
TOTAL OPERATING COSTS/ACRE	0	0	2	32	220	5	30	6	179	76	0	0	553
Cash Overhead:													
Office Expense	5	5	5	5	5	5	5	5	5	5			50
Liability Insurance		1											1
Reclamation District Fees						48							48
Property Taxes				22								22	45
Property Insurance	1						1						2
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	3
TOTAL CASH OVERHEAD COSTS	6	6	5	28	5	53	6	5	5	5	0	23	148
TOTAL CASH COSTS/ACRE	6	7	8	59	225	59	36	11	185	81	1	23	701

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE RICE

	YIELD (cwt/acre)						
	56	64	72	80	88	96	104
OPERATING COSTS:							
Cultural Cost	289	289	289	289	289	289	289
Harvest (combine & bankout)	66	76	85	95	104	114	123
Dry & Store	90	103	116	128	141	154	167
Assessment	6	7	7	8	9	10	11
Post Harvest Costs	20	20	20	20	20	20	20
Interest on operating capital @ 10%	12	12	12	13	13	13	13
TOTAL OPERATING COSTS/ACRE	483	507	529	553	576	600	623
Total Operating Costs/cwt	9	8	7	7	7	6	6
CASH OVERHEAD COSTS/ACRE	148	148	148	148	148	148	148
TOTAL CASH COSTS/ACRE	631	655	677	701	724	748	771
Total Cash Costs/cwt	11	10	9	9	8	8	7
NON-CASH OVERHEAD COSTS/ACRE	471	471	471	471	471	471	471
TOTAL COSTS/ACRE	1,102	1,126	1,148	1,172	1,195	1,219	1,242
Total Costs/cwt	20	18	16	15	14	13	12

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/cwt	YIELD (cwt/acre)						
	56	64	72	80	88	96	104
8	-35	5	47	87	128	168	209
9	21	69	119	167	216	264	313
10	77	133	191	247	304	360	417
11	133	197	263	327	392	456	521
12	189	261	335	407	480	552	625
13	245	325	407	487	568	648	729
14	301	389	479	567	656	744	833

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/cwt	YIELD (cwt/acre)						
	56	64	72	80	88	96	104
8	-183	-143	-101	-61	-20	20	61
9	-127	-79	-29	19	68	116	165
10	-71	-15	43	99	156	212	269
11	-15	49	115	179	244	308	373
12	41	113	187	259	332	404	477
13	97	177	259	339	420	500	581
14	153	241	331	419	508	596	685

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/cwt	YIELD (cwt/acre)						
	56	64	72	80	88	96	104
8	-654	-614	-572	-532	-491	-451	-410
9	-598	-550	-500	-452	-403	-355	-306
10	-542	-486	-428	-372	-315	-259	-202
11	-486	-422	-356	-292	-227	-163	-98
12	-430	-358	-284	-212	-139	-67	6
13	-374	-294	-212	-132	-51	29	110
14	-318	-230	-140	-52	37	125	214

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, & OVERHEAD COSTS
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
07 152HP MFWD Tractor	96,253	10	28,432	11,829	445	623	12,898
07 180HP MFWD Tractor	121,951	10	36,022	14,988	564	790	16,342
07 55HP MFWD Tractor	30,975	10	9,150	3,807	143	201	4,151
07 95HP 2WD Tractor #1	59,563	10	17,594	7,320	275	386	7,981
07 95HP 2WD Tractor #2	59,563	10	17,594	7,320	275	386	7,981
07 Ball Tank (loaner)	0	0	0	0	0	0	0
07 Belt #1 (loaner) 30'	0	0	0	0	0	0	0
07 Belt #2 (loaner) 30'	0	0	0	0	0	0	0
07 Bucket Scraper 15'	55,931	10	9,891	7,348	235	329	7,912
07 Disc - Finish 26'	35,589	10	6,294	4,676	150	209	5,035
07 Disc Folding 17'	26,159	10	4,626	3,437	110	154	3,701
07 Drill 6" spacing 16'	19,277	10	3,409	2,533	81	113	2,727
07 Fertilizer Spreader	18,150	10	3,210	2,384	76	107	2,568
07 Mower - Flail/Shredder 15'	13,314	10	2,354	1,749	56	78	1,883
07 Mower - Sickle 7"	4,800	10	849	631	20	28	679
07 Pickup - 1/2 ton	26,000	10	7,680	3,195	120	168	3,484
07 Pickup - 3/4 ton	28,000	10	8,271	3,441	129	181	3,752
07 Sprayer-Pull Type 200 gal 40' boom	8,591	10	1,519	1,129	36	51	1,215
07 Tender (loaner)	0	0	0	0	0	0	0
07 Tender (loaner)	0	0	0	0	0	0	0
07 Water Tank (loaner)	0	0	0	0	0	0	0
TOTAL	604,116		156,895	75,787	2,717	3,805	82,309
60% of New Cost *	362,470		94,137	45,472	1,630	2,283	49,385

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Buildings 5000 sqft	160,000	30		13,219	571	800	3,200	17,790
Field Establishment	64,683	2		35,900	0	0	0	35,900
Fuel Tanks 2-500 gal	10,000	20		962	36	50	200	1,248
Land 1500 acres	6,000,000	30	6,000,000	435,000	0	60,000	0	495,000
Shop/Field Tools	25,000	20		2,406	89	125	500	3,120
TOTAL INVESTMENT	6,259,683		6,000,000	487,487	696	60,975	3,900	553,058

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	1,400	acre	0.93	1,302
Office Expense	1,400	acre	50.00	70,000
Reclamation District	1,400	acre	48.00	67,200

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 DELTA REGION (San Joaquin & Sacramento Counties) 2007

Yr Description	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Capital Recovery	Cash Overhead			Operating		
			Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
07 152HP MFWD Tractor	1,200	5.91	0.22	0.31	1.84	23.33	25.17	31.61
07 180HP MFWD Tractor	1,600	5.62	0.21	0.30	3.11	27.63	30.74	36.87
07 55HP MFWD Tractor	1,601	1.43	0.05	0.08	0.79	7.14	7.93	9.49
07 95HP 2WD Tractor #1	1,200	3.66	0.14	0.19	2.66	12.34	15.00	18.99
07 95HP 2WD Tractor #2	1,200	3.66	0.14	0.19	2.66	12.34	15.00	18.99
07 Ball Tank (loaner)	40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07 Belt #1 (loaner) 30'	57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07 Belt #2 (loaner) 30'	57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07 Bucket Scraper 15'	300	14.72	0.47	0.66	8.46	0.00	8.46	24.31
07 Disc - Finish 26'	200	14.05	0.45	0.63	5.68	0.00	5.68	20.81
07 Disc Folding 17'	200	10.29	0.33	0.46	4.18	0.00	4.18	15.26
07 Drill 6" spacing 16'	150	10.16	0.33	0.46	5.08	0.00	5.08	16.03
07 Fertilizer Spreader	120	11.90	0.38	0.53	6.92	0.00	6.92	19.73
07 Mower - Flail/Shredder 15'	200	5.24	0.17	0.23	5.44	0.00	5.44	11.08
07 Mower - Sickle 7"	200	1.89	0.06	0.08	1.96	0.00	1.96	3.99
07 Pickup - 1/2 ton	200	9.60	0.36	0.51	1.86	3.22	5.08	15.55
07 Pickup - 3/4 ton	200	10.32	0.39	0.54	2.00	5.29	7.29	18.54
07 Sprayer-Pull Type 200 gal 40' boom	150	4.51	0.14	0.20	2.28	0.00	2.28	7.13
07 Tender (loaner)	57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07 Tender (loaner)	57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07 Water Tank (loaner)	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00

UC COOPERATIVE EXTENSION

Table 8. OPERATIONS WITH EQUIPMENT & MATERIALS - PRODUCTION YEAR FOR RICE

DELTA REGION (San Joaquin & Sacramento Counties) 2007

MONTH	OPERATION	TRACTOR	IMPLEMENT	LABOR		RATE/AC	UNIT
				HRS/acre	MATERIAL		
March	Drain Field			0.01			
March	Weed: Mow Levees (1X/2 Yr [2d yr only])	95HP #1	Mower-Rotary				
March	Box/Levee Repair (1X/2 Yr [2d yr only])			0.14			
March	Fertilize: Soil Samples			0.02	Analysis	0.04	each
April	Disc 2X (heavy duty disk)	180HP	Disc 17'				
April	Disc 1X (finish disk)	180HP	Disc 26'				
April	Float/Level	180HP	Bucket Scraper				
May	Plant/Fertilize	152HP	Drill 16'		Seed	1.40	cwt
		95HP #1	Tender		11-52-0-1Zn	150.00	lb
		95HP #2	Tender #2				
			Belt #1				
			Belt #1				
May	Weed: Spray	95HP #1	Sprayer 40'		Roundup	16.00	floz
		95HP #2	Ball Tank	0.70			
		55HP	Water Tank	0.70			
May	Weed: Spray	95HP #1	Sprayer 40'		Regiment	0.67	oz
					Prowl	2.00	pt
		95HP #2	Ball Tank	0.70			
		55HP	Water Tank	0.70			
May	Fertilize	55HP	Spreader		21-0-0	84.00	lb N
July		Custom Air			21-0-0	21.00	lb N
June	Flood	Pickup 1/2T			Water	1.50	acft
July	Flood	Pickup 1/2T			Water	1.50	acft
August	Flood & Drain	Pickup 1/2T			Water	1.50	acft
July	Fertilize: Leaf Samples			0.02	Analysis	0.04	each
July	Insect: Worms	Custom Air			Warrior	1.00	floz
Sept	Combine Rice	Custom					
Sept	Dry & Store Rice				Dry		
Oct	Dry & Store Rice				Store		
Oct	Post Harvest: Mow Levees	95HP #1	Mower-Sickle				
Oct	Post Harvest: Chop Mulch Straw	180HP	Mower-Flail				
Oct	Post Harvest: Flood for Winter			0.02	Water	3.00	acft