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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2001

**SAMPLE COSTS TO PRODUCE**  
***RICE***



**SACRAMENTO VALLEY**

**Rice Only Rotation**

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In cooperation with the California Rice Commission Industry Affairs Committee

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# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## SAMPLE COSTS TO PRODUCE RICE Sacramento Valley - 2001

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### INTRODUCTION

The sample costs to produce rice in the Sacramento Valley are presented in this study. The study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. The practices described are based on production procedures considered typical for this crop and area but will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A “*Your Costs*” column in Tables 1 and 2 is provided for you to enter your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-3589 or the Sutter - Yuba (530) 822-7515, and Butte County (530) 538-7200 UC Cooperative Extension offices.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1515. Current studies, those produced during the last five years, can be downloaded from the department website [www.agecon.ucdavis.edu](http://www.agecon.ucdavis.edu) or obtained from selected county Cooperative Extension offices.

## ASSUMPTIONS

The following assumptions pertain to sample costs to produce rice in the Sacramento Valley. Practices described should not be considered recommendations by the University of California, but represent production procedures considered typical for this crop and area. Some of the costs and practices may not be applicable to your situation or used during every production year. Other practices not indicated may be needed. Cultural practices and costs to produce rice will vary by grower and region, and can be significant. The practices and inputs used in this cost study serve as a sample or guide, only. The costs are presented on an annual, per acre basis. **The use of trade names 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.**

**Farm.** This report is based on a hypothetical 720-acre farm. The grower owns 180 acres and rents 540 acres. Rice is grown on 700 acres and 20 acres (5 owned acres and 15 rented acres) are roads, irrigation systems, and farmstead. Typically, a grower with this amount of rice acreage will have several non-adjacent fields and the cultural practices will vary among fields. Additionally, extra costs may be involved for moving equipment between fields, but are not included in this study. No other crops are grown in rotation with the rice. Both the grower owned and rented land have a rice base and are eligible for farm program benefits. All operations are done on 100% of the acres unless noted.

### Cultural Practices and Material Inputs

**Land Preparation.** Most of the primary tillage which includes chiseling, plowing, discing, land leveling, laser leveling, and rolling is normally done from March through May. In this study, the permanent levees, 5% of the acres, are reworked and drains are maintained as necessary. The Endangered Species Act may affect the way the drains are maintained and additional costs may be incurred. All fields are chiseled two times to open the ground and dry the soil. Ten percent of the acreage is plowed once, usually in the fall. This is followed by two discings to break up large clods and to increase the soil's drying surface. The field is then leveled and smoothed with a triplane. Laser leveling is done once every seventh year and in this study 1/7 of the cost is charged to the cultural operations each year. The ground is rolled with a corrugated roller prior to flooding and planting.

**Planting.** Water seeding in contrast to drill-seeding or dry-seeding is the primary seeding method in California. The soil is flooded, the seed is soaked and drained, and then the seed is broadcast by air on the fields. Most planting is done from April 20 to May 20, but sometimes continues into June.

**Irrigation.** The grower purchases the majority of the irrigation water from an irrigation district and growers may supplement this with well water. The grower pays the water costs on both the rented and grower owned land. Irrigation districts in the valley were surveyed for water cost, and rice acres in the district to obtain a weighted average water cost. The seasonal cost of irrigation water for this study is \$54.13 per surface acre.

**Fertilization.** Aqua ammonia at 120 pounds of N per acre is applied preplant with an aqua fertilizer injector 4 to 6 inches deep. At the same time, a "starter" fertilizer, ammonium phosphate (16-20-00) at 200 pounds per acre, is applied by air and incorporated with the aqua rig or roller. Zinc sulfate is applied by air to 50% of the acres. In July 33% of the acres are topdressed with ammonium sulfate at 26.25 pounds of N or 125 pounds of material per acre.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines, Rice*. For more information on pest identification, monitoring, and management

visit the UC IPM website at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu). Written recommendations are required for many pesticides, and are made by licensed pest control advisors. For information on pesticide use permits, contact the local county agricultural commissioner's office.

**Weeds.** Broadleaf and grass weeds are controlled with separate aerial and ground applications. A grass herbicide, Ordram, is applied on 75% of the acres by air in May; also a broadleaf herbicide, Londax, is applied on 25% of the acres by air. A second application is made in June to control the remaining broadleaf and grass weeds. Two herbicides are used; Propanil as Super Wham or Stam is applied on 45% of the acres by ground and Grandstand is applied on 30% of the acres by air. The percentage of acres treated with the various herbicides reflects actual use as interpreted from the 1999 Pesticide Use Report, DPR.

**Insects and Algae.** Rice water weevil control begins in May after planting, by treating 30% of the acres, which includes the field borders or edges, levees, and field area adjacent to these areas with Warrior insecticide. In May, after planting, copper sulfate is applied to 50% of the acres to control shrimp and algae. Armyworms are controlled with one insecticide application of Warrior in July on 10% of the acres.

**Diseases.** Blast and aggregate sheath spot are controlled July through August with one application of Quadris on 25% of the acres.

**Harvest.** The rice crop is harvested at 22% kernel moisture (green rice) using one combine with a cutter-bar header. The grower also owns a self-propelled bankout wagon. The grain is dumped from the combine into the bankout wagon that hauls the grain to bulk grain trailers for transport to the dryer.

Growers may choose to own harvesting equipment, purchased either new or used, or hire a custom harvester. Many factors are important in deciding which harvesting option a grower uses. These considerations and appropriate method of analysis are discussed in *"Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis of Alternatives"*.

**Transportation.** The grower pays the transportation of green rice from the field to the drier. Hauling grain from the drier to storage may be considered a processing or marketing expense, but is a cost and is reflected in the price returned to the grower. In this study, the cost of transporting the rice from the field to the drier is included, but the hauling cost between the drier and warehouse is not. The cost of transporting rice is based on a green weight of 95.34 hundredweight (cwt) per acre and a \$0.30 per cwt field pickup and hauling charge. In this study, green weight is the calculated weight of the harvested rice at 22% moisture, including 'invisible shrink' (see below).

**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 13% moisture. The drying rate charge is multiplied by the green weight calculated above. With power costs increasing, a \$.05/cwt was added to the current rate charts which made the cost of drying the rice in this study \$0.73/cwt. Storage is charged at \$0.57/cwt on the dry weight and is similarly increased to estimate future power costs. Most of the drying cost is related to natural gas prices, and the storage cost to electricity prices.

**Yields.** The crop yield used in this study is 80 cwt per acre at 13% moisture. Yields have varied over the years in the Sacramento Valley and are shown in Table A.

Table A. Average Sacramento Valley Rice Yields by County

County	Rice Yields (cwt/acre)				
	1995	1996	1997	1998	1999
Butte	81.0	80.8	89.0	69.0	73.8
Colusa	80.0	74.0	84.0	72.0	75.0
Glenn	80.0	75.8	85.0	70.0	75.0
Placer	72.0	75.2	78.8	70.0	62.0
Sacramento	76.0	80.0	80.0	74.0	86.0
Sutter	81.0	75.0	83.6	68.0	75.0
Tehama	60.0	70.0	60.5	63.0	66.0
Yolo	76.2	81.6	88.8	69.6	74.2
Yuba	82.0	76.0	84.0	69.0	66.0

Source: County Crop Reports, 1995-1999.

**Returns.** A selling price of \$8.00 per cwt of grain is used to estimate income. This study also includes income received from the Production Flexibility Contract (PFC) component of the Agricultural Marketing Transition Act (AMTA) administered by the USDA Farm Service Agency. The PFC income is calculated by taking 85% of the payment yield and multiplying it by the payment rate. The ‘payment yield’ is an established yield used to compute the production flexibility contract and is frozen. In this study the payment yield is assumed to be 68.29 cwt per acre (established statewide average) and the payment rate is \$2.10 per cwt. Program support is calculated as 68.29 cwt/acre X .85 X \$2.10/cwt = \$121.98/acre. In practice, approximately 95% of the rice grown receives full payment; therefore, the calculated payment is multiplied by 95% to reflect the less than 100% payment of \$115.88. In this study the payment yield was reduced by 5% (68.29 X .85 X .95) to calculate the reduced return shown in Table 2. All rice acreage is assumed to be covered by program payments. However, maximum payment limitations may leave some acres uncovered and will reduce the average revenue per cwt.

The PFC payment rate is set by a number of factors at harvest time. Because the actual rate is not determined until the end of each growing season the USDA sets future PFC payment rates in a range. PFC payment rates change annually according to Table B. Contact the local Farm Service Agency office for further information about the support program.

Table B. PFC Payments for Rice<sup>1</sup>

Fiscal Year	PFC Payments	\$/cwt	
		MLA <sup>2</sup>	Total
1998	2.92	1.45	4.37
1999	2.82	2.82	5.64
2000	2.60	2.82	5.42
2001	2.10		2.10
2002	2.00		2.00

<sup>1</sup>USDA-FSA Production Flexibility Contracts and Market Assistance Loans, Fact Sheet, revised August 2000. <sup>2</sup>Additional funds provided by Omnibus Consolidated and Emergency Supplemental Appropriations Act, 1999.

**Assessments.** Under a state marketing order a mandatory assessment fee is collected and administered by the California Rice Research Board. This assessment of \$0.05 per dry hundredweight (cwt) pays for rice research in California. In addition, the California Rice Commission assesses the grower and handler each \$0.03675 per dry hundredweight for marketing activities.

**Straw Management.** Postharvest operations for straw management is done using three methods. The percent of acres utilizing specific straw management practices in this study is based on available industry information.

(1) Rice straw burning is done on 15% of the acres in the fall and/or spring. Burning permits and fees vary for each air pollution control district. For this study, a \$25 burn permit is charged to the farm and additional \$0.50 per acre is charged for each acre burned. Check with the air pollution office in your county for burning regulations and fees. (2) The rice straw is chopped and then disced two times on 35% of the acres. (3) On 50% of the acres, the rice straw is chopped, flooded and rolled with a cage roller. Winter water costs for single and continuous flooding vary by district.

**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.

**Labor.** Basic hourly wages for workers are \$8.50 per hour for both machine operators and non-machine workers. Adding 34% for the grower's share of federal and state payroll taxes, insurance and other benefits raises the total labor costs to \$11.39 per hour for machine operators and non-machine labor. The labor for operations involving machinery is 20% higher than the operation time to account for the additional time involved in equipment set up, moving, maintenance and repair.

## Overhead

**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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, rents, and investment repairs. Cash overhead costs are included in Tables 1, 2, 3 and 4.

*Property Taxes.* Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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 2 on a per acre basis. Land value is assumed to remain unchanged.

*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 10.51% per year. It is assumed that all cash operations are financed. A nominal interest rate is the typical market cost of borrowed funds. The costs of postharvest operations are discounted back to the harvest month using a negative interest charge.

*Insurance.* Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$974 for the entire farm or \$1.35 per acre.

*Office Expense.* Office and business expenses are estimated at \$20 per acre. These expenses include office supplies, telephones, bookkeeping, accounting and legal fees, road maintenance, and miscellaneous business expenses.

*Rent.* Cash rents range from \$180 to \$300 per producing acre. The grower in this study rents 540 acres of which 525 are producing or planted acres and the grower pays \$225 per rented producing acre to the landlord. The rent cost is charged to the entire farm (700 acres) at \$169 per producing acre. The non-producing acres are roads, irrigation system, and equipment yard.

*Investment Repairs.* Annual cash maintenance or repair costs are associated with investments under non-cash overhead. Repairs to the fuel tanks and pumps, shop building, shop tools, irrigations system, tool carrier, and fuel wagon are calculated at 10% of new cost distributed over the investment life.

**Non-cash Overhead.** Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. This study shows the current purchase price for new equipment and then adjusts the price to 40% of new cost to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments are shown in Tables 1, 2, and 4 as the capital recovery cost on an annual per acre basis.

*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). Put another way, 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 calculation for the annual capital recovery costs is as follows:

$$\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Capital Recovery Factor}} + \frac{\text{Salvage Value} \times \text{Interest Rate}}$$

*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 equal to the purchase price because land does not depreciate. The purchase price and salvage value for certain equipment and investments are shown in Table 5.

*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.* The interest rate of 6.70% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service’s (USDA-ERS) ten year average of California’s agricultural sector long-run real rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

*Land.* Land values range from \$3,100 to \$3,800. The grower in this study owns 180 acres of land that is valued at \$3,250 per acre or \$3,342 per producing acre. The cost is charged to the entire farm (700 acres) at \$836 per producing acre. Farmstead, roads, and the irrigation system are on 5 of the 180 acres.

*Irrigation System.* The irrigation system in this study is a portable PTO powered low lift pump. The water delivery system or returns system is not calculated as a cost in this study.

**Equipment.** 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. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 5 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.

*Repairs, Fuel and Lube.* Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.26 and \$1.51 per gallon, respectively.

**Rented Equipment.** A 200 HP 4WD tractor and a chisel are rented for one month (200 hours). The tractor is used to chisel 700 acres one time. In addition, the remaining available tractor time was used to triplane a portion of the acres. The operating expenses are included in the fuel, lube, and labor items in Table 2.

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



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Table 1

UC COOPERATIVE EXTENSION  
COSTS PER ACRE to PRODUCE RICE  
SACRAMENTO VALLEY - 2001

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent		
<b>Cultural:</b>							
Maintain Drains	0.10	1	1	0	0	2	
Maintain and Rework Levees	0.05	1	1	0	0	2	
Chisel 2X	0.33	4	4	4	7	18	
Plow - 10% acre	0.02	0	0	0	0	1	
Disc 2X	0.28	4	7	0	0	10	
Triplane Fields	0.20	4	2	1	4	11	
Laser Level - 1X/7yr	0.00	0	0	0	11	11	
Fertilize - 16-20-0 @ 200 lb/ac	0.00	0	0	26	9	35	
Insect - rice weevil 30% ac Warrior	0.00	0	0	3	2	4	
Fertilize - aqua 120 lbs N/acre	0.15	2	3	36	3	44	
Roll Final Seedbed	0.11	2	3	0	0	4	
Fertilize - zinc 50% acre	0.00	0	0	9	3	12	
Irrigate	1.00	11	0	54	0	66	
Soak and Deliver Seed	0.00	0	0	0	3	3	
Plant @ 150 lbs/ac	0.00	0	0	21	12	33	
Insect - shrimp & algae 50% ac Copper	0.00	0	0	4	3	7	
Weed - grasses 75% ac Ordram	0.00	0	0	36	5	42	
Weed - broadleaf 25% ac Londax	0.00	0	0	8	2	9	
Weed - 30% ac Grandstand	0.00	0	0	3	2	5	
Weed - 45% ac Super Wham (Propanil)	0.00	0	0	22	5	27	
Fertilize - topdress 33% acres 21-0-0	0.00	0	0	1	2	2	
Insect 10% ac armyworm Warrior	0.00	0	0	1	1	1	
Disease Control 25% ac Quadris	0.00	0	0	7	7	14	
Pickup Truck Use	0.41	11	4	0	0	15	
<b>TOTAL CULTURAL COSTS</b>	<b>2.65</b>	<b>40</b>	<b>24</b>	<b>235</b>	<b>81</b>	<b>380</b>	
<b>Harvest:</b>							
Combine Rice - Cutterbar Header	0.39	5	16	0	0	21	
Bankout Rice	0.21	3	4	0	0	7	
Haul Rice To Dryer	0.00	0	0	0	29	29	
Dry & Store Rice	0.00	0	0	0	115	115	
<b>TOTAL HARVEST COSTS</b>		<b>8</b>	<b>20</b>	<b>0</b>	<b>144</b>	<b>172</b>	
<b>Assessment:</b>							
Rice Research Board Assessment	0.00	0	0	4	0	4	
California Rice Commission	0.00	0	0	3	0	3	
<b>TOTAL ASSESSMENT COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>	
<b>Postharvest:</b>							
Burn Permit & Fees 15% acres	0.00	0	0	1	0	1	
Fall/Spring Burn 15% acres	0.21	2	0	0	0	2	
Mow Levees-41% levee acres	0.01	0	0	0	0	0	
Chop Straw - 85% acres	0.32	4	8	0	0	12	
Flood & Roll 50% acres	0.07	2	2	5	0	9	
Disc Straw - 2X 35% acres	0.17	2	6	0	0	8	
<b>TOTAL POSTHARVEST COSTS</b>	<b>0.78</b>	<b>11</b>	<b>15</b>	<b>6</b>	<b>0</b>	<b>32</b>	
Interest on operating capital @ 10.51%						15	
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>59</b>	<b>59</b>	<b>248</b>	<b>225</b>	<b>606</b>	
<b>TOTAL OPERATING COSTS/CWT</b>						<b>8</b>	

UC COOPERATIVE EXTENSION  
Table 1. continued

Operation	Cash and Labor Cost per acre						
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
<b>CASH OVERHEAD:</b>							
Land Rent						169	
Office Expense						20	
Liability Insurance						1	
Property Taxes						12	
Property Insurance						8	
Investment Repairs						3	
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>213</b>	
<b>TOTAL CASH COSTS/ACRE</b>						<b>818</b>	
<b>TOTAL CASH COSTS/CWT</b>						<b>10</b>	
<b>NON-CASH OVERHEAD</b>							
Investment		Per producing Acre		Annual Cost Capital Recovery			
Land		836		56		56	
Fuel Tanks & Pumps		14		1		1	
Shop Building		56		5		5	
Shop Tools		16		1		1	
Irrigation System		9		1		1	
Tool Carrier		20		2		2	
Fuel Wagons		5		0		0	
Backhoe		12		1		1	
Equipment		448		57		57	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>		<b>1,415</b>		<b>125</b>		<b>125</b>	
<b>TOTAL COSTS/ACRE</b>						<b>944</b>	
<b>TOTAL COSTS/CWT</b>						<b>12</b>	

Table 2 UC COOPERATIVE EXTENSION  
 COSTS AND RETURNS PER ACRE to PRODUCE RICE  
 SACRAMENTO VALLEY - 2001

	Applied Rate/Acre	Amt/Farm /Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>						
Rice		80.00	cwt	8.00	640	
USDA Payment		55.14	cwt	2.10	116	
<b>TOTAL GROSS RETURNS FOR RICE</b>					<b>756</b>	
<b>OPERATING COSTS</b>						
Rent:						
Tractor 200HP 4WD		0.29	hr	32.00	9	
Chisel Plow 16'		0.29	hr	8.25	2	
Fertilizer Rig		1.00	each	3.00	3	
Custom:						
Air Appl - Dry Fertilizer		2.33	cwt	4.30	10	
Air Appl - Warrior		0.40	acre	6.00	2	
Air Appl - Zinc		0.50	acre	6.00	3	
Air Appl - Seed		1.80	cwt	6.75	12	
Air Appl - Copper		0.50	acre	6.00	3	
Air Appl - Ordram		0.75	acre	7.25	5	
Air Appl - Londax		0.25	acre	6.50	2	
Air Appl - Grandstand		0.30	acre	6.50	2	
Air Appl - Quadris		1.00	acre	7.25	7	
Grnd Appl - Propanil (SuperWham)		0.45	acre	12.00	5	
Laser Leveling		0.14	acre	75.00	11	
Soaking - Seed		1.50	cwt	1.50	2	
Delivery - Seed		1.80	cwt	0.63	1	
Contract:						
Hauling		95.34	cwt	0.30	29	
Drying Charge		95.34	cwt	0.73	70	
Storage Charge		80.00	cwt	0.57	46	
Fertilizer:						
16-20-0	200.00	200.00	lb	0.13	26	
Ammonium Sulfate	26.25	8.66	lb N	0.08	1	
Aqua Ammonia	120.00	120.00	lb N	0.30	36	
Zinc Sulfate 36%	50.00	25.00	lb	0.35	9	
Insecticide:						
Warrior T	3.10	1.24	floz	2.73	3	
Copper Sulfate	10.00	5.00	lb	0.84	4	
Herbicide:						
Ordram 15G	30.00	22.50	lb	1.61	36	
Londax 60 DF	1.66	0.42	oz	18.73	8	
Super Wham CA (Propanil)	6.00	2.70	qt	8.16	22	
Grandstand	10.00	3.00	floz	0.89	3	
Fungicide:						
Quadris	12.30	3.08	floz	2.35	7	
Irrigation:						
Water		1.00	acre	54.13	54	
Water - Straw Mgmt		0.50	acre	10.00	5	
Seed:						
Seed - Rice	1.50	1.50	cwt	14.00	21	
Assessment:						
Rice Research Fee		80.00	cwt	0.05	4	
CA Rice Commission		80.00	cwt	0.04	3	
Burn Permit:						
Burning Fees		1.00	acre	0.50	1	
Burn Permit		1.00	acre	0.04	0	

## UC COOPERATIVE EXTENSION

Table 2. continued

	Rate/acre	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Labor (machine)		3.65	hrs	11.39	42	
Labor (non-machine)		1.57	hrs	11.39	18	
Fuel - Gas		1.63	gal	1.51	2	
Fuel - Diesel		33.28	gal	1.26	42	
Lube					6	
Machinery repair					13	
Interest on operating capital @ 10.51%					15	
<b>TOTAL OPERATING COSTS/ACRE</b>					<b>605</b>	
<b>TOTAL OPERATING COSTS/CWT</b>					<b>8</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>					<b>150</b>	
<b>CASH OVERHEAD COSTS:</b>						
Land Rent					169	
Office Expense					20	
Liability Insurance					1	
Property Taxes					12	
Property Insurance					8	
Investment Repairs					3	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>					<b>213</b>	
<b>TOTAL CASH COSTS/ACRE</b>					<b>818</b>	
<b>TOTAL CASH COSTS/CWT</b>					<b>10</b>	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>						
Land					56	
Fuel Tanks & Pumps					1	
Shop Building					5	
Shop Tools					1	
Irrigation System					1	
Tool Carrier					2	
Fuel Wagons					1	
Backhoe					1	
Equipment					57	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>					<b>125</b>	
<b>TOTAL COSTS/ACRE</b>					<b>944</b>	
<b>TOTAL COSTS/CWT</b>					<b>12</b>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>					<b>-188</b>	

Table 3

UC COOPERATIVE EXTENSION  
MONTHLY CASH COSTS PER ACRE to PRODUCE RICE  
SACRAMENTO VALLEY - 2001

Beginning FEB 01	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	TOTAL
Ending JAN 02	01	01	01	01	01	01	01	01	01	01	01	02	
Cultural:													
Maintain Drains	2												2
Maintain and Rework Levee				2									2
Chisel 2X				18									18
Disc 2X				10									10
Triplane Fields				11									11
Laser Level - 1X/7yr				11									11
Fertilize - 16-20-0 @ 200 lb/ac				35									35
Insect - RiceWeevil					4								4
Fertilize - aqua 120 lb/ac				44									44
Roll Final Seedbed				4									4
Fertilize - zinc 50% acre				12									12
Irrigate					13	13	13	13	13				66
Soak and Deliver Seed					3								3
Plant @ 150 lbs/ac					33								33
Insect Shrimp & algae 50% acre					7								7
Weed - Grass 75% acre					42								42
Weed - Broadleaf 25% ac					9								9
Weed - 2d appl 30% acre						5							5
Weed - 2d appl 45% ac						27							27
Fertilize - Topdress 33% ac							2						2
Insect - armyworm 10% ac							1						1
Disease 25% acre							14						14
Plow - 10% acre									1				1
Pickup Truck Use		1	1	1	1	1	1	1	1	1	1	1	15
<b>TOTAL CULTURAL COSTS</b>	<b>4</b>	<b>1</b>	<b>147</b>	<b>115</b>	<b>46</b>	<b>33</b>	<b>14</b>	<b>14</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>380</b>
Harvest:													
Combine Rice - Cutterbar								21					21
Bankout Rice								7					7
Haul Rice To Dryer								29					29
Dry & Store Rice									115				115
Rice Research Board Assessment									4				4
California Rice Commission									3				3
<b>TOTAL HARVEST COSTS w/assessment</b>								<b>56</b>	<b>122</b>				<b>178</b>
Postharvest:													
Burn Permit & Fees 15% ac									1				1
Fall/Spring Burn 15% acre									2				2
Mow Levees-41% levee acre									0				0
Chop Straw - 85% acres									12				12
Flood & Roll 50% acres									9				9
Disc Straw - 2X 35% acres										8			8
<b>TOTAL POSTHARVEST COSTS</b>									<b>24</b>	<b>8</b>			<b>32</b>
Interest on operating capital	0	0	1	2	3	3	3	4	-1	0	0	0	15
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>4</b>	<b>1</b>	<b>148</b>	<b>117</b>	<b>49</b>	<b>36</b>	<b>18</b>	<b>74</b>	<b>147</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>606</b>
<b>TOTAL OPERATING COSTS/CWT</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>
OVERHEAD:													
Land Rent									169				169
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	20
Liability Insurance								1					1
Property Taxes			6								6		12
Property Insurance						4						4	8
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	3
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>171</b>	<b>2</b>	<b>8</b>	<b>6</b>	<b>213</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>5</b>	<b>3</b>	<b>157</b>	<b>119</b>	<b>51</b>	<b>42</b>	<b>19</b>	<b>78</b>	<b>317</b>	<b>11</b>	<b>9</b>	<b>7</b>	<b>818</b>
<b>TOTAL CASH COSTS/CWT</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>

Table 4. UC COOPERATIVE EXTENSION  
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,  
and BUSINESS OVERHEAD COSTS  
SACRAMENTO VALLEY - 2001

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
01	200 HP 4WD Tractor	142,012	10	41,948	16,860	613	920	18,393
01	310 HP 4WD Tractor	191,514	10	56,570	22,738	826	1,240	24,804
01	90 HP Utility Tractor	39,775	16	7,124	3,865	156	234	4,256
01	Bankout SP 150 Cwt	79,365	10	14,035	10,113	311	467	10,891
01	Chisel - 21'	13,581	10	2,402	1,731	53	80	1,864
01	Combine - No Head	190,000	7	51,705	28,858	805	1,209	30,871
01	Disc - Offset 21'	21,735	10	3,844	2,770	85	128	2,983
01	Disc - Stubble 16'	20,774	10	3,674	2,647	81	122	2,851
01	Disc Ridger - 12'	8,000	10	1,415	1,019	31	47	1,098
01	Header - Conv. 18'	23,500	7	6,395	3,569	100	149	3,818
01	Mower - Flail 12'	13,806	20	720	1,255	48	73	1,376
01	Mower - Sicklebr7'	3,700	10	654	472	15	22	508
01	Pickup - 1/2 Ton	22,806	7	8,651	3,179	105	157	3,441
01	Pickup - 3/4 Ton	24,906	7	9,448	3,471	114	172	3,758
01	Plow 5 Bottom 16'	16,000	10	2,829	2,039	63	94	2,196
01	Roller - Cage 22'	22,500	10	3,979	2,867	88	132	3,088
01	Roller - Rice 22'	25,000	10	4,421	3,186	98	147	3,431
01	Triplane 16'X30'	20,914	10	3,698	2,665	82	123	2,870
01	V Ditcher	4,209	20	219	383	15	22	419
TOTAL		884,097		223,731	113,686	3,689	5,539	122,914
40% of New Cost*		353,639		89,492	45,474	1,476	2,216	49,166

\*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	
INVESTMENT								
Backhoe	8,115	15	812	841	30	45	405	1,320
Fuel Tanks & Pumps	10,000	20		922	33	50	275	1,280
Fuel Wagon 2-550g	3,478	10	348	463	13	19	100	595
Irrigation System	6,000	20		553	20	30	0	603
Land	585,000	40	585,000	39,195	3,896	5,850	0	48,941
Shop Building	39,253	20		3,619	131	196	785	4,731
Shop Tools	11,330	20	1,133	1,016	42	62	227	1,347
Tool Carrier	13,731	20	1,373	1,231	50	76	100	1,457
TOTAL INVESTMENT	676,907		588,666	47,841	4,214	6,328	1,892	60,275

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	525	acre	225.00	118,125
Liability Insurance	720	acre	1.35	972
Office Expense	700	acre	20.00	14,000

Table 5

UC COOPERATIVE EXTENSION  
HOURLY EQUIPMENT COSTS  
SACRAMENTO VALLEY - 2001

Yr	Description	COSTS PER HOUR							
		Actual Hours Used	Capital Recovery	Cash Overhead		Operating		Total Oper.	Total Costs/Hr
				Insur- ance	Taxes	Repairs	Fuel & Lube		
01	200 HP 4WD Tractor	937.70	7.19	0.26	0.39	2.44	16.82	19.26	27.10
01	310 HP 4WD Tractor	131.00	69.41	2.52	3.79	3.29	26.07	29.36	105.08
01	90 HP Utility Tractor	84.70	18.26	0.74	1.11	1.11	6.40	7.51	27.62
01	Bankout SP 150 Cwt	288.80	14.01	0.43	0.65	0.1	17.39	17.49	32.58
01	Chisel - 21'	107.70	6.43	0.20	0.30	1.9	0.00	1.90	8.82
01	Combine - No Head	427.10	27.03	0.75	1.13	9.37	25.23	34.60	63.51
01	Disc - Offset 21'	196.00	5.65	0.17	0.26	2.33	0.00	2.33	8.42
01	Disc - Stubble 16'	119.10	8.89	0.27	0.41	2.23	0.00	2.23	11.80
01	Disc Ridger - 12'	35.00	11.65	0.36	0.54	0.86	0.00	0.86	13.40
01	Header - Conv. 18'	270.10	5.29	0.15	0.22	2.53	0.00	2.53	8.18
01	Mower - Flail 12'	224.20	2.24	0.09	0.13	3.44	0.00	3.44	5.89
01	Mower - Sicklebr7'	7.00	27.02	0.83	1.25	1.01	0.00	1.01	30.11
01	Pickup - 1/2 Ton	284.90	4.46	0.15	0.22	1.11	3.47	4.58	9.41
01	Pickup - 3/4 Ton	284.90	4.87	0.16	0.24	1.21	3.47	4.68	9.96
01	Plow 5 Bottom 16'	14.10	57.68	1.77	2.66	2.94	0.00	2.94	65.05
01	Roller - Cage 22'	46.70	24.57	0.76	1.13	1.7	0.00	1.70	28.16
01	Roller - Rice 22'	77.00	16.55	0.51	0.76	1.89	0.00	1.89	19.71
01	Triplane 16'X30'	141.40	7.54	0.23	0.35	2.12	0.00	2.12	10.24
01	V Ditcher	70.00	2.19	0.08	0.13	0.7	0.00	0.70	3.09



Table 6. UC COOPERATIVE EXTENSION  
RANGING ANALYSIS WITH USDA PAYMENT  
SACRAMENTO VALLEY - 2001

COSTS PER ACRE AT VARYING YIELD TO PRODUCE RICE

	YIELD (cwt/acre)						
	56.00	64.00	72.00	80.00	88.00	96.00	104.00
<b>OPERATING COSTS/ACRE:</b>							
Cultural Cost	380	380	380	380	380	380	380
Harvest Cost	153	162	171	181	190	200	209
Assessment Cost	6	7	7	7	8	8	9
Postharvest Cost	32	32	32	32	32	32	32
Interest on operating capital	15	15	15	15	15	15	15
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>586</b>	<b>596</b>	<b>606</b>	<b>616</b>	<b>626</b>	<b>635</b>	<b>645</b>
<b>TOTAL OPERATING COSTS/CWT</b>	<b>8.37</b>	<b>7.95</b>	<b>7.57</b>	<b>7.24</b>	<b>6.95</b>	<b>6.69</b>	<b>6.45</b>
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>213</b>	<b>213</b>	<b>213</b>	<b>213</b>	<b>213</b>	<b>213</b>	<b>213</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>799</b>	<b>808</b>	<b>818</b>	<b>828</b>	<b>838</b>	<b>848</b>	<b>858</b>
<b>TOTAL CASH COSTS/CWT</b>	<b>11.41</b>	<b>10.78</b>	<b>10.23</b>	<b>9.74</b>	<b>9.31</b>	<b>8.93</b>	<b>8.58</b>
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>126</b>	<b>126</b>
<b>TOTAL COSTS/ACRE</b>	<b>924</b>	<b>934</b>	<b>944</b>	<b>954</b>	<b>964</b>	<b>974</b>	<b>984</b>
<b>TOTAL COSTS/CWT</b>	<b>13.19</b>	<b>12.45</b>	<b>11.79</b>	<b>11.22</b>	<b>10.71</b>	<b>10.25</b>	<b>9.84</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR RICE

Price \$/cwt	Crop Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-50	-30	-10	10	30	50	70
7.00	20	45	70	95	120	145	170
8.00	90	120	150	180	210	240	270
9.00	160	195	230	265	300	335	370
10.00	230	270	310	350	390	430	470
11.00	300	345	390	435	480	525	570
12.00	370	420	470	520	570	620	670

NET RETURN PER ACRE ABOVE CASH COST FOR RICE

Price \$/cwt	Crop Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-263	-243	-223	-202	-182	-162	-142
7.00	-193	-168	-143	-117	-92	-67	-42
8.00	-123	-93	-63	-32	-2	28	58
9.00	-53	-18	17	53	88	123	158
10.00	17	57	97	138	178	218	258
11.00	87	132	177	223	268	313	358
12.00	157	207	257	308	358	408	458

NET RETURNS PER ACRE ABOVE TOTAL COST FOR RICE

Price \$/cwt	Crop Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-388	-368	-348	-328	-308	-288	-268
7.00	-318	-293	-268	-243	-218	-193	-168
8.00	-248	-218	-188	-158	-128	-98	-68
9.00	-178	-143	-108	-73	-38	-3	32
10.00	-108	-68	-28	12	52	92	132
11.00	-38	7	52	97	142	187	232
12.00	32	82	132	182	232	282	332

UC COOPERATIVE EXTENSION  
 Table 7. RANGING ANALYSIS WITHOUT USDA PAYMENT  
 SACRAMENTO VALLEY - 2001

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR RICE

Price \$/cwt	Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-166	-146	-126	-106	-86	-65	-45
7.00	-96	-71	-46	-21	4	30	55
8.00	-26	4	34	64	94	125	155
9.00	44	79	114	149	184	220	255
10.00	114	154	194	234	274	315	355
11.00	184	229	274	319	364	410	455
12.00	254	304	354	404	454	505	555

NET RETURN PER ACRE ABOVE CASH COST FOR RICE

Price \$/cwt	Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-379	-358	-338	-318	-298	-278	-258
7.00	-309	-283	-258	-233	-208	-183	-158
8.00	-239	-208	-178	-148	-118	-88	-58
9.00	-169	-133	-98	-63	-28	7	42
10.00	-99	-58	-18	22	62	102	142
11.00	-29	17	62	107	152	197	242
12.00	41	92	142	192	242	292	342

NET RETURNS PER ACRE ABOVE TOTAL COST FOR RICE

Price \$/cwt	Yield (cwt/acre)						
	70.00	75.00	80.00	85.00	90.00	95.00	100.00
6.00	-504	-484	-464	-444	-424	-404	-384
7.00	-434	-409	-384	-359	-334	-309	-284
8.00	-364	-334	-304	-274	-244	-214	-184
9.00	-294	-259	-224	-189	-154	-119	-84
10.00	-224	-184	-144	-104	-64	-24	16
11.00	-154	-109	-64	-19	26	71	116
12.00	-84	-34	16	66	116	166	216