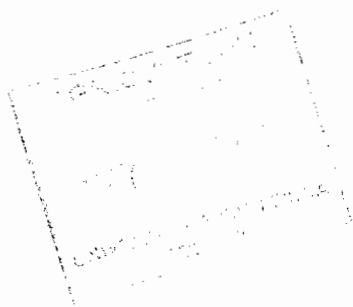


RICE PRODUCTION COSTS

SUTTER, YUBA, SACRAMENTO
AND PLACER COUNTIES



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RICE PRODUCTION COSTS

Sample costs of production for rice are revised and published as needed. This study reflects sample methods and costs of farming rice in Sutter, Yuba, Sacramento and Placer Counties, and is intended primarily for use by growers and lending institutions in budget planning. Students, real estate people and anyone else interested in rice growing may find this useful information on costs and cultural methods.

Land values and quality vary considerably within this large area, as do rice farming practices. The method of farming rice examined in this report is based on use of ground-applied, liquid fertilizer, and is explained more fully below. Other systems are in use, but the total cost is approximately the same.

PRODUCTION COSTS: 1966 VS. 1974

A previous rice production cost study for the four county area was done in 1966. Comparative changes in cost of major inputs are given in Table I, which shows an increase in many items, particularly fertilization, seed, and land cost. Labor cost has increased, but useage has decreased. Similarly, changes in equipment and cultural practices have offset increases in cost of fuel and repairs. Total production costs have increased 32% and cost per cwt has increased 23%.

TABLE I COMPARISON OF RICE PRODUCTION COSTS IN 1966 AND 1974

<u>Item</u>	<u>1966</u>	<u>Cost/Acre</u>	<u>1974</u>
Labor (hourly + salaried employees)	\$17.15		\$25.44
Fuel and repairs	20.45		20.96
Hauling and drying	19.95		28.02
<u>Cultural Practices</u>			
Fertilization	13.80		30.79
Water and water management	16.30		17.65
Seed and seeding	13.20		23.30
Pest control	1.60		.64
Weed control	8.35		8.76
Transportation of equipment	-		.60
<u>Cash Overhead</u>			
Miscellaneous	6.95		8.50
Management	13.00		23.60
<u>Investment Overhead</u>			
Land	24.00		56.00
Taxes	7.05		18.00
Buildings	1.30		.77
Equipment	41.30		36.61
Drains and roads	-		.25
Total	<u>\$204.40</u>		<u>\$299.89</u>
Yield - cwt/acre	52		59
Cost/wt	\$ 3.93		\$ 5.08

CALENDAR OF OPERATIONS

The Calendar of Operations (Table 2) shows the typical pattern of rice growth and field activity. This calendar will fluctuate considerably depending primarily on weather.

TABLE 2 RICE CALENDAR OF OPERATIONS

<u>Month and Period</u>	<u>Available Field Days</u>	<u>Rice Growth Phase</u>	<u>Typical Field Activity</u>
January 1-31	4		Repair & rebuild equipment Office and management
February 1-28	4		Repair & rebuild equipment Office and management
March 1-10	2		Land preparation - Plow, chisel Disc 1 or 2x
11-20	5		Landplane 2x
April 1-10	7		Fertilize Survey & mark, Plow contours Check, Disc-harrow, Set boxes
11-20	7		Flood
21-30	8	Seeded	Seed
May 1-10	8	Seedling emergence	Rice becomes established Continue irrigation
11-31	19		Tadpole shrimp control Algae control Watergrass control
June 1-10	9		Rice leafminer control
11-20	9	Tillering	
21-30	10		Continue irrigation
July 1-10	10	Elongation	Broad-leaved weed control Topdress fertilizer
11-31	21	Boot	Continue irrigation
August 1-31	31	Flower (heading)	Continue irrigation
September 1-30	28	Grain formation	Drain field and open checks
October 1-31	25	Maturity	Harvest-bankout-haul to drier
November 1-30	19		Burn stubble, knock down levees Fall plow or stubble disc.
December 1-31	10		Maintenance and repair of equipment and office

EXPLANATION OF TERMS AND COSTS

Price for Rice

Currently, a very strong demand for rice in the international market is setting record prices, and this demand is projected to continue through 1974. Thus, very high price levels are used in this cost study. However, only 3% of the world's rice moves in international trade, and about 62% of this nation's rice is in that market. Since 97% of the world's rice is consumed in the country where it is grown, a very small shift in world production will cause a very large change in export demand. This can directly affect the price for rice in California. Prices paid to growers for paddy rice have averaged \$5.60/cwt for the five years, 1968 - 1972, and ranged from \$4.85 to \$7.83/cwt.

Other uncertainties include fuel availability, possible changes in the federal rice program (which will affect leasing practices and acreage of rice) and continued increases in cost of material inputs, particularly fertilizers.

Farming System

The farming practices used in this study are based on ground applied fertilizer and high quality land. In this system rice is rotated with other crops, usually on a one or two years in, two or three years out basis. The ground is fairly flat so fewer levees are needed (4.37% of the acreage in levees). With such a system, fertilizer costs are lower, less watergrass herbicide is needed, and tillage and harvest operations are more efficient. Land value generally is higher because of the wider range of adapted crops. Average yields are generally higher than on poorer soil.

Prices and Wages

Prices used in this study are based on quotations made in January 1974. *Fertilizer* prices are bulk rate less 5% for payment within thirty days. *Equipment* costs include tax and are based on new value except where noted. *Water* cost is estimated average amount supplied at the field, based on records of several water districts. Charges for water vary within the four-county area, from a low of \$3/acre for the season to a high of \$4/acre foot. *Fuel* (diesel) is calculated at 26¢/gal. *Labor* is charged as follows: skilled \$2.90/hr; bankout driver \$4.40/hr; harvester operator \$4.60/hr., including Workman's Compensation and Social Security and other fringe costs. Other pertinent costs and charges are given within Table 3.

Equipment Operation and Cultural Costs

These are based on published typical data on fuel consumption, speed of operation, efficiency of use, and normal repair.

Contracts and Services

Nearly all rice growers contract some jobs during the season, particularly aerial application of materials. Many growers trade work with their neighbors. Close to 10% of the rice acreage is custom harvested. Other services may include equipment rental, soil and tissue analysis, drying, hauling and surveying. The cost of various contracts and services used in this study reflect what a grower may do using this particular system.

Cash Overhead

Miscellaneous includes office maintenance, interest on borrowed capital and incidental business expenses, and is 6% of the total of cultural and harvest costs.

Land Taxes are based on an estimate of the average for the area. The *full-time employee* salary includes fringe benefits.

Management Charge

Five percent of the crop is the amount the owner/operator may consider as his salary. In an incorporated operation, it is the amount disbursed to the officers, and is a cost of growing the crop.

Investment Costs

This category reflects costs of owning fixed assets. Annual *depreciation* is based on varying expected lifetime of the investment (Table 4). *Interest* is calculated at 7% of 1/2 of the original value of the investment, except for land which is based on full value. This 7% interest on investment charge is justified as the opportunity cost of owning the investment, and is the estimated return on the money if it had been invested elsewhere. Most equipment is allocated over the entire 900 acre ranch, except for certain specialty items used only in rice.

Ranch Size

The sample rice farm used for this study has 900 acres and grows the following crops:

Rice	380	acres
Grain Sorghum, double crop	200	acres
Wheat or Barley, double crop	200	acres
Safflower	160	acres
Fallow	160	acres
<hr/>		
Total	900	acres

SAMPLE COSTS

Sample costs to produce rice are shown in Table 3.

TABLE 3 SAMPLE COSTS TO PRODUCE RICE

Land Preparation	Man Hrs. Per Acre	Cash Cost Per Acre - \$					Total
		Labor	Materials	Contracts or Services	Fuel	Repairs	
Burn	.025	.06	-	-	-	-	.06
Doze levees	.04	.12	-	-	.05	.08	.25
Disc or chisel lx	.13	.38	-	-	.20	.48	1.06
Chisel, stubble disc or plow	.38	1.10	-	-	.65	1.90	3.65
Disc lx	.13	.38	-	-	.20	.48	1.06
Landplane 2x	.42	1.22	-	-	.73	2.01	3.96
Sub Total	1.13	3.26	-	-	1.83	4.95	\$10.04
Fertilization, Irrigation							
Fertilization	.20	.58	14.00 400 #aqua @ \$70/ton	1.00 rent aqua rig	.33	.39	16.30
Survey, mark, pull levees	.20	.58	-	1.25 survey	.05	.07	1.95
Float in and fertilize borrow pits	.05	.15	1.81 (NH) ₂ SO ₄	-	.10	.18	2.24
Starter fertilizer disc lx	.13	.38	10.00 100# 11-48-0 @ \$200/ton	1.25 fly on	.22	.48	12.43
Close levees, install boxes	.10	.29	-	-	.12	.20	.61
Flood, manage water	1.00	2.90	16.40 9.9 ac/ft/ac	-	.50	.50	20.30
Sub Total	1.68	4.88	42.21	3.50	1.32	1.82	\$53.73
Planting							
Seeding	-	-	19.24 seed 135# @ \$14.25/cwt	2.13 fly on 1.76 treat, soak .17 haul	-	-	21.37 1.76 .17
Sub Total	-	-	19.24	4.06	-	-	\$23.30

TABLE 3 SAMPLE COSTS TO PRODUCE RICE (con't)

Pest Control, Fertilizer	Man Hrs. Per Acre	Cash Cost Per Acre - \$					
		Labor	Materials	Contracts or Services	Fuel	Repairs	Total
Shrimp or leaf- miner control 1/2 acreage	-	-	.14 Parathion	.50 fly on	-	-	.64
Watergrass control	-	-	4.04 Molinate on 1/3 ac	.50 fly on	-	-	4.54
Broadleaf control	-	-	1.97 MCPA 12 oz	2.25 fly on	-	-	4.22
Topdress 1/2 acreage	-	-	2.05 100# AmS @ \$102/ton	.68 fly on	-	-	2.73
Move tractor 2x	-	-	-	.30	-	-	.30
Sub Total	-	-	8.20	4.23	-	-	\$12.43
Total: Cultural	2.81	8.14	69.65	11.89	3.15	6.77	\$99.50 \$93.78
Harvest and Drying							
Open levees, remove boxes	.20	.58	-	-	.24	.40	1.22
Combine	.87	4.00	-	-	.94	7.43	12.37
Bankout	.87	3.83	-	-	.53	1.50	5.86
Haul to dryer	-	-	-	8.24 6592 (59) @ .125/cwt	-	-	8.24
Dry	-	-	-	19.78 .30/cwt wet	-	-	19.78
Move combines 2x	-	-	-	.30 contract	-	-	.30
Total Harvest	1.94	8.41	-	28.32	1.71	9.33	\$ 47.77
Total: Cultural and Harvest	4.75	16.55	69.65	40.21	4.86	16.10	\$147.27

TABLE 3 SAMPLE COSTS TO PRODUCE RICE (con't)

Cash Overhead:

Misc., office, insurance, interest on operating capit l 6% of cultural and harvest cost)	\$ 8.50
Taxes on land	18.00
Full time employee, \$8,000/yr	\$ 8.89
<hr/> Total: Cash overhead	<hr/> \$35.39
Management: 5% of 59 cwt @ \$8/cwt	\$23.60
<hr/> Total: Cash costs (Cultural + Harvest + Overhead)	<hr/> 206.26

Investment Costs

<u>Investment</u>	<u>Per Acre</u>	<u>Annual Cost/Acre</u>	
		<u>Depreciation</u>	<u>Interest @ 7%</u>
Land	800.00	-	56.00
Drains, roads	1.85	.19	.06
Buildings	20.00	.67	.10
Equipment	<u>268.10</u>	<u>27.22</u>	<u>9.39</u>
	\$1,089.95	\$28.08	\$65.55
<hr/> Total: Fixed Costs			<hr/> \$ 93.63
Total Production Cost/Acre (Cash + Fixed Costs)			\$299.89
<hr/> Cost/cwt: 59 cwt/ac			<hr/> \$ 5.08

EQUIPMENT INVENTORY

The equipment inventory in Table 4 shows all machinery on the ranch, including some not used for rice. Specialized equipment is allocated only to the crops for which it is used, and paid for by the acreage of that crop. Equipment used on the entire acreage, or for general use, is allocated over the whole farm.

TABLE 4 EQUIPMENT INVENTORY AND ANNUAL COST

Equipment	Cost \$	Annual Use Acres	Cost/Acre \$	Life Years	Annual Cost \$		
					Dep. Per Acre/Yr	Interest	Crops
Crawler 90 h.p.	\$ 41,340	900	\$45.93	15	\$ 3.06	\$ 1.61	All
Crawler 60 h.p. w/blade - used	10,000	900	11.11	7	1.59	.39	All
Wheel tractor 110 h.p.	24,698	900	27.44	10	2.74	.96	All
Wheel tractor 45 h.p.	6,890	900	7.77	10	.78	.27	All
Stubble disc 14'	8,480	900	9.42	10	.94	.33	All
Moldboard plow 7"x16"	3,961	900	4.40	10	.44	.15	All
Offset disc 21'	5,883	900	6.54	10	.65	.23	All
Chisel plow 14'	2,226	900	2.47	10	.25	.09	All
Swede harrow 20'	525	900	.58	20	.03	.02	All
Landplane 12'x60'	6,360	900	7.07	15	.47	.25	All
Three-wheel plane 14'	3,710	380	9.76	15	.65	.34	Rice
Float, homemade	500	900	.56	15	.04	.02	All
Ridger 6' - used	1,000	200	5.00	10	.50	.18	Sorghum
Ditcher 4'	1,800	200	9.00	10	.90	.32	Sorg./r
Planter 12"x30"	5,000	360	13.89	10	1.39	.49	Sorg/saf
Grain drill 10' - used	1,000	360	2.78	10	.28	.10	Sorg/saf
Combine 16'	37,010	740	50.13	9	5.57	1.75	All
Combine 16' - used	10,600	740	14.32	5	2.86	.50	All
Bankout, self-propelled	14,840	740	20.05	10	2.01	.70	All
Bankout, pull type	4,000	740	5.41	15	.36	.19	All
Rice checker	9,010	380	23.71	15	1.58	.83	Rice
Equipment carrier	2,385	900	2.65	10	.27	.09	All
Service wagon	3,000	900	3.33	10	.33	.12	All
Tools & small equipment	4,600	900	5.11	10	.51	.18	All
Pickup - 4 wd	5,300	900	5.89	5	1.18	.21	All
Pickup - used	1,500	900	1.67	3	.56	.06	All
2 ton dump truck - used	2,500	900	2.78	8	.35	.10	All
Total	\$218,118	-	\$298.77	-	\$30.29	\$10.48	-
Amount allocated to each acre of:					<u>Annual Cost/Acre - \$</u>		
Rice					\$27.22	\$9.39	
Sorghum					28.06	9.31	
Grain					25.89	8.54	
Safflower					26.66	8.81	

PROFITABILITY OF RICE

The profitability of rice is shown in Table 5, and is simply gross sales less total production costs, corrected for differences in management, drying and hauling costs at various yields.

TABLE 5 PROFITABILITY OF RICE AT VARIOUS PRICES AND YIELDS

Yield/acre - cwt	Price/cwt - \$			
	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
40	-32	- 4	39	77
45	0	32	75	117
50	15	63	110	158
55	42	94	146	199
60	68	125	182	239
65	95	156	218	280
70	121	188	254	320

ITEMIZED COSTS

It is useful to know the percent of the total cash cost of individual items. Table 6 itemizes various inputs as a percent of the total cash cost of production.

TABLE 6 ITEMIZED COSTS AS PERCENT OF TOTAL CASH COSTS*

Operation	% of Cash Cost					Total
	Labor	Materials	Contracts & Services	Fuel	Repairs	
Land Preparation	1.6	-	0.1	0.9	2.4	5.0
Fertilization	0.5	13.5	1.4	0.3	0.4	16.1
Irrigation, water management	2.2	7.9	0.6	0.5	0.7	11.9
Planting	-	9.3	2.0	-	-	11.3
Pest Control	-	3.0	1.6	-	-	4.6
Harvest & Drying	3.8	-	13.7	0.7	4.3	22.5
Cash Overhead & Management	-	-	-	-	-	28.6
Totals (+cash overhead)	8.1	33.7	19.4	2.4	7.8	100.0%

*Total cash cost = \$206.26

LEASING ARRANGEMENTS

According to a 1969 study (see selected references) 20% of California rice farms are operated by the full owner, 21% by full tenants and 59% by part-owner-operators. In the same study, about 66% of the rice allotment acreage was under some form of share lease arrangement. A variety of leasing arrangements are in use, the most common of which are briefly described in Table 7.

TABLE 7 LEASING ARRANGEMENTS ON CALIFORNIA RICE FARMS
(Source: Leasing on California Rice Farms)

<u>Type of Arrangement</u>	<u>% of Acreage in 1969 Using This Arrangement</u>	<u>Description of Arrangement</u>
Cash Lease	2.8	Landlord provides land for cash, average \$50/acre in 1969. Low risk to landlord. Tenant provides all allotments and operating capital.
25/75 Share Lease	22.9	Landlord provides land, 25% of chemicals (including fertilizer) drying and transportation and receives 25% of crop. Tenant provides allotment.
33/67 Share Lease	24.8	Landlord provides land, water, 33% of allotment, chemicals, drying and transporting for 33% of crop (See Table 8).
15/85 Share Lease	16.8	Lessor provides allotment only in exchange for 15% of the crop.
No Lease	31.8	---
Other Types	0.9	20/80, 40/60
	<u>100.0%</u>	

The most commonly used leasing arrangement is the 33/67 share lease. A sample allocation of costs (from Table 3) based on this arrangement is given in Table 8.

TABLE 8 SAMPLE ALLOCATION OF COSTS BASED ON 33/67 SHARE LEASE

<u>Item</u>	<u>Tenant</u>	<u>Landlord</u>	<u>Total</u>
Labor	16.55	-	16.55
Fuel and repairs	20.96	-	20.96
Hauling and drying	18.69	9.33	28.02
<u>Cultural Practices</u>			
Fertilization	20.54	10.25	30.79
Water & water management	1.25	16.40	17.65
Seed and seeding	23.30	-	23.30
Pest control	.43	.21	.64
Weed control	5.84	2.92	8.76
Transportation of equipment	.60	-	.60
<u>Cash Overhead</u>			
Miscellaneous	8.50	-	8.50
Management	23.60	-	23.60
Full time employee	8.89	-	8.89
Taxes	-	18.00	18.00
<u>Investment Overhead</u>			
Land	-	56.00	56.00
Buildings	.77	-	.77
Equipment	36.61	-	36.61
Drains and roads	.25	-	.25
Total Costs	\$186.78	\$113.11	\$299.89
Gross Return	314.68	157.32	472.00
Net Return	127.90	44.22	172.11

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