

Ad Reed

RI-SV-68

RICE PRODUCTION COSTS



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Additional copies of this publication may be obtained
from the University of California Agricultural Extension
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RICE PRODUCTION AND COSTS

Rice production in Colusa, Glenn and Yolo Counties accounts for a substantial part of the total agricultural income in these counties. Rice acreage in this tri-county area has risen to one hundred and ninety-eight thousand acres (198,000) in 1968. This accounts for forty-six percent (46) of the total California acreage of approximately four hundred and thirty-five thousand (435,000) acres. Assuming an average yield of fifty-three hundred (5300) pounds of rice per acre and a \$4.85 price per one-hundred weight, a gross income of approximately 52.5 million dollars should be realized from the crop in 1968. These figures do not include the income to allied rice industries in the tri-county area. If income from rice to these was added the total would be considerably higher. These gross returns are impressive, but of even greater importance to rice growers are the net returns after paying production costs. This sample cost of production study is an attempt to provide generalized information about costs to produce rice. It is hoped this presentation will stimulate growers to evaluate their own operations and to budget for future operations.

The production costs, materials and rice yields shown in this study are not averages for rice operations in the area. Neither are these items intended to constitute recommendations for production practices. These production costs do reflect the costs of representative rice enterprises in Colusa, Glenn and Yolo Counties. The data is based upon a 400 acre planting of rice with an additional 300 acres of land planted to crops in

which much of the equipment necessary for rice production can be utilized. Rice production here is separated from the other farming enterprises because there is no typical rotation or farming system in the rice area, other than perhaps a pre-dominance of grain crops.

Individual grower costs will vary from those given here. Items of cost that are overlooked by some growers are included in this study. These include equipment depreciation, interest on investment in land and equipment, taxes and grower's own labor. A column is provided in this study for growers and readers to list their own costs of production which may more accurately reflect their own individual operation.

Cost of production figures shown in this study do not include values placed on rice units. Neither do they include investment or rent for land acreage that may be necessary for a rotational program or for other reasons. To simplify information it is sometimes necessary to use trade names of products. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned in this study.

We regularly prepare and mail a Rice Newsletter to those in the rice industry interested in receiving it. Its purpose is to inform the readers of new rice technology as well as to present information of timely and of special local interest. Should you like to receive the newsletter, please contact our office so you may be added to the mailing list.

RICE CALENDAR OF OPERATIONS

This calendar of operations shows in detail the timing of typical cultural operations used in rice production in Colusa, Glenn and Yolo Counties. In years when rains do not begin until late November or December, rice residue (stubble) is burned and the first deep tillage is accomplished

on many fields just after harvest is completed. Usually all heavy tillage and levee-making operations are completed on fallowed fields before October 1, with only light tillage work needed just previous to planting the next year. Spring field preparation for rice production

usually does not begin until March in years of "normal" amounts and distribution of rainfall. Initial spring field work may be delayed until April in high rainfall years on the more poorly drained rice soils. When late spring rains occur the calendar of operations throughout the season is changed so that all rice operations will be performed later. Field preparation is usually completed in time to permit seeding between April 20 and May 15. Timing sequence of individual operations may deviate from the period indicated here.

Days available for actual field operations within these time periods depend upon rainfall distribution, climatic conditions and soil physical properties that influence

drainage. These variables determine days available for field operations. The figures suggested here are projected from a basis of expected days of precipitation and soil drying rates. The amount of capital invested in equipment should be related to these considerations.

The rice growth stage shown in this calendar indicates the sequential development of the individual rice plant. Field development will vary considerably from this time sequence, the degree of variability depending upon planting dates, climatic conditions, water temperatures, inherent physiological factors and soil fertility.

RICE CALENDAR OF OPERATIONS

<u>Month and Period</u>	<u>Available Field Days</u>	<u>Stage of Rice Growth</u>	<u>Typical Field Activity</u>
<u>January</u> 1 - 31	4		Repair and rebuild equipment Office and management
<u>February</u> 1 - 28	4		Repair and rebuild equipment Office and management
<u>March</u> 1 - 10 11 - 20 21 - 31	2 5 7		Plow, disc 2 x, Landplane, Float, Survey and mark levees Check
<u>April</u> 1 - 10 11 - 20 21 - 30	7 7 8		Land preparation continued Fertilize Preplant grass weed control Disc-harrow, close levees Flood Treat and soak seed and seed
		Seeded	
<u>May</u> 1 - 10 11 - 31	8 19	Seedling Emergence	Rice stand establishment Continued irrigation Tadpole Shrimp control Algae control
<u>June</u> 1 - 10 11 - 20 21 - 30	9 9 10	Tillering	Rice Leafminer control Watergrass control by herbicides Continue irrigation

Month and Period	Available Field Days	Stage of Rice Growth	Typical Field Activity
<u>July</u>			
1 - 10	10	Internode elongation	Broadleaved weed control Topdress fertilizer
11 - 31	21	Boot	Prepare and check fallow fields Continue irrigation Prepare and check fallow fields
<u>August</u>			
1 - 31	31	Heading and Flowering	Continue irrigation Prepare and check fallow fields
<u>September</u>			
1 - 30	28	Grain Formation	Drain fields and open checks Seed vetch cover crop
<u>October</u>			
1 - 31	25	Maturity	Harvest, bankout and haul to drier
<u>November</u>			
1 - 30	19		Burn rice residue and/or fall plow
<u>December</u>			
1 - 31	10		Maintenance and repair of equipment and office

EXPLANATION OF TERMS

Cultural costs represent cash expenditures for labor, fuel, and repairs, and materials and services during the preharvest period. This category is further divided into various field operations, with subtotal costs shown for simplicity of presentation.

Labor includes wages, Social Security, compensation insurance and other fringe benefits. Some growers include health and retirement plans, housing, vacation and transportation. The following labor rates were used in this study:

- Skilled - \$2.50 per hour
- Harvester Operator - 4.00 per hour
- Bankout Operator - 3.80 per hour
- Supervisory - 4.00 per hour (permanent)

The supervisory labor represents foremen and managers who are permanently employed. These labor rates should not be interpreted as the prevailing wage, but rather as indicative of wages that include the above fringe benefits paid by some growers.

Fuel and Repairs include fuel lubricant and repair cost for machinery.

Material and Services include the cost of materials, application of these materials and the cost of custom operations. Fertilizer, herbicide and pesticide costs reflect current retail prices. Averages have been used in determining these figures. The amount of fertilizer, herbicide and pesticide shown in this study is not to be considered a recommendation because of differing conditions. Irrigation water cost is an average of the costs of established water districts in the rice area. Irrigation costs may be considerably higher in areas where wells are used or in high water cost districts. Many water districts charge on a "flat rate" basis, but this has been converted to cost per acre-foot of water for clarity.

It is rather typical in sections of the rice area for growers to make various soil amendments to increase rice yields. Many soils in the tri-county area are

highly alkaline, "sodic" soils that require applications of iron containing materials to produce a normal rice crop. Some soils also are phosphorus deficient so that application of this nutrient element is necessary for optimum yields. Growers who include these additional practices in their operation should increase their cultural costs as follows: \$19.00 per acre for iron-containing materials and application; \$3.50 per acre for phosphorus materials. Those who find it necessary to control blackbirds, coots, etc., should add approximately \$1.00 to \$1.50 per acre to their costs.

Harvest Costs represent operations under normal harvest conditions. They do not reflect the higher costs encountered in extremely wet weather. The combine and bankout costs shown in this study reflect their operation between contour levees, as do other operational costs. Operational efficiency is decreased in such a confined area of operation as compared to freer movement in large rectangular checks, or checks that have low levees that are passable by equipment.

Cash Overhead reflects the costs of office, use of pickup truck, insurance, interest on operating capital and other costs neces-

sary to the business. This cost is calculated as 5% of the total cultural and harvest costs. Taxes on land and equipment are included in this category.

Management Cost is not a cash cost but is charged to indicate the necessity of a return on the management of the enterprise. A charge of 5 percent of the gross sale value of the crop is made to represent management.

Investment Overhead indicates the interest and depreciation of equipment, buildings and other structures. Field establishment is designated here and includes surveying, levee installation, etc. The life of an established rice field is considered 3 years.

Interest on investment is figured at 6 percent of one-half the original cost, except on land which is figured at full 6 percent of value. Investment in equipment is based upon current market prices for new equipment shown in the equipment inventory. Depreciation is based upon the following useful life: Crawlers 15-year life; combine 8-year life; pickup trucks 5-year life; buildings 30-year life; and all other items on a 1-year life.

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SAMPLE COSTS TO PRODUCE RICE

Colusa, Glenn and Yolo Counties - 1968

Based on 400 acres of rice on a 700 acre farm with a rice yield of 5300 pounds dry rice (14% moisture) per acre

Operation	Hours Per Acre	Labor and Cash Costs Per Acre				Total Costs Per Acre	Growers Actual Cost
		Labor	Fuel & Repairs	Materials & Services	Cost		
		\$	\$		\$	\$	\$
CULTURAL							
Field Preparation							
Plow (Moldboard)	0.6	1.50	3.05			4.55	
Disc 2x	0.6	1.50	3.86			5.36	
Float (Drag)	0.3	.75	.54			1.29	
Spiketooth Harrow (Fertilizer Incorporation)	0.2	.50	.80			1.30	
Close & Maintain Levees	0.1	.25	.22			.47	
Subtotal...		4.50	8.47			12.97	
Fertilization							
Fertilizer				Nitrogen 105 lbs.	10.75	10.75	
Aerial Application				\$1/cwt. (500# material)	5.00	5.00	
Subtotal...					15.75	15.75	
Irrigation							
Flood & Irrigate	1.0	2.50		7.2 ac/ft 1.53 ea.	11.00	13.50	
Subtotal...					11.00	13.50	
Seed and Seeding							
Seed				175# @.07	12.25		
Soak, treat and handle					.81		
Application (Aerial)					2.19	15.25	
Subtotal...					15.25	15.25	
Insect Control							
(Tadpole shrimp and/or leafminer)				Parathion 1/10 lb/Ac.	.18	.18	
Application (Aerial)					1.75	1.75	
Subtotal...					1.93	1.93	
Weed Control							
Barnyardgrass-preplant or postplant)				Herbicide (Molinate or Propanil 3#/A or 5#/A)	11.61	11.61	
Application (Aerial)					2.00	2.00	
Broad-leaved weeds				Herbicide (MCPA-16 oz)	1.44	1.44	
Application (Aerial)					1.75	1.75	
Subtotal...					16.80	16.80	

Operation	Hours Per Acre	Labor and Cash Costs Per Acre			Total Costs Per Acre	Growers Actual Cost
		Labor	Fuel & Repairs	Materials & Services		
		\$	\$		\$	\$
Transportation Move crawler tractor (Con- tract based on 50% of acreage)				Two crawlers, two moves each \$25 per move)	.25	.25
Miscellaneous (includes supervisory labor, burning, etc.)	1.5	6.00	2.25 (pickup)			8.25
Subtotal...						8.50
TOTAL CULTURAL COSTS		13.00	10.72		60.98	84.70
HARVEST						
Drain and open levees	0.2	.50	.45			.95
Combine	1.2	4.80	8.58			13.38
Bankout	.6	2.28	1.44			3.72
Haul to drier				Custom 6078 green weight		6.50
Dry 6078 lbs. Paddy @ .27/cwt 25% moisture-contract					16.39	16.39
Move harvesters-\$25 per move (2 harvesters, 2 moves each contract)					.25	.25
Supervisory Labor	0.5	2.00	.75			2.75
Subtotal Harvest Costs...		12.08	15.22		16.64	43.94
TOTAL CULTURAL AND HARVEST COSTS		25.08	25.94		77.61	128.64

CASH OVERHEAD

Misc. office, insurance, travel
communications, etc.
Taxes (land and equipment)

Subtotal...

6.43
8.38
14.81
143.45

TOTAL CASH COSTS

Management 5% of 5300 lbs. @ \$5.00/cwt = \$265

13.25

INVESTMENT

Per Acre

Depreciation

Interest

Land	\$500.00		\$30.00
Headquarters (shop & equipment storage)	20.00	.67	.60
Equipment	273.65	27.02	8.21
Field establishment (land plane, survey, mark contours, pull levees-boxes & installation) based on 3 yr. life of levees	5.15	1.72	.15
Drains & boundary roads	1.67	.17	.05
Subtotal...	\$800.47	\$29.58	\$39.01

\$68.59

TOTAL COSTS OF PRODUCTION (CASH + FIXED COSTS)

\$225.29

Cost per 100 lbs. to produce rice

\$4.25

EQUIPMENT INVESTMENT FOR RICE

(Based on 700 acre farm of which 400 acres is in rice)

Item	No of Items	Cost	Annual use (Acres)	Cost Per Acre	Life (Yrs)	Depreciation	Interest	Cash Costs Per Hour			Repairs as % of New Cost Per 100 hrs.
								Fuel	Repairs	Total	
		\$		\$		\$	\$	\$	\$	\$	
<u>Tractor</u>											
Crawler (85-97 hp)	2	56,000	700	80.00	15	5.33	2.40	.88	2.80	3.68	1.0%
Crawler (60-70 hp)	1	12,000	700	17.14	15	1.14	.51	.54	1.20	1.74	1.0%
<u>Implements</u>											
Moldboard Plow 6-16" 1 way	2	3,990	700	5.70	10	.57	.17	--	1.40	1.40	7.0%
Chisel Plow 16'	1	1,340	700	1.91	10	.19	.06	--	.70	.70	5.0%
Offset Disc Plow 12'	1	4,846	700	6.92	10	.69	.21	--	2.20	2.20	4.5%
Offset Disc Harrow 18'	2	8,400	700	12.00	10	1.20	.36	--	2.75	2.75	6.5%
Spiketooth Harrow (Heavy Duty 20')	1	700	700	1.00	10	.10	.03	--	.30	.30	4.0%
Float (Drag) 16'	1	420	550	.76	10	.08	.02	--	.05	.05	0.5%
Landplane 12 x 60	1	7,350	700	10.50	10	1.05	.32	--	2.20	2.20	3.0%
Pull Grader (used)	1	1,500	400	3.75	10	.35	.11	--	.45	.45	3.0%
Spray Rig (200 gals)	1	1,000	700	1.43	10	.14	.04	--	.50	.50	5.0%
Tools & small equipment		4,500	700	6.43	10	.64	.19	--	--	--	---
<u>Harvesters & Accessories</u>											
Harvester SP 16' (includes Tracks, cab & air conditioner)	2	46,110	550	83.84	8	10.48	2.52	.90	6.25	7.15	2.7%
Bankout Wagon SP (150 cwts)	1	9,660	550	17.56	10	1.76	.53	.50	1.90	2.40	2.0%
<u>Trucks</u>											
Truck, 2 ton	2	10,500	700	15.00	10	1.50	.45	.75	1.25	2.00	--
Pickup, 3/4 ton (4 wheel drive)	1	4,000	700	5.71	5	1.14	.17	.50	1.00	1.50	2.5%
Pickup, 3/4 ton (used)	1	700	700	1.00	3	.33	.03	.50	2.00	2.50	
Equipment Carrier	1	2,100	700	3.00	10	.30	.09	--	.20	.20	1.0%
Total		175,116		273.65		27.02	8.21	4.57	27.15	31.72	

Figure 1

TYPICAL MONTHLY CASH FLOW

The monthly cash flow is a distribution of cash costs over a twelve month period, as shown below and on the next page. This distribution is a reflection of cash costs associated with the rice calendar of operations and the various cultural, harvest and overhead cash costs. Consequently, this suggested typical distribution may shift from one period to another as a result of alterations in rice operations. Such a typical distribution of cash costs may be of some value in planning for months of peak capital demand and cash flow.

MONTHLY DISTRIBUTION OF CASH COSTS

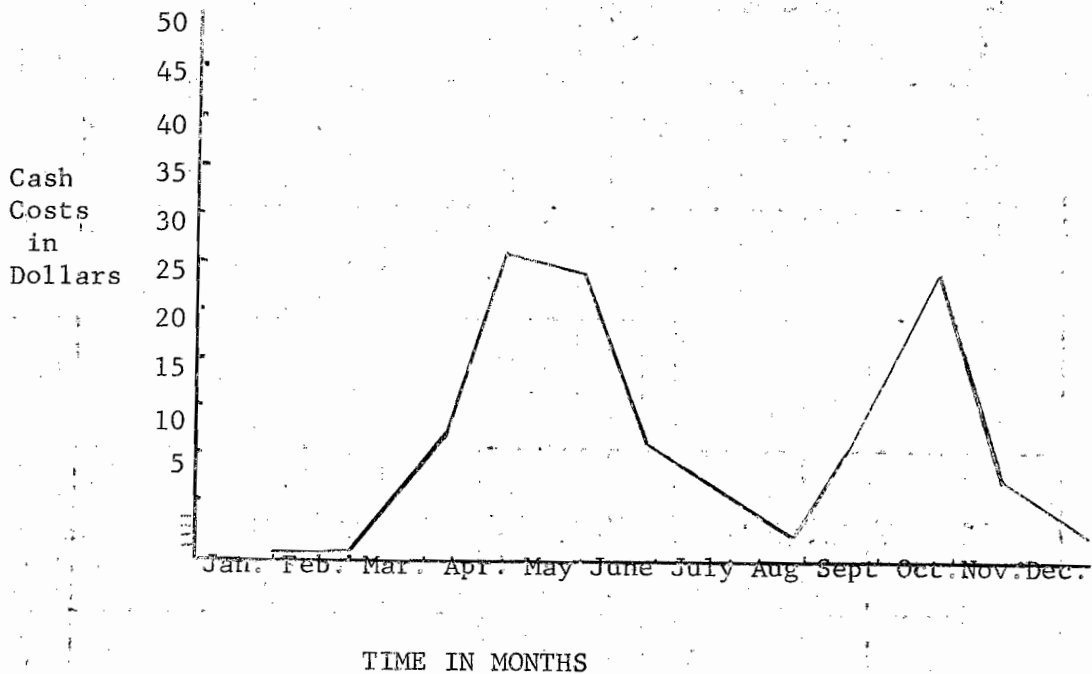


TABLE 1.

TYPICAL MONTHLY CASH FLOW FOR RICE

Operation	Total	Month											
		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cultural costs													
Plow	4.55			4.55									
Disc or chisel	3.57			2.38	1.19								
Disc	1.79			1.20	.59								
Float (Drag)	1.29			.86	.43								
Fertilize	15.75				7.88	7.87							
Incorp. Fertilizer	1.30				.65	.65							
Close & Main. Levees					.47								
Move Crawlers	.25			.13	.12								
Flood & Irrigate	13.50				6.75	6.75							
Seed & Seeding	15.25				7.63	7.62							
Insect Control	1.93					.97	.96						
Weed Control BL&WG	16.80					4.54	10.67	1.59					
Misc.	8.25	1.17	1.18	1.18	1.18	1.18	1.18	1.18					
Harvest costs													
Drain & Open Levees	.95								.48	.47			
Combine	13.38									4.46	8.92		
Bankout	3.72									1.24	2.48		
Haul to drier	6.50									2.18	4.32		
Drying	16.39									5.47	10.92		
Move harvesters	.25										.25		
Supervisory labor	2.75									.92	1.83		
Cash overhead													
Miscellaneous	6.43											3.22	3.21
Taxes	8.38				4.19							4.19	
Total cash cost	143.45	1.17	1.18	10.30	31.08	29.58	12.81	2.77	.48	14.74	28.72	7.41	3.21

TABLE 2

NET INCOME AT VARIOUS YIELDS AND PRICES*

Yields Dry Rice Per Acre Cwt.	Prices Of A Hundredweight Of Rice				
	\$3.50	\$4.00	\$4.50	\$5.00	\$5.50
	\$	\$	\$	\$	\$
40	-68.74	-49.74	-30.74	-11.74	+7.26
45	-56.29	-34.91	-13.54	+ 7.84	+29.21
50	-43.58	-19.83	+ 3.92	+27.67	+51.42
53	-35.82	-10.64	+14.53	+39.71	+64.88
55	-30.94	- 4.81	+21.31	+47.44	+73.56
60	-18.33	-10.17	+38.67	+67.17	+95.67
65	- 5.68	+25.20	+56.07	+86.05	+117.82
70	+ 6.97	+40.22	+73.47	+106.72	+139.97
75	+20.62	+56.25	+91.87	+127.50	+163.12
80	+32.28	+70.28	+108.28	+143.28	+184.28

*Cultural costs, harvest costs and other production costs have been adjusted for yield and price so that total costs increase progressively as yields and prices increase and decrease as yields and prices decrease.

LEASING RICE LAND AND UNITS

Rice growers find it profitable many times to rent rather than own additional rice land. This may be desirable because of high land investment and equipment costs that necessitate the need to enlarge their operations into a more economical unit. There are many leasing arrangements based upon various factors that are obviously satisfactory to both parties. Common rentals may vary from twenty to forty percent of the crop produced, depending upon the desirability of the land for rice culture and what the landlord furnishes, including the rice "units" or rights to grow rice. Rice land usually is not rented on a cash basis. The landlord usually furnishes the water, plus his share of soil amendments, spray materials and also the drying costs of his share of the crop in these leasing arrangements. There are many variations in leasing arrangements from that arrangement mentioned here, which are satisfactory to parties concerned. It is not implied here that any one arrangement is best.

TABLE 3.

LANDLORD-TENANT COSTS
ON THE BASIS OF ONE-FOURTH RENT*
(Sample)

<u>Item</u>	<u>Tenant</u>	<u>Landlord</u>	<u>Total</u>
	\$	\$	\$
Labor	22.58		22.58
Fuel and repairs	21.94		21.94
Drying and hauling	17.17	5.72	22.88
Subtotal...	61.69	5.72	67.41
Materials and services			
Fertilizer	13.06	2.69	15.75
Water		11.00	11.00
Seed and seeding	15.25		15.25
Insecticide	1.88	.05	1.93
Herbicide	13.54	3.26	16.80
Transportation of equipment	.50		.50
Subtotal...	44.23	17.00	61.23
Investment overhead			
Land		30.00	30.00
Taxes		6.63	6.63
Headquarters	1.27		1.27
Equipment	35.23		35.23
Field establishment		2.09	2.09
Subtotal...	36.50	38.72	75.22
Miscellaneous overhead			
Misc.-office	6.43		6.43
Management	13.25		13.25
Taxes (equipment)	1.75		1.75
Subtotal...	21.43		21.43
<hr/>			
TOTAL EXPENSES	163.85	61.44	225.29

*Based on costs shown in this study and a rice yield of 5300 pounds of dry rice per acre.

Many rice growers also lease rice units for various reasons. Here again an area-wide landlord-tenant arrangement is not predominant. Common rental of rice units may vary from fifteen to twenty percent of the crop with the landlord's share figured on the total crop yield. Leasing of rice units is not as common as the leasing of land for rice production.

TABLE 4

LANDLORD-TENANT NET RETURN ON BASIS OF
ONE-FOURTH LAND RENT AND FIFTEEN PERCENT RICE UNIT RENT

(Figured on basis of cost shown in this study and a rice yield of 5300 pounds of dry rice per acre at a price of \$5 cwt.)

(Sample)

	TENANT			LANDLORD		
	Land	Unit	Land+ Unit	Land	Unit	Land+ Unit
	\$	\$	\$	\$	\$	\$
Gross Income	198.75	same	198.75	66.25	*39.75	106.00
Costs	<u>163.85</u>	39.75	<u>203.60</u>	<u>61.44</u>	same	<u>61.44</u>
Net Income	+34.90	-39.75	-4.85	+4.81	+39.75	+44.56

*Analysis of the costs and net return in arrangements where the grower leases the land alone, and/or both the land and units to produce rice is given in this table. The landlord's share of the crop produced usually is figured on the total yields before deduction of production costs in cases of rice unit rentals. Consequently, the landlord's share of the crop becomes a cost for the grower-tenant as shown above. The ratio of net profit will change with differing crop yields.

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2. Sample Costs of Rice Production - Placer, Sacramento, Sutter and Yuba Counties, Lindt, John H., Jr., Farm Advisor, 1966.
3. Rice Market Review, Federal State Market News Service, San Francisco.

How much do you know
about UCAES?

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