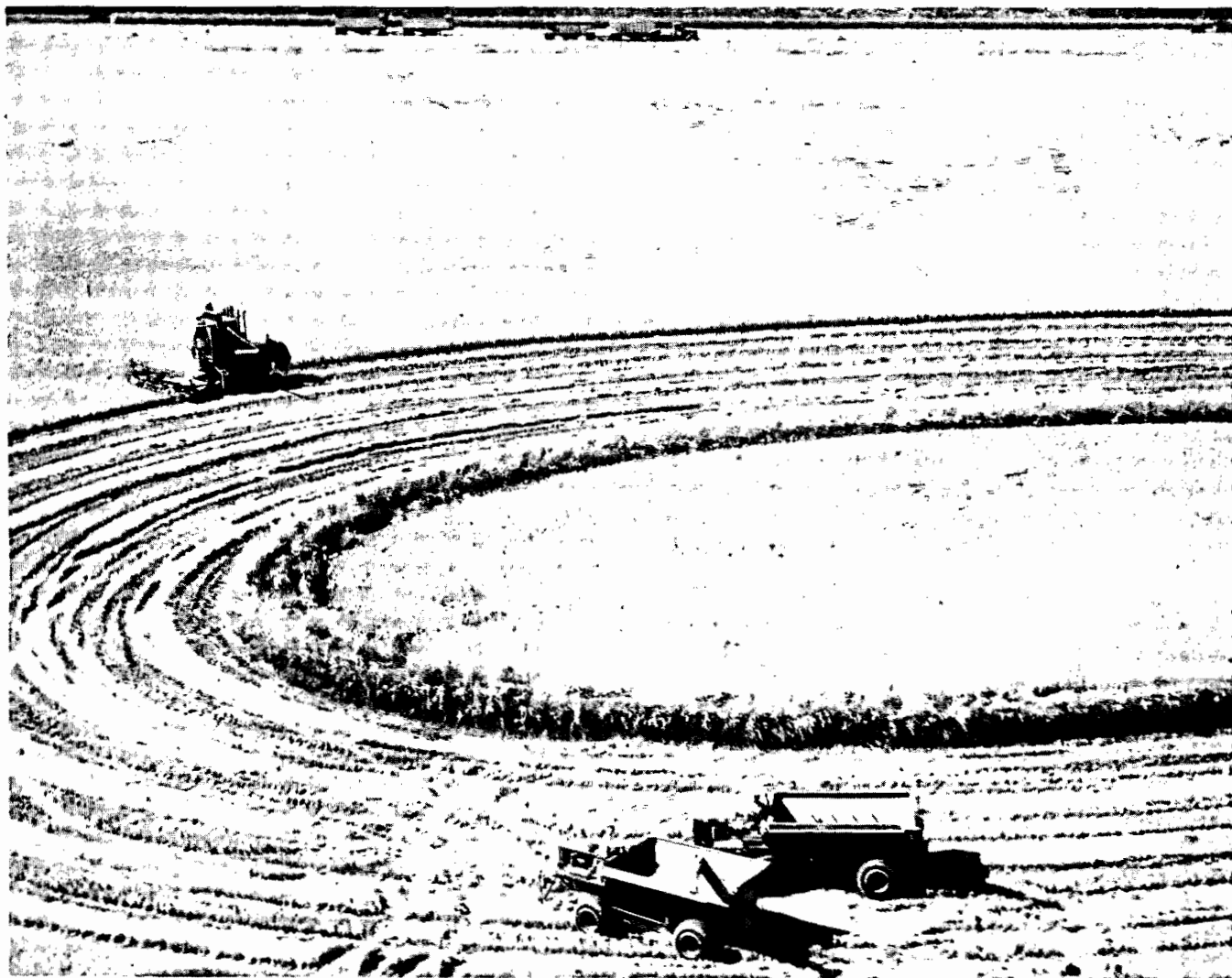


SAMPLE RICE COSTS



FOR GROWERS IN PLACER, SACRAMENTO, SUTTER, AND YUBA COUNTIES

A P R I L 1 9 6 6

UNIVERSITY OF CALIFORNIA AGRICULTURAL EXTENSION SERVICE

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Cover photograph courtesy of Rice Growers Association of California.

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RICE, SAMPLE COSTS OF PRODUCTION

SAMPLE RICE COSTS CAN HELP YOU:

- . Analyze the various enterprises which may best fit your farm.
- . Budget for cash expenses.

The greatest single factor in determining your cost of production per unit is YIELD. To increase your efficiency:

- . Avoid unnecessary operations.
- . Avoid overfertilizing as well as underfertilizing the crop.
- . Plan your operations so that you can plant and harvest at the most favorable times. This will help insure maximum yields.

Cultural practices in crop production are variable within the area, due to differences in size of operations, soil types, and grower's preference.

SOME RICE FACTS

Rice is one of California's most important crops. Eighty-eight percent of the acreage is grown in the Sacramento Valley. Leading California rice producing counties, listed in order of acreage harvested, are: Colusa, Sutter, Butte, Glenn, Yolo, Fresno, Yuba, Sacramento, Merced, and San Joaquin. The 16

million hundredweights of paddy rice produced, returned approximately \$80 million to California growers annually.

Rice is one of the most highly mechanized crops. Heavy machinery is used in preparation for planting, and the crop is direct combined. Seeding and insect and weed control are done by aircraft.

Soil, water supply, drainage. Rice is grown in continuously flooded fields. The crop is well adapted to the heavier soils and those with impervious subsoils. An abundant supply (7 to 9 acre-feet per acre) of inexpensive water is required to produce this crop profitably. Adequate drainage facilities are needed to dry the soil sufficiently in the spring for field preparation, and for harvest in the fall.

Climate. The high temperatures of California's interior valleys are favorable for rice production. Warm nights in late August and September are of great importance during heading, when pollination takes place. Presently available varieties require 135 to 160 days from planting to harvest.

Acreage allotments and controls. Rice production is regulated by the U.S. Department of Agriculture. Program details may be obtained from the Agricultural Stabilization and Conservation Service. Rice cannot be harvested without an allotment.

Yields and varieties. Rice yields have been increasing steadily and now average nearly 5,000 pounds per acre. Yields of 7,500 pounds dry rough rice are not uncommon.

Two market classes of rice are produced—Pearl and Calrose. Caloro and Colusa (CI 1600) are the short-grain Pearl types; Calrose is a medium grain. Yields are similar for these three varieties. Kokuho Rose and Earlirose are recently introduced medium-grain varieties.

Planting. April 20 to May 10 is the most satisfactory time for planting. Presoaked and treated seed is flown onto flooded fields—150 pounds (dry weight) per acre.

Fertilization. Ammonia-type nitrogen is the principal nutrient applied. Usually, 60 to 90 pounds of nitrogen per acre are adequate. Applications of 20 pounds of phosphorus (40 pounds P_2O_5) per acre improve yields in some areas.

Iron, a limiting factor in some soils, can be corrected with ferric sulfate and similar materials.

Water management. The level fields are flooded just prior to seeding and remain so until 2 to 4 weeks before harvest. Water levels are controlled by levees constructed of soil and/or plastic, placed on a contour interval of 0.15 to 0.30 foot. In the conventional system, water is kept at a depth of 4 to 8 inches. A newer system of water management under advanced development calls for the use of shallow water (1 to 3 inches deep). This system appears to offer greater yields.

Weed control. Broad-leaved weeds are controlled by rotation and cultural and chemical means. Watergrass is controlled culturally by deep water (6 to 8 inches) or by the use of the herbicides propanil or molinate.

Pests and diseases. Economic pests of rice in California include the rice leafminer, rice water weevil, and tadpole shrimp. Occasionally, other insects, rodents, fish, and birds may cause injury to rice plants or fields. There are no diseases of economic importance other than those attacking rice seedlings.

Harvesting and drying. Regular grain combines are used to harvest rice when the grain reaches a moisture content of 18 to 26 percent. After combining, the rice is dried to 13 percent moisture, using on-the-farm or commercial drying facilities.

Marketing and distribution. Most California rice is marketed through grower cooperatives; some, however, is sold to independent millers. Grower sales of rice are based on the milling yield. California rice enters the continental market principally in rice products. Large quantities of milled rice go to Puerto Rico and Hawaii; most of the remaining supply enters the world export market.

Rice production was initiated in the Sacramento Valley in 1912 and increased rapidly during World War I. In the interwar period, California rice acreage was maintained at about 100,000 to 150,000 acres. World War II in the Far East severed the main rice trade routes and encouraged rice production in the United States. Wartime exports to Allies and postwar relief shipments were very heavy. By the early 1950's, rice production in the foreign countries had recovered, and surpluses were accumulated from U.S. production. Beginning in 1955, acreage allotments were imposed in the United States. Rice now is controlled by a government acreage control program. Slight increases in acreage were instituted in 1962 and 1966.

CALENDAR OF OPERATIONS

The calendar of operations shows the detailed timing of the various cultural operations in the production of rice in the Sacramento Valley. In years with "normal" amounts and distribution of rainfall, preparation for rice production does not start until March. In wet years and on poorly drained fields, the first spring work may be delayed until April, which may retard the calendar of operations throughout the season. Field preparation is completed in time to permit seeding between April 25 and May 10. The timing sequence of individual operations may deviate from these periods.

Field days available within these time periods depend upon the distribution of rainfall, climatic conditions conducive to drying of the soil, and soil type and drainage. These figures are projected from a basis of expected days of precipitation and drying rate.

The rice growth phase indicates the sequential development of the individual rice plants.

Rice Calendar of Operations

Month and Period	Available Field Days	Rice Growth Phase	Typical Field Activity
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 Disc 2x
11-20	5		Landplane Survey & mark
21-31	7		Plow contours Check

Rice Calendar of Operations - Continued

Month and Period	Available Field Days	Rice Growth Phase	Typical Field Activity
April			
1-10	7		Fertilize
11-20	7		Preplant weed control
21-30	8	Seeded	Flood Disc-harrow Seed
May			
1-10	8	Seedling emergence	Rice becomes established Continue irrigation
11-31	19		Tadpole shrimp control Algae control
June			
1-10	9		Rice leafminer control
11-20	9	Tillering	Watergrass control
21-30	10		Continue irrigation
July			
1-10	10	Jointing	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 and/or Fall plow
December			
1-31	10		Maintenance and repair of equipment and office

PRODUCTION AND COSTS

The production costs and yields listed in this leaflet are not intended to represent the average rice grower's costs.

The costs in the table are based on typical operations for good farming practices. Sample costs are presented for two levels of technology—"present" and "advanced." The costs based on present technology reflect deep-water management for the control of watergrass. The advanced costs and related effects are to be expected with a system of shallow-water management and the use of plastic levees.

Shallow-water management generally will require the application of chemicals to control watergrass, whereas the present system of water management will provide adequate watergrass control for about three-fourths of the fields. An allowance is made for the application of propanil to control watergrass to one-fourth of the acreage.

Small earth levees covered with plastic also are a part of the advanced technology. These levees reduce the land area devoted to levees and permit harvesting of the field as a whole rather than within the levees.

Increased investment is required in grading the land for shallow-water management. The critical control of water depth also demands more care in field preparation.

Individual costs vary from these sample costs, but remember we have included all of the "hidden" costs. Hidden costs, including equipment depreciation, interest on investment in equipment and land, and taxes, are listed as overhead. The owner's labor also is charged in our sample costs. To make sample costs, we assumed:

Present technology - yields 5200 lb/A -
deep-water culture - conventional earth
levees.

Advanced technology - shallow water -
plastic levees - yields 6000 lb/A

Size of rice operations 300 acres.

Rice production is separated from the other ranch enterprises. Because there is no typical rotation or farming system in the rice area, it is not possible to present the sample costs for all of the possible ranch enterprises in a single cost study. In general, a 300-acre planting of rice will represent a farm with at least 450 acres of cropland, with 10 percent additional land devoted to roads, canals, buildings, or nondeveloped acreage.

EQUIPMENT INVESTMENT FOR 300 ACRES OF RICE

<u>Trucks</u>	<u>High</u>	<u>Low</u>
Pickup, 3/4-ton	\$3,000	\$2,600
Truck, 2-ton	4,200	4,000
Equipment carrier, 26 ft or trailer	1,000	1,000

Tractor

Crawler, 80-90 hp	28,000	---
Crawler, 60-70 ⁷ hp	---	23,000
Crawler, 30-40 hp	13,000	13,000
Bankout wagon SP	5,500	5,500
Harvesters, 2 SP 16 ft	43,000	41,000

Equipment

Plow, 6-16 2-way	5,500	---
Plow, 6-16 1-way	---	1,800
Disc, 18 ft	3,000	3,000
Swede harrow	500	500
Landplane, 15 by 80 ft	5,000	5,000
Dozer blade, 8 ft	1,500	1,500
Tools & small equipment	5,000	5,000

	Total	\$118,200	\$106,900
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EXPLANATION OF TERMS

Cultural costs represent the cash expenditures for labor, fuel and repairs, materials, and services during the preharvest and harvest periods. The operations are those considered typical for the two water-management systems compared.

Labor includes wages, Social Security, and Compensation Insurance. Some growers include health and retirement plans, housing, vacation, transportation, and others. Pre-harvest labor \$2.20 per hour. Harvest labor at \$3.25 per hour.

Fuel and repairs include operation costs and repairs but not interest on investment or depreciation. Allowance is provided for setup and moving time.

Materials and services include rental of equipment, custom operations, seed, pesticides, and purchased items. Fertilizer costs reflect current retail prices. Because of differing conditions, the amount of fertilizer included in this study is not to be considered as a recommendation. The irrigation water cost is the average of several established water districts. Many growers will find their costs considerably higher in areas where they use well water or in high cost water districts. Water use per acre varies considerably due to delivery efficiency (ditch losses), management (spill of water), and soil type.

Harvest costs reflect operations under average harvest conditions; they do not reflect the much higher costs encountered in extremely wet weather. In this study, the combine and bank-out costs reflect the additional savings in time permitted in shallow-water culture where the equipment may readily cross over the levees, compared to the conventional culture where harvest is confined to the areas between the levees. The savings in time in this comparison are offset by the greater yield with the shallow-water culture.

Cash overhead represents the costs of communication, office, accounting, transportation, and other costs necessary to the business. Taxes on land and equipment are included.

Management - A charge of 5 percent of the gross sales value of the crop is made to represent management. This is not a cash cost but is made to indicate the necessity of a return on the management for the operation of the business.

Investment overhead reflects the interest and depreciation of the equipment, buildings, and various irrigation and other structures. Interest on these items is charged at 6 percent per annum. Land values are one of the biggest variables.

SAMPLE RICE PRODUCTION COSTS 1966

Operation	Hours Per Acre	Labor and Cash Costs Per Acre			Totals		
		Labor	Fuel & Repairs	Materials & Services Kind & Quantity	Cost	Shallow Water Plastic	Deep Water Levee
		\$	\$		\$	\$	\$
CULTURAL							
Field Preparation							
Plow	.4	.90	1.85		2.75		2.75
Disc 2x	.4	.90	2.60		3.50		2.75
Landplane 2x	.5	1.30	2.40		3.70		1.85
Survey - mark & disc contours	.1	.25	.40	Custom survey	.75	1.40	1.40
Construct levees (plastic)		.10	.20	Custom installation	9.00	9.30	earth 1.70
Disc & harrow (includes incorp. of fert. and/or preplt. herbicide)	.3	.65	1.50			2.15	2.15
				Subtotal Field Preparation		22.80	12.60
Seed & Seeding							
Seed				Seed 150 lb	10.90	10.90	10.90
Soak, treat, & handle				Soak, treat, & handle	.40	.40	.40
Seeding				Custom - airplane	1.90	1.90	1.90
				Subtotal Seed & Seeding		13.20	13.20
Fertilization							
Fertilizer				Nitrogen 90 lb	9.00	9.00	9.00
Application				Custom - airplane	4.80	4.80	4.80
				Subtotal Fertilization		13.80	13.80
Weed Control							
Watergrass - preplant herbicide or topical application				Herbicide (molinate or propanil)	18.00	18.00	
Application				Application	2.00	2.00	5.00*
Broad-leaved weeds				MCPA - 16 oz	1.60		
				Application - airplane	1.75	3.35	3.35
				Subtotal Weed Control		23.35	8.35
Insect and Pest Control							
Early season - shrimp and/or leafminer				Parathion 1/10 lb/A	.20	.20	.20
				Airplane	1.00	1.00	1.00
Birds & misc. pest control	.60			Airplane	.40	1.00	1.00
				Subtotal Insects		2.20	2.20

Irrigation								
Close levees-place boxes, maintain	.3	.60	.20	Materials	.20	1.00	1.00	
Flood	.5	1.10				1.10	1.10	
Irrigate	2.0	4.40	1.50	Water	16.00	21.90	21.90	
Drain & open levees	.1	.25		Materials	.10	.35	.35	
Remove levees & boxes		.40	.80			1.20	1.20	
				Subtotal Irrigation		25.55	25.55	

PREHARVEST CULTURAL COSTS (Advanced technology)								
		11.45	11.45		78.00	100.90	75.70	
Harvest								
Combine	1.2	3.90	6.90			10.80	10.80	
Bankout	.6	1.80	2.10			3.90	3.90	
Haul to drier				Custom 67 cwt green	4.85	4.85	58 cwt 4.25	
Dry				67 cwt green	18.10	18.10	58 cwt 15.70	
				Subtotal Harvest & Drying		37.65	34.65	
TOTAL CULTURAL COSTS		17.15	20.45		100.95	138.55	110.35	

CASH OVERHEAD								
Office, accounting, insurance, communication, travel, misc.						6.95	6.95	
Taxes						7.05	7.05	
TOTAL CASH COSTS						152.55	124.35	

MANAGEMENT 5% of expected yield at \$5/cwt 15.00 13.00

INVESTMENT OVERHEAD								
		Annual Costs						
Item	Per Acre	Depreciation	Interest					
Land	\$400	\$ --	\$24.00					
Extra grading for shallow water management	50	--	3.00					
Trucks & tractor	130	13.00	3.90					
Equipment	190	19.00	5.40					
Buildings & structures	10	1.00	.30					
				33.00	36.60			
						69.60	66.60	
Total all costs per acre						237.15	203.95	
Total cost per cwt						3.95	3.92	
Yield pounds per acre						6000	5200	

* Application of herbicide to 1/4 of acreage.

TABLE 1
NET INCOME AT VARIOUS YIELDS AND PRICES
(Advanced technology)

Yields Cwt Dry Rice Per Acre	Hundredweights Per Acre					
	\$3.50	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00
40	\$-82	\$-63	\$-44	\$-25	\$-6	\$+13
45	-57	-46	-24	- 3	+18	40
50	-52	-29	- 5	+19	43	66
55	-37	-21	+15	40	67	93
60	-23	+ 5	34	52	91	120
65	- 8	23	52	85	115	146
70	+ 6	40	73	106	140	183
75	+ 21	57	92	128	163	199

Production and management costs have been adjusted to price and yield.

LEASING RICE LAND

Because of the high investment required for equipment, many producers find it profitable to rent rather than to own rice land. Common rentals vary from 20 percent to 40 percent of the crop. On a 40 percent rent, the landlord generally furnishes the water plus his share of the fertilizer and spray materials. The landlord also pays the drying on his share of the crop. There are many variations from this, depending on what the landlord furnishes. Rice land is not usually rented on a cash basis.

TABLE 2

AN EXAMPLE OF SAMPLE LANDLORD-TENANT COSTS
ON THE BASIS OF ONE-FOURTH RENT

	<u>Tenant</u>	<u>Landlord</u>	<u>Total</u>
Labor	\$ 17.15		\$ 17.15
Fuel & repairs	20.45		20.45
Contract charges			
Levees & survey	9.75		9.75
Drying & hauling	17.20	5.75	22.95
Materials and Application			
Seed	13.20		13.20
Fertilizer	13.80		13.80
Herbicide	23.35		23.35
Water		16.00	16.00
Insecticide	1.60		1.60
Other	.30		.30
Investment Overhead			
Land		27.00	27.00
Tractors, truck	16.90		16.90
Equipment	24.40		24.40
Building & structures		1.30	1.30
Taxes	1.80	5.25	7.05
Miscellaneous Overhead			
Miscellaneous-office	6.95		6.95
Management	15.00		15.00
Total Expenses	<u>\$181.85</u>	<u>\$55.30</u>	<u>\$237.15</u>

TABLE 3

NET INCOME - BASED ON 6000 POUNDS AT \$5 CWT ON A ONE-FOURTH RENTAL

	<u>Tenant</u>	<u>Landlord</u>	<u>Total</u>
Income	\$225.00	\$75.00	\$300.00
Expense	181.85	55.30	237.15
Net Income	\$ 43.15	\$19.70	\$ 62.85

You may use the above outline in estimating your returns from various leases. This example of landlord-tenant shares is presented to demonstrate one possible division of expenses. There is no areawide pattern for the division of production costs. The division offers the opportunity for dickering between the parties prior to signing the lease. Also, the division of the net income does not constitute a recommendation. The ratio of net profit will change with differing yields.

TABLE 4

CALIFORNIA ACREAGE YIELDS AND PRICE

Year	Harvested Acres 1,000 Acres	Production 1,000 Cwt	Yields Lb/Ac	Price/Cwt (Paddy)
1945	235	6,262	2665	\$ 3.64
1946	261	7,913	3032	4.80
1947	256	8,035	3139	6.13
1948	256	6,832	2669	4.40
1949	305	10,218	3350	3.42
1950	238	8,270	3475	4.54
1951	324	10,692	3300	4.95
1952	337	11,711	3475	6.25
1953	425	12,325	2900	5.38
1954	477	12,164	2550	4.61
1955	329	11,350	3450	4.31
1956	286	12,012	4200	4.44
1957	226	9,718	4300	4.48
1958	249	11,080	4450	3.81
1959	285	13,252	4650	4.19
1960	288	13,752	4775	4.43
1961	290	13,920	4800	4.78
1962	323	15,988	4950	5.11
1963	324	14,013	4325	5.07
1964	327	16,514	5050	4.92
1965/a	327	15,696	4800	5.00

/a Estimate as of January 1966

Source: Rice Situation USDA ERS, RS 10, January 1966

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Sample Rice Costs

Various Counties 1954 to 1960

The Rice Situation

Published annually by Economic Research Service, USDA

Rice, Annual Market Summary (C & MS 18)

Published annually by the Consumer and Marketing Service, USDA

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