
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

SAMPLE COSTS TO PRODUCE
WHEAT



Sacramento Valley
Irrigated

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INTRODUCTION

The sample costs to produce irrigated wheat 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. Practices described are based on those production procedures considered typical for this crop and area. Sample costs for labor, materials, equipment, and custom services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. A blank column, “*Your Costs*”, is provided to enter your actual costs on Tables 1 and 2.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-2414 or your local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, 530-752-2414. Current studies can be obtained from selected county UC Cooperative Extension offices, or downloaded from the department website at <http://coststudies.ucdavis.edu>.

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ASSUMPTIONS

The following assumptions pertain to sample costs for irrigated wheat production in the Sacramento Valley. Practices described in this cost study should not be considered recommendations by the University of California, but represent production procedures considered typical for this crop in the Sacramento Valley. Some of the costs and practices may not be applicable to your situation nor used during every production year and/or additional ones not indicated may be needed. Cultural practices for the production of wheat vary by grower and region, and can be significant. The practices and inputs used in the 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.*

Land. This report is based on a 2,900-acre field and row crop farm. Wheat is planted on noncontiguous fields totaling 900 acres, therefore farming practices can vary among fields. The other 2,000 acres, planted in rotation with wheat, may be processing tomatoes, alfalfa hay, safflower, sunflower, dry beans and/or wheat. Rented land includes developed wells and an irrigation system. All costs associated with the land and the irrigation system are incurred by the landowner. The grower also owns land, a shop, and an equipment yard.

CULTURAL PRACTICES AND MATERIAL INPUTS

Land Preparation. Primary tillage and planting groundwork operations, which include discing, preplant fertilization, listing beds, ridging, harrowing, and rolling, are done from August through October. Operations are done on all of the acreage unless noted. Beginning in August, 50% of the acres are stubble disced followed by two discings with a finish disc over 100% of the acres. Wheat is planted on raised beds or flat with irrigation border checks. Both practices are incorporated in this study. Thirty-inch beds are made with a six-row lister on 50% of the acres and irrigation border levees are made on the remaining 50%. The last operation prior to planting is to firm and smooth the ground with a harrow and roller.

Stand Establishment: Wheat is planted from late October to mid-December. In this study, 125 pounds per acre of seed is planted in November with a grain drill.

Pesticide Recommendations. Not all treatments mentioned in this report will be needed every year. Other materials other than those discussed in this report are available for labeled use on this crop. For specific pesticides choices and rates consult the UC Integrated Pest Management Guidelines for wheat online at <http://www.ipm.ucdavis.edu/PMG/selectnewpest.small-grains.html>. Written recommendations made by licensed pest control advisors are required for many pesticides. For information and pesticide use permits, contact the local county Agricultural Commissioner's office.

Weeds. In February, a postemergence herbicide (2,4-D) is applied to 75% of the acreage to control emerged winter weeds. Application may be made by air and/or ground. In this study the herbicide is applied on 50% of the acres by a grower-owned tractor-mounted sprayer and on 25% of the acres by a custom air applicator.

Fertilization. Because of field locations, soil types, and previous crops, fertilizer requirements between fields will exist. Preplant nitrogen, using aqua ammonia (20-0-0) at 80 pounds of N per acre, is applied in October on all of the fields. In February, 40 pounds of N as ammonium nitrate is topdressed on half of the acreage. At planting, phosphorous is drilled with the wheat seed on 25% of the acres. A rate of 75 pounds per acre of 11-52-00 is used to meet the crop's phosphate need.

Irrigation. In this study, water is calculated to cost \$18.83 per acre-foot and is a combination of 1/2 well water and 1/2 canal delivered surface water. The irrigation cost shown in Tables 1, 2, and 3 include water, pumping, and labor charges. In April, 6 acre-inches of water is applied to the crop which is the only irrigation.

Harvest. It is assumed the farm owns two combines and three bankout wagons to harvest the 900 acres. The wheat is dumped from the combine directly into the tractor-pulled bankout wagons that deliver the grain to grain trailers for transport to the buyer. Transportation from the field to the buyer is paid by the grower.

Costs for harvest operations are shown in Tables 1 and 3, and the equipment is listed in Tables 4 and 5. If a grower has the wheat custom harvested, related costs should be subtracted from harvest costs in Tables 1 and 3, and the equipment should be subtracted from investment costs in Table 4. A custom harvest charge should be added to harvest costs in Tables 1 and 3.

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 an appropriate method of analysis are discussed in *"Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis of Alternatives"*.

Yields. Reported average wheat yields in Sacramento Valley over the past ten years ranged from 1.89 to 2.75 tons per acre. Weighted average yields are shown in Table A. In this study, 3.0 tons per acre is used.

Returns. Growers in Sacramento Valley received prices averaging from \$86 to \$151 per ton during the last ten years. The weighted average return prices to growers from 1993 to 2002 are shown in Table A. In this study, growers are paid \$109.67 per ton.

Table A. Weighted average wheat yield and price[§]

Year	Tons/acre	\$/ton
2002	2.32	109.09
2001	2.27	86.52
2000	2.19	85.56
1999	2.38	90.96
1998	1.89	94.28
1997	2.39	130.05
1996	2.22	151.47
1995	1.98	130.93
1994	2.75	112.12
1993	2.41	105.75

[§]Agricultural Commissioner, various county Annual Crop Reports, 1993 – 2002

Assessments. Under a state marketing order, a mandatory assessment fee of \$0.60 per ton is collected and administered by the California Wheat Commission (CWC). The CWC conducts research and market development for California wheat growers.

Labor. Labor rates of \$13.43 per hour for machine operators and \$9.87 for general labor includes payroll overhead of 45%. The basic hourly wages are \$9.26 for machine operators and \$6.81 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops (code 0171), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2004 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 4 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Risk. Risks associated with wheat 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 wheat production. Because of the risk involved, growers should consider all of the agronomic and economic risks before committing resources to wheat production in the Sacramento Valley.

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, field sanitation, liability and property insurance, supervisor's salary, share rent, and investment repairs.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

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 6.89% per year. A nominal interest rate is the typical market cost of borrowed funds.

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 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,327 for the entire farm or \$0.46 per acre.

Office Expense. Office and business expenses are estimated at \$15.60 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in Tables 1, 2, 3 and 4.

Share Rent. Leasing practices and rental rates for agricultural property are continually being adjusted due to production changes, market economics, land values, and relative bargaining positions of the landlord and tenant. Land used for wheat production in the Sacramento Valley is commonly rented on a tenant-landowner basis with the landowner receiving 25% of the gross income from wheat.

Supervisor Salary. Wages for supervisors are included as a cash overhead cost. Supervisor salaries, including benefits, are \$104,000 per year for two supervisors and are allocated amongst the farm's other crops on a gross returns basis. Wheat is assumed to provide 14% of the farm's gross returns. Therefore, the supervisors' salary for wheat is \$14,560 per year or \$16.18 per acre. Any returns above total costs are considered returns to investment.

Field Sanitation. Sanitation services provide portable toilets and washing facilities for a cost of \$1,885 annually or \$0.65 per acre. The cost includes delivery and regular servicing of the units.

NON-CASH OVERHEAD

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used for wheat may be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1, 2, 3, and 5. They represent the capital recovery cost for investments 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. The calculation for the annual capital recovery costs is as follows:

$$\left[\begin{array}{c} \square \\ \square \\ \square \end{array} \right] \text{Purchase Price} - \left[\begin{array}{c} \square \\ \square \\ \square \end{array} \right] \text{Salvage Value} \left[\begin{array}{c} \square \\ \square \\ \square \end{array} \right] \text{Capital Recovery Factor} + \left[\begin{array}{c} \square \\ \square \\ \square \end{array} \right] \text{Salvage Value} \left[\begin{array}{c} \square \\ \square \\ \square \end{array} \right] \text{Interest Rate}$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (e.g., 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. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 6.23% 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 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. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Equipment Costs. 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 \$1.45 and \$1.88 per gallon, respectively.

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

REFERENCES

- American Society of Agricultural Engineers. 2002. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MO.
- Blank, Steve, Karen Klonsky, Kim Norris, and Steve Orloff. 1992. *Acquiring Alfalfa Hay Equipment: A Financial Analysis of Alternatives*. Giannini Information Series No. 92-1. University of California. Oakland, CA.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY
- Kearney, Tom, Karen Klonsky, Rich de Moura. 2001. Sample Cost to Produce Wheat, Yolo County. University of California Cooperative Extension. Department of Agricultural and Resource Economics. Davis, CA.
- Statewide IPM Project. 1990. *Integrated Pest Management for Small Grains*. Pub. 3333. UC DANR. Oakland, CA.
- Statewide IPM Project. 2000. UC Pest Management Guidelines, Small Grains. In M. L. Flint (ed.) *UC IPM Pest Management Guidelines*. Pub. 3339. IPM Education and Pub. University of California, Division of Agriculture and Natural Resources. Oakland, CA.
- USDA-ERS. 1991. Economic Indicators of the *Farm Sector: National Financial Summary*. Agriculture and Rural Economics Division, ERS. USDA. Washington, DC

For information concerning the above or other University of California publications, contact UC DANR Communications Services at 1-800-994-8849, online at www.ucop.edu, or your local county UC Cooperative Extension office.

Table 1.

UC COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE IRRIGATED WHEAT
SACRAMENTO VALLEY – 2004

Labor Rate: \$13.43/hr. machine labor Interest Rate: 6.23%
\$ 9.87/hr. non-machine labor Yield per Acre: 3.0 Ton

Operation	Operation Time (Hrs/A)	----- Cash and Labor Costs per Acre -----					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Stubble Disc - 50% of Acreage 2X	0.12	2	7	0	0	9		
Disc 2X	0.22	3	9	0	0	13		
Fertilize - Preplant N	0.10	2	2	22	3	27		
Border Disc - 50% of Acreage	0.03	0	1	0	0	1		
List Beds - 50% of Acreage	0.13	2	2	0	0	5		
Harrow & Roll Beds	0.08	1	1	0	0	2		
Plant Wheat								
& Apply P ₂ O ₅ on 25% of Acreage	0.13	2	2	23	0	28		
Weed Control - 75% of Acreage	0.06	1	1	3	2	7		
Fertilize - Topdress N on 50% of Acreage	0.00	0	0	8	4	12		
Open Ditch	0.03	0	1	0	0	1		
Irrigate	1.25	12	0	10	0	22		
Close Ditch	0.03	0	1	0	0	1		
Pickup Truck Use	0.10	3	1	0	0	5		
ATV Use	0.10	2	0	0	0	2		
TOTAL CULTURAL COSTS	2.37	32	28	65	9	134		
Harvest:								
Harvest Combine	0.23	4	9	0	0	12		
Bank Out Grain	0.23	4	5	0	0	8		
TOTAL HARVEST COSTS	0.46	7	13	0	0	21		
Interest on operating capital @ 6.89%						5		
TOTAL OPERATING COSTS/ACRE		39	42	65	9	160		
CASH OVERHEAD:								
Liability Insurance						0		
Office Expense						16		
Share Rent @ 25% Gross Wheat Returns						82		
Supervisor Salary						5		
Field Sanitation						1		
Property Taxes						2		
Property Insurance						1		
Investment Repairs						2		
TOTAL CASH OVERHEAD COSTS						109		
TOTAL CASH COSTS/ACRE						270		
NON-CASH OVERHEAD:								
<u>Investment</u>		Per producing Acre		-- Annual Cost -- Capital Recovery				
Fuel Tanks & Pumps		7		1		1		
Fuel Wagon		1		0		0		
Truck Tractor Used		16		2		2		
Trailer - Lowbed		3		0		0		
Shop Building		23		2		2		
Shop Tools		5		0		0		
Storage Building		9		1		1		
Closed Mix System		1		0		0		
Siphon Tubes		4		0		0		
Pipe Main Line		5		0		0		
Tool Carrier		5		1		1		
Portable Pump		7		1		1		
Forklift - 4 Ton		3		0		0		
Equipment		267		30		30		
TOTAL NON-CASH OVERHEAD COSTS		357		38		38		
TOTAL COSTS/ACRE						308		

Table 2.

UC COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE TO PRODUCE IRRIGATED WHEAT
SACRAMENTO VALLEY – 2004

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
IRRIGATED WHEAT	3.0	Ton	106.80	<u>320</u>	
TOTAL GROSS RETURNS FOR WHEAT				320	
OPERATING COSTS					
Fertilizer:					
20-0-0	80.00	Lb N	0	22	
11-52-0 (On 25% of Acreage)	18.75	Lb	0	3	
34-0-0 (On 50% of Acreage)	20.00	Lb N	0	8	
Rent:					
Rig to Inject Aqua	1.00	Acre	3	3	
Seed:					
Seed Wheat	125.00	Lb	0	20	
Herbicide:					
Weedar 64 (On 75% of Acreage)	1.25	Pint	2	3	
Custom:					
Air Application	0.75	Acre	8	6	
Irrigation:					
Water	6.00	AcIn	2	10	
Labor (machine)	2.02	Hrs	13	27	
Labor (non-machine)	1.25	Hrs	10	12	
Fuel - Gas	0.64	Gal	2	1	
Fuel - Diesel	16.71	Gal	1	24	
Lube				4	
Machinery repair				12	
Interest on operating capital @ 6.89%				<u>5</u>	
TOTAL OPERATING COSTS/ACRE				160	
NET RETURNS ABOVE OPERATING COSTS				160	
CASH OVERHEAD COSTS:					
Liability Insurance				0	
Office Expense				16	
Share Rent @ 25% of Wheat Gross Returns				82	
Supervisors Salary				5	
Field Sanitation				1	
Property Taxes				2	
Property Insurance				1	
Investment Repairs				<u>2</u>	
TOTAL CASH OVERHEAD COSTS/ACRE				109	
TOTAL CASH COSTS/ACRE				270	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Fuel Tanks & Pumps				1	
Fuel Wagon				0	
Truck Tractor Used				2	
Trailer - Lowbed				0	
Shop Building				2	
Shop Tools				0	
Storage Building				1	
Closed Mix System				0	
Siphon Tubes				0	
Pipe Main Line				0	
Tool Carrier				1	
Portable Pump				1	
Forklift - 4 Ton				0	
Equipment				<u>30</u>	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				38	
TOTAL COSTS/ACRE				308	
NET RETURNS ABOVE TOTAL COSTS				12	

Table 3.

UC COOPERATIVE EXTENSION
MONTHLY CASH COSTS
SACRAMENTO VALLEY – 2004
IRRIGATED WHEAT

Beginning AUG 02	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	TOTAL
Ending JUL 03	03	03	03	03	03	04	04	04	04	04	04	04	
Cultural:													
Stubble Disc - 50% of Acreage 2X	4										4		9
Disc 2X	6		6										13
Fertilize - Preplant N			27										27
Border Disc - 50% of Acreage			1										1
List Beds 50% of Acreage			5										5
Harrow & Roll Beds			2										2
Plant Wheat & Apply P ₂ O ₅ on 25% of Acreage				28									28
Weed Control - 75% of Acreage							7						7
Fertilize - Topdress on 50% of Acreage							12						12
Open Ditch									1				1
Irrigate									22				22
Close Ditch									1				1
Pickup Truck Use	0	0	0	0	0	0	0	0	0	0	0	0	5
ATV Use	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CULTURAL COSTS	11	1	42	28	1	1	19	1	25	1	5	1	134
Harvest:													
Harvest Combine												12	12
Bank Out Grain											8		8
TOTAL HARVEST COSTS											21		21
Interest on operating capital @ 6.89%	0	0	0	0	0	0	1	1	1	1	1	0	5
TOTAL OPERATING COSTS/ACRE	11	1	42	29	1	1	20	1	26	1	27	1	160
OVERHEAD:													
Liability Insurance						0							0
Office Expense	1	1	1	1	1	1	1	1	1	1	1	1	16
Share Rent @ 25% Of Wheat Gross Returns											82		82
Supervisor Salary	0	0	0	0	0	0	0	0	0	0	0	0	5
Field Sanitation	0	0	0	0	0	0	0	0	0	0	0	0	1
Property Taxes						1						1	2
Property Insurance						1						1	1
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CASH OVERHEAD COSTS	2	2	2	2	2	4	2	2	2	2	84	4	109
TOTAL CASH COSTS/ACRE	13	3	44	30	3	5	22	3	27	3	111	4	270

Table 4.

UC COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SACRAMENTO VALLEY – 2004
IRRIGATED WHEAT

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
04	135 HP 2WD Tractor	80,519	10	23,784	9,274	353	522	10,148
04	200 HP Crawler	159,210	10	47,028	18,338	697	1,031	20,067
04	425 HP Crawler	203,887	10	60,225	23,484	893	1,321	25,698
04	90 HP 2WD Tractor	41,366	10	12,219	4,765	181	268	5,214
04	ATV	4,500	5	2,017	719	22	33	773
04	Bankout Wagon - 30 Ton Pull Type	16,737	10	2,960	2,077	67	98	2,242
04	Combine - No Header	160,483	15	16,435	16,079	598	885	17,562
04	Combine - No Header	160,483	15	16,435	16,079	598	885	17,562
04	Disc - Finish 25'	41,242	12	5,712	4,647	159	235	5,041
04	Disc - Stubble 18'	45,946	10	8,125	5,701	183	270	6,154
04	Disc - Stubble 18'	916	12	127	103	4	5	112
04	Disc Ridger	45,946	10	8,125	5,701	183	270	6,154
04	Ditcher - V	7,956	12	1,102	897	31	45	972
04	Grain Drill - 20'	24,000	10	4,244	2,978	95	141	3,215
04	Grain Platform 20'	14,361	10	2,709	1,769	58	85	1,912
04	Grain Platform 20'	14,361	10	2,709	1,769	58	85	1,912
04	Harrow - Spike 32'	9,891	12	1,370	1,115	38	56	1,209
04	Lister - 6 Row	1,628	12	225	183	6	9	199
04	Pickup 1/2 Ton	21,396	5	9,589	3,418	105	155	3,678
04	Pickup 3/4 Ton	25,840	5	11,581	4,128	126	187	4,441
04	Ringroller - 32'	7,417	12	1,027	836	29	42	907
04	Saddle Tank - 300 Gallon	2,188	10	387	271	9	13	293
04	Scraper - Drag 10'	2,235	18	149	205	8	12	225
04	Spray Boom - 25'	1,609	10	285	200	6	9	215
TOTAL		1,094,117		238,569	124,737	4,504	6,663	135,905
60% of New Cost [§]		656,470		143,141	74,842	2,703	3,998	81,543

[§] 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	
Closed Mix System	4,146	10	415	538	15	23	83	660
Forklift - 4 Ton	9,481	10	948	1,231	35	52	190	1,508
Fuel Tanks & Pumps	21,422	20	2,142	1,846	80	118	428	2,471
Fuel Wagon	2,133	10	213	277	8	12	43	340
Pipe Main Line	13,446	10	5,700	1,419	65	96	358	1,937
Portable Pump	20,336	10	2,034	2,641	76	112	406	3,234
Shop Building	67,825	25	6,783	5,303	252	373	1,356	7,284
Shop Tools	13,595	20	1,360	1,171	51	75	272	1,569
Siphon Tubes	10,400	15	1,040	1,043	39	57	208	1,347
Storage Building	27,360	20	2,736	2,358	102	150	547	3,157
Tool Carrier	15,723	15	1,517	1,579	58	86	314	2,038
Trailer - Lowbed	8,311	15	831	834	31	46	166	1,076
Truck Tractor Used	46,492	15	4,649	4,663	173	256	929	6,020
TOTAL INVESTMENT		260,670	30,368	24,902	984	1,455	5,300	32,641

UC COOPERATIVE EXTENSION
Table 4 continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Field Sanitation	2,900	Acre	0.65	1,885
Liability Insurance	2,900	Acre	0.46	1,334
Office Expense	2,900	Acre	15.60	45,240
Share Rent @ 25% Of Wheat Gross Returns	900	Acre	82.32	74,088
Supervisor Salary	900	Acre	16.18	14,560

Table 5.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SACRAMENTO VALLEY – 2004
IRRIGATED WHEAT

Description	COSTS PER HOUR								
	Actual Hours Used	----Cash Overhead----			-----Operating-----			Total Oper.	Total Costs/Hr.
		Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube			
135 HP 2WD Tractor	1,199.5	4.64	0.18	0.26	3.65	13.06	16.71	21.79	
200 HP Crawler	1,599.7	6.88	0.26	0.39	4.13	19.35	23.48	31.00	
425 HP Crawler	1,599.9	8.81	0.33	0.50	5.29	41.13	46.42	56.06	
90 HP 2WD Tractor	1,199.9	2.38	0.09	0.13	1.88	7.53	9.41	12.02	
ATV	285.4	1.51	0.05	0.07	0.29	2.16	2.45	4.08	
Bankout Wagon - 30 Ton Pull Type	207.0	6.02	0.19	0.29	2.27	0.00	2.27	8.77	
Combine - No Header	199.9	48.27	1.80	2.66	10.87	20.81	31.68	84.40	
Combine - No Header	199.9	48.27	1.80	2.66	10.87	20.81	31.68	84.40	
Disc - Finish 25'	194.4	14.34	0.49	0.72	6.54	0.00	6.54	22.10	
Disc - Stubble 18'	200.0	17.10	0.55	0.81	7.43	0.00	7.43	25.90	
Disc - Stubble 18'	166.0	0.37	0.01	0.02	0.25	0.00	0.25	0.65	
Disc Ridger	200.0	17.10	0.55	0.81	7.43	0.00	7.43	25.90	
Ditcher - V	166.0	3.24	0.11	0.16	2.15	0.00	2.15	5.67	
Grain Drill - 20'	150.0	11.91	0.38	0.56	6.44	0.00	6.44	19.30	
Grain Platform 20'	199.5	5.32	0.17	0.26	2.62	0.00	2.62	8.37	
Grain Platform 20'	199.5	5.32	0.17	0.26	2.62	0.00	2.62	8.37	
Harrow - Spike 32'	166.0	4.03	0.14	0.20	1.11	0.00	1.11	5.48	
Lister - 6 Row	166.0	0.66	0.02	0.03	0.33	0.00	0.33	1.05	
Pickup 1/2 Ton	285.4	7.19	0.22	0.33	1.39	5.40	6.79	14.52	
Pickup 3/4 Ton	285.4	8.68	0.27	0.39	1.67	6.49	8.16	17.50	
Ringroller - 32'	166.0	3.02	0.10	0.15	0.83	0.00	0.83	4.11	
Saddle Tank - 300 Gallon	149.5	1.09	0.03	0.05	0.58	0.00	0.58	1.76	
Scraper - Drag 10'	166.0	0.74	0.03	0.04	0.33	0.00	0.33	1.14	
Spray Boom - 25'	149.5	0.80	0.03	0.04	0.43	0.00	0.43	1.30	

Table 6.

UC COOPERATIVE EXTENSION
RANGING ANALYSIS
SACRAMENTO VALLEY - 2004

	COSTS PER ACRE AT VARYING YIELDS TO PRODUCE IRRIGATED WHEAT						
	YIELD (TON/ACRE)						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
OPERATING COSTS/ACRE:							
Cultural Cost	134	134	134	134	134	134	134
Harvest Cost	10	14	17	21	24	28	31
Interest on operating capital	5	5	5	5	5	5	5
TOTAL OPERATING COSTS/ACRE	150	153	157	160	164	167	171
TOTAL OPERATING COSTS/TON	100	77	63	53	47	42	38
TOTAL CASH OVERHEAD	109	109	109	109	109	110	110
TOTAL CASH COSTS/ACRE	259	262	266	270	273	277	280
TOTAL CASH COSTS/TON	173	131	106	90	78	69	62
NON-CASH OVERHEAD	34	36	37	38	39	40	41
TOTAL COSTS/ACRE	293	298	303	308	313	317	321
TOTAL COSTS/TON	195	149	121	103	89	79	71

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR IRRIGATED WHEAT

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)							
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	
Irrigated Wheat								
			----- \$/ton -----					
70	-45	-13	18	50	81	113	144	
80	-30	7	43	80	116	153	189	
90	-15	27	68	110	151	193	234	
100	0	47	93	140	186	233	279	
110	15	67	118	170	221	273	324	
120	30	87	143	200	256	313	369	
130	45	107	168	230	291	353	414	

NET RETURNS PER ACRE ABOVE CASH COSTS FOR IRRIGATED WHEAT

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)							
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	
Irrigated Wheat								
			----- \$/ton -----					
70	-154	-122	-91	-60	-28	3	35	
80	-139	-102	-66	-30	7	43	80	
90	-124	-82	-41	0	42	83	125	
100	-109	-62	-16	30	77	123	170	
110	-94	-42	9	60	112	163	215	
120	-79	-22	34	90	147	203	260	
130	-64	-2	59	120	182	243	305	

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR IRRIGATED WHEAT

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)							
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	
Irrigated Wheat								
			----- \$/ton -----					
70	-188	-158	-128	-98	-68	-37	-6	
80	-173	-138	-103	-68	-33	3	39	
90	-158	-118	-78	-38	2	43	84	
100	-143	-98	-53	-8	37	83	129	
110	-128	-78	-28	22	72	123	174	
120	-113	-58	-3	52	107	163	219	
130	-98	-38	22	82	142	203	264	

Table 7.

UC COOPERATIVE EXTENSION
COST AND RETURNS/BREAKEVEN ANALYSIS
SACRAMENTO VALLEY – 2004
IRRIGATED WHEAT

COSTS AND RETURNS - PER ACRE BASIS							
Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
IRRIGATED WHEAT	320	160	160	270	51	308	12

COSTS AND RETURNS - TOTAL ACREAGE							
Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
IRRIGATED WHEAT	288,360	144,254	144,106	242,667	45,693	277,243	11,117

BREAKEVEN PRICES PER YIELD UNIT					
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
IRRIGATED WHEAT	3.0	Ton	53.43	89.88	102.68

BREAKEVEN YIELDS PER ACRE					
CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Cash Costs	Total Costs
IRRIGATED WHEAT	Ton	106.80	1.5	2.5	2.9

Table 8.

UC COOPERATIVE EXTENSION
DETAIL OF OPERATIONS
SACRAMENTO VALLEY – 2004
IRRIGATED WHEAT

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Disc Field - 50% of Acreage 2X <i>Pre- & Postharvest</i>	August	425 HP Crawler	Disc - Stubble 18'			
	June	425 HP Crawler	Disc - Stubble 18'			
Disc 2X	August	426 HP Crawler	Disc - Finish 25'			
	October	200 HP Crawler	Disc - Finish 25'			
Fertilize - Preplant N	October	135 HP 2WD Tractor		Aqua Rig	1.00	Acre
				20-0-0	80.00	Lb N
Border Disc - 50% Of Acreage	October	135 HP 2WD Tractor	Disc Ridger			
List Beds - 50% Of Acreage	October	135 HP 2WD Tractor	Lister - 6 Row			
Harrow & Roll Beds		90 HP 2WD Tractor	Harrow - Spike 32'			
			Ringroller - 32'			
Plant Wheat - & Apply P ₂ O ₅ on 25% of Acreage	November	90 HP 2WD Tractor	Grain Drill - 20'	Wheat Seed	125.00	Lbs
				11-52-0	18.75	Lbs
Weed Control - 75% Of Acreage	February	135 HP 2WD Tractor	Saddle Tank - 300 Gal	Weedar 64	0.83	Pint
			Spray Boom - 25'			
Weed Control - 75% Of Acreage	February	Air Application		Weedar 64	0.42	Pint
Fertilize - Topdress N - - 50% Of Acreage	February	Air Application		34-0-0	20.00	Lb N
Open Ditch	April	135 HP 2WD Tractor	Ditcher - V			
Irrigate	April	Labor				
Close Ditch	April	135 HP 2WD Tractor	Scraper - Drag 10'			
Harvest	June	Combine w/No				
		Header	Grain Platform 20'			
		Combine w/No				
Bank Out Grain	June	135 HP 2WD Tractor	Header	Grain Platform 20'		
Pickup Truck Use	Annual	Pickup 1/2 Ton	Bankout Wagon -30 T			
		Pickup 3/4 Ton				
ATV	Annual	ATV				