

U.C. COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE WHEAT *Irrigated, Double Cropped* IN THE SAN JOAQUIN VALLEY - 1992

by

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The detailed costs for irrigated, double cropped wheat production in the San Joaquin Valley are presented in this study. The hypothetical farm used in this report consists of 1,200 acres of which 300 acres are in wheat production. The remainder of the farm is planted to different field crops.

Practices described are based on those production procedures considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current prices. Some costs and practices detailed in this study may not be applicable to your situation. This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. A blank *Your Costs* column is provided to enter your actual costs on **Tables 1 and 2, Costs Per Acre To Produce Wheat, Irrigated, Double Cropped and Costs And Returns Per Acre To Produce Wheat, Irrigated, Double Cropped**, respectively.

This study consists of **General Assumptions for Producing Wheat, Irrigated, Double Cropped** and seven tables.

Table 1.	Costs Per Acre To Produce Wheat
Table 2.	Costs And Returns Per Acre To Produce Wheat
Table 3.	Monthly Cash Costs Per Acre to Produce Wheat
Table 4.	Whole Farm Annual Equipment, Investment And Business Overhead Costs
Table 5.	Hourly Equipment Costs
Table 6.	Ranging Analysis
Table 7.	Costs And Returns / Breakeven Analysis

For an explanation of calculations used for the study refer to the attached General Assumptions or call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (916) 752-3589 or call the farm advisor in the county of interest.

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**GENERAL ASSUMPTIONS FOR PRODUCING
WHEAT
IRRIGATED, DOUBLE CROPPED
San Joaquin Valley - 1992
U.C. Cooperative Extension**

The following is a description of some general assumptions pertaining to sample costs of double cropped wheat production in the San Joaquin Valley. The costs are based on cultural practices used by growers in this region, some of which may not be used during every production year. Costs are represented 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.*

1. LAND:

This cost of production study is based on a 1,200 acre field and row crop farm of which 300 acres is dedicated to growing double cropped wheat. Other crops grown on the same acreage in rotation with wheat might include oat hay, field corn, alfalfa hay, barley, corn silage, cotton, etc.

2. RENT AGREEMENT:

The land used for wheat production in this study is rented on a cash rent basis. Under this agreement the landowner receives \$100 per acre from the tenant. Since the land is double cropped only half of the rent, or \$50 per acre, is charged to the wheat. The landowner maintains the irrigation system on the rented land. All cost for land and the irrigation system is incurred by the landowner. Rent is shown as a cash overhead cost in **Tables 1, 2, 3 and 4.**

3. CULTURAL PRACTICES:

The cultural, pesticide and fertilizer inputs for the production of double cropped wheat vary considerably from grower to grower and field to field. Land preparation operations such as discing are done with a 200 hp (horsepower) four wheel drive (4wd) tractor during the months of November and December. After the final discing, successive operations are performed with a 130 hp wheel tractor.

Fertilization begins with 100 pounds of nitrogen in the form of NH_3 spread by custom operator. The fertilizer is spread on the field in December just prior to planting. After plant emergence in February, urea is custom applied and supplies an additional 50 pounds of N. The remaining 50 pounds of nitrogen is injected into the water once irrigation starts. A total of 200 pounds of nitrogen per acre is used by the crop during the year.

Wheat is planted on flat ground with a grain drill. A seeding rate of 125 pounds per acre is used.

Pest control starts in February with applications of both an herbicide and an insecticide. Di-syston is used to control several species of aphids, while 2, 4-D manages many different broadleaf plants. Russian wheat aphid control is not considered in this study, but might be required in individual circumstances. All pesticides in this study are custom applied by air.

Water costs in the San Joaquin Valley range widely depending on whether it is pumped from a well, if it is supplied by a water district and even which water district supplies the water. In this study, a cost of \$27.24 per acre-foot is assumed. Wheat requires 20 acre-inches of water during the growing season and is applied in six irrigations with nitrogen fertilizer injected into the water during the March irrigation.

The pesticides and rates mentioned in this cost study are a few of those that are listed in the UC IPM Small Grains Pest Management Guidelines and the Integrated Pest Management For Small Grains manual. Cultural practices for the production of double cropped wheat vary from grower to grower and region to region. The practices and inputs used in this cost study serve only as a sample or guide. Variations can be significant. Contact your local farm advisor for advice on production practices.

4. HARVEST:

In this cost study the wheat is custom harvested. Custom harvest rates are different with each custom harvester. Some charge on a straight per acre basis, some use a per ton rate, while others use a smaller per acre charge plus a smaller per ton charge. In this study a fee of \$30 per acre for harvesting is paid by the grower. A grower that harvests their own wheat would subtract the custom charge from harvest costs in **Table 1** and all equipment for harvest operations should be inventoried in investment costs in **Table 4**, and labor, fuel, repairs, depreciation, and interest on investment costs would then be added to harvest costs in **Table 1**.

5. YIELDS & RETURNS:

The crop yield used in this study is 3 tons per acre. An estimated price of a \$120 per ton is used in this study.

6. LABOR:

Basic hourly wages for workers are \$6.20 and \$4.75 per hour for machine and non-machine labor, respectively. Adding 34% for SDI, FICA, insurance and other benefits gives the labor rates shown of \$8.31 per hour for machine labor and \$6.37 per hour for non-machine labor. The labor for operations using machinery are 20% higher than the operation time to account for the extra labor involved in equipment set-up, moving, maintenance and repair. Wages for managers are not included as a cash cost. Any returns above total costs are considered a return to management and risk.

7. INVESTMENT:

The investments shown in **Table 4** are those that can be partially or completely allocated to the double cropped wheat enterprise. All of the investments used in this study can be allocated to all of the enterprises of the 1200 acre farm. Annual investments shown in **Table 1** represents depreciation and opportunity cost for each investment on an annual per acre basis.

8. OVERHEAD:

County taxes are calculated as 1% of the average of the equipment, buildings and improvements. Insurance on assets is charged at 0.5% of the average value of the asset over its useful life. Liability insurance covers accidents on the farm and costs \$850 for the entire farm or \$0.71 per acre. Office and business costs are estimated at \$30 per acre for the ranch. These expenses include office supplies, phone, bookkeeping, accounting, legal fees, road preparation and maintenance, etc. All of the overhead is charged at half of the per acre cost shown in **Table 4** since the acreage is double cropped.

The California Wheat Commission (CWC) levies an assessment fee at the rate of \$0.03 per hundredweight (cwt) at the first point of sale on wheat. All business overhead expenses are charged at half of the per acre cost to wheat since it is double cropped, except for the assessment fee charged by the CWC which is assessed completely against the wheat crop.

9. INTEREST:

Interest on operating capital is based on cash costs and is calculated monthly for eleven months until harvest at a nominal rate of 9.00% per year. Interest is also charged on investment at 4% per year to account for income foregone that could be received from an alternative investment (opportunity cost) and is based on the average value of the land, orchard, buildings and equipment. Real interest rates are used on investments, so no adjustment for inflation have been included. Nominal interest rates would contain a factor for inflation which might run 1% to 4% higher than real interest rates, to account for inflation.

10. EQUIPMENT COSTS:

In allocating the equipment costs per acre, the following calculations were made and shown in **Table 4:** (a) **Original Cost** of equipment is the cost of the new equipment plus sales tax. (b) **Depreciation** is straight line with a 10% salvage value. (c) **Interest** on investment is calculated as the average value per acre of the equipment during its useful life, multiplied by an interest rate of 4.00%. Average value equals new cost plus salvage value divided by 2 on a per acre basis. (d) The **total investment** costs are also calculated as 60% of the depreciation and the interest costs for all new equipment to reflect a mix of the new and used equipment. These values are also used in **Table 1**. Hourly equipment costs are shown in **Table 5**. The equipment listed in **Tables 4** and **5** indicate only that equipment which is used in wheat enterprise and does not necessarily include all of the equipment that would be found on a typical farm growing wheat. Most of this equipment is used on the entire 1,200 acre ranch.

11. FUEL & REPAIR:

The fuel and repair cost for each operation in **Table 1** is determined by multiplying the total hourly operating cost for each piece of equipment by the number of hours per acre for that operation. Prices for on-farm delivery of gasoline and diesel are \$0.71 and \$0.98 per gallon respectively.

Table 1.

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE WHEAT
 Irrigated, Double Cropped
 SAN JOAQUIN VALLEY - 1992

Labor Rate: \$8.31/hr. machine labor
 \$6.37/hr. non-machine labor

Interest Rate: 9.00%
 Yield per Acre: 3 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:							
Disc Stubble	0.14	1.43	3.12	0.00	0.00	4.54	
Finish Seedbed With Disc 2X	0.25	2.45	3.93	0.00	0.00	6.38	
Put Up Borders	0.02	0.20	0.24	0.00	0.00	0.44	
Apply Fertilizer - Preplant	0.00	0.00	0.00	12.00	4.75	16.75	
Plant	0.26	2.56	4.23	11.25	0.00	18.04	
Apply Fertilizer - Sidedress	0.00	0.00	0.00	11.50	4.75	16.25	
Apply Herbicide - Custom	0.00	0.00	0.00	3.91	6.75	10.66	
Open Ditch	0.01	0.10	0.16	0.00	0.00	0.26	
Irrigate & Fertilize	0.42	2.68	0.00	30.55	0.00	33.23	
Irrigate	0.63	4.01	0.00	27.24	0.00	31.25	
Close Ditches	0.01	0.10	0.12	0.00	0.00	0.22	
Pickup Truck Use	0.64	6.38	3.65	0.00	0.00	10.04	
TOTAL CULTURAL COSTS	2.38	19.91	15.45	96.45	16.25	148.07	
Harvest:							
Harvest - Custom	0.00	0.00	0.00	0.00	30.00	30.00	
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	30.00	30.00	
Interest on operating capital @ 9.00%						5.46	
TOTAL OPERATING COSTS/ACRE		19.91	15.45	96.45	46.25	183.53	
TOTAL OPERATING COSTS/TON						61.18	
CASH OVERHEAD:							
Land Rent						50.00	
Office Expense						15.00	
Liability Insurance						0.35	
Property Taxes						0.71	
Property Insurance						0.36	
Investment Repairs						0.20	
TOTAL CASH OVERHEAD COSTS						66.62	
TOTAL CASH COSTS/ACRE						250.15	
TOTAL CASH COSTS/TON						83.38	
NON-CASH OVERHEAD:							
Investment	Per producing Acre	Depreciation	Annual Cost	Interest @ 4.00%			
Shop Building	35.47	1.77		0.71		2.48	
Fuel Tanks & Pumps	3.35	0.17		0.07		0.23	
Shop Tools	5.00	0.25		0.10		0.35	
Fuel Wagon	0.63	0.06		0.01		0.08	
Siphon Tubes	0.80	0.04		0.02		0.06	
Equipment	88.69	7.98		1.95		9.93	
TOTAL NON-CASH OVERHEAD COSTS	133.95	10.27		2.86		13.13	
TOTAL COSTS/ACRE						263.28	
TOTAL COSTS/TON						87.76	

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE WHEAT
Irrigated, Double Cropped
SAN JOAQUIN VALLEY - 1992

Beginning NOV 92	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 93	92	92	93	93	93	93	93	93	93	93	93	93	

Cultural:													
Disc Stubble	4.54												4.54
Finish Seedbed With Disc		6.38											6.38
Put Up Borders		0.44											0.44
Apply Fertilizer - Preplant		16.75											16.75
Plant		18.04											18.04
Apply Fertilizer - Sidedress				16.25									16.25
Apply Herbicide - Custom				10.66									10.66
Open Ditch					0.26								0.26
Irrigate & Fertilize					16.61	16.61							33.23
Irrigate						10.42	20.84						31.25
Close Ditches									0.22				0.22
Pickup Truck Use	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25					10.04
TOTAL CULTURAL COSTS	5.80	42.87	1.25	28.17	18.12	28.29	22.09	1.48					148.07

Harvest:													
Harvest - Custom									30.00				30.00
TOTAL HARVEST COSTS									30.00				30.00

Interest on oper. capital	0.04	0.37	0.37	0.59	0.72	0.93	1.10	1.34					5.46
TOTAL OPERATING COSTS/ACRE	5.84	43.24	1.63	28.75	18.84	29.22	23.19	32.81					183.53
TOTAL OPERATING COSTS/TON	1.95	14.41	0.54	9.58	6.28	9.74	7.73	10.94					61.18

OVERHEAD:													
Land Rent			50.00										50.00
Office Expense	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88					15.00
Liability Insurance	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04					0.35
Property Taxes			0.36							0.36			0.71
Property Insurance			0.18							0.18			0.36
Investment Repairs	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02					0.20
TOTAL CASH OVERHEAD COSTS	1.94	1.94	52.48	1.94	1.94	1.94	1.94	1.94	0.54				66.62

TOTAL CASH COSTS/ACRE	7.79	45.18	54.11	30.70	20.79	31.16	25.13	34.76	0.54				250.15
TOTAL CASH COSTS/TON	2.60	15.06	18.04	10.23	6.93	10.39	8.38	11.59	0.18				83.38
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Table 4.

U.C. COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY - 1992

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. Depre- ciation	Interest	- Cash Overhead - Insur- ance	Taxes	Total
92	130 hp 2wd Tractor	77359	12	5801.92	1701.90	212.74	425.48	8142.04
92	200 hp 4wd Tractor	109503	12	8212.75	2409.06	301.13	602.26	11525.20
92	Border Disc	1210	15	72.60	26.62	3.33	6.65	109.20
92	Disc - Finish 21'	14245	15	854.67	313.40	39.17	78.35	1285.59
92	Disc - Stubble 16'	18622	15	1117.33	409.68	51.21	102.42	1680.64
92	Ditcher - V	12706	15	762.33	279.54	34.94	69.88	1146.69
92	Grain Drill - 12'	9100	7	1170.00	200.20	25.02	50.05	1445.27
92	Pickup - Used	8300	4	1867.50	182.60	22.83	45.65	2118.58
92	Pickup Truck - 1/2 Ton	17655	7	2269.86	388.42	48.55	97.11	2803.94
92	Rear Blade - 8'	1976	15	118.53	43.48	5.43	10.87	178.31
TOTAL		270676		22247.49	5954.90	744.35	1488.72	30435.46
60% of New Cost *		162406		13348.49	3572.94	446.61	893.23	18261.28

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. Depre- ciation	Interest	- Cash Overhead - Insur- ance	Taxes	Repairs	Total
INVESTMENT									
	Fuel Tanks & Pumps	8050	20	402.50	161.00	20.13	40.25	125.00	748.88
	Fuel Wagon	1500	10	150.00	30.00	3.75	7.50	50.00	241.25
	Shop Building	85137	20	4256.85	1702.74	212.84	425.68	100.00	6698.11
	Shop Tools	12000	20	600.00	240.00	30.00	60.00	100.00	1030.00
	Siphon Tubes	1930	20	96.50	38.60	4.83	9.65	100.00	249.58
TOTAL INVESTMENT		108617		5505.85	2172.34	271.55	543.08	475.00	8967.82

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	300.00	acre	50.00	15000.00
Liability Insurance	1200.00	acre	0.71	852.00
Office Expense	1200.00	acre	30.00	36000.00

Table 5.

U.C. COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY - 1992

Yr	Description	Actual Hours Used	COSTS PER HOUR							Total Costs/Hr.
			-Non-Cash Over.- Depre- ciation	Interest	- Cash Overhead - Insur- ance	Taxes	Repairs	Operating Fuel & Lube	Total Oper.	
92	130 hp 2wd Tractor	954.2	3.65	1.07	0.13	0.27	4.64	6.16	10.80	15.92
92	200 hp 4wd Tractor	864.2	5.70	1.67	0.21	0.42	5.48	9.48	14.96	22.96
92	Border Disc	166.0	0.26	0.10	0.01	0.02	0.35	0.00	0.35	0.74
92	Disc - Finish 21'	165.8	3.09	1.13	0.14	0.28	4.09	0.00	4.09	8.74
92	Disc - Stubble 16'	122.9	5.45	2.00	0.25	0.50	5.35	0.00	5.35	13.56
92	Ditcher - V	166.0	2.76	1.01	0.13	0.25	3.65	0.00	3.65	7.79
92	Grain Drill - 12'	174.1	4.03	0.69	0.09	0.17	4.56	0.00	4.56	9.54
92	Pickup - Used	500.0	2.24	0.22	0.03	0.05	1.51	2.82	4.33	6.87
92	Pickup Truck - 1/2 Ton	191.0	7.13	1.22	0.15	0.31	3.12	5.17	8.29	17.10
92	Rear Blade - 8'	166.0	0.43	0.16	0.02	0.04	0.57	0.00	0.57	1.21

Table 6.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SAN JOAQUIN VALLEY - 1992

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE WHEAT							
	YIELD (TON/ACRE)						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
OPERATING COSTS/ACRE:							
Cultural Cost	142	142	142	142	142	142	142
Harvest Cost	30	30	30	30	30	30	30
Interest on operating capital	5	5	5	5	5	5	5
TOTAL OPERATING COSTS/ACRE	177	177	177	177	177	177	177
TOTAL OPERATING COSTS/TON	117.95	88.46	70.77	58.98	50.55	44.23	39.32
CASH OVERHEAD COSTS/ACRE	67	67	67	67	67	67	67
TOTAL CASH COSTS/ACRE	244	244	244	244	244	244	244
TOTAL CASH COSTS/TON	162.37	121.78	97.42	81.18	69.59	60.89	54.12
NON-CASH OVERHEAD COSTS/ACRE	13	13	13	13	13	13	13
TOTAL COSTS/ACRE	257	257	257	257	257	257	257
TOTAL COSTS/TON	171.12	128.34	102.67	85.56	73.34	64.17	57.04

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WHEAT							
PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
90.00	-42	3	48	93	138	183	228
100.00	-27	23	73	123	173	223	273
110.00	-12	43	98	153	208	263	318
120.00	3	63	123	183	243	303	363
130.00	18	83	148	213	278	343	408
140.00	33	103	173	243	313	383	453
150.00	48	123	198	273	348	423	498

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WHEAT							
PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
90.00	-109	-64	-19	26	71	116	161
100.00	-94	-44	6	56	106	156	206
110.00	-79	-24	31	86	141	196	251
120.00	-64	-4	56	116	176	236	296
130.00	-49	16	81	146	211	276	341
140.00	-34	36	106	176	246	316	386
150.00	-19	56	131	206	281	356	431

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WHEAT							
PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
90.00	-122	-77	-32	13	58	103	148
100.00	-107	-57	-7	43	93	143	193
110.00	-92	-37	18	73	128	183	238
120.00	-77	-17	43	103	163	223	283
130.00	-62	3	68	133	198	263	328
140.00	-47	23	93	163	233	303	373
150.00	-32	43	118	193	268	343	418

Table 7.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS / BREAKEVEN ANALYSIS
 SAN JOAQUIN VALLEY - 1992

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)
Wheat	360	184	176	250	110	263	97

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)
Wheat	108000	55058	52942	75045	32955	78983	29017

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover		
			Operating Costs	Cash Costs	Total Costs
Wheat	3.0	ton	61.18	83.38	87.76

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Breakeven Yield To Cover		
			Operating Costs	Cash Costs	Total Costs
Wheat	ton	120.00	1.5	2.1	2.2