

1990

U.C. COOPERATIVE EXTENSION



**SAMPLE COSTS TO PRODUCE
FIELD CORN
IN THE SAN JOAQUIN VALLEY**

by

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and

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The detailed costs for field corn production in the San Joaquin Valley are presented in this study. The hypothetical farm used in this report consists of 1200 acres of which 300 acres are in field corn 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 1990 figures. 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 **Table 1, Costs Per Acre To Produce Field Corn**. This study consists of **General Assumptions for Producing Field Corn**, and five tables.

- Table 1. **Costs Per Acre To Produce Field Corn.**
- Table 2. **Monthly Cash Costs Per Acre to Produce Field Corn.**
- Table 3. **Annual Equipment, Investment And Business Overhead Costs.**
- Table 4. **Ranging Analysis.**
- Table 5. **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 FIELD CORN

San Joaquin Valley - 1990
U.C. Cooperative Extension

The following is a description of some general assumptions pertaining to sample costs of field corn production in the San Joaquin Valley.

1. LAND:

This cost of production study is based on a 1200 acre field and row crop operation of which 300 acres dedicated to growing field corn. Other crops grown on the same acreage in rotation with field corn might include wheat, oat hay, alfalfa hay, barley, corn silage, cotton, etc.

2. RENT AGREEMENT:

The land used for field corn production in this study is rented on a cash per acre basis. Under this agreement the landowner receives \$100 per acre from the tenant. The landowner maintains the irrigation system on the rented land. Interest cost for land and irrigation system is incurred by the landowner. Land is not depreciated.

3. CULTURAL PRACTICES:

The cultural, pesticide and fertilizer inputs for the production of field corn vary considerably from grower to grower and field to field. In this study manure is applied before any primary tillage occurs. Beds are listed, fertilized and pre-irrigated with 10 acre-inches of water. The corn is planted on the beds. Two cultivations are done through the growing season and fertilizer is custom applied. 38 acre-inches of water are utilized in nine equal irrigations during the season. Two of these irrigations are used to apply nitrogen. Harvest is done by a custom operator. Variations as to cultural practices and inputs can be significant.

4. YIELDS & RETURNS:

The crop yield used in this study is 4 tons per acre. An estimated price of a \$110 per ton is used in this study.

5. HARVEST:

It was decided, in this cost study, to use contract price for custom harvesting. A grower doing his own harvesting should inventory the equipment for the required operations, and calculate labor, fuel, depreciation, repairs, interest on investment, etc., as a cost of production.

6. LABOR:

Basic hourly wages for workers are \$6.20 and \$4.75 per hour for skilled and field workers respectively. Adding 34% for SDI, FICA, insurance and other benefits gives the labor rates shown of \$8.31 per hour for skilled labor and \$6.37 per hour for field labor. The labor for operations using machinery are 10% higher than the machine hours to account for the extra labor involved in equipment set-up, moving, maintenance and repair.

7. OVERHEAD:

County taxes are calculated as 1% of the average of the equipment, buildings and improvements. Insurance is charged at 1% of the average value of the equipment over its useful life. Office and business costs are estimated at \$20 per acre for the ranch. These expenses include office supplies, phone, bookkeeping, accounting, legal fees, road preparation and maintenance, etc.

8. INTEREST:

Interest on operating capital is based on cash costs and is calculated monthly, for nine months, until harvest at the rate of 12.5% per year. Interest is also charged on investment at 12% 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 of the buildings and equipment.

9. EQUIPMENT COSTS:

In allocating the equipment costs per acre, the following calculations were made and shown in **Table 3**: (a) **Original Cost** of equipment is the cost of the new equipment plus sales tax. (b) **Depreciation** is straight line with no salvage value. (c) **Interest** on investment is calculated as one-half of the new cost per acre (the average value of the equipment during its useful life) multiplied by an interest rate of 12%. (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**. Most of this equipment is used on the entire 1200 acre ranch.

10. FUEL & REPAIR:

The fuel and repair cost for each operation is determined by multiplying the total hourly operating cost for each piece of equipment by the number of hours per acre for that operation. On-farm delivery prices for gasoline and diesel fuel are \$0.85 per gallon and \$1.03 per gallon respectively.

Table. 1

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE FIELD CORN
 SAN JOAQUIN VALLEY - 1990

Labor Rate: \$ 8.31/hr. machine labor Interest Rate: 12.50%
 \$ 6.37/hr. non-machine labor Yield per Acre: 4.00 ton

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Apply manure	0.00	0.00	0.00	0.00	32.50	32.50		
Chisel deep	0.21	2.07	3.62	0.00	0.00	5.69		
Disc stubble	0.14	1.43	2.78	0.00	0.00	4.21		
Chisel light	0.11	1.09	1.93	0.00	0.00	3.02		
Disc light	0.12	1.23	1.83	0.00	0.00	3.06		
Pre-plant herbicide	0.13	1.30	1.18	12.00	0.00	14.47		
Triplane	0.14	1.38	1.88	0.00	0.00	3.26		
List beds & fertilize	0.15	1.55	1.95	11.20	0.00	14.70		
Mulch beds	0.18	1.80	3.15	0.00	0.00	4.96		
Roll beds	0.10	0.95	0.70	0.00	0.00	1.65		
Open ditch	0.02	0.20	0.21	0.00	0.00	0.41		
Pre-irrigate	0.14	0.89	0.00	22.70	0.00	23.59		
Close ditch	0.02	0.20	0.14	0.00	0.00	0.34		
Disc over ditch	0.02	0.20	0.16	0.00	0.00	0.36		
Plant	0.14	1.44	2.66	23.76	0.00	27.86		
Plant & cultivate	0.31	3.09	2.52	0.00	0.00	5.61		
Fertilize, custom	0.00	0.00	0.00	19.50	5.16	24.66		
Irrigate	0.98	6.24	0.00	66.74	0.00	72.98		
Apply herbicide, custom	0.00	0.00	0.00	3.50	5.00	8.50		
Irrigate & fertilize	0.28	1.78	0.00	31.57	0.00	33.35		
Apply miticide, custom	0.00	0.00	0.00	17.60	5.00	22.60		
TOTAL CULTURAL COSTS	3.20	26.83	24.72	208.57	47.66	307.78		
Harvest:								
Harvest, custom	0.00	0.00	0.00	0.00	48.00	48.00		
Hauling, custom	0.00	0.00	0.00	0.00	22.00	22.00		
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	70.00	70.00		
Interest on operating capital @ 12.50%						16.18		
TOTAL OPERATING COSTS/ACRE		26.83	24.72	208.57	117.66	393.95		
TOTAL OPERATING COSTS/TON						98.49		
CASH OVERHEAD:								
Office expense						20.00		
Land Rent						100.00		
Property Taxes						1.19		
Equipment Insurance						0.60		
Investment Repairs						0.79		
TOTAL CASH OVERHEAD COSTS						122.58		

U.C. COOPERATIVE EXTENSION

Table. 1 continued

TOTAL CASH COSTS/ACRE					516.53
TOTAL CASH COSTS/TON					129.13

NON-CASH OVERHEAD:

Investment	Per producing Acre	Annual Cost		
		Depreciation	Interest @ 12.50%	
Buildings	62.50	2.50	3.75	6.25
Siphon tubes	1.42	0.20	0.09	0.29
Fuel tanks & equip	5.83	0.39	0.35	0.74
Shop tools	10.00	0.90	0.66	1.56
Pickup, new	15.00	1.93	0.99	2.92
Pickup, used	3.33	0.60	0.22	0.82
Equipment	124.98	9.70	8.25	17.95
TOTAL NON-CASH OVERHEAD COSTS	223.06	16.22	14.30	30.52

TOTAL COSTS/ACRE					547.05
TOTAL COSTS/TON					136.76

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Table. 2

MONTHLY CASH COSTS PER ACRE TO PRODUCE FIELD CORN

Beginning NOV 89	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	TOTAL
Ending OCT 90	89	89	90	90	90	90	90	90	90	90	90	90	90
Cultural:													
Apply manure	32.5												33
Chisel deep		5.7											6
Disc stubble					4.2								4
Chisel light					3.0								3
Disc light					3.1								3
Pre-plant herbicide					14.5								14
Triplane					3.3								3
List beds & fertilize					14.7								15
Mulch beds					5.0								5
Roll beds					1.6								2
Open ditch					0.2	0.2							0
Pre-irrigate					23.6								24
Close ditch					0.2						0.2		0
Disc over ditch					0.2						0.2		0
Plant					27.9								28
Cultivate						5.6							6
Fertilize, custom						24.7							25
Irrigate						10.4		10.4	31.3	20.9			73
Apply herbicide, custom						8.5							9
Irrigate & fertilize							16.7	16.7					33
Apply miticide, custom							22.6						23
TOTAL CULTURAL COSTS	32.5	5.7			101.4	49.4	39.3	27.1	31.3	20.9	0.3		308
Harvest:													
Harvest, custom											48.0		48
Hauling, custom											22.0		22
TOTAL HARVEST COSTS											70.0		70
Interest on oper. capital	0.3	0.4	0.4	0.4	1.5	2.0	2.4	2.7	3.0	3.2			16
TOTAL OPERATING COSTS/ACRE	32.8	6.1	0.4	0.4	102.8	51.3	41.7	29.8	34.3	24.1	70.3		394
TOTAL OPERATING COSTS/TON	8.2	1.5	0.1	0.1	25.7	12.8	10.4	7.4	8.6	6.0	17.6		98
OVERHEAD:													
Office expense										20.0			20
Land Rent										100.0			100
Property Taxes						0.6				0.6			1
Equipment Insurance			0.6										1
Investment Repairs	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		1
TOTAL CASH OVERHEAD COSTS	0.1	0.1	0.7	0.1	0.1	0.7	0.1	0.1	0.1	120.7	0.1		123
TOTAL CASH COSTS/ACRE	32.9	6.2	1.1	0.5	102.9	52.0	41.7	29.8	34.3	144.7	70.4		517
TOTAL CASH COSTS/TON	8.2	1.5	0.3	0.1	25.7	13.0	10.4	7.5	8.6	36.2	17.6		129

U.C. COOPERATIVE EXTENSION

Table: 3

ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	- Non-Cash Over. -			- Cash Overhead -		Total
			Yrs Life	Depre- ciation	Interest	Insur- ance	Taxes	
90	130 hp 2wd Tractor	66000	10	5940.00	4356.00	181.50	363.00	10840.50
90	200 hp 4wd Tractor	94000	10	8460.00	6204.00	258.50	517.00	15439.50
90	80 hp 2wd Tractor	42000	10	3780.00	2772.00	115.50	231.00	6898.50
90	Chisel, heavy, 11'	5300	15	318.00	349.80	14.58	29.15	711.53
90	Chisel, light, 21'	6400	15	384.00	422.40	17.60	35.20	859.20
90	Cultipacker, 6 row	3300	15	198.00	217.80	9.07	18.15	443.02
90	Cultivator, 6 row	6000	15	360.00	396.00	16.50	33.00	805.50
90	Disc, finish, 21'	12500	15	750.00	825.00	34.38	68.75	1678.13
90	Disc, offset 7'	5500	15	330.00	363.00	15.13	30.25	738.38
90	Disc, stubble, 16'	12500	15	750.00	825.00	34.38	68.75	1678.13
90	Ditcher, 5'	5300	15	318.00	349.80	14.58	29.15	711.53
90	Lister, 6 row	4500	15	270.00	297.00	12.37	24.75	604.12
90	Mulcher, PTO, 6row	21200	15	1272.00	1399.20	58.30	116.60	2846.10
90	Planter, 6 row	14300	10	1287.00	943.80	39.33	78.65	2348.78
90	Rear blade, 3pt 8'	1900	15	114.00	125.40	5.22	10.45	255.07
90	Saddle Tanks, 2-250	1800	10	162.00	118.80	4.95	9.90	295.65
90	Spray boom, 25'	3500	10	315.00	231.00	9.63	19.25	574.88
90	Triplane, 16'	16000	15	960.00	1056.00	44.00	88.00	2148.00
TOTAL		322000		25968.00	21252.00	885.52	1771.00	49876.52
60% of New Cost *		193200		15580.80	12751.20	531.31	1062.60	29925.91

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

ANNUAL INVESTMENT COSTS

Yr	Description	Price	- Non-Cash Over. -			- Cash Overhead -			Total
			Yrs Life	Depre- ciation	Interest	Insur- ance	Taxes	Repairs	
INVESTMENT									
	Buildings	75000	25	3000.00	4500.00	187.50	375.00	350.00	8412.50
	Fuel tanks & equip	7000	15	466.67	420.00	17.50	35.00	50.00	989.17
	Pickup, new	18000	7	2314.29	1188.00	49.50	99.00	200.00	3850.79
	Pickup, used	4000	5	720.00	264.00	11.00	22.00	200.00	1217.00
	Shop tools	12000	10	1080.00	792.00	33.00	66.00	100.00	2071.00
	Siphon tubes	1700	7	242.86	102.00	4.25	8.50	50.00	407.61
TOTAL INVESTMENT		117700		7823.82	7266.00	302.75	605.50	950.00	16948.07

U.C. COOPERATIVE EXTENSION

Table. 3 continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	300.00	acre	100.00	30000.00
Office expense	1200.00	acre	20.00	24000.00

**U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS**

Table. 4

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE FIELD CORN

	YIELD (TON/ACRE)						
	2.5	3	3.5	4.00	4.5	5	5.5
OPERATING COSTS/ACRE:							
Cultural Cost	308	308	308	308	308	308	308
Harvest Cost	44	53	61	70	79	88	96
Interest on operating capital	16	16	16	16	16	16	16
TOTAL OPERATING COSTS/ACRE	368	376	385	394	403	411	420
TOTAL OPERATING COSTS/TON	147.08	125.48	110.06	98.49	89.49	82.29	76.40
CASH OVERHEAD COSTS/ACRE	123	123	123	123	123	123	123
TOTAL CASH COSTS/ACRE	490	499	508	517	525	534	543
TOTAL CASH COSTS/TON	196.11	166.34	145.08	129.13	116.73	106.81	98.69
NON-CASH OVERHEAD COSTS/ACRE	31	31	31	31	31	31	31
TOTAL COSTS/ACRE	521	530	538	547	556	565	573
TOTAL COSTS/TON	208.32	176.52	153.80	136.76	123.51	112.91	104.24

Table. 4

RANGING ANALYSIS (Continued)

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR FIELD CORN

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	2.5	3	3.5	4.00	4.5	5	5.5
80.00	-168	-136	-105	-74	-43	-11	20
90.00	-143	-106	-70	-34	2	39	75
100.00	-118	-76	-35	6	47	89	130
110.00	-93	-46	-0	46	92	139	185
120.00	-68	-16	35	86	137	189	240
130.00	-43	14	70	126	182	239	295
140.00	-18	44	105	166	227	289	350

NET RETURNS PER ACRE ABOVE CASH COSTS FOR FIELD CORN

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	2.5	3	3.5	4.00	4.5	5	5.5
80.00	-290	-259	-228	-197	-165	-134	-103
90.00	-265	-229	-193	-157	-120	-84	-48
100.00	-240	-199	-158	-117	-75	-34	7
110.00	-215	-169	-123	-77	-30	16	62
120.00	-190	-139	-88	-37	15	66	117
130.00	-165	-109	-53	3	60	116	172
140.00	-140	-79	-18	43	105	166	227

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR FIELD CORN

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	2.5	3	3.5	4.00	4.5	5	5.5
80.00	-321	-290	-258	-227	-196	-165	-133
90.00	-296	-260	-223	-187	-151	-115	-78
100.00	-271	-230	-188	-147	-106	-65	-23
110.00	-246	-200	-153	-107	-61	-15	32
120.00	-221	-170	-118	-67	-16	35	87
130.00	-196	-140	-83	-27	29	85	142
140.00	-171	-110	-48	13	74	135	197

Table. 5

U.C. COOPERATIVE EXTENSION
 COST AND RETURNS / BREAKEVEN ANALYSIS
 SAN JOAQUIN VALLEY

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)
Field corn	440	394	46	517	-77	547	-107

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)
Field corn	132000	118186	13814	154960	-22960	164116	-32116
TOTAL	132000	118186	13814	154960	-22960	164116	-32116

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover		
			Operating Costs	Cash Costs	Total Costs
Field corn	4.0	ton	98.49	129.13	136.76

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Breakeven Yield To Cover		
			Operating Costs	Cash Costs	Total Costs
Field corn	ton	110.00	3.6	4.7	5.0