UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

SAMPLE COSTS TO PRODUCE

FIELD CORN

SACRAMENTO VALLEY

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INTRODUCTION

The sample costs to produce field corn 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 to produce field corn in the Sacramento Valley. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for this crop and area. Some practices listed may not be needed nor used during every production year. Additional ones not indicated may be needed. Cultural practices for the production of field corn vary by grower and region, and variations can be significant. The practices and inputs used in the cost study serve only as a sample or guide. The costs shown are 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. Field corn is planted on 600 acres and the other 2,300 acres, planted in rotation with the corn, may be processing tomatoes, alfalfa hay, safflower, sunflower, dry beans and/or wheat. Typically, a grower with this amount of corn acreage will have several non-adjacent fields. A charge for equipment moving and set-up is shown in the tables under cultural costs. The land rented includes developed wells and irrigation system. All costs associated with land and the irrigation system is incurred by the landowner. The grower also owns land, a shop and an equipment yard.

Cultural Practices and Material Inputs

Land Preparation. Primary tillage which includes laser leveling, discing, rolling, subsoiling, land leveling, and listing beds is in October of the year preceding planting. All operations are done on 100% of the acres unless noted. To reduce annual expenses, only 7% of the acreage is laser leveled each year. Subsoiling to a depth of 22 to 24 inches and discing are done on 50% (300 acres) of the corn acreage. Ground is smoothed in two passes with a triplane. Beds on five-foot centers are made with a six-row lister, and shaped with a bed-shaper cultivator.

Stand Establishment. Field corn is generally planted from late March through April. In this study 34,000 seeds per acre are planted in April.

Fertilization. Nitrogen is the primary nutrient applied to corn throughout the growing season. At planting 151 pounds (15 gallons) of ammonium phosphate (10-34-0) plus one quart of chelated zinc is applied. This is equivalent to 15 pounds of actual nitrogen and 51 pounds of phosphorous (P_2O_5) per acre. Aqua Ammonia (20-0-0) is applied at a rate of 225 pounds (132 gallons) of N per acre.

Irrigation. In this study, water is calculated to cost $19.56 per acre foot and is a combination of 1/2 well water and 1/2 canal delivered surface water. The irrigation costs shown in Tables 1, 2, and 3 include water, pumping, and labor charges. A total of 3 acre-feet (36 acre inch) are applied to the crop in this study. Six irrigations are applied bi-weekly in May, June, and July.

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 publication UC IPM Pest Management Guidelines, Corn or can be accessed online at http://www.ipm.ucdavis.edu/PMG/crops-agriculture.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. A mix of materials and cultural practices are used to manage weeds in corn. Beginning in February a contact herbicide, Roundup, is applied by aircraft to the fallow beds to control early season weeds. For broadleaf weed control, Weedar 64 herbicide is applied in May on one-half of the corn acreage by the grower using a tractor mounted sprayer. Cultivation using a rolling or mechanical cultivator is done twice, once in March and once in May. The May cultivation is done as part of the furrowing out and fertilizing operation.

Insects and Diseases. Corn has many insect and mite pests that can cause economic damage during any given season. In this study cutworms (*Agrotis spp., Feltia spp.,* and *Peridroma spp*.) are assumed to be above the treatment threshold on 20% of the acreage. Sevin bait is applied to control cutworms on the infested acres. A tractor mounted applicator is used to apply the bait in May. Mites (*Tetranychus spp*.) can be a problem late in the season, and may be controlled with an application of Comite in June. Mite treatment is not included in this study.

Harvest. It is assumed that the grower owns a harvest combine and bankout wagon. The combine attaches to a 30-inch row, eight-row header. The corn is dumped from the combine directly into the bankout wagon which transports the grain to semi-truck bulk grain trailers for transport to the buyer. Transportation from the field to the warehouse is paid by the buyer.

Equipment for harvest operations are shown in investment costs on Table 4, and labor, fuel, repairs, depreciation, and operating interest, are calculated as harvest costs in Tables 1 and 3. If a grower contracts his harvest operation, all harvesting equipment should be subtracted from investment costs in Table 4. Related costs should be subtracted from harvest costs in Tables 1 and 3 and a custom charge added.

Yields. Annul field corn yields for counties in the Sacramento Valley from 1993 to 2002 range from a low of 4.47 tons per acre to a high of 5.34. The 10-year weighted average corn yield over that same period and region is 4.83. The average yield used in this study is for the last ten years adjusted upward to 4.96 ton per acre to reflect best management practices. Average valley yields are shown in Table A.

Table A. Weighted average field corn yield and price[§]

Year	Tons Per Acre	$ Per Ton
2002	4.89	101.86
2001	5.00	81.02
2000	5.34	87.18
1999	4.86	85.74
1998	4.66	93.46
1997	4.95	112.30
1996	4.49	130.84
1995	4.47	122.52
1994	4.86	100.81
1993	4.73	104.94

[§] Source: California Crop Reports, 1993 - 2002

Returns. Prices for field corn ranged from $81 to $130 per ton over the last 10 years. Return prices to growers in the Sacramento Valley over the last 10 years are shown in Table A. An average return of $102.07 for the last ten years is used.

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.

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. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge. To prevent a negative calculation in this study, interest is calculated based on an August harvest. The monthly interest is then distributed in Table 4 beginning in September after the August harvest, which corresponds to the month following the August harvest date.

Equipment Cash Costs. Equipment costs fall into three categories; capital recovery, cash overhead, and operating costs. The cash overhead and capital recovery costs will be discussed in later sections. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time (Operation Time) for a given operation to account for fueling, moving equipment, and setup time. Prices for on-farm delivery of diesel and gasoline are $1.45 and $1.88 per gallon, respectively.

Risk. Risks associated with field corn 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 corn production. Because of the risk involved, growers should consider all of the agronomic and economic risks before committing resources to corn production in the Sacramento Valley. Crop insurance may be a viable option that each grower should review to determine if it is appropriate for their situation.

Cash Overhead
(Tables 1-7)

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, liability and property insurance, sanitation services, equipment repairs, and management.

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.

Insurance. Insurance for farm investments vary 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 changing production and market economics, land values, and relative bargaining positions of the landlord and tenant. Land used for corn production in the Sacramento Valley is commonly rented on a tenant-landowner basis with the landowner receiving between 18-25% of the gross income. In this study the landowner receives 18% of the gross crop receipts from the sale of 4.96 tons of corn less a 2% dockage. The share rent calculated using a $102.46 per ton return price provides the landowner $91.20 per acre. The tenant pays all cash costs to produce the crop except for the landowner's share of grain drying costs if required.

Salary. Supervisor salaries, including benefits, are $99,992 per year for two supervisors and are allocated among the farm's other crops on a gross returns basis. In this study it is assumed that field corn provides 14% of the farm's gross returns. Any returns above total costs are considered returns to investment.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

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). 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 (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (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 wear out 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 the purchase price because land does not depreciate.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.23% used to calculate capital recovery cost is the USDA-ERS's 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.

Irrigation System. The fields are irrigated using a flood irrigation system. Water is delivered from a pump and district ditch and distributed by way of surface mainlines and valves. The life of the irrigation system is estimated at 40 years. The irrigation system is considered an improvement to the property and is shown in the capital recovery sections of Tables 1-3 and the Investments portion of Table 5.

Building. The shop building is a 1,800 square foot metal building or buildings on a cement slab.

Shop Tools. This includes an assortment of shop tools.

Fuel Tanks. Two 500-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the 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. 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 and are discussed under operating costs.

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

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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 FIELD CORN
SACRAMENTO VALLEY - 2004

Labor Rate: $14.43/hr. machine labor
$9.87/hr. non-machine labor

Interest Rate: 6.89
Yield per Acre: 4.96 Ton

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per acre: Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Disc Field - 50% of Acreage	0.04	1	3	0	0	4	
Subsoil - 50% of Acreage	0.10	2	7	0	0	8	
Land Plane Field - 2X	0.28	4	9	0	0	14	
List Beds	0.15	2	3	0	0	6	
Apply Fallow Herbicide	0.00	0	0	10	6	16	
Cultivate Beds	0.20	3	3	0	0	6	
Plant Corn & Apply Fertilizer	0.16	3	3	62	0	68	
Break Crust - 10% of Acreage	0.02	0	0	0	0	1	
Open Ditch - 2X	0.10	2	3	0	0	5	
Irrigate - 6X	7.50	74	0	59	0	133	
Close Ditch - 2X	0.10	2	1	0	0	3	
Apply Insecticide - Cutworms 20% of Acreage	0.03	0	0	1	0	2	
Furrow Out & Sidedress Fertilize	0.29	5	7	60	3	74	
Apply Herbicide - 50% of Acreage	0.08	1	1	2	0	4	
Postharvest - Chop Stubble	0.25	4	7	0	0	11	
Postharvest - Disc Stubble	0.22	4	13	0	0	16	
Pickup Truck Use	0.13	4	2	0	0	7	
ATV Use	0.10	2	0	0	0	2	
Equipment Moving & Set Up	1.52	15	0	0	0	15	
TOTAL CULTURAL COSTS	11.28	128	63	195	8	394	
Harvest:							
Combine Corn	0.22	4	11	0	0	15	
Bankout Grain	0.22	4	3	0	0	7	
TOTAL HARVEST COSTS	0.44	7	15	0	0	22	
Interest on operating capital @ 6.23						12	
TOTAL OPERATING COSTS/ACRE		135	78	195	8	428	
CASH OVERHEAD:							
Liability Insurance						0	
Office Expense						16	
Supervisor Salary						34	
Share Rent @ 18% of Gross Returns						91	
Field Sanitation						1	
Property Taxes						4	
Property Insurance						3	
Investment Repairs						2	
TOTAL CASH OVERHEAD COSTS						151	
TOTAL CASH COSTS/ACRE						579	

NON-CASH OVERHEAD:			
Investment	Per producing Acre	Annual Cost Capital Recovery	
Fuel Tanks & Pumps	7	1	1
Fuel Wagon	1	0	0
Truck Tractor	15	2	2
Trailer - Lowbed	3	0	0
Trailer - Pipe	1	0	0
Shop Building	23	2	2
Shop Tools	5	0	0
Storage Building	9	1	1
Closed Mix System	1	0	0
Pipe - Main Line	20	3	3
Siphon Tubes	4	0	0
Tool Carrier	5	1	1
Portable Pump	7	1	1
Forklift - 4 Ton	3	0	0
Equipment	350	40	40
TOTAL NON-CASH OVERHEAD COSTS	456	51	51
TOTAL COSTS/ACRE			614

UC COOPERATIVE EXTENSION

Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE FIELD CORN
SACRAMENTO VALLEY - 2004

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
FIELD CORN	4.96	Ton	102.07	506	
TOTAL GROSS RETURNS FOR FIELD CORN				506	
OPERATING COSTS					
Herbicide:					
Roundup	0.19	Gal	55	10	
Weedar 64	1.00	Pint	2	2	
Custom:					
Air Application	1.00	Acre	6	6	
Seed:					
Seed Corn	34.00	Thou	1	40	
Fertilizer:					
10-34-0	151.00	Lb	0	21	
Zinc Chelate 6%	2.00	Pint	0	0	
20-0-0 (Aqua)	225.00	Lb N	0	60	
Irrigation:					
Water	36.00	AcIn	2	59	
Insecticide:					
Sevin 5 Pellets	2.00	Lb	1	1	
Rent:					
Rig to Inject Aqua	1.00	Acre	3	3	
Labor (machine)	3.40	hrs	13	46	
Labor (non-machine)	9.02	hrs	10	89	
Fuel - Gas	0.83	gal	2	2	
Fuel - Diesel	26.29	gal	1	38	
Lube				6	
Machinery repair				32	
Interest on operating capital @ 6.89%				12	
TOTAL OPERATING COSTS/ACRE				428	
NET RETURNS ABOVE OPERATING COSTS				79	
CASH OVERHEAD COSTS:					
Liability Insurance				0	
Office Expense				16	
Supervisor Salary				34	
Share Rent @ 18% of Gross Returns				91	
Field Sanitation				1	
Property Taxes				4	
Property Insurance				3	
Investment Repairs				2	
TOTAL CASH OVERHEAD COSTS/ACRE				151	
TOTAL CASH COSTS/ACRE				579	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY)					
Fuel Tanks & Pumps				1	
Fuel Wagon				0	
Truck Tractor				2	
Trailer - Lowbed				0	
Trailer - Pipe				0	
Shop Building				2	
Shop Tools				0	
Storage Building				1	
Closed Mix System				0	
Pipe - Main Line				3	
Siphon Tubes				0	
Tool Carrier				1	
Portable Pump				1	
Forklift - 4 Ton				0	
Equipment				40	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				51	
TOTAL COSTS/ACRE				614	
NET RETURNS ABOVE TOTAL COSTS				-108	

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS
SACRAMENTO VALLEY – 2004

Beginning OCT 03	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Ending SEP 04	03	03	03	04	04	04	04	04	04	04	04	04	
Cultural:													
Disc Field - 50% of Acreage	4												4
Subsoil - 50% of Acreage	8												8
Land Plane Field - 2X	14												14
List Beds	6												6
Apply Fallow Herbicide					16								16
Cultivate Beds							6						6
Plant Corn & Apply Fertilize							68						68
Break Crust - 10% Of Acreage							1						1
Open Ditch - 2X								5					5
Irrigate - 6X								44	44	44			133
Close Ditch - 2X								1			1		3
Apply Insecticide - Cutworms								2					2
Furrow Out & Sidedress Fertilize								74					74
Apply Herbicide - 50% Of Acreage								4					4
Postharvest - Chop Stubble												11	11
Postharvest - Disc Stubble												16	16
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	7
ATV Use	0	0	0	0	0	0	0	0	0	0	0	0	2
Equipment Moving & Set Up	1	1	1	1	1	1	1	1	1	1	1	1	15
TOTAL CULTURAL COSTS	33	2	2	2	18	2	76	133	46	46	3	29	394
Harvest:													
Combine Corn												15	15
Bankout Grain												7	7
TOTAL HARVEST COSTS												22	22
Interest on oper. capital	0	0	0	0	0	0	1	2	2	2	2	2	12
TOTAL OPERATING COSTS/ACRE	34	2	2	2	18	2	77	135	48	48	5	54	428
OVERHEAD:													
Liability Insurance				0									0
Office Expense	1	1	1	1	1	1	1	1	1	1	1	1	16
Supervisor Salary	3	3	3	3	3	3	3	3	3	3	3	3	34
Share Rent @ 18% of Gross Returns												91	91
Field Sanitation	0	0	0	0	0	0	0	0	0	0	0	0	1
Property Taxes				2						2			4
Property Insurance				1						1			3
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CASH OVERHEAD COSTS	4	4	4	8	4	4	4	4	4	8	4	95	151
TOTAL CASH COSTS/ACRE	38	7	7	10	23	7	81	139	52	56	10	153	579

UC COOOPERATIVE EXTENSION

Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SACRAMENTO VALLEY - 2004

ANNUAL EQUIPMENT COSTS

						- Cash Overhead -		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
04	135 HP 2WD Tractor	80,519	10	23,784	9,274	353	522	10,148
04	165 HP 2WD Tractor	93,510	10	27,621	10,771	409	606	11,786
04	200 HP Crawler	159,210	10	47,028	18,338	697	1,031	20,067
04	340 HP Crawler	175,032	10	51,702	20,161	766	1,134	22,061
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	Bait Applicator	2,324	12	322	262	9	13	284
04	Bankout Wagon - 30 Ton Pull Type	16,737	10	2,960	2,077	67	98	2,242
04	Combine with No Header	160,483	15	16,435	16,079	598	885	17,562
04	Corn Header - 6 Row	29,035	10	5,477	3,577	117	173	3,866
04	Cultivator - Rolling 6 Row	4,863	12	674	548	19	28	594
04	Cultivator - 6 Row	8,752	12	1,212	986	34	50	1,070
04	Disc - Stubble 18'	45,946	10	8,125	5,701	183	270	6,154
04	Disc - Finish 25'	41,242	12	5,712	4,647	159	235	5,041
04	Ditcher - V	7,956	12	1,102	897	31	45	972
04	Lister - 6 Row	1,628	12	225	183	6	9	199
04	Mower - Flail 15'	11,870	10	2,099	1,473	47	70	1,590
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	Planter - 6 Row	15,315	10	2,708	1,900	61	90	2,051
04	Ringroller - 32'	7,417	12	1,027	836	29	42	907
04	Saddle Tank - 300 Gal	2,188	10	387	271	9	13	293
04	Scraper - Drag 10'	2,235	18	149	205	8	12	225
04	Sprayer System	3,775	10	668	468	15	22	506
04	Subsoiler - 9 Shank	32,819	10	5,804	4,072	131	193	4,396
04	Triplane - 16'	18,500	12	2,562	2,085	71	105	2,261
TOTAL		1,218,345		303,414	141,326	5,144	7,609	154,078
60% of New Cost *		731,007		182,048	84,795	3,086	4,565	92,447

*Used to reflect a mix of new and used equipment

UC COOPERATIVE EXTENSION
Table 4 continued

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	------ Cash Overhead ------ Insur-ance	Taxes	Repairs	Total
INVESTMENT								
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	59,305	10	5,931	7,701	221	326	1,186	9,433
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
Trailer - Pipe	2,012	7	210	339	8	11	40	397
Truck Tractor	44,704	15	4,470	4,484	166	246	309	5,205
TOTAL INVESTMENT	306,753		30,630	31,343	1,140	1,687	5,548	39,718

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Field Sanitation	2,900	Acre	0.68	1,972
Liability Insurance	2,900	Acre	0.46	1,334
Office Expense	2,900	Acre	15.60	45,240
Share Rent @ 18% of Gross Returns	600	Acre	91.12	54,677
Supervisor Salary	2,900	Acre	34.48	99,992

Table 5.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SACRAMENTO VALLEY – 2004

			COSTS PER HOUR						
		Actual		- Cash Overhead -		-------- Operating --------			
Yr	Description	Hours Used	Capital Recovery	Insur-ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
04	135 HP 2WD Tractor	1199.7	4.64	0.18	0.26	3.65	13.06	16.71	21.79
04	165 HP 2WD Tractor	1200.0	5.39	0.20	0.30	4.25	15.97	20.22	26.11
04	200 HP Crawler	1599.2	6.88	0.26	0.39	4.13	19.35	23.48	31.01
04	340 HP Crawler	1600.2	7.56	0.29	0.43	4.54	32.90	37.44	45.71
04	425 HP Crawler	1599.4	8.81	0.33	0.50	5.29	41.13	46.42	56.06
04	90 HP 2WD Tractor	1199.9	2.38	0.09	0.13	1.88	7.53	9.41	12.02
04	ATV	285.0	1.51	0.05	0.07	0.29	2.16	2.45	4.08
04	Bait Applicator	100.0	1.57	0.05	0.08	0.88	0.00	0.88	2.59
04	Bankout Wagon - 30 Ton	200.0	6.23	0.20	0.30	2.27	0.00	2.27	8.99
04	Combine with No Header	200.2	48.19	1.79	2.65	10.87	20.81	31.68	84.31
04	Corn Header - 6 Row	200.0	10.73	0.35	0.52	5.30	0.00	5.30	16.90
04	Cultivator - Rolling 6 Row	166.0	1.98	0.07	0.10	0.98	0.00	0.98	3.13
04	Cultivator - 6 Row	192.0	3.08	0.11	0.16	1.77	0.00	1.77	5.11
04	Disc - Stubble 18'	200.0	17.10	0.55	0.81	7.43	0.00	7.43	25.90
04	Disc - Finish 25'	166.8	16.72	0.57	0.84	6.54	0.00	6.54	24.67
04	Ditcher - V	166.0	3.24	0.11	0.16	2.15	0.00	2.15	5.67
04	Lister - 6 Row	93.0	1.18	0.04	0.06	0.33	0.00	0.33	1.61
04	Mower - Flail 15'	200.0	4.42	0.14	0.21	4.91	0.00	4.91	9.68
04	Pickup 1/2 Ton	285.0	7.20	0.22	0.33	1.39	5.40	6.79	14.53
04	Pickup 3/4 Ton	285.0	8.69	0.27	0.39	1.67	6.49	8.16	17.51
04	Planter - 6 Row	150.0	7.60	0.24	0.36	4.11	0.00	4.11	12.32
04	Ringroller - 32'	166.0	3.02	0.10	0.15	0.83	0.00	0.83	4.11
04	Saddle Tank - 300 Gal	150.0	1.09	0.03	0.05	0.58	0.00	0.58	1.75
04	Scraper - Drag 10'	166.0	0.74	0.03	0.04	0.33	0.00	0.33	1.14
04	Sprayer System	150.0	1.87	0.06	0.09	1.01	0.00	1.01	3.03
04	Subsoiler - 9 Shank	200.0	12.22	0.39	0.58	7.40	0.00	7.40	20.59
04	Triplane - 16'	250.6	4.99	0.17	0.25	2.79	0.00	2.79	8.20

Table 6.

UC COOPERATIVE EXTENSION
RANGING ANALYSIS
SACRAMENTO VALLEY - 2004

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE CORN

	YIELD (ton/acre)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
OPERATING COSTS/ACRE:							
Cultural Cost	384	384	384	384	384	384	384
Harvest Cost	13	15	17	19	21	23	25
Interest on operating capital	12	12	12	12	12	12	12
TOTAL OPERATING COSTS/ACRE	409	411	413	414	416	418	420
TOTAL OPERATING COSTS/TON	117	103	92	83	76	70	65
CASH OVERHEAD COSTS/ACRE	149	149	149	149	149	149	149
TOTAL CASH COSTS/ACRE	557	559	561	563	565	567	569
TOTAL CASH COSTS/TON	159	140	125	113	103	95	88
NON-CASH OVERHEAD COSTS/ACRE	49	50	50	51	51	52	52
TOTAL COSTS/ACRE	606	609	612	614	616	619	621
TOTAL COSTS/TON	173	152	136	123	112	103	96

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR CORN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	3.5	4.0	4.5	5.0	5.5	6.0	6.5
			---------- $/ton ----------				
70	-164	-131	-98	-64	-31	2	35
80	-129	-91	-53	-14	24	62	100
90	-94	-51	-8	36	79	122	165
100	-59	-11	37	86	134	182	230
110	-24	29	82	136	189	242	295
120	11	69	127	186	244	302	360
130	46	109	172	236	299	362	425

NET RETURN PER ACRE ABOVE CASH COST FOR CORN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	3.5	4.0	4.5	5.0	5.5	6.0	6.5
			---------- $/ton ----------				
70	-312	-279	-246	-213	-180	-147	-114
80	-277	-239	-201	-163	-125	-87	-49
90	-242	-199	-156	-113	-70	-27	16
100	-207	-159	-111	-63	-15	33	81
110	-172	-119	-66	-13	40	93	146
120	-137	-79	-21	37	95	153	211
130	-102	-39	24	87	150	213	276

NET RETURNS PER ACRE ABOVE TOTAL COST FOR CORN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	3.5	4.0	4.5	5.0	5.5	6.0	6.5
			---------- $/ton ----------				
70	-361	-329	-297	-264	-231	-199	-166
80	-326	-289	-252	-214	-176	-139	-101
90	-291	-249	-207	-164	-121	-79	-36
100	-256	-209	-162	-114	-66	-19	29
110	-221	-169	-117	-64	-11	41	94
120	-186	-129	-72	-14	44	101	159
130	-151	-89	-27	36	99	161	224

UC COOPERATIVE EXTENSION

Table 7. COST AND RETURNS/BREAKEVEN ANALYSIS
SACRAMENTO VALLEY - 2004

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	506	414	92	563	-57	614	-108

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	303,760	248,595	55,165	337,837	-34,076	368,297	-64,536

BREAKEVEN PRICES PER YIELD UNIT

			-------- Breakeven Price To Cover --------		
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
			---------- $ per Yield Unit ----------		
FIELD CORN	4.96	Ton	83.53	113.52	123.76

BREAKEVEN YIELDS PER ACRE

			-------- Breakeven Yield To Cover --------		
CROP	Yield Units	Base Price ($/Unit)	Operating Costs	Cash Costs	Total Costs
			---------- Yield Units / Acre ----------		
FIELD CORN	Ton	102.07	4.1	5.5	6.0

Table 8. UC COOPERATIVE EXTENSION
DETAIL OF OPERATIONS – FIELD CORN
SACRAMENTO VALLEY - 2004

Operation	Operation Month	Tractor/ Power Unit	Implement	Materia	Broadcast Rate/acre	Material Unit
Cultural:						
Disc Field - 50% of Acreage	October	425 HP Crawler	Disc - Finish 25'			
Subsoil - 50% of Acreage	October	425 HP Crawler	Subsoiler - 9 Shank			
Land Plane Field - 2X	October	200 HP Crawler	Triplane - 16'			
List Beds	October	135 HP 2WD Tractor	Lister - 6 Row			
Apply Fallow Herbicide	February	Air Application		Roundup	0.19	Gal
Cultivate Beds	March	90 HP 2WD Tractor	Cultivator - Rolling 6 Row			
Plant Corn & Apply Fertilize	April	90 HP 2WD Tractor	Planter - 6 Row	Seed Corn	34.00	Thousand
			Saddle Tank - 300 Gal	10-34-0	151.00	Lb
				Zinc Chelate	2.00	Pint
Break Crust - 10% Of Acreage	April	90 HP 2WD Tractor	Ringroller - 32'			
Open Ditch - 2X	May	165 HP 2WD Tractor	Ditcher - V			
	May	165 HP 2WD Tractor	Ditcher - V			
Irrigate - 6X	May	Labor		Water	12.00	AcIn
	June	Labor		Water	12.00	AcIn
	July	Labor		Water	12.00	AcIn
Close Ditch - 2X	May	90 HP 2WD Tractor	Scraper - Drag 10'			
	August	90 HP 2WD Tractor	Scraper - Drag 10'			
Apply Insecticide - Cutworms	May	90 HP 2WD Tractor	Bait Applicator	Sevin Pellets	2.00	Lb
Furrow Out & Sidedress Fertilize	May	135 HP 2WD Tractor	Cultivator - 6 Row	20-0-0	225.00	Lb N
				Aqua Rig	1.00	Acre
Apply Herbicide - 50% Of Acreage	May	90 HP 2WD Tractor	Sprayer System	Weedar 64	1.00	Pint
Combine Corn	September	Combine w/No Header	Corn Header - 6 Row			
Bankout Grain	September	90 HP 2WD Tractor	Bankout Wagon – 30 T			
Postharvest - Chop Stubble	September	135 HP 2WD Tractor	Mower - Flail 15'			
Equipment Moving & Set Up						
Postharvest - Disc Stubble	September	340 HP Crawler	Disc - Stubble 18'			
Pickup Truck Use	Annual	Pickup 1/2 Ton				
		Pickup 3/4 Ton				
ATV	Annual	ATV				