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**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

**2001**

**SAMPLE COSTS TO PRODUCE  
CORN SILAGE**



**SAN JOAQUIN VALLEY**

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# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## SAMPLE COSTS TO PRODUCE CORN SILAGE San Joaquin Valley 2001

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### INTRODUCTION

Sample costs to produce corn silage in the San Joaquin Valley are shown in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on the production practices considered typical for this crop and region, but will not apply to every farm situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A “*Your Costs*” column in Tables 1 and 2 is provided to enter your costs.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-3589 or the 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) 752-1515. Current studies can be downloaded from the department website <http://coststudies.ucdavis.edu> or obtained from the local county UC Cooperative Extension offices.

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## ASSUMPTIONS

The following assumptions refer to Tables 1 to 7 and pertain to sample costs to produce corn silage in the San Joaquin Valley. Practices described are not University of California recommendations, but represent production practices and materials considered typical of a well-managed planting in the San Joaquin Valley. Costs, materials, and practices in this study will not be applicable to all farms. Establishment and cultural practices vary among growers within the region and variations can be significant. *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.*

**Farm.** The hypothetical farm consists of 300 non-contiguous acres of which 150 acres are rented and 150 owned by the grower. Single cropped corn silage is planted on the 150 acres of rented land. The grower owned 150 acres includes 10 acres occupied by buildings and homestead, and 140 acres planted to other crops.

### Production Cultural Practices and Material Inputs

Tables 1-3 show the costs associated with ground preparation, planting, growing, and harvesting corn silage.

**Single Cropped vs. Double Cropped.** Single cropped and double cropped corn silage have similar cultural practices, but planting and harvesting is later for double cropped silage and there will also be differences in pest control. Field preparations for single cropped silage begin in the early spring and the crop is harvested in September. Double-cropped silage often results in lower yields than single cropped. If the silage follows winter forage, 25% of the single crop rent is allocated to the forage.

**Land Preparation.** Land preparations begin in April by ripping the ground in two directions to fracture the soil and improve water infiltration. The fields are then disced to incorporate the previous crop residue and break up large dirt clods. Borders are pulled to make irrigation basins for the preirrigation. After irrigation the borders are knocked down and two passes are made with a finish or offset disc to prepare the seedbed. Ripping, discing, pulling and knocking down borders are done with either a 200 or 130 hp wheel tractor.

**Planting.** In May, the corn is planted on flat ground in 30 to 36-inch lines at a rate of 32,000 seeds per acre. A seed treatment for cutworms and complete fertilizer is put on at planting. A custom planter does the planting for \$15 per acre.

**Fertilization.** Growers should apply fertilizer or soil amendments after soil tests determine nutrient and pH levels. In this study, at planting a complete fertilizer (6-20-20) at 200 pounds per acre is applied. Additional nitrogen as anhydrous ammonia is applied with one June and two July irrigations at a rate of 60 pounds of nitrogen per acre per application. Potassium may be needed in deficient areas of the San Joaquin Valley, particularly the eastside of Stanislaus and Merced Counties, but is not included in this study.

**Irrigation.** The grower uses both well and surface water at an average cost of \$3.33 per acre-inch or \$40.00 per acre-foot. A preplant irrigation of eight acre-inches is made in March. The amount of water applied preplant will vary depending on soil type and moisture remaining from winter rains and previous crop.

Effective rainfall is not accounted for in this study. After planting, eight irrigations totaling 40 acre-inches of water are furrow run. Three of the irrigations, one in June and two in July, include nitrogen fertilizer injected into the water. Growing season irrigations start in June and end in September.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines: Corn*. For more information on other available pesticides, pest identification, monitoring, and management visit the UC IPM website at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu). Written recommendations are required for many pesticides, and are made by licensed pest control advisors. For information on pesticide use permits, contact the local county agricultural commissioner's office.

**Weeds.** A preplant herbicide (Dual) is sprayed on the field prior to planting and incorporated with the final discing. Post plant weed control consists of mechanical and chemical practices. Shortly after planting, a post-emergent herbicide (Accent) is applied to maintain weed control until harvest. Normally, seven to eight days after the post-emergent herbicide application, the field is cultivated and furrowed.

**Insects.** Several insect and mite pests attack corn, but mites are the only one assumed to reach an economic threshold in this study. Monitoring is important for effective insect control and to minimize insect control costs. Mites are controlled with a custom application of an insecticide/miticide (Comite). An insecticide (Lorsban) is applied with the seed at planting for cutworm control.

**Harvest.** In September the corn is harvested, processed, hauled, and packed into a silage pit by a custom operator. The custom rate for harvesting, processing, hauling, and packing is \$7.00 per ton. Regular harvesting, which excludes the kernel processing is approximately \$0.50 to \$0.75 less. Growers or buyers bagging the silage should add \$5 per ton to their harvesting cost. Additional per ton per mile charges are incurred for hauls greater than two miles. Normally, non-dairy growers sell the crop standing and the buyer or dairy pays the harvesting cost.

If the grower harvests corn using their own equipment, harvest expense (custom harvest costs) is subtracted from harvest costs in Tables 1, 2, and 3. The cash cost for operating grower owned equipment is then added to the harvest costs and the cost of owning harvest equipment added to non-cash overhead.

**Yields.** The crop is assumed to yield 30 tons per acre at 70% moisture. Individual yields can range from 15 to 35 tons per acre in this region. The average annual county yields are shown in Table A.

Table A. Average annual corn silage yields and prices for selected counties in the San Joaquin Valley

County	1996		1997		1998		1999		2000	
	ton/ac	\$/ton	ton/ac	\$/ton	ton/ac	\$/ton	ton/ac	\$/ton	ton/ac	\$/ton
San Joaquin	27.3	21.00	28.2	20.00	28.2	20.00	28.2	18.00	28.9	18.00
Stanislaus	26.2	21.00	27.2	21.00	28.1	21.26	19.4	18.32	21.5	19.40
Merced	22.6	21.78	27.0	21.31	24.5	19.51	27.7	19.25	27.8	19.59
Madera	27.0	23.00	26.0	22.00	25.0	18.00	24.4	18.00	27.1	18.00
Fresno <sup>1</sup>	24.9	19.00	25.6	24.00	25.0	22.00	24.6	20.00	24.4	27.00
Tulare	23.0	22.00	24.8	19.50	24.3	19.50	25.0	18.00	25.7	18.30
Kings	19.2	21.80	17.8	22.16	24.4	18.84	26.0	16.83	25.4	14.24

Source: Annual County Crop Reports, 1996-2000. <sup>1</sup>Field Prices

**Returns.** Based on the current market, a price of \$21 per ton is used to calculate returns. Average annual county prices are shown in Table A. Table 6 and 7 show a range of grower returns over a range of yields. Table 6 shows net returns including harvest costs and Table 7 shows net returns when the crop is sold standing and harvest costs are incurred by the buyer.

**Labor.** Hourly wages for workers are \$7.80 per hour for labor and \$9.00 per hour for machine labor. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$10.47 for non-machine labor and \$12.06 per hour for machine labor. The labor hours for operations involving machinery are 10% higher than the machine hours to account for extra labor involved in equipment set-up, moving, maintenance and repair.

### **Overhead Costs**

**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, liability and property insurance, and investment repairs. Cash overhead costs are included in Tables 1, 2, 3, and 4. Employee benefits, payroll taxes and workman's compensation insurance are included in labor costs and not under cash overhead.

*Property Taxes.* Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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. Land value is assumed to remain unchanged.

*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 10.51% per year. This interest rate is the going market cost of borrowed funds. The costs of postharvest operations are discounted back to the harvest month using a negative interest charge.

**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 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$767 for the entire farm or \$2.56 per acre.

**Office Expense.** Office and business expenses are estimated at \$35 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, and miscellaneous overhead expenses

**Land Rent.** The cash rent for the land is \$200 per acre for a single crop. For double-cropped land with winter forage, \$150 would be allocated to the corn silage and \$50 to the winter forage. The land rented includes developed wells and irrigation system. Land rent appears as a cash overhead cost in Tables 1-4.

**Investment Repairs.** Annual repairs are calculated as 2% of the purchase price.

**Non-cash Overhead.** Farm equipment is purchased either 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. Annual ownership costs for equipment and other investments are shown in Tables 1, 2 and 4.

*Capital Recovery Costs.* Capital recovery cost is the annual depreciation and interest costs for a capital investment and is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). The capital recovery costs are 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  $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$ .

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery 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 the 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. The purchase price and salvage value for equipment and investments are shown in Tables 3 and 5.

*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 and equipment life.

*Interest Rate.* The interest rate of 6.70% 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.

**Land.** Land values for row crop land in the region range from \$1,500 per acre to \$7,000 per acre. In this study the silage is grown on rented land (see Land Rent).

**Irrigation System.** An irrigation district supplies water, though growers may supplement this with well water in some areas. The amount of water used to irrigate corn will vary in the San Joaquin Valley. District and well water costs were combined to obtain an average cost for water. The permanent irrigation system consists of buried mainline. This part of the system is already in place when the land is purchased.

**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. The fuel, lube, and repair cost per acre for each operation shown 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. The on-farm delivery fuel price is \$1.26 per gallon for diesel and \$1.51 per gallon for gasoline.

**Risk.** While this study makes every 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 silage production.

**Acknowledgment.** Appreciation is expressed to the cooperators who provided additional information for this study.

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

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UC COOPERATIVE EXTENSION  
**Table 1. COSTS PER ACRE to PRODUCE CORN SILAGE**  
 SAN JOAQUIN VALLEY - 2001

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
<b>Cultural:</b>								
Subsoil 2X	0.40	6	11	0	0	17		
Disc Stubble 2X	0.35	5	10	0	0	15		
Pull Borders	0.08	1	1	0	0	2		
Knock Down Borders	0.08	1	1	0	0	2		
Finish Disc 2X	0.25	4	7	0	0	11		
Weeds-Preemergent: Dual	0.13	2	1	25	0	28		
Plant w/insecticide+fertilizer	0.00	0	0	60	15	75		
Weeds-Postemergent: Accent	0.13	2	1	36	0	39		
Cultivate	0.15	2	2	0	0	4		
Insects-Miticicide: Comite	0.00	0	0	36	10	46		
Irrigate 1X - Preirrigation	0.10	1	0	27	0	28		
Irrigate 3X- Fertilize 3X	0.30	3	0	100	0	103		
Irrigate 5X	0.50	5	0	83	0	88		
Pickup Truck Use	0.38	5	2	0	0	8		
<b>TOTAL CULTURAL COSTS</b>	<b>2.85</b>	<b>38</b>	<b>37</b>	<b>367</b>	<b>25</b>	<b>467</b>		
<b>Harvest:</b>								
Harvest - Cut, Haul & Pack	0.00	0	0	0	210	210		
<b>TOTAL HARVEST COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>210</b>	<b>210</b>		
Interest on operating capital @ 10.51%						18		
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>38</b>	<b>37</b>	<b>367</b>	<b>235</b>	<b>695</b>		
<b>Cash Overhead</b>								
Liability Insurance						3		
Office Expense						35		
Rent - Silage acres						200		
Property Taxes						3		
Property Insurance						2		
Investment Repairs						6		
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>248</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>943</b>		
<b>Non-cash Overhead</b>								
		Per producing		-- Annual Cost --				
		Acre		Capital Recovery				
Fuel Tanks/Aboveground		22		2		2		
Fuel Wagon		10		1		1		
Shop Building		224		19		19		
Shop Tools		41		4		4		
Siphons 600-1.5" diameter		13		3		3		
Equipment		201		25		25		
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>511</b>		<b>54</b>		<b>54</b>		
<b>TOTAL COSTS/ACRE</b>						<b>997</b>		

UC COOPERATIVE EXTENSION  
**Table 2. COSTS PER ACRE to PRODUCE CORN SILAGE**  
 SAN JOAQUIN VALLEY - 2001

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Corn Silage	30.00	ton	21.00	630	
<b>OPERATING COSTS</b>					
<b>Irrigation:</b>					
Water	48.00	acin	3.33	160	
<b>Seed:</b>					
Corn Seed	32.00	thou	0.94	30	
<b>Fertilizer:</b>					
6-20-20 XB	200.00	lb	0.15	30	
80-0-0 Anhydrous Ammonia	180.00	lb N	0.28	50	
<b>Herbicide:</b>					
Dual II Magnum	2.00	pint	12.60	25	
Accent	0.66	oz	54.45	36	
<b>Insecticide:</b>					
Lorsban 15G	2.00	oz	0.18	0	
Comite	3.00	pint	12.14	36	
<b>Custom:</b>					
Plant	1.00	acre	15.00	15	
Ground Spray Application	1.00	acre	10.00	10	
Harvest w/Processing, Haul & Pack	30.00	ton	7.00	210	
Labor (machine)	2.33	hrs	12.06	28	
Labor (non-machine)	0.90	hrs	10.47	9	
Fuel - Gas	0.95	gal	1.51	1	
Fuel - Diesel	16.13	gal	1.26	20	
Lube				3	
Machinery repair				12	
Interest on operating capital @ 10.51%				18	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>695</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>-65</b>	
<b>CASH OVERHEAD COSTS:</b>					
Liability Insurance				3	
Office Expense				35	
Rent - Silage acres				200	
Property Taxes				3	
Property Insurance				2	
Investment Repairs				6	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<b>248</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>943</b>	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>					
Fuel Tanks/Aboveground				2	
Fuel Wagon				1	
Shop Building				19	
Shop Tools				4	
Siphons 600 1.5"				3	
Equipment				25	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				<b>54</b>	
<b>TOTAL COSTS/ACRE</b>				<b>997</b>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				<b>-367</b>	

UC COOPERATIVE EXTENSION  
**Table 3. COSTS PER ACRE to PRODUCE CORN SILAGE**  
 SAN JOAQUIN VALLEY - 2001

Beginning JAN 01 Ending DEC 01	JAN 01	FEB 01	MAR 01	APR 01	MAY 01	JUN 01	JUL 01	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	TOTAL
<b>Cultural:</b>													
Subsoil 2X				17									17
Disc Stubble 2X				15									15
Pull Borders				1		1							2
Pre-irrigate				28									28
Knock Down Borders					1				1				2
Finish Disc 2X					11								11
Weeds-Preemergent: Dual					28								28
Plant w/insecticide+fertilizer					75								75
Weeds-Postemergent: Accent						39							39
Cultivate						4							4
Insects-Miticide: Comite						46							46
Irrigate & Fertilize 3X						34	69						103
Irrigate 5X							18	53	18				88
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	8
<b>TOTAL CULTURAL COSTS</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>61</b>	<b>116</b>	<b>126</b>	<b>87</b>	<b>54</b>	<b>20</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>467</b>
<b>Harvest:</b>													
Harvest - Cut, Process, Haul & Pack									210				210
<b>TOTAL HARVEST COSTS</b>									<b>210</b>				<b>210</b>
Interest on operating capital	0	0	0	1	2	3	3	4	6	0	0	0	18
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>62</b>	<b>118</b>	<b>128</b>	<b>90</b>	<b>58</b>	<b>235</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>695</b>
<b>Overhead:</b>													
Liability Insurance		3											3
Office Expense		3	3	3	3	3	3	3	3	3	3	3	35
Rent - Silage acres									200				200
Property Taxes			1				1						3
Property Insurance			2										2
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	6
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>6</b>	<b>7</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>203</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>248</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>65</b>	<b>121</b>	<b>132</b>	<b>95</b>	<b>61</b>	<b>439</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>943</b>

UC COOPERATIVE EXTENSION  
**Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,  
and BUSINESS OVERHEAD COSTS**  
SAN JOAQUIN VALLEY - 2001

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		
						Insur- ance	Taxes	Total
01	130 HP 2WD Tractor	77,241	10	22,816	9,170	333	500	10,004
01	200 HP Crawler	167,990	10	49,622	19,945	725	1,088	21,757
01	92 HP 2WD Tractor	52,553	10	15,523	6,239	227	340	6,806
01	Cultivator - 6 Row	8,580	12	1,188	995	33	49	1,077
01	Disc - Border	1,837	12	254	213	7	10	231
01	Disc - Finish 18'	31,734	12	4,395	3,682	120	181	3,983
01	Disc - Stubble 14'	36,036	12	4,991	4,181	137	205	4,523
01	Pickup 1/2 Ton	24,000	5	10,756	3,925	116	174	4,214
01	Rear Blade - 8'	2,511	18	167	239	9	13	262
01	Saddle Tank 300Gal	3,218	10	569	410	13	19	442
01	Spray Boom - 20'	578	10	102	74	2	3	79
01	Subsoiler - 16'	14,500	10	2,564	1,848	57	85	1,990
<b>TOTAL</b>		<b>420,778</b>		<b>112,947</b>	<b>50,921</b>	<b>1,777</b>	<b>2,669</b>	<b>55,367</b>
60% of New Cost *		252,467		67,768	30,553	1,066	1,601	33,220

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Fuel Wagon	2,850	10	285	379	10	16	57	462
Fuel Tanks/Aboveground	6,514	20	250	594	23	34	130	781
Shop Building	65,000	25		5,428	216	325	1,300	7,269
Shop Tools	12,000	20	600	1,091	42	63	240	1,436
Siphons 600-1.5" diameter	3,675	5		889	12	18	74	994
<b>TOTAL INVESTMENT</b>	<b>90,039</b>		<b>1,135</b>	<b>8,382</b>	<b>304</b>	<b>456</b>	<b>1,801</b>	<b>10,942</b>

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	300	acre	2.56	768
Office Expense	290	acre	35.00	10,150
Rent - Silage acres	150	acre	200.00	30,000

UC COOPERATIVE EXTENSION  
**Table 5. HOURLY EQUIPMENT COSTS**  
 SAN JOAQUIN VALLEY - 2001

		COSTS PER HOUR							
Yr	Description	Actual Hours Used	Cash Overhead			Operating			Total Costs/Hr
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
01	130 HP 2WD Tractor	1,199.40	4.59	0.17	0.25	3.48	10.93	14.41	19.41
01	200 HP Crawler	1,598.70	7.49	0.27	0.41	4.33	16.82	21.15	29.31
01	92 HP 2WD Tractor	1,198.20	3.12	0.11	0.17	2.37	6.55	8.92	12.33
01	Cultivator - 6 Row	163.10	3.66	0.12	0.18	1.72	0.00	1.72	5.68
01	Disc - Border	166.00	0.77	0.03	0.04	0.29	0.00	0.29	1.12
01	Disc - Finish 18'	165.10	13.38	0.44	0.66	5.00	0.00	5.00	19.47
01	Disc - Stubble 14'	165.90	15.12	0.49	0.74	5.68	0.00	5.68	22.03
01	Pickup 1/2 Ton	295.00	7.98	0.24	0.35	1.55	4.34	5.89	14.47
01	Rear Blade - 8'	166.00	0.86	0.03	0.05	0.37	0.00	0.37	1.31
01	Saddle Tank 300Gal	165.10	1.49	0.05	0.07	0.86	0.00	0.86	2.46
01	Spray Boom - 20'	165.10	0.27	0.01	0.01	0.16	0.00	0.16	0.44
01	Subsoiler - 16'	199.60	5.55	0.17	0.26	3.26	0.00	3.26	9.24

UC COOPERATIVE EXTENSION  
**Table 6. RANGING ANALYSIS with Harvest Costs**  
 SAN JOAQUIN VALLEY - 2001

COSTS PER ACRE AT VARYING YIELD TO PRODUCE CORN SILAGE

	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
<b>OPERATING COSTS:</b>							
Cultural Cost	467	467	467	467	467	467	467
Harvest Cost	168	182	196	210	224	238	252
Interest on operating capital	18	18	18	18	18	18	18
<b>TOTAL OPERATING COSTS/acre</b>	<b>652</b>	<b>667</b>	<b>681</b>	<b>695</b>	<b>709</b>	<b>723</b>	<b>737</b>
<b>Total Operating Cost/ton</b>	<b>27</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>22</b>	<b>21</b>	<b>20</b>
<b>CASH OVERHEAD COSTS</b>							
CASH OVERHEAD COSTS	248	248	248	248	248	248	248
<b>TOTAL CASH COSTS/acre</b>	<b>901</b>	<b>915</b>	<b>929</b>	<b>943</b>	<b>957</b>	<b>972</b>	<b>986</b>
<b>Total Cash Costs/ton</b>	<b>38</b>	<b>35</b>	<b>33</b>	<b>31</b>	<b>30</b>	<b>29</b>	<b>27</b>
<b>NON-CASH OVERHEAD COSTS/acre</b>							
NON-CASH OVERHEAD COSTS/acre	54	54	54	54	54	54	54
<b>TOTAL COSTS/ACRE</b>	<b>954</b>	<b>969</b>	<b>983</b>	<b>997</b>	<b>1,011</b>	<b>1,025</b>	<b>1,039</b>
<b>Total Cost/ton</b>	<b>40</b>	<b>37</b>	<b>35</b>	<b>33</b>	<b>32</b>	<b>30</b>	<b>29</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-220	-199	-177	-155	-133	-111	-89
19.00	-196	-173	-149	-125	-101	-77	-53
20.00	-172	-147	-121	-95	-69	-43	-17
21.00	-148	-121	-93	-65	-37	-9	19
22.00	-124	-95	-65	-35	-5	25	55
23.00	-100	-69	-37	-5	27	59	91
24.00	-76	-43	-9	25	59	93	127

NET RETURN PER ACRE ABOVE CASH COST FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-469	-447	-425	-403	-381	-360	-338
19.00	-445	-421	-397	-373	-349	-326	-302
20.00	-421	-395	-369	-343	-317	-292	-266
21.00	-397	-369	-341	-313	-285	-258	-230
22.00	-373	-343	-313	-283	-253	-224	-194
23.00	-349	-317	-285	-253	-221	-190	-158
24.00	-325	-291	-257	-223	-189	-156	-122

NET RETURNS PER ACRE ABOVE TOTAL COST FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-522	-501	-479	-457	-435	-413	-391
19.00	-498	-475	-451	-427	-403	-379	-355
20.00	-474	-449	-423	-397	-371	-345	-319
21.00	-450	-423	-395	-367	-339	-311	-283
22.00	-426	-397	-367	-337	-307	-277	-247
23.00	-402	-371	-339	-307	-275	-243	-211
24.00	-378	-345	-311	-277	-243	-209	-175

UC COOPERATIVE EXTENSION  
**Table7. RANGING ANALYSIS for Corn Silage SOLD STANDING (No harvest costs)**  
 SAN JOAQUIN VALLEY - 2001

COSTS PER ACRE AT VARYING YIELD TO PRODUCE CORN SILAGE

	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
<b>OPERATING COSTS:</b>							
Cultural Cost	467	467	467	467	467	467	467
Interest on operating capital	16	16	16	16	16	16	16
<b>TOTAL OPERATING COSTS/acre</b>	<b>483</b>	<b>483</b>	<b>483</b>	<b>483</b>	<b>483</b>	<b>483</b>	<b>483</b>
<b>Total Operating Cost/ton</b>	<b>20</b>	<b>19</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>
<b>CASH OVERHEAD COSTS</b>							
TOTAL CASH COSTS/acre	731	731	731	731	731	731	731
<b>Total Cash Costs/ton</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>24</b>	<b>23</b>	<b>22</b>	<b>20</b>
<b>NON-CASH OVERHEAD COSTS/acre</b>							
TOTAL COSTS/ACRE	785	785	785	785	785	785	785
<b>Total Cost/ton</b>	<b>33</b>	<b>30</b>	<b>28</b>	<b>26</b>	<b>25</b>	<b>23</b>	<b>22</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-51	-15	21	57	93	129	165
19.00	-27	11	49	87	125	163	201
20.00	-3	37	77	117	157	197	237
21.00	21	63	105	147	189	231	273
22.00	45	89	133	177	221	265	309
23.00	69	115	161	207	253	299	345
24.00	93	141	189	237	285	333	381

NET RETURN PER ACRE ABOVE CASH COST FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-299	-263	-227	-191	-155	-119	-83
19.00	-275	-237	-199	-161	-123	-85	-47
20.00	-251	-211	-171	-131	-91	-51	-11
21.00	-227	-185	-143	-101	-59	-17	25
22.00	-203	-159	-115	-71	-27	17	61
23.00	-179	-133	-87	-41	5	51	97
24.00	-155	-107	-59	-11	37	85	133

NET RETURNS PER ACRE ABOVE TOTAL COST FOR CORN SILAGE

PRICE \$/ton	YIELD (ton/acre)						
	24.00	26.00	28.00	30.00	32.00	34.00	36.00
18.00	-353	-317	-281	-245	-209	-173	-137
19.00	-329	-291	-253	-215	-177	-139	-101
20.00	-305	-265	-225	-185	-145	-105	-65
21.00	-281	-239	-197	-155	-113	-71	-29
22.00	-257	-213	-169	-125	-81	-37	7
23.00	-233	-187	-141	-95	-49	-3	43
24.00	-209	-161	-113	-65	-17	31	79