
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2003

**SAMPLE COSTS TO
ESTABLISH AND PRODUCE**

ALFALFA



**SAN JOAQUIN VALLEY
50 Acre Planting**

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50 acres

San Joaquin Valley 2003

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INTRODUCTION

Sample costs to establish an alfalfa stand and produce alfalfa 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. “Your Costs” columns in Tables 1, 2, 3 and 4 are provided for entering your farm costs.

The hypothetical farm operations, 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, 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) 752-3589. Current studies can be downloaded from the department website <http://coststudies.ucdavis.edu> or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

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ASSUMPTIONS

The assumptions refer to Tables 1 through 8 and pertain to sample costs to establish an alfalfa stand and produce alfalfa in the San Joaquin Valley. Practices described represent production practices and materials considered typical of a well-managed alfalfa stand in the San Joaquin Valley. Costs, materials, and practices in this study will not be applicable to all situations. Establishment and cultural practices vary among growers within the region. **The use of trade names and cultural practices 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 or cultural practices.**

Farm. The hypothetical farm consists of 50 contiguous acres owned and managed by the grower. Alfalfa is planted on the entire 50 acres.

Stand Establishment Operating Costs

Tables 1 and 2 show the costs associated with ground preparation, planting and establishing an alfalfa stand. Land preparation and planting are done in the fall. The establishment year ends after the herbicide application in December.

Land Preparation. Stand establishment begins by disking down the residue from the previous crop. The ground is chiseled to a depth of 18 to 24 inches to fracture the soil, which improves root penetration and water infiltration. The field is laser leveled. Borders (levees) for irrigation checks are made at periodic intervals (60 ft in this study) through the field. The fields are disced and harrowed to prepare the seedbed. A custom operator does all operations.

Planting. A custom operator plants the alfalfa seed 1/4 inch to 1/2 inch deep at 25 to 30 pounds per acre using a Brillion seeder. The seed is planted in September and the stand life is expected to be four years.

Fertilization. Nitrogen (N) and phosphorus (P) as 11-52-0 at 300 pounds per acre of material are applied by a custom operator in September prior to the final disking. The fertilizer application in this study is assumed to be sufficient for 2 years; therefore one-half of the cost is allocated to the establishment year and one-half to the first production year. Depending upon preplant soil analysis results, potassium (K) may also be required.

Irrigation. Water for seed germination is applied immediately after planting (8 acre-inches). If winter rains do not occur, a second irrigation in October or early November may be necessary. Water is supplied by an irrigation district, although some growers may use or supplement with well water. Prices for water vary among irrigation districts. The authors agreed that \$30 per acre-foot is a fair value for this study, based upon information from their respective counties.

Pest Management. For pest identification, monitoring, management and pesticide information, visit the UC IPM website at www.ipm.ucdavis.edu. Written recommendations are required for many pesticides, and are available from licensed pest control advisers. For information on pesticide use permits, contact the local county Agricultural Commissioner's office.

Weeds. Post-emergent herbicides (Raptor) and 2,4-DB herbicide (Butyrac) are applied in December for broadleaf weed and grass control. A custom applicator applies the herbicides.

Overhead Costs. One-half of the cash and non-cash overhead costs for the establishment year are allocated to the previous crop.

Production Operating Costs

Irrigation. Irrigation includes the water cost and labor expense. From April to October, ten irrigations totaling 4.5 acre-feet of water are applied by flooding the checks. The actual water requirement will vary each year based on soil, climatic, and plant physiological factors. Water is pumped through alfalfa valves at the head of the field and flows down the alfalfa check between the borders.

Fertilization. Once the stand is established, plant tissue test should be taken to determine nutrient requirements. In this study, phosphorous as 11-52-0 at 150 pounds per acre is applied in November of the second year and is assumed to be sufficient for the remaining stand life. Therefore, the cost is allocated over three years.

Pest Management. The pesticides and rates mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines – Alfalfa*. **Pesticides mentioned in this study are not recommendations, but those commonly used in the region.** For information and pesticide use permits, contact the local county Agricultural Commissioner's office. For information on other pesticides available, pest identification, monitoring, and management, visit the UC IPM website at www.ipm.ucdavis.edu. **Pest control costs can vary considerably each year depending upon local conditions and pest populations in any given year.** Adjuvants are recommended for many pesticides for effective control and are an added cost. The adjuvants in this study are not included as a cost in all applications.

Pest Control Adviser (PCA). Written recommendations are required for many pesticides and are available from licensed pest control advisers. In addition the PCA or an independent consultant will monitor the field for agronomic problems including irrigation and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company.

Weeds. During the first two years, a preemergence herbicide (Treflan TR-10) is applied in February for grass control or in February and April if dodder is expected. Residual herbicides (Velpar and Karmex) for control of winter weeds are applied during December of the first and second years, and a contact herbicide (Gramoxone) is applied in the third year. A post emergent herbicide (Prism) is applied in April of the third and fourth years to control summer grasses. The stand is removed at the end of the fourth year, hence no winter herbicide application. The herbicide costs will vary slightly during the production years due to the difference each year in weed control.

Insects. Several insect species attack alfalfa, but alfalfa weevil, aphids, alfalfa caterpillar, and armyworms are the major economic pests in this study. Weevils and aphids are assumed to reach population levels requiring a single treatment for control for which an insecticide (Lorsban) is applied by air in March. Worms (alfalfa caterpillar and armyworms) are controlled in July with an aerial insecticide (Lannate) application.

Harvest. In this study, the alfalfa is custom harvested for hay seven times - April, May, June, July, August, September, and October. Alfalfa for hay is cut with a self-propelled swather and left to dry for several days before it is turned and windrowed using a rake. Once the hay has dried to the correct moisture content, it is baled into 125-pound bales. The bales are picked up with a balewagon that moves them from the field and roadsides them in a stack.

Custom Harvest. In this study, the custom harvester charges \$25 per ton to swath, rake, and bale and \$0.28 per 125 pound bale (\$4.48 per ton) to roadside. Many harvesting companies swath, rake, bale, and roadside (pickup bales and stack) the harvested alfalfa for a single fee. Fees to swath, rake, bale, and roadside, range from \$25 to \$32 per hay ton and are usually based on a minimum of one-ton of hay per acre. Some companies will hire out for the individual operations and charge accordingly, but these fees when added together may be higher than the fee quoted for all operations. Individually, swathing ranges around \$10 to \$12 per acre, raking \$4 to \$5 per acre, baling \$12 to \$14 per ton, and roadsiding \$4 to \$6 per ton.

Yields. The crop is assumed to yield 7.00 tons of hay per acre at 90% dry matter (DM). Annual yields range from 5 to 11 tons of hay per acre in this region.

Returns. A price of \$125 per ton for premium hay is based on USDA California 2002 averages for the San Joaquin Valley market districts. Hay prices and hay quality will vary during the season and by districts. USDA alfalfa hay standards are Supreme, Premium, Good, Fair, and Utility, with Supreme garnering the highest price. The hay price in this study is based on 90% dry matter.

Pickup. The pickup travels 7.1 miles per acre for alfalfa production use or a total of 356 miles per year. Costs are estimated and not based on any specific data.

Labor. Labor rates of \$13.14 per hour for machine operators and \$9.86 for general labor includes payroll overhead of 46%. The basic hourly wages are \$9.00 for machine operators and \$6.75 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 costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2003 (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.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.11 and \$1.58 per gallon, respectively. The fuel prices are a January 2003 average based on four California delivery locations. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in the "Cost Per Acre to Produce" table is determined by multiplying the total hourly operating cost in the "Hourly Equipment Costs" table for each piece of equipment used from the Operation Time (Hrs/A) column 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.

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 7.14% 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.

Risk. Production risks should not be minimized. 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 alfalfa production.

Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest, office expense, liability and property insurance, and investment repairs (buildings and irrigation equipment). Employee benefits, payroll taxes and workers' compensation insurance are included in labor costs and not under cash overhead. One-half of the overhead costs in the establishment year are allocated to the previous crop.

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 varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$516 for the entire farm or \$10.32 per acre.

Office. Costs are estimated at \$20 per acre for the ranch and are not based on any specific information, except that there is a cost involved for bookkeeping, payroll, tax preparation, and telephone.

Investment Repairs. Annual repairs on investments or capital recovery items that require maintenance are calculated as 2% of the purchase price. Repairs are not calculated for land and establishment costs.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. One-half of the overhead costs in the establishment year are allocated to the previous crop.

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 the estimated value of an investment at the end of its useful life. For farm machinery the value is a percentage of the new cost of the investment (Boehlje and Eidman). The value is calculated from equations developed by 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.

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 6.25% 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.

Irrigation System. The system consists of underground lines with alfalfa valves. There is an 18-inch mainline (1,680 feet) with 10 or 12-inch alfalfa valves every 60-feet. The permanent irrigation system consists of wells, pumps and motors, and buried mainline included in the land purchase price.

Land. Cropland with district water suitable for alfalfa production typically ranges in value among counties from \$2,000 to \$5,500 per acre, except for Stanislaus County, which ranges from \$3,000 to \$8,500. The land in this study is owned by the grower and cost \$5,500 per acre.

Establishment Costs. Costs to establish the alfalfa stand are used to determine capital recovery expenses, depreciation, and interest on investment, during the production years. The establishment cost is the sum of cash costs for land preparation, planting, and cash overhead for establishing the alfalfa. The Total Cash Cost shown in Table 1 represents the establishment cost per acre. For this study, the cost is \$514 per acre or \$25,700 for the 50 acres. The alfalfa stand establishment cost is amortized over the 4-year stand life.

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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UC COOPERATIVE EXTENSION
Table 1. COSTS PER ACRE to ESTABLISH ALFALFA
 SAN JOAQUIN VALLEY 2003

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/Rent			
Stubble Disc 2X	0.00	0	0	0	78	78		
Chisel Field	0.00	0	0	0	53	53		
Laser Level Field	0.00	0	0	0	75	75		
Make Borders (Levees)	0.00	0	0	0	20	20		
Fertilize -1X/2Yrs (11-52-0)	0.00	0	0	24	3	26		
Finish Disc and Harrow	0.00	0	0	0	39	39		
Plant	0.00	0	0	81	12	93		
Irrigate	0.18	2	0	20	0	22		
Weed-Winter (Raptor, 2,4-DB)	0.00	0	0	34	9	42		
Pickup Truck Use	0.12	2	1	0	0	3		
TOTAL CULTURAL COSTS	0.30	4	1	158	288	451		
Interest on operating capital @ 7.14%						11		
TOTAL OPERATING COSTS/ACRE		4	1	158	288	462		
CASH OVERHEAD:*								
Liability Insurance						5		
Office Expense						10		
Property Taxes						31		
Property Insurance						2		
Investment Repairs						4		
TOTAL CASH OVERHEAD COSTS						52		
TOTAL CASH COSTS/ACRE						514		
NON-CASH OVERHEAD:*								
		Per producing acre		-- Annual Cost --				
				Capital Recovery				
Land		2,750		172		172		
Irrigation System		206		17		17		
Equipment		336		39		39		
TOTAL NON-CASH OVERHEAD COSTS		3,292		227		227		
TOTAL COSTS/ACRE						742		

*1/2 of costs allocated to previous crop

UC COOPERATIVE EXTENSION
Table 2. MATERIAL and INPUT COSTS to ESTABLISH ALFALFA
 SAN JOAQUIN VALLEY 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS					
Custom:					
Disc Stubble	2.00	acre	39.00	78	
Chisel	1.00	acre	53.00	53	
Laser Level	1.00	acre	75.00	75	
Broadcast Fertilizer 1X/2Yr	0.50	acre	5.50	3	
Make Borders	1.00	acre	20.00	20	
Finish Disc & Harrow	1.00	acre	39.00	39	
Plant	1.00	acre	12.00	12	
Ground Application	1.00	acre	8.50	9	
Fertilizer:					
11-52-0	150.00	lb	0.16	24	
Seed:					
Alfalfa Seed (raw)	30.00	lb	2.60	78	
Inoculum (\$/seed lb)	30.00	sdlb	0.09	3	
Irrigation:					
Water	8.00	acin	2.50	20	
Herbicide:					
Raptor	4.00	floz	4.77	19	
Butyrac (2,4-DB)	2.00	pint	4.75	10	
Adjuvant:					
No Foam A	2.00	pint	2.70	5	
Labor (machine)	0.14	hrs	13.14	2	
Labor (non-machine)	0.18	hrs	9.86	2	
Fuel – Gas	0.35	gal	1.58	1	
Fuel - Diesel	0.00	gal	1.11	0	
Lube				0	
Machinery repair				0	
Interest on operating capital @ 7.14%					11
TOTAL OPERATING COSTS/ACRE				462	

UC COOPERATIVE EXTENSION
Table 3. COSTS PER ACRE to PRODUCE ALFALFA
 SAN JOAQUIN VALLEY 2003

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:							
Weed-Grasses (TR-10)	0.00	0	0	21	9	30	
Insect-Aphid/Weevil (Lorsban)	0.00	0	0	12	9	21	
Weed-Spring (Prism)	0.00	0	0	20	9	28	
Irrigate - 10X	1.80	18	0	135	0	153	
Insect-Worm (Lannate)	0.00	0	0	10	9	19	
Fertilize 1X/3Yr (11-52-0)	0.00	0	0	8	2	10	
Weed-Winter (Velpar/Karmex)	0.00	0	0	27	9	36	
Pickup Truck Use	0.24	4	2	0	0	6	
TOTAL CULTURAL COSTS	2.04	21	2	233	45	302	
Harvest:							
Harvest - Hay 7X	0.00	0	0	0	206	206	
TOTAL HARVEST COSTS	0.00	0	0	0	206	206	
Interest on operating capital @ 7.14%						9	
TOTAL OPERATING COSTS/ACRE		21	2	233	252	517	
CASH OVERHEAD:							
Liability Insurance						10	
Office Expense						20	
Property Taxes						59	
Property Insurance						3	
Investment Repairs						8	
TOTAL CASH OVERHEAD COSTS						101	
TOTAL CASH COSTS/ACRE						618	
NON-CASH OVERHEAD:							
		Per producing acre		-- Annual Cost -- Capital Recovery			
Land		5,500		344		344	
Irrigation System		413		37		37	
Alfalfa Establishment		514		149		149	
Equipment		336		39		39	
TOTAL NON-CASH OVERHEAD COSTS		6,762		568		568	
TOTAL COSTS/ACRE						1,186	

UC COOPERATIVE EXTENSION
Table 4. COSTS AND RETURNS PER ACRE to PRODUCE ALFALFA
 SAN JOAQUIN VALLEY 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Hay	7.00	ton	125.00	875	
OPERATING COSTS					
Insecticide:					
Lorsban 4 E	2.00	pint	6.19	12	
Lannate 90 SP	0.50	lb	20.00	10	
Custom:					
Air Application	2.00	acre	9.00	18	
Ground Application	3.00	acre	8.50	25	
Swath, Rake, Bale	7.00	ton	25.00	175	
Roadside Hay 125 lb bale	7.00	ton	4.48	31	
Broadcast Fertilizer	0.33	acre	5.50	2	
Herbicide:					
Treflan TR-10	20.00	lb	1.05	21	
Prism	1.00	pint	19.62	20	
Velpar L	2.00	pint	9.50	19	
Karmex DF	1.50	lb	5.59	8	
Irrigation:					
Water	54.00	acin	2.50	135	
Fertilizer:					
11-52-0	50.00	lb	0.16	8	
Labor (machine)	0.29	hrs	13.14	4	
Labor (non-machine)	1.80	hrs	9.86	18	
Fuel - Gas	0.71	gal	1.58	1	
Fuel - Diesel	0.00	gal	1.11	0	
Lube				0	
Machinery repair				0	
Interest on operating capital @ 7.14%				9	
TOTAL OPERATING COSTS/ACRE				517	
NET RETURNS ABOVE OPERATING COSTS				358	
CASH OVERHEAD COSTS:					
Liability Insurance				10	
Office Expense				20	
Property Taxes				59	
Property Insurance				3	
Investment Repairs				8	
TOTAL CASH OVERHEAD COSTS/ACRE				101	
TOTAL CASH COSTS/ACRE				618	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Land				344	
Irrigation System				37	
Alfalfa Establishment				149	
Equipment				39	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				568	
TOTAL COSTS/ACRE				1,186	
NET RETURNS ABOVE TOTAL COSTS				-311	

UC COOPERATIVE EXTENSION
Table 5. MONTHLY CASH COSTS PER ACRE to PRODUCE ALFALFA
 SAN JOAQUIN VALLEY 2003

Beginning JAN 03	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 03	03	03	03	03	03	03	03	03	03	03	03	03	
Cultural:													
Weed-Grasses (TR-10)		30											30
Insect-Aphid/Weevil (Lorsban)			21										21
Weed-Spring (Prism)				28									28
Irrigate - 10X				15	15	31	31	31	15	15			153
Insect-Worm (Lannate)							19						19
Fertilize 1X/3Yr (11-52-0)											10		10
Weed-Winter (Velpar/Karmex)												36	36
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	6
TOTAL CULTURAL COSTS	0	30	22	44	16	31	50	31	16	16	10	36	302
Harvest:													
Harvest - Hay				29	29	29	29	29	29	29			206
TOTAL HARVEST COSTS				29	29	29	29	29	29	29			206
Interest on operating capital	0	0	0	1	1	1	2	2	2	-1	0	0	9
TOTAL OPERATING COSTS/ACRE	0	30	22	74	46	62	81	63	48	45	10	36	517
TOTAL OPERATING COSTS/ton	0	4	3	11	7	9	12	9	7	6	1	5	74
OVERHEAD:													
Liability Insurance		10											10
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	20
Property Taxes	30						30						59
Property Insurance	1						1						3
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	8
TOTAL CASH OVERHEAD COSTS	33	13	2	2	2	2	33	2	2	2	2	2	101
TOTAL CASH COSTS/ACRE	34	43	25	76	49	64	115	65	50	47	12	38	618
TOTAL CASH COSTS/ton	5	6	4	11	7	9	16	9	7	7	2	5	88

UC COOPERATIVE EXTENSION
**Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS**
SAN JOAQUIN VALLEY 2003

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
					Insur- ance	Taxes	
03 Pickup 3/4 Ton	28,000	10	8,271	3,229	123	181	3,533
TOTAL	28,000		8,271	3,229	123	181	3,533
60% of New Cost*	16,800		4,963	1,938	74	109	2,120

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Alfalfa Establishment	25,700	4		7,459	0	0	0	7,459
Irrigation System	20,625	20		1,835	70	103	412	2,420
Land	275,000	20	275,000	17,188	0	2,750	0	19,937
TOTAL INVESTMENT	321,325		275,000	26,482	70	2,853	412	29,817

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/	Total
	Farm	Unit	Unit	Cost
Liability Insurance	50.00	acre	10.32	516
Office Expense	50.00	acre	20.00	1,000

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY 2003

Yr Description	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Capital Recovery	Cash Overhead		Operating			
			Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
03 Pickup 3/4 Ton	11.90	163.10	6.19	9.16	2.02	5.45	7.47	185.92

UC COOPERATIVE EXTENSION
Table 8. RANGING ANALYSIS
 SAN JOAQUIN VALLEY 2003

COSTS PER ACRE TO PRODUCE ALFALFA AT VARYING YIELDS

Total Yield as Hay:	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
OPERATING COSTS:							
Cultural Cost	302	302	302	302	302	302	302
Harvest Cost	147	177	206	236	265	295	324
Interest on operating capital	8	9	9	10	10	11	11
TOTAL OPERATING COSTS/acre	457	488	517	548	577	608	637
Operating Cost/ton	91	81	74	69	64	61	58
CASH OVERHEAD COSTS							
TOTAL CASH COSTS/acre	558	589	618	649	678	709	738
Cash Costs/ton	112	98	88	81	75	71	67
NON-CASH OVERHEAD COSTS							
TOTAL COSTS/acre	1,126	1,157	1,186	1,217	1,246	1,277	1,306
Total Costs/ton	225	193	169	152	138	128	119

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
110.00	93	172	253	332	413	492	573
120.00	143	232	323	412	503	592	683
125.00	168	262	358	452	548	642	738
130.00	193	292	393	492	593	692	793
140.00	243	352	463	572	683	792	903
150.00	293	412	533	652	773	892	1,013
160.00	343	472	603	732	863	992	1,123
170.00	393	532	673	812	953	1,092	1,233

NET RETURN PER ACRE ABOVE CASH COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
110.00	-8	71	152	231	312	391	472
120.00	42	131	222	311	402	491	582
125.00	67	161	257	351	447	541	637
130.00	92	191	292	391	492	591	692
140.00	142	251	362	471	582	691	802
150.00	192	311	432	551	672	791	912
160.00	242	371	502	631	762	891	1,022
170.00	292	431	572	711	852	991	1,132

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
110.00	-576	-497	-416	-337	-256	-177	-96
120.00	-526	-437	-346	-257	-166	-77	14
125.00	-501	-407	-311	-217	-121	-27	69
130.00	-476	-377	-276	-177	-76	23	124
140.00	-426	-317	-206	-97	14	123	234
150.00	-376	-257	-136	-17	104	223	344
160.00	-326	-197	-66	63	194	323	454
170.00	-276	-137	4	143	284	423	564