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**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

**2008**

**SAMPLE COSTS TO  
ESTABLISH AND PRODUCE  
ALFALFA**



**SAN JOAQUIN VALLEY  
50 Acre Planting**

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# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## SAMPLE COSTS TO ESTABLISH AND PRODUCE ALFALFA

50 acres  
San Joaquin Valley 2008

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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 9 and pertain to sample costs to establish an alfalfa stand and produce alfalfa hay 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. **Farms of this size may have minimum charges for custom services and also some operations may have equipment move-in fees.** These possible costs are not reflected in the study.

### Stand Establishment Operating Costs (Tables 1-2)

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 (stubble disc) 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. Preplant soil testing for phosphorous (P) and potassium (K) is recommended. In this study, the PCA collects one soil sample per 20 acres and the cost shown in Table 1 is the analysis or lab fee.

**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 \$36 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](http://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** (Tables 3-9)

**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. Water costs will vary considerably depending upon the irrigation district. A cost of \$3 per acre inch (\$36 per acre foot) is used in this study.

**Fertilization.** Once the stand is established, plant tissue tests should be taken to determine nutrient requirements. Tissue testing in this study is done each year in August to determine the levels of P and K. Costs shown are for the analysis based on one sample per 20 acres collected by the PCA. Tissue samples should be scheduled once during the growing season and your ag consultant (PCA) may recommend this be done either in the spring or fall. In this study, phosphorous as 11-52-0 at 150 pounds per acre is applied in November of the second production year and is sufficient for the remaining production years. Fertilizer previously applied (300 lbs) in the establishment year provided nutrients for the establishment and early production years. One-half (150 lbs) of the fertilizer was allocated to the establishment year. Therefore, a portion (75 lbs per acre per year) of the fertilizer cost is allocated to the production budget each year.

**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](http://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 use with some pesticides for effective control. In this study, an adjuvant is used in one of the herbicide applications during the establishment year.

*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 PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. It is assumed in this study that PCA services are provided by the 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 at the end of the first and second years, and a contact herbicide (Gramoxone) is applied at the end of the third year. A post emergent herbicide (SelectMax) is applied in May 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 (15" W x 23" H x 44-46" L). The bales are picked up with a balewagon that moves them from the field and roadsides them in a stack.

*Custom Harvest.* Some harvesting companies swath, rake, bale, and roadside (pick up bales and stack) the harvested alfalfa for a single fee and the fee is usually based on a one ton yield. In this study, the custom harvester charges \$12 per acre to swath, \$7 per acre to rake, \$16 per ton (\$1.00 per 125 lb bale) to bale and \$6.08 per ton (\$0.38 per bale) to roadside.

**Yields.** The crop is assumed to yield 8.00 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 \$185 per ton for premium hay is based on USDA California 2007 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 is used for business purposes as needed. Costs are estimated and not based on any specific data.

### **Labor, Equipment and Interest**

**Labor.** Labor rates of \$14.28 per hour for machine operators and \$10.88 for general labor includes payroll overhead of 36%. The basic hourly wages are \$10.50 for machine operators and \$8.00 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, 2008 (personal email from California Department of Insurance, March 2008, unreferenced). Labor for operations involving machinery are 20% higher than the operation time given in Table 3 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 American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$4.05 and \$3.45 per gallon, respectively. The costs are based on 2007-2008 (November to April) American Automobile Association (AAA) and Department of Energy (DOE) monthly data. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair costs per acre for each operation in Table 3 are determined by multiplying the total hourly operating cost in Table 8 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.

**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 6.75% 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. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of April 2008.

**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. 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 0.740% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$559 for the entire farm.

**Office.** Costs are estimated at \$25 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.* An interest rate of 4.25% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of April 2008.

**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 \$2,500 to \$20,000 per acre (2007 Trends & Leases). The land in this study is owned by the grower and cost \$11,200 per acre. Small farms (50 acres and less) tend to have higher land costs than farms over 50 acres. Land rents for cropland with district water range from \$125 to \$300 per acre and may vary according to value or type of crop planted.

**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 \$531 per acre or \$26,550 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 2008

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:								
Fertilize: Soil Sampling & Analysis (P&K)	0.00	0	0	0	2	2		
Land Prep: Disc Stubble 2X	0.00	0	0	0	37	37		
Land Prep: Chisel Field	0.00	0	0	0	35	35		
Land Prep: Laser Level Field	0.00	0	0	0	75	75		
Land Prep: Make Borders (Levees)	0.00	0	0	0	20	20		
Fertilize: (1X/2 Yrs or 1/2 of cost) 11-52-0	0.00	0	0	60	5	65		
Land Prep: Finish Disc and Harrow	0.00	0	0	0	19	19		
Plant	0.00	0	0	90	18	108		
Irrigate	0.18	2	0	24	0	26		
Weed: Winter (Raptor, Butyrac)	0.00	0	0	38	9	47		
Pickup Truck Use	0.12	2	2	0	0	4		
<b>TOTAL CULTURAL COSTS</b>	<b>0.30</b>	<b>4</b>	<b>2</b>	<b>212</b>	<b>219</b>	<b>437</b>		
Interest on operating capital @ 6.75%						10		
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>4</b>	<b>2</b>	<b>212</b>	<b>219</b>	<b>446</b>		
CASH OVERHEAD:								
Liability Insurance						6		
Office Expense						13		
Property Taxes						60		
Property Insurance						3		
Investment Repairs						5		
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>85</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>531</b>		
*NON-CASH OVERHEAD:								
		Per producing acre		-- Annual Cost -- Capital Recovery				
Land		5,600		238		238		
Irrigation System		225		17		17		
Equipment		384		39		39		
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>6,209</b>		<b>294</b>		<b>294</b>		
<b>TOTAL COSTS/ACRE</b>						<b>825</b>		

X = number of times as 2X = 2 passes over field. 1X/2 Yrs = applied once every 2 years & one-half cost is shown each year.

\*1/2 costs allocated to previous crop

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**Table 2. MATERIAL and INPUT COSTS to ESTABLISH ALFALFA**  
 SAN JOAQUIN VALLEY 2008

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>OPERATING COSTS</b>					
<b>Custom:</b>					
Soil Analysis (P)	0.05	each	18.00	1	
Soil Analysis (K)	0.05	each	18.00	1	
Disc	2.00	acre	18.50	37	
Chisel	1.00	acre	35.00	35	
Laser Level	1.00	acre	75.00	75	
Broadcast Fertilizer	0.50	acre	9.50	5	
Make Borders	1.00	acre	20.00	20	
Finish Disc & Harrow	1.00	acre	18.50	19	
Plant	1.00	acre	17.50	18	
Ground Application	1.00	acre	9.00	9	
<b>Fertilizer:</b>					
11-52-0 (P2O5)*	150.00	lb	0.40	60	
<b>Seed:</b>					
Alfalfa Seed (inoculated/coated)	30.00	lb	3.00	90	
<b>Irrigation:</b>					
Water Alfalfa	8.00	acin	3.00	24	
<b>Herbicide:</b>					
Raptor	4.00	floz	5.56	22	
Butyrac (2,4DB)	2.00	pint	4.75	10	
<b>Adjuvant:</b>					
No Foam A	2.00	pint	3.37	7	
Labor (machine)	0.14	hrs	14.28	2	
Labor (non-machine)	0.18	hrs	10.88	2	
Fuel (Gas)	0.35	gal	3.45	1	
Fuel (Diesel)	0.00	gal	4.05	0	
Lube				0	
Machinery repair				0	
Interest on operating capital @ 6.75%				10	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>445</b>	

\*1/2 cost, applied every 2 years

UC COOPERATIVE EXTENSION  
**Table 3. COSTS PER ACRE to PRODUCE ALFALFA HAY**  
 SAN JOAQUIN VALLEY 2008

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Weed: Grasses (TR-10)	0.00	0	0	22	9	31		
Insect: Aphid/Weevil (Lorsban)	0.00	0	0	11	11	22		
Irrigate: 10X	1.80	20	0	162	0	182		
Weed: Summer grasses (SelectMax)	0.00	0	0	20	9	29		
Insect: Worms (Lannate)	0.00	0	0	10	11	21		
Fertilize: Tissue Sampling (P&K)	0.00	0	0	0	1	1		
Fertilize: 1/2 cost applied every 2 years	0.00	0	0	30	5	35		
Weed: Winter (Velpar, Karmex)	0.00	0	0	29	9	38		
Pickup Truck Use	0.24	4	3	0	0	7		
<b>TOTAL CULTURAL COSTS</b>	<b>2.04</b>	<b>24</b>	<b>3</b>	<b>284</b>	<b>55</b>	<b>365</b>		
Harvest:								
Harvest - Hay 7X	0.00	0	0	0	310	310		
<b>TOTAL HARVEST COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>310</b>	<b>310</b>		
Interest on operating capital @ 6.75%						10		
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>24</b>	<b>3</b>	<b>284</b>	<b>364</b>	<b>685</b>		
CASH OVERHEAD:								
Liability Insurance						11		
Office Expense						25		
Property Taxes						117		
Property Insurance						4		
Investment Repairs						9		
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>165</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>851</b>		
NON-CASH OVERHEAD:								
		Per producing acre		-- Annual Cost --				
				Capital Recovery				
Land		11,200		476		476		
Irrigation System		450		34		34		
Alfalfa Establishment		531		147		147		
Equipment		384		39		39		
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>12,565</b>		<b>696</b>		<b>696</b>		
<b>TOTAL COSTS/ACRE</b>						<b>1,546</b>		

X = number of times as 7X = 7 harvests

UC COOPERATIVE EXTENSION  
**Table 4. COSTS AND RETURNS PER ACRE to PRODUCE ALFALFA HAY**  
 SAN JOAQUIN VALLEY 2008

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Hay	8.00	ton	185.00	1,480	
<b>OPERATING COSTS</b>					
<b>Insecticide:</b>					
Lorsban 4 E	2.00	pint	5.63	11	
Lannate 90 SP	0.50	lb	20.00	10	
<b>Custom:</b>					
Air Application	2.00	acre	11.00	22	
Ground Application	3.00	acre	9.00	27	
Tissue Analysis (P&K)	0.05	each	20.50	1	
Swath , Rake	7.00	acre	19.00	133	
Bale (125 lb bale)	8.00	ton	16.00	128	
Roadside Bales	8.00	ton	6.08	49	
Broadcast Fertilizer*	0.50	acre	9.50	5	
<b>Herbicide:</b>					
Treflan TR-10	20.00	lb	1.10	22	
SelectMax	16.00	floz	1.22	20	
Velpar L	2.00	pint	10.18	20	
Karmex XP	1.50	lb	5.59	8	
<b>Irrigation:</b>					
Water	54.00	acin	3.00	162	
<b>Fertilizer:</b>					
11-52-0 *	75.00	lb	0.40	30	
Labor (machine)	0.29	hrs	14.28	4	
Labor (non-machine)	1.80	hrs	10.88	20	
Fuel - Gas	0.71	gal	3.45	2	
Fuel - Diesel	0.00	gal	4.05	0	
Lube				0	
Machinery repair				1	
Interest on operating capital @ 6.75%				10	
<b>TOTAL OPERATING COSTS/ACRE</b>				685	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				795	
<b>CASH OVERHEAD COSTS:</b>					
Liability Insurance				11	
Office Expense				25	
Property Taxes				117	
Property Insurance				4	
Investment Repairs				9	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				165	
<b>TOTAL CASH COSTS/ACRE</b>				851	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery):</b>					
Land				476	
Irrigation System				34	
Alfalfa Establishment				147	
Equipment				39	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				696	
<b>TOTAL COSTS/ACRE</b>				1,546	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				-66	

\*applied alternate yeas

UC COOPERATIVE EXTENSION  
**Table 5. MONTHLY CASH COSTS PER ACRE to PRODUCE ALFALFA**  
 SAN JOAQUIN VALLEY 2008

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Beginning JAN 08													
Ending DEC 08	08	08	08	08	08	08	08	08	08	08	08	08	
Weed: Grasses (TR-10)		31											31
Insect: Aphid/Weevil (Lorsban)			22										22
Irrigate: 10X				18	18	36	36	36	18	18			182
Weed: Summer grasses (SelectMax)					29								29
Insect: Worms (Lannate)							21						21
Fertilize: Tissue Sampling (P&K)								1					1
Fertilize: (11-52-0)											35		35
Weed: Winter (Velpar, Karmex)												38	38
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	7
<b>TOTAL CULTURAL COSTS</b>	<b>1</b>	<b>32</b>	<b>23</b>	<b>19</b>	<b>47</b>	<b>37</b>	<b>58</b>	<b>38</b>	<b>19</b>	<b>19</b>	<b>35</b>	<b>38</b>	<b>365</b>
Harvest:													
Harvest - Hay 7X				41	41	41	52	52	41	41			310
<b>TOTAL HARVEST COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>41</b>	<b>41</b>	<b>52</b>	<b>52</b>	<b>41</b>	<b>41</b>	<b>0</b>	<b>0</b>	<b>310</b>
Interest on operating capital @ 6.75%	0	0	0	1	1	2	2	3	3	-1	0	0	10
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>1</b>	<b>32</b>	<b>23</b>	<b>61</b>	<b>90</b>	<b>80</b>	<b>112</b>	<b>93</b>	<b>63</b>	<b>59</b>	<b>35</b>	<b>38</b>	<b>685</b>
<b>TOTAL OPERATING COSTS/ton (based on 8 ton)</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>8</b>	<b>11</b>	<b>10</b>	<b>14</b>	<b>12</b>	<b>8</b>	<b>7</b>	<b>4</b>	<b>5</b>	<b>86</b>
OVERHEAD:													
Liability Insurance		11											11
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	25
Property Taxes	58						58						117
Property Insurance	2						2						4
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	9
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>33</b>	<b>13</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>33</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>165</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>34</b>	<b>43</b>	<b>25</b>	<b>76</b>	<b>49</b>	<b>64</b>	<b>115</b>	<b>65</b>	<b>50</b>	<b>47</b>	<b>12</b>	<b>38</b>	<b>851</b>
<b>TOTAL CASH COSTS/ton</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>10</b>	<b>6</b>	<b>8</b>	<b>14</b>	<b>8</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>5</b>	<b>106</b>

UC COOPERATIVE EXTENSION

**Table 6. RANGING ANALYSIS**

SAN JOAQUIN VALLEY 2008

COSTS PER ACRE TO PRODUCE ALFALFA AT VARYING YIELDS

Total Hay Yield :	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
<b>OPERATING COSTS:</b>							
Cultural Cost	365	365	365	365	365	365	365
Harvest Cost	243	265	288	310	332	354	376
Interest on operating capital @ 6.75%	9	10	10	10	11	11	11
<b>TOTAL OPERATING COSTS/acre</b>	<b>617</b>	<b>640</b>	<b>663</b>	<b>685</b>	<b>708</b>	<b>730</b>	<b>752</b>
Operating Cost/ton	123	107	95	86	79	73	68
<b>CASH OVERHEAD COSTS</b>	<b>165</b>	<b>165</b>	<b>165</b>	<b>165</b>	<b>165</b>	<b>165</b>	<b>165</b>
<b>TOTAL CASH COSTS/acre</b>	<b>782</b>	<b>805</b>	<b>828</b>	<b>850</b>	<b>873</b>	<b>895</b>	<b>917</b>
Cash Costs/ton	156	134	118	106	97	90	83
<b>NON-CASH OVERHEAD COSTS</b>	<b>696</b>	<b>696</b>	<b>696</b>	<b>696</b>	<b>696</b>	<b>696</b>	<b>696</b>
<b>TOTAL COSTS/acre</b>	<b>1,478</b>	<b>1,501</b>	<b>1,524</b>	<b>1,546</b>	<b>1,569</b>	<b>1,591</b>	<b>1,613</b>
Total Costs/ton	296	250	218	193	174	159	147

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
125.00	8	110	212	315	417	520	623
135.00	58	170	282	395	507	620	733
145.00	108	230	352	475	597	720	843
155.00	158	290	422	555	687	820	953
165.00	208	350	492	635	777	920	1,063
175.00	258	410	562	715	867	1,020	1,173
185.00	308	470	632	795	957	1,120	1,283
195.00	358	530	702	875	1,047	1,220	1,393
205.00	408	590	772	955	1,137	1,320	1,503
215.00	458	650	842	1,035	1,227	1,420	1,613
225.00	508	710	912	1,115	1,317	1,520	1,723
235.00	558	770	982	1,195	1,407	1,620	1,833

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
125.00	-157	-55	47	150	252	355	458
135.00	-107	5	117	230	342	455	568
145.00	-57	65	187	310	432	555	678
155.00	-7	125	257	390	522	655	788
165.00	43	185	327	470	612	755	898
175.00	93	245	397	550	702	855	1,008
185.00	143	305	467	630	792	955	1,118
195.00	193	365	537	710	882	1,055	1,228
205.00	243	425	607	790	972	1,155	1,338
215.00	293	485	677	870	1,062	1,255	1,448
225.00	343	545	747	950	1,152	1,355	1,558
235.00	393	605	817	1,030	1,242	1,455	1,668

UC COOPERATIVE EXTENSION

**Table 6 continued**

NET RETURNS PER ACRE **ABOVE TOTAL COSTS**

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
125.00	-853	-751	-649	-546	-444	-341	-238
135.00	-803	-691	-579	-466	-354	-241	-128
145.00	-753	-631	-509	-386	-264	-141	-18
155.00	-703	-571	-439	-306	-174	-41	92
165.00	-653	-511	-369	-226	-84	59	202
175.00	-603	-451	-299	-146	6	159	312
185.00	-553	-391	-229	-66	96	259	422
195.00	-503	-331	-159	14	186	359	532
205.00	-453	-271	-89	94	276	459	642
215.00	-403	-211	-19	174	366	559	752
225.00	-353	-151	51	254	456	659	862
235.00	-303	-91	121	334	546	759	972

UC COOPERATIVE EXTENSION  
**Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,  
and BUSINESS OVERHEAD COSTS**  
SAN JOAQUIN VALLEY 2008

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes		
07 Pickup 3/4 Ton	32,000	10	9,452	3,216	153	207	3,577	
<b>TOTAL</b>	<b>32,000</b>	<b>10</b>	<b>9,452</b>	<b>3,216</b>	<b>153</b>	<b>207</b>	<b>3,577</b>	
60% of New Cost*	19,200		5,671	1,930	92	124	2,146	

\*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	26,550	4		7,357	0	0	0	7,357
Irrigation System	22,500	25		1,692	83	113	450	2,338
Land	560,000	20	560,000	23,800	0	5,600	0	29,400
<b>TOTAL INVESTMENT</b>	<b>609,050</b>		<b>560,000</b>	<b>32,850</b>	<b>83</b>	<b>5,713</b>	<b>450</b>	<b>39,096</b>

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm Unit		Price/ Unit Cost	
	Liability Insurance	50.00	acre	11.18
Office Expense	50.00	acre	25.00	1,250

UC COOPERATIVE EXTENSION  
**Table 8. HOURLY EQUIPMENT COSTS**  
SAN JOAQUIN VALLEY 2008

Yr Description	COSTS PER HOUR							
	Actual Hours Used	Capital Recovery	Cash Overhead			Operating		Total Costs/Hr.
			Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
07 Pickup 3/4 Ton	12	162.44	7.75	10.47	2.35	11.90	14.25	194.91



UC COOPERATIVE EXTENSION  
**Table 9. OPERATIONS WITH EQUIPMENT - ESTABLISHMENT AND PRODUCTION**  
 SAN JOAQUIN VALLEY 2008

Operation	Operation Month	Tractor	Implement	Field Labor Hr/Acre	Material	Broadcast Rate/acre	Unit
<b>ESTABLISHMENT YEAR</b>							
Soil Analysis	August	Custom			Lab Analysis	0.05	each
Land Prep: Disc Stubble	August	Custom					
Land Prep: Chisel	August	Custom					
Land Prep: Laser Level	August	Custom					
Land Prep: Make Borders	September	Custom					
Fertilize: Alternate Years	September	Custom			11-52-0	150.00	lb
Land Prep: Disc & Harrow	September	Custom					
Plant: Alfalfa	September	Custom			Seed	30.00	lb
Irrigate:	September			0.18	Water	8.00	acin
Weed:	December	Custom			Butoxone	2.00	pint
					No Foam A	2.00	pint
<b>PRODUCTION YEAR</b>							
Weed:	February	Custom			Treflan	20.00	lb
	May	Custom			SelectMax	16.00	floz
	December	Custom			Velpar	2.00	pint
					Karmex	1.50	lb
Insect: Aphid & Weevil	March	Custom			Lorsban	2.00	pint
Insect: Worms	July	Custom			Lannate	0.50	lb
Irrigate:	April			0.18	Water	5.40	acin
	May			0.18	Water	5.40	acin
	June			0.36	Water	10.80	acin
	July			0.36	Water	10.80	acin
	August			0.36	Water	10.80	acin
	September			0.18	Water	5.40	acin
	October			0.18	Water	5.40	acin
Harvest	April	Custom					
	May	Custom					
	June	Custom					
	July	Custom					
	August	Custom					
	September	Custom					
	October	Custom					
Fertilize: once every 2 years	November	Custom			11-52-0	75.00	lb