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UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE

ALFALFA HAY



INTERMOUNTAIN REGION – SISKIYOU COUNTY
Scott Valley – Mixed Irrigation

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INTRODUCTION

The detailed costs for alfalfa hay establishment and production in the Scott Valley of Siskiyou County in the Intermountain Region of California are presented in this study. The hypothetical farm used in this report consists of 560 acres with 443 acres of alfalfa hay production, 77 acres are planted to other crops, 40 non-growing field acres, roads, buildings, and unused land.

This study consists of Assumptions to Establish and Produce Alfalfa Hay and is intended as a guide only. It 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. Sample costs for labor, materials, equipment, and custom services are based on current figures. “*Your Costs*” columns in Table 1 Costs per Acre to Establish an Alfalfa Hay Stand, Table 2 Costs and Returns per Acre to Establish an Alfalfa Hay Stand, Table 3 Costs per Acre to Produce Alfalfa Hay, and Table 4 Costs and Returns per Acre to Produce Alfalfa Hay are for you to enter your actual 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, 530-752-1517 or the local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, 530-752-4424 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 following assumptions pertain to sample costs to establish and produce alfalfa hay in the Scott Valley of Siskiyou County in the Intermountain Region. The costs are based on the cultural practices used by growers in the region, some of which may not be used during every establishment or production year. The cultural practices and production inputs for growing alfalfa hay vary considerably amongst growers and fields. Costs are represented 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 Costs & Setup. The study is based on a 560 acre field and row crop farm, of which 443 acres are dedicated to growing alfalfa hay, 77 acres are used to grow other crops, 40 acres are lost in the corners of the center pivot irrigated field, roads and farmstead. Typically, the grower will rotate out a portion (40-100 acres) of the crop each year and establishes a new stand on land grown to other crops. In this study, the land is valued at \$2,250 per acre.

Irrigation systems are a mix of wheel line and center pivot, as growers change to different water delivery systems. This study assumes combinations of these systems with 395 acres are sprinkler irrigated by three wheel-lines while the other 125 acres is covered by a center pivot system. The center pivot system normally does not cover 35 acres in the corners, but in the Scott Valley fields tend to have irregular shapes and usually all 35 acres are not lost to production. In this study the 35 acres are considered non-crop acreage for simplicity sake.

Labor. Basic hourly wages for workers are \$9.00 per hour for machine and \$7.50 per hour for non-machine (field worker) labor. Adding 48% for the employer's share of federal and state payroll taxes, insurance, and other benefits increases the labor rates to \$13.32 per hour for machine and \$11.10 per hour for non-machine labor. The labor for operations involving machinery are 20% higher than the operation time to account for the extra labor involved in equipment set up, moving, maintenance and repair. The current minimum wage is \$7.50 per hour. On January 1, 2008 it will increase to \$8.00 per hour. The farm manager in the Intermountain Region is often the owner operator and receives income after total costs have been deducted from gross income.

STAND ESTABLISHMENT AND MATERIAL INPUTS

Land Preparation. The ground is ripped to a depth of 20 to 32 inches to fracture the soil to improve water infiltration. The field is disced to break up large clods, creating better seed-to-soil contact for good seed germination. The land is leveled and the fields are floated to remove small high and low spots.

Planting. Alfalfa in the intermountain area can be seeded in the fall or spring, but for this cost study a fall planting is assumed. A cultipacker is used to firm the seedbed prior to and after planting. In late August, alfalfa seed is planted at 18 pounds per acre to a depth of 1/4 to 1/2 inch. The grower uses a grain drill to do the planting. Stand life in the region is five to eight years. Stand life in this study is seven years.

Fertilization. Prior to planting, fertilizers are spread and incorporated by discing. Sulfur is applied at a rate of 300 pounds per acre and phosphorus as 11-52-0 at 200 pounds per acre or 104 pounds of P₂O₅. This amount of sulfur is sufficient to supply crop needs for three to four years, and the phosphorus for two years. In this study one-fourth of the sulfur cost and one-half of the phosphorus cost is charged to

the establishment year. The fertilizers are custom spread by a fertilizer company at a cost of \$5.50 – \$6.50 per acre. Growers should apply fertilizer or soil amendments after soil tests determine pH and nutrient levels. Plant tissue tests are recommended in subsequent years after planting.

Irrigation. Irrigation for the newly planted alfalfa begins immediately after planting. Water is applied to 395 acres of the stand through wheel-line sprinklers and the remaining 125 acres is under a center pivot irrigation system. Fields are irrigated from late August to mid-October or until fall rain. A total of six acre-inches are applied after planting.

Pest Management. Pest management consists of herbicide treatment only. For information and specific pesticide use, contact your pest control advisor. Written recommendations are required for many pesticides and are written by licensed pest control advisors. For additional information contact the Siskiyou County field crop Farm Advisor. Pesticide-use permits are available at the county Agricultural Commissioner Office.

Weed Control. Grass and broadleaf weeds compete with the seedlings during stand establishment. In early October, a post emergent application of Raptor at five ounces per acre and Herbimax, a crop oil adjuvant, are applied by a custom applicator to control broadleaf weeds and grasses.

Harvest. August plantings will not produce a crop in the current year. The first harvest occurs in June of the next year.

Establishment Costs. The establishment cost is the sum of cash costs for land preparation, planting, production expenses, and cash overhead for establishing an alfalfa stand. The Total Cash Cost in the first year as shown in Table 2 represents the establishment cost per acre. For this study, the cost is \$247 per acre or \$107,384 for the 443 acres. The establishment cost is amortized over the remaining six years of crop life.

PRODUCTION CULTURAL PRACTICES AND MATERIAL INPUTS

Irrigation. Irrigation starts in April and continues into September. Two and half acre-feet of water at \$18 per acre-foot or \$1.50 per acre-inch are applied through wheel-line and center pivot sprinklers. Irrigation costs shown in the tables include the water cost and labor for moving the wheel lines and irrigating.

Fertilization. Phosphorus and sulfur are essential for alfalfa production in this region and are first applied in the establishment year. In March of the second and fourth production years, 200 pounds of phosphorus as 11-52-0 (104 pounds of P₂O₅) is custom applied. Three-hundred pounds of sulfur (elemental) per acre is also custom spread in March of the fourth production year. Phosphorus is applied every two years and one-half the cost is charged to the budget each year. Sulfur is applied every four years and one-fourth of the cost is charged to the budget each year. The costs for the operations are shown in Tables 3, 4, and 5. Fertilize alfalfa after either a soil or plant tissue test has indicated a need.

Pest Management. The pesticides and rates mentioned in this cost study are listed in UC *Integrated Pest Management Guidelines: Alfalfa*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at <http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>. 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. Weeds invade alfalfa in the fall as the stand becomes dormant. In February Velpar (a residual herbicide) at 0.50 pounds per acre and Gramoxone (a contact herbicide) at 1.5 pints per acre are tank mixed and applied to control winter weeds. Activator 90 (non-ionic adjuvant) is added to the mix. Summer grass control may be needed in some areas, but is not included in this study.

Insects. Several insect species attack alfalfa, but alfalfa weevil (*Hypera postica*) is the only pest assumed in this study to cause economic damage. Weevils don't reach economic damaging thresholds every year, but over the stand life, controls will be applied an average of every two years. In this study, weevils are treated every other year in April by a certified applicator with the insecticide Baythroid at two fluid ounces per acre. One-half of the actual cost is charged to the budget each year.

Vertebrates. Pocket gophers (*Thomomys spp.*), ground squirrels (*Spermophilus spp.*), and meadow mice (*Microtus spp.*) cause problems in alfalfa stands. Poison bait purchased from the local commercial suppliers is used to control these pests. In this study, vertebrate pest treatment occurs in March and April. The cost for rodent bait in the study is an average of the separate costs of gopher, squirrel and mouse baits.

Harvest. Harvest equipment owned by the farm consists of a self-propelled swather, center-delivery rake, a self-propelled balewagon (harrowbed), two engine driven, pull-type balers and a hay squeeze. Alfalfa is cut with the self-propelled swather, cured or dried in windrows for several days and then turned and two windrows are combined into one using a center-delivery rake. When dried to the correct moisture, the hay is baled with a pull-type baler. The balewagon picks up the bales and moves them from the field to stacks. A hay squeeze is used to load stacked bales onto semi trailers. The costs for these operations are shown in Tables 1, 2, 3, 4, and 5 and the equipment is listed in Tables 6 and 7. If a grower has their hay custom harvested, replace the harvest costs used in this study with the custom harvest charges.

Many factors are important in deciding which harvesting option a grower uses. The options are discussed in "*Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis of Alternatives*". The publication can be found at <http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>.

Yield. The crop is assumed to yield 6.0 tons of hay per acre over three cuttings per year. Three to four cuttings of hay each year are normally made in the Scott Valley depending on various factors. Annual yields in the region range from 4 to 8 tons per acre from June through September.

Returns. Based on current markets for premium to rain damaged hay, an estimated price of \$125 per ton of hay is used to calculate returns. Returns will vary during the season, depending upon the market. In some areas in the region, additional revenue is generated by charging a per head fee for grazing livestock on alfalfa stand that is going into winter dormancy. Table 8 shows a range of yields over a range of returns.

Risk. The risks associated with the production of alfalfa hay 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 that affect the profitability and economic viability of alfalfa hay production. Because of the risks involved, access to a market is crucial. A grower should identify potential markets and, where possible, have a market for their hay before an alfalfa hay stand is established.

CASH OVERHEAD

Property Tax. 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. Salvage value for investments will vary.

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 10.00% per year. A nominal interest rate is the going market cost of borrowed funds.

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 0.714% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,014 for the entire farm or \$1.81 per acre.

Office Expense. Various farm and office expenses are estimated at \$7.14 per acre for the ranch. These expenses include office supplies, utilities, telephones, bookkeeping, accounting, legal fees and maintenance, etc.

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-Take-Off (PTO) horsepower, and fuel type.

Prices for on-farm delivery of diesel and gasoline are \$2.30 and \$2.80 per gallon, respectively. Costs are based on current delivery prices quoted by distributors and 2007 monthly price 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 taxes that are refundable for on-farm use when filing income tax return.

The fuel, lube, and repair cost per acre for each operation in Table 1, 2, 3, and 4 is determined by multiplying the total hourly operating cost in Table 7 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.

NON-CASH OVERHEAD

Investment. The investments shown in Table 6 are those that are partially or completely allocated to the alfalfa hay operation. Costs of investments such as tractors, trucks, buildings, etc. can be spread over the whole farm. Annual investments shown in Tables 1 and 3 represent depreciation and opportunity cost for each investment on an annual per acre basis.

Capital Recovery. Capital recovery cost is calculated for equipment and other farm investments. Although farm equipment used on alfalfa hay farms might be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 40% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-4, and 6. They represent the capital recovery cost for investments on an annual per acre basis.

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 prices and salvage value (unrecovered capital). Put another way, 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 calculation for the annual capital recovery costs is as follows.

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The life in years is estimated by dividing the wear-out life, as given by American Society of Agricultural Engineers (ASAE) by the annual use in hours. Salvage value is calculated as

$$\text{New Price} \times \% \text{ Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.25% used to calculate capital recovery cost is an interest rate from an agricultural lender. 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.

Non-Cash Equipment Costs. Much of the equipment inventory on a typical alfalfa hay farm in Siskiyou County has high hours of use which reduces its value. This study shows current purchase prices for new equipment with an adjustment of 40% of new value to indicate a mix of new and used equipment.

The equipment listed in Tables 6 and 7 indicate only that equipment which is used in the alfalfa hay enterprise and does not necessarily include all of the equipment that would be found on a typical farm growing alfalfa hay.

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

Acknowledgment. Appreciation is expressed to those growers and other cooperators who provided information for this study.

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

Table 1.

U.C. COOPERATIVE EXTENSION
 COST PER ACRE TO ESTABLISH AN ALFALFA HAY STAND
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

Labor Rate: \$13.32/hr. machine labor
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 10.00%

Operation	Cash and Labor Costs per Acre						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
Cultural:							
Subsoil/Rip Ground	0.39	6	11	0	0	17	
Fertilize: Sulfur - 1X in 4 Years	0.00	0	0	5	1	7	
Fertilize: 11-52-0 - 1X in 2 Years	0.00	0	0	22	3	24	
Disc Stubble 2X	0.22	3	6	0	0	9	
Level Field with Float	0.12	2	1	0	0	3	
Roll Field	0.10	2	1	0	0	3	
Plant: 18 Lbs/Acre	0.15	2	4	47	0	53	
Irrigate 5X	0.00	0	0	11	0	11	
Weed Control - Dormant Spray	0.00	0	0	24	7	30	
Pickup Truck Use	0.46	7	5	0	0	13	
TOTAL CULTURAL COSTS	1.43	23	29	108	11	170	
Interest on Operating Capital @ 10.00%						6	
TOTAL OPERATING COSTS/ACRE		23	29	108	11	177	
CASH OVERHEAD:							
Office Expense						7	
Liability Insurance						2	
Property Taxes						27	
Property Insurance						19	
Investment Repairs						16	
TOTAL CASH OVERHEAD COSTS						71	
TOTAL CASH COSTS/ACRE						247	
NON-CASH OVERHEAD:							
	Per producing			-- Annual Cost --			
Investment	<u>Acres</u>			<u>Capital Recovery</u>			
Land	2,250			141		141	
Fuel Tanks & Pumps	17			1		1	
Shop Building	83			6		6	
Shop Tools	21			3		3	
Wheel Line Irrigation System (12)	194			17		17	
Center Pivot Irrigation System (1)	133			12		12	
Hay Barns (2)	179			15		15	
Equipment	176			21		21	
TOTAL NON-CASH OVERHEAD COSTS	3,052			216		216	
TOTAL COSTS/ACRE						463	

Table 2.

U.C. COOPERATIVE EXTENSION
 COST AND RETURNS PER ACRE TO ESTABLISH AN ALFALFA HAY STAND
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

Labor Rate: \$13.32/hr. machine labor
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 10.00%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS					
Fertilizer:					
Elemental Sulfur	75.00	Lb	0.073	5	
11-52-0	100.00	Lb	0.216	22	
Custom:					
Ground Application - Fertilizer	0.75	Acre	5.50	4	
Ground Application - Seed & Pesticide	1.00	Acre	6.50	7	
Seed:					
Seed - Alfalfa	18.00	Lb	2.60	47	
Water:					
Water	6.00	AcIn	1.77	11	
Herbicide:					
Pursuit	1.44	Oz	13.90	20	
Adjuvant:					
Herbimax	32.00	FlOz	0.11	4	
Labor (machine)	1.72	Hrs	13.30	23	
Labor (non-machine)	0.00	Hrs	0.00	0	
Fuel - Gas	1.38	Gal	2.80	4	
Fuel - Diesel	6.99	Gal	2.30	16	
Lube				3	
Machinery repair				6	
Interest on Operating Capital @ 10.00%				6	
TOTAL OPERATING COSTS/ACRE				177	
CASH OVERHEAD COSTS:					
Office Expense				7	
Liability Insurance				2	
Property Taxes				27	
Property Insurance				19	
Investment Repairs				16	
TOTAL CASH OVERHEAD COSTS/ACRE				71	
TOTAL CASH COSTS/ACRE				247	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Land				141	
Fuel Tanks & Pumps				1	
Shop Building				6	
Shop Tools				3	
Wheel Line Irrigation System (12)				17	
Center Pivot Irrigation System (1)				12	
Hay Barns (2)				15	
Equipment				21	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				216	
TOTAL COSTS/ACRE				463	

Table 3.

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE ALFALFA HAY
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

Labor Rate: \$13.32/hr. machine labor
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 10.00%
 Yield: 6.0 Tons

Operation	Operation Time (Hrs/A)	----- Cash and Labor Costs per Acre -----					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Weed Control - Dormant Spray	0.00	0	0	29	7	36		
Rodent Bait - 25% of Acres	0.50	6	0	1	0	6		
Fertilize: Sulfur - 1X in 4 Years	0.00	0	0	5	1	7		
Fertilize: 11-52-0 - 1X in 2 Years	0.00	0	0	19	3	21		
Irrigate	2.85	32	0	53	0	85		
Insect Control - Weevil - 1X in 2 Years	0.00	0	0	4	3	7		
Pickup Truck Use	<u>0.46</u>	<u>7</u>	<u>5</u>	<u>0</u>	<u>0</u>	<u>13</u>		
TOTAL CULTURAL COSTS	3.81	45	5	111	14	174		
Harvest:								
Swath Hay 3X	0.50	8	2	0	0	10		
Rake Hay 3X (2 Tractors & Balers)	0.33	5	4	0	0	9		
Bale Hay 3X	0.19	6	6	25	0	37		
Roadside Hay 3X	0.38	6	15	0	0	21		
Load Hay 3X	<u>0.28</u>	<u>4</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>10</u>		
TOTAL HARVEST COSTS	1.67	30	33	25	0	88		
<u>Interest on Operating Capital @ 10.00%</u>						<u>10</u>		
TOTAL OPERATING COSTS/ACRE		74	38	136	14	272		
CASH OVERHEAD:								
Office Expense						7		
Liability Insurance						2		
Property Taxes						29		
Property Insurance						21		
Investment Repairs						<u>16</u>		
TOTAL CASH OVERHEAD COSTS						74		
TOTAL CASH COSTS/ACRE						346		
NON-CASH OVERHEAD:								
Investment		Per producing		-- Annual Cost --				
Land		<u>Acres</u>		<u>Capital Recovery</u>				
		2,250		163		163		
Alfalfa Establishment Cost		247		52		52		
Fuel Tanks & Pumps		17		2		2		
Shop Building		83		7		7		
Shop Tools		21		3		3		
Wheel Line Irrigation System (12)		194		18		18		
Center Pivot Irrigation System (1)		133		13		13		
Hay Barns (2)		179		17		17		
Equipment		<u>275</u>		<u>35</u>		<u>35</u>		
TOTAL NON-CASH OVERHEAD COSTS		3,399		309		309		
TOTAL COSTS/ACRE						655		

Table 4.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA HAY
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

Labor Rate: \$13.32/hr. machine labor
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 10.00%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Alfalfa Hay	6.0	Tons	125	<u>750</u>	
TOTAL GROSS RETURNS FOR ALFALFA HAY				<u>750</u>	
OPERATING COSTS					
Custom:					
Ground Application - Pesticide	1.50	Acre	6.50	10	
Ground Application - Fertilizer	0.75	Acre	5.50	4	
Herbicide:					
Gramoxone Max	1.50	Pint	6.00	9	
Velpar 90S	0.50	Lb	38.76	19	
Adjuvant:					
Activator 90	6.40	FLOz	0.13	1	
Rodenticide:					
Rodent Bait	0.25	Lb	2.80	1	
Fertilizer:					
Elemental Sulfur	75.00	Lb	0.073	5	
11-52-0	100.00	Lb	0.185	19	
Water:					
Water	30.00	AcIn	1.77	53	
Insecticide:					
Baythroid	1.00	FLOz	3.59	4	
Labor (machine)	2.78	Hrs	13.30	37	
Labor (non-machine)	3.35	Hrs	11.10	37	
Fuel - Gas	3.59	Gal	2.80	5	
Fuel - Diesel	6.73	Gal	2.30	15	
Lube				3	
Machinery repair				19	
Interest on Operating Capital @ 10.00%				<u>10</u>	
TOTAL OPERATING COSTS/ACRE				<u>272</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>478</u>	
CASH OVERHEAD COSTS:					
Office Expense				7	
Liability Insurance				2	
Property Taxes				29	
Property Insurance				21	
Investment Repairs				<u>16</u>	
TOTAL CASH OVERHEAD COSTS/ACRE				<u>74</u>	
TOTAL CASH COSTS/ACRE				<u>346</u>	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Land				163	
Alfalfa Establishment Cost				52	
Fuel Tanks & Pumps				2	
Shop Building				7	
Shop Tools				3	
Wheel Line Irrigation System (12)				18	
Center Pivot Irrigation System (1)				13	
Hay Barns (2)				17	
Equipment				<u>35</u>	
TOTAL NON-CASH OVERHEAD COST				<u>309</u>	
TOTAL COSTS/ACRE				<u>655</u>	
NET RETURNS ABOVE TOTAL COST				<u>95</u>	

Table 5.

U.C. COOPERATIVE EXTENSION
MONTHLY CAST COSTS PER ACRE TO PRODUCE ALFALFA HAY
INTERMOUNTAIN REGION
SISKIYOU COUNTY – SCOTT VALLEY – 2007

Beginning FEB 06	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	TOTAL
Ending JAN 07	06	06	06	06	06	06	06	06	06	06	06	07	
Cultural:													
Weed Control - Dormant Spray	36												36
Rodent Bait - 25% of Acres		6											6
Fertilize: Sulfur - 1X in 4 Years			7										7
Fertilize: 11-52-0 - 1X in 2 Years			21										21
Irrigate				24	12	14	14	12	9				85
Insect Control - Weevil - 1X in 2 Years				7									7
Pickup Truck Use	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>				<u>13</u>
TOTAL CULTURAL COSTS	37	36	32	14	16	16	13	11					174
Harvest:													
Swath Hay 3X					3	3		3					10
Rake Hay 3X					3	3		3					9
Bale Hay 3X (2 Tractors & Balers)					12	12		12					37
Roadside Hay 3X					7	7		7					21
Load Hay 3X					<u>3</u>	<u>3</u>		<u>3</u>					<u>10</u>
TOTAL HARVEST COSTS					29	29		29					88
Interest on Operating Capital @ 10.00%	0	1	1	1	1	2	2	2					10
TOTAL OPERATING COSTS/ACRE	38	37	33	15	46	46	15	42					272
CASH OVERHEAD:													
Office Expense		1	1	1	1	1	1	1					7
Liability Insurance		2											2
Property Taxes						14						14	29
Property Insurance						10						10	21
Investment Repairs	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>16</u>
TOTAL CASH OVERHEAD COSTS	4	2	2	2	2	27	2	2	1	1	1	26	74
TOTAL CASH COSTS/ACRE	42	39	35	17	48	73	17	44	1	1	1	26	346

Table 6.

U.C. COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
INTERMOUNTAIN REGION
SISKIYOU COUNTY – SCOTT VALLEY – 2007

ANNUAL EQUIPMENT COSTS								
- Cash Overhead -								
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Total
06	62 HP 2WD Tractor	36,228	12	9,057	4,123	162	226	4,511
06	62 HP 2WD Tractor	36,228	12	9,057	4,123	162	226	4,511
06	Baler - Pull-Type w/Engine	60,000	10	9,903	7,933	250	350	8,532
06	Baler - Pull-Type w/Engine	60,000	10	9,903	7,933	250	350	8,532
06	Balewagon	125,000	10	20,631	16,528	520	728	17,776
06	Hay Squeeze	40,000	10	6,602	5,289	166	233	5,688
06	Pickup 4WD 3/4 Ton	36,000	7	13,656	5,172	177	248	5,598
06	Rake - 20' Center Delivery	21,919	10	3,876	2,880	92	129	3,101
06	Swather - SP 14	75,000	15	7,200	8,084	293	411	8,788
TOTAL		490,375		89,885	62,066	2,072	2,901	67,038
40% of New Cost *		196,150		35,954	24,826	829	1,161	26,815

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

ANNUAL INVESTMENT COSTS								
----- Cash Overhead -----								
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Repairs	Total
INVESTMENT								
Alfalfa Establishment Cost	109,421	6		23,134	391	547	0	24,071
Center Pivot Irrigation System (1)	74,750	20	7,475	7,016	294	411	2,056	9,777
Fuel Tanks & Pumps	9,315	20	932	874	37	51	256	1,218
Hay Barns (2)	100,000	20	10,000	9,386	393	550	2,750	13,079
Land	1,260,000	40	1,260,000	91,350	8,996	12,600	0	112,946
Shop Building	46,332	30	4,633	3,781	182	255	450	4,668
Shop Tools	11,583	10	1,158	1,585	45	64	318	2,013
Wheel Line Irrigation System (12)	108,606	20	10,861	10,194	426	597	2,987	14,205
TOTAL INVESTMENT	1,720,007		1,295,059	147,320	10,764	15,075	8,817	181,977

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	560	Acre	1.81	1,014
Office Expense	560	Acre	7.14	3,998

Table 7.

U.C. COOPERATIVE EXTENSION
 HOURLY EQUIPMENT COSTS
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

		----- COSTS PER HOUR -----							
		Actual	- Cash Overhead -			----- Operating -----			
Yr	Description	Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
06	62 HP 2WD Tractor	999.4	1.65	0.06	0.09	1.05	8.05	9.10	10.91
06	62 HP 2WD Tractor	999.8	1.65	0.06	0.09	1.05	8.05	9.10	10.91
06	Baler - Pull-Type w/Engine	249.1	12.74	0.40	0.56	5.74	0.00	5.74	19.44
06	Baler - Pull-Type w/Engine	249.1	12.74	0.40	0.56	5.74	0.00	5.74	19.44
06	Balewagon	199.7	33.10	1.04	1.46	18.05	18.42	36.47	72.07
06	Hay Squeeze	199.5	10.60	0.33	0.47	5.78	12.99	18.77	30.17
06	Pickup 4WD 3/4 Ton	284.6	7.27	0.25	0.35	1.75	9.66	11.41	19.28
06	Rake - 20' Center Delivery	249.7	4.61	0.15	0.21	2.02	0.00	2.02	6.99
06	Swather - SP 14	221.5	14.60	0.53	0.74	4.48	0.00	4.48	20.35

Table 8.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
INTERMOUNTAIN REGION
SISKIYOU COUNTY – SCOTT VALLEY – 2007

COSTS PER ACRE AT VARYING YIELDS FOR ALFALFA HAY							
	YIELD (TONS/ACRE)						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
OPERATING COSTS/ACRE:							
Cultural Cost	174	174	174	174	174	174	174
Harvest Cost	66	73	80	88	95	102	110
Interest on operating capital	9	10	10	10	10	10	10
TOTAL OPERATING COSTS/ACRE	249	257	264	272	279	287	294
TOTAL OPERATING COSTS/TON	55	51	48	45	43	41	39
CASH OVERHEAD COSTS/ACRE	74	74	74	74	74	74	74
TOTAL CASH COSTS/ACRE	323	331	338	346	353	361	368
TOTAL CASH COSTS/TON	72	66	62	58	54	52	49
NON-CASH OVERHEAD COSTS/ACRE	307	307	308	309	309	310	310
TOTAL COSTS/ACRE	630	638	646	655	663	671	679
TOTAL COSTS/TON	140	128	118	109	102	96	90

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
ALFALFA HAY							
85	134	168	204	238	274	308	344
95	178	218	258	298	338	378	418
105	223	268	313	358	403	448	493
115	268	318	368	418	468	518	568
125	313	368	423	478	533	588	643
135	358	418	478	538	598	658	718
145	403	468	533	598	663	728	793
155	448	518	588	658	728	798	868

NET RETURNS PER ACRE ABOVE CASH COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
ALFALFA HAY							
85	60	94	130	164	200	234	270
95	104	144	184	224	264	304	344
105	149	194	239	284	329	374	419
115	194	244	294	344	394	444	494
125	239	294	349	404	459	514	569
135	284	344	404	464	524	584	644
145	329	394	459	524	589	654	719
155	374	444	514	584	654	724	794

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
ALFALFA HAY							
85	-248	-213	-179	-145	-111	-76	-42
95	-203	-163	-124	-85	-45	-6	34
105	-158	-113	-69	-25	20	64	109
115	-113	-63	-14	35	85	134	184
125	-68	-13	41	95	150	204	259
135	-23	37	96	155	215	274	334
145	22	87	151	215	280	344	409
155	67	137	206	275	345	414	484

Table 9.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS/ BREAKEVEN ANALYSIS
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

COSTS AND RETURNS - PER ACRE BASIS							
Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Alfalfa Hay	750	272	478	346	404	655	95

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)
Alfalfa Hay	332,250	120,406	211,844	153,205	179,045	289,998	42,252

BREAKEVEN PRICES PER YIELD UNIT					
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
Alfalfa Hay	6.0	Ton	45.30	57.64	109.10

BREAKEVEN YIELDS PER ACRE					
CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Cash Costs	Total Costs
Alfalfa Hay	Ton	125.00	2.2	2.8	5.2

Table 10.

U.C. COOPERATIVE EXTENSION
 DETAIL BY OPERATIONS
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – SCOTT VALLEY – 2007

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Weed Control - Dormant Spray	February	Custom	Ground Application	Gramoxone Max	1.50	Pint
				Velpar 90S	0.33	Lb
				Activator 90	6.40	Fl Oz
Rodent Bait - 25% of Acres	March	Labor		Rodent Bait	0.25	Lb
Fertilize: Sulfur - 1X in 4 Years	March	Custom	Ground Application	Elemental Sulfur	75.00	Lb
Fertilize: 11-52-0 - 1X in 2 Years	March	Custom	Ground Application	11-52-0	100.00	Lb
Irrigate 10X	April	Labor		Water	4.00	AcIn
	May	Labor		Water	5.00	AcIn
	June	Labor		Water	6.00	AcIn
	July	Labor		Water	6.00	AcIn
	August	Labor		Water	5.00	AcIn
	September	Labor		Water	4.00	AcIn
Insect Control - Weevil - 1X in 2 Years	April	Custom	Ground Application	Baythroid	1.00	Fl Oz
Swath Hay 3X	June	Swather - SP 14'				
	July	Swather - SP 14'				
	September	Swather - SP 14'				
Rake Hay 3X	June	62 HP 2WD Tractor	Rake - 20' Center Delivery			
	July	62 HP 2WD Tractor	Rake - 20' Center Delivery			
	September	62 HP 2WD Tractor	Rake - 20' Center Delivery			
Bale Hay 3X (2 Tractors & Balers)	June	62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
		62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
	July	62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
		62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
	September	62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
		62 HP 2WD Tractor	Baler - Pull-Type w/Engine	Hay Bale Twine		
Roadside Hay 3X	June	Balewagon				
	July	Balewagon				
	September	Balewagon				
Load Hay 3X	June	Hay Squeeze				
	July	Hay Squeeze				
	September	Hay Squeeze				
Pickup Truck Use	All Months					