

---

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2012

**SAMPLE COSTS TO ESTABLISH AND  
PRODUCE  
ALFALFA HAY**



**INTERMOUNTAIN – Siskiyou County**

Scott Valley – Mixed Irrigation

Steve B. Orloff  
Karen M. Klonsky

UC Cooperative Extension Farm Advisor, Siskiyou County  
UC Cooperative Extension Economist, Department of Agricultural and Resource  
Economics, UC Davis

Kabir P. Tumber

UC Cooperative Extension Staff Research Associate, Department of Agricultural  
and Resource Economics, UC Davis

---

# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## SAMPLE COSTS TO ESTABLISH AND PRODUCE ALFALFA Intermountain Region– Siskiyou County, Scott Valley – Mixed Irrigation - 2012

### CONTENTS

INTRODUCTION .....	2
ASSUMPTIONS.....	3
Establishment Operating Costs.....	3
Production Operating Costs .....	4
Labor, Equipment, and Interest.....	5
Cash Overhead Costs .....	6
Non-Cash Overhead Costs.....	6
REFERENCES .....	8
Table 1. COSTS PER ACRE TO ESTABLISH ALFALFA.....	9
Table 2. MATERIAL & CUSTOM COSTS PER ACRE – ESTABLISHMENT YEAR.....	10
Table 3. COSTS PER ACRE TO PRODUCE ALFALFA.....	11
Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA.....	12
Table 5. MONTHLY CASH COSTS PER ACRE TO PRODUCE ALFALFA .....	14
Table 6. RANGING ANALYSIS .....	15
Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND OVERHEAD COSTS .....	16
Table 8. HOURLY EQUIPMENT COSTS .....	17
Table 9. OPERATIONS WITH EQUIPMENT & MATERIALS .....	18

### INTRODUCTION

Sample costs to establish and produce alfalfa hay under mixed irrigation in the Intermountain Region of Scott Valley in Siskiyou County are presented in this study. This 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. Sample costs for labor, materials, equipment, and custom services are based on current figures. A blank column titled “*Your Costs*” is available in Table 3 and Table 4 to enter your own costs.

The hypothetical farm operation, production practices, overhead costs, and calculations are described under the “Assumptions” section. 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 at (530) 752-3589, or contact your local UC Cooperative Extension office.

Sample Cost of Production Studies for current and archived commodities are available at <http://coststudies.ucdavis.edu>, or can be requested from the Department of Agricultural and Resource Economics, UC Davis, by phone at (530) 752-4461, or obtained from select UC Cooperative Extension offices.

The University of California is an affirmative action/equal opportunity employer.

## ASSUMPTIONS

The assumptions refer to Tables 1 through 9 and pertain to sample costs to establish and produce alfalfa hay in the Intermountain Region of Scott Valley in Siskiyou County. The cultural practices shown represent operations and materials considered typical of alfalfa in the region. Production costs, materials, and cultural practices in this study will not apply to all situations. Cultural practices and their timings will vary among growers within the region and from year to year due to variables such as weather, soil, and insect and disease pressure. **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.**

**Land.** The hypothetical farm consists of 560 contiguous acres. Establishment and production costs are based on 440 acres of alfalfa. Typically, a grower with this amount of alfalfa acreage will have several non-adjacent fields and the cultural practices may vary among fields. Additionally, extra costs may be incurred moving equipment between fields, but are not included in this study. Other crops are grown on 80 acres and the remaining 40 acres are lost in the corners of the center pivot irrigated field, or used as roads and farmstead. The grower will typically rotate out a portion (40 to 100 acres) of the alfalfa crop each year, produce a grain crop for 1 to 2 years, and then rotate back to alfalfa. In this study, land is valued at \$4,000 per acre.

### Establishment Operating Costs

Tables 1 & 2

**Land Preparation.** The ground is chiseled or ripped to a depth of approximately 16 to 30 inches to fracture the soil, which improves water infiltration and root penetration. The field is disced twice to break up large clods, creating better seed-to-soil contact for seed germination. The land is then leveled with a landplane three times to remove high and low spots and firm the seedbed.

**Fertilization.** Prior to planting, fertilizers are spread and incorporated by discing. Sulfur is applied at a rate of 200 pounds per acre, phosphorus as 11-52-0 at 150 pounds per acre, or 78 pounds of P<sub>2</sub>O<sub>5</sub>, and potassium as 0-0-60 is applied at 200 pounds per acre. This amount of sulfur is sufficient to supply crop needs for three to four years. In this study one-fourth of the sulfur cost is charged to the establishment year. The fertilizers are custom spread by a fertilizer company at a cost of \$7.75 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.

**Planting.** Alfalfa in the intermountain region can be seeded in the fall or spring, but this study assumes a fall planting. In late August, alfalfa seed is planted at 20 pounds per acre at a depth of 1/4 to 1/2 inch. The grower plants with a grain drill and pulls a cultipacker for better seed-to-soil contact. Stand life in the region is five to eight years. This study assumes stand life of six years.

**Irrigation.** Irrigation of the alfalfa begins immediately after planting. Water is applied to the alfalfa by 12 wheel-line sprinklers and one center pivot irrigation system. Fields are irrigated four times between late August to mid-October, or until fall rain. A total of 4.5 acre-inches are applied after planting.

**Pest Management.** In the establishment years, 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's Office. The pesticides and rates mentioned in this cost study as well as other materials

available are listed in *UC Integrated Pest Management Guidelines, Alfalfa*, found on the UC IPM website <http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>. Pesticides mentioned in the study are commonly used, but are not presented as a recommendation.

**Weed Control.** Grass and broadleaf weeds compete with the alfalfa seedlings during stand establishment. In early October a post emergence application of Raptor, at five ounces per acre, and Herbimax (a crop oil adjuvant), at 0.05 gallons per acre, are applied by a custom applicator to control broadleaf weeds and grasses.

**Harvest.** August plantings will not produce a crop in the establishment year. The first harvest occurs in June of the following year.

## Production Operating Costs

Tables 3 to 9

**Irrigation.** Irrigation begins in April and continues into September. Twenty-one acre-inches of water at \$57 per acre-foot, or \$4.75 per acre-inch, are applied through wheel-line and center pivot sprinklers. Irrigation costs shown in the tables include the cost of the water as well as labor to move the wheel lines. No assumption is made about effective rainfall, runoff, and evaporation.

**Fertilization.** Phosphorus and sulfur are essential for alfalfa production in this region and are first applied in the establishment year. After the establishment year, phosphorus is applied annually in March at 78 pounds of P<sub>2</sub>O<sub>5</sub> (150 pounds of 11-52-0) per acre. Two-hundred pounds of elemental sulfur per acre is custom spread in March of the fifth year. Sulfur is applied every four years and one-fourth of the cost is charged to the budget each year. Two-hundred pounds of muriate of potash (0-0-60) per acre is custom applied annually. Additionally, one pound of sodium molybdate per acre is custom applied over the course of the stand, and one-fifth of this cost is allocated to each production year. The fertilizers are custom spread by a fertilizer company at a cost of \$7.75 per acre. The nutritional program should be based on soil or plant tissue tests.

**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 your local county Agricultural Commissioner's Office.

**Weeds.** Winter annual weeds first emerge in alfalfa fields in the fall as alfalfa becomes dormant. In February, Velpar (a residual herbicide) is custom applied at 0.67 pounds per acre (0.50 pounds active ingredient per acre), with Gramoxone (a contact herbicide) at 1.5 pints per acre, and Activator 90 (non-ionic adjuvant) at 6.4 fluid ounces per acre to control winter weeds. Summer grass control may be needed in some areas, but is less common and 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. In this study, weevils are treated annually each year after the establishment year by a certified applicator with the insecticide Baythroid, at 2.6 fluid ounces per acre.

**Vertebrates.** Pocket gophers (*Thomomys spp.*), ground squirrels (*Spermophilus spp.*), and meadow voles (*Microtus spp.*) cause problems in alfalfa. In this study only meadow voles are controlled, using zinc phosphide rodent bait purchased from local commercial suppliers, with treatment in March. In this study, 10 pounds of bait is applied to 25 percent of acres.

**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 two small, pull-type balers. The balewagon collects the bales and moves them from the field to stacks. A hay squeeze is used to load stacked bales onto semi-trailers or store them in barns. 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://giannini.ucop.edu/InfoSeries/921-HayEquip.pdf>.

**Yield.** The alfalfa crop is assumed to yield 6.0 tons of hay per acre over three cuttings per year. Three cuttings are normally made in the Scott Valley, but occasionally four cuttings are made. Annual yields in the region typically range from 4 to 8 tons per acre.

**Returns.** Based on the current market, an estimated price of \$200 per ton of hay is used to calculate returns. Returns will vary during the season, depending upon market conditions. In some areas in the region, additional revenue is generated by charging a per head fee for grazing livestock on crop aftermath after the end of the production season. This study assumes that no additional revenue from grazing is received. A ranging analysis of yields and returns is provided on Table 6, page 15.

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

**Labor.** Labor rates of \$17.81 per hour for machine operators and \$13.70 for general labor includes payroll overhead of 37%. The basic hourly wages are \$13.00 for machine operators and \$10.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops, 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, 2011 (personal email from California Department of Insurance, March 2011, unreferenced). Machinery labor cost is approximately 20% higher than general labor prices, which accounts for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Wages for management are not included as a cash cost. Any return above total costs is considered a return to management and risk. However, growers wanting to account for management may wish to add a fee. The manager makes all production decisions including cultural practices, action to be taken on pest management recommendations, and labor.

**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 red dye diesel and gasoline are \$3.43 (excludes excise tax) and \$3.82 per gallon, respectively. Fuel costs are derived from the Energy Information Administration, 2011 January to December monthly data. The cost includes a 2.50% local sales tax on diesel fuel and 7.50% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and downtime.

**Interest on Operating Capital.** Interest on operating capital is based on cash operating costs and is calculated monthly at a nominal rate of 5.75% per year until harvest, or until the hay is sold. A nominal interest rate is the typical market cost of borrowed funds. The interest rate will vary depending upon various factors. The rate in this study is considered a typical lending rate by a farm lending agency as of January 2011.

**Risk.** The risks associated with crop production 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 profitability and economic viability. Crop insurance is a risk management tool available to growers.

### **Cash Overhead Costs**

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation.

**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.

**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 0.803% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,168 for the entire farm.

**Crop Insurance.** Crop insurance is available to growers, but is not included as a cost in this study.

**Office Expense.** Various farm and office expenses are estimated at \$20 per acre for the ranch. This expense includes office supplies, utilities, telephones, bookkeeping, accounting, legal fees and maintenance, etc.

**Management/Supervisor Salaries.** The grower manages the farming operation, so no cash cost is allocated to management. Returns above costs are considered a return to management.

**Investment Repairs.** Annual maintenance is calculated as 2% of the purchase price.

### **Non-Cash Overhead Costs**

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

**Capital Recovery Costs.** Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is  $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$ .

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate.

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

*Interest Rate.* An interest rate of 4.75% 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 January 2011.

**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. For this study, the cost is \$498 per acre, or \$219,120 for the 440 acres. The establishment cost is amortized over the remaining five years of crop life.

**Irrigation System:** Irrigation systems are a mix of wheel line and center pivot, which is common in the area. This study assumes combinations of these systems with 395 acres sprinkler irrigated by twelve wheel-lines and the other 125 acres 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 for production. In this study the 35 acres are considered non-crop acreage for simplicity sake. The life of the irrigation equipment is estimated at 30 years.

**Land.** In this study, land is valued at \$4,000 per acre.

*Non-Cash Equipment Costs.* Much of the equipment inventory on a typical alfalfa hay farm in the Intermountain Region 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.

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



## REFERENCES

- American Society of Agricultural Engineers. 1992. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MI.
- Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY.
- Blank, Steve, Karen Klonsky, Kim Norris, and Steve Orloff. 1992. *Acquiring Alfalfa Hay Equipment: A financial analysis of alternatives*. University of California. Oakland, California. Giannini Information Series No. 92-1. <http://giannini.ucop.edu/InfoSeries/921-HayEquip.pdf>, Internet accessed August 2012.
- Energy Information Administration. 2012. *Weekly Retail on Highway Diesel and Gasoline Prices*. Internet accessed January 2012. <http://tonto.eia.doe.gov/oog/info/wohdp>.
- Orloff, Steve B., Karen M. Klonsky, and Pete Livingston. 2007. *Sample Costs To Establish And Produce Alfalfa , Intermountain Region – Siskiyou County – 2007, Scott Valley – Mixed Irrigation*. UC Cooperative Extension, University of California, Department of Agricultural and Resource Economics, Davis, CA. <http://coststudies.ucdavis.edu>.
- University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Alfalfa*. 2006. University of California, Division of Agriculture and Natural Resources, Davis, CA. <http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>; Internet accessed February, 2012.
- University of California. 1997. *Intermountain Alfalfa Management*. Pub. 3366. Steve Orloff (ed). University of California, Division of Agriculture and Natural Resources. Oakland, CA.



UC COOPERATIVE EXTENSION  
**Table 1. COSTS PER ACRE TO ESTABLISH ALFALFA**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

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:								
Subsoil/rip ground	0.39	8	17	0	0	26		
Fertilize: sulfur, 1X every 4 yrs.	0.00	0	0	7	2	9		
Fertilize: 11-52-0	0.00	0	0	53	8	60		
Fertilize: 0-0-60	0.00	0	0	70	8	78		
Disc stubble 2X	0.33	7	15	0	0	22		
Level field with triplane 3X	0.77	16	13	0	0	29		
Plant & Roll Field: 20 Lbs/Acre (Grain Drill & Cultipacker)	0.22	5	11	73	0	89		
Irrigate	0.60	8	0	21	0	30		
Weed control	0.00	0	0	32	8	40		
Pickup truck use	0.16	3	2	0	0	6		
<b>TOTAL CULTURAL COSTS</b>	<b>2.47</b>	<b>48</b>	<b>59</b>	<b>256</b>	<b>25</b>	<b>388</b>		
Interest on operating capital at 5.75%						6		
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>2.47</b>	<b>48</b>	<b>59</b>	<b>256</b>	<b>25</b>	<b>394</b>		
CASH OVERHEAD:								
Liability insurance						2		
Office expense						20		
Property taxes						45		
Property insurance						22		
Investment repairs						15		
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>						<b>104</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>498</b>		
NON-CASH OVERHEAD:								
		Per producing Acre		Annual Cost Capital Recovery				
Fuel tanks & pumps		17		1		1		
Hay barns (2)		179		11		11		
Land		4,000		190		190		
Shop building		83		5		5		
Shop tools		21		2		2		
Wheel line sprinkler (12)		279		17		17		
Center pivot irrigation system (1)		134		8		8		
Equipment		229		24		24		
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>4,940</b>		<b>259</b>		<b>259</b>		
<b>TOTAL COSTS/ACRE</b>						<b>757</b>		

UC COOPERATIVE EXTENSION  
**Table 2. MATERIAL AND CUSTOM COSTS PER ACRE – ESTABLISHMENT YEAR**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

	Units	Unit	\$/Unit	\$	Your Cost
<b>OPERATING COSTS</b>					
<b>Fertilizer:</b>					130
Elemental sulfur	50.00	Lb.	0.14	7	
11-52-0	150.00	Lb.	0.35	53	
0-0-60	200.00	Lb.	0.35	70	
<b>Irrigation:</b>					21
Water	4.50	Ac-in	4.75	21	
<b>Custom:</b>					25
Custom material application (fertilizer & herbicide)	3.25	Acre	7.75	25	
<b>Herbicide:</b>					31
Raptor	5.00	Fl Oz	6.15	31	
<b>Adjuvant:</b>					1
Herbimax	6.40	Fl Oz	0.23	1	
<b>Seed:</b>					73
Seed – alfalfa	20.00	Lb.	3.65	73	
<b>Labor:</b>					48
Equipment operator labor	2.25	Hours	17.81	40	
Irrigation labor	0.60	Hours	13.70	8	
<b>Machinery:</b>					59
Fuel – gas	0.48	Gal.	3.82	2	
Fuel – diesel	12.21	Gal.	3.43	42	
Lube					7
Machinery repair					8
Interest on operating capital at 5.75%					6
<b>TOTAL OPERATING COSTS/ACRE</b>					<b>394</b>

UC COOPERATIVE EXTENSION  
**Table 3. COSTS PER ACRE TO PRODUCE ALFALFA**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Weed control – dormant spray	0.00	0	0	35	8	42		
Rodent bait, 25% of acreage	0.00	0	0	6	2	8		
Fertilize: sulfur, 1X every 4 yrs.	0.00	0	0	7	2	9		
Fertilize: 0-0-60	0.00	0	0	70	8	78		
Fertilize: Sodium Molybdate, 1X every 5 yrs.	0.00	0	0	5	2	7		
Fertilize: 11-52-0	0.00	0	0	53	8	60		
Irrigate	3.50	48	0	100	0	148		
Insect control – weevil	0.00	0	0	5	8	13		
Pickup truck use	0.46	10	7	0	0	17		
<b>TOTAL CULTURAL COSTS</b>	<b>3.96</b>	<b>58</b>	<b>7</b>	<b>280</b>	<b>36</b>	<b>381</b>		
Harvest:								
Swath hay 3X	0.38	8	16	0	0	24		
Rake hay 3X	0.25	5	5	0	0	10		
Bale hay 3X (small baler #1)	0.28	6	6	0	0	12		
Bale hay 3X (small baler #2)	0.28	6	6	0	0	12		
Roadside hay 3X	0.45	10	25	0	0	35		
Load hay 3X	0.15	3	5	0	0	8		
<b>TOTAL HARVEST COSTS</b>	<b>1.78</b>	<b>38</b>	<b>62</b>	<b>0</b>	<b>0</b>	<b>100</b>		
Interest on operating capital at 5.75%						11		
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>5.74</b>	<b>96</b>	<b>69</b>	<b>280</b>	<b>36</b>	<b>492</b>		
CASH OVERHEAD:								
Liability insurance						2		
Office expense						20		
Property taxes						48		
Property insurance						6		
Investment repairs						15		
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>						<b>91</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>583</b>		
NON-CASH OVERHEAD:								
		Per producing Acre		Annual Cost		Capital Recovery		
Establishment cost		498		114		114		
Fuel tanks & pumps		17		1		1		
Hay barns (2)		179		11		11		
Land		4,000		190		190		
Shop building		83		5		5		
Shop tools		21		2		2		
Wheel line sprinkler (12)		279		17		17		
Center pivot irrigation system (1)		134		8		8		
Equipment		418		45		45		
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>5,627</b>		<b>395</b>		<b>395</b>		
<b>TOTAL COSTS/ACRE</b>						<b>978</b>		

UC COOPERATIVE EXTENSION  
**Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

	Units	Unit	\$/Unit	\$	Your Cost
<b>GROSS RETURNS</b>					
Alfalfa	6.00	Ton	200.00	1,200	
<b>OPERATING COSTS</b>					
<b>Fertilizer:</b>					135
Elemental sulfur	50.00	Lb.	0.14	7	
0-0-60	200.00	Lb.	0.35	70	
Molybdenum	0.20	Lb.	25.00	5	
11-52-0	150.00	Lb.	0.35	53	
<b>Irrigation:</b>					100
Water	21.00	Ac-in	4.75	100	
<b>Custom:</b>					36
Custom material application	4.70	Acre	7.75	36	
<b>Rodenticide:</b>					6
Rodent bait	2.50	Lb.	2.26	6	
<b>Insecticide:</b>					5
Baythroid	2.60	Fl Oz	1.96	5	
<b>Herbicide:</b>					30
Gramoxone Max	1.50	Pint	4.77	7	
Velpar DS	0.67	Lb.	33.67	23	
<b>Adjuvant:</b>					5
Activator 90	6.40	Fl Oz	0.75	5	
<b>Labor:</b>					117
Equipment operator labor	2.69	Hours	17.81	48	
Irrigation labor	3.50	Hours	13.70	48	
<b>Machinery:</b>					69
Fuel – gas	1.38	Gal.	3.82	5	
Fuel – diesel	10.23	Gal.	3.43	35	
Lube					6
Machinery repair					22
Interest on operating capital at 5.75%					11
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>492</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>708</b>	
<b>CASH OVERHEAD COSTS</b>					
Liability insurance					2
Office expense					20
Property taxes					48
Property insurance					6
Investment repairs					15
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<b>91</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>583</b>	

UC COOPERATIVE EXTENSION  
**Table 4. Continued**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

	Units	Unit	\$/Unit	\$	Your Cost
<b>GROSS RETURNS</b>					
Alfalfa	6.00	Ton	200.00	1,200	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>					
Establishment cost				114	
Fuel tanks & pumps				1	
Hay barns (2)				11	
Land				190	
Shop building				5	
Shop tools				2	
Wheel line sprinkler (12)				17	
Center pivot irrigation system (1)				8	
Equipment				45	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>				<b>395</b>	
<b>TOTAL COST/ACRE</b>				<b>978</b>	
<b>NET RETURNS ABOVE TOTAL COST</b>				<b>222</b>	

UC COOPERATIVE EXTENSION  
**Table 5. MONTHLY CASH COSTS PER ACRE TO PRODUCE ALFALFA**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

Beginning 02-12	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Ending 09-12	12	12	12	12	12	12	12	12	
Cultural:									
Weed control – dormant spray	42								42
Rodent bait, 25% of acreage		8							8
Fertilize: sulfur, 1X every 4 yrs.		9							9
Fertilize: potassium		78							78
Fertilize: Sodium Molybdate, 1X every 5 yrs.		7							7
Fertilize: 11-52-0		60							60
Irrigate			21	21	21	42	21	21	148
Insect control – weevil			13						13
Pickup truck use	2	2	2	2	2	2	2	2	17
<b>TOTAL CULTURAL COSTS</b>	<b>44</b>	<b>163</b>	<b>36</b>	<b>23</b>	<b>23</b>	<b>44</b>	<b>23</b>	<b>23</b>	<b>381</b>
Harvest:									
Swath hay 3X					8	8		8	24
Rake hay 3X					3	3		3	10
Bale hay 3X (small baler #1)					4	4		4	12
Bale hay 3X (small baler #2)					4	4		4	12
Roadside hay 3X					12	12		12	35
Load hay 3X					3	3		3	8
<b>TOTAL HARVEST COSTS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>	<b>0</b>	<b>33</b>	<b>100</b>
Interest on operating capital at 5.75%	0	1	1	1	2	2	2	2	11
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>45</b>	<b>164</b>	<b>37</b>	<b>24</b>	<b>58</b>	<b>79</b>	<b>25</b>	<b>59</b>	<b>492</b>
CASH OVERHEAD									
Liability insurance									2
Office expense									20
Property taxes									48
Property insurance									6
Investment repairs	2	2	2	2	2	2	2	2	15
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>91</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>46</b>	<b>166</b>	<b>39</b>	<b>26</b>	<b>60</b>	<b>81</b>	<b>27</b>	<b>61</b>	<b>583</b>

UC COOPERATIVE EXTENSION  
**Table 6. RANGING ANALYSIS**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALFALFA

	YIELD (tons/acre)						
	4.50	5.00	5.50	6.00	6.50	7.00	7.50
<b>OPERATING COSTS:</b>							
Cultural	381	381	381	381	381	381	381
Harvest	71	78	86	100	102	110	118
Interest on operating capital at 5.75%	11	11	11	11	11	12	12
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>462</b>	<b>470</b>	<b>478</b>	<b>492</b>	<b>494</b>	<b>502</b>	<b>510</b>
Total operating costs/ton	103	94	87	82	76	72	68
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>91</b>	<b>91</b>	<b>91</b>	<b>91</b>	<b>91</b>	<b>91</b>	<b>91</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>554</b>	<b>561</b>	<b>569</b>	<b>583</b>	<b>585</b>	<b>593</b>	<b>601</b>
Total cash costs/ton	123	112	104	97	90	85	80
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>	<b>395</b>
<b>TOTAL COSTS/ACRE</b>	<b>948</b>	<b>956</b>	<b>964</b>	<b>978</b>	<b>980</b>	<b>988</b>	<b>996</b>
Total costs/ton	211	191	175	163	151	141	133

NET RETURNS PER ACRE ABOVE OPERATING COSTS

Price \$/ton	YIELD (tons/acre)						
	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	100	155	209	258	319	373	428
150	213	280	347	408	481	548	615
175	325	405	484	558	644	723	803
200	438	530	622	708	806	898	990
225	550	655	759	858	969	1,073	1,178
250	663	780	897	1,008	1,131	1,248	1,365
275	775	905	1,034	1,158	1,294	1,423	1,553

NET RETURNS PER ACRE ABOVE CASH COSTS

Price \$/ton	YIELD (tons/acre)						
	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	9	64	118	167	227	282	337
150	121	189	256	317	390	457	524
175	234	314	393	467	552	632	712
200	346	439	531	617	715	807	899
225	459	564	668	767	877	982	1,087
250	571	689	806	917	1,040	1,157	1,274
275	684	814	943	1,067	1,202	1,332	1,462

NET RETURNS PER ACRE ABOVE TOTAL COSTS

Price \$/ton	YIELD (tons/acre)						
	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	-386	-331	-277	-228	-167	-113	-58
150	-273	-206	-139	-78	-5	62	130
175	-161	-81	-2	72	158	237	317
200	-48	44	136	222	320	412	505
225	64	169	273	372	483	587	692
250	177	294	411	522	645	762	880
275	289	419	548	672	808	937	1,067



UC COOPERATIVE EXTENSION  
**Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND OVERHEAD COSTS**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

ANNUAL EQUIPMENT COSTS – PRODUCTION YEARS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insurance	Taxes	
12	62 HP 2WD tractor #1	55,000	12	13,751	5,242	276	344	5,862
12	62 HP 2WD tractor #2	55,000	12	13,751	5,242	276	344	5,862
12	Bale wagon	149,000	10	24,593	17,084	697	868	18,649
12	Baler – pull type #1	66,000	10	10,893	7,568	309	384	8,261
12	Baler – pull type #2	66,000	10	10,893	7,568	309	384	8,261
12	Hay squeeze (forklift w/ clamp)	40,000	10	6,602	4,586	187	233	5,007
12	Pickup 4WD 3/4 ton	36,000	7	13,656	4,475	199	248	4,923
12	Center delivery rake	32,000	10	5,659	3,639	151	188	3,978
12	Swather – SP rotary 16'	130,000	15	12,481	11,724	572	712	13,009
<b>TOTAL</b>		<b>629,000</b>		<b>112,279</b>	<b>67,128</b>	<b>2,976</b>	<b>3,706</b>	<b>73,811</b>
40% of new cost*		251,600		44,912	26,851	1,190	1,483	29,524

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

ANNUAL EQUIPMENT COSTS – ESTABLISHMENT YEAR

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insurance	Taxes	
12	62 HP 2WD tractor	55,000	12	13,751	5,242	276	344	5,862
12	160 HP 4WD tractor	130,000	12	32,502	12,390	652	813	13,855
12	Cultipacker – 13'	8,300	10	1,468	944	39	49	1,032
12	Offset disc – 21'	31,500	10	5,571	3,582	149	185	3,916
12	Grain drill – 13'	30,333	10	5,364	3,449	143	178	3,771
12	Pickup 4WD 3/4 ton	36,000	7	13,656	4,475	199	248	4,923
12	Subsoiler 5-Shank – 10'	15,250	10	2,697	1,734	72	90	1,896
12	Triplane 16'X30'	20,914	10	3,698	2,378	99	123	2,600
<b>TOTAL</b>		<b>327,297</b>	-	<b>78,706</b>	<b>34,194</b>	<b>1,630</b>	<b>2,030</b>	<b>37,854</b>
40% of new cost*		130,919	-	31,482	13,678	652	812	15,142

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insurance	Taxes	Repairs	
<b>INVESTMENT</b>								
Establishment cost	219,120	5	0	50,262	503	1,096	0	51,861
Fuel tanks & pumps	9,315	30	932	574	41	51	256	923
Hay barns (2)	100,000	30	10,000	6,164	442	550	2,750	9,906
Land	2,240,000	40	2,240,000	106,400	0	22,400	0	128,800
Shop building	46,332	30	4,633	2,856	205	255	450	3,765
Shop tools	11,583	10	1,158	1,389	51	64	318	1,822
Wheel line sprinkler (12)	156,000	30	15,600	9,616	664	858	3,120	14,257
Center pivot irrigation system (1)	75,000	30	7,500	4,623	295	413	1,500	6,830
<b>TOTAL INVESTMENT</b>	<b>2,857,350</b>	-	<b>2,279,823</b>	<b>181,883</b>	<b>2,200</b>	<b>25,686</b>	<b>8,394</b>	<b>218,163</b>

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability insurance	560	Acre	2.085	1,168
Office expense	560	Acre	20	11,200

UC COOPERATIVE EXTENSION  
**Table 8. HOURLY EQUIPMENT COSTS**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Capital Recovery	Cash Overhead		Operating		Total Oper.	
				Insurance	Taxes	Lube & Repairs	Fuel		
12	62 HP 2WD tractor #1	255	2.09	0.11	0.14	3.24	10.44	13.69	16.03
12	62 HP 2WD tractor #2	134	2.38	0.13	0.16	3.47	10.44	13.92	16.58
12	Bale wagon	220	28.80	1.18	1.46	22.38	23.89	46.27	77.71
12	Baler – pull type #1	122	12.11	0.49	0.62	6.50	0.00	6.50	19.71
12	Baler – pull type #2	122	12.11	0.49	0.62	6.50	0.00	6.50	19.71
12	Hay squeeze (forklift w/ clamp)	71	18.17	0.74	0.92	14.85	19.91	34.75	54.59
12	Pickup 4WD 3/4 ton	202	6.32	0.28	0.35	3.50	11.46	14.96	21.92
12	Center delivery rake	110	5.35	0.22	0.28	2.77	0.00	2.77	8.62
12	Swather – SP rotary 16'	182	19.85	0.97	1.21	10.90	25.88	36.77	58.80

UC COOPERATIVE EXTENSION  
**Table 9. OPERATIONS WITH EQUIPMENT & MATERIALS**  
 INTERMOUNTAIN  
 SISKIYOU COUNTY – SCOTT VALLEY – 2012

Operation	Month	Tractor	Implement	Material	Rate/ acre	Unit
Weed control — dormant spray	Feb			Custom application	1.00	Acre
				Gromoxone Max	1.50	Pint
				Activator 90 (Surfactant)	6.40	Fl Oz
				Velpar DS	0.67	Lb.
Rodent bait, 25% of acreage	Mar			ZP Rodent Bait AG (Aluminum Phosphide)	2.50	Lb.
				Custom application	0.25	Acre
Fertilize: sulfur, 1 X every 4 yrs.	Mar			Elemental Sulfur	50.00	Lb.
				Custom application	0.25	Acre
Fertilize: potassium	Mar			Potassium 0-0-60	200.00	Lb.
				Custom application	1.00	Acre
Fertilize: Sodium Molybdate	Mar			Molybdemun	0.20	Lb.
				Custom application	0.20	Acre
Fertilize: 11-52-0	Mar			11-52-0	150.00	Lb.
				Custom application	1.00	Acre
Irrigate	Apr			Water	3.00	Ac-in
	May			Water	3.00	Ac-in
	Jun			Water	3.00	Ac-in
	Jul			Water	3.00	Ac-in
	July			Water	3.00	Ac-in
	Aug			Water	3.00	Ac-in
	Sept			Water	3.00	Ac-in
Insect control — weevil	Apr			Custom application	1.00	Acre
				Baythroid	2.60	Fl Oz
Swath hay 3X	Jun		Swather – SP rotary 16'			
	Jul		Swather – SP rotary 16'			
	Sept		Swather – SP rotary 16'			
Rake hay 3X	Jun	62HP 2WD Trac.	Center delivery rake - 20'			
	Jul	62HP 2WD Trac.	Center delivery rake - 20'			
	Sept	62HP 2WD Trac.	Center delivery rake - 20'			
Bale hay 3X	Jun	62HP 2WD Trac.	Baler – pull type #1			
	Jul	62HP 2WD Trac.	Baler – pull type #1			
	Sept	62HP 2WD Trac.	Baler – pull type #1			
Roadside hay 3X	Jun	62HP 2WD Trac.	Baler – pull type #1			
	Jul	62HP 2WD Trac.	Baler – pull type #1			
	Sept	62HP 2WD Trac.	Baler – pull type #1			
Load hay 3X	Jun		Bale wagon			
	Jul		Bale wagon			
	Sept		Bale wagon			
	Jun		Hay squeeze (forklift w/ clamp)			
	Jul		Hay squeeze (forklift w/ clamp)			
	Sept		Hay squeeze (forklift w/ clamp)			