

2007

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABISH AND PRODUCE

ALFALFA HAY



INTERMOUNTAIN REGION – SISKIYOU COUNTY
Butte Valley – Center Pivot Irrigation

Prepared by:

Steve B. Orloff	UC Cooperative Extension Farm Advisor, Siskiyou County
Karen M. Klonsky	UC Cooperative Extension Economist, Department of Agricultural and Resource Economics, UC Davis
Pete Livingston	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 HAY
 INTERMOUNTAIN REGION – SISKIYOU COUNTY – 2007
 Butte Valley – Center Pivot Irrigation

STUDY CONTENTS

INTRODUCTION	2
ASSUMPTIONS	3
STAND ESTABLISHMENT PRACTICES AND MATERIAL INPUTS	3
PRODUCTION CULTURAL PRACTICES AND MATERIAL INPUTS	4
CASH OVERHEAD	6
NON-CASH OVERHEAD	6
REFERENCES	8
Table 1. COSTS PER ACRE TO ESTABLISH AN ALFALFA STAND.....	9
Table 2. COSTS AND RETURNS PER ACRE TO ESTABLISH AN ALFALFA STAND	10
Table 3. COSTS PER ACRE TO PRODUCE ALFALFA HAY	11
Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA HAY	12
Table 5. MONTHLY CASH COST PER ACRE TO PRODUCE ALFALFA HAY	13
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD	14
Table 7. HOURLY EQUIPMENT COSTS	15
Table 8. RANGING ANALYSIS	16
Table 9. COST AND RETURNS/BREAKEVEN ANALYSIS	17
Table 10. DETAILS BY OPERATION	18

INTRODUCTION

The detailed costs for alfalfa establishment and production in the Butte Valley of Siskiyou County in the Intermountain Region of California are presented in this study. The hypothetical farm used in this report consists of 640 acres with 440 acres of alfalfa, 60 acres planted to other crops, and 140 acres dedicated to roads, buildings, and unused land.

This study consists of Assumptions to Establish and Produce Alfalfa 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. A blank “*Your Costs*” column (in Table 1 Costs per Acre to Establish an Alfalfa Stand, Table 2 Costs and Returns per Acre to Establish an Alfalfa Stand, Table 3 Costs per Acre to Produce Alfalfa, and Table 4 Costs and Returns per Acre to Produce Alfalfa) is for you to insert your actual production 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 530 842-2711.

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.

The University of California does not discriminate in any of its policies, procedures or practices. The university is an affirmative action/equal opportunity employer.

ASSUMPTIONS

The following assumptions pertain to sample costs to establish and produce alfalfa in the Butte Valley of Siskiyou County in the Intermountain Region. Practices described are not recommendations by the University of California, but represent production practices considered typical of a well-managed farm for this crop and area. 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 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 640 acre field and row crop farm, of which 440 acres are dedicated to alfalfa hay, 60 acres are used to grow grain and hay, 140 field acres are not cultivated because of the center pivot irrigation systems, and five acres are occupied by roads and farmstead. Typically, the grower will rotate out a portion (62 – 125 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 \$1,500 per acre.

The irrigation systems used on this farm are all center pivots. Each center pivot system irrigates 125 out of 160 acres.

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 and root penetration. The field is disced to break up large clods, creating better seed-to-soil contact for good seed germination. The land is level 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 \$6.50 per

acre. Growers should apply fertilizer or soil amendments based on soil test results to determine pH and nutrient levels. Plant tissue tests are recommended in subsequent years.

Irrigation. Irrigation for the newly-planted alfalfa begins immediately after planting. Water is applied to the newly planted acreage as well as to the established alfalfa stands through center pivot irrigation systems. Recently planted fields are irrigated from late August to mid-October or until fall rain. A total of six acre-inches of water are applied during the establishment year.

Pest Management. Pest management consists of herbicide treatment only. 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 or your pest control advisor. Pesticide-use permits are available at the county Agricultural Commissioner Office.

Weed Control. Grass and broadleaf weeds compete with alfalfa 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 late 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 up to the first cutting. The Total Accumulated Net Cash Cost in the first year as shown in Table 2 represents the establishment cost per acre. For this study, the cost is \$233 per acre or \$102,520 for the 440 established alfalfa acres. The establishment cost is amortized over the remaining six years of crop life.

PRODUCTION CULTURAL PRACTICES AND MATERIAL INPUTS

Irrigation. Irrigation begins in April and continues into September. Two and one-quarter acre-feet (28 acre-inches) of water at \$21.24 per acre-foot or \$1.77 per acre-inch are applied through center pivot irrigation systems. Irrigation costs shown in the tables include the water cost and labor.

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 lbs 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 and winter as the alfalfa 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 do not reach economic damaging levels 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 early May 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 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 5.0 tons of hay per acre over three cuttings per year. Three cuttings per year are normally made in the Butte Valley. Annual yields in the region range from 4 to 6 tons per acre.

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 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 which 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 for their hay before an alfalfa stand is established.

CASH OVERHEAD COSTS

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 0.690% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,018 for the entire farm or \$1.59 per acre.

Office Expense. Various farm and office expenses are estimated at \$6.25 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 COSTS

Investment. The investments shown in Table 6 are those that are partially or completely allocated to the alfalfa 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 capital recovery 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 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.

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

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 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.

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.

REFERENCES

- American Society of Agricultural Engineers. 2003. *American Society of Agricultural Engineers Standards Yearbook*. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.
- American Society of Farm Managers and Rural Appraisers. 2006. *Trends in Agricultural Land & Lease Values*. California Chapter of the American Society of Farms Managers and Rural Appraisers. Woodbridge, CA.
- Barker, Doug. *California Workers' Compensation Rating Data for Selected Agricultural Classifications as of January 2005*. California Department of Insurance, Rate Regulation Branch.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York
- 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 May, 2006
- 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>.
- Orloff, Steve B., Karen Klonsky, and Rich De Moura. 2001. *Sample Costs To Establish And Produce Alfalfa , Intermountain Region, Siskiyou County, Center Pivot Irrigation – 2001*. UC Cooperative Extension, University of California, Department of Agricultural and Resource Economics, Davis, CA, http://www.agecon.ucdavis.edu/uploads/cost_return_articles/alfir2001-1.pdf, Internet accessed December, 2005.
- Orloff, Steve B., Karen M. Klonsky, and Pete Livingston. 2007. *Sample Costs To Produce Grain Hay, Intermountain Region – Siskiyou County – 2007*. 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 December, 2006.
- University of California. 1997. *Intermountain Alfalfa Management*. Pub. 3366. Steve Orloff (ed). University of California, Division of Agriculture and Natural Resources. Oakland, CA.

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.

UC COOPERATIVE EXTENSION
COST PER ACRE TO ESTABLISH AN ALFALFA STAND
INTERMOUNTAIN REGION
SISKIYOU COUNTY – BUTTE 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 Every 3 Years	0.00	0	0	6	1	7	
Fertilize: 11-52-0 1X Every 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	0.00	0	0	11	0	11	
Weed Control - Fall Post-Emergent	0.00	0	0	27	7	33	
Pickup Truck Use	<u>0.16</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>4</u>	
TOTAL CULTURAL COSTS	1.14	18	25	112	11	166	
Interest on Operating Capital @ 10.00%						6	
TOTAL OPERATING COSTS/ACRE		18	25	112	11	172	
CASH OVERHEAD:							
Office Expense						6	
Liability Insurance						2	
Property Taxes						20	
Property Insurance						14	
Investment Repairs						<u>19</u>	
TOTAL CASH OVERHEAD COSTS						60	
TOTAL CASH COSTS/ACRE						233	
NON-CASH OVERHEAD:							
		Per producing		-- Annual Cost --			
Investment		<u>Acres</u>		<u>Capital Recovery</u>			
Land		1,500		94		94	
Fuel Tanks & Pumps		15		1		1	
Shop Building		72		5		5	
Shop Tools		18		2		2	
Center Pivot Irrigation System (4)		467		40		40	
Hay Barns (2)		156		13		13	
Equipment		<u>143</u>		<u>17</u>		<u>17</u>	
TOTAL NON-CASH OVERHEAD COSTS		2,371		174		174	
TOTAL COSTS/ACRE						406	

Table 2.

U.C. COOPERATIVE EXTENSION
 COST AND RETURNS PER ACRE TO ESTABLISH AN ALFALFA STAND
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – BUTTE 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	83.30	Lb	0.07	6	
11-52-0	100.00	Lb	0.216	22	
Custom:					
Ground Application - Fertilizer	0.75	Acre	5.50	4	
Ground Application - Seed & Pesticides	1.00	Acre	6.50	7	
Seed:					
Seed - Alfalfa	18.00	Lb	2.60	47	
Irrigation:					
Water	6.00	AcIn	1.77	11	
Herbicide:					
Raptor	5.00	FIOz	4.65	23	
Adjuvant:					
Herbimax	32.00	FIOz	0.11	4	
Labor (machine)	1.36	Hrs	13.30	18	
Labor (non-machine)	0.00	Hrs	0.00	0	
Fuel - Gas	0.48	Gal	2.80	1	
Fuel - Diesel	6.99	Gal	2.30	16	
Lube				3	
Machinery repair				5	
Interest on Operating Capital @ 10.00%				<u>6</u>	
TOTAL OPERATING COSTS/ACRE				172	
CASH OVERHEAD COSTS:					
Office Expense				6	
Liability Insurance				2	
Property Taxes				20	
Property Insurance				14	
Investment Repairs				<u>19</u>	
TOTAL CASH OVERHEAD COSTS/ACRE				60	
TOTAL CASH COSTS/ACRE				233	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Land				94	
Fuel Tanks & Pumps				1	
Fuel Wagon				5	
Shop Building				2	
Shop Tools				40	
Center Pivot Irrigation System (4 Each)				13	
Hay Barns (2 Each)				<u>17</u>	
Equipment				174	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				406	

Table 3.

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

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

Short Term Interest Rate: 10.00%
 Yield: 5.0 Tons

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:							
Weed Control - Winter Spray	0.00	0	0	29	7	36	
Rodent Bait - 25% of Acreage	0.50	6	0	1	0	6	
Fertilize: Sulfur 1X Every 3 Years	0.00	0	0	5	1	7	
Fertilize: 11-52-0 1X Every 2 Years	0.00	0	0	19	3	21	
Irrigate	0.00	0	0	50	0	50	
Insect Control - Weevil 1X Every 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	0.96	13	5	107	14	139	
Harvest:							
Swath Hay 3X	0.50	8	2	0	0	10	
Rake Hay 3X	0.33	5	4	0	0	9	
Bale Hay 3X (2 Tractors & Balers)	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	
Interest on Operating Capital @ 10.00%						9	
TOTAL OPERATING COSTS/ACRE		43	38	132	14	235	
CASH OVERHEAD:							
Office Expense						6	
Liability Insurance						2	
Property Taxes						22	
Property Insurance						16	
Investment Repairs						<u>19</u>	
TOTAL CASH OVERHEAD COSTS						64	
TOTAL CASH COSTS/ACRE						299	
NON-CASH OVERHEAD:							
Investment		Per producing Acre		-- Annual Cost --			
Land		1,500		Capital Recovery	109	109	
Alfalfa Establishment Cost		233			49	49	
Fuel Tanks & Pumps		15			1	1	
Shop Building		72			6	6	
Shop Tools		18			2	2	
Center Pivot Irrigation System (4)		467			44	44	
Hay Barns (2)		156			15	15	
Equipment		<u>276</u>			<u>35</u>	<u>35</u>	
TOTAL NON-CASH OVERHEAD COSTS		2,737			261	261	
TOTAL COSTS/ACRE						560	

Table 4.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA HAY
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – BUTTE 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	5.0	Ton	125.00	<u>625</u>	
TOTAL GROSS RETURNS FOR ALFAFA HAY				<u>625</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	
Irrigation:					
Water	28.00	AcIn	1.77	50	
Insecticide:					
Baythroid	1.00	FLOz	3.59	4	
Labor (machine)	2.78	Hrs	13.30	37	
Labor (non-machine)	0.50	Hrs	11.10	6	
Fuel - Gas	3.59	Gal	2.80	10	
Fuel - Diesel	6.73	Gal	2.30	15	
Lube				3	
Machinery repair				34	
Interest on Operating Capital @ 10.00%				<u>9</u>	
TOTAL OPERATING COSTS/ACRE				<u>235</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>390</u>	
CASH OVERHEAD COSTS:					
Office Expense				6	
Liability Insurance				2	
Property Taxes				22	
Property Insurance				16	
Investment Repairs				<u>19</u>	
TOTAL CASH OVERHEAD COSTS/ACRE				<u>64</u>	
TOTAL CASH COSTS/ACRE				<u>299</u>	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Land				109	
Alfalfa Establishment Cost				49	
Fuel Tanks & Pumps				1	
Shop Building				6	
Shop Tools				2	
Center Pivot Irrigation System (4 Each)				44	
Hay Barns (2 Each)				15	
Equipment				<u>35</u>	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				<u>261</u>	
TOTAL COSTS/ACRE				<u>560</u>	
NET RETURNS ABOVE TOTAL COSTS				<u>65</u>	

Table 5.

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

Beginning JAN 06	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 06	06	06	06	06	06	06	06	06	06	06	06	06	
Cultural:													
Weed Control - Winter Spray		36											36
Rodent Bait - 25% of Acres			6										6
Fertilize: Sulfur - 1X Every 3 Years			7										7
Fertilize: 11-52-0 - 1X Every 2 Years			21										21
Irrigate				4	9	12	14	9	2				50
Insect Control - Weevil - 1X Every 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>13</u>
TOTAL CULTURAL COSTS		37	36	12	10	14	16	10	3				139
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				9
TOTAL OPERATING COSTS/ACRE		38	37	13	11	44	46	12	34				235
CASH OVERHEAD:													
Office Expense			1	1	1	1	1	1	1				6
Liability Insurance		2											2
Property Taxes		11						11					22
Property Insurance		8						8					16
Investment Repairs		<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>2</u>	<u>2</u>	<u>19</u>
TOTAL CASH OVERHEAD COSTS		22	2	2	2	2	2	21	2	2	2	2	64
TOTAL CASH COSTS/ACRE		22	40	39	15	47	67	14	37	2	2	2	299

Table 6.

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

ANNUAL EQUIPMENT COSTS									
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -			Total
						Insur- ance	Taxes		
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									
Description	Price	Yrs Life	Salvage Value	Capital Recovery	----- Cash Overhead -----				Total
					Insur- ance	Taxes	Repairs		
INVESTMENT									
Alfalfa Establishment Cost	102,520	6		21,013	359	513	0		21,884
Center Pivot Irrigation System (4 Each)	299,000	20	29,900	25,808	1,151	1,645	8,223		36,827
Fuel Tanks & Pumps	9,315	20	932	804	36	51	256		1,147
Hay Barns (2 Each)	100,000	20	10,000	8,632	385	550	2,750		12,317
Land	960,000	40	960,000	60,000	6,720	9,600	0		76,320
Shop Building	46,332	30	4,633	3,400	178	255	450		4,284
Shop Tools	11,583	10	1,158	1,506	45	64	318		1,932
TOTAL INVESTMENT	1,528,750		1,006,623	121,163	8,874	12,677	11,997		154,711

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/		Price/	Total
	Farm	Unit	Unit	Cost
Liability Insurance	640	Acre	1.59	1,018
Office Expense	640	Acre	6.25	4,000

Table 7.

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

		----- COSTS PER HOUR -----							
Yr	Description	Actual Hours Used	- Cash Overhead -			----- Operating -----			Total Costs/Hr.
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Oper.	
06	62 HP 2WD Tractor	999.7	1.65	0.06	0.09	1.05	8.05	9.10	10.91
06	62 HP 2WD Tractor	999.1	1.65	0.06	0.09	1.05	8.05	9.10	10.91
06	Baler - Pull-Type w/Engine	249.5	12.72	0.40	0.56	5.74	0.00	5.74	19.42
06	Baler - Pull-Type w/Engine	249.5	12.72	0.40	0.56	5.74	0.00	5.74	19.42
06	Balewagon	199.5	33.14	1.04	1.46	18.05	18.42	36.47	72.11
06	Hay Squeeze	199.6	10.60	0.33	0.47	5.78	12.99	18.77	30.17
06	Pickup 4WD 3/4 Ton	284.2	7.28	0.25	0.35	1.75	9.66	11.41	19.29
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'	220.0	14.70	0.53	0.75	4.48	0.00	4.48	20.46

Table 8.

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

COSTS PER ACRE AT VARYING YIELDS FOR ALFALFA HAY							
	YIELD (TONS/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
OPERATING COSTS/ACRE:							
Cultural Cost	139	139	139	139	139	139	139
Harvest Cost	61	70	79	88	96	105	114
Interest on Operating Capital	8	8	8	9	9	9	9
TOTAL OPERATING COSTS/ACRE	208	217	226	235	244	253	262
TOTAL OPERATING COSTS/TON	60	54	50	47	44	42	40
CASH OVERHEAD COSTS/ACRE	64	64	64	64	64	64	64
TOTAL CASH COSTS/ACRE	272	281	290	299	308	317	326
TOTAL CASH COSTS/TON	78	70	64	60	56	53	50
NON-CASH OVERHEAD COSTS/ACRE	259	260	260	261	262	262	263
TOTAL COSTS/ACRE	531	541	551	560	570	580	589
TOTAL COSTS/TON	152	135	122	112	104	97	91

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
ALFALFA HAY							
85	90	123	157	190	224	257	291
95	124	163	201	240	278	317	355
105	159	203	246	290	333	377	420
115	194	243	291	340	388	437	485
125	229	283	336	390	443	497	550
135	264	323	381	440	498	557	615
145	299	363	426	490	553	617	680
155	334	403	471	540	608	677	745

NET RETURNS PER ACRE ABOVE CASH COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
ALFALFA HAY							
85	26	59	93	126	160	193	227
95	60	99	137	176	214	253	291
105	95	139	182	226	269	313	356
115	130	179	227	276	324	373	421
125	165	219	272	326	379	433	486
135	200	259	317	376	434	493	551
145	235	299	362	426	489	553	616
155	270	339	407	476	544	613	681

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR ALFALFA HAY							
PRICE (DOLLARS/TONS)	YIELD (TONS/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
ALFALFA HAY							
85	-234	-201	-169	-135	-103	-70	-37
95	-198	-161	-123	-85	-48	-10	28
105	-163	-121	-78	-35	7	50	93
115	-128	-81	-33	15	62	110	158
125	-93	-41	12	65	117	170	223
135	-58	-1	57	115	172	230	288
145	-23	39	102	165	227	290	353
155	12	79	147	215	282	350	418

Table 9.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS/ BREAKEVEN ANALYSIS
 INTERMOUNTAIN REGION
 SISKIYOU COUNTY – BUTTE 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	625	235	390	299	326	560	65

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	275,000	103,540	171,460	131,667	143,333	246,566	28,434

BREAKEVEN PRICES PER YIELD UNIT					
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
Alfalfa Hay	5.0	Ton	47.06	59.85	112.08

BREAKEVEN YIELDS PER ACRE					
CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Cash Costs	Total Costs
Alfalfa Hay	Ton	125.00	1.9	2.4	4.5

Table 10.

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

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Weed Control - Winter 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	3.00	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	3.00	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	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					