
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2012

SAMPLE COSTS TO ESTABLISH AND PRODUCE

ALFALFA HAY



INTERMOUNTAIN – Siskiyou County

Butte Valley – Center Pivot Irrigation

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INTRODUCTION

Sample costs to establish and produce alfalfa hay under a center pivot irrigation system in the Intermountain Region of Butte Valley in Siskiyou County are presented in this. 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, 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 selected county UC Cooperative Extension offices.

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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 Butte 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 645 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 60 acres, roads and farmstead occupy five acres, and 140 field acres are not cultivated because of the center pivot irrigation systems. The grower will typically rotate out a portion (62 to 125 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 \$2,750 per acre.

Establishment Operating Costs

Tables 1 & 2

Land Preparation. The ground is ripped or chiseled to a depth of approximately 16 to 30 inches, depending on which implement is used, 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 and phosphorus, as 11-52-0, is applied at 125 pounds per acre, or 65 pounds of P₂O₅. 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 mid-to-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 newly planted acreage as well as to the established alfalfa through center pivot irrigation systems. Seedling fields are irrigated with 10 to 12 passes, with the center pivot applying 0.25 to 0.50 inches of water per pass, between mid-to-late-August to mid-October, or until fall rain. A total of 3.5 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 at 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 seedlings during the establishment year. In early October, a post emergent 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 late June of the following year.

Production Operating Costs

Tables 3 to 9

Irrigation. Irrigation begins in April and continues into September. Twenty (20) acre-inches of water at \$60.00 per acre-foot, or \$5.00 per acre-inch, are applied through four center pivot irrigation systems. No assumption is made about effective rainfall, runoff, and evaporation.

Fertilization. Phosphorus and sulfur are first applied in the establishment year. After the establishment year, phosphorus is applied annually in March at 65 pounds of P₂O₅ (125 pounds of 11-52-0) per acre. Two-hundred pounds of elemental sulfur per acre is 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. The fertilizers are custom spread by a fertilizer company at a cost of \$7.75 per acre. Boron is also occasionally needed on some fields in Butte Valley but is not included in this study. 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.

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. Winter annual weeds first emerge in alfalfa fields in the fall and winter as alfalfa becomes dormant. In March, 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.

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 crop life, controls will be applied an average of once every three to four years.

In this study, weevils are treated every third year in early May by a certified applicator with the insecticide Baythroid at 2.6 fluid ounces per acre. One-third of the 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. Belding's ground squirrel is the most serious vertebrate pest in Butte Valley. Rodenticide treatment is not common, because poison grain baits have not been found to be effective for Belding's ground squirrel, so most growers use shooting for control. Costs associated with shooting are not included in this study.

Harvest. Harvest equipment owned by the farm consists of a self-propelled rotary swather, center-delivery rake, a self-propelled balewagon (harrowbed), one big baler, 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 large pull-type baler. 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 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 typically range from 4 to 6 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 14.

Labor, Equipment and Interest

Labor. Labor rates of \$17.81 per hour for machine operators and \$13.70 for general labor (irrigation labor and non-machine 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 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 Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property.

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, 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 up to the first cutting. For this study, the cost is \$387 per acre or \$170,280 for the 440 alfalfa acres. The establishment cost is amortized over the remaining five years of crop life.

Irrigation System. The irrigation systems used on this farm are all center pivots. Each center pivot system irrigates 125 out of 160 acres. The life of the irrigation equipment is estimated at 30 years.

Land. Land values in the Butte Valley typically range from \$2,500 to \$3,000 per acre. In this study, the land is valued at \$2,750 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.

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UC COOPERATIVE EXTENSION
Table 1. COSTS PER ACRE TO ESTABLISH ALFALFA
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/Ac)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Subsoil/rip ground	0.39	8	17	0	0	26		
Fertilize: sulfur, 1 X every 4 yrs.	0.00	0	0	7	2	9		
Fertilize: 11-52-0,	0.00	0	0	44	8	52		
Disc stubble 2X	0.33	7	15	0	0	22		
Level field with triplane 3X	0.77	16	13	0	0	29		
Plant: 20 lbs./ac (grain drill & cultipacker)	0.22	5	11	73	0	89		
Irrigate	0.60	8	0	18	0	26		
Weed control	0.00	0	0	32	8	40		
Pickup truck use	0.16	3	2	0	0	6		
TOTAL CULTURAL COSTS	2.47	48	59	173	17	298		
Interest on operating capital at 5.75%							4	
TOTAL OPERATING COSTS/ACRE	2.47	48	59	173	17	302		
CASH OVERHEAD:								
Liability insurance							2	
Office expense							20	
Property taxes							32	
Property insurance							16	
Investment repairs							15	
TOTAL CASH OVERHEAD COSTS/ACRE							85	
TOTAL CASH COSTS/ACRE							387	
NON-CASH OVERHEAD:								
		Per producing Acre		Annual Cost				
				Capital Recovery				
Fuel tanks & pumps		14		1		1		
Hay barns (2)		155		12		12		
Land		2,750		131		131		
Shop building		72		4		4		
Shop tools		18		2		2		
Center pivot irrigation system (4)		465		29		29		
Equipment		229		24		24		
TOTAL NON-CASH OVERHEAD COSTS		3,703		202		202		
TOTAL COSTS/ACRE							590	

UC COOPERATIVE EXTENSION
Table 2. MATERIAL AND CUSTOM WORK COSTS PER ACRE - ESTABLISHMENT YEAR
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

	Units	Unit	\$/Unit	\$	Your Cost
OPERATING COSTS					
Fertilizer:					
Elemental sulfur	50.00	Lb.	0.14	7	
11-52-0	125.00	Lb.	0.35	44	
Irrigation:					
Water	3.50	Ac-in	5.00	18	
Custom:					
Custom material application (fertilizer & herbicide)	2.25	Acre	7.75	17	
Herbicide:					
Raptor	5.00	Fl Oz	6.15	31	
Adjuvant:					
Herbimax	6.40	Fl Oz	0.23	1	
Seed:					
Seed	20.00	Lb.	3.65	73	
Labor:					
Equipment operator labor	2.25	Hours	17.81	40	
Irrigation labor	0.60	Hours	13.70	8	
Machinery:					
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%				4	
TOTAL OPERATING COSTS/ACRE				302	

UC COOPERATIVE EXTENSION
Table 3. COSTS PER ACRE TO PRODUCE ALFALFA
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE 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	31	8	38		
Fertilize: sulfur, 1X every 4 yrs.	0.00	0	0	7	2	9		
Fertilize: 11-52-0	0.00	0	0	44	8	52		
Irrigate	2.00	27	0	100	0	127		
Insect control – weevil, 1X every 3 yrs.	0.00	0	0	2	3	4		
Pickup truck use	0.46	10	7	0	0	17		
TOTAL CULTURAL COSTS	2.46	37	7	183	20	247		
Harvest:								
Swath hay 3X	0.38	8	16	0	0	24		
Rake hay 3X	0.25	5	4	0	0	10		
Bale hay 3X	0.33	7	19	0	0	26		
Roadside hay 3X	0.31	7	17	0	0	24		
Load hay 3X	0.15	3	5	0	0	8		
TOTAL HARVEST COSTS	1.42	30	60	0	0	91		
Interest on operating capital at 5.75%						7		
TOTAL OPERATING COSTS/ACRE	3.88	68	67	183	20	345		
CASH OVERHEAD:								
Office expense						20		
Liability insurance						2		
Property taxes						35		
Property insurance						5		
Investment repairs						15		
TOTAL CASH OVERHEAD COSTS/ACRE						77		
TOTAL CASH COSTS/ACRE						422		
NON-CASH OVERHEAD:								
		Per producing Acre		Annual Cost				
				Capital Recovery				
Establishment cost		387		89		89		
Fuel tanks & pumps		14		1		1		
Hay barns (2)		155		12		12		
Land		2,750		131		131		
Shop building		72		4		4		
Shop tools		18		2		2		
Center pivot irrigation system (4)		465		29		29		
Equipment		377		40		40		
TOTAL NON-CASH OVERHEAD COSTS		4,239		307		307		
TOTAL COSTS/ACRE						729		

UC COOPERATIVE EXTENSION
Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

	Units	Unit	\$/Unit	\$	Your Cost
GROSS RETURNS					
Alfalfa	5	Tons	200	1,000	
OPERATING COSTS					
Fertilizer:					
Elemental sulfur	50.00	Lb.	0.14	7	
11-52-0	125.00	Lb.	0.35	44	
Irrigation:					
Water	20.00	Ac-in	5.00	100	
Custom:					
Custom material application	2.58*	Acre	7.75	20	
Insecticid:					
Baythroid	0.87	Fl Oz	1.96	2	
Herbicide:					
Gramoxone Max	1.50	Pint	4.77	7	
Velpar DS	0.67	Lb.	33.67	23	
Adjuvant:					
Activator 90	6.76	Fl Oz	0.13	1	
Labor:					
Equipment operator labor	2.25	Hours	17.81	40	
Irrigation labor	2.00	Hours	13.70	27	
Machinery:					
Fuel – gas	1.38	Gal.	3.82	5	
Fuel – diesel	10.90	Gal.	3.43	37	
Lube				6	
Machinery repair				19	
Interest on operating capital at 5.75%				7	
TOTAL OPERATING COSTS/ACRE				345	
NET RETURNS ABOVE OPERATING COSTS				655	
CASH OVERHEAD COSTS					
Office expense				20	
Liability insurance				2	
Property taxes				35	
Property insurance				5	
Investment repairs				15	
TOTAL CASH OVERHEAD COSTS/ACRE				77	
TOTAL CASH COSTS/ACRE				422	
NON-CASH OVERHEAD COSTS (capital recovery)					
Establishment cost				89	
Fuel tanks & pumps				1	
Hay barns (2)				12	
Land				131	
Shop building				4	
Shop tools				2	
Center pivot irrigation system (4)				29	
Equipment				40	
TOTAL NON-CASH OVERHEAD COSTS				307	
TOTAL COST/ACRE				730	
NET RETURNS ABOVE TOTAL COST				270	

* Custom cost calculated as annual phosphorus application (1), elemental sulfur every four years (0.25), annual weed control (1), and insecticides every third year (0.33), totaling 2.58 (1+0.25+1+0.33) custom applications, annually.

UC COOPERATIVE EXTENSION
Table 5. MONTHLY CASH COSTS PER ACRE TO PRODUCE ALFALFA
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Beginning 03-12								
Ending 09-12	12	12	12	12	12	12	12	
Cultural:								
Weed control – dormant spray	38							38
Fertilize: sulfur, 1X every 4 yrs.	9							9
Fertilize: 11-52-0	52							52
Irrigate		16	16	16	32	32	16	127
Insect control – weevil, 1 X every 3 yrs.			4					4
Pickup truck use	2	2	2	2	2	2	2	17
TOTAL CULTURAL COSTS	101	18	23	18	34	34	18	247
Harvest:								
Swath hay 3X				8	8		8	24
Rake hay 3X				3	3		3	10
Bale hay 3X				9	9		9	26
Roadside hay 3X				8	8		8	24
Load hay 3X				3	3		3	8
TOTAL HARVEST COSTS	0	0	0	30	30	0	30	91
Interest on operating capital at 5.75%	0	1	1	1	1	1	2	7
TOTAL OPERATING COSTS/ACRE	102	19	23	49	66	36	50	345
CASH OVERHEAD								
Office expense								20
Liability insurance								2
Property taxes								35
Property insurance								5
Investment repairs	2	2	2	2	2	2	2	15
TOTAL CASH OVERHEAD COSTS	2	2	2	2	2	2	2	77
TOTAL CASH COSTS/ACRE	104	21	25	52	68	38	52	422

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALFALFA

	YIELD (tons/acre)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
OPERATING COSTS:							
Cultural	247	247	247	247	247	247	247
Harvest	59	67	75	91	92	100	109
Interest on operating capital at 5.75%	7	7	7	7	7	7	7
TOTAL OPERATING COSTS/ACRE	312	321	329	345	346	354	363
Total operating costs/ton	89	80	73	69	63	59	56
CASH OVERHEAD COSTS/ACRE	77	77	77	77	77	77	77
TOTAL CASH COSTS/ACRE	390	398	407	422	423	432	440
Total cash costs/ton	111	100	90	84	77	72	68
NON-CASH OVERHEAD COSTS/ACRE	307	307	307	307	307	307	307
TOTAL COSTS/ACRE	697	706	714	729	731	739	747
Total costs/ton	199	176	159	146	133	123	115

NET RETURNS PER ACRE ABOVE OPERATING COSTS

Price \$/ton	YIELD (tons/acre)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
125	125	179	233	280	341	396	450
150	213	279	346	405	479	546	612
175	300	379	458	530	616	696	775
200	388	479	571	655	754	846	937
225	475	579	683	780	891	996	1,100
250	563	679	796	905	1,029	1,146	1,262
275	650	779	908	1,030	1,166	1,296	1,425

NET RETURNS PER ACRE ABOVE CASH COSTS

Price \$/ton	YIELD (tons/acre)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
125	48	102	156	203	264	318	372
150	135	202	268	328	402	468	535
175	223	302	381	453	539	618	697
200	310	402	493	578	677	768	860
225	398	502	606	703	814	918	1,022
250	485	602	718	828	952	1,068	1,185
275	573	702	831	953	1,089	1,218	1,347

NET RETURNS PER ACRE ABOVE TOTAL COSTS

Price \$/ton	YIELD (tons/acre)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
125	-260	-206	-151	-104	-43	11	65
150	-172	-106	-39	21	94	161	228
175	-85	-6	74	146	232	311	390
200	3	95	186	271	369	461	553
225	90	195	299	396	507	611	715
250	178	295	411	521	644	761	878
275	265	395	524	646	782	911	1,040

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

ANNUAL EQUIPMENT COSTS – PRODUCTION YEARS

Yr	Description	Price	Yrs. Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insurance	Taxes	
12	170 HP 4WD tractor	153,000	12	38,252	14,582	768	956	16,306
12	62 HP 2WD tractor	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	Hay squeeze (forklift w/ clamp)	40,000	10	6,602	4,586	187	233	5,007
12	Large baler (3x4)	109,750	10	18,114	12,584	513	639	13,737
12	Pickup 4WD 3/4 ton	36,000	7	13,656	4,475	199	248	4,923
12	Rake – 20'	25,500	10	4,509	2,900	120	150	3,170
12	Rotary swather – SP 16'	130,000	15	12,481	11,724	572	712	13,009
TOTAL		698,250		131,958	73,177	3,333	4,151	80,662
40% of new cost*		279,300		52,783	29,271	1,333	1,660	32,265

*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
TOTAL		327,297	-	78,706	34,194	1,630	2,030	37,854
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	
INVESTMENT								
Establishment cost	170,280	5	0	39,059	525	851	0	40,435
Fuel tanks & pumps	9,315	30	932	574	41	51	256	923
Hay barns (2)	100,000	20	10,000	7,545	442	550	2,750	11,286
Land	1,773,750	40	1,773,750	84,253	0	17,738	0	101,991
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
Center pivot irrigation system (4)	300,000	30	30,000	18,492	1,178	1,650	6,000	27,320
TOTAL INVESTMENT	2,411,260		1,820,473	154,167	2,441	21,159	9,774	187,541

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Office expense	645	Acre	20.00	12,900
Liability insurance	645	Acre	1.81	1,167

UC COOPERATIVE EXTENSION
Table 8. HOURLY EQUIPMENT COSTS
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

Yr Description	COSTS PER HOUR							
	Actual Hours Used	Capital Recovery	Cash Overhead		Operating			Total Costs/Hr.
			Insurance	Taxes	Lube & Repairs	Fuel	Total Oper.	
12 170 HP 4WD tractor	161	4.16	0.22	0.27	7.61	33.84	41.45	46.10
12 62 HP 2WD tractor	121	2.42	0.13	0.16	3.50	10.44	13.94	16.64
12 Bale wagon	151	40.38	1.65	2.05	29.94	23.89	53.82	97.90
12 Hay squeeze (forklift w/ clamp)	71	9.17	0.37	0.47	8.97	19.91	28.88	38.89
12 Large baler (3x4)	161	13.58	0.55	0.69	8.00	0.00	8.00	22.82
12 Pickup 4WD 3/4 ton	202	6.30	0.28	0.35	3.50	11.46	14.96	21.89
12 Rake - 20'	110	5.44	0.23	0.28	2.82	0.00	2.82	8.76
12 Rotary swather - SP 16'	182	23.45	1.14	1.42	12.17	25.88	38.05	64.07

UC COOPERATIVE EXTENSION
Table 9. OPERATIONS WITH EQUIPMENT & MATERIALS
 INTERMOUNTAIN
 SISKIYOU COUNTY - BUTTE VALLEY - 2012

Operation	Operation Month	Tractor	Implement	Material	Rate/acre	Unit
Weed control - dormant spray	February			Custom application	1.00	Acre
				Gromoxone Max	1.50	Pint
				Activator 90	6.76	Fl Oz
				Velpar DS	0.67	Lb.
Fertilize: sulfur, 1X every 4 yrs.	March			Elemental sulfur	50.00	Lb.
				Custom application	0.25	Acre
Fertilize: 11-52-0	March			11-52-0	125.00	Lb.
				Custom application	1.00	Acre
Irrigate	April			Water	2.50	Ac-in
	May			Water	2.50	Ac-in
	June			Water	2.50	Ac-in
	July			Water	2.50	Ac-in
	July			Water	2.50	Ac-in
	August			Water	2.50	Ac-in
	August			Water	2.50	Ac-in
	September			Water	2.50	Ac-in
Insect control - weevil, 1X every 3 yrs.	May			Custom application	0.33	Acre
				Baythroid	0.87	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'			
	July	62 HP 2WD tractor	Rake - 20'			
	September	62 HP 2WD tractor	Rake - 20'			
Bale hay 3X	June	170 HP 4WD tractor	Large baler			
	July	170 HP 4WD tractor	Large baler			
	September	170 HP 4WD tractor	Large baler			
Roadside hay 3X	June		Bale wagon			
	July		Bale wagon			
	September		Bale wagon			
Load hay 3X	June		Hay squeeze (forklift w/ clamp)			
	July		Hay squeeze (forklift w/ clamp)			
	September		Hay squeeze (forklift w/ clamp)			