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# **UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

**2008**

## **SAMPLE COSTS TO ESTABLISH AND PRODUCE PASTURE**



### **IRRIGATED IN THE INTERMOUNTAIN REGION SHASTA, LASSEN, AND MODOC COUNTIES**

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In the Intermountain Region  
Shasta, Lassen, and Modoc Counties - 2008

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### INTRODUCTION

Sample costs to establish a pasture stand and produce pasture in the Intermountain Region of Shasta, Lassen, and Modoc Counties are shown in this study. The study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on the production practices considered typical for this crop and region, but will not apply to every farm situation. Sample costs for labor, materials, equipment and custom services are based on current figures. “*Your Costs*” columns in Tables 1 and 2, are provided for you to enter your costs.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-2414 or the local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-2414. Current studies can be downloaded from the department website <http://coststudies.ucdavis.edu/> or obtained from the local county UC Cooperative Extension offices.

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## ASSUMPTIONS

The following assumptions refer to Tables 1 to 11 and pertain to sample costs to establish a pasture stand, produce pasture and pasture hay in the Intermountain Region of Shasta, Lassen, and Modoc Counties. Practices described are not University of California recommendations, but represent production practices and materials considered typical of a well-managed pasture stand in the Intermountain Region. Costs, materials, and practices in this study will not be applicable to all situations. Establishment and cultural practices vary among growers within the region; variations can be significant. **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.**

**Farm.** The hypothetical farm consist of 1,000 contiguous acres of land on which 200 acres previously planted to grain are being planted to pasture, 800 acres are improved and unimproved range. The pasture land is owned by the grower at a price of \$2,500 per acre. The farm also includes cattle that are grazed on the range or pasture and also fed pasture hay. The cattle operation is considered a separate enterprise. The owner manages the farm and cattle.

## STAND ESTABLISHMENT

### TABLES 1 AND 2

**Land Preparation.** The ground is chiselled 20 to 32 inches deep to fracture the soil and improve water infiltration. The field is disced one time to break up large clods, creating better seed-to-soil contact for good germination. Borders (levees) for irrigation checks are made at periodic intervals through the field. The land is custom laser leveled so the fields are graded and passed over with a harrow roller to let water irrigate the pasture efficiently. A soil test is done prior to any field work to determine fertilizer and nutrient levels. All land and establishment preparation are done by a custom operator.

**Planting.** A cultipacker is used to firm the seedbed prior to and after planting. In late August, orchardgrass at 12 pounds or tall fescue at 16 pounds per acre plus clover seed (ladino, alsike, strawberry, or white Dutch) at 2 – 4 pounds (two pounds in this study) per acre is planted 1/4 to 1/2 inch deep. A custom operator does the planting with a 16 foot grain drill or broadcast seeder. Stand life in this study is 20 years.

**Fertilization.** Prior to planting, fertilizers are spread and incorporated by discing. Elemental sulfur (recommended by Farm Advisors) is applied at 200 pounds per acre while about 25% of acreage in the Intermountain Region need  $P_2O_5$ . The fertilizers are custom spread by a fertilizer company at a cost of \$8.50 per acre. Growers should apply fertilizer or soil amendments after soil tests determine pH and nutrient levels. Plant tissue tests are recommended in subsequent years.

**Irrigation.** During August and September of the establishment year, irrigation water is applied preplant, immediately after planting, and 10 to 14 days later. The combined total of the three irrigations is about six acre-inches of water.

**Weed Control.** Grasses and broadleaf weeds can compete with the seedlings during stand establishment, but are not always a problem. In this study Roundup is applied at a rate of 1.0 quart per acre prior to planting by an ATV with a sprayer.

**Harvest.** August plantings will not produce a crop in the first year.

## PRODUCTION OPERATING COSTS

TABLES 3 TO 10.

**Irrigation.** Irrigation begins in May and continues into September. Three acre-feet of water at \$21.24 per acre-foot or \$1.77 per acre-inch is applied by border-flood irrigation.

**Fertilization.** Fertilizer is applied in March and in June after hay harvest. Ammonium Sulfate (21-0-0-24S) at 200 pounds per acre or 42 pounds of N per acre and 48 pounds of sulfur is applied in March to cover sulfur and nitrogen deficiency, common in Lassen County. Urea is added annually at 100 pounds per acre or 46 pounds of N and is applied in June immediately following hay harvest.

**Pest Management.** For pesticide information, pest identification, monitoring, and management visit the UC IPM website at <http://www.ipm.ucdavis.edu/>. 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.** Spot sprays with Roundup and 2,4-D Amine in March and April are applied to approximately 1% of the acres.

**Insects.** Are not normally a considered a problem.

**Vertebrates.** Pocket gophers (*Thomomys spp.*), ground squirrels (*Spermophilus spp.*), and meadow mice (*Microtus spp.*) cause problems in pasture stands. Poison bait purchased from the local Agricultural Commissioner is used to control these pests. In this study, vertebrate pest treatment is applied to 25% of the acres in March. The cost for rodent bait in the study is an average of the separate costs of gopher, squirrel and mouse baits.

**Other Cultural Practices.** A tractor and harrow are used to break up cow paddies in March. An All Terrain Vehicle (ATV, four wheel drive) is used for spot spraying, checking bait stations, installing the electric fence, irrigating, and inspecting cattle.

**Temporary Fencing.** Two to four paddocks are created with an electric fence for grazing cattle. Insulated t-posts are placed in the ground to which the wire is attached. The fence is installed after the first harvest and removed at the end of the season.

**Harvest.** The crop is custom harvested in June. The chambered bales are for winter-feeding or off-farm sales. The pasture is cut with a self-propelled swather, cured or dried in windrows for several days and then turned with a center-delivery rake. Once the hay has dried to the correct moisture content, it is baled with a pull-type baler into 100 to 125 pound for small bales. The bales are picked up with a balewagon that moves them from the field and roadsides (stacks) the bales. Instead of baling the first cutting for hay some growers graze the pasture. The regrowth is grazed from July through October.

**Custom Harvest.** In this study, the custom harvester charges \$41 per ton to swath, rake, bale, roadside (pickup bales and stack), and load. Many harvesting companies swath, rake, bale, roadside, and load the harvested alfalfa for a single fee. Fees to swath, rake, bale, roadside, and load the hay range from \$40 to \$48 per hay ton and are usually based on a minimum of one-ton of hay per acre. Some companies will hire out for the individual operations and charge accordingly, but these fees when added together may be

higher than the fee quoted for all operations. Individually, swathing ranges around \$12 to \$15 per acre, raking \$5 to \$6 per acre, baling \$15 to \$18 per ton, and roadsiding \$5 to \$8 per ton.

**Yield.** The crop is assumed to yield 2.5 tons of hay per acre per year. Stocking rate of beef cattle is approximately one cow/calf per acre or two yearlings per acre. The study summarizes grazing yield in total Animal Unit Months (AUM). The total grazing yield assumed in this study is three AUMs. AUMs can be converted to approximate hay tons equivalent. For air-dried irrigated pasture hay, 800 pounds of hay is equivalent to 1 AUM or 2.5 AUM is equivalent to one ton of pasture hay.

**Returns.** Based on current markets for meadow hay, an estimated price of \$220 per ton is used to calculate returns. Returns will vary during the season, depending upon the hay and grazing markets. Based on lease market rates, the price ranchers are paying for good summer pasture, the grower assumes a price of \$27 per AUM to calculate returns.

**Labor.** Labor rates of \$16.47 per hour for machine operators and \$10.88 for general labor includes payroll overhead of 39%. The basic hourly wages are \$11.85 for machine operators and \$8.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for beef production (code 0038), and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2008 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 4 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

**Pickup and ATV Use.** The three-quarter ton pickup is used by the grower for one-half personal and one-half business use. The ATV is used to spot spray, check irrigation, pests, and inspect and move the electric fence and cattle.

**Equipment Operating Costs.** Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower and fuel type. Prices for on-farm delivery of diesel and gasoline are \$3.57 and \$3.54 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration (EIA) 2008 monthly data. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 are determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

**Interest On Operating Capital.** Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 6.75% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

**Risk.** The associated production risks should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect the profitability and economic viability of pasture production.

## CASH OVERHEAD

Assumptions in this section refer to the cash overhead and capital recovery sections in Tables 1 – 6 and 8 – 9. One-half of the annual overhead costs for the 200 acres in the establishment year (Tables 1 and 2) are allocated to the previous crop.

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest, office expense, liability and property insurance, and investment repairs (buildings and irrigation equipment). Employee benefits, payroll taxes and workman's compensation insurance are included in labor costs and not under cash overhead.

**Property Taxes.** Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

**Insurance.** Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.740% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,216 for the entire farm or \$1.22 per acre.

**Office Expense.** Office and business expenses for 1,000 acres are estimated at \$2,630 annually or \$2.63 per acre. These expenses include office supplies, telephones, accounting, legal fees, office and shop utilities, and miscellaneous overhead expenses.

**Manager's Salary.** Although the farm is managed by the owner, a salary of \$35,556 per year is used to show a management cost. Adding 39% for federal and state payroll taxes, insurance, and miscellaneous benefits, the total cost is \$49,423.

**Investment Repairs.** Annual repairs on investments or capital recovery items that require maintenance are calculated as two percent of the purchase price.

## NON-CASH OVERHEAD

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

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

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery 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 the operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Tables 3 and 8.

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

*Interest Rate.* The interest rate of 4.25% used to calculate capital recovery cost is used to calculate capital recovery cost is the effective long-term interest rate in January 2008. The interest rate 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.

**Shop.** An 8,000 square foot building used for equipment maintenance and storage.

**Tools.** Includes shop equipment/tools, and hand tools used in the shop and field.

**Electric Fence.** An energizer (electrical unit), wire, fiberglass posts, and metal T-posts for corner posts for 4 paddocks on the 200 acres

**Irrigation System.** Water cost varies across the Intermountain Region depending on well characteristics or irrigation district. The irrigation system consists of a 40 horsepower electric pump used to lift the water from a river or ditch and an underground main line and lateral lines with alfalfa valves that delivers the water to the field.

**Land.** Land suitable for pasture production can vary widely in value across the region. Prices range from \$1,750 per acre to \$4,000. Rangeland is valued at \$175 to \$850 per acre. The land in this study is owned by the grower and cost \$2,500 per acre.

**Livestock Facility.** These facilities for handling the grazing cattle are estimated costs for corrals, loading and squeeze chutes.

**Establishment Costs.** Costs to establish the pasture stand are used to determine capital recovery expenses, depreciation, and interest on investment, during the production years. The establishment cost is the sum of cash costs for land preparation, planting, production expenses, and cash overhead for establishing the pasture. The Total Cash Cost in the first year shown in Tables 1 and 2 represents the establishment cost per acre. For this study, the cost is \$712 per acre or \$71,200 for the entire stand. The pasture stand establishment cost is amortized over the 20-year stand life.

**Equipment.** Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Tables 3 and 8. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

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

**Acknowledgment.** Appreciation is expressed to all cooperators who provided support and 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 (eds.) St. Joseph, Missouri. 41st edition.
- American Society of Farm Managers and Rural Appraisers. 2008. *Trends in Agricultural Land & Lease Values*. California Chapter of the American Society of Farms Managers and Rural Appraisers. Woodbridge, CA.
- Barker, Doug. January 22, 2008. *California Workers' Compensation Rating Data for Selected Agricultural Classifications as of January 1, 2008*. 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 March, 2008.
- California State Automobile Association. 2008. *Gas Price Averages 2007 - 2008*. AAA Press Room, San Francisco, CA. <http://www.csaa.com/portal/site/CSAA/menuitem.5313747aa611bd4e320cfad592278a0c/?vgnextoid=8d642ce6cda97010VgnVCM1000002872a8c0RCRD>. Internet accessed April, 2008.
- California State Board of equalization. *Fuel Tax Division Tax Rates*. <http://www.boe.ca.gov/sptaxprog/spftdrates.htm>. Internet accessed April, 2008.
- Energy Information Administration. 2008. *Weekly Retail on Highway Diesel Prices*. <http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp>. Internet accessed April, 2008.
- Lancaster, Donald L., Daniel B. Marcum, David F. Lile, Karen M. Klonsky, and Richard L. De Moura. 2002. *Sample Cost to Establish and Produce Pasture, Intermountain Region 2002*. University of California, Davis, CA. <http://coststudies.ucdavis.edu/>. Internet accessed June, 2008.
- Integrated Pest Management Education and Publications. 2008. "UC Pest Management Guidelines, Alfalfa". In M. L. Flint (ed.) *UC IPM Pest Management Guidelines*. University of California. Division of Agriculture and Natural Resources. Oakland, CA. Publication 3339. <http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>. Internet accessed June, 2008.
- University of California. Division of Agriculture and Natural Resources. 1995. *Intermountain Alfalfa Management*. Steve B. Orloff and Harry L. Carlson, (ed.) University of California. Division of Agriculture and Natural Resources. Oakland, California. Publication 3366.

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Table 1.

UC COOPERATIVE EXTENSION  
COSTS PER ACRE TO ESTABLISH PASTURE  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Labor Rate: \$16.47/hr. machine labor  
\$10.88/hr. non-machine labor

Short Term Interest Rate: 6.75%

	Operation	Cash and Labor Costs per Acre					
	Time	Labor	Fuel, Lube	Material	Custom/	Total	Your
Operation	(Hrs/A)	Cost	& Repairs	Cost	Rent	Cost	Cost
Cultural:							
Chisel Ground	0.00	0	0	0	75	75	
Fertilize - Sulfur	0.00	0	0	20	9	28	
Fertilize - 11-52-0 on 25% of Acreage	0.00	0	0	15	2	17	
Stubble Disc	0.00	0	0	0	12	12	
Make Borders	0.00	0	0	0	5	5	
Float Field	0.00	0	0	0	12	12	
Roll Field	0.00	0	0	0	9	9	
Weed Control - Preplant Herbicide	0.11	2	1	17	0	20	
Plant Pasture	0.00	0	0	69	8	77	
Irrigate	0.40	4	0	11	0	15	
Pickup Truck Use	0.29	6	4	0	0	10	
ATV Use	0.29	6	1	0	0	7	
TOTAL CULTURAL COSTS	1.08	18	6	132	131	287	
Interest on Operating Capital @ 6.75%						9	
TOTAL OPERATING COSTS/ACRE		18	6	132	131	296	
CASH OVERHEAD:							
Office Expense						1	
Liability Insurance						1	
Manager's Salary						27	
Property Taxes						15	
Property Insurance						11	
Investment Repairs						4	
TOTAL CASH OVERHEAD COSTS						60	
TOTAL CASH COSTS/ACRE						356	
NON-CASH OVERHEAD:							
	Per producing			-- Annual Cost --			
Investment	Acre			Capital Recovery			
Land	1,389			59		59	
Irrigation System	9			1		1	
Fuel Tanks & Pumps	2			0		0	
Hay Barn - 500 Tons	28			2		2	
Shop Building	115			8		8	
Shop Tools	8			1		1	
Electric Fencing	4			0		0	
Equipment	26			3		3	
TOTAL NON-CASH OVERHEAD COSTS		1,580		74		74	
TOTAL COSTS/ACRE						430	

Table 2.

UC COOPERATIVE EXTENSION  
MATERIAL AND INPUT COSTS TO ESTABLISH PASTURE  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Labor Rate: \$16.47/hr. machine labor		Short Term Interest Rate: 6.75%			
\$10.88/hr. non-machine labor					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS					
Custom:					
Chisel - Custom	1.00	Acre	75.00	75	
Ground Application	1.25	Ton	8.50	11	
Stubble Disc - Custom	1.00	Acre	12.00	12	
Borders - Custom	0.30	Acre	16.00	5	
Float - Custom	1.00	Acre	12.00	12	
Roll Field - Custom	1.00	Acre	9.00	9	
Plant - Custom	1.00	Acre	8.00	8	
Fertilizer:					
Elemental Sulfur	200.00	Lb	0.10	20	
11-52-0	25.00	Lb	0.60	15	
Herbicide:					
Roundup Ultra Max	2.00	Pint	8.58	17	
Seed:					
Seed - Orchardgrass	12.00	Lb	3.33	40	
Seed - Tall Fescue	16.00	Lb	1.48	24	
Seed - Ladino	1.00	Lb	2.71	3	
Seed - White Dutch	0.50	Lb	2.71	1	
Seed - Alsike	0.50	Lb	2.85	1	
Irrigation:					
Water	6.00	AcIn	1.77	11	
Labor (machine)	0.81	Hrs	16.47	13	
Labor (non-machine)	0.40	Hrs	10.88	4	
Fuel - Gas	1.12	Gal	3.57	4	
Lube				1	
Machinery repair				1	
Interest on Operating Capital @ 6.75%				9	
TOTAL OPERATING COSTS/ACRE				296	
CASH OVERHEAD COSTS:					
Office Expense				1	
Liability Insurance				1	
Manager's Salary				27	
Property Taxes				15	
Property Insurance				11	
Investment Repairs				4	
TOTAL CASH OVERHEAD COSTS/ACRE				60	
TOTAL CASH COSTS/ACRE				356	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Land				59	
Irrigation System				1	
Fuel Tanks & Pumps				0	
Hay Barn - 500 Tons				2	
Shop Building				8	
Shop Tools				1	
Electric Fencing				0	
Equipment				3	
TOTAL NON-CASH OVERHEAD COST/ACRE				74	
TOTAL COSTS/ACRE				430	

Table 3.

UC COOPERATIVE EXTENSION  
ANNUAL EQUIPMENT COSTS PER ACRE TO ESTABLISH PASTURE  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs		Salvage Value	Capital Recovery	- Cash Overhead -		Total
			Life				Insur- ance	Taxes	
08	100 Gallon Sprayer with Boom for ATV	5,218	10		923	575	23	31	629
08	ATV	6,459	7		2,450	778	33	45	856
08	Pickup - 4WD 3/4 Ton	36,000	7		13,656	4,338	184	248	4,770
	TOTAL	47,677			17,029	5,691	239	324	6,254
	60% of New Cost *	28,606			10,217	3,415	144	194	3,752

Table 4.

HOURLY EQUIPMENT COSTS PER ACRE TO ESTABLISH PASTURE  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

HOURLY EQUIPMENT COSTS

----- COSTS PER HOUR -----									
Yr	Description	Actual Hours Used	Capital		- Cash Overhead -		Operating		Total Costs/Hr.
			Recovery		Insur- ance	Taxes	Repairs	Fuel & Lube	
08	100 Gallon Sprayer with Boom for ATV	149.8	2.30		0.09	0.12	1.41	0.00	3.93
08	ATV	284.3	1.64		0.07	0.09	0.48	2.74	5.03
08	Pickup - 4WD 3/4 Ton	284.5	9.15		0.39	0.52	2.67	12.32	25.05

Table 5.

UC COOPERATIVE EXTENSION  
COSTS PER ACRE TO PRODUCE PASTURE AND HAY  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Labor Rate: \$16.47/hr. machine labor  
\$10.88/hr. non-machine labor

Short Term Interest Rate: 6.75%

	Operation Time	----- Cash and Labor Costs per Acre -----					
Operation	(Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Fertilize - 21-0-0-24	0.00	0	0	45	9	54	
Weed Control - Spot Spray 2X	0.02	0	0	2	0	3	
Harrow Pasture	0.12	2	1	0	0	4	
Rodent Control - Rodent Bait	0.06	1	0	1	0	2	
Irrigate 6X	1.20	13	0	74	0	87	
Fertilize - 46-0-0 (Urea)	0.00	0	0	41	9	49	
Make Electric Fence	0.10	1	0	0	0	1	
Remove Electric Fence	0.10	1	0	0	0	1	
Pickup Truck Use	0.29	6	4	0	0	10	
ATV Use	0.29	6	1	0	0	7	
TOTAL CULTURAL COSTS	2.17	30	7	163	17	217	
Harvest:							
Harvest Hay	0.00	0	0	0	45	45	
Graze Pasture - July	0.05	1	0	0	0	1	
Graze Pasture - August	0.05	1	0	0	0	1	
Graze Pasture - September	0.05	1	0	0	0	1	
Graze Pasture - October	0.05	1	0	0	0	1	
TOTAL HARVEST COSTS	0.20	2	0	0	45	47	
Interest on Operating Capital @ 6.75%						1	
TOTAL OPERATING COSTS/ACRE		33	7	163	62	266	
CASH OVERHEAD:							
Office Expense						3	
Liability Insurance						1	
Manager's Salary						49	
Property Taxes						29	
Property Insurance						21	
Investment Repairs						8	
TOTAL CASH OVERHEAD COSTS						111	
TOTAL CASH COSTS/ACRE						376	
NON-CASH OVERHEAD:							
		Per producing Acre		-- Annual Cost -- Capital Recovery			
Investment							
Land		2,500		106		106	
Irrigation System		16		1		1	
Fuel Tanks & Pumps		4		0		0	
Hay Barn - 500 Tons		51		4		4	
Shop Building		207		15		15	
Shop Tools		14		1		1	
Electric Fencing		6		0		0	
Pasture Establishment Cost		356		27		27	
Equipment		28		3		3	
TOTAL NON-CASH OVERHEAD COSTS						157	
TOTAL COSTS/ACRE						534	

Table 6.

UC COOPERATIVE EXTENSION  
COSTS AND RETURNS PER ACRE TO PRODUCE PASTURE AND HAY  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Labor Rate: \$16.47/hr. machine labor  
\$10.88/hr. non-machine labor

Short Term Interest Rate: 6.75%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Pasture - Hay	2.5	Ton	220.00	550	
Pasture – Graze	3.0	AUM	27.00	81	
<b>TOTAL GROSS RETURNS</b>				631	
<b>OPERATING COSTS</b>					
Fertilizer:					
21-0-0-24	42.00	Lb N	1.072	45	
Urea 46-0-0	46.00	Lb N	0.891	41	
Custom:					
Ground Application	2.00	Acre	8.50	17	
Hay Harvest	1.00	Acre	45.00	45	
Herbicide:					
Roundup Ultra Max	0.20	Pint	8.58	2	
2,4-D Amine	0.20	Pint	2.79	1	
Rodenticide:					
Rodent Bait	0.25	Lb	2.80	1	
Irrigation:					
Water	42.00	AcIn	1.77	74	
Labor (machine)	0.92	Hrs	16.47	15	
Labor (non-machine)	1.60	Hrs	10.88	17	
Fuel - Gas	1.10	Gal	3.57	4	
Fuel - Diesel	0.25	Gal	3.54	1	
Lube				1	
Machinery repair				1	
Interest on Operating Capital @ 6.75%				1	
<b>TOTAL OPERATING COSTS/ACRE</b>				266	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				365	
<b>CASH OVERHEAD COSTS:</b>					
Office Expense				3	
Liability Insurance				1	
Manager's Salary				49	
Property Taxes				29	
Property Insurance				21	
Investment Repairs				8	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				111	
<b>TOTAL CASH COSTS/ACRE</b>				376	
<b>NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):</b>					
Land				106	
Irrigation System				1	
Fuel Tanks & Pumps				0	
Hay Barn - 500 Tons				4	
Shop Building				15	
Shop Tools				1	
Electric Fencing				0	
Pasture Establishment Cost				27	
Equipment				3	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				157	
<b>TOTAL COSTS/ACRE</b>				534	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				97	

Table 7.

UC COOPERATIVE EXTENSION  
MONTHLY CASH COSTS PER ACRE TO PRODUCE PASTURE AND HAY  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Beginning JAN 08	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 08	08	08	08	08	08	08	08	08	08	08	08	08	
Cultural:													
Fertilize - 21-0-0-24			54										54
Weed Control - Spot Spray 2X			2	1									3
Harrow Pasture			4										4
Rodent Control - Rodent Bait 25% of Acreage				2									2
Irrigate 6X					13	13	23	13	13	13			87
Fertilize - 46-0-0 (Urea)						49							49
Make Electric Fence						1							1
Remove Electric Fence										1			1
Pickup Truck Use			1	1	1	1	1	1	1	1			10
ATV Use			1	1	1	1	1	1	1	1			7
<b>TOTAL CULTURAL COSTS</b>			61	5	15	65	25	15	15	16			217
Harvest:													
Harvest Hay						45							45
Graze Pasture - July							1						1
Graze Pasture - August								1					1
Graze Pasture - September									1				1
Graze Pasture - October										1			1
<b>TOTAL HARVEST COSTS</b>						45	1	1	1	1			47
Interest on Operating Capital @ 6.75%			0	0	0	1	0	0	0	0			1
<b>TOTAL OPERATING COSTS/ACRE</b>			61	5	15	112	26	15	15	16			266
OVERHEAD:													
Office Expense			0	0	0	0	0	0	0	0			3
Liability Insurance	1												1
Manager's Salary			6	6	6	6	6	6	6	6			49
Property Taxes	14						14						29
Property Insurance	11						11						21
Investment Repairs	1	1	1	1	1	1	1	1	1	1	1	1	8
<b>TOTAL CASH OVERHEAD COSTS</b>	27	1	7	7	7	7	32	7	7	7	1	1	111
<b>TOTAL CASH COSTS/ACRE</b>	27	1	69	12	22	119	58	22	22	23	1	1	376

Table 8.

UC COOPERATIVE EXTENSION  
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

ANNUAL EQUIPMENT COSTS

		- Cash Overhead -						
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Total
08	100 Gallon Sprayer with Boom For ATV	5,218	10	923	575	23	31	629
08	40 HP 4WD Tractor	25,540	12	6,385	2,342	118	160	2,620
08	ATV	6,459	7	2,450	778	33	45	856
08	Harrow - 12'	2,120	20	110	156	8	11	175
08	Pickup - 4WD 3/4 Ton	36,000	7	13,656	4,338	184	248	4,770
08	Spreader -Spinner Pull Type	855	10	151	94	4	5	103
	TOTAL	76,192		23,675	8,283	370	499	9,152
	60% of New Cost *	45,715		14,205	4,970	222	300	5,491

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

ANNUAL INVESTMENT COSTS

		----- Cash Overhead -----						
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Repairs	Total
INVESTMENT								
Electric Fencing	6,300	20	630	453	26	35	173	687
Fuel Tanks & Pumps	3,617	20	362	260	15	20	100	395
Hay Barn - 500 Tons	50,638	20	5,064	3,643	206	279	1,392	5,520
Irrigation System	15,750	25	1,575	998	64	87	433	1,582
Pasture Establishment Cost	71,200	20		5,356	263	356	0	5,975
Land	2,500,000	40	2,500,000	106,250	18,500	25,000	0	149,750
Shop Building	206,688	20	20,669	14,871	841	1,137	5,684	22,533
Shop Tools	13,509	20	1,351	972	55	74	186	1,287
TOTAL INVESTMENT	2,867,702		2,529,651	132,804	19,970	26,987	7,968	187,728

ANNUAL BUSINESS OVERHEAD COSTS

		Units/ Farm	Unit	Price/ Unit	Total Cost
Description					
Liability Insurance		2,900	Acre	0.50	1,450
Manager's Salary		1,000	Acre	49.42	49,420
Office Expense		1,000	Acre	2.63	2,630

Table 9.

UC COOPERATIVE EXTENSION  
HOURLY EQUIPMENT COSTS  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

		----- COSTS PER HOUR -----						
		Actual Hours	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.
Yr	Description	Used						Costs/Hr.
08	100 Gallon Sprayer with Boom For ATV	139.2	2.48	0.10	0.13	1.41	0.00	4.12
08	40 HP 4WD Tractor	999.8	1.41	0.07	0.10	1.18	8.00	10.75
08	ATV	283.6	1.65	0.07	0.09	0.48	2.74	5.03
08	Harrow - 12'	99.6	0.94	0.05	0.07	0.42	0.00	1.48
08	Pickup - 4WD 3/4 Ton	284.5	9.15	0.39	0.52	2.67	12.32	25.05
08	Spreader -Spinner Pull Type	119.9	0.47	0.02	0.03	0.33	0.00	0.85

Table 10.

UC COOPERATIVE EXTENSION  
RANGING ANALYSIS  
INTERMOUNTAIN REGION – 2008

COSTS PER ACRE AT VARYING YIELDS FOR PASTURE

	----- AUM -----						
	1.5	2.0	2.5	3.0	3.5	4.0	4.5
	----- Ton -----						
	1.75	2.00	2.25	2.50	2.75	3.00	3.25
OPERATING COSTS/ACRE:							
Cultural Cost	217	217	217	217	217	217	217
Harvest Cost	47	47	47	47	47	47	47
Interest on Operating Capital	1	1	1	1	1	1	1
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>266</b>	<b>266</b>	<b>266</b>	<b>266</b>	<b>266</b>	<b>266</b>	<b>266</b>
CASH OVERHEAD COSTS/ACRE	111	111	111	111	111	111	111
<b>TOTAL CASH COSTS/ACRE</b>	<b>376</b>	<b>376</b>	<b>376</b>	<b>376</b>	<b>376</b>	<b>376</b>	<b>376</b>
NON-CASH OVERHEAD COSTS/ACRE	157	157	157	157	157	157	157
<b>TOTAL COSTS/ACRE</b>	<b>534</b>	<b>534</b>	<b>534</b>	<b>534</b>	<b>534</b>	<b>534</b>	<b>534</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR PASTURE

PRICE (\$/Unit)		YIELD (Unit)						
Pasture AUM	Hay Ton	----- AUM -----						
		1.5	2.0	2.5	3.0	3.5	4.0	4.5
		-----Ton -----						
		1.75	2.00	2.25	2.50	2.75	3.00	3.25
21	190	98	156	214	272	330	388	446
23	200	119	180	192	203	215	226	238
25	210	139	204	217	229	242	254	267
27	220	160	228	242	365	269	282	296
29	230	180	252	267	396	296	310	325
31	240	201	276	292	427	323	338	354
33	250	221	300	317	458	350	366	383

NET RETURNS PER ACRE ABOVE CASH COSTS FOR PASTURE

PRICE (\$/Unit)		YIELD (Unit)						
Pasture AUM	Hay Ton	----- AUM -----						
		1.5	2.0	2.5	3.0	3.5	4.0	4.5
		-----Ton -----						
		1.75	2.00	2.25	2.50	2.75	3.00	3.25
21	190	-12	46	104	162	220	278	336
23	200	9	70	132	193	255	316	378
25	210	29	94	159	224	289	354	419
27	220	50	118	187	255	324	392	461
29	230	70	142	214	286	358	430	502
31	240	91	166	242	317	393	468	544
33	250	111	190	269	348	427	506	585

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR PASTURE

PRICE (\$/Unit)		YIELD (Unit)						
Pasture AUM	Hay Ton	----- AUM -----						
		1.5	2.0	2.5	3.0	3.5	4.0	4.5
		-----Ton -----						
		1.75	2.00	2.25	2.50	2.75	3.00	3.25
21	190	-170	-112	-54	4	62	120	178
23	200	-150	-88	-27	35	97	158	220
25	210	-129	-64	1	66	131	196	261
27	220	-109	-40	29	97	166	234	303
29	230	-88	-16	56	128	200	272	344
31	240	-68	8	84	159	235	310	386
33	250	-47	32	111	190	269	348	427

Table 11.

UC COOPERATIVE EXTENSION  
DETAILS BY OPERATION  
INTERMOUNTAIN REGION – 2008  
IRRIGATED

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Fertilize - 21-0-0-24	March	Custom	Ground Application	21-0-0-24	42.00	Lb N
Weed Control - 25% Of Acreage -2X	March	ATV	100 Gal ATV Sprayer w/Boom	Roundup	0.25	Pint
	April	ATV	100 Gal ATV Sprayer w/Boom	2, 4-D	0.25	Pint
Harrow Pasture	March	40 HP 4WD Tractor	Harrow - 12'			
Rodent Control - Rodent Bait	April	ATV	Spreader - Spinner Pull Type	Rodent Bait	0.25	Lb
Irrigate - 7X	May	Labor		Water	6.00	AcIn
	June	Labor		Water	6.00	AcIn
	July	Labor		Water	12.00	AcIn
	August	Labor		Water	6.00	AcIn
	September	Labor		Water	6.00	AcIn
	October	Labor		Water	6.00	AcIn
Harvest Hay	June	Custom				
Fertilize - 46-0-0 (Urea)	June	Custom	Ground Application	46-0-0	46.00	Lb N
Make Electric Fence	June	Labor				
Graze Pasture	July	Labor				
	August	Labor				
	September	Labor				
	October	Labor				
Remove Electric Fence	October	Labor				
Pickup Truck Use	All Months					
ATV Use	All Months					