
UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL RESOURCES
COOPERATIVE EXTENSION
AGRICULTURAL ISSUES CENTER
UC DAVIS DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS
2020
SAMPLE COSTS
TO ESTABLISH OR REESTABLISH AND PRODUCE
IRRIGATED PASTURE



Sierra Nevada Foothills

Flood Irrigation

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 In the Sierra Nevada Foothills - 2020

CONTENTS

INTRODUCTION	2
ASSUMPTIONS	3
Establishment Options	4
Establish New Pasture, Tilled	4
Re-Establish Pasture, No-Till	5
Production Operations 2 nd Year	5
Harvest, Yields and Revenue	6
Labor and Interest	6
Cash Overhead	7
Non-Cash Overhead	8
REFERENCES	9
Table 1. COSTS PER ACRE to ESTABLISH PASTURE – TILL	10
Table 2. MATERIAL and INPUT COSTS to ESTABLISH PASTURE – TILL	11
Table 3. COSTS PER ACRE to REESTABLISH PASTURE – NO TILL	12
Table 4. MATERIAL and INPUT COSTS to REESTABLISH PASTURE – NO TILL	13
Table 5. COSTS PER ACRE for FIRST YEAR PRODUCTION – 2 ND YEAR TILL	14
Table 6. COSTS AND RETURNS per ACRE for FIRST YEAR PRODUCTION – 2 ND YEAR TILL	15
Table 7. MONTHLY CASH COSTS PER ACRE to PRODUCE PASTURE – 2 ND YEAR TILL	16
Table 8. RANGING ANALYSIS -2 ND YEAR TILL	17
Table 9. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT and OVERHEAD COSTS - TILL	18
Table 10. OPERATIONS WITH EQUIPMENT & MATERIALS - TILL	18
Table 10-A. OPERATIONS WITH EQUIPMENT & MATERIALS – NO TILL	19
Table 10-B. OPERATIONS WITH EQUIPMENT & MATERIALS – 2 ND YEAR TILL	19

INTRODUCTION

Sample costs to establish a pasture stand and produce irrigated pasture in the Sierra Nevada Foothills are shown in this study. This analysis does not represent any single farm and is intended as a guide only. It can be used to help guide production decisions, estimate potential returns, prepare budgets and evaluate production loans. Sample costs given for labor, materials, equipment and contract services are based on January 2020 figures. A blank column titled Your Costs is provided in Tables 1 thru 6 for your convenience.

For an explanation of calculations used refer to the section titled Assumptions. For more information contact Donald Stewart; University of California Agriculture and Natural Resources, Agricultural Issues Center, Department of Agricultural and Resource Economics, at 530-752-4651 or destewart@ucdavis.edu. To discuss this study with a local extension farm advisor, contact your county cooperative extension office. ucanr.edu/County_Offices/

Sample Cost of Production studies for many commodities are available and can be downloaded from the website, coststudies.ucdavis.edu. Archived studies are also available on the website.

Costs and Returns Study Program/Acknowledgements. Costs and returns study are a compilation of specific crop data collected from meetings with professionals working in production agriculture from the region in which the study is based. The authors thank the rancher cooperators, UC Cooperative Extension and other industry representatives who provided information, assistance, and expert advice. **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.** *The University is an affirmative action/equal opportunity employer.*

ASSUMPTIONS

The assumptions contain background in developing Tables 1 to 10 and pertain to sample costs to establish an irrigated pasture stand, produce pasture and pasture hay in the Sierra Nevada Foothills. The cultural practices described are based on production practices considered typical for the crop and area, which will not apply to every situation.

This study explains the annual costs associated with an ongoing operation, under the assumptions that the farm was operated this way in prior years and will continue in subsequent years. The costs, materials, and practices will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and insect and disease pressure.

Farm. The hypothetical farm is leased and consists of 40 contiguous acres of pasture land. Irrigated pastureland is valued at \$2,500 per acre. The land in this area rents for \$25 - \$55 per animal unit month (AUM); this analysis uses \$40/AUM. In the establishment years of the Tilled and No-Till scenarios the pasture is rented for 4 months, from September through December. For the production year, (year-2) the pasture is rented at the same rate over 6 months.

This cost study analyzes the expenses of two separate scenarios of establishing a pasture. A custom operator with the proper equipment is hired for both scenarios. It is assumed that the irrigation infrastructure is already in place and the maintenance costs for this system are charged to the landowner. Also included is the following year pasture production operating costs, (year-2) after establishment.

Tilled. In the first scenario a pasture is established by tilling the soil for a seedbed. This includes chiseling/sub-soiling to 24", applying fertilizer and discing and rolling twice, in different directions.

No-Till. The second scenario the pasture is intensively grazed to remove undesirable vegetation. A non-selective herbicide is applied twice, on separate dates. A no-till pasture/grain drill is used to replant and fertilize the pasture. There is no seedbed preparation for the no-till scenario.

Soil Sampling (both systems). Growers should apply fertilizer or soil amendments after appropriate soil and/or tissue testing in the pasture establishment year. Sampling occurs in early fall, so the analysis is available for fertilizer applications with planting and for early spring applications. Soil sampling during the production years is an option to monitor fertilizer deficiencies, costs of which are not included in this study.

The farm also has cattle operations that are fed pasture hay and/or grazed on annual rangeland from October through April. During the irrigation season, cattle are grazed on the pasture. The tenant manages the farm and cattle. This study includes the costs from land preparation and planting, through the following year's harvest approximately 12 months after planting. After the first year of production, refer

to the “*Sample Costs to Produce Pasture in The Sierra Nevada Foothills-2020*” for maintenance and production data.

Establishment Options

All the operations (seedbed, planting, cultivation, pesticide and fertilizer applications and harvesting) for both systems are contracted and performed by a custom operator. The custom operator charges for the field operations. Some operators charge a one-time in/out fee for moving equipment to the pasture, this charge is not included in this study.

Irrigation. The water is supplied by Nevada Irrigation District (NID) and is gravity fed into the growers’ irrigation system. Costs vary among districts. The rates are either metered (per acre-foot) or non-metered rates (per acre) or per Miners-Inch (MI), which is used in this cost study. Most foothill irrigation district rates are based on a Miner’s Inch, (MI – 11.22 gallons per minute) plus a basic service fee (\$510.87). 40 acres of irrigated pasture will require the purchase of 24 Miner’s Inches of water. Total water cost is \$8,179.

If your pasture depends on pumped irrigation water or irrigating after October 15, (irrigation districts turn off summer water from October 15 to April 15, winter water is available), these costs will significantly increase.

Soil Sampling. Growers should apply fertilizer or soil amendments after appropriate soil and/or tissue testing in the establishment year. No costs for soil sampling or analysis is shown during the production year.

Establish New Pasture (Tilled)

Land Preparation. The ground is ripped with a chisel plow 24 inches deep to fracture the soil to improve water infiltration and root growth for seedling plants. The field is disced with a semi stubble and/or finish disc and ring roller to break up clods and smooth the surface, creating better seed-to-soil contact for good germination.

Land Leveling. Land leveling is not a common practice for this region and not required on this field. Cost to laser level are significant and will vary depending on the amount of leveling required.

Borders/Ridges. This field does not require borders or ridges for this open-flood irrigation system.

Fertilization. Prior to planting, 200 pounds of ammonium phosphate, (16-20-0-24% sulfur) is spread and incorporated by discing. Phosphorous does not move in the soil profile, therefore pre-plant application serves as a long-term investment within the root zone. The addition of sulfur will last one to three years, depending on soil type.

Weed Control. Annual grasses and broadleaf weeds can compete with the seedlings during stand establishment. After the pre-plant irrigation, before planting, germinated weeds are killed with a non-selective herbicide.

Planting. In September, an irrigated pasture mix at 15 to 20 pounds per acre is planted with a tractor-pulled Brillion, small seed planter. Stand life is 30 years.

Irrigation. Irrigations are done pre-plant (September), immediately after planting and 10 to 14 days later in early October to germinate the seed.

Harvest. September/October plantings will not produce a crop the first year until late spring.

Re-Establish Pasture (No-Till)

Remove litter. In September the pasture is grazed heavily to remove litter.

Chemical Removal of Old Pasture. After being heavily grazed in late summer or early fall, all vegetation is killed with a non-selective herbicide. The pasture is then irrigated, allowed to germinate, and again sprayed with non-selective herbicides.

Planting. Once the second herbicide application has taken effect (up to 1 week) an irrigated pasture mix is planted with a tractor-pulled no-till pasture/grain drill at 15 to 20 pounds per acre in late September or early October. Stand life is 30 years.

Fertilization. At planting ammonium phosphate (16-20-0, 24% sulfur) is added to the fertilizer hopper of the no-till drill and applied at 200 lbs. per acre.

Irrigation. Irrigation is done prior to planting and then again, soon after planting.

Harvest. September/October plantings will not produce a crop in the first year until late spring.

Production Operations (Year-2)

The second-year costs use the tilled establishment costs of \$782/acre to determine the \$49 non-cash overhead costs of establishment. If you use the no-till method costs of \$572/acre, your establishment costs would be significantly less.

Irrigation. Irrigation begins in April and continues into October. This pasture uses a total of 0.6 MI per acre for the season. Pumped irrigation water for either flood or sprinklers will increase the irrigation costs. Water charges increase significantly if delivered in the winter months from NID

Fertilization. 100 lbs. of urea (46-0-0), applied per acre in June provides 46 pounds of nitrogen for the second hay cutting. Deficiencies of phosphorus and sulfur were corrected at planting with the use of (16-20-0, 24% sulfur). The second year of production, (calendar year-3) ammonium sulfate (NH₄SO₄) would be applied based upon the analysis results of the soil/tissue samples.

Pest Management. The pesticides and rates mentioned in this cost study, as well as other materials available, are listed in the UC Integrated Pest Management Guidelines for *Alfalfa*, on the UC IPM website at ipm.ucanr.edu For information on other pesticides available, pest identification, monitoring, and management, check with your local extension farm advisor, PCA and/or visit the UC IPM website. For information and pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included.

UCCE Farm Advisor, Pest Control Adviser/Certified Crop Advisor (PCA/CCA). Written recommendations are required for many pesticide applications and are available from licensed pest control or certified crop advisors. Ranchers may contact the local UC farm advisor or hire a private PCA, which is

not a common practice. Farm advisors do not charge fees for pest management farm calls.

Weeds. Spot sprays with non-selective herbicides, glyphosate for grasses and 2, 4-D for broadleaves in March and April are applied to approximately 1 percent of the acres with a sprayer mounted on an ATV. This would include spot spraying ditch banks, irrigation main lines and around alfalfa valves. Wild berries grow along ditch banks and riparian areas which left uncontrolled, can become invasive and need control.

Harvest, Yield and Revenue

Harvest. Newly Established Pasture - Forty acres are custom harvested in June, with a second cutting in September. The pasture is swathed, raked, baled and roadside stacked by a custom operator. Bales are two-stranded and weigh about 105 lbs. each (19 bales/ton). The hay is for winter-feeding or off-farm sales.

Yield. The June hay harvest at 90 percent dry matter is assumed to yield 2.0 tons per acre in the first cutting and 1.5 tons per acre from the second cutting in late August or early September. Haying management, species composition, access to timely irrigation water and the fertilizer program will affect the pasture production (yield). Custom harvest is charged at \$48/ton at a combined total of 3.5 tons at \$168 per acre.

Revenue. The price of \$230 per ton is based on an average of the 2019 Sacramento Valley USDA market prices for hay. Returns will vary during the season, depending upon the hay quality and grazing markets.

The price received (revenue) for pasture rental can vary greatly (\$25-\$55/AUM) depending on the structure of the lease and pasture amenities. The price received will vary depending on who pays (lessor or lessee) for the irrigation water and the labor to apply it, and for the fertilizer. Responsibility for animal management (checking livestock water, providing salt and minerals, and doctoring sick animals), for death loss, for moving the cattle from field to field, and for repairing the fence are also items to consider.

Ranging Analysis. Table 8 shows a range of yields, 2.0 – 5.0 tons per acre over a range of prices, \$95 - \$155 per ton. The ranging analysis does not show the cases of very high yields with very high return prices or very low yields with very low return prices.

Labor and Interest

Labor. On this 40-acre operation, the labor is listed under custom charges. The rate of \$18.37 per hour, (includes payroll overhead) is used for hand labor.

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 5.25 percent 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. The rate will vary depending upon various factors, but the rate is considered a typical lending rate by a farm lending agency as of January 2020.

The costs to produce irrigated pasture is relatively low, no operating loan is required. The ranchers renting the pasture pays cash costs as received.

Risk. 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. Because of so many potential risk factors, effective risk management must combine specific tactics in a detailed manner, in various combinations for a sustainable operation.

Cash Overhead

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 interest, office expense, liability 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 percent 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. Property taxes are calculated as 1 percent of the average value of the property and not influenced by the Williamson Act or additional county taxes. Average value equals new cost, plus salvage value divided by 2 on a per acre basis.

The Williamson Act. California Land Conservation Act has helped preserve agricultural and open space lands since 1965. Local governments and landowners enter into voluntary contracts to restrict enrolled lands to agricultural and open space uses in exchange for property tax reductions. The impact of the Williamson Act on property taxes will vary from year to year and property to property. This is due to how it is annually calculated and then compared to its Proposition 13 (factored base year value). The lower of the two is used for the annual assessment.

boe.ca.gov/proptaxes/pdf/lta19029.pdf

boe.ca.gov/proptaxes/faqs/changeinownership.htm

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage.

Property Insurance. This provides coverage for property loss and is charged at 8.86 percent per \$1,000 of the average value of the assets over their useful life.

Liability Insurance. A standard farm liability insurance policy will help cover the expenses for which you become legally obligated to pay for bodily injury claims on your property and damages to another person's property as a result of a covered accident. Common liability expenses covered under your policy include medical expenses for people injured on your property, injury or damage to another's property. For this analysis a basic policy fee of \$621 is charged and covers the entire farm.

Crop Insurance. This is available to pasture/hay producers for any unavoidable loss of production, damage or poor quality resulting from adverse weather conditions such as cool wet weather, freeze, frost, hail, heat, rain, wind and damage from birds, drought, earthquakes and fire. Coverage levels are from 50-85 percent of the approved average yield as established by verifiable production records. Actual insurance coverage is by unit, not by acre. Very few, if any ranchers purchase crop insurance for pasture. Due to variability in coverages no level is specified. rma.usda.gov/

Office Expense. Costs are estimated at \$25 per acre to include bookkeeping, tax preparation, phone and internet.

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

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 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; $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery 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 ASABE based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASABE 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.

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 6.00 percent is used to calculate capital recovery, which is the basic suggested rate by a farm-lending agency as of January 2020. The rate will vary depending upon loan amount and other conditions.

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 Table 1 represents the establishment cost per acre for the tilled System of reestablishment. For this method, the cost is \$783 per acre or \$31,320 for the 40 acres. The Total Cash Cost in the first year shown in Table 3 represents the establishment cost for the no-till planting method, which is significantly less at \$574 per acre or \$22,960 for the 40 acres. The pasture stand establishment cost is amortized over the 30-year stand life.

Irrigation System. This pasture is under open flood irrigation using an underground main line with alfalfa valves every 50-75 feet at the top-end of the pasture. The water is gravity fed from a water district canal into the underground main line.

Livestock Facility. The facilities for handling the grazing cattle, 10' portable panels for two corrals, a squeeze chute, energizer (electrical unit), posts, clips, wire and related equipment costs are not included. These costs are included in a cow/calf operation.

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

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UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 1. COSTS PER ACRE TO ESTABLISH PASTURE
TILL
SIERRA NEVADA FOOTHILLS-2020

Operation	Equipment	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/Rent		
Pre-Plant:								
Sub-Soil/Chisel 24" 2x	0.00	0	0	0	0	120	120	
Fertilizer: Broadcast 16-20-0-24% Sulfur	0.00	0	0	0	136	13	149	
Soil Sample	0.00	0	0	0	0	2	2	
Disc & Roll 2x	0.00	0	0	0	0	70	70	
Irrigate: Flood 3x	0.00	0	0	0	43	7	49	
Weeds: Herbicide Application	0.00	0	0	0	8	13	20	
TOTAL PRE-PLANT COSTS	0.00	0	0	0	186	224	410	
Plant:								
Plant Pasture Mix	0.00	0	0	0	50	20	70	
TOTAL PLANT COSTS	0.00	0	0	0	50	20	70	
Cultural:								
Irrigate: Flood 3x	0.00	0	0	0	89	13	103	
TOTAL CULTURAL COSTS	0.00	0	0	0	89	13	103	
TOTAL OPERATING COSTS/ACRE	0.00	0	0	0	326	257	583	
CASH OVERHEAD:								
Office Expense							25	
Liability Insurance							16	
Land Lease: 4 Months 40 Acres							160	
TOTAL CASH OVERHEAD COSTS/ACRE							201	
TOTAL CASH COSTS/ACRE							783	
TOTAL COSTS/ACRE							783	

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
**TABLE 2. MATERIAL AND INPUT COSTS TO ESTABLISH PASTURE
TILL**
SIERRA NEVADA FOOTHILLS-2020

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS					
Fertilizer:					136
Ammonium Phosphate 16-20-0-24%	200.00	Lb	0.68		136
Custom:					257
Chisel 18-24"	2.00	Acre	60.00		120
Broadcast Fertilizer	1.00	Acre	12.50		13
Soil Test	1.00	Acre	2.00		2
Disc & Roll	2.00	Acre	35.00		70
Ground Application	1.00	Acre	12.50		13
Hand Labor: Irrigation	1.08	Hour	18.37		20
Plant Pasture Mix	1.00	Acre	20.00		20
Seed:					50
Pasture Mix	18.00	Lb.	2.80		50
Herbicide:					8
Roundup PowerMax	2.00	Pint	3.75		8
Irrigation:					132
Water: Miner's Inch (NID)	0.38	MI	341.00		128
Water: Service Fee	1.00	Acre	12.77		4
TOTAL OPERATING COSTS/ACRE					583
CASH OVERHEAD COSTS					
Office Expense					25
Liability Insurance					16
Land Lease-4 Months 40 Ac					160
TOTAL CASH OVERHEAD COSTS/ACRE					201
TOTAL CASH COSTS/ACRE					783
TOTAL COSTS/ACRE					783

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 3. COSTS PER ACRE TO REESTABLISH PASTURE
NO-TILL
SIERRA NEVADA FOOTHILLS-2020

Operation	Equipment		Cash and Labor Costs per Acre				Total Cost	Your Cost
	Time (Hrs./Acre)	Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/Rent		
Pre-Plant:								
Remove Litter/Graze	0.00	0	0	0	0	22	22	
Soil Sample	0.00	0	0	0	0	2	2	
Weeds-Spray Broadcast 2x	0.00	0	0	0	15	25	40	
Irrigate-Flood 2x	0.00	0	0	0	43	7	49	
TOTAL PRE-PLANT COSTS	0.00	0	0	0	58	56	113	
Plant:								
Plant Pasture Mix-Fertilize	0.00	0	0	0	186	20	206	
TOTAL PLANT COSTS	0.00	0	0	0	186	20	206	
Cultural:								
Irrigate-Flood 2x	0.00	0	0	0	47	7	53	
TOTAL CULTURAL COSTS	0.00	0	0	0	47	7	53	
TOTAL OPERATING COSTS/ACRE	0.00	0	0	0	291	82	373	
CASH OVERHEAD:								
Office Expense							25	
Liability Insurance							16	
Land Lease-4 Months 40 Ac							160	
TOTAL CASH OVERHEAD COSTS/ACRE							201	
TOTAL CASH COSTS/ACRE							574	
TOTAL COSTS/ACRE							574	

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 4. MATERIAL INPUT COSTS TO REESTABLISH PASTURE
NO-TILL
SIERRA NEVADA FOOTHILLS-2020

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
OPERATING COSTS:					
Fertilizer:					136
Ammonium Phosphate 16-20-0-24% Sulfur	200.00	Lb.	0.68		136
Custom:					82
Hand Labor - Field	1.20	Hour	18.37		22
Soil Test	1.00	Acre	2.00		2
Ground Application	2.00	Acre	12.50		25
Hand Labor - Irrigation	0.72	Hour	18.37		13
Plant Pasture Mix	1.00	Acre	20.00		20
Seed:					50
Pasture Mix	18.00	Lb.	2.80		50
Herbicide:					15
Roundup PowerMax	4.00	Pint	3.75		15
Irrigation:					89
Water: Miner's Inch (NID)	0.25	MI	341.00		85
Water: Service Fee	1.00	Acre	12.77		4
TOTAL OPERATING COSTS/ACRE					373
CASH OVERHEAD COSTS:					
Office Expense					25
Liability Insurance					16
Land Lease-4 Months 40 Ac					160
TOTAL CASH OVERHEAD COSTS/ACRE					201
TOTAL CASH COSTS/ACRE					574
TOTAL COST/ACRE					574

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 5. COSTS PER ACRE FOR FIRST YEAR PRODUCTION-PASTURE
Second Year-TILL
SIERRA NEVADA FOOTHILLS-2020

Operation	Equipment		Cash and Labor Costs per Acre				Total Cost	Your Cost
	Time (Hrs/Ac)	Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/Rent		
Cultural:								
Weeds: Spot Spray 2x	0.00	0	0	0	3	3	5	
Irrigate: Flood 7x	0.00	0	0	0	211	46	257	
Fertilizer: 46-0-0	0.00	0	0	0	72	13	85	
TOTAL CULTURAL COSTS	0.00	0	0	0	286	61	347	
Harvest:								
Harvest: Hay	0.00	0	0	0	0	168	168	
TOTAL HARVEST COSTS	0.00	0	0	0	0	168	168	
TOTAL OPERATING COSTS/ACRE	0.00	0	0	0	286	229	515	
CASH OVERHEAD:								
Office Expense							25	
Liability Insurance							16	
Land Lease: 6-Months 40 Acres							240	
Property Taxes							4	
TOTAL CASH OVERHEAD COSTS/ACRE							285	
TOTAL CASH COSTS/ACRE							800	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Establish Pasture: Tilled 40 Acres		783		57			57	
TOTAL NON-CASH OVERHEAD COSTS		783		57			57	
TOTAL COSTS/ACRE							857	

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 6. COSTS AND RETURNS PER ACRE FOR FIRST YEAR-PASTURE
Second Year-TILL
SIERRA NEVADA FOOTHILLS-2020

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS:					
Hay	3.50	Ton	230.00	805	
TOTAL GROSS RETURNS				805	
OPERATING COSTS:					
Fertilizer:				72	
46-0-0	100.00	Lb.	0.72	72	
Custom:				229	
Ground Application	0.20	Acre	12.50	3	
Hand Labor - Irrigation	2.52	Hour	18.37	46	
Swath/Rake/Bale/Roadside	3.50	Ton	48.00	168	
Broadcast Fertilizer	1.00	Acre	12.50	13	
Herbicide:				3	
Roundup PowerMax	0.40	Pint	3.75	2	
2,4-D	0.40	Pint	2.82	1	
Irrigation:				211	
Water: Miner's Inch (NID)	0.60	MI	341.00	205	
Water: Service Fee	1.00	Acre	12.77	6	
TOTAL OPERATING COSTS/ACRE				515	
NET RETURNS ABOVE OPERATING COSTS				290	
CASH OVERHEAD COSTS:					
Office Expense				25	
Liability Insurance				16	
Land Lease 40 Ac				240	
Property Taxes				4	
TOTAL CASH OVERHEAD COSTS/ACRE				285	
TOTAL CASH COSTS/ACRE				800	
NET RETURNS ABOVE CASH COSTS				5	
NON-CASH OVERHEAD COSTS: (Capital Recovery)					
Establish Pasture: Tilled 40ac				57	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				57	
TOTAL COST/ACRE				857	
NET RETURNS ABOVE TOTAL COST				-52	

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 7. MONTHLY CASH COSTS PER ACRE TO PRODUCE PASTURE
Second Year-TILL
SIERRA NEVADA FOOTHILLS-2020

	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	Total
	20	20	20	20	20	20	20	20	
Cultural:									
Weeds: Spot Spray 2x	3	3							5
Irrigate: Flood 7x		27	34	34	51	51	27	33	257
Fertilizer: 46-0-0				85					85
TOTAL CULTURAL COSTS	3	30	34	118	51	51	27	33	347
Harvest:									
Harvest: Hay				96			72		168
TOTAL HARVEST COSTS	0	0	0	96	0	0	72	0	168
TOTAL OPERATING COSTS/ACRE	3	30	34	214	51	51	99	33	515
CASH OVERHEAD:									
Office Expense							25		25
Liability Insurance							16		16
Land Lease 40 Ac								240	240
Property Taxes					2				4
TOTAL CASH OVERHEAD COSTS	0	0	0	0	2	0	41	240	285
TOTAL CASH COSTS/ACRE	3	30	34	286	53	51	140	273	800

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 8. RANGING ANALYSIS – PASTURE
Second Year-TILL
SIERRA NEVADA FOOTHILLS-2020

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE IRRIGATED PASTURE

	YIELD (TONS)						
	0.50	1.50	2.50	3.50	4.50	5.50	6.50
Hay:							
OPERATING COSTS/ACRE:							
Cultural	347	347	347	347	347	347	347
Harvest	24	72	120	168	216	264	312
TOTAL OPERATING COSTS/ACRE	371	419	467	515	563	611	659
TOTAL OPERATING COSTS/TON	742	279	187	147	125	111	101
CASH OVERHEAD COSTS/ACRE	285	285	283	285	285	285	285
TOTAL CASH COSTS/ACRE	656	704	752	800	848	896	944
TOTAL CASH COSTS/TON	1,311	469	301	228	188	163	145
NON-CASH OVERHEAD COSTS/ACRE	57	57	57	57	57	57	57
TOTAL COSTS/ACRE	713	761	809	857	905	953	1,001
TOTAL COSTS/TON	1,425	507	323	245	201	173	154

Net Return per Acre above Operating Costs for Pasture Production

PRICE (\$/ton)		YIELD (tons/acre)						
June-Hay	Sept-Hay	0.50	1.00	1.50	2.00	2.50	3.00	3.50
		0.00	0.50	1.00	1.50	2.00	2.50	3.00
200.00	200.00	-343	-191	-39	113	265	417	569
210.00	210.00	-338	-176	-14	148	310	472	634
220.00	220.00	-333	-161	11	183	355	527	699
230.00	230.00	-328	-146	36	218	400	582	764
240.00	240.00	-323	-131	61	253	445	637	829
250.00	250.00	-318	-116	86	288	490	692	894
260.00	260.00	-313	-101	111	323	535	747	959

Net Return per Acre above Cash Costs for Pasture Production

PRICE (\$/ton)		YIELD (tons/acre)						
June-Hay	Sept-Hay	0.50	1.00	1.50	2.00	2.50	3.00	3.50
		0.00	0.50	1.00	1.50	2.00	2.50	3.00
200.00	200.00	-626	-474	-322	-170	-18	134	286
210.00	210.00	-621	-459	-297	-135	27	189	351
220.00	220.00	-616	-444	-272	-100	72	244	416
230.00	230.00	-611	-429	-247	-65	117	299	481
240.00	240.00	-606	-414	-222	-30	162	354	546
250.00	250.00	-601	-399	-197	5	207	409	611
260.00	260.00	-596	-384	-172	40	252	464	676

Net Return per Acre above Total Costs for Pasture Production

PRICE (\$/ton)		YIELD (tons/acre)						
June-Hay	Sept-Hay	0.50	1.00	1.50	2.00	2.50	3.00	3.50
		0.00	0.50	1.00	1.50	2.00	2.50	3.00
200.00	200.00	-683	-531	-379	-227	-75	77	229
210.00	210.00	-678	-516	-354	-192	-30	132	294
220.00	220.00	-673	-501	-329	-157	15	187	359
230.00	230.00	-668	-486	-304	-122	60	242	424
240.00	240.00	-663	-471	-279	-87	105	297	489
250.00	250.00	-658	-456	-254	-52	150	352	554
260.00	260.00	-653	-441	-229	-17	195	407	619

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
**TABLE 9. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND
 BUSINESS OVERHEAD COSTS**
Second Year-TILL
 SIERRA NEVADA FOOTHILLS-2020

ANNUAL EQUIPMENT COSTS								
There is no equipment								
ANNUAL INVESTMENT COSTS								
Description	Price	Yrs	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insurance	Taxes	Repairs	
INVESTMENT								
Establish Pasture: Tilled 40 Ac	31,320	30	0	2,275	14	157	0	2,446
TOTAL INVESTMENT	31,320	-	0	2,275	14	157	0	2,446

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Office Expense	40	Acre	25.00	1,000
Liability Insurance	40	Acre	15.53	621
Land Lease 40 Ac	40	Acre	240.00	9,600

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 10. OPERATIONS WITH EQUIPMENT & MATERIALS
TILL
 SIERRA NEVADA FOOTHILLS-2020

Operation	Operation Month	Labor Type/ Material	Rate/ acre	Unit
Sub-Soil/Chisel 24"	Sept	Chisel 18-24" 1x	2.00	Acre
Fertilizer: Broadcast	Sept	16-20-0-24% Sulfur Broadcast Fertilizer	200.00 1.00	Lb. Acre
Soil Sample	Sept	Soil Test Pasture	1.00	Acre
Disc & Roll 2x	Sept	Disc & Roll	2.00	Acre
Irrigate-Flood 3x	Sept	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
Weeds: Herbicide	Sept	Ground Application	1.00	Acre
		Roundup PowerMax	2.00	Pint
Plant: Pasture Mix	Sept	Plant Pasture Mix	1.00	Acre
		Pasture Mix	18.00	Lb.
Irrigate-Flood 3x	Sept	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
		Water: Service Fee	1.00	Acre

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 10-A. OPERATIONS WITH EQUIPMENT & MATERIALS
NO-TILL
SIERRA NEVADA FOOTHILLS-2020

Operation	Operation Month	Labor Type/ Material	Rate/ acre	Unit
Remove Litter/Graze	Sept	Hand Labor - Field	1.20	Hour
Soil Sample	Sept	Soil Test Pasture	1.00	Acre
Weeds-Spray Broadcast	Sept	Ground Application	1.00	Acre
		Roundup PowerMax	2.00	Pint
	Sept	Ground Application	1.00	Acre
		Roundup PowerMax	2.00	Pint
Irrigate-Flood 2x	Sept	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
Plant & Fertilize	Oct	Plant Pasture Mix	1.00	Acre
		Pasture Mix	18.00	Lb.
		16-20-0-24% Sulfur	200.00	Lb.
Irrigate-Flood 2x	Sept	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
		Water: Service Fee	1.00	Acre

UC COOPERATIVE EXTENSION- AGRICULTURAL ISSUES CENTER
TABLE 10-B. OPERATIONS WITH EQUIPMENT & MATERIALS
Second Year-TILL
SIERRA NEVADA FOOTHILLS-2020

Operation	Operation Month	Labor Type/ Material	Rate/acre	Unit
Weeds: Spot Spray 2x	Mar	Roundup PowerMax	0.20	Pint
		2,4-D	0.20	Pint
		Ground Application	0.10	Acre
	Apr	Roundup PowerMax	0.20	Pint
		2,4-D	0.20	Pint
		Ground Application	0.10	Acre
Irrigate: Flood 7x	Apr	Water: Miner's Inch (MI)	0.06	MI
		Hand Labor - Irrigation	0.36	Hour
	May	Water: Miner's Inch (MI)	0.08	MI
		Hand Labor - Irrigation	0.36	Hour
	June	Water: Miner's Inch (MI)	0.08	MI
		Hand Labor - Irrigation	0.36	Hour
	July	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Aug	Water: Miner's Inch (MI)	0.13	MI
		Hand Labor - Irrigation	0.36	Hour
	Sept	Water: Miner's Inch (MI)	0.06	MI
		Hand Labor - Irrigation	0.36	Hour
	Oct	Water: Miner's Inch (MI)	0.06	MI
		Hand Labor - Irrigation	0.36	Hour
		Water: Service Fee	1.00	Acre
Fertilizer: 46-0-0	June	Broadcast Fertilizer	1.00	Acre
		46-0-0	100.00	Lb.
Harvest: Hay	June	Swath/Rake/Bale/Roadside	2.00	Ton
	Sept	Swath/Rake/Bale/Roadside	1.50	Ton