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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2015

**SAMPLE COSTS TO PRODUCE  
PASTURE**



**SACRAMENTO VALLEY**

Flood Irrigation

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# UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

## SAMPLE COSTS TO PRODUCE PASTURE

In the Sacramento Valley -2015

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### INTRODUCTION

Sample costs to produce irrigated pasture in the Sacramento Valley 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 entering your farm 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 contact the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-4651, [destewart@ucdavis.edu](mailto:destewart@ucdavis.edu).

Sample Cost of Production Studies for many commodities are available and can be downloaded from the department website <http://coststudies.ucdavis.edu>. Many older archived studies are also available on the website.

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## ASSUMPTIONS

The assumptions refer to Tables 1 to 6 and pertain to sample costs to produce pasture and pasture hay in the Sacramento Valley. Practices described are Not University of California recommendations but represent production practices and materials considered typical of a well-managed pasture stand in the Sacramento Valley. Costs, materials, and practices in this study will not be applicable to all situations. Cultural practices vary among growers within the region. **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 that is leased consists of 45 contiguous acres. Forty of the acres are considered pasture land. The remaining 5 acres are roads, farmstead, and miscellaneous buildings and corrals. For this study the pasture land is established and rented at \$180.00 per acre. If your farm does not already have an established pasture, refer to (*“Sample Costs to Establish or Reestablish and Produce Pasture in the Sacramento Valley - 2015”*) for the costs of establishing a pasture. For this study it is assumed that the irrigation infrastructure is already intact.

### Production Operating Costs

Tables 1 to 6.

**Irrigation.** The water is supplied by an irrigation district and is gravity fed into the growers’ irrigation system. Water districts in the Sacramento Valley were randomly selected for 2014 water costs and an average cost determined. Costs vary among districts and depending on the district, the rates are either metered (per acre foot) or non-metered rates (per acre). Four-acre feet of water ranged from \$42 to \$101 per acre or \$10 to \$25 per acre-foot, including base charges and application fees. Irrigation begins in April and continues into October. Four and half acre-feet of water at \$16.32 per acre-foot, (\$1.36 per acre inch) or \$73.44 per acre is applied by border-flood irrigation. Pumped irrigation water for either flood or sprinklers will increase the irrigation costs. Water costs are volatile and vary between irrigation districts and within counties.

**Fertilization.** 200 lb ammonium sulfate (21-0-0, 24% S) provides 42 pounds of N applied in April or June. The fertilizer also supplies 48 pounds of elemental sulfur to cover sulfur deficiency. Growers should apply fertilizer or soil amendments after appropriate soil and/or tissue testing in the establishment and succeeding years. It is assumed that phosphorous was applied pre-plant, none is required at this stage.

**Pest Management. Pesticides mentioned in this study are not recommendations, but those commonly used in the region.** For information and pesticide use permits, contact the local county Agricultural Commissioner’s office. For information on other pesticides available, pest identification, monitoring, and management, visit the UC IPM website at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu). **Pest control costs can vary considerably each year depending upon local conditions and pest populations in any given year.** Adjuvants are recommended for many pesticides for effective control and are an added cost. Adjuvants and costs are not included in this study.

*Pest Control Adviser/Certified Crop Advisor (PCA/CCA).* Written recommendations are required for many pesticides and are available from licensed pest control or certified crop advisers. In addition the PCA/CCA or an independent consultant will monitor the field for agronomic problems including irrigation and nutrition. Growers may hire a private PCA/CCA or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. It is assumed in this study that PCA/CCA services are provided by the chemical and Fertilizer Company.

*Weeds-Spot sprays.* Spot application with glyphosate (Roundup) for grasses and 2,4-D for broadleaves in March and April are applied to approximately 1% of the acres with a small sprayer on the ATV. Each would be applied at 3% concentration and approximately 1 gallon per acre of solution would be used.

*Weeds-Rotary wiper.* A rotary wiper is used to control smutgrass and other undesirable weeds in late summer or early fall, after smutgrass has flowered. It is assumed that about one third of the pasture is infested with smutgrass, which would use approximately 5 gallons of glyphosate at 50% concentration in the roto-wiper for 40 acres. It is critical that desirable plants are grazed closer to the ground before using a rotary wiper.

*Harrow.* The field is harrowed twice, June and September to break up and spread the manure deposited in the pasture.

**Harvest.** There are two different operational options. Option 1 - Forty acres are custom harvested in June. The pasture is swathed, raked, baled and roadside stacked by a custom operator for \$48 per ton. The regrowth is grazed from July through October. Option 2- the 40 acres are grazed from April through October. Grazing costs are the

ATV use for daily checking of the fence and cattle at one-hour per day or 0.025 hours per acre for 40 acres.

Table A. Forage Produced Per Acre for Grazed Only Acres, Grazed and Hayed Only Acres and Average Yield Over Entire 40 Acres

| Month        | lbs/acre      | tons/acre   | Grazed Only (40 acres) |             | Grazed & Hayed Only (40 acres) |             | Average Yield over 40 acres |             |
|--------------|---------------|-------------|------------------------|-------------|--------------------------------|-------------|-----------------------------|-------------|
|              |               |             | Yield/acre             | AUM         | Yield/acre                     | hay tons    | Yield/acre                  | hay tons    |
| May*         | 3,247         | 1.62        | 3.25                   |             | 0                              | 0           | 1.62                        | 0           |
| June         | 1,783         | 0.89        | 1.78                   |             | 0                              | 2.51        | 0.89                        | 1.25        |
| July         | 1,628         | 0.81        | 1.63                   | 1.63        | 0                              | 0           | 1.63                        | 0           |
| August       | 1,665         | 0.83        | 1.67                   | 1.67        | 0                              | 0           | 1.67                        | 0           |
| Sept.        | 1,422         | 0.71        | 1.42                   | 1.42        | 0                              | 0           | 1.42                        | 0           |
| Oct.         | 753           | 0.38        | 0.75                   | 0.75        | 0                              | 0           | 0.75                        | 0           |
| <b>Total</b> | <b>10,498</b> | <b>5.25</b> | <b>10.50</b>           | <b>5.47</b> | <b>2.51</b>                    | <b>2.51</b> | <b>7.98</b>                 | <b>1.25</b> |

\*Includes forage produced in the months preceding

**Yield.** In option 1 the June hay harvest is at 90% dry matter is assumed to yield 2.50 tons of hay per acre per year over 20 acres. Stocking rate of beef cattle varies with production. Total grazing yield on the hayed acreage is 5.50 AUM/acre (July to October) In Option 2- the grazed only there is 10.50

AUM/acre (April to October). AUM's (animal unit month) can be converted to approximate hay tons equivalent. For air-dried irrigated pasture hay, 1,000 pounds of hay is equivalent to 1.0 AUM or 2.0 AUM is equivalent to one ton of pasture hay. Projected forage yields based on unpublished data from five locations in the Sacramento Valley, grazed only yields for 2=40 acres, grazed and hayed yields on 40 acres and average yields over 40 acres, are shown in Table A. Grazing and haying management, species composition, access to timely irrigation water and the fertilizer program will affect the pasture production (yield).

**Returns.** The price of \$185 per ton is based on October 2014 California hay Report, USDA market prices for fair grade orchard grass hay. Returns will vary during the season, depending upon the hay quality and grazing markets. Returns for grazing forage are assumed to be the stated hay value and give a return of \$35 per AUM (each animal unit = 0.5 ton). The price received (returns) for pasture rental can vary greatly (\$18-\$40/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.

Other rental and rent price considerations are the ranch infrastructure and location variables such as quality of the livestock handling facilities, proximity to lessee's operation, quality of the pasture, and number of AUM's. Table 4 "Ranging Analysis" shows a range of returns and yields. Harvest costs in the table are based on a combination of grazing and hay harvest costs.

**Grazing Management.** Increasing the management of irrigated pasture will require a capital investment in fence installation and maintenance, as well as labor in monitoring electric fences, forage and animals and moving animals more frequently. In return, stocking rate could easily increase by 30% and has been increased to 50-100% in some cases. Implementing grazing management requires dividing the pasture into smaller paddocks and rotating animals frequently to optimize the amount of forage harvested and providing the proper length of rest allowed for regrowth. Intensive grazing management may also minimize the need for harrowing to break up manure and mowing weeds.

*Fencing.* In this study, twenty 2 acre paddocks would be developed. Fencing is a mixture of permanent and electric temporary fencing, and layout will vary greatly with each operation's needs. Cattle trained to electric fence can be controlled with a one-wire electric fence on irrigated pasture.

*Watering.* If livestock always have to come back to a single water point, the result will be heavier utilization closer to the water and lighter grazing farther out from the water. Water will need to be available in each paddock and temporary paddock. Five watering points are developed (each one located in a corner that meets 4 paddocks) to serve 20 paddocks.

*Labor.* Time will be invested into installing the permanent fencing and water points. More labor will also be required throughout the grazing season to monitor forage, animals, and move animals frequently. On average, animals will be move every 2 days.

On a 40 acre operation, the labor is provided by the owner/operator and will not be a cash cost in this study. The labor and equipment operator charges are included in the individual custom operations.

*Carrying Capacity.* This can vary greatly based on rainfall, irrigation, and temperature. Stocking rates will vary by location, topography, and slope. A good starting point on irrigated pasture would be 1 Animal-Unit Month (AUM) per acre. This would be the equivalent of one 1,000 pound cow one acre per month.

### **Cash Overhead**

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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, crop insurance, and investment repairs. Employee benefits, insurance, and payroll taxes are included in labor costs and not in overhead. Cash overhead costs are shown in Tables 1, 2, 3, 4 and 5.

*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. For this study the only taxed property is the corral fencing.

*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 5.75% per year. A nominal interest rate is the typical market cost of borrowed funds.

*Insurance.* Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.843% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$627 for the entire farm (45 acres) or \$13.93 per acre.

*Crop Insurance.* The insurance protects the grower from crop losses due to adverse weather conditions, fire, unusual diseases and/or insects, wildlife, earthquake, volcanic eruption, and failure of the irrigation system. The grower can choose the protection level at 50% to 75% of production history or county yields. In this study, no level is specified.

*Office Expense.* Office and business expenses are estimated to be \$20.00 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, office and shop utilities, and miscellaneous administrative expenses.

*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 prices 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 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.

*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 4.75% used to calculate capital recovery cost is the effective long-term interest rate in January 2014. 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.

**Fence.** This is as dealer-estimated cost for energizer (electrical unit), posts, clips and wire. Corral fencing is 10' portable panels.

**Irrigation System.** The system consists of two underground lines with alfalfa valves, each line is one-quarter mile long and installed at the edge and middle of the 40 acres. The water is gravity fed from a water district canal into the growers' underground main line.

**Livestock Facility.** These facilities for handling the grazing cattle are estimated costs for two corrals, a squeeze chute and related equipment that are included in the \$180 per acre lease price.

**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 power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$3.88 and \$3.39 per gallon, respectively. The costs are based on October 2014 prices. Energy Information Administration, Department of Energy (DOE) weekly data. 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 costs per acre for each operation in Table 1 is 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.

*ATV.* An All-Terrain Vehicle (ATV – 4 wheeler) is used for spot spraying, irrigating, checking fence lines and cattle. The charges for the ATV and other equipment are included in the individual custom operations.

**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.

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

## REFERENCES

- American Society of Agricultural Engineers. 2011. American Society of Agricultural Engineers Standards Yearbook. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.
- American Society of Farm Managers and Rural Appraisers. 2014. Trends in Agricultural Land & Lease Values. California Chapter of the American Society of Farms Managers and Rural Appraisers. Woodbridge, CA.
- Boelje, Michael D., and Vernon R. Eidman. 1984. Farm Management. John Wiley and Sons. New York, New York.
- Lile, David F., Daniel B. Marcum, Donald L. Lancaster, Karen, M. Klonsky, and Pete Livingston. 2008. *Sample Costs To Establish and Produce Pasture, Intermountain Region-2008*. University of California Cooperative Extension and Department of Agricultural and Resource Economics. Davis, CA. <http://coststudies.ucdavis.edu/en/current/>
- Forero, Larry C., Barbara A. Reed, Karen M. Klonsky, Richard L. De Moura. 2003. *Sample Costs to Establish and Produce Pasture, Sacramento Valley-2003*. University of California Cooperative Extension and Department of Agricultural and Resource Economics. Davis, CA. <http://coststudies.ucdavis.edu/en/current/>
- University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Alfalfa*. 2001. University of California, Davis, CA. <http://www.ipm.ucdavis.edu>.
- California Department of Insurance, Rate Regulation Branch. <http://www.insurance.ca.gov/0500-about-us/Energy>.
- Information Administration 2014. Weekly Retail prices for farm delivery of Diesel & Gasoline. <http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp>.
- University of California Agriculture and Natural Resources. Statewide IPM Program, How to Manage Pests, Alfalfa. <http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>.

**UC COOPERATIVE EXTENSION**  
**TABLE 1. COSTS PER ACRE TO PRODUCE PASTURE 40 AC**  
**SACRAMENTO VALLEY-2015**

| Operation                              | Operation<br>Time<br>(Hrs/A) | Cash and Labor Costs per Acre |          |                                 |                  |                 | Total<br>Cost | Your<br>Cost |
|--|------------------------------|-------------------------------|----------|---------------------------------|------------------|-----------------|---------------|--------------|
|  |                              | Labor<br>Cost                 | Fuel     | Lube<br>& Repairs               | Material<br>Cost | Custom/<br>Rent |               |              |
| Cultural:                              |                              |                               |          |                                 |                  |                 |               |              |
| Weeds-Spot Spray 2X                    | 0.00                         | 0                             | 0        | 0                               | 5                | 11              | 16            |              |
| Irrigate-Flood 7X                      | 0.00                         | 0                             | 0        | 0                               | 73               | 10              | 83            |              |
| Fencing Setup                          | 0.00                         | 0                             | 0        | 0                               | 0                | 7               | 7             |              |
| Fertilizer-21-0-0, 24% S               | 0.00                         | 0                             | 0        | 0                               | 68               | 11              | 79            |              |
| Harrow Pasture 2X                      | 0.00                         | 0                             | 0        | 0                               | 0                | 15              | 15            |              |
| Weeds-Rotary Wiper                     | 0.00                         | 0                             | 0        | 0                               | 2                | 5               | 7             |              |
| <b>TOTAL CULTURAL COSTS</b>            | <b>0.00</b>                  | <b>0</b>                      | <b>0</b> | <b>0</b>                        | <b>149</b>       | <b>58</b>       | <b>206</b>    |              |
| Harvest:                               |                              |                               |          |                                 |                  |                 |               |              |
| Harvest Hay 40 Ac                      | 0.00                         | 0                             | 0        | 0                               | 0                | 120             | 120           |              |
| Graze 40 Ac 5X                         | 0.00                         | 0                             | 0        | 0                               | 0                | 14              | 14            |              |
| <b>TOTAL HARVEST COSTS</b>             | <b>0.00</b>                  | <b>0</b>                      | <b>0</b> | <b>0</b>                        | <b>0</b>         | <b>134</b>      | <b>134</b>    |              |
| Interest on Operating Capital at 5.75% |                              |                               |          |                                 |                  |                 | 0             |              |
| <b>TOTAL OPERATING COSTS/ACRE</b>      | <b>0</b>                     | <b>0</b>                      | <b>0</b> | <b>0</b>                        | <b>149</b>       | <b>191</b>      | <b>339</b>    |              |
| CASH OVERHEAD:                         |                              |                               |          |                                 |                  |                 |               |              |
| Office Expense                         |                              |                               |          |                                 |                  |                 | 20            |              |
| Liability Insurance 45Ac               |                              |                               |          |                                 |                  |                 | 16            |              |
| Land Lease 40 Ac                       |                              |                               |          |                                 |                  |                 | 180           |              |
| Property Taxes (Corral fencing)        |                              |                               |          |                                 |                  |                 | 1             |              |
| Property Insurance                     |                              |                               |          |                                 |                  |                 | 1             |              |
| Investment Repairs                     |                              |                               |          |                                 |                  |                 | 2             |              |
| <b>TOTAL CASH OVERHEAD COSTS/ACRE</b>  |                              |                               |          |                                 |                  |                 | <b>220</b>    |              |
| <b>TOTAL CASH COSTS/ACRE</b>           |                              |                               |          |                                 |                  |                 | <b>559</b>    |              |
| NON-CASH OVERHEAD:                     |                              |                               |          |                                 |                  |                 |               |              |
|  |                              | Per Producing<br>Acre         |          | Annual Cost<br>Capital Recovery |                  |                 |               |              |
| Corral Fencing                         |                              | 42                            |          | 3                               |                  |                 | 3             |              |
| Electric Fencing                       |                              | 198                           |          | 15                              |                  |                 | 15            |              |
| Equipment                              |                              | 0                             |          | 0                               |                  |                 | 0             |              |
| <b>TOTAL NON-CASH OVERHEAD COSTS</b>   |                              | <b>240</b>                    |          | <b>18</b>                       |                  |                 | <b>18</b>     |              |
| <b>TOTAL COSTS/ACRE</b>                |                              |                               |          |                                 |                  |                 | <b>577</b>    |              |

**UC COOPERATIVE EXTENSION**  
**TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE PASTURE 40 AC**  
**SACRAMENTO VALLEY-2015**

|   | Quantity/<br>Acre | Unit | Price or<br>Cost/Unit | Value or<br>Cost/Acre | Your<br>Cost |
|---|-------------------|------|-----------------------|-----------------------|--------------|
| <b>GROSS RETURNS</b>                              |                   |      |                       |                       |              |
| Hay 40 Ac   | 2.5               | Ton  | 185.00                | 463                   |              |
| Graze 40 Ac                                       | 5                 | AUM  | 35.00                 | 175                   |              |
| <b>TOTAL GROSS RETURNS</b>                        |                   |      |                       | <b>638</b>            |              |
| <b>OPERATING COSTS</b>                            |                   |      |                       |                       |              |
| <b>Fertilizer:</b>                                |                   |      |                       |                       |              |
| Ammonium Sulfate                                  | 200.00            | Lb   | 0.34                  | 68                    |              |
| <b>Custom:</b>                                    |                   |      |                       |                       |              |
| Ground Application                                | 1.00              | Acre | 10.50                 | 11                    |              |
| Hand Labor  | 2.20              | Hour | 13.60                 | 30                    |              |
| Swath/Rake/Bale/Roadside                          | 2.50              | Ton  | 48.00                 | 120                   |              |
| Broadcast Fertilizer                              | 1.00              | Acre | 10.50                 | 11                    |              |
| Harrow  | 1.00              | Acre | 15.00                 | 15                    |              |
| Rotary Weeder                                     | 0.50              | Acre | 10.50                 | 5                     |              |
| <b>Herbicide:</b>                                 |                   |      |                       |                       |              |
| Roundup UltraMax                                  | 1.00              | Pint | 4.31                  | 5                     |              |
| 2,4-D   | 0.50              | Pint | 3.55                  | 2                     |              |
| <b>Irrigation:</b>                                |                   |      |                       |                       |              |
| Water Delivered                                   | 54.00             | AcIn | 1.36                  | 73                    |              |
| Interest on Operating Capital @ 5.75%             |                   |      |                       | 0                     |              |
| <b>TOTAL OPERATING COSTS/ACRE</b>                 |                   |      |                       | <b>339</b>            |              |
| <b>NET RETURNS ABOVE OPERATING COSTS</b>          |                   |      |                       | <b>298</b>            |              |
| <b>CASH OVERHEAD COSTS</b>                        |                   |      |                       |                       |              |
| Office Expense                                    |                   |      |                       | 20                    |              |
| Liability Insurance 45Ac                          |                   |      |                       | 16                    |              |
| Land Lease 40 Ac                                  |                   |      |                       | 180                   |              |
| Property Taxes (Corral fencing)                   |                   |      |                       | 1                     |              |
| Property Insurance                                |                   |      |                       | 1                     |              |
| Investment Repairs                                |                   |      |                       | 2                     |              |
| <b>TOTAL CASH OVERHEAD COSTS/ACRE</b>             |                   |      |                       | <b>220</b>            |              |
| <b>TOTAL CASH COSTS/ACRE</b>                      |                   |      |                       | <b>559</b>            |              |
| <b>NET RETURNS ABOVE CASH COSTS</b>               |                   |      |                       | <b>79</b>             |              |
| <b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b> |                   |      |                       |                       |              |
| Corral Fencing                                    |                   |      |                       | 3                     |              |
| Electric Fencing                                  |                   |      |                       | 15                    |              |
| Equipment   |                   |      |                       | 0                     |              |
| <b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>         |                   |      |                       | <b>18</b>             |              |
| <b>TOTAL COST/ACRE</b>                            |                   |      |                       | <b>577</b>            |              |
| <b>NET RETURNS ABOVE TOTAL COST</b>               |                   |      |                       | <b>60</b>             |              |

**UC COOPERATIVE EXTENSION**  
**TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE PASTURE 40 AC**  
**SACRAMENTO VALLEY-2015**

|                                       | MAR<br>15 | APR<br>15 | MAY<br>15  | JUN<br>15  | JUL<br>15 | AUG<br>15 | SEP<br>15  | OCT<br>15 | Total      |
|---------------------------------------|-----------|-----------|------------|------------|-----------|-----------|------------|-----------|------------|
| <b>Cultural:</b>                      |           |           |            |            |           |           |            |           |            |
| Weeds-Spot Spray 2X                   | 9         | 6         |            |            |           |           |            |           | 16         |
| Irrigate-Flood 7X                     |           | 11        | 11         | 14         | 14        | 14        | 11         | 10        | 83         |
| Fencing Setup                         |           | 7         |            |            |           |           |            |           | 7          |
| Fertilizer-21-0-0, 24%S               |           |           |            | 79         |           |           |            |           | 79         |
| Harrow Pasture 2X                     |           |           |            | 8          |           | 8         |            |           | 15         |
| Weeds-Rotary Wiper                    |           |           |            |            |           | 7         |            |           | 7          |
| <b>TOTAL CULTURAL COSTS</b>           | <b>9</b>  | <b>24</b> | <b>11</b>  | <b>100</b> | <b>14</b> | <b>29</b> | <b>11</b>  | <b>10</b> | <b>206</b> |
| <b>Harvest:</b>                       |           |           |            |            |           |           |            |           |            |
| Harvest Hay 40 Ac                     |           |           | 120        |            |           |           |            |           | 120        |
| Graze 40 Ac 5X                        |           |           |            | 3          | 3         | 3         | 3          | 3         | 14         |
| <b>TOTAL HARVEST COSTS</b>            | <b>0</b>  | <b>0</b>  | <b>120</b> | <b>3</b>   | <b>3</b>  | <b>3</b>  | <b>3</b>   | <b>3</b>  | <b>134</b> |
| Interest on Operating Capital @ 5.75% | 0         | 0         | 0          | 0          | 0         | 0         | 0          | 0         | 0          |
| <b>TOTAL OPERATING COSTS/ACRE</b>     | <b>9</b>  | <b>24</b> | <b>132</b> | <b>101</b> | <b>16</b> | <b>31</b> | <b>13</b>  | <b>12</b> | <b>339</b> |
| <b>CASH OVERHEAD</b>                  |           |           |            |            |           |           |            |           |            |
| Office Expense                        |           |           |            |            |           |           | 20         |           | 20         |
| Liability Insurance 45Ac              |           |           |            |            |           |           | 16         |           | 16         |
| Land Lease 40 Ac                      |           |           |            |            |           |           | 180        |           | 180        |
| Property Taxes (Corral fencing)       |           |           |            |            | 1         |           |            |           | 1          |
| Property Insurance                    |           |           |            |            | 1         |           |            |           | 1          |
| Investment Repairs                    | 0         | 0         | 0          | 0          | 0         | 0         | 0          | 0         | 2          |
| <b>TOTAL CASH OVERHEAD COSTS</b>      | <b>0</b>  | <b>0</b>  | <b>0</b>   | <b>0</b>   | <b>1</b>  | <b>0</b>  | <b>216</b> | <b>0</b>  | <b>220</b> |
| <b>TOTAL CASH COSTS/ACRE</b>          | <b>9</b>  | <b>24</b> | <b>132</b> | <b>102</b> | <b>17</b> | <b>31</b> | <b>229</b> | <b>12</b> | <b>559</b> |

**UC COOPERATIVE EXTENSION**  
**TABLE 4. RANGING ANALYSIS - PASTURE 40 AC**  
 SACRAMENTO VALLEY-2015

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE PASTURE 40 AC

|                                       | TOTAL<br>YIELD (TON) |        |       |       |       |       |       |
|---------------------------------------|----------------------|--------|-------|-------|-------|-------|-------|
|                                       | 3.00                 | 4.50   | 6.00  | 7.50  | 9.00  | 10.50 | 12.00 |
| OPERATING COSTS/ACRE:                 |                      |        |       |       |       |       |       |
| Cultural                              | 206                  | 206    | 206   | 206   | 206   | 206   | 206   |
| Harvest                               | 53                   | 80     | 107   | 134   | 160   | 187   | 214   |
| Interest on Operating Capital @ 5.75% | 0                    | 0      | 0     | 0     | 0     | 0     | 0     |
| TOTAL OPERATING COSTS/ACRE            | 259                  | 286    | 312   | 339   | 366   | 393   | 419   |
| TOTAL OPERATING COSTS/TON             | 86.24                | 63.45  | 52.05 | 45.21 | 40.66 | 37.40 | 34.96 |
| CASH OVERHEAD COSTS/ACRE              | 220                  | 220    | 220   | 220   | 220   | 220   | 220   |
| TOTAL CASH COSTS/ACRE                 | 478                  | 505    | 532   | 559   | 586   | 612   | 639   |
| TOTAL CASH COSTS/TON                  | 159.48               | 112.27 | 88.67 | 74.51 | 65.07 | 58.33 | 53.27 |
| NON-CASH OVERHEAD COSTS/ACRE          | 18                   | 18     | 18    | 18    | 18    | 18    | 18    |
| TOTAL COSTS/ACRE                      | 497                  | 524    | 550   | 577   | 604   | 631   | 658   |
| TOTAL COSTS/TON                       | 166.00               | 116.00 | 92.00 | 77.00 | 67.00 | 60.00 | 55.00 |

Net Return per Acre above Operating Costs for Pasture 40 Ac

| PRICE (\$/ton) |             | YIELD (Ton/acre) |      |      |      |      |      |      |
|----------------|-------------|------------------|------|------|------|------|------|------|
| Hay 40 Ac      | Graze 40 Ac | 1.00             | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 |
| \$/ton         | \$/AUM      | 2.00             | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 |
| 125.00         | 20.00       | -94              | -38  | 18   | 73   | 129  | 185  | 241  |
| 145.00         | 25.00       | -64              | 7    | 78   | 148  | 219  | 290  | 361  |
| 165.00         | 30.00       | -34              | 52   | 138  | 223  | 309  | 395  | 481  |
| 185.00         | 35.00       | -4               | 97   | 198  | 298  | 399  | 500  | 601  |
| 205.00         | 40.00       | 26               | 142  | 258  | 373  | 489  | 605  | 721  |
| 225.00         | 45.00       | 56               | 187  | 318  | 448  | 579  | 710  | 841  |
| 245.00         | 50.00       | 86               | 232  | 378  | 523  | 669  | 815  | 961  |

Net Return per Acre above Cash Costs for Pasture 40 Ac

| PRICE (\$/ton) |             | YIELD (Ton/acre) |      |      |      |      |      |      |
|----------------|-------------|------------------|------|------|------|------|------|------|
| Hay 40 Ac      | Graze 40 Ac | 1.00             | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 |
| \$/ton         | \$/AUM      | 2.00             | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 |
| 125.00         | 20.00       | -313             | -258 | -202 | -146 | -91  | -35  | 21   |
| 145.00         | 25.00       | -283             | -213 | -142 | -71  | -1   | 70   | 141  |
| 165.00         | 30.00       | -253             | -168 | -82  | 4    | 89   | 175  | 261  |
| 185.00         | 35.00       | -223             | -123 | -22  | 79   | 179  | 280  | 381  |
| 205.00         | 40.00       | -193             | -78  | 38   | 154  | 269  | 385  | 501  |
| 225.00         | 45.00       | -163             | -33  | 98   | 229  | 359  | 490  | 621  |
| 245.00         | 50.00       | -133             | 12   | 158  | 304  | 449  | 595  | 741  |

**TABLE 4. RANGING ANALYSIS CONTINUED**  
SACRAMENTO VALLEY-2015

Net Return per Acre above Total Costs for Pasture 40 Ac

| PRICE (\$/ton) |             | YIELD (Ton/acre) |      |      |      |      |      |      |
|----------------|-------------|------------------|------|------|------|------|------|------|
| Hay 40 Ac      | Graze 40 Ac | 1.00             | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 |
| \$/ton         | \$/AUM      | 2.00             | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 |
| 125.00         | 20.00       | -332             | -276 | -220 | -165 | -109 | -53  | 2    |
| 145.00         | 25.00       | -302             | -231 | -160 | -90  | -19  | 52   | 122  |
| 165.00         | 30.00       | -272             | -186 | -100 | -15  | 71   | 157  | 242  |
| 185.00         | 35.00       | -242             | -141 | -40  | 60   | 161  | 262  | 362  |
| 205.00         | 40.00       | -212             | -96  | 20   | 135  | 251  | 367  | 482  |
| 225.00         | 45.00       | -182             | -51  | 80   | 210  | 341  | 472  | 602  |
| 245.00         | 50.00       | -152             | -6   | 140  | 285  | 431  | 577  | 722  |

**UC COOPERATIVE EXTENSION**  
**TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT AND BUSINESS OVERHEAD COSTS**  
 SACRAMENTO VALLEY-2015

ANNUAL EQUIPMENT COSTS

No Equipment in this study. All operations are hired through a custom farming operation.

ANNUAL INVESTMENT COSTS

| Description             | Price        | Yrs<br>Life | Salvage<br>Value | Capital<br>Recovery | Cash Overhead  |           |           | Total      |
|-------------------------|--------------|-------------|------------------|---------------------|----------------|-----------|-----------|------------|
|                         |              |             |                  |                     | Insur-<br>ance | Taxes     | Repairs   |            |
| INVESTMENT              |              |             |                  |                     |                |           |           |            |
| Corral Fencing          | 1,670        | 20          | 84               | 129                 | 7              | 9         | 20        | 165        |
| Electric Fencing        | 7,920        | 20          | 396              | 610                 | 34             | 42        | 50        | 736        |
| <b>TOTAL INVESTMENT</b> | <b>9,590</b> | <b>-</b>    | <b>480</b>       | <b>738</b>          | <b>42</b>      | <b>50</b> | <b>70</b> | <b>900</b> |

ANNUAL BUSINESS OVERHEAD COSTS

| Description              | Units/<br>Farm | Unit | Price/<br>Unit | Total<br>Cost |
|--------------------------|----------------|------|----------------|---------------|
| Office Expense           | 40             | Acre | 20.00          | 800           |
| Liability Insurance 45Ac | 45             | Acre | 13.93          | 627           |
| Land Lease 40 Ac         | 40             | Acre | 180            | 7,200         |

**UC COOPERATIVE EXTENSION**  
**TABLE 6. OPERATIONS WITH EQUIPMENT & MATERIALS**  
 SACRAMENTO VALLEY-2015

| Operation                | Operation Month | Tractor*                    | Implement*         | Labor Type/<br>Material  | Rate/<br>acre | Unit |
|--------------------------|-----------------|-----------------------------|--------------------|--------------------------|---------------|------|
| Weeds-Spot Spray         | Mar             | ATV                         | Sprayer            | Roundup UltraMax         | 0.25          | Pint |
|                          |                 |                             |                    | 2,4-D                    | 0.50          | Pint |
|                          | Apr             | ATV                         | Sprayer            | Ground Application       | 0.50          | Acre |
|                          |                 |                             |                    | Roundup UltraMax         | 0.25          | Pint |
| Irrigate-Flood 7X        | Apr             | ATV                         |                    | Ground Application       | 0.50          | Acre |
|                          |                 |                             |                    | Water Delivered          | 7.00          | AcIn |
|                          | May             | ATV                         |                    | Hand Labor               | 0.10          | Hour |
|                          |                 |                             |                    | Water Delivered          | 7.00          | AcIn |
|                          | June            | ATV                         |                    | Hand Labor               | 0.10          | Hour |
|                          |                 |                             |                    | Water Delivered          | 9.00          | AcIn |
|                          | July            | ATV                         |                    | Hand Labor               | 0.10          | Hour |
|                          |                 |                             |                    | Water Delivered          | 9.00          | AcIn |
|                          | Aug             | ATV                         |                    | Hand Labor               | 0.10          | Hour |
|                          |                 |                             |                    | Water Delivered          | 9.00          | AcIn |
| Sept                     | ATV             |                             | Hand Labor         | 0.10                     | Hour          |      |
|                          |                 |                             | Water Delivered    | 7.00                     | AcIn          |      |
| Oct                      | ATV             |                             | Hand Labor         | 0.10                     | Hour          |      |
|                          |                 |                             | Water Delivered    | 6.00                     | AcIn          |      |
| Fencing Setup            | Apr             | ATV                         |                    | Hand Labor               | 0.10          | Hour |
| Fertilizer-21-0-0, 24% S | June            | 45HP Tractor                | Broadcast Spreader | Broadcast Fertilizer     | 1.00          | Acre |
|                          |                 |                             |                    | Ammonium Sulfate         | 200.00        | Lb   |
| Harrow Pasture 2X        | June            | 45HP Tractor                | Harrow             | Equipment Operator Labor | 0.09          | hour |
|                          |                 |                             |                    | Harrow                   | 0.50          | Acre |
|                          | Aug             | 45HP Tractor                | Harrow             | Equipment Operator Labor | 0.09          | hour |
|                          |                 |                             |                    | Harrow                   | 0.50          | Acre |
| Weeds-Rotary Wiper       | Aug             | ATV                         | Rotary wiper       | Equipment Operator Labor | 0.16          | hour |
|                          |                 |                             |                    | Roundup UltraMax         | 0.50          | Pint |
|                          |                 |                             |                    | Rotary Weeder            | 0.50          | Acre |
|                          |                 |                             |                    |                          |               |      |
| Harvest Hay 40 Ac        | May             | Swather 16'<br>45HP Tractor | Rake 20'<br>Baler  | Swath                    |               |      |
|                          |                 |                             |                    | Rake                     |               |      |
| Graze 40 Ac              | June            | 45HP Tractor<br>Bale Wagon  |                    | Bale                     | 2.50          | Ton  |
|                          |                 |                             |                    | Roadside                 |               |      |
|                          |                 |                             |                    | Hand Labor               | 0.20          | Hour |
|                          |                 |                             |                    | Hand Labor               | 0.20          | Hour |
|                          |                 |                             |                    | Hand Labor               | 0.20          | Hour |
|                          | Sept            | ATV                         |                    | Hand Labor               | 0.20          | Hour |
|                          | Oct             | ATV                         |                    | Hand Labor               | 0.20          | Hour |

\*Equipment listed is owned-operated by custom farmer