UNIVERSITY OF CALIFORNIA – COOPERATIVE EXTENSION

2014

SAMPLE COSTS TO ESTABLISH AND PRODUCE

ALFALFA HAY

In The Sacramento Valley and Northern Delta Using Sub-Surface Drip Irrigation (SDI)

Prepared by:

Dan Putnam	UC Cooperative Extension Specialist, Department of Plant and Environmental Sciences, UC Davis
Rachael Long	UC Cooperative Extension Farm Advisor, Yolo, Solano and Sacramento Counties
Michelle Leinfelder-Miles	UC Cooperative Extension Delta Crops Resource Management Advisor, San Joaquin County
Karen Klonsky	UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis
Don Stewart	Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
Sample Costs to Establish and Produce Alfalfa Hay In the Sacramento Valley and Northern Delta – 2014- Sub-Surface Drip Irrigation (SDI)

STUDY CONTENTS

INTRODUCTION

Sample costs to establish an alfalfa stand and produce alfalfa hay under subsurface drip irrigation (SDI) in the Sacramento Valley and northern Delta are shown in this study. A key benefit of irrigating alfalfa with SDI is the ability to irrigate the entire stand immediately following harvest, allowing for rapid re-growth that results in higher yields (25% to 40% higher). Weed control is also improved because the soil surface is kept dry so weed seeds on the surface will not germinate. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on the production practices considered typical for this crop and region, 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, 2, 4 and 5 are provided for entering your farm costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under assumptions. For additional information or an explanation of the calculations used in the study contact the Department of Agricultural and Resource Economics, University of California, Davis, 530-752-4651, destewart@ucdavis.edu.

The expected differences of growing alfalfa on SDI versus alfalfa grown with flood irrigation are significant. The ability to put the water into the root zone more efficiently and evenly across the field right after harvest affects nutrient uptake, plant growth, evapotranspiration of the plants, yield increase and stand longevity from better water management. Growers who decide not to put in borders when converting to drip can change their harvest pattern and are not stuck with the same wheel traffic patterns determined by cutting in

the same direction with the borders. This method will decrease tractor wheel traffic and windrows in the same areas, decreasing plant crown damage. The ability to swath/windrow the crop within 3-4 days after irrigation and the ability to get water back into the root zone within a few hours after picking up and roadsiding the bales combats plant water stress, especially during hot summer months.

Sample Cost of Production studies for many commodities are available and can be down loaded from the Department website, http://coststudies.ucdavis.edu. Many older archived studies are also available on the website.

ASSUMPTIONS

The assumptions refer to Tables 1 through 11 and pertain to sample costs to establish an alfalfa stand, and produce alfalfa for hay in the Sacramento Valley and northern Delta on subsurface drip irrigation (SDI). Practices described represent production practices and materials considered typical of an alfalfa stand in the 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. **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.**

Farm. The hypothetical farm consists of 3,000 non-contiguous acres of field, row, and tree crops of which 600 acres are in alfalfa (440 in production and 160 being established) and the remaining 2,400 acres are planted to other crops such as almonds, corn, grains, processing tomatoes, sunflowers and dry beans. For this study the farm and land is owned and operated by the grower.

Stand Establishment Operating Costs
(Tables 1-3)

Tables 1 to 3 show the costs associated with ground preparation, planting, weed control, equipment, labor, and establishing an alfalfa stand on sub-surface drip. Land preparation, installing the drip system and planting are done in the fall. The establishment year ends after the stand is established and the late fall herbicide is applied. Year 1 production begins with the February herbicide application after the September planting. For this study the buried drip lines are removed after the last harvest in the 6th year, though SDI alfalfa stands can last longer than 6 years if well-managed.

Land Preparation. Stand establishment begins with a stubble disc and roller to incorporate the residue from the previous crop. The ground is chiseled to a depth of 20 to 32 inches to fracture the soil to improve water infiltration and root growth. The field is disced to break up large clods, creating better seed-to-soil contact for good seed germination. Laser leveling is performed by a custom operator once every seven cropping years. Therefore, one-seventh of this cost is included in the establishment costs. The rest of the field is smoothed with a tri-plane. Borders are pulled every 50 feet down the length of the field in the event that the field needs flood irrigation, for example to help control gophers. Tractor mounted Global Positioning Systems, (GPS) is used for field operations and the costs are included in this study.

The drip lines are inserted into the soil at a depth of 12 inches and spaced every 40 inches across the field using a tractor mounted drip line insertion sled. The fields are floated to remove high and low spots that may affect stand establishment from too much or too little water. Healthy alfalfa stands compete well against weeds, insects, and diseases, so it is important to spend time on land preparation to ensure a dense and vigorous stand.

Fertilization. Nitrogen (N) and phosphorus (P) as 11-52-0 at 125 pounds per acre of material is applied by a custom operator in September during field work. Prior to planting, the PCA/CCA collects one soil sample per 20 acres and has it analyzed by a lab for phosphorous (P), potassium (K) and sulfur (S) as shown in Tables 1, 2 and 3. This is especially important when alfalfa follows a crop like processing tomatoes where there may be high residual levels of phosphorus left over in the soil after harvest.

Planting. Alfalfa seed is planted with a Brillion seeder 1/4 inch or less deep at 25 pounds of seed per acre. The seed is planted in September or October and for this study the stand life is six years. Roundup Ready seed is used in this study at a cost of $8.00 per pound (including the $3.00 per pound tech fee) that comes coated with a specific Rhizobial inoculant for nitrogen fixation. The field is ring rolled after planting. For selecting an appropriate variety with specific characteristic that are best adapted to your region, view the listed varieties at the UC Alfalfa & Forage website at http://alfalfa.ucdavis.edu/%2Bproducing/variety/index.aspx or the National Alfalfa Forage Alliance Alfalfa Variety Leaflet at https://www.alfalfa.org/varietyLeaflet.php.

Irrigation. In this study water for seed germination is sprinkled immediately after planting and then again two weeks later with a total of 6 acre-inches. The drip system is used after the stand is established and the roots have penetrated the drip system irrigation/wetting zone. Water costs are 50% well/pumped at ($90 per acre foot) and 50% Canal/district at ($40 per acre foot). For this study an average of $65 per acre foot ($5.42 per acre inch) is used.

Pest Management. The pesticides, rates, and application practices mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines – Alfalfa.* **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 http://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. The adjuvants in this study are not included as a cost in all applications.

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 Agricultural Company.

Weeds. With Roundup Ready alfalfa planted, the broad spectrum post-emergent herbicide Roundup PowerMax is used for weed control. Weed control with Roundup PowerMax is used in late fall at the 3-5 trifoliate leaf stage when weeds are less than 4 inches tall.

Production Operating Costs

(Tables 4-11)

The production costs are shown in Tables 4-11. Tables 4 to 6 show the production costs associated with equipment, pest control, irrigation, labor, and harvesting alfalfa on sub-surface drip.

Irrigation. Irrigation costs include water costs and labor expenses. From April to September, irrigations totaling 4.5 acre-feet, (54 inches) of water are applied through the buried drip system. The actual water requirement will vary each year based on soil, climatic, and plant physiological factors and will range from 0.2 inches per day to 0.4 inches per day. In the drip system, water is pumped through the filters into buried PVC main line, which is connected to the buried drip lines underground, at the head of the fields.

Drip system and drip line maintenance is lower in the first year and increase over the 6 year life expectancy of the stand. The costs are for additional labor, repairs, water and time for flushing the system and adding chemicals to reduce drip emitter clogging. In October of every production year N-pHuric acid is injected into the drip system with an additional ½ inch of water (equaling 54.50 inches total applied), to prevent root intrusion and combat calcium buildup. Approximately $51 per year is used to capture these costs. In year 6 this operation is omitted, since it is the end of the life of the stand and the drip system will be removed. In some instances the flood irrigation system is used to fill the entire soil profile and also can combat gopher problems. A 'Your Cost' column is included to add in these costs if needed.

Fertilization. Once the stand is established, plant tissue tests should be taken every year in August to determine the levels of phosphorus, potassium and other micro nutrients needed by the alfalfa. Costs shown in Tables 4, 5 and 6 are for the analysis based on plant samples collected by the PCA/CCA. In this study, in years two and four, 11-52-0 at 250 pounds per acre is actually applied each January, the fertilizer is charged at 125 pounds per year over these four years. In year six, 125 pounds of 11-52-0 is applied. Including the 125 pounds of fertilizer applied pre-plant, this equals 750 pounds of 11-52-0 per acre over the six year life of the stand. Subsequent micro-nutrient fertilizers are applied as needed from tissue analysis and PCA/CCA recommendations. Summer tissue samples are omitted in year six, the end of the stand life.

Pest Management during Production Years.

Weeds. In Year 1 of the production stage Roundup PowerMax is used in February. In production years, (2-5) Roundup is tank mixed with Velpar herbicide and applied in December-February with an ATV pulled sprayer to protect against weed species shift and resistance. In Year 6, Roundup is used in January and again in June for summer grass control. Other pre-emergence or contact herbicides with different active ingredients should be rotated with Roundup as needed during production years to combat species shift and resistance.

Insects. Several insect species attack alfalfa, but weevils (Egyptian and alfalfa), aphids, alfalfa caterpillar, and armyworms are the pests that cause the most economic damage. Weevils and aphids are assumed to reach population levels requiring a single treatment for control for which the insecticide (Warrior II) is applied in March. Worms, alfalfa caterpillar and armyworms are controlled in July and August with insecticide (Coragen and Belt) applications.

Vertebrate Pest Control. Pocket gophers and meadow mice are the main vertebrate pests that can cause damage in alfalfa stands in the Sacramento Valley. Gophers are especially troublesome in sub-surface drip

irrigated fields because they chew holes in the lines. Burying the drip tape no deeper than 12 inches will help manage repairs. Poison bait-strychnine is sub-surface applied mechanically around the perimeter of the field 3 times per year in every production year in late fall (after first rains of the 'wet season'), winter and spring except year 6, the last, early fall application is omitted. In areas of heavy infestation gopher tunnels are dug up by hand and traps are placed into the tunnels. Under post-harvest drip line maintenance $41 per acre is allocated for repairing buried drip lines from rodent damage and other factors.

Harvest. In this study, the alfalfa is harvested by the grower for hay seven times; April, May, June, July (twice), August, and September. Alfalfa for hay is cut with a self-propelled swather and left to dry for several days before it is turned and windrowed using a rake. Once the hay has dried to the correct moisture content, it is baled into 100 to 125 pound small bales or 1,300 pounds for large bales. The bales are picked up with a bale wagon that moves them from the field and roadsides them (picks up bales and puts in stacks). Using the growers equipment the costs are $33/ton including road siding. For this study we are using 1300 lb bales. The moisture content of alfalfa growing in the field is generally between 75% and 83%. Optimum moisture for raking is 35% to 40%. The optimum moisture content for baling large 1300 pound bales is 14%.

Custom Harvest. Some harvesting companies swath, rake, bale, and roadside the harvested alfalfa for a single fee based on tonnage per acre. Custom operations can be as much as $36/ton for swathing, raking and baling with an additional $14/ton roadside charges for a total of $50/ton.

Yields. The crop is assumed to yield 9.0 tons of hay per acre at 90% dry matter (DM). Annual yields range from 5.0 to 9.0 tons of hay per acre in this region on flood irrigation (averaging 7.0 tons). Yields for subsurface drip irrigated alfalfa range from 25% to 40% higher, averaging about 30%, the value used in this study. Alfalfa hay quality in subsurface drip does not differ from flood irrigated alfalfa. Yield gains are due to faster regrowth of the alfalfa with water being uniformly applied to the field and additional acreage where head and tail ditches have stronger stands in these areas due to better water management.

Returns. A price of $285 per ton for premium hay is based on current USDA California 2014 averages over all grades for the Sacramento Valley market districts. Hay prices and hay quality will vary during the season and by district. USDA alfalfa hay standards are Supreme, Premium, Good, Fair, and Utility, with Supreme garnering the highest price. For this study Table 7 shows grower returns over a range of yields and prices.

Pickups/ATV. The ½ ton pickup is used for irrigation, on road transportation and farm work. The ¾ ton pickup is for business purposes as needed. The ATV is used for pesticide applications, in-field gopher scouting, drip line repair and off road transportation.

Labor, Equipment and Interest

Labor. Labor rates of $17.00 per hour for machine operators and $13.60 for general labor includes payroll overhead of 36%. The basic hourly wages are $12.50 for machine operators and $10.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops and a percentage for other possible benefits. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2014. Labor costs for operations involving machinery are 20% higher than the operation time given in Tables 1 and 4 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

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 Tables 1 and 4 are determined by multiplying the total hourly operating cost in Table 9 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 5.75% 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. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2014.

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 alfalfa production.

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. Employee benefits, payroll taxes and workers' compensation insurance are included in labor costs and not under cash overhead. A portion of the overhead costs in the establishment year is allocated to the previous crop.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.740% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $1,616 for the entire farm.

Office Expense. Costs are estimated at $50 per acre for the ranch and are not based on any specific information, except that there is a cost involved for bookkeeping, payroll, tax preparation, and telephone.

Investment Repairs. Annual repairs on investments or capital recovery items that require maintenance are calculated as 2% of the purchase price. Repairs are not calculated for land and establishment costs.

Field Supervisors' Salary. Supervisor salaries for alfalfa include insurance, payroll taxes, benefits and bonuses. One third of the supervisors' time is allocated to alfalfa. The costs used in this study are $42.50 per acre.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. A portion of the overhead costs in the establishment year are allocated to the previous crop

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;

[(Purchase Price – Salvage Value) x Capital Recovery Factor] + (Salvage Value x Interest Rate).

Salvage Value. Salvage value is the estimated value of an investment at the end of its useful life. For farm machinery the value is a percentage of the new cost of the investment (Boehlje and Eidman 1984). The value is calculated from equations developed by ASAE (American Society of Agricultural Engineers), 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. An interest rate of 4.75% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic rate suggested by a farm lending agency as of January 2014.

Tools. Includes shop equipment/tools and other tools used on the farm and does not recognize any specific inventory.

Shop Building. A shop building is used for equipment maintenance and repair, parts and supply storage, a bathroom, and houses the farm's office. The building encompasses 8,000 square feet, has a concrete floor, and is wired and plumbed as needed to meet building codes.

Irrigation System. The established permanent irrigation system consists of wells, pumps, buried mainline and alfalfa valves which are included in the land purchase price. The cost for the 600 acres is based on a quarter section (160 acres) with one-quarter mile runs. There are two 18-inch mainlines each approximately 2,640 feet long with 10 or 12-inch alfalfa valves every 50 feet and a quarter mile intertie line (connects two mainlines) with 12-inch PVC.

The sprinkler irrigation system consists of pipes & risers, main and laterals lines, valve openers/bonnets and booster pumps owned by grower and shown under non-cash overhead.

The Drip system consists of filters, PVC mainline, connectors to drip lines and sub-surface drip lines, which are owned by the grower and shown under non-cash overhead in Table 1. The sub-surface drip lines have a life expectancy of at least 6 years. For this study the lines are removed at the end of the life of the alfalfa stand.

Land. Cropland with district water suitable for alfalfa production typically ranges in value among counties from $5,000 to $12,000 per acre. The land in this study is owned by the grower and cost $8,000 per acre. Land rents for $300 per acre or 12.0% of harvest income for cropland within a water district and may vary according to value or type of crop planted.

Hay Barn. The open barn with a metal roof covers 5,000 square feet and is 20 feet high. The building's ten support poles are on concrete piers with a natural floor (ground).

Fuel Tanks. Two 5,000-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Establishment Costs. Costs to establish the alfalfa 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, installing & removing sub-surface drip lines, planting, and cash overhead for establishing the alfalfa. The Total Cash Costs shown in Table 1 represents the establishment cost per acre. For this study, the cost is $1,158 per acre or $185,280 for the 160 acres. The alfalfa stand establishment cost is amortized over the 4-year stand life.

Equipment. Although, farm equipment is purchased new or used, 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. 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.

REFERENCES

American Society of Agricultural Engineers. 2011. 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. 2014. Trends in Agricultural Land & Lease Values. California Chapter of the American Society of Farms Managers and Rural Appraisers. Woodbridge, CA.

Barker, Doug. January 22, 2014. California Workers' Compensation Rating Data for Selected Agricultural Classifications as of January 1, 2014. 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.

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

Integrated Pest Management Education and Publications. 2008. "UC Pest Management Guidelines, Alfalfa." 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.tomatoes.html.

John Deere Equipment Configurator. https://configurator.deere.com/servlet/com.deere.u90947.eproducts.view.servlets.EProductsInitializationServlet?sbu=AG&userAction=&lang=en&country=us.

Long, Rachael F., Jerry L. Schmierer, Karen M. Klonsky, Richard L. De Moura. 2008. Sample Cost to Establish An Alfalfa Stand and Produce Alfalfa Hay. University of California, Davis, CA. http://coststudies.ucdavis.edu/.

Summers C and DH Putnam [eds]. 2008. Irrigated Alfalfa Management for Mediterranean and Desert Zones. UC ANR publication number 3512, http://ucanr.org/pubs.cfm.

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

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TABLE 1. COSTS PER ACRE TO ESTABLISH ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Pre-Plant:								
Soil Samples	0.00	0	0	0	0	4	4	
Stubble Disc	0.13	3	9	4	0	0	15	
Chisel/Rip & Roll	0.12	3	8	4	0	0	14	
Finish Disc & Roll 2X	0.19	4	10	5	0	0	18	
Laser Level 7% Ac	0.00	0	0	0	0	12	12	
Fertilize 11-52-0	0.00	0	0	0	46	11	57	
Insert Drip Lines	0.75	97	48	16	0	0	161	
Tri-Plane 2X	0.24	5	12	4	0	0	22	
Pull Border/Levees	0.14	3	7	2	0	0	12	
TOTAL PRE-PLANT COSTS	1.59	114	94	34	46	26	315	
Cultural:								
Plant-Roundup Ready Seed	0.33	7	7	4	200	0	217	
Roll-Cover Seed	0.10	2	2	1	0	0	5	
Sprinkler Irrigate 2X	2.00	68	17	3	33	0	120	
Weed Control-Roundup PowerMax	0.07	1	0	0	6	0	7	
Service Truck	0.25	5	3	1	0	0	9	
1/2 Ton Pickup	0.37	7	3	1	0	0	12	
3/4 Ton Pickup (Farm use)	0.40	8	4	1	0	0	14	
TOTAL CULTURAL COSTS	3.51	99	36	10	238	0	383	
Postharvest:								
Remove Drip Lines (Year-6)	0.58	94	38	14	0	0	145	
TOTAL POSTHARVEST COSTS	0.58	94	38	14	0	0	145	
Interest on Operating Capital at 5.75%							9	
TOTAL OPERATING COSTS/ACRE	6	306	168	58	284	26	851	
Office Expense							50	
Supervisor Salary							43	
Liability Insurance							1	
Miscellaneous Costs							20	
Property Taxes							90	
Property Insurance							74	
Investment Repairs							30	
TOTAL CASH OVERHEAD COSTS/ACRE							307	
TOTAL CASH COSTS/ACRE							1,158	

NON-CASH OVERHEAD:	Per Producing Acre	Annual Cost Capital Recovery	
Fuel Tanks Overhead	4	0	0
Shop Tools	7	1	1
Hay Barn/Pole Barn	25	2	2
Land 160 Acres	8,000	380	380
GPS Sending Unit	2	0	0
GPS Receiving Unit	1	0	0
Drip Line (Buried)	450	88	88
Sprinkler Pipe	11	1	1
Pipe Main Line 10" 1/4 Mile	4	1	1
Shop 8,000 sqft	53	4	4
Drip Irrigation System	1,350	106	106
Equipment	523	61	61
TOTAL NON-CASH OVERHEAD COSTS	10,430	644	644
TOTAL COSTS/ACRE			1,802

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TABLE 2. MATERIAL and INPUT COSTS to ESTABLISH ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Hay	9	Ton	285.00	2,565	
TOTAL GROSS RETURNS	9	Ton		2,565	
OPERATING COSTS					
Fertilizer:				**46**	
11-52-0	125.00	Lb	0.37	46	
Custom:				**26**	
Soil Test P	1.00	Each	2.00	2	
Soil Test K	1.00	Each	2.00	2	
Laser Level	0.07	Acre	165.00	12	
Ground Application	1.00	Acre	10.50	11	
Seed:				**200**	
Alfalfa Seed RR	25.00	Lb	5.00	125	
Seed Tech Fee	25.00	Lb	3.00	75	
Herbicide:				**6**	
Roundup PowerMax	2.00	Pint	2.75	6	
Irrigation:				**33**	
Water-Alfalfa	6.00	AcIn	5.42	33	
Labor				**306**	
Equipment Operator Labor	6.81	Hrs	17.00	116	
Non-Machine Labor	12.00	Hrs	13.60	163	
Irrigation Labor	2.00	Hrs	13.60	27	
Machinery				**226**	
Fuel-Gas	2.18	Gal	3.39	7	
Fuel-Diesel	41.33	Gal	3.88	160	
Lube				25	
Machinery Repair				33	
Interest on Operating Capital @ 5.75%				9	
TOTAL OPERATING COSTS/ACRE				851	

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TABLE 3. WHOLE FARM ANNUAL EQUIPMENT COSTS-ESTABLISHMENT YEAR
ANNUAL EQUIPMENT COSTS
SACRAMENTO VALLEY & NORTHERN DELTA-2014

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
14	Irrigation Pipe Trailer #1	2,141	25	65	147	9	11	167
14	Irrigation Pipe Trailer #2	2,141	25	65	147	9	11	167
14	260HP4WD Tractor	265,355	10	78,382	27,644	1,425	1,719	30,787
14	205HP Crawler	229,338	10	67,743	23,892	1,231	1,485	26,609
14	95HP2WD Tractor	66,599	10	19,672	6,938	358	431	7,727
14	Chisel - Heavy 26'	51,218	10	9,057	5,824	250	301	6,375
14	Disc - Finish 25'	48,769	10	8,624	5,546	238	287	6,071
14	Triplane - 16'	24,478	10	4,329	2,783	119	144	3,047
14	Border-Ridger	19,625	10	3,702	2,213	97	117	2,426
14	Rice Roller-18'	15,552	10	2,750	1,768	76	92	1,936
14	Booster Pump #2	11,000	10	1,945	1,251	54	65	1,369
14	Booster Pump #1	11,000	10	1,945	1,251	54	65	1,369
14	Ring roller - 25'	7,290	10	1,289	829	36	43	907
14	ATV Sprayer System	4,017	10	710	457	20	24	500
14	Brillion Seeder 12'	17,235	7	4,397	2,407	90	108	2,605
14	Disc - Stubble 18'	55,000	5	17,916	9,357	302	365	10,024
14	Service Truck	38,600	5	17,300	5,708	232	279	6,219
14	Drip Tape Extraction Sled	30,000	5	9,772	5,104	165	199	5,468
14	Pickup 3/4 Ton	28,000	5	12,549	4,140	168	203	4,511
14	Pickup 1/2 Ton	24,000	5	10,756	3,549	144	174	3,867
14	Drip Tape Inserting Sled	16,117	5	5,250	2,742	89	107	2,937
14	ATV	6,499	5	2,913	961	39	47	1,047
	TOTAL	973,974	-	281,131	114,658	5,202	6,276	126,136
	60% of New Cost*	584,384	-	168,679	68,795	3,121	3,765	75,682

*Used to reflect a mix of new and used equipment

UC COOPERATIVE EXTENSION
TABLE 4. COSTS PER ACRE TO PRODUCE ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:								
Fertilize 11-52-0	0.00	0	0	0	46	7	54	
Weeds-Roundup PowerMax	0.07	1	0	0	63	0	65	
Insects-Aphids/Weevil-Warrior II	0.07	1	0	0	8	0	10	
Vertebrate Pests-Gophers 3X	0.42	12	3	1	23	0	40	
Irrigate-Drip	0.00	82	0	0	293	0	374	
Insects-Worms Coragen	0.07	1	0	0	21	0	22	
Insects-Worms Belt SC	0.07	1	0	0	28	0	30	
Tissue Samples	0.00	0	0	0	0	11	11	
Pickup 1/2 Ton	0.47	10	4	2	0	0	15	
Pickup 3/4 Ton	0.40	8	4	1	0	0	14	
Service Truck	0.20	4	2	1	0	0	7	
TOTAL CULTURAL COSTS	1.75	121	14	5	482	18	640	
Harvest:								
Harvest-Swathing	0.75	15	26	14	0	0	55	
Harvest-Raking	0.60	12	5	4	0	0	21	
Harvest-Baling	1.17	24	43	41	7	0	115	
Harvest-Roadsiding	1.05	21	37	45	0	0	103	
TOTAL HARVEST COSTS	3.57	73	111	104	7	0	294	
Postharvest:								
Irrigate-Flush Drip System	0.00	7	0	0	3	0	10	
Drip System Maintenance	0.00	41	0	0	0	0	41	
TOTAL POSTHARVEST COSTS	0.00	48	0	0	3	0	50	
Interest on Operating Capital at 5.75%							18	
TOTAL OPERATING COSTS/ACRE	5	241	125	109	492	18	1,003	
CASH OVERHEAD:								
Office Expense							50	
Miscellaneous Costs							20	
Supervisor Salary							43	
Liability Insurance							1	
Property Taxes							96	
Property Insurance							79	
Investment Repairs							30	
TOTAL CASH OVERHEAD COSTS/ACRE							318	
TOTAL CASH COSTS/ACRE							1,321	
NON-CASH OVERHEAD:		Per Producing Acre		Annual Cost Capital Recovery				
Fuel Tanks Overhead		4		0			0	
Shop Tools		7		1			1	
Hay Barn/Pole Barn		25		2			2	
Land 160 Acres		8,000		380			380	
GPS Sending Unit		2		0			0	
GPS Receiving Unit		1		0			0	
Sprinkler Pipe		11		1			1	
Pipe Main Line 10" 1/4 Mile		4		1			1	
Shop 8,000 sqft		53		4			4	
Establishment Costs 160 Ac		1,158		226			226	
Drip Irrigation System		1,350		106			106	
Drip Line (Buried)		450		88			88	
Equipment		1,065		129			129	
TOTAL NON-CASH OVERHEAD COSTS		12,130		937			937	
TOTAL COSTS/ACRE							2,258	

UC COOPERATIVE EXTENSION
TABLE 5. COSTS AND RETURNS PER ACRE TO PRODUCE ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Hay	9	Ton	275.00	2,475	
TOTAL GROSS RETURNS	9	Ton		2,475	
OPERATING COSTS					
Fertilizer:				**46**	
11-52-0	125.00	Lb	0.37	46	
Custom:				**18**	
Air Application-Fertilizer	1.25	Cwt	5.85	7	
Tissue Test P&K	5.00	Acre	2.10	11	
Herbicide:				**63**	
Roundup PowerMax	2.00	Pint	2.75	6	
Velpar L	4.00	Pint	14.41	58	
Insecticide:				**57**	
Warrior II	1.50	FlOz	5.25	8	
Coragen	2.00	FlOz	10.25	21	
Belt SC	3.00	FlOz	9.40	28	
Irrigation:				**295**	
Water-Alfalfa	54.50	AcIn	5.42	295	
Miscellaneous:				**7**	
Bale Twine	0.98	Acre	7.00	7	
N-pHuric Acid	0.15	Gal	1.00	0	
Rodenticides:				**23**	
Bait-Strychnine	7.80	Lb	3.00	23	
Labor				**241**	
Equipment Operator Labor	6.38	Hrs	17.00	108	
Irrigation Labor	9.50	Hrs	13.60	129	
Non-Machine Labor	0.25	Hrs	13.60	3	
Machinery				**245**	
Fuel-Gas	2.63	Gal	3.39	9	
Fuel-Diesel	32.45	Gal	3.88	126	
Lube				20	
Machinery Repair				90	
Interest on Operating Capital @ 5.75%				18	
TOTAL OPERATING COSTS/ACRE				1,014	
TOTAL OPERATING COSTS/TON				113	
NET RETURNS ABOVE OPERATING COSTS				1,461	

TABLE 5. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
Office Expense				50	
Miscellaneous Costs				20	
Supervisor Salary				43	
Liability Insurance				1	
Property Taxes				96	
Property Insurance				79	
Investment Repairs				30	
TOTAL CASH OVERHEAD COSTS/ACRE				318	
TOTAL CASH OVERHEAD COSTS/TON				35	
TOTAL CASH COSTS/ACRE				1,332	
TOTAL CASH COSTS/TON				148	
NET RETURNS ABOVE CASH COSTS				1,143	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Fuel Tanks Overhead				0	
Shop Tools				1	
Hay Barn/Pole Barn				2	
Land 160 Acres				380	
GPS Sending Unit				0	
GPS Receiving Unit				0	
Sprinkler Pipe				1	
Pipe Main Line 10" 1/4 Mile				1	
Shop 8,000 sqft				4	
Establishment Costs 160 Ac				226	
Drip Irrigation System				106	
Drip Line (Buried)				88	
Equipment				129	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				937	
TOTAL NON-CASH OVERHEAD COSTS/TON				104	
TOTAL COST/ACRE				2,269	
TOTAL COST/TON				252	
NET RETURNS ABOVE TOTAL COST				206	

UC COOPERATIVE EXTENSION
TABLE 6. MONTHLY COSTS PER ACRE TO PRODUCE ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

	JAN 14	FEB 14	MAR 14	APR 14	MAY 14	JUN 14	JUL 14	AUG 14	SEP 14	OCT 14	Total
Cultural:											
Fertilize 11-52-0	54										54
Weeds-Roundup PowerMax		65									65
Insects-Aphids/Weevil-Warrior II			10								10
Vertebrate Pests-Gophers 3X			12			15			12		40
Irrigate-Drip				57	57	62	73	68	57		374
Insects-Worms Coragen							22				22
Insects-Worms Belt SC								30			30
Tissue Samples								11			11
Pickup 1/2 Ton	2	2	2	2	2	2	2	2	2	2	15
Pickup 3/4 Ton	1	1	1	1	1	1	1	1	1	1	14
Service Truck	1	1	1	1	1	1	1	1	1	1	7
TOTAL CULTURAL COSTS	57	68	25	61	61	81	99	112	73	4	640
Harvest:											
Harvest-Swathing				8	8	8	16	8	8		55
Harvest-Raking				3	3	3	6	3	3		21
Harvest-Baling				16	16	16	33	16	16		115
Harvest-Roadsiding				15	15	15	30	15	15		103
TOTAL HARVEST COSTS	0	0	0	42	42	42	84	42	42	0	294
Postharvest:											
Irrigate-Flush Drip System										10	10
Drip System Maintenance										41	41
TOTAL POSTHARVEST COSTS	0	0	0	0	0	0	0	0	0	50	50
Interest on Operating Capital @ 5.75%	0	1	1	1	2	2	3	4	4	0	18
TOTAL OPERATING COSTS/ACRE	57	69	26	104	104	126	186	158	119	54	1,003
CASH OVERHEAD											
Office Expense									50		50
Miscellaneous Costs									20		20
Supervisor Salary	4	4	4	4	4	4	4	4	4	4	43
Liability Insurance									1		1
Property Taxes	48						48				96
Property Insurance	40						40				79
Investment Repairs	3	3	3	3	3	3	3	3	3	3	30
TOTAL CASH OVERHEAD COSTS	95	7	7	7	7	7	95	7	78	7	318
TOTAL CASH COSTS/ACRE	152	76	33	111	112	133	281	165	197	61	1,321

UC COOPERATIVE EXTENSION
TABLE 7. RANGING ANALYSIS - ALFALFA
COSTS PER ACRE AND PER TON AT VARYING YIELDS TO PRODUCE ALFALFA
SACRAMENTO VALLEY & NORTHERN DELTA-2014

	YIELD (TON)						
	6.00	7.00	8.00	9.00	10.00	11.00	12.00
OPERATING COSTS/ACRE:							
Cultural	640	640	640	640	640	640	640
Harvest	196	229	261	294	327	359	392
Postharvest	50	50	50	50	50	50	50
Interest on Operating Capital @ 5.75%	16	17	18	18	19	19	20
TOTAL OPERATING COSTS/ACRE	903	936	969	1,003	1,036	1,069	1,103
TOTAL OPERATING COSTS/TON	150.49	133.77	121.16	111.42	103.62	97.19	91.88
CASH OVERHEAD COSTS/ACRE	329	329	329	329	329	329	329
TOTAL CASH COSTS/ACRE	1,232	1,266	1,298	1,332	1,365	1,398	1,432
TOTAL CASH COSTS/TON	205.35	180.79	162.31	147.99	136.53	127.11	119.31
NON-CASH OVERHEAD COSTS/ACRE	937	937	937	937	937	937	937
TOTAL COSTS/ACRE	2,170	2,203	2,236	2,269	2,303	2,336	2,369
TOTAL COSTS/TON	362.00	315.00	279.00	252.00	230.00	212.00	197.00

Net Return per Acre above Operating Costs for Alfalfa

PRICE ($/ton)	YIELD (Ton /acre)						
Hay	6.00	7.00	8.00	9.00	10.00	11.00	12.00
200.00	297	464	631	797	964	1,131	1,297
225.00	447	639	831	1,022	1,214	1,406	1,597
250.00	597	814	1,031	1,247	1,464	1,681	1,897
275.00	747	989	1,231	1,472	1,714	1,956	2,197
300.00	897	1,164	1,431	1,697	1,964	2,231	2,497
325.00	1,047	1,339	1,631	1,922	2,214	2,506	2,797
350.00	1,197	1,514	1,831	2,147	2,464	2,781	3,097

Net Return per Acre above Cash Costs for Alfalfa

PRICE ($/ton)	YIELD (Ton /acre)						
Hay	6.00	7.00	8.00	9.00	10.00	11.00	12.00
200.00	-32	134	302	468	635	802	968
225.00	118	309	502	693	885	1,077	1,268
250.00	268	484	702	918	1,135	1,352	1,568
275.00	418	659	902	1,143	1,385	1,627	1,868
300.00	568	834	1,102	1,368	1,635	1,902	2,168
325.00	718	1,009	1,302	1,593	1,885	2,177	2,468
350.00	868	1,184	1,502	1,818	2,135	2,452	2,768

TABLE 4. RANGING ANALYSIS CONTINUED

Net Return per Acre above Total Costs for Alfalfa

PRICE ($/ton)	YIELD (Ton /acre)						
Hay	6.00	7.00	8.00	9.00	10.00	11.00	12.00
200.00	-970	-803	-636	-469	-303	-136	31
225.00	-820	-628	-436	-244	-53	139	331
250.00	-670	-453	-236	-19	197	414	631
275.00	-520	-278	-36	206	447	689	931
300.00	-370	-103	164	431	697	964	1,231
325.00	-220	72	364	656	947	1,239	1,531
350.00	-70	247	564	881	1,197	1,514	1,831

UC COOPERATIVE EXTENSION

TABLE 8. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

ANNUAL EQUIPMENT COSTS

SACRAMENTO VALLEY & NORTHERN DELTA-2014

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
14	Bait Applicator	2,473	20	137	190	11	13	214
14	150HP4WD Tractor	158,066	10	46,690	16,467	849	1,024	18,339
14	Swather 16'	123,582	10	21,854	14,053	603	727	15,383
14	Baler1300#PTO	113,665	10	20,101	12,925	554	669	14,148
14	37HP 4WD Tractor	34,922	10	10,315	3,638	188	226	4,052
14	Rake 20'	28,840	10	5,100	3,279	141	170	3,590
14	ATV Sprayer System	4,017	10	710	457	20	24	500
14	Bale Wagon 1300# Attm	148,625	8	31,320	19,454	746	900	21,100
14	Service Truck	38,600	5	17,300	5,708	232	279	6,219
14	Pickup 3/4 Ton	28,000	5	12,549	4,140	168	203	4,511
14	Pickup 1/2 Ton	24,000	5	10,756	3,549	144	174	3,867
14	ATV	6,499	5	2,913	961	39	47	1,047
	TOTAL	711,289	-	179,746	84,821	3,693	4,455	92,970
	60% of New Cost*	426,773	-	107,848	50,893	2,216	2,673	55,782

*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								
Fuel Tanks Overhead	10,975	20	0	862	45	55	220	1,182
Shop Tools	20,000	20	2,000	1,509	91	110	400	2,110
Hay Barn/Pole Barn	75,000	20	0	5,891	311	375	1,500	8,077
Land 160 Acres	1,280,000	20	1,280,000	60,800	10,611	12,800	0	84,211
Sprinkler Pipe	33,865	20	3,387	2,555	154	186	677	3,573
Shop 8,000 sqft	160,000	20	0	12,568	663	800	3,200	17,231
Drip Irrigation System	216,000	20	0	16,967	895	1,080	3,168	22,110
GPS Sending Unit	5,895	10	590	707	27	32	118	884
GPS Receiving Unit	1,995	10	200	239	9	11	40	299
Pipe Main Line 10" 1/4 Mile	13,446	10	1,345	1,612	61	74	269	2,016
Establishment Costs 160 Ac	185,280	6	0	36,212	768	926	0	37,906
Drip Line (Buried)	72,000	6	0	14,072	298	360	1,277	16,007
TOTAL INVESTMENT	2,074,456	-	1,287,522	153,994	13,935	16,810	10,869	195,609

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Office Expense	160	Acre	50.00	8,000
Miscellaneous Costs	160	Acre	20.00	3,200
Supervisor Salary	160	Acre	42.50	6,800
Liability Insurance	160	Acre	0.56	90

UC COOPERATIVE EXTENSION TABLE
9. HOURLY EQUIPMENT COSTS
SACRAMENTO VALLEY & NORTHERN DELTA-2014

Yr	Description	Alfalfa Hours Used	Total Hours Used	Capital Recovery	Cash Overhead Insur-ance	Cash Overhead Taxes	Operating Lube& Repairs	Operating Fuel	Operating Total Oper.	Total Costs/Hr.
14	150HP4WD Tractor	205	1600	6.18	0.32	0.38	9.27	33.78	43.05	49.93
14	37HP 4WD Tractor	180	1600	1.36	0.07	0.08	1.99	7.05	9.04	10.56
14	Service Truck	32	1000	3.42	0.14	0.17	2.92	11.64	14.56	18.29
14	Pickup 1/2 Ton	75	400	5.32	0.22	0.26	3.64	8.48	12.11	17.91
14	Pickup 3/4 Ton	64	400	6.21	0.25	0.30	3.61	10.17	13.78	20.55
14	ATV	42	400	1.44	0.06	0.07	0.99	3.39	4.38	5.95
14	Baler1300#PTO	187	300	25.85	1.11	1.34	24.97	0.00	24.97	53.26
14	Swather 16'	132	300	28.11	1.21	1.45	16.98	31.04	48.02	78.79
14	Bale Wagon 1300# Attm	185	250	46.69	1.79	2.16	38.68	32.20	70.88	121.52
14	Rake 20'	96	250	7.87	0.34	0.41	4.08	0.00	4.08	12.70
14	ATV Sprayer System	42	150	1.83	0.08	0.09	1.08	0.00	1.08	3.08
14	Bait Applicator	67	100	1.14	0.06	0.08	0.00	0.00	0.00	1.28

UC COOPERATIVE EXTENSION
TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS
SACRAMENTO VALLEY & NORTHERN DELTA-2014

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Fertilize 11-52-0	Jan			11-52-0	125.00	Lb
				Air Application-Fertilizer	1.25	Cwt
Weeds-Roundup PowerMax	Feb		ATV	Equipment Operator Labor	0.08	hour
				Roundup PowerMax	2.00	Pint
			ATV Sprayer System	Velpar L	4.00	Pint
Insects-Aphids/Weevils	Mar		ATV	Equipment Operator Labor	0.08	hour
				Warrior II	1.50	FlOz
			ATV Sprayer System			
Vertebrate Pests-Gophers	Mar	37HP 4WD Tractor	Bait Applicator	Equipment Operator Labor	0.17	hour
				Bait-Strychnine	2.60	Lb
	June	37HP 4WD Tractor	Bait Applicator	Non-Machine Labor	0.25	hour
				Bait-Strychnine	2.60	Lb
	Sept	37HP 4WD Tractor	Bait Applicator	Equipment Operator Labor	0.17	hour
				Bait-Strychnine	2.60	Lb
Irrigate-Drip	Apr			Irrigation Labor	1.00	hour
				Water-Alfalfa	8.00	AcIn
	May			Irrigation Labor	1.00	hour
				Water-Alfalfa	8.00	AcIn
	June			Irrigation Labor	1.00	hour
				Water-Alfalfa	9.00	AcIn
	July			Irrigation Labor	1.00	hour
				Water-Alfalfa	11.00	AcIn
	Aug			Irrigation Labor	1.00	hour
				Water-Alfalfa	10.00	AcIn
	Sept			Irrigation Labor	1.00	hour
				Water-Alfalfa	8.00	AcIn
Insects-Worms Coragen	July		ATV	Equipment Operator Labor	0.08	hour
				Coragen	2.00	FlOz
			ATV Sprayer System			
Insects-Worms Belt SC	Aug		ATV	Equipment Operator Labor	0.08	hour
				Belt SC	3.00	FlOz
			ATV Sprayer System			
Tissue Samples	Aug			Tissue Test P&K	5.00	Acre
Pickup 1/2 Ton	Aug		Pickup 1/2 Ton	Equipment Operator Labor	0.56	hour
Pickup 3/4 Ton	Aug		Pickup 3/4 Ton	Equipment Operator Labor	0.48	hour
Service Truck	Aug		Service Truck	Equipment Operator Labor	0.24	hour
Harvest-Swathing	Apr		Swather 16'	Equipment Operator Labor	0.13	hour
	May		Swather 16'	Equipment Operator Labor	0.13	hour
	June		Swather 16'	Equipment Operator Labor	0.13	hour
	July		Swather 16'	Equipment Operator Labor	0.13	hour
	July		Swather 16'	Equipment Operator Labor	0.13	hour
	Aug		Swather 16'	Equipment Operator Labor	0.13	hour
	Sept		Swather 16'	Equipment Operator Labor	0.13	hour
Harvest-Raking	Apr	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	May	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	June	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	July	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	July	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	Aug	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
	Sept	37HP 4WD Tractor	Rake 20'	Equipment Operator Labor	0.10	hour
Harvest-Baling	Apr	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	May	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	June	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	July	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	July	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	Aug	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
	Sept	150HP4WD Tractor	Baler1300# PTO	Equipment Operator Labor	0.20	hour
Harvest-Roadsiding	Apr		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	May		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	June		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	July		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	July		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	Aug		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
	Sept		Bale Wagon 1300# Attm	Equipment Operator Labor	0.18	hour
Irrigate-Flush Drip	Oct			Irrigation Labor	0.50	hour
				Water-Alfalfa	0.50	AcIn
				N-pHuric Acid	0.15	Gal
Drip System Maint	Oct			Irrigation Labor	3.00	hours

UC COOPERATIVE EXTENSION

TABLE 11. SUMMARY OF COSTS FOR ALFALFA- PER ACRE OVER YEARS

SACRAMENTO VALLEY & NORTHERN DELTA-2014

Operations	Establishment-Year	Year-1	Years-2-5*	Year-6	Annualized Costs Over 7 Years
Pre-Plant:					
Land Prep (Combined)	154				22
Insert Sub-Surface Drip Lines	161				23
TOTAL PRE-PLANT COSTS	315				45
Cultural:					
Plant-Roll-Cover Seed	222				32
Sprinkler Irrigate 2X	120				17
Irrigate-Drip		374	374	374	321
Weed Control	7	7	65	14	41
Insect Control		62	62	62	53
Vertebrate Pest Control		40	40	27	32
Tissue Samples		11	11		8
Fertilizer 11-52-0	57		54	54	39
Farm Trucks	35	36	36	36	31
TOTAL CULTURAL COSTS	383	529	640	567	574
Harvest:					
Harvest (All operations)		294	294	294	252
TOTAL HARVEST COSTS		294	294	294	252
Postharvest:					
Drip System Maintenance		51	51	41	42
Remove Drip Lines, (last year)	145				21
TOTAL POSTHARVEST COSTS	145	51	51	41	63
Interest on Operating Capital at 5.75%	8	14	18	16	16
TOTAL OPERATING COSTS/ACRE	851	888	1,003	918	950
CASH OVERHEAD COSTS/ACRE	307	318	318	318	316
TOTAL CASH COSTS/ACRE	1,158	1,205	1,321	1,236	1,269
NON-CASH OVERHEAD COSTS/ACRE	644	937	937	937	895
TOTAL COSTS/ACRE	1,802	2,142	2,258	2,173	2,164
TOTAL COSTS/TON		100	113	103	94

- This column multiplied by 4, added to rest of the row and divided by 7 years to get Annualized costs.