

**1992**  
**U.C. COOPERATIVE EXTENSION**  
**SAMPLE COSTS TO ESTABLISH AND PRODUCE ALFALFA HAY**  
**IN THE HIGH DESERT OF SOUTHERN CALIFORNIA**  
**(Center Pivot Irrigation System)**

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by

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The detailed costs for alfalfa hay establishment and production in the high desert areas (Barstow, Daggett and Newberry Springs) of Los Angeles and San Bernardino counties are presented in this study. The hypothetical farm used in this report consists of 480 acres of which 300 acres are in alfalfa hay production.

Practices described are based on those production procedures considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. **This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans.** A blank Your Costs column is provided to enter your actual costs on Table 1, Costs Per Acre To Establish Alfalfa Hay and Table 5, Costs Per Acre To Produce Alfalfa Hay.

This study consists of **General Assumptions for Establishing and Producing Alfalfa Hay** and ten tables.

Table 1.	<b>Costs Per Acre To Establish Alfalfa Hay</b>
Table 2.	<b>Monthly Cash Costs Per Acre To Establish Alfalfa Hay</b>
Table 3.	<b>Annual Equipment Costs for Alfalfa Hay Establishment</b>
Table 4.	<b>Hourly Equipment Costs For Alfalfa Hay Establishment</b>
Table 5.	<b>Costs Per Acre To Produce Alfalfa Hay</b>
Table 6.	<b>Monthly Cash Costs Per Acre To Produce Alfalfa Hay</b>
Table 7.	<b>Annual Equipment, Investment And Business Overhead Costs For Alfalfa Hay Production</b>
Table 8.	<b>Hourly Equipment Costs For Alfalfa Hay Production</b>
Table 9.	<b>Ranging Analysis</b>
Table 10.	<b>Costs And Returns / Breakeven Analysis</b>

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (916) 752-3589 or call the Farm Advisor in the county of interest.

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# GENERAL ASSUMPTIONS FOR ESTABLISHING AND PRODUCING ALFALFA HAY

*High Desert of Southern California - 1992*

(Center Pivot Irrigation System)

U.C. Cooperative Extension

The following is a description of some general assumptions pertaining to sample costs of alfalfa hay establishment and production in the high desert of Southern California. These costs are presented on an annual, per acre basis.

## **1. LAND:**

This cost of land in this production study is based on a 480 acre field crop farm consisting of three quarter sections of 160 acres each. A center pivot irrigation system is used in each of the three 160 acre fields. Due to the loss of acreage from using a center pivot irrigation system, only 120 acres of each 160 acre field is under cultivation. Of the 360 producing acres a total of 300 acres dedicated to growing alfalfa. The remaining 60 production acres is used to grow cereal for hay and sudangrass in rotation with alfalfa hay. The 480 acres of land in this study is owned by the grower and is valued at \$2500 per acre. The production acreage is only 360 acres which brings the price up to \$3333 per producing acre. Land is not depreciated.

## **2. STAND ESTABLISHMENT:**

Table 1, **Costs Per Acre To Establish Alfalfa Hay** shows the cost associated with ground preparation, planting and growing an alfalfa stand until the first production year. All of the primary tillage and land preparation operations are done in September. Fertilizer is custom applied to the field in September before the alfalfa stand is planted in October. A total of 1 acre-foot of water applied during stand establishment starting with a pre-irrigation in September. The rest of the irrigations are scheduled during the months of October, November and December. A post-emergent herbicide (2,4-DB) is applied to seedling stands when needed. A herbicide (Kerb or Poast) is used for grass control as needed. The first production year's hay is harvested over the following summer. Stand life can vary from as few as 3 years to as many as 8 years or more. Stand life is assumed to be 5 years. To obtain stand establishment cost for an average production year, the total cost per acre to establish alfalfa hay in Table 1, is divided by 5 (years of stand life). This becomes an investment cost in Table 5, **Costs Per Acre To Produce Alfalfa Hay**. The annual production cost in the study represents the production costs for any year in the life of the stand .

## **3. CULTURAL PRACTICES:**

Cultural, pesticide and fertilizer inputs for the production of alfalfa hay vary considerably from grower to grower and field to field. Seven acre-feet of water is applied at a cost of \$28 per acre-foot. Water is pumped from three wells from a depth of 300 feet to the center pivot irrigation system. Insect control is managed with one insecticide application. Aphids and weevils are sprayed in March. The spray is custom applied. Herbicides for winter weed control are applied in December through early February to established stands. Treflan is used for summer grass and dodder control. The practices and inputs used in this cost study serve only as a sample or a guide. Variations of cultural practices and inputs can be significant.

## **4. YIELDS & RETURNS:**

The crop yield used in this study is 9 tons of hay per acre from a total of seven cuttings per year. An estimated price of a \$110 per ton of hay is used in this study. After the last cutting of hay is taken in the winter the field is grazed with sheep. A grazing fee of \$12 per acre is charged. Returns will vary depending on market conditions.

## **5. HARVEST:**

In this cost study the ranch owns its harvesting equipment and performs all of its harvest operations. Seven cuttings of hay is normal for the area, though some fields are only harvested six times. This study assumes a three twine baler with a twine cost of \$21.50 per

box. The equipment for harvest operations are inventoried, and labor, fuel, repairs, depreciation, and interest on investment, are calculated as a cost of production. If a grower contracts his harvest operation, all harvest equipment and its appropriate cost should be subtracted from harvest and investment costs in Table 1 and a custom charge would then be added to harvest costs in Table 1.

#### **6. LABOR:**

Basic hourly wages for workers are \$7.00 and \$4.45 per hour for machine operators and field workers (irrigator), respectively. Adding 34% for SDI, FICA, insurance and other benefits increases the labor rates shown to \$9.38 per hour for machine labor and \$6.10 per hour for non-machine labor. The labor hours for operations involving machinery are 10% higher than the machine hours to account for extra labor involved in equipment set-up, moving, maintenance and repair. Wages for managers are not included as a cash cost. Any returns above total costs are considered returns to management.

#### **7. INVESTMENT:**

The investments shown in Table 7 are those that are partially or completely allocated to the alfalfa hay operation. Costs of investments such as stand establishment and hay barn are attributed only to alfalfa hay and cannot be spread over the rest of the farms enterprises. Other investments including land, shop buildings and irrigation systems can be used by the whole farm so only a portion of the costs can be assigned to the alfalfa hay enterprise and the rest of the costs are distributed to the other farm enterprises. Annual investments shown in Tables 1 and 5 represent depreciation and opportunity cost for each investment on an annual per acre basis.

#### **8. OVERHEAD:**

County taxes are calculated as 1% of the average value of equipment, buildings and improvements. Insurance is charged at 0.5% of the average value of the equipment over its useful life. Office and business costs are estimated at \$20 per acre for the ranch. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

#### **9. INTEREST:**

Interest on operating capital is based on cash costs and is calculated monthly for eleven months until the last harvest at the rate of 11.75% per year. Interest is also charged on investment at 12.05% per year to account for income foregone that could be received from an alternative investment (opportunity cost) and is based on the average value of the buildings and equipment.

#### **10. EQUIPMENT COSTS:**

In allocating the equipment costs per acre, the following calculations were made and shown in Table 3 and Table 7: (a) **Original Cost** of equipment is the cost of the new equipment plus sales tax. (b) **Depreciation** is straight line with a 10% salvage value. (c) **Interest on investment** is calculated as the average value per acre of the equipment during its useful life (average value equals  $(\text{new cost} + \text{salvage value}) / 2$  on a per acre basis) multiplied by an interest rate of 12.05%. (d) The total investment costs are also calculated as 50% of the depreciation and the interest costs for all new equipment to reflect a mix of the new and used equipment. These values are also used in Table 1 and Table 5. Most of this equipment is used on the entire 360 producing acres. Hourly equipment costs are shown in Table 4.

#### **11. FUEL & REPAIR:**

The fuel and repair cost per acre for each operation in Tables 1 and 5, is determined by multiplying the total hourly operating cost for each piece of equipment in Tables 4 and 8, by the number of hours per acre for that operation. Prices for on-farm delivery of gasoline and diesel are \$0.79 and \$1.00 per gallon respectively.

Table 1.

U.C. COOPERATIVE EXTENSION  
 COSTS PER ACRE TO ESTABLISH ALFALFA HAY  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Labor Rate: \$ 9.38/hr. machine labor      Interest Rate: 11.75%  
 \$ 6.10/hr. non-machine labor      Stand Life 5 years

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel & Repairs	Material Cost	Custom/Rent		
<b>Cultural:</b>							
Subsoil	0.29	3.22	3.88	0.00	0.00	7.10	
Plow	0.46	5.16	6.02	0.00	0.00	11.18	
Disc 2X	0.33	3.69	5.04	0.00	0.00	8.73	
Land plane field	0.14	1.55	1.89	0.00	0.00	3.45	
Fertilize - custom	0.00	0.00	0.00	28.00	5.00	33.00	
Plant (20 lbs of seed)	0.26	2.89	3.78	50.00	0.00	56.67	
Irrigate (1 acft)	0.04	0.24	0.00	27.96	0.00	28.20	
Post emergence herbicide	0.12	1.38	0.88	16.36	0.00	18.63	
Pickup use	0.74	8.34	3.45	0.00	0.00	11.79	
<b>TOTAL CULTURAL COSTS</b>	<b>2.37</b>	<b>26.48</b>	<b>24.95</b>	<b>122.32</b>	<b>5.00</b>	<b>178.74</b>	
Interest on operating capital @ 11.75%						5.50	
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>26.48</b>	<b>24.95</b>	<b>122.32</b>	<b>5.00</b>	<b>184.25</b>	
<b>CASH OVERHEAD:</b>							
Office expense							20.00
Property Taxes							39.06
Investment Insurance							19.53
Investment Repairs							2.54
<b>TOTAL CASH OVERHEAD COSTS</b>							<b>81.13</b>
<b>TOTAL CASH COSTS/ACRE</b>						<b>265.38</b>	
<b>NON-CASH OVERHEAD:</b>							
Investment	Per producing Acre	Annual Cost					
		Depreciation	Interest @ 12.05%				
Land	3333.33		401.67	401.67			
Shop Building	102.78	5.14	6.19	11.33			
Center Pivot Systems	633.33	19.00	41.97	60.97			
Shop tools	27.78	1.67	1.84	3.51			
Motorcycle	3.33	0.30	0.22	0.52			
Hay barns 1000 ton	120.00	3.60	7.95	11.55			
Fuel tanks & pumps	22.36	1.12	1.35	2.47			
Storage building	20.83	1.04	1.26	2.30			
Equipment	123.70	10.70	8.20	18.90			
<b>TOTAL NON-CASH OVERHEAD COSTS</b>	<b>4387.45</b>	<b>42.56</b>	<b>470.65</b>	<b>513.21</b>			
<b>TOTAL COSTS/ACRE</b>						<b>778.59</b>	

Table 2.

U.C. COOPERATIVE EXTENSION  
 MONTHLY CASH COSTS PER ACRE TO ESTABLISH ALFALFA HAY  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Beginning SEP 90	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	TOTAL
Ending AUG 91	90	90	90	90	91	91	91	91	91	91	91	91	
<b>Cultural:</b>													
Subsoil	7.10												7.10
Plow	11.18												11.18
Disc 2X	8.73												8.73
Land plane field	3.45												3.45
Fertilize - custom	33.00												33.00
Plant (20 lbs of seed)		56.67											56.67
Irrigate (1 acft)	9.38	7.05	7.05	4.72									28.20
Post emergence herbicide			18.63										18.63
Pickup use			11.79										11.79
<b>TOTAL CULTURAL COSTS</b>	<b>72.83</b>	<b>63.73</b>	<b>37.47</b>	<b>4.72</b>									<b>178.74</b>
Interest on oper. capital	0.71	1.34	1.70	1.75									5.50
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>73.55</b>	<b>65.06</b>	<b>39.17</b>	<b>6.47</b>									<b>184.25</b>
<b>OVERHEAD:</b>													
Office expense				20.00									20.00
Property Taxes					39.06								39.06
Equipment Insurance					19.53								19.53
Investment Repairs	0.64	0.64	0.64	0.64									2.54
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>0.64</b>	<b>0.64</b>	<b>0.64</b>	<b>20.64</b>	<b>58.59</b>								<b>81.13</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>74.18</b>	<b>65.70</b>	<b>39.81</b>	<b>27.11</b>	<b>58.59</b>								<b>265.38</b>

U.C. COOPERATIVE EXTENSION  
 ANNUAL AND HOURLY EQUIPMENT COSTS  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Table 3.

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. -		- Cash Overhead -		Total
				Depre- ciation	Interest	Insur- ance	Taxes	
90	130 hp 2wd tractor	66000	10	5940.00	4374.15	181.50	363.00	10858.65
90	50 hp 2wd tractor	31000	20	1395.00	2054.52	85.25	170.50	3705.27
90	Disc - 14' stubble	17500	15	1050.00	1159.81	48.13	96.25	2354.19
90	Grain drill - 12'	8500	7	1092.86	563.34	23.38	46.75	1726.33
90	Landplane 40'x 16'	21200	15	1272.00	1405.03	58.30	116.60	2851.93
90	Pickup - 3/4 ton	16000	7	2057.14	1060.40	44.00	88.00	3249.54
90	Plow - 4 bottom 16"	8300	15	498.00	550.08	22.83	45.65	1116.56
90	Sprayer - 300 gal PTO	7200	10	648.00	477.18	19.80	39.60	1184.58
90	Subsoiler - 8' 3 shank	10000	15	600.00	662.75	27.50	55.00	1345.25
TOTAL		185700		14553.00	12307.26	510.69	1021.35	28392.30
50% of New Cost *		92850		7276.50	6153.63	255.34	510.67	14196.15

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

Table 4.

HOURLY EQUIPMENT COSTS

Yr	Description	Actual Hours Used	----- COSTS PER HOUR -----							Total Costs/Hr.
			-Non-Cash Over- Depre- ciation	- Interest	- Cash Overhead - Insur- ance	Taxes	Repairs	Operating Fuel & Lube	Total Oper.	
90	130 hp 2wd tractor	1270.6	2.34	1.72	0.07	0.14	3.30	6.85	10.15	14.42
90	50 hp 2wd tractor	655.5	1.06	1.57	0.07	0.13	1.55	2.23	3.78	6.61
90	Disc - 14' stubble	165.4	3.17	3.51	0.15	0.29	4.19	0.00	4.19	11.31
90	Grain drill - 12'	174.1	3.14	1.62	0.07	0.13	3.55	0.00	3.55	8.51
90	Landplane 40'x 16'	163.4	3.89	4.30	0.18	0.36	2.56	0.00	2.56	11.29
90	Pickup - 3/4 ton	266.2	3.86	1.99	0.08	0.17	2.36	2.30	4.66	10.76
90	Plow - 4 bottom 16"	165.4	1.51	1.66	0.07	0.14	1.99	0.00	1.99	5.36
90	Sprayer - 300 gal PTO	119.9	2.70	1.99	0.08	0.17	3.01	0.00	3.01	7.95
90	Subsoiler - 8' 3 shank	166.8	1.80	1.99	0.08	0.16	2.40	0.00	2.40	6.43

Table 5.

U.C. COOPERATIVE EXTENSION  
 COSTS PER ACRE TO PRODUCE ALFALFA HAY  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Labor Rate: \$ 9.38/hr. machine labor      Interest Rate: 11.75%  
 \$ 6.10/hr. non-machine labor      Yield per Acre: 9.00 ton

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel & Repairs	Material Cost	Custom/ Rent		
<b>Cultural:</b>							
Irrigate (7 acft)	0.10	0.61	0.00	195.72	0.00	196.33	
Summer weed control	0.12	1.38	0.88	17.60	0.00	19.87	
Insect control	0.00	0.00	0.00	15.95	9.00	24.95	
Winter weed control	0.12	1.38	0.88	19.18	0.00	21.45	
Fertilize (100 lbs P205)	0.00	0.00	0.00	28.00	5.00	33.00	
Pickup use	0.60	6.75	2.80	0.00	0.00	9.55	
<b>TOTAL CULTURAL COSTS</b>	<b>0.95</b>	<b>10.13</b>	<b>4.56</b>	<b>276.45</b>	<b>14.00</b>	<b>305.14</b>	
<b>Harvest:</b>							
Swath hay - 7X	1.40	15.76	19.54	0.00	0.00	35.30	
Bale hay - 7X (with 2 balers)	0.98	11.03	24.07	22.89	0.00	57.99	
Roadside hay - 7X	0.88	9.85	18.15	0.00	0.00	28.00	
<b>TOTAL HARVEST COSTS</b>	<b>3.26</b>	<b>36.64</b>	<b>61.76</b>	<b>22.89</b>	<b>0.00</b>	<b>121.29</b>	
Interest on operating capital @ 11.75%							20.70
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>46.77</b>	<b>66.32</b>	<b>299.34</b>	<b>14.00</b>	<b>447.14</b>	
<b>OPERATING COSTS/TON</b>							<b>49.68</b>
<b>CASH OVERHEAD:</b>							
Office expense							20.00
Property Taxes							44.67
Equipment Insurance							22.34
Investment Repairs							2.54
<b>TOTAL CASH OVERHEAD COSTS</b>							<b>89.55</b>
<b>TOTAL CASH COSTS/ACRE</b>							<b>536.69</b>
<b>TOTAL CASH COSTS/TON</b>							<b>59.63</b>

U.C. COOPERATIVE EXTENSION  
Table 5. continued

NON-CASH OVERHEAD:	Per producing Acre	Annual Cost		
		Depreciation	Interest @ 12.05%	
Investment				
-----	-----	-----	-----	-----
Establishment cost	778.90	155.78	46.93	202.71
Land	3333.33		401.67	401.67
Hay barns 1000 ton	120.00	3.60	7.95	11.55
Shop Building	102.78	5.14	6.19	11.33
Motorcycle	3.33	0.30	0.22	0.52
Shop tools	27.78	1.67	1.84	3.51
Fuel tanks & pumps	22.36	1.12	1.35	2.47
Storage building	20.83	1.04	1.26	2.30
Center Pivot Systems	633.33	19.00	41.97	60.97
Equipment	436.37	49.80	28.92	78.72
-----	-----	-----	-----	-----
TOTAL NON-CASH OVERHEAD COSTS	5479.02	237.44	538.30	775.74
-----	-----	-----	-----	-----
TOTAL COSTS/ACRE				1312.43
TOTAL COST/TON				145.79
=====	=====	=====	=====	=====



Table 6.

U.C. COOPERATIVE EXTENSION  
 MONTHLY CASH COSTS PER ACRE TO PRODUCE ALFALFA HAY  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Beginning FEB 91	FEB 91	MAR 91	APR 91	MAY 91	JUN 91	JUL 91	AUG 91	SEP 91	OCT 91	NOV 91	DEC 91	JAN 92	TOTAL
Ending JAN 92													
<b>Cultural:</b>													
Irrigate (7 acft)	7.05	14.04	18.70	23.36	35.01	35.01	28.02	14.04	14.04	7.05			196.33
Summer weed control	19.87												19.87
Insect control		24.95											24.95
Winter weed control											21.45		21.45
Fertilize (100 lbs P2O5)											33.00		33.00
Pickup use											9.55		9.55
<b>TOTAL CULTURAL COSTS</b>	<b>26.92</b>	<b>38.99</b>	<b>18.70</b>	<b>23.36</b>	<b>35.01</b>	<b>35.01</b>	<b>28.02</b>	<b>14.04</b>	<b>14.04</b>	<b>7.05</b>	<b>64.00</b>		<b>305.14</b>
<b>Harvest:</b>													
Swath hay - 7X			5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04			35.30
Bale hay - 7X			8.28	8.28	8.28	8.28	8.28	8.28	8.28				57.99
Roadside hay - 7X			4.00	4.00	4.00	4.00	4.00	4.00	4.00				28.00
<b>TOTAL HARVEST COSTS</b>			<b>17.33</b>	<b>17.33</b>	<b>17.33</b>	<b>17.33</b>	<b>17.33</b>	<b>17.33</b>	<b>17.33</b>				<b>121.29</b>
Interest on oper. capital	0.26	0.65	1.00	1.40	1.91	2.42	2.87	3.17	3.48	3.55			20.70
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>27.18</b>	<b>39.64</b>	<b>37.03</b>	<b>42.08</b>	<b>54.25</b>	<b>54.76</b>	<b>48.21</b>	<b>34.54</b>	<b>34.85</b>	<b>10.60</b>	<b>64.00</b>		<b>447.14</b>
<b>TOTAL OPERATING COST/TON</b>	<b>3.02</b>	<b>4.40</b>	<b>4.11</b>	<b>4.68</b>	<b>6.03</b>	<b>6.08</b>	<b>5.36</b>	<b>3.84</b>	<b>3.87</b>	<b>1.18</b>	<b>7.11</b>		<b>49.68</b>
<b>OVERHEAD:</b>													
Office expense					20.00								20.00
Property Taxes					44.67								44.67
Equipment Insurance					22.34								22.34
Investment Repairs	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23		2.54
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>	<b>87.24</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>	<b>0.23</b>		<b>89.55</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>27.41</b>	<b>39.87</b>	<b>37.26</b>	<b>42.32</b>	<b>141.49</b>	<b>54.99</b>	<b>48.44</b>	<b>34.77</b>	<b>35.08</b>	<b>10.83</b>	<b>64.23</b>		<b>536.69</b>
<b>TOTAL CASH COST/TON</b>	<b>3.05</b>	<b>4.43</b>	<b>4.14</b>	<b>4.70</b>	<b>15.72</b>	<b>6.11</b>	<b>5.38</b>	<b>3.86</b>	<b>3.90</b>	<b>1.20</b>	<b>7.14</b>		<b>59.63</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>27.41</b>	<b>32.85</b>	<b>37.00</b>	<b>42.06</b>	<b>140.60</b>	<b>54.73</b>	<b>48.18</b>	<b>34.51</b>	<b>34.81</b>	<b>10.75</b>	<b>64.23</b>		<b>527.13</b>
<b>TOTAL CASH COSTS/TON</b>	<b>3.05</b>	<b>3.65</b>	<b>4.11</b>	<b>4.67</b>	<b>15.62</b>	<b>6.08</b>	<b>5.35</b>	<b>3.83</b>	<b>3.87</b>	<b>1.19</b>	<b>7.14</b>		<b>58.57</b>

Table 7.

U.C. COOPERATIVE EXTENSION  
ANNUAL EQUIPMENT, INVESTMENT AND BUSINESS OVERHEAD COSTS  
HIGH DESERT OF SOUTHERN CALIFORNIA  
(Center Pivot Irrigation System)

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. -		Cash Overhead -		Total
				Depre- ciation	Interest	Insur- ance	Taxes	
90	50 hp 2wd trac #1	31000	20	1395.00	2054.52	85.25	170.50	3705.27
90	50 hp 2wd trac #2	31000	20	1395.00	2054.52	85.25	170.50	3705.27
90	Baler - engine #1	42000	7	5400.00	2783.55	115.50	231.00	8530.05
90	Baler - engine #2	42000	7	5400.00	2783.55	115.50	231.00	8530.05
90	Balewagon - SP	78100	10	7029.00	5176.08	214.78	429.55	12849.41
90	Pickup - 3/4 ton	16000	7	2057.14	1060.40	44.00	88.00	3249.54
90	Sprayer - 300g PTO	7200	10	648.00	477.18	19.80	39.60	1184.58
90	Swather - SP 14'	47100	5	8478.00	3121.55	129.52	259.05	11988.12
TOTAL		294400		31802.14	19511.35	809.60	1619.20	53742.29
50% of New Cost *		147200		15901.07	9755.68	404.80	809.60	26871.15

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

ANNUAL INVESTMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. -		Cash Overhead -----			Total
				Depre- ciation	Interest	Insur- ance	Taxes	Repairs	
INVESTMENT									
	Center Pivot Systems	228000	30	6840.00	15110.70	627.00	1254.00	250.00	24081.70
	Establishment cost	233670	5	46734.00	14078.60	584.17	1168.35	0.00	62565.12
	Fuel tanks & pumps	8050	20	402.50	485.01	20.13	40.25	125.00	1072.89
	Hay barns 1000 ton	36000	30	1080.00	2385.90	99.00	198.00	25.00	3787.90
	Land	1200000			144600.00	6000.00	12000.00	0.00	162600.00
	Motorcycle	1000	10	90.00	66.28	2.75	5.50	50.00	214.53
	Shop Building	37000	20	1850.00	2229.25	92.50	185.00	250.00	4606.75
	Shop tools	10000	15	600.00	662.75	27.50	55.00	100.00	1445.25
	Storage building	7500	20	375.00	451.88	18.75	37.50	100.00	983.13
TOTAL INVESTMENT		1761220		57971.50	180070.37	7471.80	14943.60	900.00	261357.27

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Office expense	360.00	acre	20.00	7200.00

Table 8.

U.C. COOPERATIVE EXTENSION  
 HOURLY EQUIPMENT COSTS  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

Yr Description	COSTS PER HOUR								
	Actual Hours Used	-Non-Cash Over-Depre- ciation	Over- Interest	- Cash Overhead - Insur- ance	Taxes	Repairs	Operating Fuel & Lube	Total Oper.	Total Costs/Hr.
90 50 hp 2wd trac #1	623.6	1.12	1.65	0.07	0.14	1.55	2.23	3.78	6.75
90 50 hp 2wd trac #2	623.6	1.12	1.65	0.07	0.14	1.55	2.23	3.78	6.75
90 Baler - engine #1	323.4	8.35	4.30	0.18	0.36	5.08	2.30	7.39	20.57
90 Baler - engine #2	323.4	8.35	4.30	0.18	0.36	5.08	2.30	7.39	20.57
90 Balewagon - SP	288.8	12.17	8.96	0.37	0.74	12.49	6.36	18.86	41.11
90 Pickup - 3/4 ton	240.0	4.29	2.21	0.09	0.18	2.36	2.30	4.66	11.43
90 Sprayer - 300g PTO	119.8	2.70	1.99	0.08	0.17	3.01	0.00	3.01	7.95
90 Swather - SP 14'	462.0	9.18	3.38	0.14	0.28	9.06	3.63	12.69	25.66

Table 9.

U.C. COOPERATIVE EXTENSION  
RANGING ANALYSIS  
HIGH DESERT OF SOUTHERN CALIFORNIA  
(Center Pivot Irrigation System)

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALFALFA HAY

	YIELD (TON/ACRE)						
	7.5	8.0	8.5	9.0	9.5	10.0	10.5
<b>OPERATING COSTS/ACRE:</b>							
Cultural Cost	305	305	305	305	305	305	305
Harvest Cost	101	108	115	121	128	135	142
Interest on operating capital	20	20	20	21	21	21	22
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>426</b>	<b>433</b>	<b>440</b>	<b>447</b>	<b>454</b>	<b>461</b>	<b>468</b>
<b>TOTAL OPERATING COSTS/TON</b>	<b>56.79</b>	<b>54.12</b>	<b>51.77</b>	<b>49.68</b>	<b>47.81</b>	<b>46.13</b>	<b>44.60</b>
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>90</b>	<b>90</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>515</b>	<b>523</b>	<b>530</b>	<b>537</b>	<b>544</b>	<b>551</b>	<b>558</b>
<b>TOTAL CASH COSTS/TON</b>	<b>68.73</b>	<b>65.32</b>	<b>62.31</b>	<b>59.63</b>	<b>57.24</b>	<b>55.08</b>	<b>53.14</b>
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>775</b>	<b>775</b>	<b>776</b>	<b>776</b>	<b>776</b>	<b>776</b>	<b>776</b>
<b>TOTAL COSTS/ACRE</b>	<b>1291</b>	<b>1298</b>	<b>1305</b>	<b>1312</b>	<b>1320</b>	<b>1327</b>	<b>1334</b>
<b>TOTAL COSTS/TON</b>	<b>172.10</b>	<b>162.25</b>	<b>153.55</b>	<b>145.83</b>	<b>138.91</b>	<b>132.68</b>	<b>127.05</b>

U.C. COOPERATIVE EXTENSION  
RANGING ANALYSIS Table 9. continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR ALFALFA HAY

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	7.5	8.0	8.5	9.0	9.5	10.0	10.5
95.00	305	346	388	429	471	413	554
100.00	343	387	431	476	520	564	608
105.00	381	428	475	522	568	615	662
110.00	420	469	519	568	617	667	716
115.00	458	510	562	614	666	718	770
120.00	497	551	606	660	715	769	823
125.00	535	592	649	706	763	820	877

NET RETURNS PER ACRE ABOVE CASH COSTS FOR ALFALFA

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	7.5	8.0	8.5	9.0	9.5	10.0	10.5
95.00	215	257	298	340	382	423	465
100.00	253	298	342	386	430	474	519
105.00	292	339	385	432	479	526	572
110.00	330	380	429	478	528	577	626
115.00	369	421	473	524	576	628	680
120.00	407	462	516	571	625	679	734
125.00	446	503	560	617	674	731	788

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR ALFALFA

PRICE (DOLLARS PER TON)	YIELD (TON/ACRE)						
	7.5	8.0	8.5	9.0	9.5	10.0	10.5
95.00	-560	-519	-477	-436	-394	-353	-311
100.00	-522	-478	-434	-390	-346	-302	-258
105.00	-483	-437	-390	-344	-297	-250	-204
110.00	-445	-396	-347	-297	-248	-199	-150
115.00	-406	-355	-303	-251	-200	-148	-96
120.00	-368	-314	-259	-205	-151	-97	-42
125.00	-330	-273	-216	-159	-102	-45	12

Table 10.

U.C. COOPERATIVE EXTENSION  
 COSTS AND RETURNS / BREAKEVEN ANALYSIS  
 HIGH DESERT OF SOUTHERN CALIFORNIA  
 (Center Pivot Irrigation System)

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Alfalfa hay	1015	447	568	537	478	1312	-297

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Alfalfa hay	304500	134141	170359	161006	143494	393728	-89228
TOTAL	304500	134141	170359	161006	143494	393728	-89228

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover		
			Operating Costs	Cash Costs	Total Costs
Alfalfa hay	9.0	ton	48.46	58.16	142.23

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Breakeven Yield To Cover		
			Operating Costs	Cash Costs	Total Costs
Alfalfa hay	ton	110.00	4.0	4.8	11.6