

2012

SAMPLE COSTS TO PRODUCE
OAT HAY



SACRAMENTO VALLEY
DRYLAND

Prepared by

Rachael Long	UC Cooperative Extension Farm Advisor, Yolo, Solano, & Sacramento Counties
Doug Munier	UC Cooperative Extension Farm Advisor, Glenn, Tehama, & Butte Counties
Karen M. Klonsky	UC Cooperative Extension Economist, Department of Agriculture and Resource Economics, UC Davis
Richard L. De Moura	UC Cooperative Extension Staff Research Associate, Department of Agriculture and Resource Economics, UC Davis

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE OAT HAY

Dryland

Sacramento Valley 2012

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INTRODUCTION

Sample costs to produce oat hay under dryland conditions 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 the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-3589 or the local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension offices.

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ASSUMPTIONS

The assumptions refer to Tables 1 through 7 and pertain to sample costs to produce oat hay in the Sacramento Valley. Practices described represent production practices and materials considered typical of a well-managed dryland oat hay crop 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 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.*

Land. This report is based on a 2,900-acre field and row crop farm that produces processing tomatoes, alfalfa hay, safflower, sunflower, dry beans, wheat, and tree crops. Oat hay is planted on noncontiguous fields totaling 100 acres. Farming practices can vary among fields.

The 100 acres of rented land is used for growing oat hay with operations beginning in the fall. The land rent is considered a cash overhead cost. The farm buildings, roads, and homestead occupy 20 of the 2,900 acres.

Cultural Practices and Material Inputs

Land Preparation. The fields are stubble disced in September to incorporate any plant residue and finished disced once in October to prepare the seedbed.

Planting. The oats are planted at a rate of 100 pounds per acre, depending on variety. Planting occurs in the fall and in this study the grower drills the seed in October. No irrigations are made for this crop.

Variety. The most commonly planted oat hay varieties for forage in California are Montezuma and Cal Red. However, both are very susceptible to crown and stem rusts and barley yellow dwarf virus. More recently released varieties include UC 113, UC 128, UC 148 (licensed by Baglietto Seeds in Stockton, CA) and UC 132 (licensed by Barkley Seeds in Yuma, AZ). UC 142 (Howard) is another recently released variety that has not been licensed to a seed company and is available through the University of California Foundation Seed Program (<http://fsp.ucdavis.edu/UC-142/>). These varieties are expected to replace older varieties, such as Cal Red, Montezuma, Sierra, Swan, Kanota, Bates 89, Pert, and Curt, because of better disease resistance and higher forage and grain yields. Following is information on these varieties bred and /or selected at UC Davis from 1983 to 2007 (Qualset et al. 2012).

Comparisons to Montezuma (or Curt for forage quality).

UC 113: Heading later, 4-5 inches shorter. Excellent straw strength, thicker. Barley yellow dwarf virus, moderately susceptible under severe infection conditions, tolerant in most environments. Crown rust moderately resistant, stem rust resistant. Equivalent hay yields. Higher crude protein, lower acid and neutral detergent fiber percentage.

UC 128: Heading later, 8-10 inches taller. Excellent straw strength, thicker. Barley yellow dwarf virus, moderately resistant under severe infection conditions, resistant in most environments. Crown and stem rust moderately resistant. Hay yields: 128%. Higher crude protein and comparable acid detergent fiber, but higher neutral detergent fiber percentage. The later is an undesirable quality attribute.

UC 132: Heading later, 5-8 inches shorter. Excellent straw strength, thicker. Barley yellow dwarf virus, moderately susceptible to under severe infection conditions, resistant in most environments. Crown rust resistant, stem rust susceptible. Hay yields: 109%. Higher crude protein and comparable acid and neutral detergent fiber percentage.

UC 148: Heading later, 3 inches taller. Good straw strength, thicker. Barley yellow dwarf virus, moderately susceptible under severe infection conditions, resistant in most environments. Crown rust resistant, stem rust susceptible. Hay yields: 105%. Higher crude protein and comparable acid detergent and higher neutral fiber percentage.

UC 142 (Howard): Heading similar (early), 8 inches shorter. Good straw strength, thinner. Barley yellow dwarf virus moderately resistant. Crown rust and stem rust, resistant. Hay yields: comparable. Higher crude protein percentage and comparable acid detergent fiber and higher neutral detergent acid percentage.

Fertilization. Total nitrogen (N) recommendations range from 50 to 75 pounds of N per acre as urea or aqua ammonia. Less nitrogen will be needed following some crops such as legumes (alfalfa) or those with high nitrogen input (processing tomatoes). The N is applied in the fall (September to October) prior to planting. On low fertility soils, growers should apply a starter fertilizer with the seed. Monoammonium phosphate (11-52-0) at 50 pounds per acre (26 pounds P₂O₅) is applied in this study. Top dressing of additional N may be considered by March, when oats are in the boot stage, if rainfall is sufficient for good yield.

Pest Management. The pesticides, rates, and application practices mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines for small grains*. 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. 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 costs for these adjuvants are not included in this study. Pesticide costs will vary by grower location and the grower's purchasing volume or use. Material costs are shown at full retail from a single chemical dealer.

Pest Control Adviser (PCA). Written recommendations are required for many commercially applied pesticides and are available from licensed pest control advisers. In addition the PCA or an independent consultant will monitor the field for agronomic problems including irrigation and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. PCA costs are not shown in this study.

Weeds. 2,4-D (Weedar) is applied to control broadleaf weeds in February when weeds are still small. The herbicide is applied by ground using an ATV and sprayer.

Harvest. In this study, the oats are harvested for hay in April or May. The grower has the hay custom swathed, raked, baled, and roadsided. A rate of \$45 per ton based on small bales is used in this study.

Yields. The crop is assumed to yield 2.50 tons per acre. Grower yields will vary depending on the oat variety and growing conditions.

Returns. An estimated price over the last five years based on the USDA California Weekly Market Report of a \$150 per ton for oat hay is used to calculate returns above several cost levels. Table 4 indicates the effects on grower returns based on varying yields and returns.

Pickup/ATV. The pickup and the all terrain vehicle (ATV) each travel 3.00 miles per acre for oat hay production or a total of 300 miles per vehicle per year. Costs are estimated and not based on any specific data.

Labor, Equipment and Interest

Labor. Labor rates of \$14.28 per hour for machine operators and \$12.60 for general labor includes payroll overhead of 40%. Basic hourly wages for workers are \$10.20 and \$9.00 per hour for machine operators and non-machine (irrigators and manual laborers) workers, respectively. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for field crops (code 0171), 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, 2012 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 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 and Biological Engineers (ASABE). Fuel and lubrication costs are also determined by ASABE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$3.43 and \$3.82 per gallon, respectively. Fuel costs are derived from the Energy Information Administration (EIA) 2011 monthly data. The cost includes a 2.5% local sales tax on diesel fuel and 7.5% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost 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.

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.

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 oat hay 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.

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

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.803% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,565 for the entire farm or \$0.54 per producing acre. If the field is double cropped, one half of the costs would be charged to the second crop.

Office. Costs are estimated at \$25 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. If the field is double cropped, one half of the expenses would be charged to the second crop.

Land Rent. Rent for the land that the hay crop is grown on is 20% of the gross returns or \$75 per acre (http://ceyolo.ucdavis.edu/Additional_Resources/). If the field is double cropped rent is also charged on the second crop grown in the field.

Supervisor Salary. Wages for supervisors are included as a cash overhead cost. Supervisor salaries, including benefits, are \$75,000 per year for one farm manager and allocated amongst the farm's other crops on a gross returns basis. Oat hay is assumed to provide 1.65% of the farm's gross returns. Therefore, the supervisor's salary for oat hay is \$1,238 per year or \$12.38 per acre. Any returns above total costs are considered returns to investment.

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.

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. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is 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 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). The 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% is used to calculate capital recovery cost is the effective long term interest rate in January 2012. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

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

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.

Acknowledgment. Assistance provided by local producers and supplier was greatly appreciated.

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

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Table 1. COSTS PER ACRE TO PRODUCE OAT HAY

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:								
Land Prep: Stubble Disc	0.13	2	6	2	0	0	10	
Land Prep: Finish Disc	0.12	2	5	2	0	0	9	
Fertilize: Preplant N (aqua)	0.13	2	2	1	44	3	52	
Plant: Drill (oat seed) . Fertilize: (11-52-0)	0.12	2	2	1	56	0	61	
Weed: (Weedar)	0.07	1	0	0	8	0	10	
Pickup	0.10	2	1	0	0	0	3	
ATV	0.10	2	0	0	0	0	2	
TOTAL CULTURAL COSTS	0.76	13	17	6	108	3	148	
Harvest:								
Harvest (custom)	0.00	0	0	0	0	113	113	
TOTAL HARVEST COSTS	0.00	0	0	0	0	113	113	
Interest on Operating Capital @ 5.75%							5	
TOTAL OPERATING COSTS/ACRE	0.76	13	17	6	108	116	265	
CASH OVERHEAD:								
Liability Insurance							1	
Office Expense							25	
Field Sanitation							1	
Share Rent @ 20%							75	
Supervisor Salary-Oats							12	
Property Taxes							0	
Property Insurance							0	
Investment Repairs							1	
TOTAL CASH OVERHEAD COSTS/ACRE							116	
TOTAL CASH COSTS/ACRE							381	
NON-CASH OVERHEAD:								
		Per producing Acre		Annual Cost Capital Recovery				
Shop Building		24		2			2	
Storage Building		9		1			1	
Shop Tools		5		0			0	
Fuel Tanks & Pumps		6		0			0	
Fuel Wagon		1		0			0	
Truck Tractor		17		2			2	
Trailer - Lowbed		3		0			0	
Tool Carrier		5		0			0	
Equipment		58		6			6	
TOTAL NON-CASH OVERHEAD COSTS		128		12			12	
TOTAL COSTS/ACRE							393	

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Table 2. COSTS AND RETURNS PER ACRE TO PRODUCE OAT HAY

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Hay	2.50	ton	150.00	375	
TOTAL GROSS RETURNS	2.50	ton		375	
OPERATING COSTS					
Fertilizer:				67	
20-0-0 (Aqua Ammonia)	60.00	lb N	0.73	44	
11-52-0	50.00	lb	0.46	23	
Custom:				113	
Swath Rake Bale Roadside	2.50	ton	45.00	113	
Herbicide:				8	
Weedar 64	2.50	pint	3.25	8	
Seed:				33	
Oat Seed	100.00	lb	0.33	33	
Rent:				3	
Fertilizer Injector (aqua)	1.00	acre	3.25	3	
Labor:				13	
Equipment Operator Labor	0.92	hrs	14.28	13	
Machinery:				23	
Fuel-Gas	0.50	gal	3.82	2	
Fuel-Diesel	4.40	gal	3.43	15	
Lube				3	
Machinery Repair				4	
Interest on Operating Capital (5.75%)				5	
TOTAL OPERATING COSTS/ACRE				265	
NET RETURNS ABOVE OPERATING COSTS				110	
CASH OVERHEAD COSTS					
Liability Insurance				1	
Office Expense				25	
Field Sanitation				1	
Share Rent @ 20%				75	
Supervisor Salary-Oat				12	
Property Taxes				0	
Property Insurance				0	
Investment Repairs				1	
TOTAL CASH OVERHEAD COSTS/ACRE				116	
TOTAL CASH COSTS/ACRE				381	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Shop Building				2	
Storage Building				1	
Shop Tools				0	
Fuel Tanks & Pumps				0	
Fuel Wagon				0	
Truck Tractor				2	
Trailer - Lowbed				0	
Tool Carrier				0	
Equipment				6	
TOTAL NON-CASH OVERHEAD COSTS				12	
TOTAL COST/ACRE				393	
TOTAL COST/ ton				157	
NET RETURNS ABOVE TOTAL COST				-18	

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Table 3. MONTHLY CASH COSTS PER ACRE TO PRODUCE OAT HAY

Beginning 09-11	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOTAL
Ending 04-12	11	11	11	11	12	12	12	12	
Cultural:									
Land Prep: Stubble Disc	10								10
Land Prep: Finish Disc		9							9
Fertilize: Preplant N (aqua)		52							52
Plant: Drill (oat seed). Fertilize: (11-52-0)		61							61
Weed: (Weedar)						10			10
Pickup Use	0	0	0	0	0	0	0	0	3
ATV	0	0	0	0	0	0	0	0	2
TOTAL Cultural COSTS	11	123	1	1	1	10	1	1	148
Harvest:									
Harvest (custom)								113	113
TOTAL Harvest COSTS								113	113
Interest on Operating Capital (5.75%)	0	1	1	1	1	1	1	1	5
TOTAL OPERATING COSTS/ACRE	11	124	1	1	1	11	1	114	265
CASH OVERHEAD									
Liability Insurance	0	0	0	0	0	0	0	0	1
Office Expense	2	2	2	2	2	2	2	2	25
Field Sanitation	0	0	0	0	0	0	0	0	1
Share Rent @ 20%								75	75
Supervisor Sal-Oat	1	1	1	1	1	1	1	1	12
Property Taxes					0				0
Property Insurance					0				0
Investment Repairs	0	0	0	0	0	0	0	0	1
TOTAL CASH OVERHEAD COSTS	3	3	3	3	4	3	3	78	116
TOTAL CASH COSTS/ACRE	14	127	5	5	5	14	5	193	381

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Table 4. RANGING ANALYSIS

COST PER ACRE AT VARYING YIELDS TO PRODUCE OAT HAY

	YIELD (tons/acre)						
	1.75	2.00	2.25	2.50	2.75	3.00	3.25
OPERATING COSTS:							
Cultural	148	148	148	148	148	148	148
Harvest	79	90	101	113	124	135	146
Interest on operating capital @ 5.75%	5	5	5	5	5	5	5
TOTAL OPERATING COSTS/ACRE	231	243	254	265	277	288	299
Total Operating Costs/ton	132	121	113	106	101	96	92
CASH OVERHEAD COSTS/ACRE	116	116	116	116	116	116	116
TOTAL CASH COSTS/ACRE	347	358	370	381	392	404	415
Total Cash Costs/ton	198	179	164	152	143	135	128
NON-CASH OVERHEAD	12	12	12	12	12	12	12
TOTAL COSTS/ACRE	359	370	381	393	403	415	426
Total Costs/ton	205	185	169	157	147	138	131

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE(\$/ton) Hay	YIELD(ton/acre)						
	1.75	2.00	2.25	2.50	2.75	3.00	3.25
90	-74	-63	-52	-40	-29	-18	-7
110	-39	-23	-7	10	26	42	58
130	-4	17	38	60	81	102	123
150	31	57	83	110	136	162	188
170	66	97	128	160	191	222	253
190	101	137	173	210	246	282	318
210	136	177	218	260	301	342	383

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE(\$/ton) Hay	YIELD(ton/acre)						
	1.75	2.00	2.25	2.50	2.75	3.00	3.25
90	-189	-178	-167	-156	-144	-133	-122
110	-154	-138	-122	-106	-89	-73	-57
130	-119	-98	-77	-56	-34	-13	8
150	-84	-58	-32	-6	21	47	73
170	-49	-18	13	44	76	107	138
190	-14	22	58	94	131	167	203
210	21	62	103	144	186	227	268

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE(\$/ton) Hay	YIELD(ton/acre)						
	1.75	2.00	2.25	2.50	2.75	3.00	3.25
90	-201	-190	-178	-167	-156	-145	-134
110	-166	-150	-133	-117	-101	-85	-69
130	-131	-110	-88	-67	-46	-25	-4
150	-96	-70	-43	-17	9	35	61
170	-61	-30	2	33	64	95	126
190	-26	10	47	83	119	155	191
210	9	50	92	133	174	215	256

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Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
12	200 HP 4WD Tractor	94,000	10	9,400	11,270	415	517	12,202
12	Disc, finish, 21'	12,500	15	1,250	1,125	55	69	1,249
12	Disc, stubble, 16'	12,500	15	1,250	1,125	55	69	1,249
12	200 HP Crawler	168,891	10	49,888	17,595	878	1,094	19,567
12	90 HP 2WD Tractor	64,227	10	18,972	6,691	334	416	7,441
12	Grain Drill - 20'	24,480	10	4,329	2,784	116	144	3,043
12	Sprayer - ATV 30'	3,473	10	614	395	16	20	432
12	Pickup 3/4 Ton	26,357	5	11,813	3,897	153	191	4,241
12	ATV	5,700	7	2,162	709	32	39	779
TOTAL		412,128		99,677	45,590	2,055	2,559	50,204
60% of new cost*		247,277		59,806	27,354	1,233	1,535	30,122

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Shop Building	69,694	25	6,969	4,671	308	383	940	6,302
Storage Building	27,370	20	2,737	2,065	121	151	550	2,886
Shop Tools	14,000	20	1,400	1,056	62	77	280	1,475
Fuel Tanks & Pumps	17,196	20	1,720	1,297	76	95	232	1,700
Fuel Wagon	2,085	10	209	250	9	11	41	312
Truck Tractor	49,825	15	4,983	4,484	220	274	385	5,363
Trailer - Lowbed	7,850	15	785	706	35	43	105	889
Tool Carrier	15,420	15	15,420	732	124	154	365	1,375
TOTAL INVESTMENT	203,440		34,223	15,262	954	1,188	2,898	20,303

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	2,900	acre	0.54	1,566
Office Expense	2,900	acre	25.00	72,500
Field Sanitation	2,900	acre	0.86	2,494
Share Rent @ 20%	100	acre	75.00	7,500
Supervisor Salary-Oat*	2,900	acre	25.86	74,994

*See Supervisor Salary, page 6

UC COOPERATIVE EXTENSION
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Table 6. HOURLY EQUIPMENT COSTS

Yr	Description	Oat Hay Hours Used	Total Hours Used	COSTS PER HOUR						Total Oper.	Total Costs/Hr.
				Capital Recovery	Cash Overhead		Operating		Total		
					Insur- ance	Taxes	Lube & Repairs	Fuel			
12	200 HP 4WD Tractor	15	1,079	6.27	0.23	0.29	8.06	39.81	47.87	54.66	
12	Disc, finish, 21'	12	141	4.80	0.24	0.29	4.80	0	4.80	10.13	
12	Disc, stubble, 16'	13	136	4.95	0.24	0.30	4.95	0	4.95	10.44	
12	200 HP Crawler	13	1,600	6.60	0.33	0.41	10.46	39.81	50.28	57.61	
12	90 HP 2WD Tractor	27	1,200	3.35	0.17	0.21	5.26	15.16	20.42	24.14	
12	Grain Drill - 20'	12	150	11.13	0.46	0.58	6.75	0	6.75	18.92	
12	Sprayer - ATV 30'	7	150	1.58	0.07	0.08	0.94	0	0.94	2.66	
12	Pickup 3/4 Ton	10	285	8.20	0.32	0.40	3.44	11.46	14.90	23.83	
12	ATV	17	284	1.50	0.07	0.08	1.11	4.58	5.69	7.34	

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Table 7. OPERATIONS WITH EQUIPMENT and MATERIALS

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Land Prep: Stubble Disc	Sept	200 HP 4WD Tractor	Disc, stubble, 16'	Equipment Operator Labor	0.16	hour
Land Prep: Finish Disc	Oct	200 HP Crawler	Disc, finish, 21'	Equipment Operator Labor	0.14	hour
Fertilize: Preplant N (aqua)	Oct	90 HP 2WD Tractor		Equipment Operator Labor 20-0-0 (Aqua Ammonia) Fertilizer Injector	0.16 60.00 1.00	hour lb N acre
Plant: Drill (oat seed). Fertilize	Oct	90 HP 2WD Tractor	Grain Drill - 20'	Non-Machine Labor Oat Seed 11-52-0 - 2% S	 100.00 50.00	lb lb
Weed: (Weedar)	Feb		Sprayer - ATV 30' ATV	Equipment Operator Labor Weedar 64	0.08 2.50	hour pint
Pickup	Feb		Pickup 3/4 Ton	Equipment Operator Labor	0.13	hour
ATV	Feb		ATV	Equipment Operator Labor	0.12	hour
Harvest, custom	Apr			Custom (SwathRakeBaleRdside)	2.50	ton