
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
AGRICULTURE AND NATURAL RESOURCES
AGRICULTURAL ISSUES CENTER

2016

SAMPLE COSTS TO PRODUCE
SORGHUM SILAGE



SAN JOAQUIN VALLEY

Prepared By:

Steven D. Wright

Robert B. Hutmacher

Jeff A. Dahlberg

Karen Klonsky

Daniel A. Sumner

Donald Stewart

Jeremy Murdock

UC Cooperative Extension Farm Advisor, Tulare County

UC Cooperative Extension Specialist, West Side Research and Extension Center

UC Cooperative Extension, Director, Kearney Agricultural Research and Extension Center

UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis

Director, Agricultural Issues Center, Department of Agricultural and Resource Economics, UC Davis

Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis

Staff Research Associate, Department of Agricultural and Resource Economics, UC Davis

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
AGRICULTURE AND NATURAL RESOURCES
AGRICULTURAL ISSUES CENTER
SAMPLE COSTS TO PRODUCE SORGHUM SILAGE
San Joaquin Valley – 2016

STUDY CONTENTS

INTRODUCTION	2
ASSUMPTIONS	3
Production Cultural Practices and Material Inputs	3
Labor, Equipment & Interest	4
Cash Overhead Costs	5
Non-Cash Overhead Costs	5
REFERENCES	7
Table 1. COSTS PER ACRE to PRODUCE SORGHUM SILAGE	8
Table 2. COSTS and RETURNS to PRODUCE SORGHUM SILAGE	9
Table 3. MONTHLY CASH COST to PRODUCE SORGHUM SILAGE	10
Table 4. RANGING ANALYSIS	11
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT and OVERHEAD COSTS	12
Table 6. HOURLY EQUIPMENT COSTS	13
Table 7. OPERATIONS WITH EQUIPMENT & MATERIALS	13

INTRODUCTION

Sample costs to produce sorghum silage in the San Joaquin Valley are presented in this study. The study is intended as a guide only, and can be used to make production decisions, estimate 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 early 2016 figures. A “*Your Costs*” column in Tables 1 and 2 is provided to enter your estimated costs.

For an explanation of calculations used in the study refer to the section titled Assumptions. For more information contact Jeremy Murdock or Donald Stewart; University of California Agriculture and Natural Resources, Agricultural Issues Center, Department of Agricultural and Resource Economics, at 530-752-4651, jmmurdock@ucdavis.edu, or destewart@ucdavis.edu.

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

The University of California is an affirmative action/equal opportunity employer.

ASSUMPTIONS

The following assumptions refer to Tables 1 to 7 and pertain to sample costs to produce sorghum silage in the San Joaquin Valley. Practices described represent production practices and materials considered typical of a well-managed farm in the region. The costs, materials, and practices shown in this study will not apply to all situations. Establishment and production cultural practices vary by grower and the differences can be significant. **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 1000 non-contiguous acres of which 250 acres are rented. Sorghum for silage is planted on 240 acres of the 250 acres of rented land. The remaining 10 acres are roads and field edges. Other field crops are grown on 750 acres.

Production Cultural Practices and Material Inputs

Tables 1-3 show the costs associated with ground preparation, planting, growing, and harvesting sorghum silage.

Land Preparation. Land preparations begin in the spring (April/May). The fields are disced once with a stubble disc to incorporate the previous crop residue, fifty percent of this operation is charged to the previous crop as crop destruct. Borders are pulled to make irrigation basins for the pre-irrigation and are left in place for the season. After irrigation one pass is made with a finish or offset disc to prepare the seedbed.

Planting. Sorghum is planted from late May through early July in this region. For this study, the sorghum seed is planted in May on flat ground in rows spaced 30 inches apart at 10 pounds of seeds per acre. A seed treatment (Lorsban granules) for cutworms is applied with the planting. A custom planter does the planting for \$25 per acre. Raised beds are formed after planting by cultivating and furrowing.

Fertilization. Growers should apply fertilizer or soil amendments after soil tests to determine nutrient and pH levels. Nitrogen (N) as UAN-32 is side-dressed once in June at 100 pounds N per acre and water run once in July at 40 pounds N per acre. Commercial fertilizers may be reduced or eliminated with the use of dairy pond water or manure.

Irrigation. The grower uses both well and surface water at an average cost of \$16.67 per acre-inch or \$200 per acre-foot. A pre-plant irrigation of eight acre-inches is made in May. The amount of water applied pre-plant will vary depending on soil type and moisture remaining from winter rains and previous crop. Effective rainfall is not accounted for in this study. Four irrigations including the pre-irrigation totaling 24.5 acre-inches of water are applied. In past years a total of five irrigations was standard practice, but due to reduced water availability caused by drought one irrigation event in July has been eliminated.

Pest Management. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu or contact your local UCCE farm advisor. For information and pesticide use permits, contact the local county agricultural commissioner's office. Adjuvants or surfactants may be recommended for use with some pesticides, but are not included in this study. Pesticide costs vary by location and grower volume. Pesticide and fertilizer costs are taken from a single dealer and are shown as full retail.

Pest Control Adviser (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition, the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. In this study, there is no line item charge for the PCA, it is part of their service agreement with the grower.

Weeds. Post plant weed control consists of mechanical and chemical practices. Shortly after planting, an herbicide, Yukon is applied for broadleaf and nutsedge control. A layby application of Prowl is applied in June. Normally, seven to eight days after the post-emergent herbicide application, the field is cultivated and furrowed and again approximately two weeks after the first irrigation.

Insects. Several insect and spider mite pests attack sorghum, but aphids are the only one assumed to reach an economic threshold in this study. Monitoring is important for effective insect control and to minimize insect control costs. Aphids are controlled with an insecticide Lorsban 4E application. An insecticide Lorsban 15G is applied with the seed at planting for cutworm control.

Harvest. Normally, non-dairy growers sell the crop standing and the buyer or dairy pays the harvesting cost. Therefore no costs are shown in the tables. The sorghum is harvested in September for silage, processed, hauled, and packed into a silage pit by a custom operator. The custom rate for harvesting, processing, hauling, and packing is \$10 to \$12 per ton. Regular harvesting, which excludes the kernel processing is approximately \$1.00 less. Growers or buyers bagging the silage should add \$6 per ton to their harvesting cost. Additional per ton per mile charges are incurred for hauls greater than two miles.

Yields. The crop is assumed to yield 20 tons per acre at 70 percent moisture. Individual yields can range from 15 to 28 tons per acre in this region. Grower experience has shown an approximate 20% decline in yield from reducing irrigations in July.

Returns. The Kern County 2010-2014 average market price of \$42 per ton is used to calculate returns. Table 4 shows a range of grower returns over a range of yields.

Labor, Equipment, and Interest

Labor. Labor rates of \$23.36 per hour for machine operators and \$19.60 for general labor includes payroll overhead of 46 percent. The basic hourly wages are \$16.00 for machine operators and \$12.00 for general labor. 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. For this study, the cost is based upon the average industry rate as of January, 2016.

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 take off (PTO) horsepower and fuel type. Prices for on-farm delivery of diesel and gasoline are \$2.49 (excludes excise taxes) and \$2.77 per gallon, respectively. The fuel prices are the average costs from January 2016 derived from Energy Information Administration monthly data. The cost includes a 7.5 percent sales tax on gasoline. The fuel, lube, and repair cost per acre for each operation in the "Cost Per Acre to Produce" table is determined by multiplying the total hourly operating cost in the "Hourly Equipment Costs" table for each piece of equipment used from the Operation Time (Hrs/Ac) column by the hours per acre. Tractor time is 10 percent 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 4.25 percent per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post-harvest operations is discounted back to the last harvest month using a negative interest charge. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2016.

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.

Cash Overhead

Cash overhead consists of various cash expenses paid out during the year that are assigned to the farm and not to a particular operation.

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

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.843 percent of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,389 for the entire farm or \$1.39 per acre.

Office Expense. Office and business expenses are estimated at \$75 per producing acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, and miscellaneous overhead expenses

Land Rent. The cash rent for the land is \$250 per acre or \$260 per production acre (240 acres) for a single crop. The land rented includes developed wells and irrigation system. Land rent appears as a Cash Overhead cost.

Investment Repairs. Annual repairs are calculated as 2 percent of the purchase price.

Non-Cash Overhead

Non-Cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase prices 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 an estimate of the remaining value of an investment at the end of its useful life. For farm machinery the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (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. The purchase price and salvage value for equipment and investments are shown in Table 5.

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 3.25 percent is used to calculate capital recovery. The rate will vary depending upon size of loan and other lending agency conditions, but is a suggested rate by a farm lending agency in January 2016.

Building. The shop building is a 2,400 square foot metal building or buildings on a cement slab with a bathroom.

Land. Land values for row crop land in the region range from \$16,000 per acre to \$24,000 per acre. Prices are affected by location, soil type, and water availability. In this study the silage is grown on rented land (see Land Rent).

Fuel Tanks. Two 1000-gallon fuel tanks using gravity feed are on separate metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Shop Tools. This includes shop tools and equipment and miscellaneous hand tools. The cost is assumed and not based on any collected data.

Irrigation System. An irrigation district supplies water, though growers may supplement this with well water in some areas. The amount of water used to irrigate sorghum will vary in the San Joaquin Valley. District and well water costs were combined to obtain an average cost for water. The permanent irrigation system consists of buried mainline. This part of the system is already in place when the land is purchased/rented; therefore, no costs are shown.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60 percent to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. 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.

Acknowledgements. Appreciation is expressed to the UC Cooperative Extension, growers, packers, input suppliers, and other industry representatives who provided information, assistance, and expertise for this study.

REFERENCES

- American Society of Agricultural and Biological Engineers (ASABE). *2011 ASABE Standards Book with 2015 Standards Supplement*. St. Joseph, MI: Curran Associates, Inc., 2015.
- Boehlje, Michael D., and Vernon R. Eidman. *Farm Management*. New York: John Wiley and Sons, 1984.
- California Chapter of the American Society of Farm Managers and Rural Appraisers. *Trends in Agricultural Land & Lease Values*. Woodbridge, CA: American Society of Farm Managers and Rural Appraisers, 2015.
- "Economic Research Service - Publications." United States Department of Agriculture. www.ers.usda.gov/data-products.aspx.
- "Identify and Manage Pests in Crops and Agriculture." University of California Statewide Integrated Pest Management Program. <http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>.
- "National Agricultural Statistics Service." United States Department of Agriculture. www.nass.usda.gov/Quick_Stats/.
- "Tax Rates for Motor Vehicle and Diesel Fuels." California State Board of Equalization. Last modified May 2015. <http://www.boe.ca.gov/pdf/1413.pdf>.
- "U.S. Gasoline and Diesel Retail Prices." U.S. Energy Information Administration (EIA). Last modified January 2016. https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_m.htm.
- "Workers' Compensation Rate Comparison." California Department of Insurance. <http://www.insurance.ca.gov/01-consumers/105-type/9-compare-prem/wc-rate/index.cfm>.
- Wright, Steven D., Carol A. Collar, Karen Klonsky, and Richard L. De Moura. "*Sample Cost to Produce Sorghum Silage, San Joaquin Valley-South- 2009*" UC Davis Cost Studies. <http://coststudies.ucdavis.edu/en/current/>
- Wright, Steven D., Robert B. Hutmacher, Karen Klonsky, and Richard L. De Moura. "*Sample Cost to Produce Grain Sorghum, San Joaquin Valley-South- 2009*" UC Davis Cost Studies. <http://coststudies.ucdavis.edu/en/current/>

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 1. COSTS PER ACRE TO PRODUCE SORGHUM SILAGE
 SAN JOAQUIN VALLEY - 2016

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repairs	Material Cost	Custom/ Rent		
Pre-Plant:								
Stubble Disc 50% Ac	0.09	3	3	2	0	0	7	
Pull Borders	0.17	5	2	1	0	0	8	
Pre-Irrigate	0.00	2	0	0	133	0	135	
Finish Disc & Roll	0.12	3	4	3	0	0	10	
TOTAL PRE-PLANT COSTS	0.38	13	9	7	133	0	162	
Planting:								
Plant Sorghum- Pre-Plant Insect	0.00	0	0	0	32	25	57	
TOTAL PLANTING COSTS	0.00	0	0	0	32	25	57	
Cultural:								
Pests-Weeds Post-Plant	0.21	6	3	2	23	0	33	
Pests-Weeds Layby	0.21	6	3	2	13	0	24	
Cultivate & Furrow	0.43	12	6	5	0	0	22	
Pests-Insects Aphids	0.21	6	3	2	9	0	19	
Fertilize- Sidedress UAN-32	0.00	0	0	0	70	16	86	
Irrigate 3X	0.00	6	0	0	275	0	281	
Fertigate UAN-32	0.00	0	0	0	28	0	28	
Pickup Truck Use	0.67	19	3	2	0	0	24	
TOTAL CULTURAL COSTS	1.73	54	16	13	418	16	518	
Harvest:								
Harvest: Cut/Haul/Pack (Paid by Buyer)	0.00	0	0	0	0	0	0	
TOTAL HARVEST COSTS								
Interest on Operating Capital at 4.25%							10	
TOTAL OPERATING COSTS/ACRE	2	67	25	20	584	41	746	
CASH OVERHEAD:								
Liability Insurance- Silage							1	
Office Expense							75	
Land Rent							250	
Property Taxes							1	
Property Insurance							0	
Investment Repairs							2	
TOTAL CASH OVERHEAD COSTS/ACRE							330	
TOTAL CASH COSTS/ACRE							1,076	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Fuel Tanks-1,000 Gal (2)		11		1			1	
Shop Building 2400		80		4			4	
Shop Tools		15		1			1	
Equipment		262		24			24	
TOTAL NON-CASH OVERHEAD COSTS		368		30			30	
TOTAL COSTS/ACRE							1,106	

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 2. COSTS AND RETURNS PER ACRE TO PRODUCE SORGHUM SILAGE
 SAN JOAQUIN VALLEY - 2016

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Silage	20	Ton	42.00	840	
TOTAL GROSS RETURNS	20	Ton		840	
OPERATING COSTS					
Fertilizer:					98
UAN-32	140.00	Lb N	0.70	98	
Insecticide:					9
Lorsban 15G	2.00	Oz	0.19	0	
Lorsban 4E pt	1.00	Pint	8.65	9	
Herbicide:					36
Yukon	6.00	Oz	3.80	23	
Prowl H20	3.00	Pint	4.48	13	
Seed:					32
Sorghum Seed-Silage	10.00	Lb	3.20	32	
Custom:					41
Plant Sorghum	1.00	Acre	25.00	25	
Sidedress UAN-32	1.00	Acre	16.00	16	
Irrigation:					408
Water	24.50	Acln	16.67	408	
Labor					67
Equipment Operator Labor	2.53	hrs	23.36	59	
Irrigation Labor	0.40	hrs	19.60	8	
Machinery					45
Fuel-Gas	1.00	gal	2.77	3	
Fuel-Diesel	9.06	gal	2.49	23	
Lube				4	
Machinery Repair				16	
Interest on Operating Capital @ 4.25%					10
TOTAL OPERATING COSTS/ACRE				746	
TOTAL OPERATING COSTS/TON				37	
NET RETURNS ABOVE OPERATING COSTS				94	

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE SORGHUM SILAGE
 SAN JOAQUIN VALLEY - 2016

	MAY 16	JUN 16	JUL 16	AUG 16	SEP 16	Total
Pre-Plant:						
Stubble Disc 50% Ac	7					7
Pull Borders	8					8
Pre-irrigate	135					135
Finish Disc & Roll	10					10
TOTAL PRE-PLANT COSTS	162					162
Planting:						
Plant Sorghum- Pre-Plant Insect	57					57
TOTAL PLANTING COSTS	57					57
Cultural:						
Pests-Weeds Post-Plant		33				33
Pests-Weeds Layby		24				24
Cultivate & Furrow		11	11			22
Pests-Insects Aphids		19				19
Fertilize- Sidedress UAN-32		86				86
Irrigate 3X		94	94	94		281
Fertigate UAN-32			28			28
Pickup Truck Use	5	5	5	5	5	24
TOTAL CULTURAL COSTS	5	272	137	98	5	518
Harvest:						
Harvest: Cut/Haul/Pack						0
TOTAL HARVEST COSTS	0	0	0	0	0	0
Interest on Operating Capital @ 4.25%	1	2	2	3	3	10
TOTAL OPERATING COSTS/ACRE	225	274	140	101	7	746
CASH OVERHEAD						
Liability Insurance- Silage	0	0	0	0	0	1
Office Expense	15	15	15	15	15	75
Land Rent					250	250
Property Taxes					0	1
Property Insurance					0	0
Investment Repairs	0	0	0	0	0	2
TOTAL CASH OVERHEAD COSTS	16	16	16	16	266	330
TOTAL CASH COSTS/ACRE	240	290	155	117	274	1,076

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 4. RANGING ANALYSIS – SORGHUM SILAGE
 SAN JOAQUIN VALLEY – 2016

COSTS PER ACRE AND PER TON AT VARYING YIELDS TO PRODUCE SORGHUM SILAGE

	YIELD (TONS)						
	16.00	18.00	20.00	22.00	24.00	26.00	28.00
OPERATING COSTS/ACRE:							
Pre-Plant	161.60	161.60	161.60	161.60	161.60	161.60	161.60
Planting	57.38	57.38	57.38	57.38	57.38	57.38	57.38
Cultural	517.51	517.51	517.51	517.51	517.51	517.51	517.51
Harvest	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Operating Capital @ 4.25%	9.99	9.99	9.99	9.99	9.99	9.99	9.99
TOTAL OPERATING COSTS/ACRE	746.48	746.48	746.48	746.48	746.48	746.48	746.48
TOTAL OPERATING COSTS/TON	46.66	41.47	37.32	33.93	31.10	28.71	26.66
CASH OVERHEAD COSTS/ACRE	329.51	329.51	329.51	329.51	329.51	329.51	329.51
TOTAL CASH COSTS/ACRE	1,075.99	1,075.99	1,075.99	1,075.99	1,075.99	1,075.99	1,075.99
TOTAL CASH COSTS/TON	67.25	59.78	53.80	48.91	44.83	41.38	38.43
NON-CASH OVERHEAD COSTS/ACRE	29.92	29.92	29.92	29.92	29.92	29.92	29.92
TOTAL COSTS/ACRE	1,105.92	1,105.92	1,105.92	1,105.92	1,105.92	1,105.92	1,105.92
TOTAL COSTS/TON	69.12	61.44	55.30	50.27	46.08	42.54	39.50

Net Return per Acre above Operating Costs for Sorghum

PRICE (\$/ton)	YIELD (Tons/acre @ 70 percent Moisture)						
Silage	16.00	18.00	20.00	22.00	24.00	26.00	28.00
36.00	-170.48	-98.48	-26.48	45.52	117.52	189.52	261.52
38.00	-138.48	-62.48	13.52	89.52	165.52	241.52	317.52
40.00	-106.48	-26.48	53.52	133.52	213.52	293.52	373.52
42.00	-74.48	9.52	93.52	177.52	261.52	345.52	429.52
44.00	-42.48	45.52	133.52	221.52	309.52	397.52	485.52
46.00	-10.48	81.52	173.52	265.52	357.52	449.52	541.52
48.00	21.52	117.52	213.52	309.52	405.52	501.52	597.52

Net Return per Acre above Cash Costs for Sorghum

PRICE (\$/ton)	YIELD (Tons/acre @ 70 percent Moisture)						
Silage	16.00	18.00	20.00	22.00	24.00	26.00	28.00
36.00	-499.99	-427.99	-355.99	-283.99	-211.99	-139.99	-67.99
38.00	-467.99	-391.99	-315.99	-239.99	-163.99	-87.99	-11.99
40.00	-435.99	-355.99	-275.99	-195.99	-115.99	-35.99	44.01
42.00	-403.99	-319.99	-235.99	-151.99	-67.99	16.01	100.01
44.00	-371.99	-283.99	-195.99	-107.99	-19.99	68.01	156.01
46.00	-339.99	-247.99	-155.99	-63.99	28.01	120.01	212.01
48.00	-307.99	-211.99	-115.99	-19.99	76.01	172.01	268.01

Net Return per Acre above Total Costs for Sorghum

PRICE (\$/ton)	YIELD (Tons/acre @ 70 percent Moisture)						
Silage	16.00	18.00	20.00	22.00	24.00	26.00	28.00
36.00	-529.92	-457.92	-385.92	-313.92	-241.92	-169.92	-97.92
38.00	-497.92	-421.92	-345.92	-269.92	-193.92	-117.92	-41.92
40.00	-465.92	-385.92	-305.92	-225.92	-145.92	-65.92	14.08
42.00	-433.92	-349.92	-265.92	-181.92	-97.92	-13.92	70.08
44.00	-401.92	-313.92	-225.92	-137.92	-49.92	38.08	126.08
46.00	-369.92	-277.92	-185.92	-93.92	-1.92	90.08	182.08
48.00	-337.92	-241.92	-145.92	-49.92	46.08	142.08	238.08

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SAN JOAQUIN VALLEY - 2016

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Years Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insurance	Taxes	
16	Pickup 1/2 Ton	28,000	5	12,549	3,806	17	203	4,026
16	Disc - Stubble 18'	45,000	10	7,958	4,657	22	265	4,944
16	205HP Crawler	350,000	15	68,139	26,254	176	2,091	28,521
16	Disc - Finish 25'	58,000	10	10,257	6,002	29	341	6,372
16	Ring-roller 25'	29,000	10	5,128	3,001	14	171	3,186
16	Border Ridger	19,625	10	3,702	2,011	10	117	2,137
16	#1 Saddle Tanks 300gal	1,660	3	690	367	1	12	380
16	#1 Spray Boom 20'	2,900	6	836	411	2	19	432
16	Cultivator 6 Row	12,000	5	3,909	1,906	7	80	1,993
16	95HP2WD Tractor	120,465	15	23,452	9,036	61	720	9,817
TOTAL		666,650	-	136,620	57,451	339	4,016	61,806
60% of New Cost*		399,990	-	81,972	34,471	203	2,410	37,084

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

Description	Price	Years Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insurance	Taxes	Repairs	
INVESTMENT								
Fuel Tanks-1,000 Gal (2)	10,975	20	768	727	5	59	220	1,011
Shop Building 2400	80,000	30	0	4,215	34	400	1,600	6,248
Shop Tools	15,000	20	1,050	994	7	80	300	1,381
TOTAL INVESTMENT	105,975	-	1,818	5,935	45	539	2,120	8,640

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance- Silage	250	Acre	1.39	348
Office Expense	240	Acre	75.00	18,000
Land Rent	250	Acre	250	62,500

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 6. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 2016

Yr	Description	Sorghum	Total	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
		Hours Used	Hours Used	Capital Recovery	Insurance	Taxes	Lube & Repairs	Fuel		
16	Pickup 1/2 Ton	160	400	5.71	0.03	0.30	3.40	4.16	7.56	13.60
16	Disc - Stubble 18'	22	200	13.97	0.07	0.79	7.57	0.00	7.57	22.40
16	205HP Crawler	55	1066	14.78	0.10	1.18	13.72	29.62	43.34	59.40
16	Disc - Finish 25'	28	200	18.01	0.09	1.02	9.76	0.00	9.76	28.87
16	Ring-roller 25'	28	200	9.00	0.04	0.51	3.36	0.00	3.36	12.91
16	Border Ridger	41	200	6.03	0.03	0.35	0.30	0.00	0.30	6.71
16	#1 Saddle Tanks 300gal	152	500	0.44	0.00	0.01	0.46	0.00	0.46	0.91
16	#1 Spray Boom 20'	152	250	0.99	0.00	0.04	0.80	0.00	0.80	1.83
16	Cultivator 6 Row	103	400	2.86	0.01	0.12	2.53	0.00	2.53	5.52
16	95HP2WD Tractor	326	800	6.78	0.05	0.54	7.33	11.62	18.95	26.31

UC COOPERATIVE EXTENSION-AGRICULTURAL ISSUES CENTER
TABLE 7. OPERATIONS WITH EQUIPMENT & MATERIALS
 SAN JOAQUIN VALLEY - 2016

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Stubble Disc 50% Ac	May	205HP Crawler	Disc - Stubble 18'	Equipment Operator Labor	0.11	hour
Pull Borders	May	95HP2WD Tractor	Border Ridger	Equipment Operator Labor	0.20	hour
Pre-irrigate	May			Irrigation Labor	0.10	hour
				Water	8.00	AcIn
Finish Disc & Roll	May	205HP Crawler	Disc - Finish 25'	Equipment Operator Labor	0.14	hour
			Ring-roller 25'			
Plant Sorghum- Pre-Plant	May			Sorghum Seed-Silage	10.00	Lb
				Lorsban 15G	2.00	Oz
				Plant Sorghum	1.00	Acre
Pests-Weeds Post-Plant	June	95HP2WD Tractor	#1 Saddle Tanks 300gal	Equipment Operator Labor	0.25	hour
			#1 Spray Boom 20'	Yukon	6.00	Oz
Pests-Weeds Layby	June	95HP2WD Tractor	#1 Saddle Tanks 300gal	Equipment Operator Labor	0.25	hour
			#1 Spray Boom 20'	Prowl H20	3.00	Pint
Cultivate & Furrow	June	95HP2WD Tractor	Cultivator 6 Row	Equipment Operator Labor	0.26	hour
	July	95HP2WD Tractor	Cultivator 6 Row	Equipment Operator Labor	0.26	hour
Pests-Insects Aphids	June	95HP2WD Tractor	#1 Saddle Tanks 300gal	Equipment Operator Labor	0.25	hour
			#1 Spray Boom 20'	Lorsban 4E pt	1.00	Pint
Fertilize- Sidedress	June			UAN-32	100.00	Lb N
				Sidedress UAN-32	1.00	Acre
Irrigate 3X	June			Irrigation Labor	0.10	hour
				Water	5.50	AcIn
	July			Irrigation Labor	0.10	hour
				Water	5.50	AcIn
	Aug			Irrigation Labor	0.10	hour
				Water	5.50	AcIn
Fertigate UAN-32	July			UAN-32	40.00	Lb N
Pickup Truck Use	July		Pickup 1/2 Ton	Equipment Operator Labor	0.80	hour
Harvest: Cut/Haul	Sept					