



Enterprise Budgets

Silage Corn, Flood Irrigated, Southern Arizona

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This enterprise budget estimates the typical economic costs and returns to grow silage corn using flood irrigation in southern Arizona. It should be used as a guide to estimate actual costs and returns and is not representative of any farm. The assumptions used in constructing this budget are discussed below. Assistance provided by area producers and agribusinesses is much appreciated.

As of the date of this publication, the price for labor, fuel, fertilizer, and chemicals is increasing dramatically, which makes developing a long-term budget difficult. Therefore, a sensitivity analysis shows the net returns per acre as these inputs increase by 10 and 20 percent.

Cropping Pattern

This budget is based on a 1,500-tillable acre farm. As Arizona is experiencing irrigation water shortages, approximately 40 percent (597 acres) of the total farm tillable acres are fallowed. This fallowed land will allow adequate water to irrigate the following crops: 271 acres in cotton, 45 acres in silage corn, 90 acres in spring barley, 181 acres in durum wheat, and 316 acres of alfalfa hay. The costs to fallow land are allocated to each crop based on its water use. All crops are grown using flood irrigation.

Labor

Tractor driver labor cost is \$17.89 per hour and general labor \$14.55 per hour; both rates include social security, workers' compensation, unemployment insurance, and other labor overhead expenses. For this study, owner labor is valued at the same rate as tractor driver rates, and all labor is assumed to be a cash cost. Tractor labor hours are calculated based on machinery hours, plus ten percent.

Capital

Interest on operating capital for harvest and production inputs (six percent) is treated as a cash expense, borrowed for 6-months. An interest rate of six percent is charged as an opportunity to the owner for machinery ownership

Machinery and Equipment

The machinery and equipment used in this budget are sufficient for a 1,500-acre farm with 1,000 acres in crops. The machinery and equipment hours reflect producing cotton, silage corn, spring barley, durum wheat, and alfalfa hay. A detailed breakdown of machinery values is shown in Table 2. Estimated labor, variable, and fixed costs for machinery are shown in Table 3, based on an hour and per acre basis. The machinery costs are calculated based on the total farm use of the machinery. Off-road diesel is \$4.00 per gallon.

Operations

The cultural operations are listed approximately in the order in which they are performed. A 175-hp tractor is used to pull the v-ripper, heavy offset disk, moldboard plow, landplane, lister, and planter. A 125-hp tractor is used to pull the shredder/root puller, drill, cultivator, fertilizer spreader, and boom sprayer. A charge for miscellaneous and other expenses is five percent of production costs, including additional labor, machinery repairs and maintenance, supplies and materials, tax preparation, memberships in professional organizations, and educational workshops not included in field operations.

Results

In this budget the price of silage corn is \$60 per ton, with an average yield of 30 tons, resulting in a gross income of \$1,800 per acre. Variable costs are \$1,160 per acre and

fixed cash costs of \$351 per acre, giving a net return above variable cash costs of \$289 per acre. Total fixed costs are \$84 per acre and total costs of \$1,595 per acre, when all variable and fixed costs are considered. The gross income minus total costs results in a \$205 per acre return. A breakeven price of \$50.37 per cwt would be required to cover variable and fixed cash costs and \$53.17 per cwt to cover total costs.

Tables 4 and 5 show the baseline net returns per acre for cash and total costs at various yields and prices as in this

study. Tables 6, 7, 8, and 9 show a sensitivity analysis of returns per acre as the price for labor, fuel, fertilizer, and chemicals are increased an additional 10 and 20 percent.

NOTE: Not included in these budgets are family living withdrawals for unpaid labor, returns to management, depreciation and opportunity costs for vehicles, buildings and improvements, inflation, property and crop insurance, and local, state, and federal income and property taxes.

Table 1. Economic and Cash Costs and Returns of Producing Silage Corn, \$/acre.

Returns		Unit	\$/Unit	Quantity	Value		
Corn Silage		ton	\$0.08	22,000.00	\$1,760.000		
Total Returns					\$1,760.00		
Variable Cash Costs	Price	Quantity	Unit	Labor	Machinery	Materials	Total
Land Preparation and Maintenance							
V-Ripper		1.00	acre	\$13.53	\$34.60	\$0.00	\$48.13
Offset Disk		1.00	acre	4.72	11.88	0.00	16.60
Chisel		0.00	acre	0.00	0.00	0.00	0.00
Landplane		1.00	acre	3.87	9.31	0.00	13.18
Lister		1.00	acre	6.18	14.44	0.00	20.63
Crop Production							
Row Planter		1.00	acre	4.51	13.34	50.00	67.85
- Seed	\$50.00	1.00	acre				
Fertilizer Program		1.00	acre	1.88	373	379.50	385.11
- Nitrogen	\$312.00	1.00	acre				
- Phosphorus	\$67.50	1.00	acre				
Boom Sprayer		2.00	acre	2.38	3.64	110.0	116.02
- Herbicides	\$90.00	1.00	acre				
- Insecticides	\$20.00	1.00	acre				
Row Cultivator		3.00	acre	9.02	13.14	0.00	22.16
Irrigation				80.03	0.00	302.50	382.53
- Irrigation Water, Flood	\$55.00	5.50	ac ft				
- Irrigation Labor, Flood	\$14.55	5.50	hous				
Harvest							
Harvest expenses paid by buyer		1.00	acre	0.00	0.00	0.00	0.00
Other Charges							
Other Expenses		5.0%		0.00	0.00	53.61	53.61
Interest on Operating Capital		6.0%		0.00	0.00	33.77	33.77
Total Variable Cash Costs				\$126.11	\$104.10	\$929.38	\$1,159.59
Fixed Cash Costs			Unit	\$/Unit	Value		
Fallow Costs			acre	\$181.33	\$181.33		
Annual Cash Rent Payment			acre	170.00	170.00		
Total Fixed Cash Costs					\$351.33		
Total minus Total Variable and Fixed Cash Costs							
Fixed Non-Cash Costs			Unit	\$/Unit	Value		
Power Units, Machinery & Equipment, depreciation & interest			acre	\$84.12	\$84.12		
Total Fixed Non-Cash Costs					\$84.12		
Total Annual Costs					\$1,595.04		
Returns minus Total Annual Costs					\$204.96		

¹ Cost includes cutting and hauling wheat from field to a market within a round trip of 20 miles..

Table 2. Whole Farm Machinery Cost Assumptions.

Machine	Width (feet)	Market Value	Annual Use	Hours of Expected Life (Years)
175 HP Tractor	N/A	\$180,000	1,365	10
125 HP Tractor	N/A	80,000	495	15
V-Ripper	8.0	22,000	459	10
Offset Disk	18.0	30,000	517	15
Moldboard Plow	9.3	35,000	138	15
Landplane	16.0	18,000	78	15
Lister	10.0	6,500	99	15
Cotton Shredder/Root Puller	20.0	12,000	41	15
Row Planter	24.0	40,000	72	15
Row Cultivator	24.0	22,000	103	10
Drill	20.0	25,000	97	15
Fertilizer Spreader	40.0	18,000	109	20
Boom Sprayer	60.0	9,500	145	20

Table 3. Machinery Cost Calculations, on a per hour and per acre basis.

Machine	-Variable Costs-			Fixed Cost	Total Cost
	Fuel & Lube	Repairs & Maint.	Deprec. & Interest		
----- Costs Per Hour -----					
175 HP Tractor	\$36.80	\$7.37	\$17.20	\$61.37	
125 HP Tractor	23.00	1.78	18.31	43.09	
V-Ripper	0.00	6.16	6.19	12.35	
Offset Disk	0.00	5.40	6.48	11.88	
Moldboard Plow	0.00	18.20	28.29	46.50	
Landplane	0.00	3.24	25.80	29.04	
Lister	0.00	1.78	7.32	9.10	
Cotton Shredder/Root Puller	0.00	2.76	32.57	35.33	
Row Planter	0.00	14.02	64.48	78.50	
Row Cultivator	0.00	3.90	27.10	30.99	
Drill	0.00	12.06	30.14	42.20	
Fertilizer Spreader	0.00	14.31	19.02	33.34	
Boom Sprayer	0.00	5.36	7.51	12.87	
----- Costs Per Acre -----					
Field Operation	Acre/ Hour	Operator Labor	Variable Costs	Fixed Costs	Total Costs
175 HP Tractor & V-Ripper	1.45	\$13.53	\$34.60	\$16.08	\$64.21
175 HP Tractor & Offset Disk	4.17	4.72	11.88	5.68	22.27
175 HP Tractor & Moldboard Plow	2.55	7.73	24.50	17.87	50.11
175 HP Tractor & Landplane	5.09	3.87	9.31	8.45	21.62
175 HP Tractor & Lister	3.18	6.18	14.44	7.71	28.33
175 HP Tractor & Shredder	6.64	2.97	4.15	7.67	14.78
175 HP Tractor & Planter	4.36	4.51	13.34	18.72	36.56
175 HP Tractor & Cultivator	6.55	3.01	4.38	6.94	14.32
175 HP Tractor & Drill	3.64	5.41	10.13	13.32	28.87
175 HP Tractor & Fertilizer Spreader	10.47	1.88	3.73	3.56	9.18
175 HP Tractor & Boom Sprayer	16.55	1.19	1.82	1.56	4.57

Table 4. Estimated Per Acre Returns Over Cash Cost at Varying Yields and Prices.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$134)	(\$83)	(\$32)	\$19	\$70	\$121	\$172
\$54.00	(53)	1	55	109	109	217	271
\$57.00	28	85	142	199	199	313	370
\$60.00	109	169	229	289	289	409	469
\$63.00	190	253	316	379	379	505	568
\$66.00	271	337	403	469	469	601	667
\$69.00	352	421	490	559	559	697	766

Table 5. Estimated Per Acre Returns Over Total Cost at Varying Yields and Prices.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$218)	(\$167)	(\$116)		(\$14)	\$37	\$88
\$54.00	(137)	(83)	(29)		79	133	187
\$57.00	(56)	1	58		172	229	286
\$63.00	106	169	232		358	421	484
\$66.00	187	253	319		451	517	583
\$69.00	268	337	406		544	613	682

Table 6. Estimated Per Acre Returns Over Cash Cost at Varying Yields and Prices with a 10 percent Increase in Fuel, Labor, Fertilizer and Chemical Costs.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$210)	(\$159)	(\$108)		(\$6)	\$45	\$96
\$54.00	(129)	(75)	(21)		87	141	195
\$57.00	(48)	9	66		180	237	294
\$63.00	114	177	240		366	429	492
\$66.00	195	261	327		459	525	591
\$69.00	276	345	414		552	621	690

Table 7. Estimated Per Acre Returns Over Total Cost at Varying Yields and Prices with a 10 percent Increase in Fuel, Labor, Fertilizer and Chemical Costs.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$294)	(\$243)	(\$192)	(\$141)	(\$90)	(\$39)	\$12
\$54.00	(213)	(159)	(105)	(51)	3	57	111
\$57.00	(132)	(75)	(18)	39	96	153	210
\$60.00	(51)	9	69	129	189	249	309
\$63.00	30	93	156	219	282	345	408
\$66.00	111	177	243	309	375	441	507
\$69.00	192	261	330	399	468	537	606

Table 8. Estimated Per Acre Returns Over Cash Cost at Varying Yields and Prices with a 20 percent Increase in Fuel, Labor, Fertilizer and Chemical Costs.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$286)	(\$235)	(\$184)	(\$133)	(\$82)	(\$31)	\$20
\$54.00	(205)	(151)	(97)	(43)	11	65	119
\$57.00	(124)	(67)	(10)	47	104	161	218
\$60.00	(43)	17	77	137	197	257	317
\$63.00	38	101	164	227	290	353	416
\$66.00	119	185	251	317	383	449	515
\$69.00	200	269	338	407	476	545	614

Table 9. Estimated Per Acre Returns Over Total Cost at Varying Yields and Prices with a 20 percent Increase in Fuel, Labor, Fertilizer and Chemical Costs.

Price/Ton	Tons per Acre						
	27.0	28.0	29.0	30.0	31.0	32.0	33.0
\$51.00	(\$371)	(\$320)	(\$269)	(\$218)	(\$167)	(\$116)	(\$65)
\$54.00	(290)	(236)	(182)	(128)	(74)	(20)	34
\$57.00	(209)	(152)	(95)	(38)	19	76	133
\$60.00	(128)	(68)	(8)	52	112	172	232
\$63.00	(47)	16	79	142	205	268	331
\$66.00	34	100	166	232	298	364	430
\$69.00	115	184	253	322	391	460	529



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