



Center-Pivot-Irrigated Forage Sorghum Silage Cost-Return Budget (Custom Harvested)

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Irrigated sorghum silage is produced for feed by livestock feeders and for cash sales to feedlots. Forage sorghum silage will generally outyield corn silage. However, because of the lower feed value, sorghum silage is often valued less on a per unit basis. Research indicates that grain sorghum put up as silage has a higher feeding value than forage sorghum silage, but with lower yields. The type of silage to produce will depend somewhat on the producer's feeding program. Grain sorghum silage will be the choice of producers either feeding or backgrounding cattle at high rates of gain. Alternatively, feeders wintering calves at slow rates of gain for a summer pasture program would choose the higher yielding forage sorghum silage.

The type of sorghum silage to produce for sale as a cash crop will depend on the intended buyer. If the silage is sold on a tonnage basis with little concern for quality, forage sorghum silage will generate more income due to its higher yield. However, if the buyer is asking for a high grain content silage, there is an incentive to plant a grain sorghum and harvest it as silage. There are several varieties that fall somewhere in between grain and forage sorghum that work well as silage. This budget is based on a forage sorghum put up as silage. The costs would be similar for grain sorghum put up as silage, but with lower yields.

Cost-Return Projections

Any land preparation costs are included with the land charge. Other investments are shown in Table 1. Price of the energy source and Total Dynamic Head (TDH) are the important factors affecting pumping costs. For instance, at 300 TDH, an increase in natural gas prices from \$3 to \$4 per mcf causes pumping costs to increase from \$2.22 to \$2.97 per acre inch. At 500 TDH, the same increase in natural gas price causes pumping costs to increase from \$3.71 to \$4.94 per acre inch. See MF-836, *Irrigation Capital Requirements and Energy Costs*, for an explanation of Total Dynamic Head and other examples of pumping costs for diesel, electricity and propane.

Expected Yields and Enterprise Returns

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budget includes three different yield levels, which are intended to represent expected yields for land of varying quality for a given level of management. Alternative expected yields can

help producers compare the profitability of crop enterprises on farmland tracts with varying yield potentials. Land values, government payments and some variable inputs have been adjusted for alternative yield levels in this budget. In customizing this budget to your farm, attention should be given to using land values representative of your farm's productive capacity. Projections of net percentage return on investment permit comparisons to be made among alternative enterprises or other investments.

Table 1. Factors Used for Cost-Return Budget

Item	Yield Level (ton)			
	19.4	23.3	27.2	
Water, 325 TDH	11 in	13 in	15 in	\$3.76/inch
Fertilizer:				
N (Anhy.)	138	166	194	\$0.15/lb
N (Dry)	46	55	65	\$0.24/lb
P	73	88	103	\$0.18/lb
K	0	0	0	\$0.14/lb
Lime	0	0	0	\$0.01/lb
Seed, lbs.	15.0	17.5	17.5	
Seed price, \$/lb*	\$1.25	\$1.25	\$1.25	
Labor hours	1.50	1.50	1.50	
Labor price/hour				\$10.80
Custom harvest, \$/ton				\$4.51
Land value/acre	\$558	\$697	\$836	
Land interest rate				6.00%
Land real estate tax				0.50%
Machinery investment				\$115
Machinery life				10 yrs
Salvage value				35%
Well, pump and gearhead value				\$317.42
Well, pump and gearhead life				15 yrs
Power unit and meter value				\$41.27
Power unit and meter life				7 yrs
Irrigation system value				\$360.90
Irrigation system life				10 yrs
Interest rate on machinery and equipment				10.00%
Insurance rate on machinery and equipment				0.25%
Interest on variable costs				10.00%

*Assumes seed is treated with Concep.

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED SORGHUM SILAGE (CUSTOM HARVESTED)

	Yield Level (ton)			Your
	19.4	23.3	27.2	Farm
VARIABLE COSTS PER ACRE:¹				
1. Labor	\$ 16.20	\$ 16.20	\$ 16.20	
2. Seed	18.75	21.88	21.88	
3. Herbicide	23.99	23.99	23.99	
4. Insecticide	9.36	9.36	9.36	
5. Fertilizer and Lime	44.88	53.94	63.24	
6. Fuel and Oil — Crop	9.55	9.55	9.55	
7. Fuel and Oil — Pumping ²	41.36	48.88	56.40	
8. Machinery and Equipment Repairs	12.99	13.95	13.95	
9. Irrigation Repairs and Maintenance	3.30	3.90	4.50	
10. Crop Insurance				
11. Drying				
12. Custom Hire ³	87.49	105.08	122.67	
13. Crop Consulting	6.25	6.25	6.25	
14. Miscellaneous	8.00	8.00	8.00	
15. Interest on 1/2 Variable Costs	14.11	16.05	17.80	
A. TOTAL VARIABLE COSTS	\$ 296.23	\$ 337.03	\$ 373.79	
FIXED COSTS PER ACRE:¹				
16. Real Estate Taxes (including well)	4.38	5.07	5.77	
17. Interest on Land and Well ⁴	52.53	60.87	69.21	
18. Rent for Rented Land ⁵				
19. Depreciation on Crop Machinery	7.48	7.48	7.48	
20. Interest on Crop Machinery ⁶	7.76	7.76	7.76	
21. Depreciation on Irrigation Equipment and Well	63.15	63.15	63.15	
22. Interest on Irrigation Equipment ⁶	20.11	20.11	20.11	
23. Insurance on Machinery and Equipment	1.29	1.29	1.29	
B. TOTAL FIXED COSTS	\$ 156.69	\$ 165.72	\$ 174.76	
C. TOTAL COSTS (A + B)	\$ 452.92	\$ 502.75	\$ 548.54	
D. YIELD PER ACRE	19.4	23.3	27.2	
E. PRICE PER TON⁷	\$ 13.44	\$ 13.44	\$ 13.44	
F. NET GOVERNMENT PAYMENT⁷	\$ 8.67	\$ 9.42	\$ 10.17	
G. INDEMNITY PAYMENTS	\$	\$	\$	
H. MISCELLANEOUS INCOME	\$	\$	\$	
I. RETURNS PER ACRE [(D × E) + F + G + H]	\$ 269.41	\$ 322.57	\$ 375.74	
J. RETURNS OVER VARIABLE COSTS (I – A)	\$ -26.82	\$ -14.45	\$ 1.95	
K. RETURNS OVER TOTAL COSTS (I – C)	\$ -183.51	\$ -180.18	\$ -172.81	
L. VARIABLE COSTS PER TON (A ÷ D)	\$ 15.27	\$ 14.46	\$ 13.74	
M. TOTAL COSTS PER TON (C ÷ D)	\$ 23.35	\$ 21.58	\$ 20.17	
N. NET RETURN ON INVESTMENT				
[(K+15+17+20+22) ÷ INVESTMENT] ⁸	-6.39%	-4.92%	-3.47%	

¹Totals were derived using information listed in Table 1. ²See MF-836, "Irrigation Capital Requirements and Energy Costs." ³If using custom hire, adjust lines 6, 8, 19, and 20. ⁴Assumes interest rate shown in Table 1. ⁵If cash rented, insert zero in lines 16 and 17. ⁶Assumes one-half the average investment [(initial investment + salvage value) ÷ 2] at the interest rate shown in Table 1. ⁷See MF-1013 "Prices for Crop and Livestock Cost-Return Budgets" and MF-2236 "Government Program Payments for Crop Cost-Return Budgets" for additional information on crop prices and program payments. ⁸Investment equals total value of all fixed assets shown in Table 1.

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