Farm Management Guide MF-998

Center-Pivot-Irrigated Forage Sorghum Silage Cost-Return Budget

Department of Agricultural Economics

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Daniel M. O'Brien
Agricultural Economist, NW

Roger Stockton
Crops and Soils, NW

Troy J. Dumler
Agricultural Economist, SW

Curtis R. Thompson
Crops and Soils, SW

Irrigated sorghum silage is produced for feed by livestock feeders and for cash sales to feedlots. Forage sorghum silage will generally out-yield 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 or the intended use of the silage buyer. 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. 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.

Income Per Acre

Crop production costs per unit and net returns are highly dependent on yields. The following estimated budgets include three different yield levels, which are intended to

Table 1. *Production Inputs — Center-Pivot-Irrigated Forage Sorghum Silage*

	Yield Level (ton)			
Item	19.4	23.3	27.2	
Seed, lbs*	15	15	15	$2.03/lb
Fertilizer:				
N (anhydrous)	184	221	259	$0.13/lb
N	0	0	0	$0.22/lb
P	73	88	103	$0.22/lb
K	0	0	0	$0.14/lb
Lime	0	0	0	$0.01/lb
Herbicide				
Bicep II Magnum	2.0	2.0	2.0	$9.90/qt
Insecticide / Fungicide				
Irrigation water, in	11	15	17	$3.34/in

** Concep/Gaucho treated*

Table 2. *Machinery and Land Resources — Center-Pivot-Irrigated Forage Sorghum Silage*

	Yield Level (ton)			
ITEM	19.4	23.3	27.2	
Tillage/Planting/Chemical Applications:				
Chisel	1	1	1	$6.41/ac
Disk	1	1	1	$5.74/ac
Field cultivate	1	1	1	$5.49/ac
Plant	1	1	1	$7.10/ac
Anhydrous application	1	1	1	$5.58/ac
Fertilizer application	0	0	0	$3.66/ac
Herbicide application	1	1	1	$3.66/ac
Insecticide / fungicide application	0	0	0	$3.74/ac
Harvest				
Base charge	1	1	1	$0.00/ac
Extra charge for yields exceeding	0	0	0	$5.330/ton
Hauling	19.4	23.3	27.2	$0.000/ton
Non-machinery labor	0.50	0.50	0.50	$10.00/hr
Irrigation labor	0.50	0.50	0.50	$10.00/hr
Land value/acre	$553	$692	$830	5.75%
Interest on capital				8.0%
Irrigation Equipment	Investment, $/ac		Years	Salvage value
Well, pump and gearhead value	$377.00		15	0%
Power unit and meter	$63.00		7	0%
Irrigation system	$387.00		15	0%

represent expected yields for land of varying quality for a given level of management. Producers can compare the profitability of crop enterprises on farmland tracts with varying yield potential by considering alternative expected yield scenarios. Land values and government payments have been adjusted for alternative yield levels in this budget. In customizing a budget to your farm, attention should be given to using land values representative of your farm's productive capacity and local farmland market conditions.

Costs Per Acre

Production costs at the three production levels are shown on lines 1 through 13. Kansas Custom Rates for specific field operations are used to represent fuel and labor costs as well as machinery repair, depreciation, and interest expenses in these budgets. Table 1 identifies the typical seed, fertilizer, herbicide, insecticide, and irrigation water requirements (rate and cost/unit) for center-pivot-irrigated forage sorghum silage. Herbicide requirements include both pre-crop and in-crop treatments. Table 2 outlines the machinery, irrigation equipment, and land resources used for center-pivot-irrigated forage sorghum silage. Each tillage, planting, and harvest operation is identified.

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED SORGHUM SILAGE

	Yield Level (ton)			Your
	19.4	23.3	27.2	Farm
INCOME PER ACRE				
A. Yield per acre	19.4	23.3	27.2	
B. Price per ton	$ 15.04	$ 15.04	$ 15.04	
C. Net government payment	$ 30.04	$ 32.65	$ 35.26	
D. Indemnity payments	$	$	$	
E. Miscellaneous income	$	$	$	
F. Returns/acre ((A × B) + C + D + E)	$ 321.81	$ 383.08	$ 444.35	
COSTS PER ACRE				
1. Seed	$ 30.45	$ 30.45	$ 30.45	
2. Herbicide	19.81	19.81	19.81	
3. Insecticide / Fungicide				
4. Fertilizer and Lime	39.98	48.09	56.33	
5. Crop Consulting	6.25	6.25	6.25	
6. Crop Insurance				
7. Drying				
8. Miscellaneous	10.00	10.00	10.00	
9. Custom Hire / Machinery Expense	137.38	158.17	178.96	
10. Non-machinery Labor	5.00	5.00	5.00	
11. Irrigation				
a. Labor	5.00	5.00	5.00	
b. Fuel and Oil	36.74	50.10	56.78	
c. Repairs and Maintenance	3.63	4.95	5.61	
d. Depreciation on Equipment and Well	59.93	59.93	59.93	
e. Interest on Equipment	33.08	33.08	33.08	
12. Land Charge / Rent	31.80	39.76	47.73	
G. SUB TOTAL	$ 419.05	$ 470.59	$ 514.92	
13. Interest on 1/2 Nonland Costs	11.77	13.51	14.97	
H. TOTAL COSTS	$ 430.82	$ 484.10	$ 529.89	
I. RETURNS OVER COSTS (F - H)	$–109.00	$–101.02	$ –85.54	
J. TOTAL COSTS/TON (H ÷ A)	$ 22.21	$ 20.78	$ 19.48	
K. RETURN TO ANNUAL COST (I + 13) ÷ G	-23.20%	-18.60%	-13.70%	

Publications from Kansas State University are available on the World Wide Web at: http://www.oznet.ksu.edu

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-998 October 2002

It is the policy of Kansas State University Agricultural Experiment Station and Cooperative Extension Service that all persons shall have equal opportunity and access to its educational programs, services, activities, and materials without regard to race, color, religion, national origin, sex, age or disability. Kansas State University is an equal opportunity organization. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Marc A. Johnson, Director.