

Center-Pivot-Irrigated Alfalfa

Cost-Return Budget

Department of Agricultural Economics



Kansas State University Agricultural Experiment Station and Cooperative Extension Service

Troy J. Dumler
Agricultural Economist, SW

Curtis R. Thompson
Crops and Soils, SW

Daniel M. O'Brien
Agricultural Economist, NW

Roger Stockton
Crops and Soils, NW

Markets for alfalfa hay are firmly established in western Kansas, where sizable cattle feeding and expanding dairy operations provide a ready demand. Additionally, alfalfa hay and pellets produced in the region are routinely shipped to other areas. Perhaps in alfalfa, as in no other western Kansas crop enterprise, the timely and effective management of harvesting, handling, storage, and marketing operations is rewarded with higher hay quality and selling prices. Under good management, alfalfa can be as, or more, profitable than corn or other irrigated crops.

Income Per Acre

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 potential. Land values and government payments 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.

Table 1. Production Inputs — Center-Pivot-Irrigated Alfalfa *

Item	Yield Level (ton)			
	4.8	6.2	7.5	
Seed, lbs	3.0	3.0	3.0	\$2.74/lb
Fertilizer:				
N (anhydrous)	0	0	0	\$0.16/lb
N	0	0	0	\$0.23/lb
P	78	102	125	\$0.21/lb
K	0	0	0	\$0.14/lb
Lime	0	0	0	\$0.01/lb
Herbicide				
Velpar	1.0	1.0	1.0	\$15.47/qt
Insecticide / Fungicide				
Warrior 1 EC	0.03	0.03	0.03	\$346.27/lb
Irrigation water, in	14	19	24	\$3.72/in

* Inputs represent annualized amounts over the 5-year stand.

Table 2. Machinery and Land Resources — Center Pivot Irrigated Alfalfa*

ITEM	Yield Level (ton)			
	4.8	6.2	7.5	
Tillage/Planting/Chemical Applications:				
Chisel	0	0	0	\$6.58/ac
Disk	0.4	0.4	0.4	\$5.60/ac
Field cultivate	0.2	0.2	0.2	\$5.74/ac
Plant	0.2	0.2	0.2	\$7.61/ac
Anhydrous application	0	0	0	\$5.23/ac
Fertilizer application	1	1	1	\$3.64/ac
Herbicide application	1	1	1	\$3.61/ac
Insecticide / fungicide application	1	1	1	\$3.66/ac
Harvest				
Swathing and conditioning	4	4	4	\$8.84/ac
Sideraking	2	2	2	\$3.11/ac
Baling (number of bales/acre)**	6.4	8.3	10.0	\$10.06/bale
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	\$589	\$736	\$883	6.00%
Interest on capital				8.0%
Irrigation Equipment	Investment, \$/ac		Years	Salvage value
Well, pump and gearhead value	\$317.42		15	0%
Power unit and meter	\$41.27		7	0%
Irrigation system	\$360.90		10	0%

* Machinery operations represent annualized amounts over the 5-year stand.

** Assumes big round bales weighing 1,500 pounds, without net — cost includes hauling to storage.

Price per ton is based on the average Kansas Agricultural Statistics prices from May through July 2001.

Sizable price premiums are typically received for premium or dairy quality as opposed to average quality alfalfa hay. Producers need to account for the quality of their alfalfa and marketing opportunities when making their own price forecasts.

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 alfalfa. 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 alfalfa. Each tillage, planting, and harvest operation is identified.

Irrigation Costs

Any land preparation costs are included with the land charge. Capital requirements for sprinkler systems will run \$20,000 to \$40,000 higher than flood irrigation systems. Price of the energy source and Total Dynamic Head (TDH) are the major factors affecting pumping costs. See MF-836, *Irrigation Capital Requirements and Energy Costs*, for an explanation of differences in capital costs, TDH, and examples of pumping costs for natural gas, diesel, electricity and propane.

COST-RETURN PROJECTION — CENTER-PIVOT-IRRIGATED ALFALFA

	Yield Level (ton)			Your Farm
	4.8	6.2	7.5	
INCOME PER ACRE				
A. Yield per acre	4.8	6.2	7.5	
B. Price per ton	\$ 90.67	\$ 90.67	\$ 90.67	
C. Net government payment	\$ 14.76	\$ 16.05	\$ 17.33	
D. Indemnity payments	\$	\$	\$	
E. Miscellaneous income	\$	\$	\$	
F. Returns/acre ((A × B) + C + D + E)	\$ 449.98	\$ 578.20	\$ 697.36	
COSTS PER ACRE				
1. Seed	\$ 8.22	\$ 8.22	\$ 8.22	
2. Herbicide	15.47	15.47	15.47	
3. Insecticide / Fungicide	10.39	10.39	10.39	
4. Fertilizer and Lime	16.38	21.42	26.25	
5. Crop Consulting	6.50	6.50	6.50	
6. Crop Insurance				
7. Drying				
8. Miscellaneous	10.00	10.00	10.00	
9. Custom Hire / Machinery Expense	121.78	140.59	157.99	
10. Non-machinery Labor	5.00	5.00	5.00	
11. Irrigation				
a. Labor	5.00	5.00	5.00	
b. Fuel and Oil	52.08	70.68	89.28	
c. Repairs and Maintenance	4.62	6.27	7.92	
d. Depreciation on Equipment and Well	63.15	63.15	63.15	
e. Interest on Equipment	16.09	16.09	16.09	
12. Land Charge / Rent	35.34	44.16	52.98	
G. SUB TOTAL	\$ 370.01	\$ 422.93	\$ 474.23	
13. Interest on 1/2 Nonland Costs	13.39	15.15	16.85	
H. TOTAL COSTS	\$ 383.40	\$ 438.08	\$ 491.08	
I. RETURNS OVER COSTS (F - H)	\$ 66.58	\$ 140.12	\$ 206.28	
J. TOTAL COSTS/TON (H ÷ A)	\$ 79.87	\$ 70.66	\$ 65.48	
K. RETURN TO ANNUAL COST (I + 13) ÷ G	21.61%	36.71%	47.05%	

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

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved. In each case, credit Troy J. Dumler et al., *Center-Pivot-Irrigated Alfalfa Cost-Return Budget*, Kansas State University, October 2001.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-584

October 2001

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.