

# CROP COSTS AND RETURNS

## SOYBEANS, PINTO BEANS, CORN AND SUNFLOWERS

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Production of row crops in North Dakota is concentrated in the Red River Valley area. Soybeans, field beans, sunflowers, and corn should be considered in the cropping system as a means of increasing net returns. Also, when produced in rotation with small grains, row crops improve labor distribution and aid in weed control. Less specialized equipment is needed to produce these crops than is needed for sugarbeets and potatoes, the other important row crops produced in eastern North Dakota. Average harvested acreage, yield, and production in the past five years are shown in Table 1.

TABLE 1. HARVESTED ACREAGE, YIELD PER HARVESTED ACRE, AND PRODUCTION OF SELECTED ROW CROPS IN NORTH DAKOTA, AVERAGE 1966-1970

Crop	Harvested		Yield Per		Production
	Acreage	Unit	Acre	Harvested	
Soybeans	220,400	bu.	16.3		3,602,400
Field Beans	22,200	cwt.	11.6		257,800 <sup>a</sup>
Corn Grain	141,400	bu.	48.0		6,785,200
Sunflowers	98,800	cwt.	9.7		956,200

<sup>a</sup>238,000 cwt. is in pinto beans, 5,600 cwt. in great northern, and 14,200 cwt. in pink beans.

Source: Crop Production, Annual Summaries, 1967-1970, Statistical Reporting Service, United States Department of Agriculture.

\*Schaffner and Johnson are agricultural economists, Experiment Station; Rice is agricultural economist, Extension Service, North Dakota State University.

Production of each crop for the past five years is summarized in Table 2. All yields are shown in hundredweight units for comparative purposes. Soybean production has declined about 50 per cent over the past five years, while sunflower production has tended to increase. Corn and field beans have exhibited no trend in production throughout the period.

TABLE 2. PRODUCTION IN CWT OF SELECTED ROW CROPS NORTH DAKOTA, 1966-1970

Year	Soybeans	Field Beans	Corn Grain	Sunflowers
	- cwt -			
1966	3,186,000	294,000	4,586,400	422,400
1967	2,262,000	213,000	3,292,800	1,325,000
1968	1,999,200	240,000	3,622,080	896,100
1969	1,776,000	231,000	3,857,280	972,000
1970	1,584,000	311,000	3,640,000	1,165,500

Source: Crop Production, Annual Summaries, 1967-1970, Statistical Reporting Service, United States Department of Agriculture.

Soybean production in North Dakota is confined almost entirely to the southern half of the Red River Valley: in Richland, Cass, and southeastern Traill Counties.

Although some corn is planted throughout the state, two-thirds of it is harvested as forage. Corn harvested as grain is concentrated in extreme southeastern North Dakota, mainly in Richland County with lesser amounts in Cass, Sargent, Ransom, and Dickey Counties.

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TABLE 3. SOYBEANS, PINTO BEANS, CORN, AND SUNFLOWER COSTS AND RETURNS FOR EASTERN NORTH DAKOTA<sup>a/</sup>

Crop Production and Cost Inputs	SOYBEANS		PINTO BEANS		CORN GRAIN			SUNFLOWERS		
	Southern Red River Valley		Red River Valley		Richland County	Other Southeast	Yours	Non-oilseed	Oilseed	Yours
	Budget	Yours	Budget	Yours	Budget	Budget		Budget	Budget	
1 Yield Per Acre	22 bu.		12.0 cwt.		80 bu.	57 bu.		10.8 cwt.	12.7 cwt.	
2 Unit Price	\$ 2.50		\$ 6.15		\$ 1.10	\$ 1.10		\$ 5.15	\$ 4.20	
3 GROSS RETURNS	55.00		73.80		88.00	62.70		55.62	53.34	
<u>Direct Production Costs</u>										
4 Seed	\$ 4.10		\$ 7.50		\$ 4.80	\$ 4.00		\$ 1.60	\$ 2.00	
5 Fertilizer	1.95		1.95		13.15	9.95		3.35	3.35	
6 Spray	1.40		3.15		4.40	.40		..	..	
7 Repairs	3.67		4.43		4.85	4.98		3.74	3.74	
8 Fuel & Oil	1.30		1.45		1.10	1.15		1.20	1.20	
9 Interest on Operating Capital	.87		1.32		1.85	1.33		.68	.70	
10 Crop Insurance	2.02		3.45		2.48	1.77		1.52	1.44	
11 Custom Cost										
12 TOTAL DIRECT COSTS	15.31		23.25		32.63	23.58		12.09	12.43	
13 RETURN OVER DIRECT COSTS	\$39.69		\$50.55		\$55.37	\$39.12		\$43.53	\$40.91	
<u>Fixed Costs</u>										
14 Land Cost	\$17.60		\$17.60		\$17.60	\$12.31 <sup>b/</sup>		\$17.60	\$17.60	
15 Machinery Depreciation	3.84		4.19		5.64	5.58		3.71	3.71	
16 Interest on Machinery, Housing, & Insurance	3.54		3.86		5.22	5.15		3.42	3.42	
17 TOTAL FIXED COSTS	24.98		25.65		28.46	23.04		24.73	24.73	
18 OPERATOR LABOR - MANAGEMENT RETURN	\$14.71		\$24.90		\$26.91	\$16.08		\$18.80	\$16.18	
19 LABOR REQUIREMENT PER ACRE IN HOURS	2.00		2.56		2.27	2.17		1.97	1.97	

<sup>a/</sup>These costs and returns should not be construed to be the average for farmers in the area. Yields and input levels are higher than the average for the area.<sup>b/</sup>Average for Dickey, Sargent, Ransom, and Cass Counties.

Two types of sunflowers are produced in North Dakota. The large and medium-seeded varieties are used for birdseed and confectioneries. The smaller seeded, high oil content varieties are processed into oil and protein meal. In 1970, 28 per cent of the North Dakota planted acreage was oilseed varieties, which average slightly higher in yield but normally bring a lower price than the birdseed and confectionery varieties. Most sunflower production is in the Red River Valley and adjoining counties. The crop is usually grown under contract.

Several types of dry field beans are grown commercially, but nearly all the production in North Dakota is the pinto type. Pinto beans are a relatively new crop in North Dakota and are produced in localized areas of the Red River Valley and the irrigated area in the Yellowstone Valley. They are produced largely under contract.

Cost and return budgets are presented for each crop in Table 3. The sunflower and pinto bean budgets represent the entire Red River Valley area. The soybean budget is for only the southern part of the Valley. Separate corn budgets are presented for the commercial corn area of Richland County and other areas in the southeastern part of the state. Separate budgets are also presented for oilseed and nonoilseed varieties of sunflowers.

The input and output data used are what are being achieved on well-managed farms. All crops are assumed to be grown on previously cropped land. Production costs are based upon an 855 crop acre farm, 275 of which are devoted to row crops.

#### EXPLANATION OF COSTS AND RETURN DATA

Line 1, Yields: The yields shown are what can be expected using recommended practices and the levels of inputs shown in Table 3.

Line 2, Price: These are planning prices, based upon past price relationships and future outlook. They do not necessarily represent expected prices for next year.

Line 4, Seed: This cost assumes hybrid corn varieties, certified seed for sunflowers and pinto beans, and certified seed every third year for soybeans.

Line 5, Fertilizer: Rates used were recommended rates for corn based on a low phosphate test and low nitrogen fertility rating (45 lbs. per acre). (See Extension Circular S&F-12.) For soybeans and pinto beans, 5 pounds of nitrogen and 20 pounds of phosphate are charged to the crop. Sunflowers are charged for 25 pounds of nitrogen and 20 pounds of phosphate. Although most farmers do not apply fertilizer to beans or sunflowers and response to direct fertilization has been erratic, these crops do best in fertile soil and make good use of carry-over fertilizer. Good soil fertility is necessary to achieve the levels of yield in the budgets.

Line 6, Spray: The cost for spray is for the following: Richland County corn—atrazine plus oil on all acres; other southeast corn—2-4-D on all acres; soybeans—amiben banded on one-third of the acres; pinto beans—triflurolin broadcast on one-half the acres; no herbicides used on sunflowers.

Line 7, Repairs: Machinery repair costs were estimated on a percentage of the new cost based on agricultural engineering studies.

Line 8, Fuel and Oil: Nebraska tractor tests were used to calculate fuel consumption. Local fuel prices were used in arriving at the value. Diesel tractors and gasoline self-propelled machines were assumed in calculating fuel costs.

Line 9, Interest on Operating Capital: This cost was figured at 9 per cent of the direct production costs. The time period was eight months.

Line 10, Crop Insurance: The crop insurance premium used insures 45 per cent of the gross return. The premium rate used varied by crop, depending upon the risk as established by insurance companies.

Line 11, Custom Cost: None assumed.

Line 14, Land Cost: The charge for land is the average net return that North Dakota landlords received in 1969. This amounted to 7.3 per cent of the current market value of cropland. The calculation for the Red River Valley is as follows:

Cropland value	\$210.00
Land charge (7.3%)	15.35
Land taxes	2.25
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Total land cost	\$ 17.60

Line 15, Machinery Depreciation: Depreciation is based on normal machinery life, using the straight line method of calculating depreciation.

Line 16, Interest on Machinery, Housing, and Insurance: These fixed costs were calculated on the basis of 10 per cent of the average machinery investment.

Line 18, Operator Labor and Management Return: Costs are included for all the resources required for these crops except labor and management. When the total costs--direct plus fixed--are subtracted from the gross income, this gives a return to the farm operator for his labor and management. No hired labor is assumed in the costs presented.

Line 19, Labor Requirement Per Acre in Hours: The labor requirements include the direct hours of labor to prepare the seedbed, seed, post seeding cultivations, harvest, and store or market the crop.