

Performance of Sunflowers in Central and Western North Dakota

G. N. Fick

Sunflower yields from variety trials conducted at Carrington, Minot and Williston, ND, under sometimes droughty conditions ranged from 621 to 1,837 pounds per acre. Seed oil contents of oilseed varieties at Minot and Williston were similar to those of sunflowers produced at Casselton in the Red River Valley production area. Oil contents at Carrington and percentage of large seed of confectionery varieties at all three locations were lower than at Casselton. At present prices and yields, sunflowers show promise as an alternative crop for portions of central and western North Dakota.

North Dakota is the leading sunflower producing state in the United States, with about 400,000 acres harvested in each of the last three years. This acreage has been concentrated in the eastern portion of the state, largely within the Red River Valley. Recently, because of the possibilities of relatively high returns per acre and a search for alternative crops, growers in central and western North Dakota also have become interested in including sunflowers in their farming operations. Although sunflowers are considered relatively drought tolerant and adapted to a wide range of soil types, little information is available on the performance of sunflowers outside the generally more favorable soil and moisture conditions prevailing in the eastern part of the state.

The North Dakota Agricultural Experiment Station, in cooperation with the Agricultural Research Service, U.S. Department of Agriculture, has grown sunflower variety trials at the Carrington, Minot and Williston Branch Experiment Stations in central and western North Dakota. The results of the tests conducted since 1970 are reported here.

Production Methods

The sunflower variety trials were planted on soil types classified as Heimdal-Emrick sandy

Dr. Fick is research geneticist, Agricultural Research Service, U.S. Department of Agriculture, Fargo.

CONTRIBUTORS: F. J. Sobolik and H. M. Olson, P. Stahlman and B. K. Hoag, N. R. Riveland and E. W. French, Carrington, Minot and Williston Branch Experiment Stations, respectively; H. D. Wilkins, extension agronomist.

loam at Carrington and Williams loam at Minot and Williston. Trials at Carrington were planted on continuous cropland, whereas Minot and Williston trials were on summer fallow. Planting dates were generally mid to late May with plant populations ranging from 15,000 to 20,000 plants per acre. Weeds were controlled by herbicides and cultivation. Long-term average rainfall during the April-September growing periods at Carrington, Minot and Williston are 13.5, 12.2 and 10.2 inches, respectively, although the actual amounts received varied widely at the three locations during individual seasons.

Results of the trials were compared to those obtained from Casselton, ND, where tests have been planted on continuously cropped Fargo silty clay loam at comparable planting dates, and at the slightly higher plant populations (22,000) recommended for the eastern production area. Average rainfall at Casselton during April-September is 14.5 inches.

Performance Results

Average sunflower seed yields from the tests conducted during 1970-74 ranged from a low of 621 pounds per acre at Carrington in 1971 to a high of 1,837 pounds per acre at Minot in 1974. Average yields for the 1970-74 period were 1,154, 1,424 and 1,302 pounds per acre at Carrington, Minot and Williston, respectively (Table 1). These yields compared to an average yield of 1,766 pounds per acre for sunflowers grown at Casselton in a prime sunflower production area of the Red River Valley. Other comparisons with the Casselton results indicated that the sunflower

Table 1. Agronomic and Seed Quality Characteristics of Sunflowers Grown at Casselton, Carrington, Minot, and Williston, North Dakota, 1970-74.

Character	Location			
	Casselton	Carrington	Minot	Williston ¹
Days to 50% flowering	72	74	75	74
Plant height, inches	70	62	64	54
Seed yield, lb/A	1766	1154	1424	1302
Test weight, lb/bu				
Oilseed varieties	29.4	28.4	28.2	28.7
Confectionery varieties	23.8	25.3	23.6	26.3
Percentage oil, oilseed varieties	44.0	40.0	43.9	44.6
Percentage over 20/64 screen,				
Confectionery varieties	45.4	20.8	27.0	5.6

¹ 1972-74.

plants were shorter, were comparable in days to 50 per cent flowering, and produced seed of similar test weight and oil content, except at Carrington, where oil contents were lower. Percentage of seed of the confectionery varieties over a 20/64-inch round-hole screen was less for the central and western sites.

Among the oilseed sunflower varieties currently available for commercial production and tested during 1972-74 (Table 2), the highest yields were obtained with the open-pollinated variety Peredovik. Hybrid varieties, produced by the cytoplasmic male-sterility and fertility restorer system, did not exhibit the yield superiority over Peredovik and Sputnik that has occurred at Casselton and other eastern test sites. Consequently, it may be that until more widely adapted hybrids become available, growers in central and western North Dakota should consider the lower priced

planting seed of the open-pollinated varieties for commercial production. Hybrid varieties, because of improved resistance to rust, downy mildew and Verticillium wilt, likely will perform better where these diseases are a problem.

The confectionery variety Sundak showed yields comparable to the oilseed types. However, percentage of large seed of the confectionery varieties was lower at the central and western locations (Table 1), and growers may experience difficulty in meeting the quality standards for the limited confectionery market.

Economic Considerations

The cash return per acre for sunflowers as compared to alternative crops is a primary consideration for a grower in deciding whether to include sunflowers in his farming operation. Although relatively few sunflowers have been grown in central and western North Dakota,

Table 2. Seed Yields and Disease Characteristics of Six Sunflower Varieties, Grown at Casselton, Carrington, Minot, and Williston, North Dakota, 1972-74.

	Seed Yields, lbs/acre				Disease Reaction ¹		
	Casselton	Carrington	Minot	Williston	Rust	Downy Mildew	Verticillium Wilt
Oilseed varieties							
Peredovik	1655	1216	1663	1303	MS	S	MS
Sputnik	1832	1150	1522	1208	MS	S	MS
Hybrid 894 ²	2026	1274	1553	1235	R	R	R
Hybrid 896	2022	844	1308	1225	R	S	R
Confectionery varieties							
Sundak	2001	1273	1379	1336	R	S	S
Commander	1575	1187	1094	1132	S	S	S

¹ R = resistant, S = susceptible, MS = moderately susceptible.

² Not tested 1972-73.

Agricultural Experiment Station
NORTH DAKOTA STATE UNIVERSITY
of Agriculture and Applied Science
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Alan L. Hayes

DIRECTOR

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BULK THIRD-CLASS

limited data are available from the North Dakota Crop and Livestock Reporting Service for the Central District consisting of Eddy, Foster, Stutsman, Wells, Sheridan and Kidder counties (Table 3). Based on 5-year average yield estimates and 1972-74 prices, sunflowers would appear to give as high as or higher return than other crops grown in this area. Costs of production are generally considered similar to those of small grains and flax, although this will depend on usage of ferti-

lizers, herbicides, insecticides, artificial drying and other inputs.

Seasonal droughts, bird depredation, available markets, lack of row-crop equipment and performance of subsequent crops on sunflower ground are other considerations of concern to prospective growers. Information on certain of these and other production related problems is available in the North Dakota Agricultural Extension Service Circular A-538, Sunflower Production in North Dakota.

Table 3. Average Yields, Prices, and Values Per Acre of Sunflowers and Alternative Crops in Central North Dakota.¹

Crop	5-Year	1974		1972-74	1972-74
	Average Yield	Average Prices	Value Per Acre	Average Prices	Value Per Acre
Sunflowers	892 (lb)	16.03 (cwt)	\$142.99	\$9.81 (cwt)	\$ 87.51
Wheat (HRS) ²	28.3	4.90	138.67	3.69	104.43
Barley ²	39.9	3.30	131.67	2.14	85.39
Flax ²	11.5	10.20	117.30	6.98	80.27
Oats ²	49.7	1.65	82.00	1.12	55.66

¹ From North Dakota Crop and Livestock Reporting Service statistics, 1970-75, for Eddy, Foster, Stutsman, Wells, Sheridan, and Kidder counties.

² Yields and prices on a bushel basis.