

## FERTILIZER TRIALS ON SUNFLOWERS

By

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Experimental work with sunflowers at the Northwest Experiment Station, Crookston, started in 1948 when a few new oil varieties from Canada were field tested. Since then the work at this Station has increased, and this year approximately 4.5 acres are in experimental plots.

The commercial production of sunflowers in the Red River Valley of Minnesota and North Dakota is rapidly increasing, and growers are asking for information about fertilizers and other cultural practices.

The soils of this area belong to the Chernozem soil group and are alkaline, ranging in pH from 7.5 to 8.4. They test medium in organic matter, low in extractable phosphorus, and high to very high in exchangeable potassium. Sunflowers were planted in 22-inch rows and at a population of 20,000 plants per acre. The fertilizer was applied as a band treatment 2 inches beside and below the seed. The plots were 6 rows wide and 50 feet in length. May 25 was the average date of planting and the plots were harvested on October 5. Peredovik was the variety of sunflowers used in these trials.

Table 1 gives the yield, bushel weight, and oil content of sunflowers for 1966, 1967, and 1966-67 averages. The 2-year average yields varied from a low of 1289 for 0-0-40 treatment to a high of 1894 pounds per acre for 20-40-0 treatment. The check plot averaged 1499 pounds per acre, and four of the treatments were below this figure. The 20-40-0 and 40-80-0 treatments gave the highest yields, but the difference between them was not significant. The 20-40-20 treatment gave the third highest yield but it was 145 lbs. less than the top yield. The single applications of nitrogen, phosphate, and potash and treatment 80-160-80 were below the check plot in yield. There was some fertilizer damage to some of the plots from the higher rates and especially the 80-160-80 rate in 1967.

The average bushel weight showed very little variance, and no treatment increased the bushel weight when compared to the check plot.

The oil content was 2-4% higher in 1966 when compared to the 1967 results. The average 2-year data were similar, and no treatment produced

any large increase or decrease when compared to the check. The 80-160-80 treatment was the lowest in oil content, but this may have been caused by the high fertilizer rate.

This report covers only 2 years and further field trials are necessary before final conclusions can be made.

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See Table 1 on following page.

Table 1. The effect of fertilizer on the yield, bushel weight, and oil content of sunflowers for 1966, 1967, and 1966-67 averages.

Treatment	Yield		Bu. Wt. AVE 1966-67	Percent oil	
	lbs/acre N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O	lbs/acre 1966 1967 Avg 1966-67		1966 1967 Avg 1966-67	1966 1967 Avg 1966-67
20-40-0	1582	2205	1894	28	46.1 43.9 45.0
40-80-0	1670	2094	1882	29	45.5 42.9 44.2
20-40-20	1527	1971	1749	28	46.5 43.1 44.8
40-80-40	1664	1711	1688	29	46.3 43.0 44.7
0-0-20	1550	1791	1671	28	46.5 43.8 45.2
0-40-20	1505	1754	1630	28	46.7 44.8 45.8
0-80-0	1450	1680	1565	28	46.6 44.0 45.3
20-0-0	1465	1626	1546	28	47.5 43.4 45.5
0-80-40	1412	1638	1525	29	46.5 43.6 45.0
0-0-0	1397	1578	1488	29	46.7 42.4 44.5
40-0-0	1621	1319	1470	28	46.2 42.2 44.2
0-40-0	1515	1393	1454	29	46.6 43.6 45.1
80-160-80	--	1390	1390*	27	-- 40.2 40.2*
0-0-40	1288	1290	1289	28	46.5 41.5 44.0
L.S.D. 5%	204	N.S.			N.S.
L.S.D. 1%	273	N.S.			N.S.

\* One-year data

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