

CURRENT AGRICULTURE RESEARCH IN SUNFLOWERS  
AT THE  
NORTHWEST EXPERIMENT STATION

By

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This report will serve as a prelude to the tour the conference will take to the plots. It is not the intent that this be a scientific report as many of the reports have been.

Breeding - The objectives of the breeding program at Crookston are to improve the large seeded sunflowers for yield and for disease and insect resistance. Since Cargill, Inc. has a program to improve oil varieties, we chose to work with the large seeded varieties. Materials growing presently include twenty-eight inbred lines received from Murray Kinman and a number of lines from the world collection. The world collection lines were selected primarily on the basis of seed size and color and were open pollinated at least one generation prior to seeding at Crookston.

Additionally, two natural crossing blocks are included in the breeding program. Both of these crossing blocks have Mennonite RR as the pollinator. One block has Peredovik male sterile sublines as females at a 1 to 1 ratio. The other block has CM90RR as a female at a 1 female to 3 male ratio.

Yield Tests - The first yield test, the USDA Test #1, contains twenty-five entries. The plots consist of three 24 inch rows and are 20 feet long. Another yield test grown at Crookston is the Canadian Cooperative Test which contains seven entries in two 36 inch rows that are 20 feet long.

There are four hybrid yield tests. The first of these (USDA Test #2) has 52 entries in single row plots. The female of these hybrids is Peredovik and male sterile. The male parents are various inbreds and varieties. A second hybrid test (USDA Test #3) has twelve entries in single row plots. The females are CM323 selections and the males are HA 60, 61, 62, and 63 selections. Another hybrid test (USDA Test #4) includes 10 entries of Peredovik male steriles crossed to Mennonite RR selections. The last hybrid test is more of a demonstration to exemplify the heterosis phenomenon compared to inbreeding depression. In this demonstration, inbred parent plots are grown on either side of their  $F_1$  hybrids.

Production Experiments - The first production experiment I will mention is the population - row width - variety experiment. The six populations begin with 15,000 plants per acre and increase at 5,000 plant increments up to 40,000 plants per acre. Twenty, thirty, and forty inch row widths are grown for each variety and population. The varieties are Peredovik, Krasnodarets, Mingren, and Arrowhead.

An attempt was made to seed sunflowers in late fall just before the ground froze. The reasoning behind such a seemingly unusual practice reverts to the observation of volunteer sunflowers the year following a crop. Although this practice was successful over the 1966-67 winter, the attempt over the 1967-68 winter was a failure. Only four plants emerged from the seedings. No yields were obtained on the 1966-67 material due to extreme bird damage.

Dr. Olaf Soine has reported on his fertilizer studies at Crookston. He also has conducted herbicide trials for a few years in cooperation with Dr. R. G. Robinson of St. Paul.

Special Studies - Four experiments to study the effects of simulated hail damage are being conducted at the Northwest Experiment Station. In one experiment the stand was reduced at three levels early in the growing season. Another experiment compares the effect of stem breakage on various percentages of the population. In a third experiment a modified staple gun is employed to simulate stem bruising at various stages of growth to the plants. The last experiment compares the effect of given amounts of defoliation at various stages of growth.

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