S E C T I O N B

BRIEF SUMMARY OF PRINCIPAL ACCOMPLISHMENTS

1940

The sugar beet experiments were moved from the Mantz tract to the Agronomy Farm of the Colorado Experiment Station where soil and water conditions are much better for experimental work. Closer co-operation with the Agronomy staff of the College and Experiment Station was established by this change.

Progress was made in the adaptation of the top cross method of evaluating the probable combining ability of inbred sugar beet lines. From this test, it also appears probable that ~~the use of~~ a minimum of six replications of plots as small as single 20 foot rows may be used with considerable confidence in the evaluation of large numbers of sugar beet strains at a considerable saving in costs for the care and harvesting of such plots. Inbred strains of sugar beets vary in crossability. The percentage of known hybrids from top crossed sugar beet mothers varied from less than ten to over ninety percent. A high or low percent crossing is an inherent character of some of these inbred sugar beet strains.

Leaf-Spot-Resistant varieties now available or which soon may be available to sugar beet growers were approximately equal in yield to the generally grown commercial variety in a field test under non leaf spot conditions.

The yield of the first generation of a synthetic sugar beet variety produced by the interplanting of a large number of inbred strains for seed production was approximately equal to the yield of a good commercial variety. Such random combinations of inbreds do not appear to be a promising means of producing superior varieties.

Progress was made in the purification of several beet lines for specific genetic characters. Several lines are now apparently homozygous for some specific character and other lines are approaching that point. Several crosses of genetic interest were advanced to the first generation root stage. Roots were selected from a number of these crosses which could be positively identified as hybrids and which will be used for the production of seed for a second generation of roots. The segregation of certain genetic characters is to be studied in the second root generation.

A considerable number of inbred sugar beet strains were advanced another generation. A large number of these strains have now been carried through from two to five selfings and are now ready for the elimination of the "poor combiners". Top cross seed of a large number of these lines was produced and will be tested in 1941.