10. A single plot testing technique for the agronomic evaluation of substrains of recovered restoring versions of inbred lines.

Three hundred and one substrains of recovered restoring versions of several standard lines were tested in 1955, using a single plot technique.

Testcross seed was made up using a "T" sterile version of the appropriate seed line as the female parent. Male parents were individual BC6 recovery plants of an inbred line, heterozygous at the "F" locus.

Testing was done by planting the resulting seed, segregating about 1 sterile: 1 fertile, in single, bordered plots 30 plants long. At flowering time, the fertile segregates were tagged. At harvest time, yield and other data were gathered separately from both the sterile and fertile segregates. Performance will be calculated by expressing yield of fertile segregates in terms of percent of yield of sterile segregates, reduced or weighted to a single plant average.

It would seem likely that, testcrossing during the BC6 generations resultant sterile and fertile segregates would differ genetically only by the chromosome segment carrying the "F" locus. Thus, if it can be shown that steriles and fertiles differ, this difference must relate to agronomic characters linked to the restorer. Hence differences within a lines within an "F" gene source would probably relate to the amount or length of the non-recurrent "F" segment, and differences within a line between "F" gene sources would probably represent an estimation of the general differences between agronomic factors closely linked to the "F" locus between gene sources.

Thus the method may be an efficient and timely means of selecting best recovered individuals within a recovery family, and will most certainly provide an accurate comparison between sources, of agronomic factors linked to the restorer. This latter consideration may well prove to be the most logical criterion to use in making final choice of "F" gene sources to use.

The efficiency of an adaption of this technique is being preliminarily evaluated as a possible device useful for usual testing needs.

(Actually, some strains were testcrossed before BC6, in order to make use of the summer of 1955 for testing).