Fertile and sterile classes should consist of equal number of normal and semi-sterile plants where no linkage exists between the restorer genes and the translocation breakpoints.

Frank M. Remley

4. Linkage studies between a fertility restorer gene and genetic markers both in the presence and absence of translocations.

A recombination figure of 28% was obtained for the A293 fertility restorer gene and translocation 1-3 (5982-2) which has breaks in the short arm of chromosome one and about .66 of the distance out in the long arm of chromosome three. A recombination value of 5.4% was obtained between the A293 fertility restorer gene and translocation 1-3 (5883-1) which has breaks in the short arm of chromosome one and about .65 of the distance out on the short arm of chromosome three. These data indicated that the A293 fertility restorer gene is in the short arm of chromosome one. However allelic tests with other sources of fertility restoration which have been located in chromosome three have led to further studies.

The A293 source of fertility restoration has been crossed with several genes in chromosomes one and three which include in various combinations: sr, zb_4, br, d_1, Rg, ts_4, na and lg_2. The recombination results will be obtained in the summer of 1957.

A test is being made to determine if one or both of the translocations reduce crossing over in regions adjacent to the break positions. Crosses were made between plants which were heterozygous for both the fertility restorer gene and the translocation and various combinations of the genes previously mentioned. Crosses were also made with plants which did not have the translocation. Testcrosses were made by selecting plants which had both the translocation and the fertility restorer gene and backcrossing them to the appropriate recessive genetic stock. Whenever possible these crosses were made reciprocally. Testcrosses were also made with plants in the same row which did not contain the translocation so a comparison can be made of the effect of the presence of the translocation on the recombination between the fertility restorer gene and the various genetic markers. As the frequency of plants with both the fertility restorer gene and the 1-3 (5883-1) translocation was very low some crosses were also made onto sterile plants so the recombination percentages between the translocation and the genetic markers may be measured. These results will be obtained in the summer of 1957.

Duane B. Linden