

backcrossing program for Ht.

The data for 2-6 (9002) appear to be somewhat out of line with the other stocks; this may be due to sampling error or faulty cytological determination of breakpoints.

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2. A second modification of Anderson's method.

A similar, but somewhat different modification of Anderson's method has been used to move Rf₁ into genotypes of rf₁ constitution. Selection of a close linkage between a translocation and the desired gene is made, as in the above scheme, but the intention is to break the linkage after sufficient backcrossing has been done. This will require selfing and testcrossing large numbers of individuals at the end of the backcrossing series, in order to pick up the infrequent recombinations of normal chromosomes with desired gene. In this respect the scheme is more cumbersome than the first one, but it does give one a recovered line with normal chromosomes, should one desire this.

Translocation 3-9c has about 3% recombinations with Rf₁. The recombination of T3-9c and Rf₁ was identified and has been placed in three inbred lines, by continual backcrossing (in normal cytoplasm) with selection (by examination of pollen and ears) for semi-sterility. Two plants per inbred were selected in each generation. At BC⁴, testcrosses revealed that all plants tested still had the desired linkage of T3-9c and Rf₁. At BC⁷ an attempt was made to identify and self (with testcrossing) large numbers of normal-chromosome backcross plants in one of the lines (WF9⁷), hoping that some 3% of the normal-chromosome plants would have Rf₁. Due to hot weather at pollinating time nearly all BC⁷ plants were partially sterile and it was not possible to classify their tassels for presence vs. absence of semi-sterility (presence of 3-9c in heterozygous condition). A few random selfs and testcrosses were made successfully, however, all going back to two semi-sterile BC⁶ plants. One of the two BC⁶ plants whose BC⁷ progeny was tested proved still to have Rf₁ linked with T3-9c (genotype $\frac{T}{N} \frac{Rf_1}{rf_1}$). The other plant appeared to have an undesired recombinant, having rf₁ linked to T3-9c (genotype $\frac{T}{N} \frac{rf_1}{rf_1}$).

Further attempts will be made to identify desired recombinants.

This scheme also is being used to "cure" inbreds of partial restoration. T3-9c with rf₁ is being transferred to plants of partial restorer genotype (Rf₁^P) with the intention of selecting recombinants with normal chromosomes and rf₁ genotype at the end of the backcrossing period. This method obviates the need for testcrossing backcross plants, to distinguish those of Rf₁^P rf₁ genotype from those of Rf₁^P Rf₁^P genotype.

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