

In addition to the monosomic plants shown in the table, ten additional plants with monosomic chromosome, supposedly independent of those listed in the table, were found and given an Mo number for further study. Most of this latter group, as in the group in the table, carry in addition to the monosome other chromosome aberrations. The additional aberrations generally make it much more difficult to reisolate the monosomic chromosome.

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TESTS FOR THE ASSOCIATION OF EIGHT MONOSOMES
AND THE MARKER GOLDEN CROWN (gc)

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In our program to associate the effects of a gene with a specific chromosome in the cultivated cottons, the test for the association of monosomes and the gene marker "golden crown" was completed this year.

A general outline of the procedures employed to determine whether a recessive marker gene and a specific monosomic chromosome is associated is given below:

P_1 haplo-X dominant X P_2 diplo-X recessive.

F_1 haplo-X dominant or recessive + diplo-X dominant.

- (a) If the F_1 haplo-X has a recessive phenotype, this indicates that the 1 genetic marker locus and the monosomic chromosome are "linked," i.e., the locus is on that particular chromosome.
- (b) On the other hand, if the F_1 haplo-X has the dominant phenotype, then this indicates that the 1 monosomic chromosome and the marker loci are independent, i.e., the marker locus is not located on the monosomic chromosome. However, when working with polyploid forms we cannot always rely on the presence of the dominant phenotype in the F_1 as reliable criterion for concluding that the chromosome and 1 marker locus are independent. It is possible that the mutant allele may be an anti-morph in which case a single dose of the mutant allele would result in the haplo- F_1 having a phenotypic expression similar to the diplo-dominant 1 . The above results are summarized under 1 and 2 on the following page.

1. Expected results if the marker and the haplo-X are not associated:
 - (a) F_1 haplo-X x diplo-X recessive \rightarrow haplo-X dominant and recessive and diplo-X dominant and recessive.
 - (b) diplo-X recessive X F_1 haplo-X (only a pollen is functional) \rightarrow diplo-X dominant and recessive.
2. Expected results if the marker and haplo-X are associated:
 - (a) F_1 haplo-X x diplo-X recessive \rightarrow haplo-X either "dominant" or recessive.
 - (b) diplo-X recessive x F_1 haplo-X (only a pollen is functional) \rightarrow diplo-X recessive.

Monosomes M2(H17), M3(H2), M6(H4), M10(H13), M17(h1), Mo7(H7), and M24(H16) were crossed with the recessive marker gene "golden crown" to test the possible association of this locus with one of the monosomic chromosomes. These results are shown in the following table. Since both the dominant and recessive phenotypes were observed in the reciprocal crosses and they appeared in both cytological classes, it is concluded that the marker locus is not associated with any one of the chromosomes.

Distribution of Mutant Phenotypes in the Two Cytological Classes in Test Crosses of F_1 2n-1 with Tester Stocks

		Gc	gc
M2(H17) F_1 (2n-1 x gc) x gc	2n	6	5
	2n-1	1	4
	gc x F_1	10	5
M3(H2) F_1 (2n-1 x gc) x gc	2n	4	2
	2n-1	3	6
	gc x F_1	12	3
M5(H6) F_1 (2n-1 x gc) x gc	2n	4	5
	2n-1	5	1
	gc x F_1	10	5
M6(H4) F_1 (2n-1 x gc) x gc	2n	3	6
	2n-1	4	2
	gc x F_1	11	4
M10(H1) F_1 (2n-1 x gc) x gc	2n	4	6
	2n-1	3	2
	gc x F_1	7	3
M17(H1) F_1 (2n-1 x gc) x gc	2n	4	2
	2n-1	3	6
	gc x F_1	6	9
Mo7(H7) F_1 (2n-1 x gc) x gc	2n	6	7
	wn-1	0	2
	gc x F_1	6	8
M25(H16) F_1 (2n-1 x gc) x gc	2n	14	12
	2n-1	2	2
	gc x F_1	10	5