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1) Linkage tests between the A_p and W_1 loci.

The F_2 generation of the cross 'Williams' x 'Manchu (Madison)' was used to determine if the A_p and W_1 loci were linked. The A_p locus controls a seed acid phosphatase which exists in the germplasm in three different electrophoretic forms controlled by three codominant alleles-- A_p^a , A_p^b , and A_p^c (Hildebrand *et al.*, 1980). The W_1 locus controls flower color--purple (W_1) and white (w_1).

The W_1 genotype of F_2 individuals was determined by observing hypocotyl color of germinating seeds. Plants with purple hypocotyls have purple flowers. The A_p genotype was determined by electrophoresis (Hildebrand *et al.*, 1980).

The results of the linkage study are presented in Table 1. In the table $a = A_p^b A_p^b W_1$, $b = A_p^b A_p^c W_1$, $c = A_p^c A_p^c W_1$, $d = A_p^b A_p^b w_1 w_1$, $e = A_p^b A_p^c w_1 w_1$, and $f = A_p^c A_p^c w_1 w_1$. The chi-square test for independent assortment was used to determine whether linkage was present. The chi-square test for independence was 1.64 with 2 degrees of freedom, indicating that the A_p locus is inherited independently of the W_1 locus.

Table 1
 F_2 linkage test of A_p and W_1 loci, from the cross Williams
($A_p^b A_p^b w_1 w_1$) x Manchu (Madison) ($A_p^c A_p^c W_1 W_1$)

a	b	c	d	e	f	Sum	% R
21	44	28	11	22	8	134	I

Reference

Hildebrand, D. F., J. H. Orf and T. Hymowitz. 1980. Inheritance of an acid phosphatase and its linkage with the Kunitz trypsin inhibitor in seed protein of soybeans. *Crop Sci.* 20 (in press).

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