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1. K1O and crossing over in Tp9Tp9.

Past studies have revealed that B chromosomes and K1O will both increase recombination in particular regions of the genome. B chromosomes have affected crossing over in the centromere regions of chromosomes 5 and 9, whereas, abnormal 10 enhances crossing over in centromere regions of chromosomes 3 and 5. B chromosomes have very little effect on the centromere region of chromosome 3, and K1O has little effect on the same region of chromosome 9. Differences in regional responses have also been noted between male and female flowers. Although not yet tested for B chromosomes, more intimate synapsis and increased recombination in heteromorphic knob regions and aberrations has been observed with K1O.

The presence of a single B in plants homozygous for the transposition in chromosome 9 (between C and Wx) elevates crossing over considerably. In order to determine if the response of Tp9Tp9 is specific to B chromosomes, the effect of K1O was studied.

Plants were synthesized as Tp9Tp9 being either k1Ok1O or K1Ok1O. Crossing over between C and Wx was determined. The data are given below.

Sporocytes	# plants	Used as	# progeny	% C.O.	Average ear size
k1Ok1O	20	female	6409	22.8	320.5
	17	male	5050	29.5	
K1Ok1O	17	female	4227	27.0	248.7
	14	male	3454	32.4	

The results of t tests on data from C Tp Wx/c Tp wx female parents indicated that the increase in recombination from 22.8% in k1Ok1O to 27.0% in K1Ok1O plants was significant ($P < .01$). However, no significant difference could be demonstrated for crossing over in the male. The difference between male and female recombination within the k1Ok1O and K1Ok1O

groups were significant ($P < .01$), as was the drop in seed set in K1Ok1O plants as compared to k1Ok1O plants ($P < .01$).

Data obtained by Weber (MNL 42:56-59) are relevant to these observations. Little if any effect of K1O on the C-Sh-Wx region was found in plants heterozygous for Tp. Although a small increase in recombination may have occurred in female cells, no effect of K1O was found in male flowers.

The results indicate that the Tp9 region (when homozygous) is sensitive to the presence of both B chromosomes and K1O. Increased recombination has been demonstrated, however, only when crossing over is determined through the female. Furthermore, the data from this sample suggest that K1O has an adverse effect on the reproductive capacity of the organism.

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1. The mutations, de*-91 and de*-92.

Two recessive, defective seed mutants, de*-91 and de*-92 were sent to this laboratory by Francesco Salamini (Montanaso). Both are small-seeded papery pericarp mutants that are distinguishable from normal kernels on the same ear three weeks after pollination. They are not allelic in spite of their phenotypic similarity. Plants grown from mutant seeds are normal.

Neither mutant is allelic to bt, bt2, sh, sh2, sh4, mn, or o5.

In extracting seeds harvested 22 days post-pollination in order to test the activity of enzymes involved in starch synthesis, it was observed that the supernatant fraction following homogenization with an equal weight of buffer and centrifugation lacked the pronounced opalescence of such extracts from other mutants or from normal seeds. Assays of the protein content of such supernatants showed that the soluble protein content of de*-91 and de*-92 is abnormally low (Table 1).