However the data indicate that the inheritance of resistance is not so complicated that the back-cross method of transferring resistance could not be used.

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1. Partial restorer and full restorer genes in a common genetic background.

Four partial restorer inbreds, each having a partial restoring gene allelic to $\underline{Rf}_1$ but of less restoring strength, have been crossed to SK2-T, of genotype $\underline{rf}_1\underline{rf}_1\underline{Rf}_2\underline{Rf}_2$. SK2 has a full complement of modifying genes for $\underline{Rf}_1$. Each cross has now been backcrossed (as female) to SK2 6 or 7 times, selecting fertile plants in each generation. As a control, SK2-T $\underline{Rf}_1\underline{rf}_1$, segregating for the full restorer gene from WG3, has been carried along also, with the same selection.

In each winter generation (Florida) all backcrosses segregate approximately 1 sterile to 1 "fertile". The "fertiles" given by the partial restorer sources usually are class 4, with class 5 being of normal full fertility. The fertiles with the WG3 source are, as expected, nearly all class 5.

In each summer generation the backcross with the WG3 gene continues to segregate 1 sterile: 1 fully fertile. However, the four backcrosses with partial restorer source typically have 80 - 95 per cent completely sterile plants, with the fertiles being class 3 or less (a few, weakly fertile anthers are exserted). Obviously the environment prevents most of the partial restorer genctypes from expressing themselves.

As backcrossing continues the different sources of partial restoration resemble each other more and more, in restoration strength, but it appears that the gene from one source (L) is more powerful than those from the other 3 sources, although it clearly is less powerful than the gene from WG3.

Segregations obtained in Florida, 1964-5, in BC_4, are shown in the following table:

Restorer Source	Sterile (No.)	Partially Fertile (No.)	Fully Fertile (No.)	S:"F" (No.)
B	19	18	0	19:18
G	25	17	0	25:17
L	17	14	6	17:20
M	23	16	1	23:17
WG3	11	3	18	11:21
Total				95:94

Chi square tests show no significant differences from the ratio 1 sterile: 1 "fertile" for the individual restorer sources, nor for the pooled data, and the interaction chi square is not significant. Nevertheless the WG3 gene clearly has more restoration power than any of the other four genes.

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1. DNA from maize with B-chromosomes.

Heterochromatin, that is, chromosome material showing heteropycnosis, has been reported to differ from euchromatin in coiling cycle, time of DNA replication and turnover of DNA as well as in content of identifiable oligogenes. The suggestion has been made (e.g. Herskowitz, Genetics, p. 371) that heterochromatin might differ from euchromatin in the base composition of its DNA. An investigation of this possibility was made by comparing base ratios of DNA prepared from two lines of Black Mexican Sweet Corn isogenic with the exception that one contained a variable number of largely heterochromatic B-chromosomes in addition to the 20 A-chromosomes.

DNA was extracted from the endosperm of kernels in the milk stage of development. The yield of DNA from the B-chromosome