

mutant plastids which were restored to normal functioning by one or more restorer genes brought in by the pollen parent, the F_1 plants coming from these zygotes should possess mutant plastids whose expression would be realized in F_2 plants lacking the restorer genes. The ratio of green to white offspring would depend on the number of segregating restorer genes. The selfed F_1 plants which segregated whites in the F_2 would also be crossed as the pollen parent onto lines free of white alleles. None of the F_2 's from these outcrosses should segregate for white seedlings since normal plastids were contributed by the egg parent of the P_1 generation. If these results are obtained it follows that irreversible plastid mutations are produced by *iojap* and that, even though they may be restored to normal activity by genic interaction, their intrinsic mutant quality is retained and becomes evident when the restoring alleles are lost.

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7. Disturbed ratios due to semi-lethality of etched kernels.

Ears segregating for the etched allele, which is 12 units distal to *A* in chromosome 3, often have a deficiency of homozygous etched kernels. Deviation from the expected percentage varies in different genetic backgrounds; in some, no marked discrepancy is found while in others there is a significant reduction in the number of etched kernels. Tests were made to determine if the deficiency of etched is gametophytic or zygotic in nature. Crosses of $\underline{A} \underline{Et/a} \underline{Et} \times \underline{A} \underline{Et/a} \underline{et}$ pollen gave 1 : 1 ratios for the *A:a* pair so transmission of *et* pollen is normal. Crosses of $\underline{A} \underline{Et/a} \underline{et}$ by a *Et* pollen also gave 1 : 1 ratios for *A:a* so *et* megaspores are fully viable. However, the crosses of $\underline{A} \underline{Et/a} \underline{et}$ by $\underline{a} \underline{et}$ showed that the deficiency of etched kernels is due to the deleterious effect of *et* on kernel development—i. e., etched acts as a semi-zygotic lethal. Etched kernels may abort early in development.

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8. A test for recombination between the \underline{bt}_1 and \underline{sh}_3 alleles in chromosome 5.

Although the recessive mutants \underline{bt}_1 and \underline{sh}_3 differ markedly in their effect on kernel development, they are allelic. The compound $\underline{bt/sh}$ is similar in phenotype to *sh* homozygotes. The phenotypes produced by the two mutants are so unlike that their allelism was unsuspected for some time and was accidentally revealed through a chance cross of the two mutant strains. Differing as they do in