that the germplasm of the diallel should respond within a few cycles of mass selection.

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2. Measurement of pollen grain size in the diallel.

The same diallel used to study the inheritance of maturity was also used for an investigation of diameter of pollen grains. Bulk pollen samples from maturing plants in each plot were collected by tapping the tassels over a petri dish. The pollen was suspended in acetocarmine stain solution and examined with a light microscope. Diameters of at least 50 grains per plot with the grains randomly oriented in the microscope field were measured with an ocular micrometer. The data were analyzed in ocular micrometer units without transformation to metric scale.

A preliminary analysis of variance indicated highly significant differences among the parents for both general and specific combining ability effects. Also, the analysis of Wr,Vr indicated homogeneity of that statistic over arrays. However, upon proceeding further with the analysis it was evident that the genetic partitions of the components of variation did not differ significantly from zero. These components are shown in Table 7.

Table 7

Component	Estimate	Standard error
D	-0.2175	2.1563
F	-4.7487	4.9752
H1	2.7980	4.5899
H2	2.6978	3.9009
LOWH2	-0.5152	2.6111
D-H1	-3.0154	3.8595
E	4.2276	0.6501

Thus, despite the fact that the parents were selected to provide a maximum range of expression in pollen grain diameter, the differences observed in 1972 were not sufficiently large to permit a genetic analysis. Banerjee and Barghoorn (Maize Genetics Coop. News Letter 45:244-245, 1971) reported that position of the flower on the tassel, size of the anthers, time of anthesis and anther dehiscence and water deprivation cause variability in maize pollen grain size. Rumbaugh and Whalen (Maize Genetics Coop. News Letter 46:171-172, 1972) noted real differences in pollen grain size when the same plants were sampled on successive days. The results of the 1972 research indicated the sensitivity of this trait to environmental influences and the difficulties inherent in a genetic analysis of pollen grain size.

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1. Linkage relations of opaque-7 with marker loci in linkage group 10.

Linkage relations of the opaque endosperm, high lysine mutant previously reported to be in linkage group 10 (M.N.L. 45: 184, 1971), and now designated opaque-7, have been determined in testcrosses involving the marker loci : R (aleurone color), M^{st} (modifier of Stippled), G_1 (plant color) and Lc (leaf color). The locus of opaque-7 is situated about 25 recombination units to the right of the R locus on the linkage map of chromosome 10.

In testcrosses of $R^r o_7 / r^g o_7$ heterozygotes, the recombination value varied from .224±.02 to .333±.01. Differences in recombination value between families were significant and there was a significant tendency for recombination in microsporogenesis to be more frequent than recombination in megasporogenesis. Recombination values of .244±.02 and .264±.02, .245±.01 and .333±.01, .296±.01 and .319±.01 among female and male gametes,