seedlings were observed in the M_1. In the selfed progeny, a colorless sugary seed, which could be due to simultaneous mutations at three different loci *A*$_1$ *Y*$_1$ *Su*$_1$, and four normal colorless seeds, which could be due to simultaneous mutations at two loci *A*$_1$ and *Y*$_1$, were observed. These observations suggest that hydrazine may induce recessive mutations at specific loci even in the M_1.

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6. Position of the purple gene (Pr/pr) in gene action sequences of anthocyanin biosynthesis.

The U.V. absorption spectra of the alcoholic extracts of aleurone tissue of *a*$_1$, *a*$_2$, *c*$_1$, *c*$_2$, *r* testers and homozygous double recessive mutants of *a*$_1$ *pr*, *a*$_2$ *pr*, *c*$_1$ *pr*, *c*$_2$ *pr*, and *in pr* were compared.

All the single and double mutant extracts gave the same absorption maxima, i.e. 320mu, 286mu, and 275mu, with the exception of *a*$_1$ *pr* and *a*$_2$ *pr*, which gave 308mu and 310mu respectively in addition to 286mu and 275mu. The spectral pattern of tissue extracts of *pr* differs from *Pr* extracts only in the *a*$_1$ *pr* and *a*$_2$ *pr* combinations whereas in combination with *c*$_1$, *c*$_2$, *in*, and *r* the pattern is the same. This might suggest that the *Pr/pr* locus actively controls the nature of the accumulated substance(s) only in *a*$_1$ and *a*$_2$, if the spectral pattern and absorption maxima are controlled by the *Pr/pr* locus in the aleurone tissue. Thus, *Pr/pr* may act prior to *A*$_1$ and after *R* in the gene action sequence (MNL 36:62, 1962).

It is possible that the *Pr/pr* locus, which controls the hydroxylation of the B-ring, may not necessarily shift the observed absorption maxima and/or spectral pattern.

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7. Opaque-2 synthetic variety of maize.

Several Indian inbred lines were selected to incorporate the opaque-2 gene to develop hybrids (MNL 42:148, 1968). The yellow opaque-2

seed was recovered by selfing after each backcross. After two backcrosses, the yellow opaque seed were selected from CM 104, CM 105, CM 109, CM 110, CM 111, CM 201, CM 202, Eto-25-F, Eto-182, and Eto-297 to develop a synthetic variety. About 100 seed from each inbred were mixed thoroughly to randomize. These seeds were planted in isolation and free interpollination among the inbreds was allowed. The F_1 seed was harvested and yield trials in the F_2 are in progress. Studies on the incorporation of opaque-2 by the backcross method into Indian inbreds and the development of new varieties are in progress. The assessment of protein quality and quantity in these varieties is in progress.

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1. Adaptation of maize cultivars under South African conditions.

The research project was motivated by the need for greater reliability in determining maize cultivar adaptability in the different maize areas of South Africa. Data from South African cultivar trials, which were carried out during the four seasons 1965/66 to 1968/69, were used for further analysis. Various methods were used and computor programs which facilitated analysis have been developed.

The regression lines of specific cultivar yield over mean yield of standards were represented graphically and, on testing, found to be linear. Basically six types of lines can be differentiated, namely:

1. lines with a negative regression coefficient and an intercept of nought,
2. lines with a positive regression coefficient and an intercept of nought
3. lines with a positive intercept and a negative regression coefficient,