

5. An indication of genic interaction in maize.

In the local hybrid maize breeding program an effort was made to test all possible crosses of the elite white lines. As these single crosses were tested over a period of four years, each trial contained approximately 30% duplications from other seasons in order to standardize the results.

This method gives rise to some inaccuracy due to gene-environment interaction, but, as the main purpose was a preliminary screening of possible double hybrids, it was felt that the method would be adequate for our needs.

Two complete diallels were compiled from the available data: (1) a 19 x 19 diallel consisting only of lines derived from the variety Pretoria Potchefstroom Pearl and (2) a 23 x 23 diallel containing the above lines together with lines from other sources.

The expected yields of the single crosses according to an additive scheme were calculated as $1/2$ (average of all the single crosses + the sum of the average effects of the two parents).

If the genic effects are predominantly additive, the distribution of the deviations from the expected yields should not differ significantly from a normal curve. As the deviation from a normal distribution was significant in both cases, P being between .02 and .05 in the first case and smaller than .01 in the second case, it would seem that genic interaction (either intra- or inter-allelic or both) is important in breeding for yield in maize.

J. M. P. Geerthsen
Department of Genetics

UNIVERSITY OF PUERTO RICO
Mayagüez, Puerto Rico
Agricultural Bio-Sciences Division
Puerto Rico Nuclear Center

1. Experiments utilizing radiation in a paramutation program.

A series of experiments have been started to investigate the pre-paramutant and postparamutant effects of radiation. Alterations of the (R^r) paramutant types and the (R^{st} , R^{mb}) types that induce paramutation are being studied. The induction of mutations of R^{st} by gamma and neutron irradiation is also being done and the spectrum of alterations of paramutability will be determined.

A collection of South American races which have variegated aleurones has been made for inclusion in a paramutation program being initiated. The original seeds have been classified for the type of pattern they exhibited using the stippled (R^{st}) and mottled (R^{mb}) types as the code. The following races included seeds of one or both patterns: