

If the breeder chooses to select on the basis of female plant or plants performance in the inter- and testcrossing blocks a maximum of only two years per cycle is involved.

Preliminary to the initiation of a program utilizing the rapid method, the following projects are planned:

1. To observe and test reciprocal crosses of white inbreds of different origin with yellow inbreds of different origin to examine the complexities of separating intercrossed and testcrossed seed.
2. To measure the combining ability of crosses within and among yellow and white lines to determine the relative merits of these sources of germ plasm.

A. Forrest Troyer

UNIVERSITY OF PRETORIA
Pretoria, Union of South Africa
Department of Genetics

1. Cytoplasmic factors and pollen tube growth of Zea mays, L.*

Competition of pollen tube growth is provided by making use of pollen mixtures from yellow and white sources (M. N. L. 1958). In this investigation the reaction of cytoplasm of the well known American Inbred 33-16 was subjected to further tests. Evidence obtained from the testing of pollen originating from single crosses where 33-16 functioned respectively as maternal and pollen parent, support the assumption previously made (M. N. L. 1958), that the deficiency in the performance of 33-16 pollen tubes in pollen mixtures is due to cytoplasmic factors. A significant heterogeneity in the ratios realized was observed when different maternal parents were used suggesting a strong maternal effect. This was also apparent, but to a lesser extent within inbreds of long standing which could be regarded as having attained a high degree of homozygosity. This study has revealed that pollen tubes are very sensitive to conditions in maternal tissue and thus may be a means to study the relative homogeneity of inbreds.

Similar results were obtained in the study of the inbred Mexico 155 and a local inbred C56.

* (In press, Proceedings of the First South African Genetic Congress, University of Pretoria, 1958).

J. D. J. Hofmeyr