1. Cytoplasmic pollen sterility.

The experiment of 1951 as previously reported (Maize News Letter 1952) was continued on a limited scale. A preliminary study has been made, completing the examination of pollen samples for viability. The general result obtained continues to support a potency difference of the plasmagene. The microscopic readings also indicate a positive correlation between the size of the pollen grain and its viability. The diameter of the viable pollen grains ranged from 70-82 microns whereas the range of non-viable ones was between 40 and 45 microns.

The high potency of Ky 21 as a fertility-restorer over Minn. A 71 and Wis. W9 is re-confirmed. In single crosses of Ky 21 with Iowa $I205^{t}$ the percentage of viable pollen grains was 94.8% whereas those of crosses between $I205^{t}$ and A71 and W9 were 0% and 0% respectively.

In 1951 ears were taken from plants in 4 otherwise highly sterile lines that showed a relatively high percent of pollen shedding. Seed from these ears was planted in 1952. The percent of pollen viability of these plants on the average shows a significant regression toward sterility and also a polymodal distribution pattern. This is an agreement with the postulation advanced by Gabelman that pollen abortion was due to a particulate cytoplasmic factor and that the presence of one or more of these cytoplasmic particles in the microspores resulted in their failure to form functional pollen.

A limited experiment designed to test the transmission of sterilizing plasmagenes through the pollen grains of the restored single crosses also has been continued. The restored plants ($C106^{ts}$ x Ky21) were used to pollinate a normal fertile inbred (C106). The $S_1$ of the three-way cross showed no significant difference from the $S_0$ as far as pollen viability is concerned. The experiments will be continued in 1953 and the preliminary studies made in 1952 will be reported later in greater detail.

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