

10. Vivipary induced by a fungus.

Several years ago while studying the comparative ear rotting effect of different isolate strains of Diplodia maydis, we noted that two isolates obtained from Dr. Arthur L. Hooker of the University of Illinois produced premature germination (vivipary) of kernels on the diseased ears. In 1967 a replicated experiment was conducted with five isolate strains including the original two isolate strains that induced vivipary. Inoculum laden toothpicks were inserted in the center of each ear of the single cross K4XB2, approximately 20 days after 50% of the plants had silked. At harvest it was found that ears inoculated with the two isolates exhibited 100% vivipary. The strains inducing vivipary also were milder in their attack on these ears. Kernels which germinated were located in the region of recent infection, but not where infection had already destroyed the kernels. We suspect that the two isolates may synthesize some hormone or enzyme which breaks the normal dormancy of the embryo.

M. S. Zuber
O. H. Calvert
M. G. Neuffer

NATIONAL COLONIAL FARM
Accokeek, Maryland

1. The National Colonial Farm.

The National Colonial Farm is destined to become a working colonial farm of about the period 1750, with crops and livestock of the period. Since maize was an important colonial crop it will be one of the main crops of the colonial farm. Items regarding maize grown at the Farm appear below.

2. Reconstitution of Dent corn.

Virginia Gourd seed and Northern Flint varieties are being grown in an attempt to reconstitute by crossing and selection the Dent types grown so widely. Fortunately we were able to obtain Virginia Gourd seed from Dr. William Brown at the Pioneer HiBred Seed Company, and the Northern Flints from the Cornstock-Ferre Seed Company in Wethersfield, Connecticut.

3. A reconstituted Golden Bantam Sweet Corn.

Crosses of Black Mexican sweet corn and Canada Flint are expected to produce a yellow sweet corn similar to the old 8 Row Golden Bantam.

4. Gaspé Flint--world's earliest corn?

In 1966 we obtained seed of Gaspé Flint from Dr. Robert I. Brawn, MacDonald College, Quebec. Plants from an August 2 sowing produced pollen on August 27, just 25 days after putting dry seed in the ground. The F_1 plants between this Flint and Virginia Gourdseed were much nearer the Gaspé than the Gourdseed in maturity. This study is being continued. Efforts will be made to obtain F_2 plants comparable in maturity to Gaspé Flint.

5. Seed irradiation studies.

Seed irradiation studies are continuing. In 1967, seeds of the B14 inbred were treated by Dr. Robert Briggs at the Brookhaven National Laboratory, and an isolated open pollinated field grown at the National Colonial Farm in Accokeek, Maryland. Many self-pollinations will be made in 1968 to test the effectiveness of inducing mutations in maize seed. This method should be applicable to all open pollinated crops.

W. Ralph Singleton

UNIVERSITY OF NEW HAMPSHIRE
Durham, New Hampshire

1. A dosage effect at the Ht locus.

The Ht gene conditions chlorotic lesion resistance to northern corn leaf blight. In a program directed toward the study of gene dosage at the Ht locus, we were able to obtain monoploid, triploid, and tetraploid seed from diploid Ht Ht and ht ht stocks. As a result, we were able to test one, two, three, and four doses of both the Ht and ht alleles for disease reaction. The diploid stocks were secured from Dr. Albert L. Hooker of the University of Illinois in Urbana. Lines R223 and 65:225-1 are homozygous Ht. W153R is homozygous ht. Lines 65:225-1 and W153R are isogenic. Most of our data were obtained from R223 and W153R. Experiments now in progress are aimed at testing the dosage levels in the isogenic material.

Putative monoploids were detected by crossing purple embryo marker as pollen parent to the diploid lines. The kernels with purple endosperm and non-purple embryos were saved. Monoploids were confirmed by chromosome counts on growing root tips. Tetraploid seedlings were obtained by means of Shaver's "decapitated root" technique (Maize Genetics Newsletter 38: 21-22). Triploids were obtained from tetraploid x diploid crosses.

Plants on the four dosage levels were inoculated at the three-four leaf seedling stage with spore suspensions of the pathogen, Helminthosporium turcicum. Seedlings were incubated for 18 hours at 20°C and 100% humidity. The degree of infection was determined by measuring the total area of the fourth leaf, and then the area of that leaf covered with lesions. The per cent infection was calculated as follows:

$$\frac{\text{Infected area of leaf}}{\text{Total area of leaf}} \times 100$$

Monoploid and diploid seedlings, carrying one and two doses of Ht, showed no significant difference in degree of resistance. Triploid and tetraploid seedlings, carrying three and four doses of Ht, did not differ significantly. However, three and four doses of Ht conferred a significantly higher level of resistance than did one or two doses. The heterozygote (Ht ht) was less resistant than the n-2n class, although this difference was not statistically significant. However, heterozygous seedlings were significantly less resistant than the 3n-4n class.