

plants, shading of the apical meristem enhanced development of photosynthetic tissue.

These observations suggest that albescent plants can produce functional photosynthetic tissue by means of a light-requiring pathway. Inhibition of greening by red or blue light would seem to correspond to photodestruction of protochlorophyll in the absence of sufficient carotenoids. Transverse green bands found at times on field-grown albescent plants are apparently produced when the apical meristem is below the soil surface with the emerged foliage acting as a light filter. There is a striking parallel between albescent responses noted here and the light requirement for carotenoid formation in *Neurospora* reported by Zalokar (Arch. Biochem. and Biophys. 56: 318-325. 1955).

Carol Sander
William D. Bell

THE PENNSYLVANIA STATE UNIVERSITY
University Park, Pennsylvania
Department of Plant Pathology

1. Genetics of resistance to Maize Dwarf Mosaic Virus.

The inbred Pa. 11 has exhibited a high degree of resistance, but not immunity, to the Ohio Type Strain of M.D.M.V. in both greenhouse and field trials. Repeated inoculations of Pa. 54 (susceptible) x Pa. 11 have failed to produce symptoms. The virus has not been recovered from this single cross after repeated inoculations.

Of 988 seedlings of the single cross selfed, following two inoculations, 659 were symptomless; the remaining 229 were infected. Of the infected, 24 showed symptoms as broad bands (tolerant) but these were classified as susceptible. No distinction in symptom severity of the other 205 susceptibles was observed. The X^2 probability for a 3:1 segregation is 0.25.

Pa. 32 shows resistance to M.D.M.V. in the seedling stage and in the field until anthesis. Pa. 444 (Pa. 54 x Pa. 11) (Pa. 32 x Pa. 33 susc.)⁷ was selfed and the S_1 seedlings were inoculated to determine if the genetics of resistance of Pa. 32 was similar in expression to that of Pa. 11.

816 seedlings were classified for reaction to M.D.M.V. as follows: 362 symptomless, 170 mildly infected, 224 moderately infected, 30 severe and 30 showed symptoms as broad bands. No simple segregation ratios could be fitted to the data.

However the data indicate that the inheritance of resistance is not so complicated that the back-cross method of transferring resistance could not be used.

C. C. Wernham
D. R. MacKenzie

PIONEER H1-BRED CORN COMPANY
Department of Plant Breeding
Johnston, Iowa

1. Partial restorer and full restorer genes in a common genetic background.

Four partial restorer inbreds, each having a partial restoring gene allelic to Rf_1 , but of less restoring strength, have been crossed to SK2-T, of genotype $rf_1rf_1Rf_2Rf_2$. SK2 has a full complement of modifying genes for Rf_1 . Each cross has now been backcrossed (as female) to SK2 6 or 7 times, selecting fertile plants in each generation. As a control, SK2-T Rf_1rf_1 , segregating for the full restorer gene from WG3, has been carried along also, with the same selection.

In each winter generation (Florida) all backcrosses segregate approximately 1 sterile to 1 "fertile". The "fertiles" given by the partial restorer sources usually are class 4, with class 5 being of normal full fertility. The fertiles with the WG3 source are, as expected, nearly all class 5.

In each summer generation the backcross with the WG3 gene continues to segregate 1 sterile: 1 fully fertile. However, the four backcrosses with partial restorer source typically have 80 - 95 per cent completely sterile plants, with the fertiles being class 3 or less (a few, weakly fertile anthers are exerted). Obviously the environment prevents most of the partial restorer genotypes from expressing themselves.

As backcrossing continues the different sources of partial restoration resemble each other more and more, in restoration strength, but it appears that the gene from one source (L) is more powerful than those from the other 3 sources, although it clearly is less powerful than the gene from WG3.

Segregations obtained in Florida, 1964-5, in BC_4 , are shown in the following table: