

It is hoped that such a study will yield more information on the nature of variation in these traits and also help us to select additional traits for a thorough characterization of inbred lines. Further, this study has an important bearing on the problem of choice of material (inbreds or hybrids) for experimental studies, especially for evaluating the effect of different factors on growth and development including the meiotic events. This point will be elaborated elsewhere.

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### 1. Photoresponse of albescent maize.

Wrapping the bases of stems of young, field-grown al/al plants with aluminum foil proved useful in prolonging the period during which green tissue was produced. Plants with the typical albescent top reverted to the production of green foliage after a 15-cm length of aluminum foil was secured to shade the bases of such plants. Following treatment, the greening response was evident within 48 hours in the tissue just emerging from the leaf rolls. Most responsive to the treatment were those albescent plants which had produced the most green tissue in the lower leaves. This technique should be of use whenever al/al pollen is required; treated early, albescent plants would probably produce enough green foliage to sustain a moderate seed set.

Green tissue produced on al/al plants appeared in thin-layer chromatographic separations to have carotenoid and chlorophyll complements similar to those of +/al foliage. Illuminated al/al seedlings also contained a component in the white tissue with an absorption peak near 340 m $\mu$ , tentatively identified as phytofluene. Dark-grown al/al and +/al seedlings contained similar amounts of protochlorophyll. Dark or brightly illuminated albescent seedlings failed to develop a content of carotenoids equivalent to that of heterozygotes. On the other hand, in dim light, somewhere below 0.06 m watt/cm<sup>2</sup>, total pigment content of al/al seedlings approached that of heterozygotes. Red or blue light under higher intensity illumination appeared to be most effective in preventing pigment accumulation whereas a green cellophane filter allowed moderate pigment formation. In seedlings as in field-grown

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).

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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.)<sup>7</sup> 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.