

11. Inheritance of reaction to Diplodia and Gibberella stalk-rot fungi.

Two single crosses involving susceptible by resistant inbreds, A239 x E11 and A427 x E10, are being used in this study. The parental inbreds, F_1 , F_2 and first backcross generations were infected by the toothpick method and their reaction recorded after splitting the stalks. Powers' partitioning analysis will be used to analyze the data.

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12. Components of genetic variance for ear number.

Information concerning genetic variability and inheritance of traits that may contribute to grain yield is important in selecting for maximum production. The within population variance for ear number is being estimated for the five inbred lines, B14, Oh43, W22, M42 and A547, and the F_1 , F_2 , first backcross and second backcross generations derived from single crosses between these lines. Estimates of additive and dominance genetic variance will be made following general procedures first given by Mather (Biometrical Genetics, Dover Publications, 1949).

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1. A possible new knotted leaf similar to the original was found in an advanced generation from an F_2 ear of Dixie 18 double cross. It differs from knotted leaf only in the time and manner of expression. The character is not expressed on the leaves below the first visible ear shoot nor on the terminal leaf, and only from the ligule to approximately the mid-point of the affected leaves. Studies of the character are in progress.

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2. A new ear mutant in the form of an appendage ear was attached to the end of the main ear. The appendage was completely inverted to form a structure similar to a geode with seeds on the inside. The silks grew out through the end of the structure where they could be pollinated. In the following generation the inverted appendage ear was again observed, and some of the main ears showed signs of starting to invert near the apex.

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