

5. Relative importance of genetic and nutritional factors in influencing susceptibility of corn to stalk rot caused by Gibberella-zeae (Schw.) Petch.

A study was conducted during 1953 and 1954 to determine the effect of varying levels of nitrogen and potassium on the occurrence of stalk rot of corn in divergent genetic material. In general, increasing levels of nitrogen tended to increase the amount of stalk rot while increasing amounts of potassium tended to decrease the amount of stalk rot. The data indicated that heavy applications of potassium can, in part, overcome the effect of excessive nitrogen levels. For those hybrids which were highly susceptible to stalk rot, differences were shown in the severity of the disease, but the disease was by no means controlled by differential applications of fertilizers. The more resistant hybrids showed smaller amounts of stalk rot when grown on soils with balanced levels of nitrogen and potassium, but tended to become more rotted as the nitrogen was increased or as the potassium level was decreased.

Six single-cross hybrids were grown at various fertility levels in 1953. Three hybrids, one resistant, one intermediate, and one susceptible to the disease were grown in 1954. The hybrids are listed below with the average percentage of stalk-rotted plants for each year.

Hybrid	Percentage stalk-rotted plants	
	1953	1954
Ohio 51A X Iowa B8	8.1	21.2
Ohio 26 x Ohio 51	15.9	
N.Y. 2 X N.Y. 1	37.5	
N.Y. 3 X Idaho D50	39.3	83.9
N.Y. 3 X N.Y. 4	56.7	
Ill. A X Wise. W23	85.8	94.5

The results infer a genetic basis for resistance to the disease, and indicate that resistant commercial hybrids may be developed by using proper procedures.

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