RESISTANCE OF CORN STRAINS TO THE CORN EAR WORM
RALPH A. BLANCHARD, JOHN H. BIGGER, AND RALPH O. SNELLING

THE corn ear worm (Heliothis armigera Hbn.) is responsible for some loss to field corn in the southern part of the Corn Belt almost every year. During occasional years the injury due to this insect is general throughout the Corn Belt. The relatively low value of the crop per acre precludes the possibility of reducing damage by the application of insecticides or by other direct control methods. The development and use of resistant hybrids seems, therefore, to be the most promising means of materially reducing ear worm damage to dent corn.

Differences among corn strains in the damage they suffered from the corn ear worm have been observed by various workers. Early observations have dealt largely with open-pollinated corn varieties or double-cross hybrids. During recent years, however, inbred lines and single crosses have been studied, and it is now believed that the status of inbred lines as ear worm resistant parents can be best determined by testing them in series of single crosses. Data presented here were obtained at three locations in Illinois during the period of 1937 to 1939.

METHODS

In 1937, the plots were located near Urbana in east-central Illinois. The strains were grown in single rows, 10 hills long, and each strain was replicated four times in randomized blocks. Fifty-one inbred lines and 69 single crosses were studied. Five newly hatched ear worm larvae were placed on the silks of each of several ear shoots of each strain to assure an adequate infestation. The natural infestation further increased the number of ears damaged as well as the severity of the damage.

In 1938, plantings were made at Urbana and also at McClure, in the extreme southern part of Illinois. The Urbana plots consisted of duplicated single rows, 10 hills long. Several ear shoots of each entry were hand-infested with five newly hatched larvae per shoot. The McClure plots were triplicated single rows, 10 hills long.

In 1939, the tests were conducted at McClure. The inbred lines were compared in single-row plots, 10 hills long, replicated four times. The single crosses were planted in 2 X 10-hill plots, replicated five times. Natural infestation was depended upon for data from the McClure plots both years.

The ear worm causes injury to the ears at two stages of growth, the developing ear and the maturing corn. The stage of maturity of the corn at the time infestation occurs determines the type of damage. Since the ear worm moth prefers fresh corn silks for oviposition, the damage to the developing ears is more general than damage to corn that is more mature. However, during dry, warm fall seasons

1Cooperative investigations by U. S. Dept. of Agriculture, the Illinois Natural History Survey, and the Illinois Agricultural Experiment Station, Urbana, Ill. Received for publication January 13, 1941.
2Entomologist, Bureau of Entomology and Plant Quarantine, U. S. Dept. of Agriculture; Associate Entomologist, Illinois Natural History Survey; and Associate Agronomist, Bureau of Plant Industry, U. S. Dept. of Agriculture, respectively. The writers express appreciation to J. M. Magner and A. F. Satterthwait for aid given in judging the corn.