

EUROPEAN CORN BORER OCCURRENCE IN NORTH DAKOTA

by

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The first record of European corn borer occurrence in North Dakota was from near the eastern border, at Hillsboro (Traill County), on August 12, 1946. For that year and the two years following, the pest spread slowly and caused no loss of economic importance. By the summer of 1948 a few specimens were collected at Jamestown, which was an advance of about 100 miles westward, but there was no further advance to the north. Up to this time the one-generation strain predominated. During 1949 however, the two-brooded or two-generation strain came into prominence.

In 1949 the borer spread more than 100 miles further west and north than previously recorded in the state. A recent survey conducted jointly by the North Dakota Agricultural Experiment Station and Extension Service shows the borer to be now established in all of the eastern counties, and extending westward fully two-thirds of the way across the state.

The rapidity and extent of this spread in 1949 was apparently due to the dominance of the two-brooded strain and the prevailing southerly winds of the past season which aided the moths in their dispersal.

The damage caused in 1949 was due largely to the second brood. This was confirmed by observations conducted on plantings of sweet corn at several widely distributed points in North Dakota during mid-summer when the first brood was maturing, and again in the same locations in the fall when the second brood was in the larval stage. At Bismarck, Fargo and Northwood examination showed the maturing larvae and pupae to be present in about two per cent of the stalks in mid-summer. A fall check-up of the same plots showed an average of 88 per cent of the stalks infested. The increase represented the second generation which had developed since mid-summer.

Lighter infestations however, usually prevailed in field corn. Most reports of corn borer activity were received in late summer as further evidence that borers were not sufficiently abundant until then to attract much attention.

Field observations conducted during the fall of 1949 indicated a wide variation in the condition of the hibernating larvae. In the northern counties fully 80 per cent of the borers appeared to be too immature to survive the winter, but in the southern counties most of the larvae had advanced to a satisfactory stage of development for wintering. Most of the larvae were found in the lower one-third of the stalks.

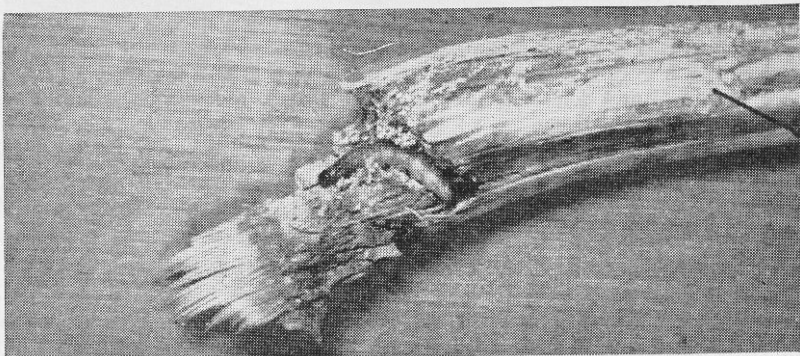
To determine to what extent that parasitism might possibly be present, collections of 50 larvae were made from each of the following places in North Dakota: Binford, Bismarck, Ellendale, Fargo, Hamilton,

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Mapleton, Michigan, Minot, Northwood and Valley City. The collections were forwarded to the European Corn Borer Laboratory, U. S. Bureau of Entomology & Plant Quarantine, Moorestown, New Jersey, for observation.

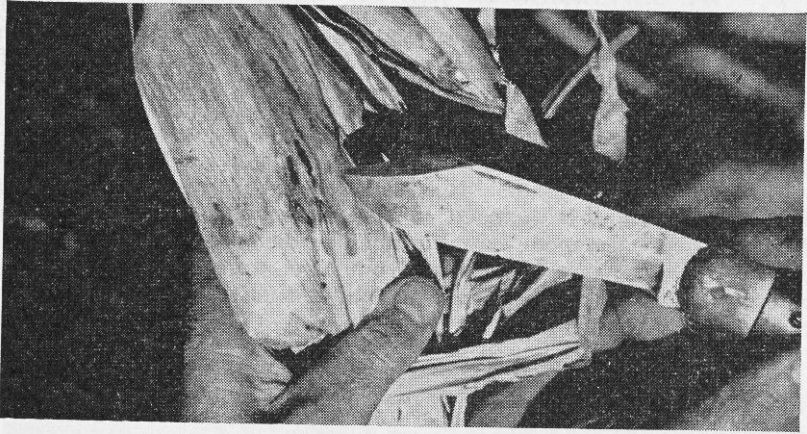
The losses caused by European corn borer are due largely to the reduction in yield from the feeding and boring of the larvae into the plants, the weakened stalks breaking over in the wind, and the ears falling to the ground as a result of borer tunneling. During the fall of 1949, at harvest time, an examination of fallen ears in borer infested fields in the Red River Valley showed 90 per cent of those which had broken away from the stalks to have had their shanks weakened by borer damage.



Corn borer larva invading a corn stalk.



Weakened ear shank as the result of corn borer injury.

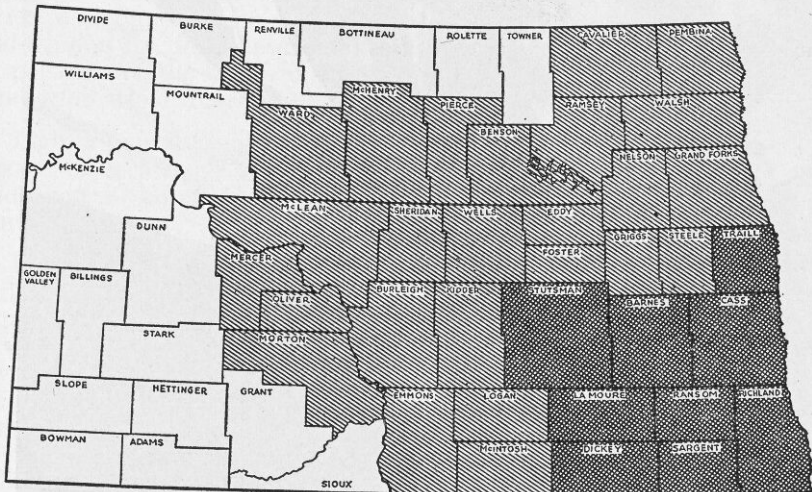


Knife points to holes made by the borer larvae.

Borer damage to the ears exposes the developing kernels to the organisms which cause mold and rots. The presence of the larvae in sweet corn detracts from its market value and table use.

CORN BORER LOSS IN NORTH DAKOTA

A conservative estimate, based on evidence that one borer per stalk causes a three per cent reduction in yield, indicates that European corn borer caused a loss of 325,560 bushels of corn in North Dakota in 1949. Computed on the basis of the October 15 price of 96 cents per bushel, this represents a monetary loss of \$312,537.60.



The heavily shaded southeastern counties indicate the spread of the European Corn Borer in North Dakota prior to 1949. The lighter shaded area indicates its spread in 1949.

A survey based on the examination of four to twelve fields at fairly well distributed points in each of the counties shows the borer population to have averaged 65 larvae per 100 stalks in the eastern or Red River Valley counties, as contrasted with only five borers per 100 stalks in the counties marking its westward spread in North Dakota.

The prevalence of European corn borer in North Dakota, while objectionable, is not believed to be a serious threat to corn production provided adequate steps are taken in meeting the situation.

Once the borer becomes established in a corn growing area it is unlikely that any type of applied control will be anything more than a partial check on the pest. Of the various measures, clean plowing in fall or early spring to bury the stalks which harbor the larvae, to prevent their escape as moths, is considered most effective when done on a widespread basis. Making silage of the corn and not allowing stalks to remain exposed around farmyards and gardens are also of importance in checking the pest.

Stalk shredding and chopping machines are occasionally used to kill the larvae and to aid in clean plowing. A checkup on results obtained on a field near Mapleton where one of these machines was used during the fall of 1949 showed about 85 per cent of the overwintering borers to have been destroyed. It was evident that the main advantage of this pulverizing or crushing action was to insure clean plowing and prevent the stalks from being harrowed to the surface in spring tillage operations.

In other north central and eastern states where the borer problem has been more severe and of longer standing, insecticides have been used to advantage in combatting the pest. Both DDT and Ryania dust have been used for the purpose.

Various state and federal experiment stations are endeavoring with a fair degree of success to develop varieties of corn which stand up fairly well and produce satisfactory yields in the midst of heavy infestations. There are, however, no varieties known to be immune to the borer.

Acknowledgements

Appreciation is expressed to the county extension agents who reported on their field observations for their respective counties; to Royce B. Knapp for collections of corn borer larvae from Binford and Minot; to Amos Mallow for the collection of larvae from Ellendale, and to members of the Experiment Station staff who reported on their findings.

After declining steadily from the 10,517,000 peak in 1945, North Dakota's chicken population started a comeback in 1949. Farmers raised 7,434,000 birds this year, up from the 1948 low point of 6,409,000. In 1948 cash receipts from sale of chickens, plus value of chickens used on the farm, totaled \$6,720,000—slightly more than a dollar per bird. This does not include income from eggs. North Dakota's poultry income in the past decade was lowest at \$1,146,000 in 1938 and highest at \$8,130,000 in 1943, reports C. J. Heltemes, USDA agricultural statistician.