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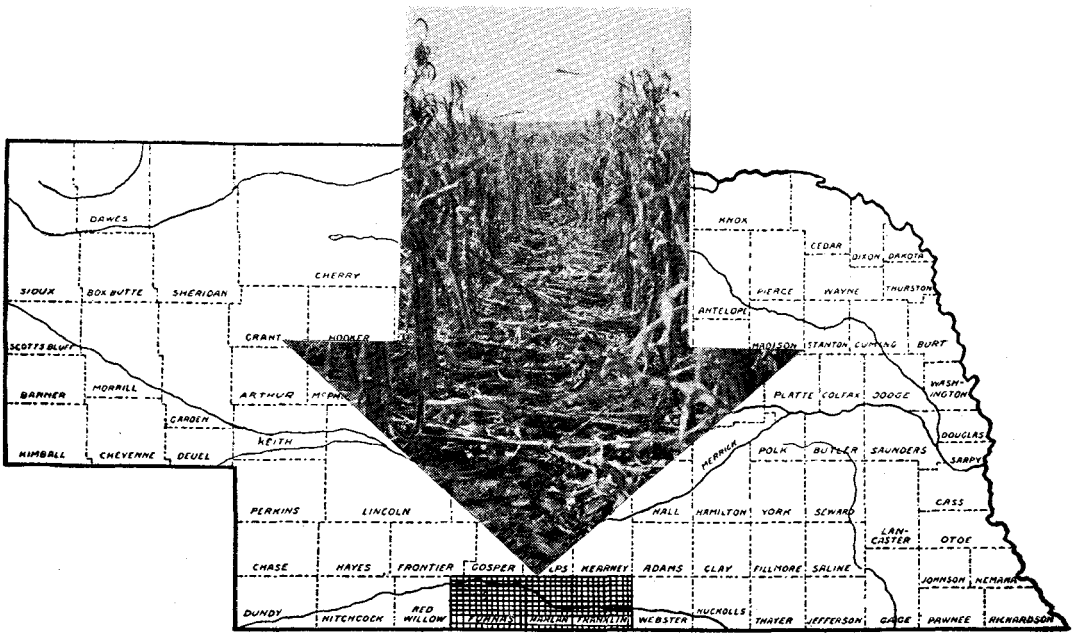
The Southwestern Corn Borer

H. DOUGLAS TATE and O. S. BARE



Map shaded to show counties infested with Southwestern corn borer in Nebraska **in 1943 and 1944.**

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The Southwestern Corn Borer[1]

H. Douglas Tate * and O. S. Bare **

The southwestern corn borer was found in south central Nebraska for the first time in the fall of 1943. Whether or not this pest will be able to establish itself in Nebraska cannot be determined at present, but preliminary evidence indicates that it is a threat to corn production in this state. In certain areas having climatic conditions favorable for the development of this insect, it has proved to be one of the most destructive corn pests known. Because of its damage, growing corn has been practically abandoned in some localities.

ORIGIN AND PRESENT DISTRIBUTION

The southwestern corn borer is believed to have crossed the Mexican border into Texas, Arizona and New Mexico in or before 1913. By 1931, it had spread into the Panhandle of Oklahoma, southeastern Colorado and southwestern Kansas. During the drouth of the 1930's when relatively little corn was produced in southwestern Kansas, the borer made no further advance to the northeast; in fact it disappeared from Kansas during that period. In 1941 it again showed up in southwestern Kansas, and since then has spread across the state to become established in several north central counties bordering Nebraska. A light infestation was found in a few south central Nebraska counties in 1943. Observations in 1944 did not indicate any increase over the previous year in this state. Our low winter temperatures may be a limiting factor in the southwestern corn borer's spread northward.

PLANTS ATTACKED

In Kansas it has been found to attack corn, including field corn, sweetcorn, popcorn, and sorghums, both forage and grain types. Infestations in sorghum, broomcorn and sudan grass have been too light to be of economic importance. Farther south, it feeds to some extent on broomcorn, sudan grass, and a few other kinds of plants, in addition to corn and sorghum.

Fig. 1. Summer larvae (borers) showing spots.

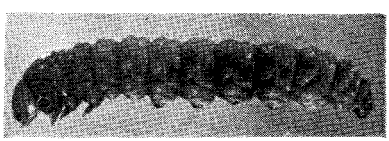

Fig. 2. White overwintering larvae (borers).

[1] *Diatraea grandiosella* Dyar, different from the European corn borer.

* Chairman Dept. of Entomology. ** Extension Entomologist.

GENERAL APPEARANCE OF INSECT

Adults of the southwestern corn borer are moths that are soiled white to pale yellow in color and about three-fifths to three-fourths inch long. They fly mostly at night and seldom are seen during the day. The small white eggs are deposited singly or in chains both on the upper surface and lower surface of the leaves. Borers (larvae) are dull white in color with a regular pattern of brown or black spots (fig. 1). However, upon maturing in late summer or early fall, second generation borers lose their spots and become entirely white (fig. 2). When full grown they are 1 to 1¼ inches long. The resting stage or pupae has a typical brown color and is found within the tunnel made by the borer.

SEASONAL DEVELOPMENT

There are two generations or broods of borers per year. Mature borers or larvae of the second generation are present throughout the winter in the base of the stalks. Adult moths developing from these overwintering borers emerge during the latter half of June and deposit eggs on the young corn plants. Borers, hatched from these eggs, which are known as first generation borers, reach maturity by late July. During early August adult moths developing from the first generation borers deposit eggs for the second generation. These reach maturity by about mid-September.

DAMAGE

All parts of the corn plant are attacked by the southwestern corn borer. The young borers feed as they move down the leaves and older borers feed in the leaf whorls causing a ragged appearance of the leaves as they expand. Their attack on the terminal buds, usually by first generation borers, often results in a condition known as "dead heart" (fig. 3). Stalks with severed buds do not develop normally and frequently they produce lateral buds giving the plants a short bushy appearance. Kansas workers have reported that early planted corn is likely to be in tassel when the first generation borers appear and consequently escapes this type of injury. After becoming about half grown, the borers tunnel into the stalk (fig. 4) and they may bore into the shanks and ears.

FIG. 3. "Dead heart" caused by first generation of borers.

FIG. 4. Stalks tunnelled by borers.

Internal girdling of stalks by second generation borers late in the season is perhaps the most serious type of damage. Before going into hibernation at the base of the stalks, the borers ream or girdle the inside of the stalk usually a few inches above the ground surface (fig. 5). This may sever the stalk so that it falls immediately or it may stand for some time (see front cover). In case of heavy infestation, practically all of the stalks may be flat on the ground by husking time. This results in great waste because of the difficulty of harvesting, spoilage, and destruction by rodents and other animals.

CONTROL

Information on control measures is limited and some of the procedures suggested in other states may or may not be applicable under Nebraska conditions. Measures now being used or showing promise are:

1. Substitution of sorghum for corn. This is proving practical in Kansas.
2. Early planting. This tends to decrease "dead heart" caused by first generation borers.
3. Late fall treatment which uproots corn stubble exposing borers to the rigors of winter.
4. Plowing stubble under to a depth of at least four inches before June 1.
5. Low cutting of stalks with binder and use as fodder or silage by early September removes many of the larvae from the field.
6. Resistant varieties. There is evidence of variability among varieties of corn, but this phase of investigation is only in the experimental stage.

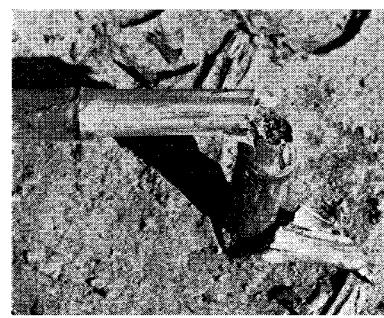

FIG. 5. Stalk broken over as a result of girdling by borer.

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