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Control of the European Corn Borer

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Discovery and Spread in the United States

The European corn borer[1] was first discovered in the United States near Boston, Mass., in 1917. How this pest gained entrance to the United States is not definitely known, but evidence indicates

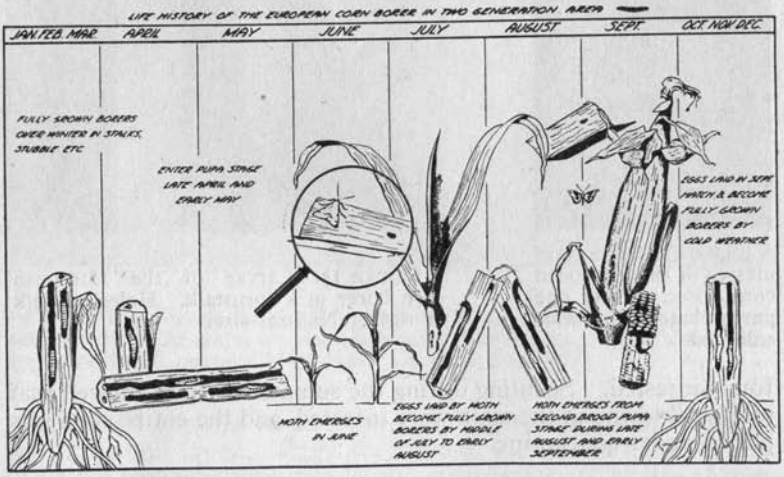

FIGURE 13. Chart showing life history of the two-generation European corn borer. (After Bureau of Plant Quarantine, United States Department of Agriculture).

that it was introduced several years before 1917 from Hungary or Italy in shipments of broom corn, which was imported in large quantities for manufacturing brooms. Since its introduction, it has spread throughout the eastern Atlantic states as far south as

[1] *Pyrausta nubilalis* Hubn.

Virginia and westward into those states and into that part of Canada bordering the Great Lakes.

The first infestation of the European corn borer in Connecticut was found in the southeastern part in 1923. Control measures by the state kept the pest confined to this section for five years. During the summer of 1928 there was a rapid spread to the westward and all the towns along the eastern border of Connecticut were

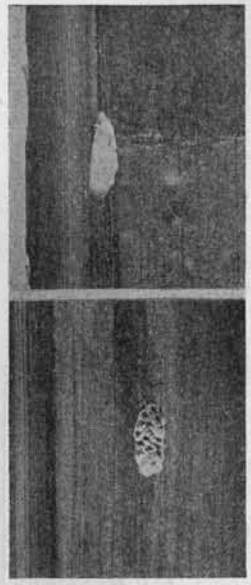

FIGURE 14. Egg-masses of the European corn borer. Lower one partly hatched. Twice enlarged.

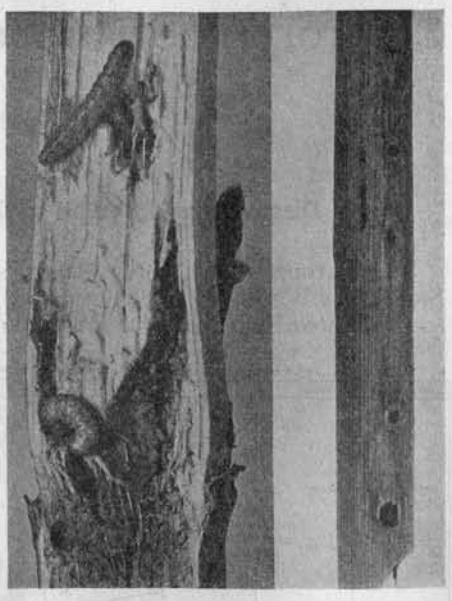

FIGURE 15. Larvae of the European corn borer in a cornstalk. Holes in stalk at right. Natural size.

found infested. Scouting during the summer of 1931 showed that nearly all towns in the state were infested, and the entire state was placed under quarantine.

Life History and Habits

The corn borer passes the winter in the larval or caterpillar stage in the stalks of corn and weeds where it has been feeding during the summer. Any stalk as large as a lead pencil may contain one or more larvae where the infestation is severe. During the latter part of April or early May the larva transforms to the pupal or resting stage. It remains in this form for about 10 to 14 days and then emerges as the adult moth. In two or three days egg laying

begins. The adult moths are strong fliers and may travel as far as 20 miles if no desirable food plants are available nearby. Female moths are capable of laying from 100 to 1,900 eggs each, although the average is about 400. The moths live for 10 to 24 days.

Eggs are usually laid on the leaves in masses of 15 to 20 eggs each. (Figure 14). When the eggs hatch, the young larvae begin to feed on leaves nearby. They soon tunnel into the stem or midvein of the host plants and complete their development inside the plants. In Connecticut, there are two generations. The first

FIGURE 16. Sweetcorn patch in eastern Massachusetts heavily infested with borers. The stalks are so weakened by the feeding of the borers that they soon break over. (After Mass. Dept. of Agric.)

generation completes its life cycle in August when moths appear for the second brood. Eggs are laid and the second brood borers spend the winter in corn, weeds, and other stalks. The life history is shown in Figure 13.

Signs of Infestation

The young borers usually attack the softer parts of the corn, that is, the upper portions of the plant. The first indication that the pest is present is the fact that many tassels are broken over by the wind. If these tassel stems are split, the borers can be found

inside. During the tunneling process, the borer pushes the frass from a hole in the side of the stem and even when the tassels are not broken, this frass, which looks like sawdust, may be found in the axils of the leaves. As the borers become larger, they work down into the heavier portions of the plant, as shown in Figure 15. When the borers are abundant, they may be found in all parts of the corn plant, which will break down as shown in Figure 16, and severe crop losses result. This condition does not exist in Connecticut at the present time and with the cooperation of all growers of host plants, these losses will be kept to a minimum.

Food Plants

Although corn is the favorite host plant, the injury caused by this insect is by no means limited to corn. Most of our common weeds are subject to attack, especially smartweed, and certain cultivated crops, such as rhubarb, beet, celery, bean, oat, millet, dahlia, aster, gladiolus, and chrysanthemum are also infested. Some of the larger grasses, such as barnyard grass, may also be infested. Hardly any plant with a stem large enough to harbor the larva is safe from its ravages. The United States Department of Agriculture in 1926 listed 224 species of plants that had been found infested in New England.

Methods of Control

This insect spends the winter in the stems of corn and various other plants. The most effective control methods yet devised aim to destroy the hosts while the borers are still in the stalks. Adult moths begin to emerge in May; therefore, it is very essential that all control operations be completed before the adult moths appear.

There are several methods of disposal of infested plants. Three of them are:

Low cutting
Plowing
Burning

Since some of the borers are present in the lower portions of the corn plant, it is necessary to cut the corn as near the ground level as possible. This may be done by hand in smaller fields by the use of a sharp hoe or, where machinery is employed, the new low-cutting attachments should be used. When corn is cut flush with the ground, it will not be necessary to plow under the low stubble that remains. Another advantage of very low cutting is that more corn stalks are available for silage. When grass or clover is sown at the last cultivation of the corn, the stalks must be cut very low so that it will not be necessary to plow under the grass in the spring.

If the corn cannot be cut flush with the ground, all stubble must be plowed under deeply before April 10 of each year. On many farms where corn is grown for seed or on truck farms where only the ears are of value, all standing stalks and weeds may be plowed under cleanly by the use of wires attached to the plow. These wires draw the stalks into the furrow so that they can be covered by the plow.

All cornstalks left on the farms in the spring should be burned. Some farmers make a practice of feeding the cornstalks to cattle during the winter, either in the field or in the barns. When fed in the fields, all uneaten portions of corn should be raked up and burned. When fed in the barn, many of the uneaten cornstalks find their way into the manure; this should be spread on the land and plowed under before the middle of April. If the corn is to be fed to cattle the ideal method of disposal is to cut the corn into short lengths and store in a silo. The cutting and fermentation that takes place in the silo will kill all the borers. All corn on the cob in corn cribs should be shelled and cobs burned. Cornstalks stored in barns should be fed out to cattle or burned by April 10. Flower stalks and weeds in the field should be destroyed either by plowing under or burning.

Summary

As the European corn borer spends the winter in the stalks and stubble of corn and also in weed and flower stalks, it is very important that by the middle of April all this plant material be disposed of either by plowing under or burning. To secure the greatest benefit from the control measures, it is necessary that all growers cooperate by cleaning up their premises. In order to insure such cooperation, the State of Connecticut has enacted certain legislation that makes it compulsory for everyone to clean up all waste plant materials by April 10 (General Statutes, 1930, Section 2125). If all the growers in the state will help in this control work by cleaning up their premises, we have every reason to believe that the European corn borer can be held in check so that corn may be grown at a profit. If the clean-up work is not done properly and at the right time, the losses from this insect may be so heavy that it will not pay to grow corn in Connecticut.