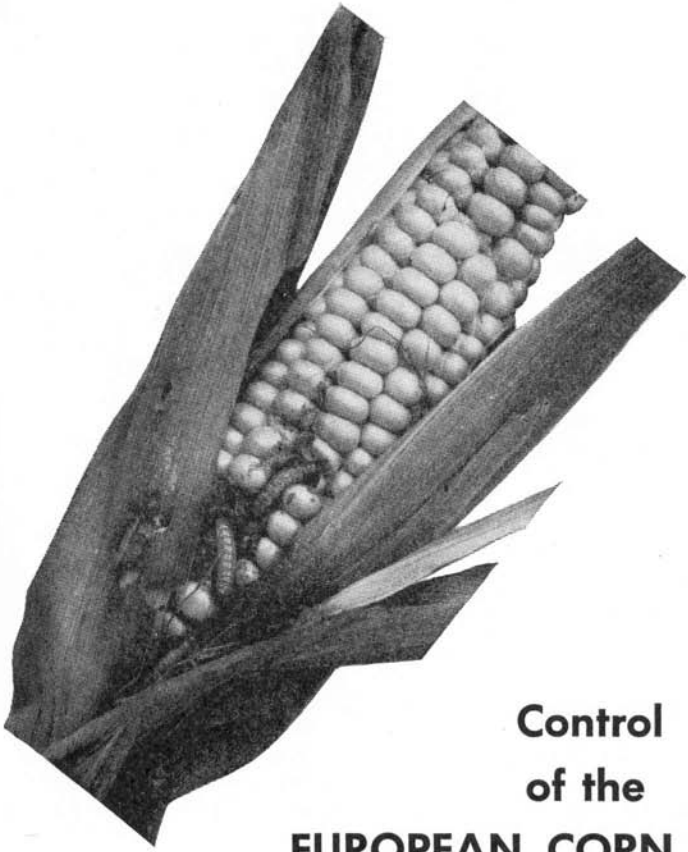
Circular 176
March, 1950

Connecticut Agricultural
Experiment Station
New Haven



Control of the EUROPEAN CORN BORER

by Neely Turner

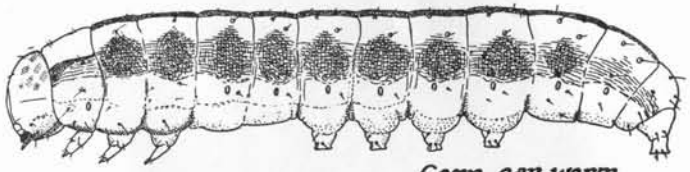
The European corn borer continues to be a serious pest of early sweet corn in Connecticut, and occasionally severely infests corn harvested late in August. Thorough investigations of the habits of the pest have shown that it may be controlled by insecticides applied to the right parts of the plant at the proper time. This circular has been written to provide corn growers with the information necessary for successful control of the borer.

DESCRIPTION OF THE BORER

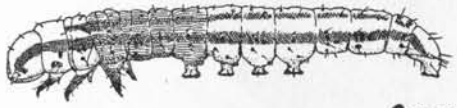
The larva or caterpillar of the European corn borer is dirty-white with rows of small brown spots and is almost an inch long when fully grown. It may be found in both stalks and ears of corn and may enter the ear on the silks or through the husk.

Several other caterpillars may bore into corn stalks or feed on ears. The common stalk borer, a white caterpillar with a broad chocolate brown "collar" is an occasional pest. Corn earworms feed on the silk and the tip of the ear in some seasons. These worms are light green to brown in color with alternating stripes running lengthwise of the body. The fall armyworm, which may attack both leaves and ears, is large and usually light brown in color.

In general, the control measures used for the European corn borer do not prevent damage by these other pests.



Corn ear worm



Common stalk borer

European corn borer

SEASONAL HISTORY OF THE BORER ON CORN

Mature corn borer larvae pass the winter within their burrows in stalks of infested corn. During the last half of May they transform to pupae, and moths emerge late in May and during June. The females deposit eggs in masses on the undersides of the lower leaves of the young corn plants. The larvae hatch within a week or 10 days and may feed for a short time on the surfaces of the leaves. They soon migrate up the plant and enter the developing tassels. If the corn is too small to have tassels, most of the young larvae die. Larvae hatching after the tassels have opened enter the young ear shoots. As the plant develops, the larvae that fed in the tassels migrate to other parts of the plant. The period of hatching of this generation of eggs lasts about a month; in normal seasons it occurs during June.

The first generation of larvae become fully grown in July, pupate at once, and emerge as moths late in July and during August. These moths deposit eggs on late corn as described above. The larvae are found usually during August and September. They pass the winter in this stage.

It is obvious that only the corn in the proper stage of growth when eggs are laid will be seriously infested. The corn most severely damaged is the crop that is ready to harvest at the time the borers are reaching full growth. This means that corn harvested during the first three weeks of July is usually seriously damaged. Most of the sweet corn picked the last week in July and the first two or three weeks of August is usually not infested by the corn borer. The crop maturing late in August and during September may be infested.

CONTROL BY APPLICATION OF INSECTICIDES

Although they are borers, the larvae of the European corn borer feed for several days in places where they can be reached by insecticides. The method of treatment, developed originally by Dr. C. H. Batchelder of the U. S. Department of Agriculture Bureau of Entomology and Plant Quarantine, involves applications of sprays or dusts at intervals during the period when the borers are hatching from the eggs. Repeated treatments are necessary because the plants grow very rapidly at this time.

Timing and Number of Treatments

Since young larvae do not survive on corn plants too small to have a tassel, no treatment is necessary until the appearance of the tassel. The first application may be made as soon as half the plants have *tassels that can be seen by looking directly down into the plant.* Corn too late to develop these young tassels by July 1 seldom needs any treatment.

Satisfactory commercial control has been obtained by applying four treatments at intervals of five days on extra early corn, and three treatments at the same interval when tassels developed after June 15.

For second generation larvae, treatment may be needed on all corn which does not have open tassels on August 1. Treatment of very late corn may be started when half the plants show young tassels (seen by looking directly down into the whorl). Four applications at intervals of seven days have given satisfactory control.

Parts of Plants Treated

Extensive experiments have shown that directing the dust or spray at the whorl of the young plants and on the ear shoot when it developed gave better results than covering the entire plant. On extra early corn this has meant one treatment of whorls and three of ear shoots and developing ears.

Use of Dusts

Most corn growers in this area have preferred dusts to sprays for corn borer control. Multiple-row dusters having at least 42 inches clearance have been used successfully on early corn.

Dosage tests have shown that good control can be obtained with 20 to 30 pounds of dust per acre for each application.

Two materials have been outstanding in effectiveness. DDT (5 per cent dust) has provided excellent control of the borer. It has caused slight injury to corn growing on light sandy soil in southern Connecticut. It has provided some

control of the corn earworm when the final application was made after the corn silked. Residues of DDT left on corn plants make them unsuitable for silage or fodder used for dairy cows.

Ryania (usually sold as a 40 per cent dust) has provided almost as good control as DDT in tests made in Connecticut. It leaves no poisonous residue and has caused no injury to corn.

Use of Sprays

For farmers or gardeners who prefer to spray corn, the following materials have been used successfully at the rate of 100 gallons per acre:

Ground cube or derris root (4 to 5% rotenone), 4 lbs. in 100 gallons of water.

Ground Ryania, 4 lbs. in 100 gallons of water.

DDT wettable powder (50% DDT) 2 lbs. in 100 gallons of water.

Results to be Expected

The degree of control obtained has varied a great deal in the experiments conducted. As a rule, almost perfect control in terms of borer-free ears has been obtained when the infestation was light. In seasons of heavy infestation, the best treatments seldom produced more than 90 per cent borer-free ears. In such cases, some sorting was necessary to market clean corn.

Treating Succession Plantings

The practice of planting on the same day a number of varieties selected for maturity in succession adds no particular problem to corn borer control. A schedule for such varieties may be as follows:

First generation

(1) Start treatment of the earliest varieties when half the plants have young tassels in the whorl. Repeat treatments at intervals of 5 days until July 1.

(2) Treat all later varieties that show young tassels before July 1 at least once, and twice or more if tassels form 5 to 10 days before July 1.

Second generation

(1) Treat any variety that has not shed pollen on August 1, and repeat at weekly intervals until the silks have dried. No treatments are needed after September 1.