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A HOME COURSE IN AGRICULTURE

X—Some Insect Pests

By C. V. GREGORY

Agricultural Division Iowa State College

AMONG the enemies which the farmer has to combat perhaps none are more troublesome than insects. Nothing is more aggravating than to have a promising crop of fruit or grain attacked by a horde of "bugs" and greatly injured if not entirely ruined.

Insects, like weeds, are very difficult to deal with if you go at them one at a time, but if properly managed they can be easily held in check. From the standpoint of the damage they do, insects may be divided into two classes—those which attack field crops and those which are injurious to fruit and garden crops.

There are a number of insects which attack corn. While these are seldom present in large enough numbers to destroy any considerable part of the entire crop, the money value of the damage they inflict on the corn grown on a quarter section each year amounts to no small sum.

One of the most important of these pests is the corn root worm. The eggs, which are laid in the cornfield during August or September, hatch during the next June or July. The worms when full grown are about one-third of an inch long and as big around as a pin. They bore up inside the roots, injuring them so badly that the growth of the plant is seriously checked. Often, too, the roots are so weakened that the corn blows down badly. Some time during August the worm goes through a transformation called pupation, which changes it into a small light green beetle. This beetle feeds on the silks and tips of ears and lays eggs for the next year's crop of worms.

Another insect which lives on the roots of corn is the root louse. These lice are very small and helpless. They are kept through the winter in the egg stage in ant hills. In the spring after they hatch they are placed on the corn roots by the ants. The ants are very fond of a sweet fluid which is secreted by the lice, and they take care of them for this purpose.

Other insects which do more or less damage to the corn crop are the stalk borer, wireworm, white grub, bill bug, cutworm, etc. These insects live and multiply in grass land and from there find their way into the adjoining cornfields. They do the greatest damage, however, when the grass land is plowed up and put into corn.

The damage from nearly all insects affecting corn, small grain or grass can be readily prevented by a good system of rotation. This is especially true if clover is used, since such insects as cutworms and grubs do not work to any extent on clover. The frequent plowing of the ground and change of crops where a rotation is followed are fatal to most insects. Damage from these pests will be still further reduced if the soil is kept so well supplied with plant food that the plants can get a quick start in the spring. Treated in this way, they are more vigorous and better able to withstand insect attacks.

These remedies, with the exception of the last, cannot be applied to or-



FIG. XIX.—CORN PLANTS INJURED BY ROOT WORM.

chard and garden crops, since these must be grown on the same land year after year. For the insects affecting these crops spraying is the best remedy.

The principal insect that attacks the apple is the codling moth. These insects pass the winter in a ball of silk, or cocoon, which they spin around themselves. These cocoons are hidden beneath the bark and under rubbish. Such as happen to escape the hungry search of woodpeckers and other birds change to the pupa stage in the spring. In this stage changes take place inside the body of the worm, which so transform it that early in June it comes out of the cocoon as a small brown moth.

These moths lay great numbers of eggs, which hatch into small worms. These worms eat their way into the apple through the blossom end. The apples thus affected usually fall off, and in a short time the worms crawl out and again spin cocoons around themselves. The life cycle is lived over again, and a second brood of the

moths appears about the middle of July. It is this brood which does the most damage. It is the worms which hatch from the eggs laid by them that are so often found in fall and winter apples.

Many poisons, of which paris green is the one most commonly used, are effective in destroying the codling moth. Paris green is usually used in connection with bordeaux mixture, which is a remedy for the various fungous diseases which affect the leaves and fruit.

To make this mixture dissolve five pounds of copper sulphate and five pounds of lime separately in twenty-five gallons of water each. When they are thoroughly dissolved mix the two solutions and add four ounces of paris green. The lime in this solution is added to prevent the chemicals from injuring the leaves and to make the mixture stick better.

Three sprayings are sufficient for the codling moth. The first should be given immediately after the blossoms fall, the second from ten to twenty days later and the third about the last of July.

One of the chief insect enemies of the plum and one which also attacks many of the other fruits is the curcu-



FIG. XX.—A SPRAYER AT WORK

lio. The curculio beetle lays its eggs in the young fruit shortly after it sets. In doing so it leaves a half moon shaped scar, which is its trademark. One of the surest ways of getting rid of this insect is to jar the beetles from the tree at this time.

Spraying is also an effective remedy. The bordeaux-paris green mixture may be used, but arsenate of lead is better, since it is less liable to injure the leaves. It is applied at the rate of three pounds to fifty gallons of water. The spray should be applied just before the blossoms open, just after they fall and again about fifteen days later. Poisonous sprays should never be applied to fruit trees while they are in blossom. It is not necessary in order to destroy the insects and will kill many of the honeybees, upon which the blossoms are so dependent for pollination.

The insects that have been mentioned so far live by eating the leaves and fruit and in doing so take up enough of the poison to put an end to their destructive work. There is another class of insects, however, for which such remedies are not effective. These are the sucking insects, of which plant lice are the most common examples. Insects of this kind feed by drilling through the outer layer of the leaf or bark and sucking the plant juices. They thus escape damage from any poison which may be on the surface.

To get rid of sucking insects some substance which will kill by coming in contact with them must be used. There is nothing better for this purpose than kerosene emulsion. This is made by dissolving half a pound of soap in a gallon of boiling rainwater. This mixture is then taken from the stove and two gallons of kerosene added. The compound should be churned violently for a few moments by pumping it up with the spray pump and back into the pail. This causes the oil to mix thoroughly with the water. Before using, this original mixture is diluted with six to ten parts of water.

A common insect affecting garden crops and one that is hard to handle is the striped cucumber beetle. This is a serious enemy of cucumbers, squashes, melons and other plants of like nature. Spraying does little good and is liable to injure the tender plants as well. Where but a few hills are raised, covering them for the first two weeks with a small box with mosquito bar stretched across the top is a good preventive measure. Another effective plan is to go over the patch in the morning while the dew is on and the beetles cannot fly, knock them to the ground by giving the plant a slight blow and put a drop of kerosene on each one.

Where any of these crops are raised on a large scale the most effective remedy is the use of "trap plants." Plant the field to squashes a week or ten days before time to plant the main crop. The beetles are especially fond of squash plants and will gather on them in large numbers as soon as they come up. Just about the time the other plants begin to peep through the ground the squashes can be sprayed with very strong kerosene emulsion. This will destroy both the squash plants and the beetles. There will usually not be enough of the latter left in the neighborhood to do much damage.

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