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CONTROL OF CORN EARWORM ON SWEET CORN

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The method of individual ear treatment to control the corn earworm on sweet corn has recently received considerable publicity. Although only a limited amount of work has been done in Oregon, it is the purpose of this circular to make available to gardeners and growers of Oregon the information at hand, and especially to point out certain limitations and precautions.

1. The Insect: The corn earworm, Heliothis armigera (Hubner), in the adult stage is a rather large grayish-brown moth. The pearly white eggs are laid singly on fresh corn silks, and occasionally on or near tassels. The eggs hatch in about four days in warm weather, and the young larvae begin feeding on the silk, working their way to the tips of the ears where they mature on the developing kernels. In three to four weeks after hatching, the larvae are full grown, over an inch long, and variable cream, pink, green, or brown in color. The mature larva eats its way through the husks and drops to the ground, where an earthen cell is constructed two or three inches below the surface. Here it passes the pupal stage when the change from larva to adult takes place. This stage requires about two weeks.

There were two generations in Western Oregon in 1941. Adults from the overwintering pupae emerged in May and June to lay eggs for the first generation. Second generation adults were observed laying eggs from the middle of August to about the middle of September, and probably continued as long as silks were present. In 1941 the late corn, harvested after the first of September, was the most heavily infested.

2. The Treatment: The treatment for control of the corn earworm consists of the application of small quantities of oil, or oil containing a pyrethrum extract, to the tips of the ears.

a. Materials. White mineral oil can be used, but more satisfactory results will be obtained if sufficient pyrethrum extract is added to give 0.2 percent pyrethrins (the active principle of pyrethrum) in the diluted mixture. A heavy white mineral oil with a Saybolt viscosity of not less than 110-120 seconds, and an unsulphonatable residue of not less than 99 percent should be used. Heavier oils (such as "Russian" mineral oil) can be used, but their added cost is probably not justified.

The pyrethrum is most readily obtained as a kerosene extract containing 2 percent pyrethrins. The extract must be in an odorless kerosene base, for if the ordinary kerosene base is used, it may affect the flavor of the corn. One part of the above pyrethrum concentrate should be mixed with 9 parts of white mineral oil to give the correct proportion of ingredients for ear treatment. Ready mixed preparations conforming to the above specifications are on the market, and most dealers who handle insecticides can supply them.

Preparations containing dichlorethyl ether as the active ingredient are on the market, but this material cannot be recommended at the present time for use under Oregon conditions. There is a tendency for the dichlorethyl ether to affect the flavor of the corn.

b. Time of Treatment Timing the treatment is the most important phase of the method, both from the standpoint of preventing injury and obtaining control.

Oil will prevent pollination, so treatment must not be made until most of the silks have been pollinized. This can be determined by the fact that the silks wilt and the tips turn brown soon after pollination. It is important that the ears not be treated until the silks have wilted. The oil will prevent the formation of kernels on all parts of the ear touched by it. The quantity of oil must therefore be carefully controlled so that not more than one-half to one inch of the tips of the ears are contacted by the oil.

By the time the ears are ready to treat, some of the eggs have hatched, and the young larvae are feeding in the silk or at the tip of the ears. It has been observed that in loose-husked ears some of the larvae will crawl about halfway down the ears before beginning to feed. These worms cannot be killed by this method. Control is easiest on long, tight-husked varieties.

It is necessary to treat at least twice, due to the unevenness of silking. Ears should be marked as the first treatment is made, to prevent duplication during later applications. White or red chalk is satisfactory for marking the ears.

c. How to Treat Any small force oiler which can be adjusted to deliver a fixed quantity of oil at each stroke of the plunger can be used. If a large amount of corn is to be treated, a one-gallon can may be fitted with straps to be carried as a knapsack, and connected by a tube to the oiler. The spout of the oiler should be so adjusted in relation to the position of the trigger that it can be easily manipulated.

The amount of oil delivered at each stroke can be regulated by means of a setscrew behind the trigger mechanism, to stop the stroke at any desired spot. It should be set so that the oiler delivers one-half to three-fourths cubic centimeters per stroke (one stroke per ear). This is equivalent to 10 to 15 drops. Calibration is most accurately made by regulating the setscrew so that 45 to 60 strokes deliver one fluid ounce. (29.6 c.c. = 1 fluid ounce)

The tip of the oiler should be inserted about one-fourth to one-half inch into the tip of the husks. If it is inserted too far, the tip of the ear may be damaged; if not far enough the oil may run back out the tip of the ear. A washer can be soldered to the spout of the oiler about one-half inch from the tip to prevent inserting the spout into the ear too far.

Home gardeners may find that a medicine dropper will be satisfactory for applying the oil to the ears.