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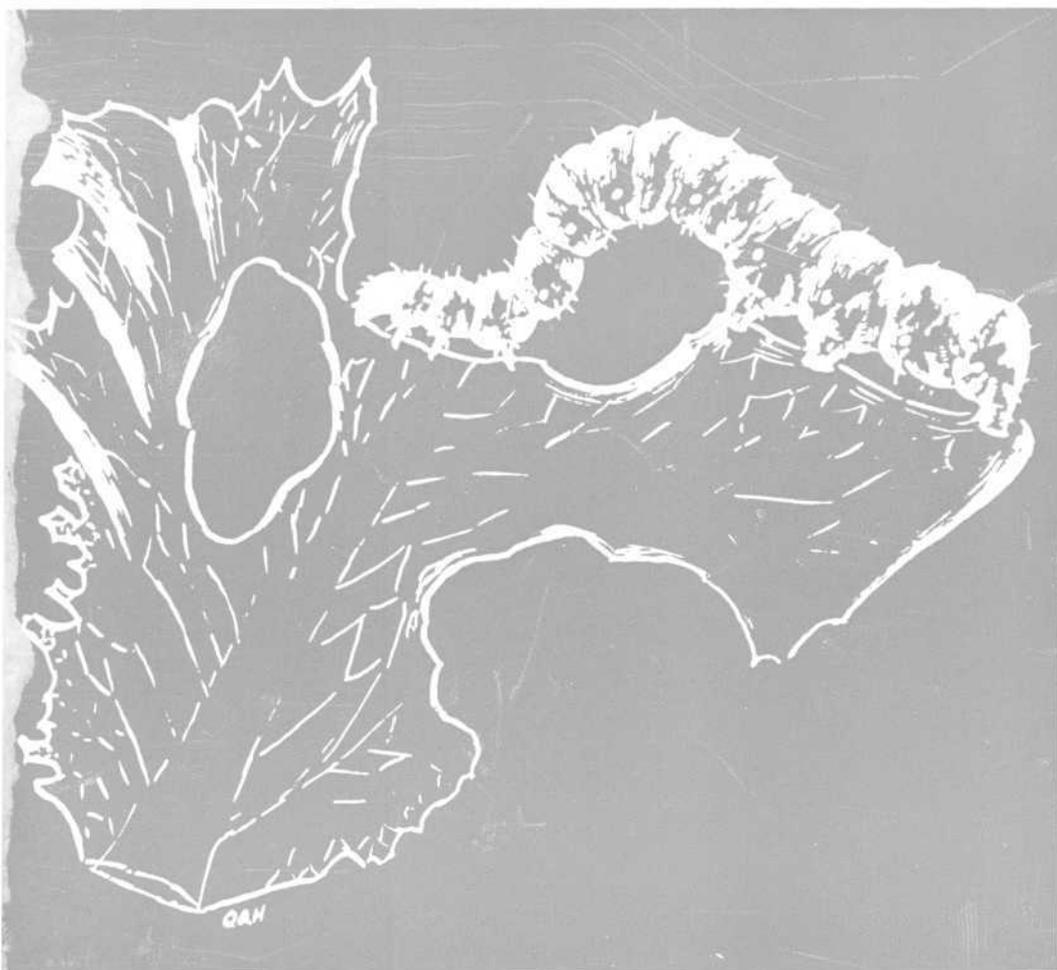
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Control Worms On Fall Lettuce



..... Circular 219

Agricultural Extension Service, University of Arizona

Tucson

This circular is based on experimental work conducted by Orin A. Hills, Edgar A. Taylor, and Ford H. Harries of the Entomology Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

During the past few years cabbage loopers and other worms have become a serious problem on fall lettuce in the Salt River Valley of Arizona. In many instances the injury has been so severe that growers have had to plant their crop several times before securing a stand. As many as 6 to 8 applications of insecticides have been applied with varying results.

Workers of the Entomology Research Branch, USDA, have conducted experiments for control of the cabbage looper which seemed to have become resistant to DDT and the other insecticides. Their work has shown that the insect can be controlled.

Control Worms on Fall Lettuce

By J. N. Roney, Extension Entomologist

Control of "worms" in fall lettuce in the Salt River Valley of Arizona is essential if the crop is to be grown successfully. The cabbage looper is among one of the important insects attacking this crop, and its resistance to DDT in recent years has made control more difficult.

The problem has not yet been completely solved, but improved methods of control have been developed.

Toxaphene as a 15-percent dust is recommended. Dieldrin dust also is effective and should be used at the 2-percent strength. Results equally as good can be expected from sprays if they are applied to give the same amount of active ingredient per acre as the dust.

When to Apply

Three or four well-timed insecticide applications should be sufficient to control even the most severe looper infestations in fall lettuce in the Salt River Valley. Make the first application shortly after the plants are up in order to prevent worm damage and insure a good stand. This application should also control other worms sometimes found on lettuce, such as the beet armyworm, the yellow-striped armyworm, and various cutworms.

No further application should be necessary until after thinning, but the fields should be carefully watched since reinfestation of the small plants can be serious. A second application probably will be necessary after thinning.

If looper numbers are low and you can delay the after-thinning treatment until the plants have six

or eight leaves, you will save one application. If looper numbers are high, treat soon after thinning and again in about 2 weeks if necessary. No further application should be necessary until just before head formation begins or approximately 30 days from harvest. This is the last opportunity for treatment with toxaphene or dieldrin, and if any worms occur on lettuce at this time the crop should be treated.

No applications of toxaphene, dieldrin, or any other long-lasting poisonous insecticide should be made on lettuce after head formation has commenced or within 30 days of harvest.

Do not attempt to maintain a worm-free condition in your lettuce between the 6 to 8 leaf stage and the beginning of head development. To do so results in unnecessary insecticide applications and additional expense. However, it is important to keep worm numbers at a low level on the small plants in order to protect the stand.

It is also important to prevent damage to the marketable head, but between the 6 to 8 leaf stage and the beginning of head development many leaves are produced which are discarded at harvest. Slight damage by worms to these leaves is unimportant and costly to prevent. Excessive worm damage to the plants at this stage will delay head development and should be avoided, but if worms are controlled on the small plants this is not likely to occur.

If you get a good looper control just before head development begins and a good deposit of toxa-

phene or dieldrin is left on the leaves, further treatment will probably not be necessary. If you should need to control loopers within 30 days of harvest, use a dust containing 1 per cent rotenone.

How to Apply

Dusts or sprays may be applied with ground equipment or from the air. However, on low-growing row crops, such as young lettuce, ground equipment is preferred.

With ground equipment, apply a dust at the rate of 20 pounds per acre. From aircraft use 25 pounds per application. If you use a spray, apply the same amount of active ingredient per acre as for a dust, 3.0 to 4.5 pounds of toxaphene and 0.4 to 0.5 pound of dieldrin.

Use sufficient water to give good coverage. This will depend upon the equipment used. Some equipment is designed for use with concentrated emulsion sprays and you can get good coverage with as little as 5 to 10 gallons per acre.

A number of good power dusters are on the market for application from the ground. Either a tractor-mounted one utilizing the power take-off or a duster equipped with an auxiliary motor is satisfactory if in good repair and proper adjustment. Set the nozzles directly over the lettuce rows.

Drive slowly. You cannot dust well at high speed. Have the air velocity at the nozzles sufficient to penetrate the foliage with dust but not enough to blow the dust off the leaves. Use a lightweight canvas drag to make any duster more efficient and to check drift.

Good weather conditions are necessary for satisfactory results. Do not dust if wind movement is greater than 5 miles per hour.

Slightly more air movement may be tolerated in case of sprays.

To estimate the wind velocity toss a handful of dust or blow smoke into the air and then walk down-wind with the cloud of dust or smoke. If you can keep up with it at a slow walk, the wind is blowing at about 2 miles per hour. If it takes a fast walk, the velocity of the wind is about 4 miles. And if you must run to keep up with the smoke or dust cloud, it is 10 miles an hour and dusting should be stopped.

Precautions

Most insecticides, including toxaphene and dieldrin, are poisonous to people and animals. Handle them with care.

✓ Store insecticides in closed, plainly labeled containers so that they cannot be mistaken for food or medicine. Keep them out of reach of children and farm animals. Follow all directions, and heed all precautions given on the labels. Avoid inhaling or swallowing insecticides when handling or applying them.

✓ Avoid unnecessary exposure of the skin while mixing or applying sprays containing toxaphene or dieldrin. These sprays may cause irritation. Wash thoroughly with soap and water after exposure and before eating or smoking.

✓ Do not apply insecticides when hives of bees are near enough to be affected by the drift. Dust or spray at night, if possible, to avoid poisoning bees.

✓ Do not use an insecticide on lettuce unless it is recommended for that crop. Do not apply toxaphene or dieldrin to lettuce after the heads form or within 30 days of harvest.