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Collard Insect Control

by E. A. Heinrichs, E. E. Burgess, and Charles A. Mullins *

Collards, **Brassica oleracea** var. **viridis,** because of their nutritional value, are important vegetables in the diets of many Tennesseans. According to a survey conducted by R. D. Freeland of the University of Tennessee Institute of Agriculture, Tennessee produced 1,544 acres of fresh and 4,405 acres of processor collards in 1971. Most were grown on the Cumberland Plateau and in West Tennessee.

Many insects attack collard foliage. Flea beetle feeding causes "shot holes" in the leaf. Various caterpillars such as the cabbage looper, **Trichoplusia ni** (Hubner), and the imported cabbageworm, **Pieris rapae** (L.), are capable of severe defoliation (Figure 1). If controls are not applied, heavy losses will generally occur.

Some chemicals currently recommended by the Institute of Agriculture for collard insect control were tested and some new chemicals and biological preparations were evaluated for effectiveness. Results are herein reported.

Figure 1. Cabbage looper damage to collard foliage.

Procedure

The collard variety Vates was planted July 11, 1972, at the Plateau Experiment Station near Crossville. Treatments were replicated four times in a randomized-block design, three 15-foot rows per replicate. Row width within a replicate was 12 inches with 18 inches between treatments. Treatments listed in Table 1 were applied with a 2-gallon, compressed air sprayer at the rate of 50 gallons of spray per acre. Four treatments consisted of biological agents and the rest were chemical insecticides. Of the biological agents, IMC 90013, Thuricide HPC, and Dipel are preparations of **Bacillus thuringiensis** Berliner. The former two are made by International Minerals and Chemicals and the latter by Abbott Laboratories. The biologic Viron/T is a cabbage looper specific virus. The chemical insecticide treatments Orthene and Dibrom are phosphates, Sevin and Lannate carbamates, and Thiodan a chlorinated hydrocarbon.

Treatments were applied when insect damage became apparent September 1 and were repeated September 11 and October 9, 1972. Damage ratings were taken prior to treatment on the above dates and on October 26.

Results

Damage ratings in the untreated check progressively increased from 1.5 on the first observation to 4.0 on the last observation date (Table 1). Most common insects feeding on the collards were cabbage loopers and the imported cabbageworm. Various flea beetle species, the diamond-back moth **Plutella maculipennis** (Curtis), and the cross-striped cabbageworm **Evergestis rimosalis** (Guenee) were also present.

At the second observation (September 15), 2 weeks after the first application, all treatments except Viron/T showed significantly less damage than the check. All treatments had significantly less damage than the check on the third and fourth observations. Of these, Lannate-treated plants had the least insect damage (0.3).

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Table 1. Effect of chemical insecticides and biologic agents on prevention of feeding by collard insects, primarily cabbage loopers and imported cabbageworms, 1972

Treatment	Rate per acre	Pretreatment Damage rating[1] on various dates			
		9-1[2]	9-15	10-9	10-26
1. Lannate 90 WSP	2.5 lb a.i.	2.5a	1.3a	1.5abc	0.3a
2. Orthene 75S	1.0 lb a.i.	2.1a	1.5ab	1.0ab	0.7ab
3. Thiodan 2E	1.0 lb a.i.	1.6a	1.4ab	1.1ab	0.7ab
4. IMC 90013	1.0 qt formulation	1.5a	1.8ab	2.1 c	1.0ab
5. Dipel 2.5 WP	1.0 lb formulation	1.5a	1.3a	1.2ab	1.0ab
6. Thuricide HPC	1.0 qt formulation	1.8a	1.6ab	1.0ab	1.4abc
7. Sevin 80S	1.5 lb a.i.	1.8a	1.9ab	1.7 bc	1.6 bc
8. Dibrom 8E	.5 lb a.i.	1.5a	2.0 b	0.6a	2.2 c
9. Viron/T	20 gm formulation	1.9a	2.6 c	2.3 c	2.2 c
10. Check	—	1.5a	2.9 c	3.3 d	4.0 d

[1]Damage rating is based on severity of leaf damage: 0=no damage; 4=more than 50% of leaf area destroyed.

[2]All means followed by a common letter within a column do not differ at the 1% level of significance.

There was some chemical damage to plants treated with Lannate and Thiodan. Lannate-treated plants had marginal leaf necrosis and Thiodan caused leaf curling. Phytotoxicity was evident only after cold weather set in and was first observed October 9.

Orthene, Lannate, and Thiodan appear to be the most effective of the chemicals tested. Of these, only Thiodan is currently recommended. Thiodan should only be applied once per growing season and requires a minimum of 21 days from application to harvest. Orthene and Lannate are relatively new insecticides and have not thus far been labeled for use on collards.

All of the bacterial preparations equally prevented insect feeding and were not significantly different from the best chemicals. In an attempt to find replacements for chemicals, the performance of the various preparations of **B. thuringiensis** is encouraging, and it is currently recommended by the University of Tennessee Institute of Agriculture to control caterpillars on greens.