



Elm Leaf Beetles

Fact Sheet No. 22

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Introduction

The elm leaf beetle, *Pyrrhalta luteola* (Muller), was accidentally introduced into the eastern United States in about 1834. Both the adults and larvae (immatures) feed on the foliage of all varieties of elm trees, especially Siberian and European elms. However, some varieties such as cedar elm, American elm, and winged elm are seldom attacked if other host trees are available.

Identification

Adults are about 1/4 inch long and yellowish to olive green with black stripes along the outer margin of each wing cover. Mature larvae are about 1/2 inch long and yellow with black spots and a pair of black spots and a pair of black stripes down the back. The yellowish-orange eggs are laid in clumps or irregular rows. Pupae are 1/4 inch long and bright orange-yellow with scattered black bristles.



young larva



pupa



adult

Biology and Habits

Elm leaf beetles are gregarious, bunching up in the fall to seek a place to hibernate. They overwinter in any sheltered area they can find, including beneath piles of leaves, under boards, and in structures. Whenever the weather turns warm during the winter, the beetles become active, which tends to disturb homeowners. They are harmless to people, pets, and structures. They merely constitute a nuisance in the home.

In the spring the beetles leave their overwintering sites and return to the elms about the time the buds begin to swell. They begin feeding on the unfolding leaves. Females lay yellow, lemon-shaped eggs on the undersides of the leaves in groups of about 25. A single female

may produce as many as 400 to 800 eggs. Eggs hatch in about a week into small black and yellow larvae that closely resemble lady beetle larvae.

Larvae feed for 2-3 weeks on the undersides of the leaves and when mature crawl down the tree to gather in large masses at the base of the trunk (or any other nearby, sheltered place) to pupate (form cocoons). Many may pupate under loose bark or bark crevices on the trunk. New adults emerge in 1-2 weeks and move back to the leaves to start a second generation. Second generation adults move to sheltered areas in the fall to overwinter and complete the cycle.

Damage

New infestations of young elm leaf beetle larvae are easily overlooked because of their feeding location under the leaves. At first, the green part of the leaves are removed with just the thin veins remaining. As damage accumulates, dry, skeletonized leaves become obvious. Heavily infested trees have sparse foliage, and remaining leaves take on a rusty, reddish-brown tint. Heavily infested trees drop leaves prematurely and may eventually die.

Control

Natural enemies include birds, toads, diseases, and predaceous and parasitic insects. A small wasp frequently kills many pupae. A fungus also kills pupae and adults late in the summer, especially in humid seasons. Unfortunately, these natural controls often are not sufficient to hold the beetles in check and the application of chemical controls becomes necessary.

A large percentage of the beetles that get into homes can be prevented from doing so merely by caulking or sealing holes and cracks in the foundation, holes around plumbing or electrical conduits, weather stripping around doors and windows, repairing damaged screens, and by screening off attic vents. Spraying outside walls and the immediate adjacent perimeter helps reduce adult populations from entering the home in the fall. Use products containing diazinon, chlorpyrifos (Dursban), or propoxur (Baygon). Once the beetles gain entry to the structure, they can be picked up with a vacuum cleaner. They can also be killed by swatting them with a fly swatter or spraying them directly with household aerosol or pump sprays containing 1% or less pyrethrins, diazinon, propoxur (Baygon), or chlorpyrifos (Dursban). Spraying them is expensive, often produces a disagreeable odor, may stain household furnishings, and when you've killed them you still have the dead insects to remove--so you may as well use the vacuum cleaner to begin with.

Chemical control of elm leaf beetles on trees depends on early detection of infestations and thorough insecticidal coverage of the tree. Examine the undersides of leaves for yellow eggs and young larvae in March and April, soon after the tree leafs out. If eggs and small larvae are present, control measures normally are applied about three weeks after the leaves begin to emerge. A second application may be necessary 2 to 3 weeks later. Continue to examine trees every 2 to 3 weeks during the remainder of the summer because reinfestations from adjacent, untreated trees may occur.

Products containing carbaryl (Sevin), methoxychlor, and acephate (Orthene) are effective against elm leaf beetles. Other active ingredients in products labeled for elm leaf beetle

(foliar application to elms) include azadirachtin (Neem), *Bacillus thuringiensis* (M-Trak), chlorpyrifos (Dursban, Ortho-Klor), diazinon, imidacloprid (Merit), naled (Dibrom), permethrin, phosmet (Imidan), resmethrin, and rotenone. Even this list is not all-inclusive and many other active ingredients are labeled for ornamental trees in general.

About 15 gallons of finished spray will be required to treat a tree 30 feet high. With good water pressure you can usually spray up to 25 feet high with a hose end sprayer. Taller trees will require power spray equipment to treat and the cost may not be justified. In general, under good growing conditions and in the absence of other stress factors, established deciduous trees can normally withstand at least 30% defoliation before the long term health of the tree is affected. Many homeowners prefer to spray before this level of defoliation is reached in order to preserve the aesthetic beauty of the tree. Small trees, recently planted trees, and trees under stress should be treated before this level of defoliation is reached.

Many larvae can be killed by spraying them when they move down the trunk to the base of the trees to pupate. You can also place boards on the ground at the base of the trees to attract the larvae, which will pupate under the boards. Large numbers of larvae can be sprayed directly after removing the boards. Neither of these methods will prevent defoliation of the trees by the first generation, but they will cut down on the degree of injury produced by the second generation.

Some formulations of the insecticide disulfoton (Di-Syston, plus homeowner-type brands from Dexol and Cooke) can be applied as a soil treatment in April to provide systemic control of the beetles. The insecticide is absorbed by the roots and translocated to the leaves where it kills the beetles and larvae as they feed. Formulations of Di-Syston are restricted-use-pesticides and must be applied by a licensed applicator.

Trunk Banding

Trials conducted in Colorado during 1984 attempted to control elm leaf beetles with a trunk band treatment of pesticides. Personnel from the Colorado State Forest Service, Extension Service, and various city and county agencies were responsible for these trials.

The trunk banding trials were to test the effectiveness of killing first and second generation full grown larvae as they move down the trunk to pupate. It was believed that the application method was simple and that relatively small amounts of insecticide would be effective in controlling populations.

Results of the trials indicated that large numbers of elm leaf beetles were killed by the trunk band treatments. Effective insecticides applied at the proper time can help to control the insect. However, most trials were conducted on single trees so that it was impossible to assess the effectiveness of this method in reducing leaf feeding injury to the tree. There was too much migration of insects from one tree to another.

Their results show that banding offers some control under the following conditions:

1. Most of the trees within an area are treated.
2. Damage by first generation larvae is not a serious concern. Banding is most effective in reducing the numbers of second generation feeding larvae and overwintering adults that migrate into homes.
3. Effective insecticides are used.
4. Insecticides are applied at the proper time.

Sevimol (carbaryl), Dursban (chlorpyrifos) and Pydrin (fenvalerate) proved to give good control (Note: Pydrin is not registered for use on elm trees but formulations of two other pyrethroids, permethrin and resmethrin, are). Most trials were conducted using Sevimol at rates ranging from 1 qt/5 gals to 1 qt/100 gals of water. All rates appeared to be effective. Diazinon did not appear to be an effective treatment.

For best results, banding should occur immediately before the larvae move down the trunks to pupate. For the first generation this will be in late June to early July, while the second generation will move down from late July to mid- August. Each band should be several inches in width and located high on the trunk creating a band/barrier that the larvae must cross. Generally, this will be just below the first major branching.

Precautionary Statement

All pesticides have both benefits and risks. Benefits can be maximized and risks minimized by reading and following the labeling. Pay close attention to the directions for use and the precautionary statements. The information on pesticide labels contains both instructions and limitations. Pesticide labels are legal documents, and it is a violation of both federal and state laws to use a pesticide inconsistent with its labeling. The pesticide applicator is legally responsible for proper use. Always read and follow the label.

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