

# CHEMICAL LOG

## Controlling Elm Leaf Beetles

**J**ohn Goolsby, a graduate research assistant in the Department of Entomology at Texas A&M University in College Station used to watch helplessly as elm trees were defoliated by large populations of elm leaf beetles (*Xanthogaleruca luteola*) in the spring.

One study ranked the elm leaf beetle as the second most destructive pest among urban trees, said Don Clair, pest management specialist for the Texas Department of Agriculture, Austin.

"The beetle was originally brought to this country from Europe, and now they can be found in the U.S. virtually everywhere that elm trees are found," Clair said.

Both environmental stresses and tree variety selection can increase the risk of attack. English elms and Siberian elms are among the most susceptible, according to Clair. Other species, such as the Chinese elm, have a degree of tolerance to the pests. Other trees, such as the Japanese zelcova, also can succumb to elm leaf beetle attacks.

The standard practice has been to spray elms on a regular basis. However, grounds keepers often waited to call until the beetles had reached large numbers and had caused significant damage. Then, although the insecticide treatments reduced the pest population, they did not return the tree's foliage. Goolsby felt he was treating the symptoms, not the problem. He looked around for another method.

### How Trunk Bonding Works

Goolsby read about a new technique, called trunk banding, that was being used successfully in California. It targets a key weak point in the pest's life cycle.

During the spring, adult elm leaf beetles emerge from their winter resting places and fly to trees. There, they lay eggs on the underside of leaves. In about a week, the eggs hatch into small, yellow and black larvae. These immature larvae soon develop into mature larvae that feed on the foliage. Then, they crawl down the tree's trunk to pupate on

the soil surface. You can most effectively destroy the pests at this critical time.

"Since they have to crawl down to the soil, we decided to spray the trunks with the insecticide Sevin," says Goolsby. "What this does is knock out the first generation, so there are few surviving insects that can fly back into the tree and lay more eggs. If you do that for one or two generations, they are never going to reach a population level that can do any real damage to the tree.

"By using this strategy," says Goolsby,



"we're getting better results than with traditional spraying." It's also a lot faster and requires only conventional application equipment.

The results of his first trunk sprayings, he says, spoke for themselves. "By using the trunk bonding technique, we were able to keep the trees green all year. Otherwise, they would have been severely defoliated by July.

"I think it's crucial for landscape managers and groundskeepers to use a preventative treatment when dealing with these pests," he adds. "If you wait until the leaves turn brown, you've obviously waited too long."

The traditional method used for elm leaf beetle control involves spraying entire trees. This practice requires equipment that can spray high into the tree canopy. Drift concerns make this application method difficult in heavily populated areas or on windy days.

"What you can do now is send a single man out with a low-pressure three-gallon sprayer in virtually any kind of weather," says Goolsby. "He can do it quickly, inexpensively and during working hours for people in the surrounding buildings."

The trunk treatments also avoid killing off the elm leaf beetle's natural enemies, such as various egg parasites, Clair said.

"The most important natural predators of the elm leaf beetle are earwigs that feed on eggs and lacewings that feed on both the eggs and larvae," says Clair. "By treating the tree's trunk, you are killing 95 to 99 percent of the larvae that crawl through the sprayed band, but not the beetle's natural enemies."

### Damage Beetles Cause

"City environments are particularly tough on trees," he says, "because they are stressed by compacted soil, air pollution, poor fertilization and poor irrigation. Trees that are already in a weakened state are less able to withstand attacks, and when the trees are grouped closely together, the beetles are able to reproduce rapidly."

Severe defoliation by beetles can seriously stress or even kill a tree within three to four years, he adds. Goolsby advocates using a preventative approach to help avoid the cycle of tree decline.

"You need to start looking for the bright, yellow eggs in the early spring," Goolsby says. "You should apply the insecticide before the larvae start crawling down the tree trunk to pupate.

"Once a tree is defoliated, it is stressed and suffers from a reduced ability to store carbohydrates during the winter. The tree then becomes more susceptible to stress-related pathogens, as well as insect pests, such as borers."

The war against destructive pests, such as the elm leaf beetle, is far from over. However, innovative techniques like tree banding have given golf course superintendents and groundskeepers new weapons in the fight. □