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## Scale Insects Difficult Pests of Ornamentals

by James A. Fizzell, Sr. Ext. Advisor  
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There are few plants that are not subject to attack by one or more species of scale. All are well adapted for survival under adverse conditions and, as a group, they are very difficult to control.

Scales belong to the Hemiptera insect order. They are sucking insects that spend most of their lives beneath the protective shells from which they get their name. They are divided into two large groups, the armored scales and the soft scales.

### Armored scales

Armored scales produce a waxy shell that is separate from their bodies. They begin life as eggs, usually laid beneath the shell of a mature female. Crawlers hatch from eggs and move out from under the shell to find suitable feeding sites. Once such sites are located, the crawlers begin to feed, molt and start producing their characteristic covering.

In the molting stage, the scale has no body parts, eyes, wings or legs. It is simple a sack with a thread-like beak that inserts into the host plant tissue. Over this sack is a protective covering.

Females of most species never complete their metamorphosis, but instead spend the rest of their lives in this form. Males, however, leave this protective covering and develop into tiny, two-winged insects which are capable of flying to the immobile females to mate and then die. After mating, the females deposit their eggs, shrivel to one end of their shell and die.

### Soft shell scales

Soft scales' shells do not separate from their bodies. Their life history is like that of the armored scales, except the females retain their legs and antennae throughout their life cycle. They reproduce by eggs generally, though live young are produced in some cases.

### Why control is difficult

Two factors make scales difficult to control. Because of their size and coloring, they are often overlooked until well established. And once they develop their protective covering, they are unaffected by applications of sprays.

There are parasites that keep scale populations in check. But the problem is that most scales are not native to the United States, but have been inadvertently introduced. Unless the natural parasites are also introduced, the pest population grows unchecked. When single plant species are extensively planted, this creates an abundance of ideal feeding sites. A case in point is the proliferation of cottony maple scale.

By introducing the natural parasites and using cultural practices favorable to these parasites, some spectacular successes in control have been seen. In California, for example, cottony cushion scale of oranges has been controlled by a ladybug; black scale has been controlled through the introduction of several species of chalcidoid wasps.

Within the nursery industry, control of scales by parasites and predators is in its infancy. As a result, a carefully planned spray program is needed to produce clean stock.

To develop an effective program, the particular scale needs to be identified and its life cycle determined to find the "weak link" for proper timing of spraying.

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(Scale cont'd.)

### Recommended control measures

The most common scales we see in the extension offices are oystershell, lecanium, cottony maple scale and euonymous.

### Oystershell scale

Oystershell is a small, brownish, hard-shelled scale about 1/8 inch long and 1/16 inch wide, with a curved shape like a miniature oyster shell. These scales can completely cover the bark of affected plants. They overwinter as eggs, hatching into crawlers in late spring. This scale is especially troublesome on ash, lilac and dogwood. While there are several natural predators to keep the population down, dormant oil also provides some control. Malathion or dimethoate should be applied in June when the crawlers are exposed. In some areas, a second generation of crawlers is produced in early August.

### Lecanium

Lecanium scales attack yews (Fletcher scale) and broadleaf trees and shrubs. These are soft-shelled scales that are brown, globe-shaped pests about 3/16 of an inch in diameter when mature. Half-grown fertile females spend the winter on the bark of twigs. Feeding resumes in the spring, and in early June eggs are deposited in a cavity beneath the female's body. After laying her eggs, the female dies. Crawlers hatch in a few days, move to the leaves and begin feeding by sucking the sap. During this period, honeydew drips from the scales and covers leaves, branches and objects beneath the tree. A sooty mold then grows on the honeydew.

By midsummer, the growing female scales relocate to the twigs where winged males find them, mate and die. The females continue to feed until cold weather, then go into hibernation. Thus the cycle repeats itself, with only one generation produced each year.

Fletcher scale should be sprayed with malathion in early April and again in June. Other species of lecanium scale respond to treatment with malathion or diazinon applied in mid-June and repeated in two weeks.

### Cottony maple scale

Cottony maple scale is a soft-shelled species that commonly attacks silver maple and box elder, but can also be found on many other species where infestations on maple are severe. Honeylocust can also be severely injured by this scale.

The life cycle of cottony maple scale is essentially the same as that of lecanium scale. The most distinctive feature of this insect is its egg laying habits. In June, mature females deposit eggs in a cotton-like mass of wax several times larger than the insect itself. These masses look like popcorn strung on infested branches and are easily noticed.

Cottony maple scale is often controlled by the twice-stabbed ladybug, which feeds on the egg masses. This predator is a small, black beetle with a red spot on each wing cover. These beetles are to be protected so they can do their job. Dormant oil sprays applied prior to leaf-out will not harm the predators, and will reduce the population of overwintering females. Malathion or diazinon can be applied to the foliage after crawlers have hatched in July.

There is a regular cycle to the occurrence of cottony maple scale in a given area. As the population increases to the point where it becomes noticeable, you will see the predators begin to move in. After a season or two, the pests's population is

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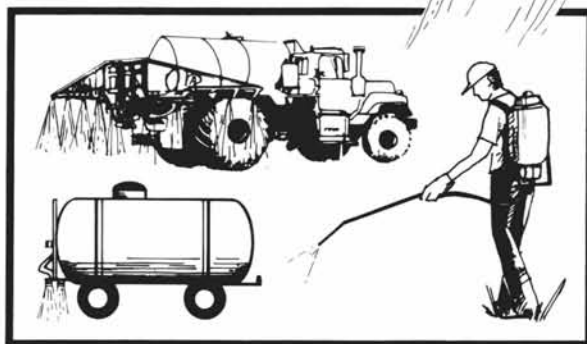
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(Scale cont'd.)

reduced to the point where it is no longer noticed. Then the predators move in. Eventually the cycle repeats itself.

### Euonymous scale

Euonymous scale is the most destructive insect. Severe infestations will easily kill groundcover species. Females of this hard-shelled scale resemble oystershell scale. As such, they are not easily seen. But the white covering of the males is a conspicuous aid to identification. These insects spend the winter partially grown. In the spring, the females lay eggs which hatch into orange-colored crawlers. A close look at infested plants will reveal the exposed crawlers. They are vulnerable to spray applications at this time. A second generation hatches in late summer.

Euonymous scale is very difficult to control. Some Extension stations have reported success with a 3% dormant oil spray before plant growth begins in the spring. When you see crawlers about the first of June, spray with dimethoate, malathion or diazinon four times at ten-day intervals. Repeat this treatment in late August, when the second generation of crawlers can be seen.

(Editor's Note cont'd.)


Any advertisers that sent me special ads for the June issue were also lost. If these advertisers wish, they may get in touch with me and I will give them 50% credit for the June issue.

Kerry Blatteau's Director's Column is also missing. John Gurke had an excellent article with pictures. I have a copy of the article, but need the pictures. This will be used in July — if John still has the negatives.

Ed Stewart had a retirement party and many of his friends were invited. I took pictures of the event — they are lost. Again I will print this in July once I get the negatives and have another set printed. Speaking of Ed, he spent a few days in the hospital the first part of June. He should be out and at home when you read this. Give him a call to cheer him up at 309/463-2376.


The survey concerning the newsletter will also be in the July issue. We had a pretty good response and some cards are still trickling in.

It is amazing what one sees when you are visiting different courses. One fine "plantsman" I know painted some yews green because they had died over winter and he didn't have the time to get new ones in. He had me fooled and I never would have known if he hadn't pointed it out to me. Another superintendent, this one a "chemist" really had a witches brew going to spray his fairways. First time out with the "brew" he singed the grass. He took a pH reading and it registered 3.6! He then added another chemical to raise the pH and just about blew the lid off the tank — he took off running when he saw the chemical reaction. But it worked, the new pH was 6.8 and no burn to the grass.



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