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## Scale Insects

Scale insects are small, highly modified animals that have little resemblance to most insects. Because of their small size and often cryptic appearance, large numbers may be present without being noticed. While a few scale insects are little cause for concern, large numbers may be harmful to the host plant. By closely watching your trees and shrubs, we can often catch a scale infestation in its early stages and take appropriate action.

Scale insects injure plants as they feed. Long, threadlike mouthparts are inserted into the host plant and used to suck plant sap from the tissues. If large numbers are present, the insects can remove so many nutrients from the plant that it does not have enough left over to carry on its own metabolic activities. Scale insects can injure plants in other ways, too. Large amounts of honeydew, a sugary waste product, can cover leaf and other surfaces located beneath a scale infestation. A fungus called “sooty mold” will use the honeydew for food and can cover leaves, sidewalks, patios or other surfaces, giving them a discolored appearance. We divide scale insects into two broad categories: 1) the soft scales, and 2) the armored scales. Each category has characteristics that are important to recognize. Let’s look at each separately.

### Categories of Scale Insects

Armored scale insects secrete a thick, waxy covering over the tops of their bodies. This covering, combined with their own cast skins, serves to protect the insect from the

environment as well as from contact pesticides. Therefore, it is difficult to control scale insects with most contact insecticides after the waxy covering has formed. Examples of armored scales include pine needle scale, oystershell scale, euonymus scale, and obscure scale.

Soft scale insects do not produce such a thick protective barrier. While they may produce waxy secretions, the wax is granular and does not serve as a protective barrier as do the armored scale secretions. Examples of soft scales insects include lecanium scale, Fletcher scale, cottony maple scale, and magnolia scale.

There are many different scale insects and their life cycles vary. As a general rule, however, armored scales usually spend the winter in the egg stage or as mature females. The eggs are located beneath the waxy scale covers of the female scale insects. The eggs usually begin to hatch during late May or early June.

### Life Cycles

Soft scale insects overwinter as young nymphs attached to the twigs of the host plant. The nymphs complete development and the females lay their eggs during late spring. The eggs begin to hatch later in the year than those of armored scale insects; usually during late June and July.

Newly emerged scale insects are called crawlers. They receive this name because unlike mature scale insects, they



**Left: Scale insects are very small and can go unnoticed, the red dots pictured here are “crawlers”; Center: sooty mold caused by scale honeydew; Right: a scale infestation of a small tree.**

Left to right photo credit: F.W. Howard, University of Florida, Bugwood.org

have the ability to crawl and move from place to place. The newly emerged crawlers are in the dispersal stage of scale insects. The crawlers move to different portions of the host plant, insert their mouthparts and begin to feed. Armored scale crawlers then begin to build the waxy coverings over their bodies. The covering enlarges with each molt.

The crawlers of most soft scale species leave the twigs where the eggs were located and move to the leaves to begin feeding. The crawlers feed on sap from the leaves all summer, but return to the twigs to overwinter. They leave the foliage before the leaves drop in the fall. If they do not, they will fall from the tree with the leaves and eventually die.

### Management

Scale insects are often difficult to control. Because of their cryptic nature, they can build up to heavy populations without being noticed. Armored scales are protected from insecticides by the waxy coverings over their bodies. Overwintering soft scale nymphs are susceptible to superior oils applied during the dormant season. Because of the waxy covering and their tendency to overwinter in the egg stage, dormant applications of superior oils are not as effective against armored scales.

Scale crawlers, whether they are armored or soft, are vulnerable to insecticides. Soft scale crawlers can be treated anytime they are feeding on the leaves during the summer. Armored scale crawlers must be treated just after the eggs hatch, but before the protective covering is formed. Soaps and oils are very effective against scale crawlers. Because thorough coverage is so important to good control, smaller trees can be more effectively treated than can larger trees.

If possible, soft scale insects can be treated with early spring applications of superior oils whenever practical. The feeding activities of soft scale insects are most harmful

to the tree after the overwintering female crawlers begin to enlarge in the spring. The growing females draw large quantities of plant sap directly from the twigs. The trees need this sap to maximize their leaf growth for the season.

The feeding of soft scale crawlers on the foliage during the summer is not as harmful to the tree. Honeydew produced from the crawlers can still be a concern because of its effects on the tree's appearance or discoloration of patios and sidewalks beneath the tree. This can make summer applications against soft scale crawlers a viable alternative.

Treatments are now available to treat the leaf feeding stage of soft scale insects without spraying. Systemic insecticides can be injected into the soil or into the trunk of the tree. The insecticide is carried to the leaves to destroy the crawlers feeding there.

Unfortunately, tree anatomy reduces the effectiveness of this technique for managing scale insects that feed on the twigs or other woody tissues, such as armored scales.

Multiple treatments are often necessary to gain the upper hand on heavy scale infestations. This is especially true for armored scale insects. In some cases, even though the scale insects are effectively managed, the injury to the host can be so extensive that it dies.

Many parasites and predators attack scale insects. Several species of lady beetles and wasps attack the crawlers. By closely observing scale populations, it may be unnecessary to treat the populations with insecticides.

**If you have any additional questions or concerns, please do not hesitate to contact your local office for further details.**



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