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How to recognize and manage scale insects

July 14, 2017 - By [Steve Frank](#)

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Terrapin Station

Terrapin scale infestation on a red maple branch.

First, distinguish between armored and soft scale.

Some insect pests are easy to find. Tent caterpillars and webworms build big silk nests you can see a mile away. Japanese beetles are big, shiny and cling to trees by the thousands. Other pests, though, are hard to see. Scale insects are common landscape pests, but many people don't see them until it's too late, which comes when scales drain their host plant of energy, and they begin dropping leaves or dying. It's important to understand how to find scale insect infestations and some tactics to stymie them.

There are thousands of scale insect species, but most landscape pests fall within two major groups. The most challenging to manage are armored scales. Armored scales have a hard cover, called a test, made largely from waxes. The test seals tightly against the branch or leaf, making the insect essentially waterproof. Most armored scale species spend the winter as adults or nymphs beneath their test. The tiny nymphs that hatch from eggs in spring are called crawlers. Crawlers are the only mobile stage of most armored scales and the only stage without a test. They wander out to find a spot on the plant to feed, then insert their mouthparts into plant tissue and begin to form their protective test. Some species have one generation per year; others have many.

Soft scales are the other major group of scale insect pests on landscape plants. They usually have a softer test. Some soft scale species, like wax scales, are covered entirely by their test, but others are partially covered. Many soft scales move at least twice in their lives. Especially on deciduous trees and shrubs, they spend the winter on branches as late-stage nymphs or adults. In spring, they produce eggs on the branches, but crawlers migrate to leaves to feed for the summer. Before fall, the nymphs migrate back to the branches for winter. Some soft scales have one generation and others have many; this can vary by temperature and region.

Soft vs. armored scale

Scale insect management can be tricky, but there are critical differences between armored scales and soft scales in the insecticides that are effective, so you at least need to distinguish between these groups. But how do you tell? There are thousands of scale insect species that are all small and cryptic, but luckily there are a couple tricks to help you determine if the scale insects on your plant are soft or armored.

First, try to remove the test. It's easier said than done, but use a probe or the tip of a pocketknife to flip the test from the branch. (You do have a hand lens, right?) If you're looking at an armored scale, the test will float off in the wind and you will see the insect's body, which is usually yellow, orange, pink or purple on the twig. Armored scale tests are not attached to their bodies. Soft scales have a test that's softer and attached to their body. So, if you perform this trick on a soft scale, the whole critter, test and body will fling off the branch to the ground.

The second way to distinguish armored and soft scales does not require such good vision and dexterity. Armored and soft scales suck different fluids from plants. You can tell what a scale insect is eating by what comes out the other end. Armored scales feed in parenchyma cells or other cells their stylet encounters. They excrete very little, and no excretions leave the test. In contrast, soft scales feed in plant phloem, which is rich in sugar, so they excrete lots of a shiny, sticky fluid called honeydew. Honeydew accumulates on leaves, sidewalks, cars and decks beneath soft scales and other phloem feeders like aphids, whiteflies and mealybugs. Besides making things sticky, honeydew is also a substrate for black sooty mold fungus. So, look around your suspect scale insects for honeydew or black sooty mold. If leaves beneath the scales are dry, you probably have armored scales. If they are shiny or sticky, you have soft scales.



Fluff it up

The yellow body of a female white peach scale among hundreds of fluffy white males.

Scouting pest populations are basic integrated pest management (IPM) tasks, but how do you find scale infestations quickly when you're on a client's property? First, there are some telltale signs of scale infestations to recognize. For example, teascale and euonymus scale feed primarily on the undersides of camellia and euonymus leaves, respectively. As the scales draw fluids and chlorophyll out of the leaf from below, yellow spots appear on top. So, as you inspect these and other broadleaf evergreen plants look for leaf discoloration. Even if it's not scale, it's probably something that needs attention.

Many scale insects feed on stems and twigs instead of leaves. This takes closer inspection, but it's generally easy to spot heavy infestations. If the bark of a tree appears oddly textured or flaky, use a hand lens to look closer. Armored scales can be round, oval, oyster shell-shaped or long and symmetrical. Soft scales can be round, oval, globular or other shapes. Scale density will be highest on the oldest parts of the plant, so you may have to dig into the middle of dense plants like hollies and boxwoods to see the trunk. This is where Japanese maple scales, an aggressive armored scale, hang out.

Treatment options

Deciding if management is necessary—an important IPM concept—is not well-established for scale insects or any landscape pests. There are no established thresholds based on number of scales per plant that will help you decide if the population is likely to cause aesthetic damage. Basic decision-making starts with determining whether the scales are alive. Scale tests can remain on plants for a year or more after the insect dies. So before you apply insecticides, squash some of the scales with your thumbnail. If the scales are alive, juice will come out and smear on your finger.

Scales are relatively waterproof, so contact insecticides, such as pyrethroids, do not provide adequate control unless applied to the crawler stage. In addition, pyrethroids, organophosphates and other insecticides that leave a toxic residue on plant surfaces kill natural enemies and can make scale infestations worse. Several other classes of insecticides available for scale control and cause less harm to natural enemies. Insect growth regulators disrupt insect development, preventing eggs and nymphs from developing into reproductive adults.

Neonicotinoids are another class of insecticides used for scale management. Imidacloprid is the most commonly used chemical in this class but is not effective against armored scales, which is why it's important to distinguish scale families. Imidacloprid does not control armored scales but can be used to manage soft scales and other related phloem feeders like aphids. Neonicotinoids are systemic, so they can move into plant tissues making them toxic for pests to consume. Thus, even though applications during crawler emergence are optimal, neonicotinoids can kill other scale stages feeding on treated plants.

Horticultural oils and insecticidal soaps are also important tools for scale management. Horticultural oils kill insects by blocking their breathing pores and also by disrupting cell membranes. They kill on contact, so they're best applied when crawlers are active but can penetrate the waxy tests of armored scales. Insecticidal soaps are better for soft scales. These products do not leave a toxic residue, so multiple applications may be required. However, horticultural oils and soaps are inexpensive and relatively safe for natural enemies and pollinators.

Every plant in every landscape probably has at least a few scales. Since no one can see them, a few is not a crisis or even a problem. The trick is to identify plants with moderate infestations that are growing to prevent discolored leaves, branch dieback and accumulation of ugly scale tests and honeydew.

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Photos: SD Frank

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