

Scale Insects¹

By Arthur L. Antonelli, Extension Entomologist
WSU Puyallup

Scale insects are common on ornamental trees and shrubs. Occasionally scale insects build up in large enough numbers to cause serious damage or death to the host tree. Scales do not resemble typical insect pests, so they often go unnoticed until a large population has developed and caused damage. To prevent damage from scale insects, maintain healthy, vigorously growing trees, monitor insect populations, and use correct control measures when those populations increase.

Hosts and Damage

Scale insects attack many types of trees and shrubs, garden plants, and houseplants. Considerable damage may occur when large numbers of these insects feed upon plants already weakened by environmental stresses, such as drought, or disease. Scales remove plant juices with piercing-sucking mouthparts. At times, certain scale insects produce tremendous amounts of honeydew (an excess of liquid and sugar expelled from their bodies). This sticky material may serve as a growth medium for a sooty mold fungus. During periods of large populations, some scales become so abundant that an infested plant tissue is totally encrusted with insects.

Life Cycle

Scale insects have three distinct life stages (egg, immature, adult) and may complete several generations in a single year. Adult females produce eggs beneath the scale covering or in a cottony material, and in many cases spend the cold winter months in this stage. Tiny six-legged crawlers emerge from the eggs, move to newer growth on the plant, insert their mouthparts and begin to feed. A scale-like covering produced from waxy filaments and feces then forms over each individual scale. Scale species are identified by the color and shape of the covering. The covering protects scales from predation by other insects and from insecticides. The male scale is often a slightly different shape than the female and passes through a tiny, winged stage. The casual observer seldom sees winged stages. Females are wingless and usually remain in one place after inserting their mouthparts into plant tissues.

Monitoring

A crucial step in scale insect management is determining when the crawlers emerge. A hand lens or magnifying glass will help you to examine the plant to determine when this happens. Double sticky tape may be applied near adult scales to trap crawlers as they migrate to new growth. For convenience, you may put an infested branch in water to keep it from drying out and leave it outdoors in a shady place. Observe the scale eggs

¹ Adapted from: [Scale Insects on Ornamentals](#), WSU EB 1552, by Dan A. Suomi

every few days for a hatch. Chemical management strategies must be timed to coincide with emergence of the crawlers. Remember that emergence times will vary depending on your location and seasonal weather conditions, so do not depend on notification from other sources or areas. Monitor your own crops and plants.

Management

Scales may be managed in several ways. Dormant (or delayed dormant) oils may be applied; they work by cutting off the insect's oxygen supply. These oils should be applied when plants are not actively growing (late winter to early spring). Using too much oil may cause burning or other damage to plants. Oils must be applied when temperatures are greater than 40 degrees to prevent separation of oil and water. A light, superior oil/insecticide mixture may be applied just as plants begin to grow to control emerging crawlers. This time period usually lasts only a few days, so timing is critical. The oil must be applied before leaves open, yet late enough so that this mixture will kill the crawlers. Refer to Table 1. for a list of scale insects that can be effectively managed by a delayed dormant oil application. The best time to apply any insecticide is when crawlers are present, as this stage does not have a protective covering, and is therefore vulnerable to almost any chemical registered for this use. Several conventional insecticides and insecticidal soaps are registered for crawler management. The plant must be thoroughly covered to kill the crawlers with one application. Systemic insecticides, applied as a foliar spray, can help control adult scale insects during the growing season. Each situation is unique, so it is important to know which scale species is present. For insecticide recommendations, consult the Hortsense website (<http://pep.wsu.edu/hortsense>) or the current PNW Insect Management Handbook. Always follow label instructions carefully.

Systemics vs. Contact Insecticides

Systemic insecticides are used to control insects that feed with piercing-sucking mouthparts inserted into plant tissues. The materials are applied either as a foliar spray, where the insecticide concentrates in leaves, or as a root drench, where the xylem (water-conductive tissue), transports the material to the leaves from the roots. Scale insects found on bark feed in the food transport tissue, called phloem, and do not feed on xylem tissue. Therefore, systemic insecticides do not kill these phloem feeders. The exception to this is if an insecticide has both contact and systemic activity and is applied when the scale is vulnerable to contact pesticides. Thorough coverage is important when using contact insecticides since many crawlers feed on the undersides of leaves and on twigs, branches, or the trunk. Scale insects feeding on leaves will be killed by systemics, since these concentrate in the leaf tissue whether they are applied as direct sprays or as a root drench. Note that beneficial predators will often reduce scale infestations to levels where no other control measures are necessary.

Table 1. Common Scale Insects

Scale	Hosts	Feeding Sites	Overwintering Stage	Generations
Lecanium	hundreds (deciduous)	leaves and bark	*immature	one
Oystershell	many broadleaf and deciduous	bark	eggs under ♀	one
San Jose	many (deciduous)	twigs, leaves, fruit	*immature	up to 5
Oak pit	oak	twigs	*immature?	one
Brown soft	many (incl. dogwood, houseplants)	leaves primarily	*immature	2 outdoors 5 indoors
Azalea bark	azalea, rhodi, blueberry, willow, andromeda	bark	*immature	one
Cottony Camellia	camellia, yew, holly, maple, rhododendron	leaves + bark	*immature	one
Cottony maple (one of largest)	primarily maple, also apple, dogwood, etc.	leaves + bark	*immature	one
Elm bark	elm	leaves + bark	*immature	one
Juniper	conifers in general	leaves	adults	one
Hemlock	hemlock, spruce	leaves	*immature	two
Spruce bud	spruce, pine	leaves + bark	*immature	one
Pine needle	pine, Douglas-fir, spruce	leaves	eggs under ♀	one-two



Lecanium scales. By R.S. Byther.



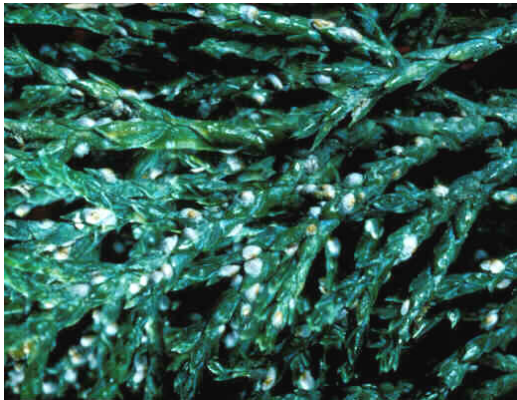
Oystershell scales. Author unknown.



Brown soft scales. By A.L. Antonelli.



Cottony maple scales. By R.S. Byther.



Juniper scales. Author unknown.



Pine needle scales. By K. Grey.