

Scale Insects



Scale insects are so highly modified that they bear little resemblance to typical insects. Female scales are wingless, legless and more or less flattened; mature males are gnat-like with absent mouthparts.



Scale Crawlers on Magnolia.

The development of scale insects is complex. The first instar nymph (commonly known as “crawler”) has well-developed legs and antennae and is quite active. Crawlers are responsible for the dispersal of the species; they readily colonize new plant stems and foliage. In addition they may be transported to new host plants by hitchhiking on birds’ feet. In the next life stage, the mouthparts are permanently inserted into the plant, the legs and antennae degenerate and a waxy and/or hard scale-like cover is secreted over the body. The female scale remains sessile (non-mobile) for its entire life; males develop in an identical fashion, except in the final molt, wings are produced. Females may produce eggs or living young, sometimes partheno-

genetically (without fertilization by males).

Scale insects injure plants by sucking sap. When numerous, they may be responsible for stunting and the die back of branches and foliage and may even cause the death of the entire plant. Many scales produce a sugary liquid known as honeydew. This may in turn provide a growth medium for black sooty mold. This mold is harmless to the plant, except in rare instances where very thick deposits block sunlight and inhibit photosynthesis.



Woody plant pest scales belong to two types, the armored scales and the soft scales.

Armored scales are less than 1/8” in diameter and have a plate-like, hard, waxy cover that is usually separate from the scale’s body and completely covers its body. They do not produce honeydew and usually have several generations per year. Some armored scales can kill plants and must be controlled when their populations rise.

Soft scales can be smooth or cottony, and are usually larger (1/2" diameter or less), more rounded and convex than armored scales. Their scale cover is the actual body wall of the insect and it can't be removed like the armored scale covers, leaving their bodies partially exposed. They produce large quantities of honeydew and often have only one generation per year. Soft scales reduce plant vigor but are seldom lethal to the tree or shrub. Control of scale insects is complicated by the tough, waxy layers and/or thick cuticular covering of the scale. Therefore, controls are most effective when initiated at a vulnerable time in the scale life cycle.

Horticultural Oils

One way to control scale insects is with horticultural spray oils. Oils are preferred over conventional insecticides because they do not kill beneficial insects. These materials are highly refined paraffinic petroleum oils, which are used to coat, and thereby smother, scales. Spray oils are generally used in the spring (as dormant treatments, 4-6% concentration rate), early summer and fall (as a crawler treatment, 1-3% concentration rate). Be sure to use only specially designed 60 or 70 second horticultural oils. They can be purchased at most local farm and garden supply stores. Never use motor oil; it will not control scales but will injure foliage.

Thorough and uniform coverage is essential to achieving satisfactory control. Do not apply oils if the air temperature is greater than 90 degrees or less than 40 degrees F., or if the

relative humidity is above 90% at the higher temperatures. Be sure to follow all label instructions. Do not apply when there is the possibility of heavy rain; this will wash the oil off the plant before it has controlled the scales. The leaves must be dry and the oil must have a chance to evaporate. Do not spray trees and shrubs that are flowering.

Certain plants are sensitive to oil and can be damaged (i.e. have a phytotoxic reaction). These include maple, hickory, black walnut, *Cryptomeria*, smoketree and many azaleas. Plants tending toward oil sensitivity are beech, Japanese holly, redbud, Savin juniper, *Photinia*, spruce and Douglas fir.

Crawler Sprays

Scales are most vulnerable to insecticides when in the crawler stage. Therefore the application of crawler insecticides (Malathion, Orthene, Sevin, insecticidal soap or horticultural oil) is timed to the expected period of crawler activity. Refer to the Table for Guidelines on crawler activity in Michigan. Keep in mind that crawler activity will vary according to geographic location and species of host plant. You may find it necessary to use a 15X hand lens to detect crawler activity on your plants. Another way to check for crawler hatch is to pull off a few female scales and check for eggs at weekly intervals. When no eggs are found, all of the crawlers have emerged.

Thorough application is essential to achieve satisfactory control. Be sure to read and follow all label instructions when using insecticides.

Scale species and Type	Estimated dates of crawler activity	Location on Host
Pine needle scale * (A)	May 15— 25	Needles
Scurfy scale (A)	May 25—June 5	Twigs and branches
Putname scale (A)	May 25—June 20	Twigs and branches
Oystershell scale (A)	June 2—10	Twigs, branches and trunk
Euonymus scale * (A)	June 3—10	Foliage and stems
Golden oak scale (A)	June 15—30	Twigs and branches
Juniper scale (A)	June 20—30	Foliage
Lecanium scale (S)	June 22—30	Leaf underside
Fletcher scale (S)	June 22—30	Needle undersides
San Jose scale ** (A)	June 24—30	Twigs, branches and trunk
European elm scale (S)	June 25—July 5	Leaf underside
Azalea bark scale (S)	June 25—July 10	Twigs and branches
Cottony maple scale (S)	July 1— 10	Leaf underside
Spruce bud scale (S)	July 1—15	Twigs
Pine tortoise scale (S)	July 10—20	Twigs
Kermes oak scale (S)	July 20—30	Twigs and branches
Pine needle scale * (A)	July 20—30	Needles
Euonymus scale * (A)	July 25—August 5	Foliage and stems
Tulip tree scale (S)	August 20—30	Twigs and branches
Magnolia scale *** (S)	Late August—October	Twigs and branches

* Two generations per year

Type

** May have several overlapping generations

A = Armored scale

*** Timing adjusted by new data

S = Soft scale