

Florida Wax Scales: A Major Pest of Hollies and Other Landscape Shrubs and Trees

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Although hollies have historically been a good choice as landscape plant species and are well adapted to the environmental conditions in Texas, the situation has changed over recent years. More and more landscape hedges of hollies (*Ilex* sp.) throughout the eastern half of Texas and the southeastern U. S. are becoming infested with the Florida wax scale, *Ceroplastes floridensis* Comstock (Homoptera: Coccidae) (**Fig. 1**). Now, foliage of infested plants appears blackened with coatings of sooty mold, a fungus that grows on the sugary honeydew produced by these scale insects. Control is difficult on heavily-infested plants, in part, because proper timing and thorough coverage using insecticide treatments are needed to achieve success. Even after the insects are killed, many of the scales and the sooty mold will remain on the plants and continue to disfigure them.

Identification

There are many scale insect species that infest ornamental landscape plants. However, none resemble the shape and size of this group of “soft scale” insect species in shape or size. The “wax scales” are globular in shape and coated with a heavy layer of wet-looking white, beige, pinkish-white or grayish wax. From the top view, they appear rectangular, oval or lobed at the base. Underneath the wax “cap”, the body of the scale is reddish in color. The adult female of the Florida wax scale grows to about 3 mm (1/8 inch). Many other species of wax scales occur in the state including the larger barnacle scale, *C. cirripediformis* Comstock, that grows to almost 1/4 inch in diameter (Drees and Jackman 1998).

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Eggs (**Fig. 2**) are oval and reddish-orange in color, and fill the cavity underneath the bodies of dead or mature adult female scales. First stage (instar) nymphs, called crawlers (**Fig. 3**), hatch from eggs over a period of 2 to 3 weeks and crawl to and settle on leaves, twigs and stems of host plants - thereby spreading the infestation. Nymphs will often line up on the veins of the upper surface of the leaf (**Fig. 4**). After settling, nymphs insert their thread-like mouthparts into the plant and begin to secrete wax in tufts around the body that give them a star-like appearance.

Unlike the hard scales, Florida wax scale nymphs will often move from one location to another. When a new flush of growth occurs on the host plant, the more mature scales will often migrate to the new growth at the top of the plant.

Wax scale females feed and develop through three immature stages (first, second and third instars) before becoming adults, producing eggs and dying. When removing individual adult female scales from leaves at certain times of the year, hundreds of eggs will pour out of their body cavities (**Fig. 2**). In Texas, the Florida wax scale has two fairly distinct generations per year (eggs hatching in late April through May and again in late July through August), although some eggs can hatch during other months. They overwinter predominantly as newly mature females. Male forms have not been observed in this species.

Florida wax scales have been reported infesting a wide range of host plants, including shrubs, trees and several herbaceous plants. In Florida, this species has been recorded from many species of holly, elm, crape myrtles, oaks, loblolly pine, deodar cedar, citrus and other hardwoods and softwoods (http://www.fl-dof.com/pubs/insects_and_diseases). In Texas, the authors have observed infestations on other plants including elephant ear, golden Euonymus, honeysuckle, pomegranate, winged elm and Virginia creeper.

On holly, Florida wax scales are easily spotted because most colonize the upper leaf surface. This location makes the scales vulnerable to heavy rain and other environmental factors that reduce their ability to survive and are more easily reached with foliar insecticide sprays. However, some of the scales colonize the underside of leaves, on twigs and branches, where they are more protected.

Wax scales injure plants by removing large quantities of plant sap. Severe infestations may result in leaf discoloration, shoot or branch dieback and occasionally death of the host plant. Large amounts of a sticky, sugary liquid, called honeydew, is secreted by these scale insects and is colonized by a fungus called sooty mold, and causes infested plant parts to turn black and become unsightly. Honeydew also attracts other insects including bees, wasps, hornets and ants (Hymenoptera). Some species of "bark lice" (Psocidae) are associated with sooty mold.

Three parasitic wasp species (*Coccophagus lycimnia*, *Scutellista cynea* and *Metaphycus eruptor*) have been reported for Florida wax scales in some parts of the U. S. (Hamon & Williams 1984). However, no natural enemies (pathogens, parasites, predators) have been observed to provide biological control of Florida wax scales in Texas. This insect is widely distributed from Maryland to Florida including the Caribbean archipelago, and from Missouri to California. In recent years, infestations in the eastern half of Texas have become particularly noticeable.

Management

Cultural control. Consider replacing heavily infested landscape hollies and other host plants with non-host species of plants to eliminate the need for repeated insecticide treatments. Alternative shrubs to hollies in eastern Texas include junipers (except "Blue Point"), Ligustrum, privet, boxwood, pittosporium, bottle brush, sea grapes, oleander, wax myrtle (regular and dwarf). Of course, these other landscape ornamental plants may have other limitations. If hollies are selected for planting, inspect plants thoroughly to avoid purchasing already-infested plants.

Established host-plants. Promote plant vigor and health by properly selecting preparing planting sites, and providing optimal watering and fertilization. Visually inspect plants regularly for early signs of infestation. When infested plants are to be preserved, control should begin with pruning away and discarding heavily infested foliage. Sanitation and pruning will reduce initial pest density and opens the canopy for improving spray coverage.

The goal of insecticide based efforts should be to prevent new regrowth from becoming infested by crawlers. Treatment options include use of soil-applied systemic insecticides and/or foliar sprays with label directions for control of "scale insects" or "soft scale" on ornamental landscape plants (See "**Applying Systemic Soil and Foliar Spray Insecticides to Control Florida Wax Scale on Hollies**"). Systemic insecticides generally do not eliminate all scales located on branches or twigs, so the addition of foliar treatments may be necessary to eliminate the whole population. Similar treatments may be useful to control other pests on landscape plants such as azalea lace bugs and crape myrtle aphids, although timing of application(s) will vary.

Soil applied systemic insecticide products, such as those containing imidacloprid (e.g. Merit®, Bayer® Tree & Shrub Insect Control) should be applied prior to egg hatch to allow the active ingredient to be trans-located from the soil, through the roots and into the leaf tissue. Scales attached to branches or twigs may be unaffected. Carefully follow label directions.

Foliar treatments are best applied after the crawler stage hatches from eggs and begins to settle on new foliage. Beginning in late April and again in mid-August, examine leaves on infested plants weekly or bi-weekly for newly settled nymphs that appear small, white and star-like as they begin to exude their wax coating. Several foliar sprays applied in 7 to 10 day intervals, or as directed on the product's label, may be necessary to provide protection of new foliage through the period of egg hatch, particularly when using insecticide products with little or no residual activity such as insecticidal soap or horticultural oil. A contact systemic insecticide such as products containing acephate (Orthene® Tree, Turf and Ornamental Spray) can provide a longer period of control.

Literature cited:

- Drees, B. M. and J. A. Jackman. 1998. *A Field Guide to Common Texas Insects*. Gulf Publ. Co., Houston, TX. 359 pp.
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Further reading:

- Gimpel, F. W., D. R. Miller, and J. A. Davidson. 1974. Systematic revision of the wax scales, genus *Ceroplastes*, in the United States (Homoptera: Coccoidea, Coccidae). Univ. Maryland Agri. Exp. Stn. Misc. Pub. 841, 85 p.
- Johnson, W. T. And H. H. Lyon. 1988. *Insects That Feed on Trees and Shrubs*, 2nd ed. Cornell Univ. Press, Ithaca, NY. 556 p.
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For more information about Florida wax scales, see: “**Applying Systemic Soil and Foliar Spray Insecticides to Control Florida Wax Scale on Hollies**” (visit <http://insects.tamu.edu>).

For educational presentations through County Extension faculty, use these fact sheets with the PowerPoint program, “Florida Wax Scale Biology and Management” (CD-25) available from the Audio-Visual Library (<http://av-library.tamu.edu/>).

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Fig. 1. Holly leaf infested with Florida wax scale.



Fig. 2. Eggs from beneath an adult female wax scale.



Fig. 3. Active crawlers (two on right) and Settled crawler (on left).



Fig. 4. Adult and early star-like immature stages.