

## Managing Scale Insects in the Greenhouse

### Introduction

Scale insects are more common on woody ornamental trees and shrubs. They tend to be less of a problem on herbaceous annual and perennial plants grown in the greenhouse. Woody tropical plants and other long-term crops are more susceptible to scale insects. There are two major types of scale insects found on ornamental plants: soft scales (Coccidae) and armored scales (Diaspididae). Some species are host specific, and some feed on many different species.

### Feeding Damage

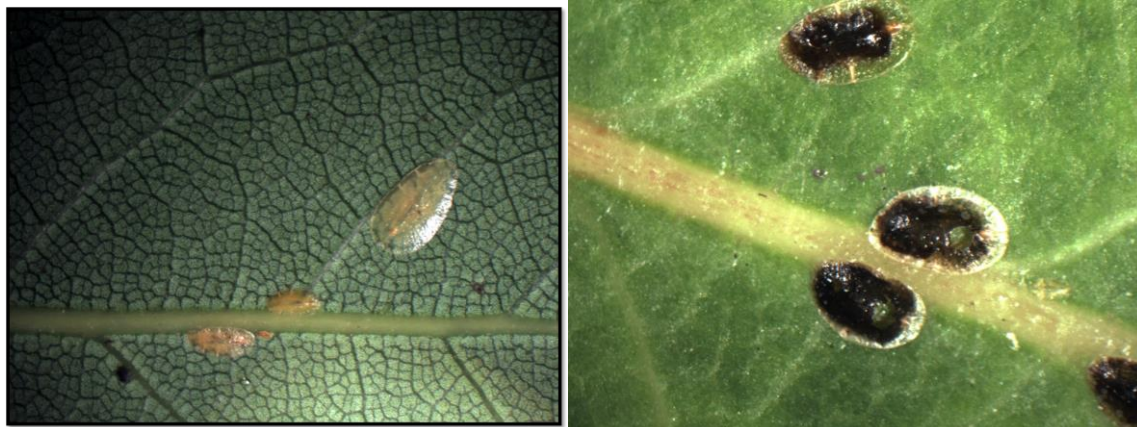
Scales damage plants by using their piercing-sucking mouthparts to withdraw plant fluids. As they feed, they also inject toxic saliva, so you may see yellowing of the foliage. With heavy scale infestations, dieback and leaf drop may occur. Armored scale insects are protected by a hard waxy covering known as a shield or test, which is made of the wax they secrete and cast skins. They do not produce honeydew.

Soft scales whose body is just covered by wax do secrete honeydew. Black sooty mold may grow on the honeydew.

### Biology and Life Cycle

Adult females are wingless and usually legless insects. Their life cycle consists of eggs, nymphs and adults. Only the first instar nymphs (“crawlers”) that emerge from eggs are mobile as they look for a suitable place to feed. Later nymphal stages and females are not mobile. The short-lived, rarely seen males are mobile. Males do not feed and their primary purpose is to fertilize females. Soft scales usually have one generation a year and females can lay more than 1000 eggs over several months during their lifetime. Eggs are laid in cottony sacs at the end of the female body. Some may keep their eggs and antennae as adults. Males may be winged or wingless. Soft scales often feed on a wide range of woody and herbaceous plants.

*Figure 1: Immature scale crawlers on left and signs of parasitism on right (L. Pundt)*



Armored scales usually have two more generations a year and lay less than 100 eggs during their lifetime. The biology and life cycle varies among species. Some females lay eggs whereas others give birth to live young. The scale you see is a covering known as a test, consisting of wax and molted skins from earlier instars. Depending upon the species, it may be circular, elliptical, oyster shell like and color varies. Armored scales more common on woody ornamentals and may feed on one or two hosts. Scale insects often have long generation times so are more commonly found in plants with long production cycles or in conservatories.

### **Scouting**

Inspect incoming plants with a 20-30x hand lens. Look on the upper and lower leaf surfaces, leaf axils, bud and stems.

For soft scales, look for honeydew, and black sooty mold. Ants and wasps may also be attracted to the honeydew. They appear convex in shape resembling a helmet.

Hard scales are harder to detect because they do not produce honeydew. They produce a waxy covering called a test, which protects adult females, as well as eggs and crawlers from natural enemies. Armored scales are circular or rounded in shape.

It is important to know if the scale insect is alive or dead. Use a small needle or sharp fingernail to see if you can pop off the scale cover. Look for a pink or orange-bodied scale insect. If the scale is dead, the body will be dry and shriveled or absent. If when you probe the insect, and you see a colored liquid, they are alive. When you crush them, if there is no liquid, they are dead.

### **Cultural Controls**

Inspect incoming plants for scale insects. Remove heavily infested plants and do not overwinter pet plants infested with scale insects. Prune out heavily infested branches. Avoid over-fertilizing especially with nitrogen, as this encourages the development and reproduction of scales.

### **Biological Controls**

*Rhyzobius (=Lindorus) lophanthae* is a type of ladybird beetle that feeds upon armored scale insects. Release this beetle in the evening when greenhouse vents are closed. It lays its eggs under the scale insect in small groups of 1 to 5 eggs. Mated females can live about 2 months. Optimum conditions are 77 F and 65% relative humidity but 46 F is the minimum threshold for development. Consult your supplier for information on release rates and availability.

### **Chemical Controls**

Foliar sprays to target the most susceptible crawler stage are often used because the crawler stage is the most susceptible stage to insecticides. However, there are overlapping generations in the greenhouse, so repeated

applications are needed as not all the eggs hatch at once. In addition, some insecticides such as systemic insecticides kill soft scales more effectively than armored scales. Mineral oils can also smother the insects and penetrate their coverings depending upon their thickness. Consult the most recent edition of the *New England Greenhouse Floriculture Guide: A Management Guide for Insects, Diseases, Weeds and Growth Regulators* available from [Northeast Greenhouse Conference and Expo](#) and the [UConn CAHNR Communications Resource Center](#).

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**References:**

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