

Armored Scale Insects

Solution Sheet

The Problem

Scale insects are all members of a diverse group of piercing-sucking pests (Hemiptera) and can be common in greenhouses, nursery production, and landscapes. Scale insects that attack ornamental plants can generally be divided into two groups: armored or soft scales. These insects are notorious for attacking all types of ornamental plants, and when not controlled, can move across the country on plant material.

Armored scale insects are the smallest of the scale insects (1-3 mm, <1/32 inch) but have disproportionately large mouthparts to feed on crushed plant cell contents—unlike soft scale that are phloem feeders. These insects can secrete a waxy covering or armor that protects them from adverse environmental conditions as well as insecticide applications. The wax cover can be detached to expose the body of the insect, which is often yellow, orange, pink or red in color. This armor also protects the eggs laid by the female. The armor covering varies from circular to elongate or oyster shell-shaped. Male and female covers may differ in size and shape for the same species. Common armored scale insects include euonymus scale, false oleander scale, gloomy scale, Japanese maple scale, juniper scale, lesser snow scale, obscure scale, oystershell scale, San Jose scale, pine needle scale and tea scale.

What to Look For

Armored scale eggs hatch beneath the scale body and 'crawlers' (first instar nymphs) migrate to find a feeding site where they settle. Upon first molt, females lose their legs and remain sessile for the rest of their lives. Armored scales may overwinter as eggs, nymphs, or adult females. Winged, adult males crawl out from beneath their armor and are usually present about two weeks in each generation. Some armored scales have four generations per year.

Symptoms may not be obvious when just a few individuals are present, but larger populations of scale insects can cause stunting, chlorosis and branch dieback.

The Solution

Highly susceptible plants should be monitored closely. When it comes to effective control, early detection followed by isolation of infested plants is crucial. Scale outbreaks require immediate treatment with an effective insecticide to minimize further damage and eliminate the potential for spread to healthy plants. For optimum control, insecticides should be applied preventatively or when crawlers are active. Timing of application is especially important for contact insecticides. It is always important to positively identify all insect pests including scales, especially when using biological controls, as there are some scale parasitoids that are species specific.



Figure 1. False oleander scale, adults and crawlers

Table 1. Products available for armored scale insect control. Efficacy varies with each species but all products were deemed effective to highly effective in IR4 trials against multiple species of armored scale. All products perform better on foliage-feeding scale. It is important to understand the life cycle and number of generations of the target scale for best timing of the application, with best results obtained by targeting crawlers.

Solution1	IRAC Group	Activity	REI	Rate/100 Gallons	Application Intervals
Talstar Select (RUP)	3	Contact	12 hr	Foliar, bark control: 10-20 fl oz	Treat trunks, stems and twigs in addition to plant foliage. Use with oil or spreader-sticker to improve coverage and penetration through the scale cover.
Merit 2Fi®	4A	Systemic	12 hr	Drench: 0.2 fl oz (6 mL) per inch of trunk diameter (DBH) or per foot of shrub height	For trees larger than 15" DBH: 0.1 to 0.4 fl oz (3 to 12 mL) per inch of trunk diameter (DBH). Review Bee Box.
Safari®	4A	Systemic	12 hr	Foliar: 4-8 oz Soil: 1.25-5.0 level teaspoons per inch of trunk diameter at breast height (DBH) Basal/Trunk: 12-24 oz	See label for detailed list of scale insects controlled, and site of use. Speed of control will be dependent on tree size, tree health, environmental conditions and how actively pests are feeding. Review Bee Box.
The following products are neonicotinoid free, with less impact on beneficial insects, parasitoids, and natural enemies. Begin with Altus, rotating products as needed.					
Altus®	4D	Systemic	4 hr ²	Foliar: 10.5-14 fl. oz.	Apply to crawlers or drench early as a preventative; 28 + days. For smaller trees and shrubs
Aria®	29	Contact, translaminar, systemic	12 hr	Foliar or Drench: 2.1-4.3 oz.	Apply to crawlers or drench early as a preventative; 28 + days. Drench only recommended for smaller trees and shrubs
Distance	7C	Contact-IGR	12 hr	Foliar: 8-12 fl. oz.	Highly effective IGR. Check label for list of contraindicated plant species.
Durentis	28	Ingested, Systemic	12	Drench: 0.082 oz (2.4 ml) per foot shrub height	Apply to roots 45-60 days prior to crawler emergence. Most effective in plants under 6' tall.
Kontos®	23	Systemic	None	Drench: 3.4 fl. oz.	Apply to crawlers or drench early as a preventative; 28 + days. For smaller trees and shrubs
Talus® 70DF	16	Contact-IGR	12 hr	Foliar: 12 oz.	Insect growth regulator (IGR). Do not exceed 2 applications per crop per growing season
Ultra-Pure® Oil	UNM	Contact	4 hr	Foliar: 1 gal.	Re-apply every 2 to 3 weeks as necessary

¹See insecticide labels for complete details. Always read and carefully follow label instructions.

²The REI for Altus in California is 12 hours.