



URI COLLEGE OF THE ENVIRONMENT AND LIFE SCIENCES (CELS) OUTREACH CENTER

3 East Alumni Avenue  
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**For more information:**

**Call:**

In RI: URI MGA Hotline  
1-800-448-1011  
Mon.-Thurs. 9:00 a.m.—2:00 p.m.

In MA and CT: 401-874-2900

Outside New England please contact Cooperative Extension in your county.

**Websites:**

URI Master Gardener Association  
[www.urimga.org](http://www.urimga.org)

CELS Outreach Center  
[www.uri.edu/cels/ceo](http://www.uri.edu/cels/ceo)

**SCALE INSECTS**

Scale insects are a peculiar group of small, immobile insects with no visible legs or antennae. They resemble fish scales pressed tightly against the plant on which they are feeding. There are over 150 different kinds of scales. Many are common and serious pests of trees, shrubs, and indoor plants.

Scale insects are divided into three groups: armored scales, soft scales, and mealybugs. The armored and soft scales are one of the most destructive groups of insects that attack ornamental crops. Mealybugs generally are not considered a problem on most woody ornamentals.

**Armored Scales**

Armored scales secrete a waxy cover over their bodies. Most species overwinter as eggs beneath the female armor. In spring, eggs hatch into tiny mobile crawlers that migrate to new feeding sites. The crawlers settle after a few days, insert their mouthparts in the plant, and begin to feed. Soon they secrete a protective cover and lose their legs. Large populations can build up before plants begin to show visible symptoms. The most common armored scale pests are:

**San Jose scale:** The San Jose scale was once a devastating pest of fruit trees. In 1922, more than 1,000 acres of mature apple trees were killed in southern Illinois by this insect. The scale was first introduced in the United States in 1870 in the San Jose Valley of California on nursery stock shipped from the Orient. With the introduction of the long-lasting chlorinated hydrocarbon insecticides, namely DDT, during World War II, San Jose scale disappeared from the scene and was no longer a threat to the commercial fruit producer. There are now an increasing number of reports of San Jose scale-infested fruit samples from unsprayed fruit plantings. The insect is making a comeback in home plantings and in some commercial plantings. Over 60 host plants are known, including apple, pear, peach, cherry, ash, poplar, lilac, elm, willow, pyracantha, and cotoneaster. Both dormant and summer oils are effective.

**Oystershell scale:** These scales are shaped like the shell of an oyster. They are chestnut to dark brown, sometimes with lighter transverse bands. Infested twigs are often completely encrusted. This is a common and destructive pest of over 120 different species of fruit trees, shade trees, and woody ornamental shrubs, including apple, lilac, dogwood, box-



Euonymous Scale (top) and a Soft Scale (below)

**PESTICIDES ARE POISONOUS!!** Read and follow all safety precautions on labels. Handle carefully and store in original containers out of reach of children, pets, or livestock. Dispose of empty containers immediately, in a safe manner and place. Pesticides should never be stored with foods or in areas where people eat.

When trade names are used for identification, no product endorsement is implied, nor is discrimination intended against similar materials. Be sure that the pesticide that you wish to use is registered in the state of use.

The user of this information assumes all risk for personal injury or property damage.

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**Note:** The Hotline is open Monday—Thursday, 9:00 a.m.—2:00 p.m. from March 1 to November 1.



wood, birch, elm, sycamore, viburnum, and many others. It occurs throughout the United States and is more common in northern states than southern states.

Use a dormant oil spray in April or treat crawlers between late May and mid-June.

**Pine needle scale:** Mature scales are pure white and shaped like oyster shells. Pine needle scales are probably the most common armored scale found on ornamental pines and various spruces on conifers in the United States and Canada. Less preferred hosts include hemlock and fir. Ornamental plants, Christmas tree plantations, and nursery stock are more frequently infested than forest trees. In heavy infestations, needles may be completely whitened by a continuous layer of scales. Use dormant or summer oils against adults or treat crawlers when lilacs are in bloom.

**Euonymus scale:** Females are pear-shaped and blackish-brown. Males are elongate and white. This is a common and serious pest of evergreen euonymus, often causing defoliation and dieback. Pachysandra and bittersweet are also suitable hosts. Crawlers are active in early June and mid-July. Avoid use of *Euonymus japonica*, a highly susceptible species. Watch for a small black ladybug with 2 red spots which often provides good control of this scale.

**Juniper scale:** Native to Europe, juniper scale is distributed throughout the United States. Females are round and dirty-white with yellow centers (under a magnifying glass they resemble miniature fried eggs). Males are also white, but smaller and narrower. Hosts include junipers, arborvitae, incense cedar, and cypress. Crawlers are active mid-June to early July.

**Hemlock scales:** The two species of hemlock scale – one is round and the other oblong – are brown and found on the undersides of needles of hemlock and occasionally on other conifers. These scales are usually effectively controlled with biological controls but dormant or summer oils may be used when needed. This pest occurs in Connecticut, Maryland, Massachusetts, New Jersey, New York, Ohio, Rhode Island, and Virginia.

## Soft Scales

In general, soft scales are larger and more convex than armored scales. Many resemble miniature tortoise shells. Soft scales usually cover themselves with wax, but they lack the detachable protective cover for which armored scales are named. Most soft scales overwinter as immature, fertilized females. In spring they resume feeding, mature, and lay eggs which hatch into tiny crawlers. After locating suitable feeding sites, crawlers settle and begin feeding. Some species lose their legs once they've settled; others retain legs and are able to crawl short distances to find suitable overwintering sites in the fall. Except for those soft scales that infest indoor plants, most have only a single generation per year at northern latitudes. The most common soft scale pests are:

**Magnolia scale:** This large scale insect reaches 1/2 inch in length. Color ranges from dark brown to pink-orange and older scales are covered with a white, waxy powder. This scale produces large amounts of honeydew. Treat with dormant oil in April or treat crawlers in October with two treatments seven to ten days apart.

**Fletcher scale:** Mature scales are dark brown, shiny, and very convex. Arborvitae and yew are the most frequently attacked hosts, but pachysandra and Eastern red cedar are also susceptible. Honeydew is produced. Crawlers active from late June through early July. Treat with dormant oil in late April.

**Cottony maple scale:** Large, conspicuous, white egg sacs are produced on the twigs and small branches of host plants. During summer, immature scales feed on leaves, but they migrate to twigs as fall approaches. Honeydew is produced. Cottony maple scale is most common on silver maple, but is also found on other maples, boxelder, linden, black locust, red mulberry, white ash, apple, beech, cherry, dogwood, elm, hickory, holly, honeylocust, peach, plum, sycamore, willow, and others. Crawlers active from late June through July. Many maples are sensitive to both dormant and summer oils. Check labels carefully.

**Oak kermes scale:** Mature scales are tan, globular, and hard. They are easily mistaken for galls or buds. Oak is the only host. This species is not particularly injurious to host trees, but, if necessary, treat crawlers between late May and mid-July or use a dormant oil in April.

## Damage

Scale insects feed on plant sap. They have long, threadlike mouthparts that are six to eight times longer than the insect itself. Scale feeding slowly reduces plant vigor; heavily infested plants grow poorly and may suffer dieback of twigs and branches. An infested host is occasionally so weakened that it dies. Scales often secrete a sticky honeydew that is attractive to wasps and ants and which supports the growth of black sooty molds.

## Control

Scale insects are generally controlled by natural enemies, including tiny parasitic wasps and predators such as ladybugs. It is very common for ladybugs to move onto a plant with a growing scale infestation. Before deciding on a treatment, look for adult and immature ladybugs on plants. Dormant oil treatments can be used against almost all scale problems and are generally applied in very early spring, before bud break. Summer oils can also be very effective against most scales, but as with dormant oils, some plants are sensitive to these treatments. Check labels to make sure the plant is not harmed by the treatment being considered. Most other insecticides, including insecticidal soaps, can be used only against the mobile crawler stage of scales since adult scales are protected from insecticides by a waxy covering. These treatments are very effective, but must be carefully timed as crawlers are only active for a limited period.

*Adapted from the Virginia Cooperative Extension and the University of Massachusetts Extension, 1999*

## Taxus Mealybug

The most common and readily noticed sign of taxus mealybug presence on a yew is sparse yellow foliage covered with sooty mold. The taxus mealybug occurs on stems and branches, and tends to cluster in the forks of branches. They overwinter as nymphs, which become active in the latter half of May; by early summer adult females begin giving birth to live young. There are two or three generations per year. The taxus mealybug has been reported on other plants such as apple, cedar, linden and maple, but is not known to reproduce on these plants.

In general, controls are more effective if the mealybug population on a plant is first physically reduced by pruning out heavily infested and sickly branches. In some cases, large mealybugs can be scrubbed off with a brush.

Horticultural oil sprays kill primarily by smothering, so they will be less effective against mealybugs crowded together or occurring in layers on the plant. Horticultural oil sprays kill all stages of mealybugs that are present at the time of application. Most trees and shrubs can tolerate application of light (summer) oil even during the summer months. Refer to the product label for guidelines on plant sensitivity and any temperature restrictions. Oil products labeled as summer, superior, or Volck oil are of the highest grade and may be used on tolerant plants during either the growing season or the dormant season, but at different spray concentrations.



Taxus Mealybug

Insecticidal soaps provide another alternative. They are effective against both active and settled crawlers. Oils and soaps are relatively non-toxic and are especially good choices for areas where people are present soon after treatment. Because of their short residual life, they help to conserve beneficial species.

An alternative to oil or soap sprays are contact insecticides applied during the growing season when the crawler stages of the mealybugs are present. The presence of crawlers can sometimes be determined by sharply tapping an infested twig or branch over a white paper. Crawlers may be orange, brown, or purple and appear as moving specks of dust. Because of their waxy protective covering other stages of mealybugs are not readily controlled by contact insecticides. Contact insecticide sprays will not reach crawlers that have settled under old scales. Most garden centers carry a number of insecticides registered for mealybug control. Although resistance to insecticides may occur in some cases, failure of contact sprays is more often the result of not timing the applications to coincide with crawler activity. Thus, horticultural oils are often the most effective control. In all cases, thorough spray coverage is essential for good control.

*Adapted from Lee Townsend, University of Kentucky College of Agriculture, 1999*