

## SAN JOSE SCALE

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San Jose scale is an extremely important indirect pest of apples, pears, peaches, and plums. It is a sucking insect that injects a toxin into the plant as it feeds causing localized discolorations. The presence of reddish blemishes on fruit at harvest indicates potentially damaging numbers on the trees. Left uncontrolled, San Jose scale can kill the entire tree in a couple years. If such damage is noted, inspect trees for scale, especially one year-old wood. Purplish-red halos on young bark are indications of scale infestation. Often this very small insect goes unnoticed until large populations have developed.



San Jose Scale overwinter as immature scales. In the spring, the tiny winged males emerge and mate with the wingless females, and about one month after the begin of the male flight, the first crawlers can be seen. Eggs are not seen because females give birth to live crawlers. These tiny yellow insects move around randomly on bark and foliage before settling down permanently. A few days after settling down, crawlers will secrete a waxy covering over their body that will protect them from most pesticides. From this point on female scales will not move. Males will remain in one location until maturity, at which time the winged males will seek out females and the cycle will begin again.

### Pheromone Trapping & Degree Day Accumulation

Pheromone trapping involves the use of chemical lures to attract male scales. These chemical lures are synthetic copies of the chemicals female scale use to attract the male for mating. A trap consists of a lure suspended between the two sticky sides of a tent-like trap. Pheromone traps for this insect should be placed in scale

infested trees either prior to or during bloom. For a list of the sources of various types of pheromone traps see *ENT-54, Vendors of Microbial and Botanical Insecticides and Insect Monitoring Devices*. Lures should be replaced monthly. Male scales are extremely small gnat-like insects, so traps need to be examined carefully. Scales appear as a fine dust on the trap, usually concentrated on the sticky surface near the pheromone lure. Trapping of scale is used to indicate when the activity of the male scales begins. The date that the first males are caught in the trap is termed the biofix date. Male flight usually occurs after petal fall (mid to late April). Pheromone traps need to be examined daily in order to know when biofix occurs. After the biofix has occurred, degree days are calculated on a daily basis and a running total kept (see "*Predicting Insect Development Using Degree Day*" in *ENTFACT-201*). San Jose scale has a 51EF threshold temperature. These degree day accumulations are compared with the target values in the following table.

DD Target	Action taken when target reached
300	Place a piece of black tape, with sticky side out on an infested scaffold limb. Begin examining tape at least twice weekly for minute scale crawlers.
380-400	Crawler emergence should begin.
600-700	Maximum crawler movement. This is the best time for an insecticide spray.

### Detecting Crawler Movement

Crawler movement begins sometime between mid-May and mid-June. Dark double-sided sticky tape should be used to monitor for emerging crawlers. A small amount of tape is applied tightly around a scaffold limb after removing surface debris with sandpaper. A limb with a known infestation should be selected. Crawlers will appear as extremely small flattened yellowish insects which can be seen with a hand lens on the tape (especially around the edges). Within two days, the crawlers will find a permanent resting spot where they will feed and begin to secrete a protective waxy

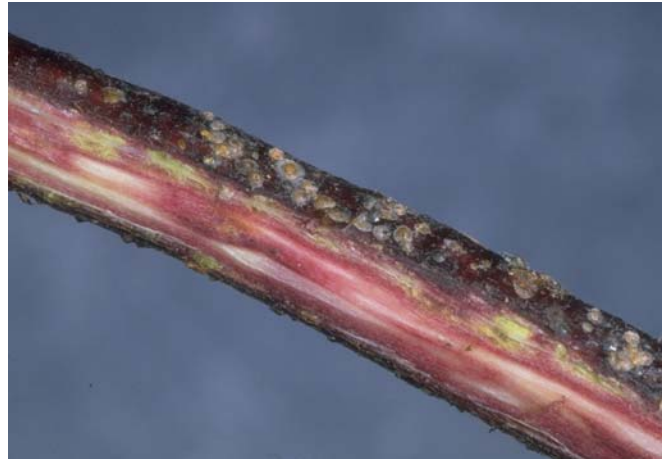
covering. There are two generations each year.



Crawlers stuck to electrical tape on apple limb

Effective control of San Jose Scale in apples is obtained with dormant oil sprays and a late spring insecticide spray aimed at the immature crawler, stage. With commercial orchards, an insect growth regulator, Esteem 35WP, can be used against the nymphs before bloom (pink stage) or the crawlers in late May. Because San Jose Scale occur on all parts of the tree, spray coverage as well as are very critical to effective control. Although there is a second generation later in the summer, crawlers emerge over an extended period of time making insecticidal control of this generation impractical.

For more information on reduced insecticide apple management programs, see *ENTFACT-201, Apple Insect Control with Reduced Insecticide Use*.



San Jose scale and injury to new wood

Revised: 11/03