

IPM Fact Sheet Series**UMass Extension Fruit Team**

Fact Sheet #AI-009

Apple – San Jose Scale (*Quadraspidiotus perniciosus*)**Overview**

San Jose Scale (SJS) infested bark has a grey, roughened appearance due to scale insects on limbs and trunk. Infested fruit develop a reddish-purple ring surrounding each spot where a scale settles.

ID/Life Cycle: The adult San Jose scale (SJS) females are permanently attached to plant tissue. They are about 1/10 inch in diameter, round, and white to gray with a raised spot in the center. Males have functional legs and wings and develop under a slightly smaller, more elongated scale covering. Active immature scales (crawlers) are 1/100 inch long and bright yellow. Although the wingless females never emerge from the scales, males do emerge to fertilize the females in spring. SJS crawlers overwinter on twigs and branches under scale covering. Around bloom, winged males emerge, seek out female scales, and mate.

Each female produces several hundred living young, which disperse over the tree in search of suitable feeding sites. As crawlers mature, they produce a whitish secretion which blackens with time and hardens into a waxy protective covering. Second-generation male flight and mating usually begins by mid-July, producing crawlers by mid-August.



Figure 1) Close up of adult female San Jose scale showing circular grey scale. **Photo credit:** Biologische Bundesanstalt für Land- und Forstwirtschaft, Bugwood.org

Damage: All life stages of SJS remove sap from trees, which depletes vigor and decreases yield. Prolonged attack causes cracking and splitting of the wood; if the scale is not controlled, the tree may die. Scales on new growth and fruit produce deep purplish-red coloration in the tissue.



Figure 2) Left: Severe SJS infestation of apple branch. Right: Damage to apple fruit. **Photo credit:** Left: Biologische Bundesanstalt für Land- und Forstwirtschaft, Bugwood.org. Right: Elizabeth Garofalo, UMass

Management Strategies

Monitoring: SJS populations can be monitored by either checking adult male emergence or crawler emergence. For adult males, pheromone traps should be placed in trees with known active populations (if any) at the pink stage. Crawlers can be monitored by wrapping black electrical tape that has been coated with petroleum jelly around infested branches. The tape should be inspected daily with a hand lens until active crawlers are found. Decision to treat is usually based on finding infested fruit at previous year's harvest. At harvest, examine 50 fruits per tree on 2 trees per acre and treat if find more than 0.1% fruit with SJS injury.

Cultural/Biological

- Thorough, yearly pruning helps manage SJS.
- Biological control agents consist mostly of various species of parasitic wasps that attack the scale under their waxy covering and some predators of crawlers.

Chemical

- Refer to the [New England Tree Fruit Management Guide](#) for specific materials and rates recommended for managing San Jose Scale.
- Established, heavy SJS populations are difficult to manage and may require dormant or delayed dormant oil application and insecticide application targeting crawlers.
- For best results, apply horticultural (3 gallons per 100 gallons of water for heavy infestation; otherwise use 2 gallons per 100 gallons of water) around half-inch green.
- Apply insecticide when crawlers become visible.

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