

Pine Tortoise Scale

Insect Pest of Christmas Trees

The pine tortoise scale, *Toumeyella parvicornis*, is a major insect pest of pine trees grown in Christmas tree production systems and feeds on different types of pines, including Scots and Austrian. This publication provides information on pest biology and damage and the management strategies that can be used to reduce plant damage caused by pine tortoise scale.

Biology

Pine tortoise scale females develop in spring and reach maturity in early summer. Adult females are ¼ inch (6.3 mm) in diameter, helmet-shaped, red-brown with dark-brown to black markings, and are located on the terminal growth of branches (Figure 1). Eggs are laid underneath the body of adult females with each female capable of producing up to 500 eggs during her lifespan.



Figure 1. Pine tortoise scale females located on the terminal growth of a branch. (Photo: Raymond Cloyd)



Figure 2. Pine tortoise scale red nymphs emerging from underneath the female covering. (Photo: Raymond Cloyd)

Red nymphs (crawlers) emerge (eclose) from eggs and crawl out from underneath the female covering (Figure 2). The young red nymphs are active from early- to mid-summer. After finding suitable locations, the nymphs settle down and insert their long, stylet-like mouthparts into the vascular system. They feed by withdrawing plant fluids from the food-conducting tissues (phloem) within the plant. Nymphs can spread to other Christmas trees by wind currents or by attaching to the feet of birds.

After feeding for about a month, pine tortoise scale males enter a pupal or resting stage. The white pupal cases are located on the terminal growth of branches (Figure 3). The males that emerge (eclose) from the pupal cases are small and winged but do not feed because they have nonfunctional mouthparts. Males fly in search of females. After mating with a female, the male dies. Pine tortoise scale overwinters as an immature fertilized female attached to the branches of Christmas trees. There is one generation per year in Kansas.

Damage

Pine tortoise scale feeding results in yellowing of needles and stunted needle growth. Extensive infestations of pine tortoise scale can kill branches and even mature (older) Christmas trees. In general, young Christmas trees are more susceptible to infestations of pine tortoise scale than mature (older) Christmas trees. Foliage close to the ground tends to support higher populations of pine tortoise scale than foliage higher in the tree canopy. Pine tortoise scale is



Figure 3. Close-up of pine tortoise scale male pupal cases. (Photo: Raymond Cloyd)

a soft scale that excretes copious amounts of honeydew, a clear sticky liquid that serves as a growing medium for black sooty mold. Christmas trees may appear to be covered with soot (Figure 4) due to the black sooty mold that develops when Christmas trees are heavily infested with populations of pine tortoise scale. Wasps, bees, flies, and ants are commonly seen feeding on the honeydew excreted by pine tortoise scales.

Management

Scout Christmas trees from May through June to detect the red nymphs. Scout by placing a white sheet of paper attached to a clipboard under a branch. Then shake the branch over the white sheet of paper until the red nymphs fall onto the paper and start moving. A 10- or 16-power hand lens is useful for observing the red nymphs.

Remove heavily infested branches to prevent the nymphs from spreading to noninfested Christmas trees. Apply a high-pressure water spray once a week to quickly dislodge the nymphs and mature females from infested Christmas trees.

A dormant oil insecticide can be applied before bud break in the spring to kill the overwintering females. Contact insecticides can be used to suppress populations of pine tortoise scale. Make applications from June through July when the young red nymphs are present. Thorough coverage of all branches on the outside and interior canopy is required to obtain sufficient suppression of pine tortoise scale nymphal populations. Repeat applications may be needed if nymphs are present after scouting Christmas trees.

Several natural enemies, including parasitoids and predators, will attack or feed on pine tortoise scale. However, natural enemies, in general, do not regulate pine tortoise scale populations sufficiently to reduce damage to Christmas trees.



Figure 4. Black sooty mold on a Christmas tree. (Photo: Raymond Cloyd)

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