

# Pine Needle Scale Insect Pest of Pine Trees

Pine needle scale, *Chionaspis pinifoliae*, is an insect pest native to the U.S. that feeds on pine trees grown in ornamental nurseries, landscapes, and Christmas tree plantations, including Scots pine, *Pinus sylvestris* and mugo pine, *P. mugo*. Pine needle scale will also feed on Austrian pine, *P. nigra*, red pine, *P. resinosa*, and occasionally feed on fir, *Abies* spp. and spruce *Picea* spp. trees. This publication provides information on pest biology and plant damage, and management strategies that can be used to prevent damage caused by pine needle scale.

## Biology

Adult pine needle scale females are  $\frac{1}{8}$  inches (3.0 mm) long and white with an orange portion that tapers at one end (Figures 1 and 2). Males are white with a rectangular covering about  $\frac{1}{25}$  inch (1.0 mm) long. The males develop into winged individuals, mate with females, and then die. Mated females produce a white, waxy covering that provides protection from exposure to insecticide sprays. The females lay (oviposit) red eggs underneath the protective covering, and then die. Each pine needle scale female can produce up to 100 eggs.

Red nymphs (crawlers) emerge (eclose) from the eggs and crawl out from under the covering of the dead female. First-generation nymphs emerge over a 2-3 week period in spring, moving to pine needles to feed on current growth

or pine needle growth from the previous year. A second generation of nymphs emerges in the summer. The first-instar nymphs are flat, narrow, and red, and after molting, become second-instar nymphs that are yellow to light-orange (Figure 3). The developmental stage of an insect between molts is an instar. After 6-8 weeks, pine needle scale nymphs become mature adults.

Pine needle scale nymphs are dispersed by wind or carried by birds to new locations where they can infest other trees. Pine needle scale also moves onto branches of adjacent trees that are touching. Pine needle scale overwinters as red eggs underneath the dead female's covering. There are two generations per year in Kansas.

## Damage

Pine needle scales withdraw plant fluids from the inner tissues (mesophyll layer) of pine needles using their piercing-sucking mouthparts. Feeding causes pine needles to turn yellow and fall from trees, beginning with the lower branches. Pine needle scale feeding can affect the appearance and marketability of pine trees grown for Christmas trees, and reduces the growth and vigor of pine trees grown in nurseries and landscapes. Heavy infestations of mature pine needle scale appear as white flecks on needles (Figures 4 and 5).



Figures 1 and 2. Pine needle scale females on pine needles. (Photos: Raymond Cloyd)

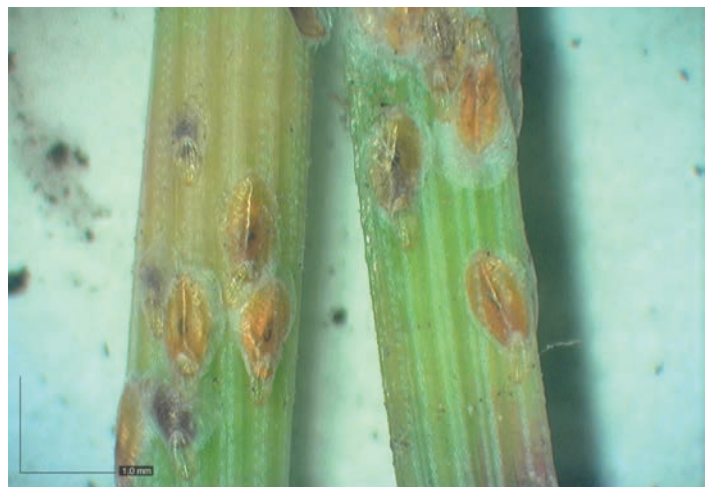


Figure 3. Pine needle scale nymphs. (Photo: Raymond Cloyd)

## Management

Scout pine trees in the spring by wrapping double-sided sticky tape around branches. The tape captures red pine needle scale nymphs, which will help time insecticide applications. Check the tape at least once a week from spring through summer using a 10- to 16-power hand lens to look for the red nymphs. Another scouting method involves attaching a white sheet of paper to a clipboard and placing under a branch that is shaken. Any red nymphs that are dislodged from the branch can be seen crawling on the paper.

Branches heavily infested with pine needle scale should be pruned out and removed from the area. In nurseries, landscapes, and Christmas tree plantations, pine trees heavily infested with pine needle scale should be cut at the base just above the soil line and removed from the area.

Pine needle scale nymphs do not have a protective, waxy covering, which makes them easier to kill with contact insecticides. Apply contact insecticides when the nymphs are active in the spring and summer to help reduce pine needle scale infestations later in the growing season. Time

applications to target first-generation nymphs in the spring when Vanhoutte spirea (*Spiraea x vanhouttei*) plants are in full bloom (Figure 6). Reapply every 7 to 10 days to kill the nymphs that emerge from underneath the dead female covering over a 2-3 week period. The needles and branches should be thoroughly covered with insecticide spray to suppress pine needle scale populations. Pine needle scale is a hard or armored scale, so systemic insecticides applied to the soil will not protect pine trees from infestations.

Always read the label directions before applying any insecticide product. To reduce drought stress and alleviate potential plant damage from insecticide sprays, water plants thoroughly before applying an insecticide.

Pine needle scale is susceptible to beneficial insects including parasitoids (parasitic wasps) and ladybird beetles. In most cases, beneficial insects do not provide sufficient regulation to prevent plant damage caused by extensive populations of pine needle scale. Contact insecticides used to manage pine needle scale are harmful to most beneficial insects. A disruption in regulation by beneficial insects can increase pine needle scale infestations.



Figures 4 and 5. Pine needle scales feeding on needles (left) and appearing as white flecks on branch of pine (right). (Photos: Raymond Cloyd)



Figure 6. Vanhoutte spirea, *Spiraea x vanhouttei*, in full bloom. (Photo: Raymond Cloyd)

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