CHRISTMAS TREE INSECT PESTS

SPOTTED PINE APHID

http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2031.html

Although many different aphid species may be found on all Christmas trees, the spotted pine aphid is of most concern. This species is especially destructive to Scotch pine. The aphids suck juices from the needles, turning the affected
needles yellow and causing them to prematurely fall in late summer. By early fall, it is not uncommon to find most of the 2 and 3
year old needles off the tree, with only the present year's needles remaining; the trees are too sparse to be of any value.

The spotted pine aphid is relatively small (3/16 inch), and is light green. Its long legs and rapid movement are its most recognizable characteristics. Trees can be checked for aphids by jarring the branches to dislodge the aphids onto a board, cloth, or paper.

WHITE PINE APHID

http://ipmwww.ncsu.edu/AG189/html/White_Pine_Aphid.HTML

The white pine aphid feeds on white pine twigs and branches wherever eastern white pine is grown. Young trees or branches of large trees may have reduced growth or, in the case of a heavy infestation, be killed. The adult aphid may be winged or wingless. The winged aphid is about 6 mm in length; wingless aphid is slightly smaller. Aphids are shiny, dark brown to black, and have long, stiff hairs. Eggs are laid end-to-end in rows of eight or more eggs on the long-needled pines. Eggs are blackish in color. Six generations of aphids in one year are not uncommon, with new generations often moving to fresh sites on the tree.
Sooty mold is a distinctive feature of a heavy white pine aphid infestation. The mold, a dark fungus, grows in the honeydew excreted by the aphids as they feed.

EUROPEAN PINE SHOOT MOTH

http://www.na.fs.fed.us/spfo/pubs/fidls/eps_moth/eps_moth.htm

Small (1/5 inch), dark-brown larvae with black heads overwinter inside buds or under masses of pitch on the buds; the caterpillars become active in late April and then bore into another bud. When the catepillars reach maturity in late May or early June, their length is approximately 5/8 inch. They pupate inside their resinous burrows, and the moths emerge from mid-to late June. The moths have coopery-orange front wings marked with several silvery lines; the rear wings are gray. Their wing expanse is about 3/4 inch.

In late June to mid-July, eggs are deposited on the needles, buds, and twigs. The larvae first bore into the base of needles; by August, they move to the buds to feed and prepare an overwintering site. The insects attack most pine species. Red pine and muhgo pine often are damaged severely. The greatest damage

results from the caterpillars' feeding in the spring. Killed buds result in dead tops and forked and bent stems; the trees have little value. Cutting out and destroying infested buds before mid-June is somewhat helpful in reducing the number of moths that normally emerge.

NANTUCKET PINE TIP MOTH

http://www.na.fs.fed.us/spfo/pubs/fidls/nantucket/nantucket.htm
http://entweb.clemson.edu/cuentres/cesheets/forest/ce80.htm

This species causes damage similar to that of the European pine shoot moth. In this area, its preferred host trees are Scotch, pitch, and Virginia pines; it does not attack white pine or long-needled pines. Moths are predominately brick-red with some gray with a wing expanse of about 1/2 inch. The larvae are cream to light brown and, when fully grown, are slightly longer than 1/4 inch. The second generation of moths emerge about mid-July.

Small, fragile, webs constructed in the axil of a needle sheath and stem are the first signs of the larvae. Later, webbing mixed with resin can be seen at the tip of the shoot; infested shoots often die and turn brown. The principle difference between the damage of the Nantucket and the European moth is that the latter attacks the buds while the Nantucket moth mainly attacks the tips of the shoots.

GYPSY MOTH

http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2173.html

Partially grown caterpillars of this species migrate or are carried by wind into pines, spruce, and fir. Depending on the amount of defoliation, they can be extremely destructive. Gypsy moths overwinter in the egg stage. Small, dark, hairy caterpillars start hatching about May 1. They prefer oak and other broadleaf trees, feeding on those for a short time. The newly hatched larvae do not prefer evergreens, but will feed on them readily after the insects have gone through their first molt. In mid-to late June, the caterpillars reach maturity; at that time, they are approximately 2 inches long. They pupate on tree trunks and other stationary objects. In early June, the moths appear. The heavy-bodied female moths are white with black dots along their wings. They do not fly. The brown male moths are active all day and at night. There is only one generation per year.

MITES

http://ipmwww.ncsu.edu/AG189/html/Southern_Red_Mite.HTML

The spruce mites, yellowish to red spider-like insects, are 3.8 mm in length (barely visible). Seldom a problem on pine or fir, they prefer spruce. The mites extract sap from the needles; affected needles have a faded, grayish appearance eventually turning a coppery-green. Badly damaged needles will drop prematurely.

A second type of mite, the Eriophyid, is too small to see without magnification. These mites, creamy-white and elongate, are almost worm-like. Found on Scotch, Austrian, mugho, and white pines, they feed inside the needle sheath. The stunting of needles on new growth is the first sign of an infestation. The tips of the needles may be twisted; they may turn yellow and then brown and drop off.

NORTHERN PINE WEEVIL

http://ctr.uvm.edu/ctr/el/el234.htm

About 1/4 inch long, adult weevils are brown with white spots toward the rear of their back; their mouthparts form a beak. The larvae are white, legless, fleshy grubs. When fully grown, they are slightly longer than 1/4 inch. The adult weevils and the grubs are almost identical in size and appearance to the white pine weevil, but the life cycles of the two species are different.

Northern pine weevils overwinter as adult weevils hibernating in the duff under the trees. They emerge in May and June and deposit eggs in freshly cut pine stumps, in slashings, and, sometimes, in spruce and fir stumps and cut limbs. In June, grubs mature and pupate in borrows.

In late July, the adults begin emerging, feeding on the bark of twigs of healthy pine and spruce for about a month before hibernating. Extensive feeding results in the girdling of branches or seedlings, which eventually die. Scattered brown branches throughout the infested trees is the typical type of injury. Since the larvae develop in stumps and large cut limbs, all slashings should be removed from the plantation and burned. If possible, allow stumps to rot away for at least one year before replanting the same area.

PALES WEEVIL

http://entweb.clemson.edu/cuentres/cesheets/forest/ce78.htm

This species causes damage similar to that of the northern pine weevil. Adult weevils, dark reddish-brown to almost black, are slightly larger than the northern pine weevil (about 3/8 inch). In Christmas tree plantations, practically all larval development has been observed in freshly cut stumps near or below ground level. The insect's preferred host trees are Scotch, white, and red pines and Douglas fir. The adult weevils also will attack spruce, especially seedlings. Cultural control measures are the same as those for the northern pine weevil.

PINE SPITTLE BUGS

http://www.ext.vt.edu/departments/entomology/christmas/slideshow2.html

Although the white spittle masses in which the slimy, brown nymphs feed are conspicuous, damage to trees is minor. The nymphs hatch in May from eggs that were deposited on the bark the previous summer. The feeding nymphs extract juices from the twigs; when the nymph population is high, the trunk and limbs remain wet with spittle. Heavy feeding causes some stunting of new growth, and limbs and twigs often become blackened from a sooty fungus and dirt collecting on the wet bark.

Present during late July and August, the dark-brown to black adult spittle bugs are about 3/8 inch long, plump, and tapered at both ends. They appear not to feed. Pine spittle masses may appear on all Christmas trees, but Scotch pine seems to be the preferred host.

PINE WEBWORM

http://txforestservice.tamu.edu/tfshome/i&d/pineww.htm

This pest causes major damage to young trees in their first five years of growth. Pine webworms prefer pitch and jack pines, but will attack Scotch, red, and white pines as well.

The insect overwinters in the pupal stage in soil under trees. From June to August, the adult moths are present. They have a wingspread of approximately 1 inch with mostly black forewings. They deposit their eggs on pine needles. At first, small larvae mine the needles, but later live in silken tubes surrounded by masses of brown granular frass (excrement) as they develop. The clumps of frass webbed in the ends of the branches is the typical symptom of webworm damage. Pine webworm larvae are yellowish-brown with a narrow dark stripe along each side of the back; When the larvae reach full size in late summer, they are approximately 3/4 inch long.

PINE NEEDLE SCALE

http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2053.html

Small infestations show up as scattered white spots on the needles; moderate to severe infestations cause a yellowish to brownish discoloration of the needles and death of the trees. This scale, which attacks all Christmas tree species, also may be found on spruce and Douglas fir.

Both the female and male are white. Female scales are approximately 1/8 inch long; male scales are slender and much smaller than the females. Heavily encrusted needles are practically white, covered with the bodies of these insects.

Purplish eggs overwinter under the female scale's dead body. Each cluster normally contains 20 to 30 eggs. The eggs begin to hatch about May 10, with hatching completed by June 1. The tiny nymphs, or "crawlers," are pale yellow. This is the mobile stage of the insect; their mobility is limited to only a few inches from their origin unless they are carried by the wind or picked up on the bodies of birds or other insects. Crawlers move on the needles until they find a suitable site to insert their sucking mouthparts. Within a week after attachment to the needles, the legs of the nymphs degenerate and disappear, and the hard scale covering starts to form. The scales mature and produce eggs for a second generation of nymphs in early July. During the end of July, new nymphs are present. The second generation matures in early fall; eggs from the second generation overwinter.

The twice-stabbed lady beetle, a small black beetle with two red gnats on its back, is an efficient predator of pine needle scale. This insect may be seen in the trees from early spring to late fall, feeding on the eggs and other stages of the scale.

PINE TORTOISE SCALE

http://ppathw3.cals.cornell.edu/Trees/PtortSc.html

A black, sooty appearance on trees is the first indication of an infestation by this scale insect. This scale produces large amounts of honeydew which drip onto the needles, twigs, and limbs, creating an excellent medium for the growth of a sooty fungus, giving the tree a blackened appearance. The adult female scale is turtle-shaped, reddish-brown, and about 1/4 inch in diameter. Scotch, jack, and Austrian pine are favored hosts; other species are seldom attacked. Damage is most severe on seedlings and young trees, which often die.

One generation is produced each year. After overwintering attached to stems and twigs, fertilized females resume feeding in the spring. They die in June after approximately 500 eggs are developed within their body. Tiny, red nymphs start hatching in mid-June. Heavily infested twigs look dusted with a finely ground brick dust. The nymphs then settle down on the twigs and feed until the onset of cold weather.

Infestations in a plantation often are confined to a few individual trees. Usually, it is wise to cut such trees and remove them to reduce the possibility of scales moving to other trees. Several predators and parasites help keep this species in check.

SAWFLIES

At least a half-dozen different species of sawflies attack Christmas trees; European pine sawfly and the red-headed pine sawfly are the most common and abundant. The larvae of both species eat the needles, causing partial to complete defoliation of the infested trees.

EUROPEAN PINE SAWFLY

http://www.msue.msu.edu/msue/imp/mod03/01700721.html
http://ppathw3.cals.cornell.edu/Trees/TreePests.html

This insect is an early spring feeder. In late April and early May, larvae hatch from overwintered eggs. The olive green larvae have wrinkled skin with a narrow, pale-white stripe along the center of the back and a narrow black stripe along each side. In early June, the larvae are 3/4 to 1 inch long. They drop to the ground, forming chocolate-brown, hard-shelled, smooth cocoons. Adult sawflies emerge in late August and September and deposit eggs in slits along the edges of selected needles. This sawfly produces one generation each year. The larvae feed on the 1 and 2-year-old needles of Scotch, jack, and red pines. Sometimes, they feed on Austrian, white, and mugho pines; they do not prefer these species, however.

RED-HEADED PINE SAWFLY

http://www.msue.msu.edu/msue/imp/mod03/01700721.html
http://entweb.clemson.edu/cuentres/cesheets/forest/ce74.htm

Although larvae of this species usually do not appear until late May, some are likely to be present throughout the summer. The larvae are white to yellowish with pale red heads. As the larvae reach maturity, they are about 1 inch long and are covered with black spots. They overwinter in pupal cells in

the duff and soil below trees. Adult sawflies start emerging in May and continue to emerge over a period of several months. Eggs are deposited on 1-year-old needles.

The larvae feed in groups starting at the tip of a branch and working downward, causing defoliation as they go. They prefer jack, red, Scotch, mugho, and Austrian pines; occasionally, the larvae may be found on white pine and Norway spruce. General infestation of an entire plantation is rare. Normally, a few trees are infested. Spot treatment and applying insecticide to the few infested trees usually is adequate to prevent serious defoliation.

SPRUCE BUDWORM

http://www.na.fs.fed.us/spfo/pubs/fidls/sbw/budworm.htm

Spruce budworms prefer balsam fir, spruce, and hemlock, but also feed on larch and pine. They overwinter as small larvae inside small silken cases stuck to twigs of the tree. In the spring before the buds expand, they start feeding, boring into needles and developing buds. They feed later on developing shoots and new foliage. In late June and July, the larvae reach maturity. About 7/8 inch long, they have a reddish-brown body with prominent, small yellow warts on each body segment. The insects pupate within webbed needles on the tree.

During July, the adult moths appear. They are mostly gray with yellowish-orange markings, and have a wingspread of about 1 inch. The tiny, light-green, flat eggs are deposited in elongate masses on the needles with eggs overlapping in a shingle-like fashion. The young larvae hatch in August, and soon prepare thin silken cases for overwintering. One generation is produced each year.

SPRUCE GALL ADELGIDS

http://ctr.uvm.edu/ctr/el/el24.htm

Two species of adelgids are responsible for the formation of galls (distorted swellings) on new spruce growth.

COOLEY SPRUCE GALL ADELGID

http://ppathw3.cals.cornell.edu/Trees/CSGA.html

This adelgid attacks Colorado blue, white, Sitka, and Engelmann spruce. It also attacks Douglas fir; their feeding on fir results in twisted and curled needles instead of galls. The insect overwinters as a partially grown nymph attached to a twig near the base of a bud. During late April and early May, eggs develop in the overwintered females. The nymphs that hatch from these eggs feed at the base of needles, producing galls on spruce and causing twisted needles on fir. The elongate galls are green with a purplish or reddish tint. In July, when the aphids mature and escape, the galls turn brown and unsightly. Several generations are produced each year. Aphids move back and forth from spruce to fir.

The spring nymphs attacking fir needles produce a white, cottony substance covering their bodies. When the adelgids are feeding in May, heavily infested fir tree appear to have a light dusting of snow.

EASTERN SPRUCE GALL ADELGID

http://ppathw3.cals.cornell.edu/Trees/TreePests.html

Norway spruce and occasionally white spruce are the primary hosts for this species. The insect overwinters as an immobile, bluish-black female attached to a twig or bud; eggs develop in late April, and hatch in May when the spruce buds are developing. The feeding by the nymphs results in reddish-green, pineapple-shaped galls at the base of the new twigs. In late July and August, the galls break open and the aphids escape. They molt into winged aphids, which may fly to other trees or remain on the same tree. The galls soon turn brown. By late September, the overwintering forms have settled on a site to pass the winter. Those that do not select suitable sites will not survive.

A few individual trees in a plantation always are more susceptible than others to attack. Remove such trees from the plantation while they are small.

WHITE PINE WEEVIL

http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2556.html
http://www.na.fs.fed.us/spfo/pubs/fidls/wp_weevil/weevil.htm

This insect pest has been a limiting factor in the use of white pine for reforestation and for Christmas trees. The insect overwinters as an adult weevil. The adult, about 1/4 inch long with a brown body with white patches near the end of its back, has mouthparts that protrude to form a short snout. After a few warm days in April, the adults emerge and feed on the bark of terminal growth of white pines. Eggs are deposited in the bark on the terminal growth at about the time the buds begin to swell.

The small (1/8 to 1/4 inch), white, fleshy, legless grubs feed on the cambium layer just under the bark. They feed in small groups and work from the top of the leader downward; the girdled leader wilts and dies. Side laterals replace the central leaders, creating a bushy-topped and useless tree.

In late July and August, the larvae mature. They pupate near the base of the infested leader; adult weevils emerge in August. These new adult weevils feed a bit on the bark of the new and old leaders before hibernating. The feeding of the adults is of minor importance, however. The removal of infested terminals by mid-July will help reduce the potential numbers of white pine weevils in areas where white pine is scarce.

Additional References:

Johnson, W.T. & Lyon, H.H. Insects That Feed On Trees and Shrubs, An Illustrated Practical Guide. 1976. Cornell University Press. Ithaca, N.Y.