

# Forest and Tree Health Issues

May 2004

As the growing season of 2004 progresses there are several forest/tree health issues facing the landscapes and forests of the Town of Biltmore Forest. Awareness of these issues and prompt action can go far toward the goal of minimizing their damage. These serious threats include both insects, and weeds. The insects of concern are the native black turpentine beetle, and carpenter ant, both common pests of white pine and the non-native exotic elongate hemlock scale and hemlock woolly adelgid both are serious pests of eastern hemlocks.

These trees are very common in the forests and landscapes of the Town of Biltmore Forest. They occur as large over-story trees and as smaller under-story trees and in the case of hemlocks as hedges. The weed of concern is non-native exotic called oriental bitter-sweet. This aggressive climbing vine can capture landscapes and displace native species. This exotic weed has been noticed on many of the properties within the Town. Below you will find a brief description of each of these pests, photos, and the most effective measures for control.

## Black Turpentine beetle

The black turpentine beetle, *Dendroctonus terebrans* (Oliv.), has caused extensive losses throughout the pine belt in the Southern States. It has been found aggressively killing trees from Texas to Virginia and southward through Florida. The beetle most commonly kills less than 10 percent of the stand during a single season. The beetle is usually associated with low tree vigor resulting from drought, flooding or severe stand disturbances.

All southern pines are attacked, as well as white pine. Freshly cut stumps are usually preferred for breeding, whereas freshly cut logs are rarely attacked. The beetle also shows a preference for weakened trees usually due to mechanical injury or environmental stresses or infested by other bark beetles; but is capable of severely attacking apparently normal, healthy trees.



(Black Turpentine Beetle Adults)

The beetle confines its attacks to the base of the tree, and initial infestations are almost always located in the lowest 18 inches. The attack is characterized by large pitch tubes that appear on the bark surface (seen above). These tubes

are a mixture of pitch, frass, and bark borings and thus have a reddish-



(Pitch tube, entry whole)

white color that quickly ages to a gray hue. Heavily infested trees are almost always secondarily attacked by ambrosia beetles. These attacks also are at the base of the tree and are characterized by fine white sawdust that accumulates around the trunk.

Attacks of the beetle do not always prove fatal. In trees that are killed, the needles begin to lose their normal healthy green color and fade, first to a yellowish green and finally to a reddish brown. Fading usually begins 4 to 8 months after the initial attacks, but sometimes it is 12 months or longer before fading starts. The fading tree takes about 1 month to change to fully red foliage, and about 2 months later most of the foliage will fall off.

Treatment recommendations for this pest include removing severely infested material including stumps and or treating with the pesticide Dursban according to label rates. In severe outbreaks 2 to 3 treatments may be required during the growing season.

## Carpenter Ants

Carpenter ants are a nuisance by their presence when found in parts of the home such as the kitchen, bathroom, living room and other quarters. When 20 or more large winged and/or wingless ants are found indoors, in the daytime near one location, it is possible that the colony is well established in the home and the nest may have been extended into sound wood, sometimes causing structural damage. They do not eat wood, but often remove quantities of it to expand their nest size. However, if only one to two large wingless ants are erratically crawling, they may simply be foraging for food with the nest located outside. Outdoors, they are frequently seen running over plants and tree trunks or living in moist, partly rotten wood stumps.



(Adult Carpenter Ant)

They also nest in wall voids, hollow doors, cracks and crevices, furniture, and termite galleries. Infestations can occur

in new buildings when land clearing in the area disturbs existing native colonies. In the wild, carpenter ants nest in soil and beneath rocks; they bore into living and dead trees and stumps. This boring can cause large cavities in trees and in turn reducing their structural integrity. This can cause seemingly healthy trees to break or fall. This is a common problem in many large white pines.

Exclude carpenter ants from buildings by caulking cracks and blocking other entrances whenever possible. Trim branches and limbs of trees and shrubs that touch the building to keep ants from gaining access to these routes. Eliminate food sources inside the building or prevent access to suitable food by keeping it in ant-proof containers. Use mulch, such as gravel or stones, around the perimeter of the building to discourage nest building. Locate and destroy colonies in tree stumps and other nearby places. Eliminate damp conditions that promote wood decay. Replace decayed or damaged wood and correct problems that caused the decay, such as clogged rain gutters. Increase ventilation to damp areas beneath the building and in attics.

Search for nesting sites in the building. Nests may be located by observing ant activity and following their trails, especially during the night because many species are nocturnal. To attract the ants, set out food such as a mixture of sugar and milk or sliced up crickets and then follow the workers back to the nest. Try to find the gallery openings, which are usually small oval holes. Look for sawdust accumulation associated with these openings. Carpenter ant sawdust is considerably different from the palletized frass left by drywood termites. Once colony openings are located, apply insecticide formulations (containing materials such as permethrin, cyfluthrin, boric acid, or disodium octaborate tetrahydrate) or desiccant dusts through these openings and other holes drilled into the galleries.

## Elongate Hemlock Scale

The Elongate Hemlock Scale is a serious armored scale pest of the Hemlock. Scales also infest Fir, Spruce and Yews, but these are only secondary hosts. Such secondary hosts, if infested, are usually found adjacent to infested Hemlocks.

Look for Hemlocks with a yellowish cast, particularly in the lower branches, that may resemble Spider Mite damage. Look on the underside of needles for tan to brown female covers and white male covers.



(Elongate Hemlock Scale)

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Scales injure host plants by inserting their threadlike mouthparts into the needle and withdrawing vital nutrients necessary for plant growth. Excessive loss of plant sap reduces the growth and vigor of the plant, and causes needles to turn yellow and drop prematurely. In light infestations, some needles have yellow spots; in moderate infestations, many needles become yellowish; and in heavy infestations, needle drop occurs and trees are killed. The underside of needles may appear whitish from the white, waxy threads and covers produced by males.

Crawlers may be managed with formulations of acephate, carbaryl, chlorpyrifos (Dursban 50W only), cyfluthrin, deltamethrin (5SC only), dimethoate, horticultural oil, hydrophobic extract of neem oil, insecticidal soap, lambda-ylalothrin, and methidathion. Select and apply horticultural spray oils according to label directions. Crawlers may be managed from late May through early June. Egg laying and crawler activity occur throughout the growing season. Crawler sprays may need to be applied at 7- to 10-day periods from mid-May to mid-September if an infestation is severe.

#### **Hemlock Woolly Adelgid**

The hemlock woolly adelgid, *Adelges tsugae*, has been in the United States since 1924. This introduced insect, believed to be a native of Asia, is a serious pest of eastern hemlock and Carolina hemlock. In the eastern United States, it is present from the Smoky Mountains, north to the mid-Hudson River Valley and southern New England.

White cottony sacs of the base of the needles are good evidence of a hemlock woolly adelgid infestation. These sacs resemble the tips of cotton swabs. They are present throughout the year, but are most prominent in early spring. The hemlock woolly adelgid feeds during all seasons with the greatest damage occurring in the spring. It is dispersed by wind, birds and mammals.

By sucking sap from the young twigs, the insect retards or prevents tree growth causing needles to discolor from deep green to grayish green, and to drop prematurely. The loss of new shoots and needles seriously impairs

tree health. Defoliation and tree death can occur within several years.



**(Hemlock Woolly Adelgid)**

In your home landscape, one of the most effective control methods is the application of insecticidal soap or horticultural oil. Soap and oil have been used to control other soft-bodied insects (for example, aphids) for about 20 years, and they cause no or minimal harm to other, beneficial insects. Insecticidal soaps and horticultural oils are sold at your garden center under many different name brands. Mix a 2% solution of either soap or oil (2 ounces of soap to 98 ounces of water) in your pump sprayer (or backpack sprayer). Thoroughly drench both the top and bottom of needles, covering the entire tree. The best times for application are March-April, after adelgids have hatched from the eggs, and September-October, before the nymphs produce their woolly covering. Application in June may also be beneficial.

If your tree(s) are so tall that you cannot apply soap or oil to the entire tree, you may consider contracting an arborist to apply the soap or oil or consider another treatment type. For trees over 30 feet tall, ground or stem injection of a systemic insecticide is an effective control for the adelgids. The systemic insecticide imidacloprid, sold under the brand name Merit, can be injected with approved application devices such as the Kioritz soil injector or the arborjet stem injector. Mix the insecticide according to the manufacturer's instructions. Systemic insecticides are taken up by the tree's vascular system and are, therefore, best made during the growing season to assure uptake of the insecticide. Applications can be effective for one year and possibly longer. One may wish to contract a professional arborist, familiar with these application systems

#### **Oriental Bittersweet**

Oriental bittersweet is a deciduous, woody, perennial vine in the staff-tree family (Celastraceae), which sometimes occurs

as a trailing shrub. Also known as round-leaved and Asiatic bittersweet, stems of older plants sometimes grow to four inches in diameter. Leaves of oriental bittersweet are glossy, rounded, finely toothed and arranged alternately along the stem. Clusters of small greenish flowers emerge from leaf axils, allowing each plant to produce large numbers of seeds. At maturity, globular, green to yellow fruits split open to reveal three red-orange, fleshy arils that contain the seeds. These showy fruits have made oriental bittersweet very popular for use in floral arrangements. Since this plant is easily confused with our native climbing bittersweet vine (*Celastrus scandens*), which flowers at the tips rather than along the stems, it is imperative that correct identification be made before controls are attempted.



**(Oriental Bittersweet)**

Where hand labor is practical, vines can be pulled out by the roots and removed from the site, preferably before fruiting. If fruits are present, vines should be bagged and disposed of in a landfill, or left in the bags and allowed to bake in the sun long enough to kill the seeds.

Systemic herbicides, such as glyphosate (e.g., Roundup) or triclopyr (e.g., Garlon), that are taken into the roots and kill the entire plant, have been used successfully in bittersweet management. This method is most effective if the stems are first cut by hand or mowed and herbicide is applied immediately to cut stem tissue. In areas where spring wildflowers or other native plants occur, application of herbicides should be conducted prior to their emergence, delayed until late summer or autumn, after the last killing frost occurs, or carefully targeted. Herbicidal contact with desirable plants should always be avoided. No biological controls are currently known for oriental bittersweet.

**James Rhea, Consulting Entomologist**

## *Town of Biltmore Forest*

355 Vanderbilt Road, Biltmore Forest, NC 28803

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