

INSECTS OF HARDWOOD NURSERIES

Robert C. Morris
Southern Forest Experiment Station
U. S. Forest Service

The chief insect pests of hardwood nurseries can be divided into two general groups--those that are common to all nurseries and those that are more or less specific to certain hardwood hosts. The first group includes subterranean insects, sucking insects, and those that feed on the foliage, stems, and buds. The second group is divided by host species into those attacking cottonwood, oaks, sweetgum, sycamore, and ash.

The discussion will not include insect pests of hardwood plantations; i.e., the scale insects, gall makers, twig girdlers, and large borers which may damage trees after their first year.

Insects generally found in hardwood nurseries

The subterranean pests, including the white grubs, wireworms, and mole crickets, feed on the roots of seedlings and may by their burrowing up-root very young seedlings and cause drying-out of the soil in seedbeds. They may be controlled by applying 10 pounds of chlordane or 5 pounds of aldrin, dieldrin, or heptachlor per acre to the soil in nurseries.

Aphids, leafhoppers, and stinkbugs weaken tree seedlings by sucking the sap and damaging the leaves and tender tips. Contact insecticides applied by spraying are needed for their control. Malathion or nicotine sulphate is recommended for aphids. DDT is effective against leafhoppers and stinkbugs.

Spider mites multiply rapidly and can cause serious damage in a short time. Spray applications of malathion, aramite, ovotran, or trithion are recommended.

A host of defoliating insects may attack and damage hardwood seedlings in nurseries. Usually the attacks are sporadic and unpredictable, but control is generally achieved quickly by spraying with insecticides. Detection of the attacks before serious damage occurs is the most important control requirement. Cutworms may cut young seedlings off at the ground at night--unless forestalled by soil applications of dieldrin, heptachlor, or chlordane. The leaf-eating caterpillars, leaf rollers, bagworms, leaf beetles, and sawflies are killed by DDT, chlordane, or endrin sprayed on the foliage. Leaf miners and skeletonizers may require disyston, phorate, or systox for complete control.

1/ The author is stationed at the Southern Hardwoods Laboratory, which is maintained at Stoneville, Mississippi, by the Southern Forest Experiment Station in cooperation with the Mississippi Agricultural Experiment Station and the Southern Hardwood Forest Research Group.

June bugs or May beetles, the adults of white grubs, may feed at night on the tender leaves of seedlings and cause serious damage. Spraying the leaves with DDT or chlordane can protect the nursery.

Adult cicadas, such as the 17-year locust, damage the terminals of hardwood seedlings by cutting shreddy slits in which they lay eggs. Several inches of the terminal may be girdled and killed. These big insects prefer shrubs and trees of sapling size or above, but when large numbers emerge in a nursery they use the seedlings as oviposition sites. It is difficult to kill the adults before the damage is done. Perhaps the best control is to poison the larvae in the ground at the nursery with chlordane or dieldrin. The application of contact insecticides during the period of adult emergence has been suggested.

Nursery insects of certain hardwood species

Cottonwoods are damaged by a large group of host-specific insects, as well as by general feeders. The most serious damage to first-year cottonwoods from cuttings is by a twig borer that stunts terminal growth and may injure or kill the terminal bud, with consequent forking of the tree and loss of height growth. This pest apparently prefers thick, succulent shoots. It has not been observed in small seedlings, but as the seedlings become larger and more vigorous in mid-summer, they too are attacked and damaged. If cuttings are dipped before planting in Thimet 44-D, an activated carbon dust containing 44 percent phorate, they will be safe for the first year. Applications of 10 percent granular phorate to the ground around the trees show promise for second- and third-year nursery protection. Treating the roots of transplanted seedlings with the 44 percent phorate dust also has proven effective.

Other important insects of young cottonwoods are clearwing borers in the root crown and lower trunk, leaf beetles, leaf miners, aphids, leaf hoppers, sawflies, and defoliating caterpillars. The phorate treatments cited above greatly reduce damage from all these pests. Additional spraying with chlordane, endrin, or dieldrin may help ward off heavy defoliator attacks during dry periods.

Tiny 4-legged Eriophyid mites may seriously damage cottonwood terminals in mid-summer. Tender leaves are stunted to one-half normal size, the tissues turn discolored and brittle, and the midribs and petioles become enlarged and scurfy. The terminals are dwarfed and the buds may be stunted or killed. The exact cause of this "leaf curl" disorder is not known. It may be entirely mite-caused, or a virus disease may be involved. The leafhoppers mentioned above are often associated with the mites and leaf curl. The same leafhopper species are known to be the principal vectors of the "phony peach" virus disease of peach trees.

The mites are difficult to control. Phorate-treated cottonwoods show less leaf curl damage and fewer mites than untreated ones, and the leafhoppers are controlled by the phorate.

Various oaks now being grown in nurseries are attacked by leaf beetles, June bugs, and defoliators such as oak worms, skeletonizers, and leaf rollers. Spraying the foliage with DDT, chlordane, or dieldrin is recommended.

Sweetgum defoliators such as the fall webworm and leaf skeletonizers can be controlled by spraying with DDT or other residual insecticides.

Sycamore lace bugs feed on the undersides of leaves. Heavy infestations require two spray applications of malathion, DDT, or lindane spaced 10 days apart. The same sprays will kill small caterpillars that feed on the undersides of leaves and cause partial defoliation in mid-summer.

Ash seedlings can be protected against aphids by contact sprays of malathion or nicotine sulphate, and against sawflies and other defoliators with residual sprays of DDT, dieldrin, or chlordane.

All sprays should be water emulsions or wettable powder--oil formulations may injure the trees. If it is thought that the chemical may harm the seedlings, tests should be made on small samples before large areas are sprayed. Care is needed in using phorate and the other phosphate ester insecticides, because they are toxic to mammals.