

HARDWOOD INSECTS AND THEIR CONTROL IN THE NURSERY

Daniel R. Kucera, U. S. Forest Service

Until recent years little emphasis has been given to hardwood insect pests and their control. The conversion of bottomlands into soybean production (1,000,000 acres in Louisiana for 1962-1969) has forced the timber producer into getting the most possible use from his land. For example, under modest hardwood management potential income is as follows:

<u>Site--species group</u>	<u>Gross annual income from sales of stumpage per acre</u>
Cottonwood	\$ 30.00
Willow	20.00
Riverfront hardwoods	13.50
Sweetgum - water oaks	12.60
Hackberry - elm - ash	9.45
Bitter pecan - overcup oak	4.95

On the other hand, net returns for soybean production on newly cleared land are over \$51 per acre. So, there is no doubt that to become competitive, hardwood management must definitely become more intensive not only in pest control but all phases of timber management.

From the nursery standpoint there are about 70 hardwood species of commercial importance. Of these only about 20 are planted in the average nursery. In the Louisiana, Texas, and Mississippi area the order of importance is as follows:

I. Major importance	II° Lesser importance
Cottonwood	Water tupelo
Sycamore	Yellow poplar
Sweetgum	Water oak
Cherrybark oak	Catalpa
Green ash	Pecan

Cottonwood has received much attention in the last few years as a pulpwood species because of its rapid growth and it also makes a lighter weight paper thereby reducing shipping costs. For example, a 4-year-old cottonwood grown in the Delta was 7 inches d.b.h. Another, 8 years old, was 13 inches d.b.h. and 70 feet tall, producing 13 4-foot bolts to a 4-inch top. However, several companies have found that cottonwood is a good producer only on the better bottomland sites.

A tree which is more tolerant of site is the sycamore. It doesn't do exceptionally well on the bottomlands, but will do moderately well on the drier marginal sites. Scientists at the Stoneville Laboratory have found relatively few insect or disease problems when inspecting sycamore in the forests. However, what will happen when grown in plantations is just too early to tell although results to date show much less insect and disease problems than with cottonwood. For the remaining species, production varies considerably with demand. In addition, International Paper Company in Mississippi is currently testing a combination of pine, sweetgum and sycamore in alternate rows on a site index of 100+.

Hardwood insects of importance from a nursery standpoint are relatively few because we are dealing with that group which primarily attacks seedlings. Based on current plantings, the cottonwood twig borer rates number one with the cottonwood leaf beetle and clearwing borers a close second. In addition, there are too many other cottonwood insects to mention here. To give you an idea of what the twig borer can do, as many as 22 twig borers have been found in the top 12 inches of a stem.

Second in importance are the white grubs. Recorded damage to plantations has been listed as severe from the Lake States to the Carolinas. Although pines are primarily attacked, hardwoods are not exempt. Similar feeders are cutworms, mole crickets, and even the common black cricket.

Sycamore insects have not received much attention in the past, but from damage seen on leaders we know problems do exist. Insects causing damage in the past are the lace bug, aphids, and numerous defoliators.

In general, aphids and mites are also a problem especially where rigorous spray schedules are maintained. Problems have occurred on oaks and cottonwoods to mention a few.

Both chemical and natural control agents are being studied at the Hardwood Laboratory. Natural agents have not occurred in sufficient numbers to control cottonwood insects. A potter wasp digs the cottonwood twig borer out of branches, and a wasp yet unidentified parasitizes the cottonwood leaf beetle. Numerous insects and mammals prey on white grubs but again none occur in sufficient numbers to significantly reduce hardwood mortality or damage.

From the nursery standpoint, systemic insecticides have proven satisfactory in increasing production in certain areas. However, let's face it gentlemen, chemical companies have practically ceased registration of new forest pesticides because the cost is simply not economical at our present rate of use. For example, Thimet 44D is currently the only registered pesticide for cottonwood borers. However, it is no longer available nor is it listed in Agricultural Handbook **331**. So, in actuality, we have no registered pesticide for cottonwood insects. For those of you using Thimet 10G, we know it will work provided the soil has sufficient moisture so that it will be absorbed by the tree, and provided it is placed at a depth where root uptake occurs, This may account for some of the erratic results.

There are several pesticides which we know are effective, but not registered. The Hardwood Insect Research Laboratory at Stoneville, Mississippi, is currently working toward registration of pesticides for cottonwood insects and the forest tent caterpillar. Should sufficient insect problems occur on sycamore this will be their next area of work.

In conclusion, insects and associated diseases often go hand-in-hand although they have not been covered here nor have the nut insects which are also a problem. Some of the major hardwood insects are on display and also radiographs of the cottonwood twig borer.