

# Sycamore Canker— Pesky But Not Disastrous

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During the record drought that struck the Mid-south's hardwood forests in the early 1950's, a very conspicuous form of damage was top-kill of large sycamore trees. Lack of moisture did not appear to be the direct cause, since on examination the dead and dying trees were found to have long, narrow cankers on the main stems and in the crowns.

Pretty clearly, a fungus was the cause of the canker. But what fungus? And how much of a threat did it constitute? As the scientific literature contained no information on the disease, pathologists of the Southern

Hardwoods Laboratory<sup>1</sup> undertook an investigation. This article describes the results.

As most hardwood lumbermen probably are now aware, the canker is easy to recognize. The first symptoms are sunken areas on the bark. Next, the surface of the sunken bark begins to look rough; on close view it appears to be covered with black pimples. These are the fruiting bodies of the fungus—the organisms that

<sup>1</sup>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.

form the spores that spread the disease. As the fungus grows it kills the bark and cambium, which slough off and leave the sapwood bare.

The cankers usually do not girdle the trees, but instead run up and down in narrow strips. A canker eight years old may be 12 feet long. Cankers can form on any part of a tree, including the small twigs. They attack trees of all ages and sizes. They occur throughout the South, but for reasons still unclear are most prevalent in the Mississippi Delta.

## Fungus Identified

An essential first step was to identify the fungus that is responsible. Because fungus species are numerous and closely related, and because several species are often found in or near a canker, this task was time-consuming. It is now clearly established, though, that the cankers are caused by *Botryodiplodia theobromae* Pat. This organism can be consistently isolated from cankers, and it produces cankers on trees inoculated with it.

With the fungus identified, something was learned of its life history. It usually enters trees through wounds made by insects, logging machinery, or breakage of live branches. It seems able to spread from twigs to the trunk. Hence insect damage to succulent twigs may be a prime point of entry.

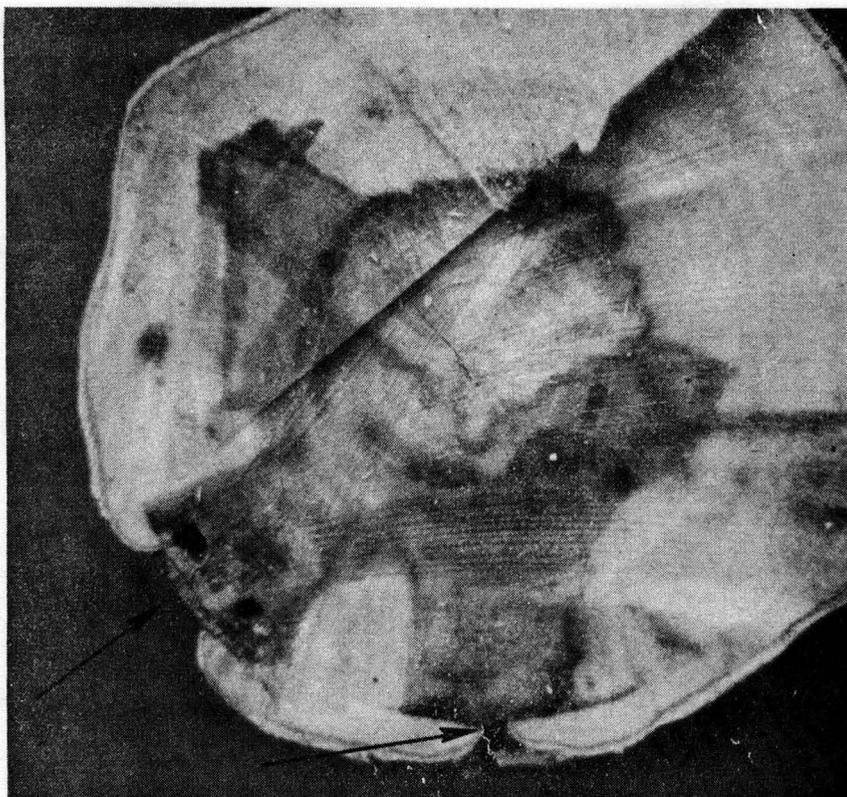
Once in, the fungus spreads, killing the cambium as it goes. The canker is merely the area of killed tissue bordered by callus growth. The fungus is perennial, and the airborne spores from the fruiting bodies cause new infections if they land on exposed tissue of the same or other trees.

On seedlings, cankers are often fatal. Saplings or larger trees usually live, but the cankers grow with the tree. By themselves they do not constitute lumber defects, or at worst only small ones, but the sapwood they expose quickly develops stain and decay. A sycamore with a trunk canker several years old usually contains a large amount of rot. Eventually the rot may weaken the tree so that it breaks in a wind-storm, but before that happens it has lost all value for lumber. The stain and rot appear to be caused by fungi different from the species that causes the cankers. To date *Botryodiplodia theobromae* has been isolated only from the cankers, not from the infected wood nearby.

All the evidence so far is that the disease is worst on dry, sandy soils, where vigor of the trees is apt to be low. Sycamore is best suited to river banks, stream bottoms, and other places where the soil is moist but well drained. Cankers form on trees on



Left: This canker, arising from a natural infection, is several feet long. Right: This tree was inoculated near the point indicated by the pencil. Ten months later, when the picture was made, a two-foot canker had developed. Most of the bark is still in place, but it is dead and will soon slough off.



*Cross-section of a sycamore log. The arrows point to small cankers, and the dark portions of the wood are caused by stain and rot that entered through the cankers.*

such sites, but in normal times they stay small and cause negligible damage.

Many of the big trees that died in the early 1950's were on sites considered good for sycamore. Drought, however, had lowered their vigor, and they developed multiple cankers that proved fatal. When the drought was over the dying stopped and the num-

ber of cankers on living trees lessened markedly.

The effects of tree vigor on susceptibility to disease were demonstrated in a test begun in 1956. During that year, which was near the close of the drought, trees on a good sycamore site were inoculated with the fungus. Every tree promptly developed a canker at the point of inoculation. Two

years later, after rainfall had returned to normal and the trees had regained their vigor, 80 more were inoculated. This time no infections developed. Recent inoculations have confirmed this early test. Observations of trees growing naturally in the forest point to the same conclusion, for all through the South, cankering is less severe now than it was during the drought.

### **No Cure, But Losses Can Be Cut**

What can be done about the canker? No cure is known, but foresters and lumbermen can learn to live with it, as they have learned to live with much worse diseases. Here are some suggestions for holding losses to a minimum:

Harvest merchantable trees that have large trunk cankers. Stain and decay will destroy their value rapidly if they are left in the woods.

Deaden unmerchantable trees that have trunk cankers. This practice will allow healthy trees to take over the growing space and will also reduce the sources of infection.

During logging, avoid damage to trees that are to be left to grow.

On sites where sycamores are badly cankered, favor trees of some other species. Some of the driest acid sites may be more profitable in pine. On others, white oak, Shumard oak, and yellow poplar are alternatives.

In summary, sycamore canker is likely to remain a cause of loss to trees on dry sites. On good sites, it probably will not do substantial damage except under highly unusual conditions.

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