Oaks, Oak Wilt, and Golf Courses

by Rex Bastian, Tech. Services Coordinator

Oak trees are often among the most dominating landscape features of many golf courses in the Chicago area. Their presence can dominate the character of play on a given hole. Because the loss of an oak can create a major change in a course, superintendents should be aware of the possible threats to the oak trees under their care. Because oak wilt can become established on a course rather quickly, an understanding of its biology and management strategies is important.

Oak wilt is an aggressive, tree killing disease of oaks. It is caused by the fungus *Ceratocystis fagacearum* and is closely related to the fungus that causes Dutch elm disease, *Ceratocystis ulmi.* The fungus enters the water conducting vessels of the sapwood through fresh wounds or through roots connecting healthy and diseased trees.

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When the fungus enters the vessel, adjacent cells develop balloon like structures that extend into the infected vessels and plug them. This disrupts the sap flow in the vessels and the foliage wilts and falls. The disease is a threat to all oaks, but trees of the red oak group (red, black, pin and scarlet oaks) are killed more rapidly than trees of the white oak group (white, bur, and swamp white oaks).

SYMPTOMS (RED OAK GROUP)

Early foliar symptoms are wilting, bronzing and shedding of the leaves at the ends of branches in the upper crown. The symptoms can spread through the crown very quickly, often within a few weeks.

Bronzing begins at the outer leaf edges and moves toward the midrib. The boundary between the green and discolored areas is usually very distinct. Along with the discoloration, the leaves often wilt. Both discolored and entirely green leaves fall from the tree in large numbers, but a few discolored leaves usually remain attached. As the disease progresses, fungus mats may be produced between the bark and sapwood. The fungus mats can exert enough pressure

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on the overlying bark to raise then rupture it. A fruity odor is produced from the mat that will attract sap beetles to feed on the mat.

SYMPTOMS (WHITE OAK GROUP)

Symptoms in white oaks are much more variable than in red oaks. Symptoms may develop in the upper crowns of white oaks as with red oaks, but they do not spread as quickly. Symptoms are often restricted to one or a few branches at a time. Members of the white oak group are seldom killed outright as those in the red oak group are. Leaf discoloration occurs, but the changes are often more gradual than with the red oak group. Streaking of sapwood beneath the bark of infested branches is much more common on white oaks.

(continued on page 16)

(Oak Wilt continued)

Spore mats are seldom produced on the white oaks.

It is important to remember that oak wilt is commonly confused with drought stress. The following items can help distinguish one from the other.

OAK WILT:

More common, during first half of summer
Small leaves, thin crown, wilting
Edges and tips of leaves turning color first
Leaves drop soon after discoloring
Dying trees found in groups (root graft transmission)

DROUGHT STRESS:

More common during last half of summer
Regular size leaves, little wilting
Leaves browning uniformly
Leaves stay attached to tree
Dying trees scattered throughout stand
More common on stressed sites
Often with trunk sprouts

Positive identification of oak wilt requires recovery of the fungus from trees suspected of having the disease. During the growing season, samples can be sent to the University of Illinois plant clinic in Urbana.

MANAGEMENT

At present, there is no cure for oak wilt. Management therefore consists of preventing the spread of the disease within an oak stand. Four considerations should be kept in mind:

1. If possible, avoid pruning oaks in known oak wilt areas during approximately mid April to early July. "Picnic" beetles are thought to move the fungus from the spore mats to fresh pruning cuts during this period.

2. If oaks must be pruned during this time, pruning cuts should be covered with a wound dressing. This is one of the few times that wound dressings are a recommended arboricultural practice. The dressing keeps the picnic beetles away from the fresh wound.

3. Sever root grafts between diseased and healthy trees. Oaks within 50 feet of diseased trees already may be infected without showing symptoms. Consider such trees to be suspect and place additional barriers between them and neighboring oaks. Root grafts can be severed by trenching to a depth of 3 to 4 feet or by chemical methods (Vapam).

4. Remove diseased red oaks as soon as possible. If quick removal is not possible, the trunks should be girdled to keep the fungus from spreading into the root system and to speed drying of the trunk. Diseased white oaks do not need to be cut down, but diseased branches should be removed and the tree treated to improve its vitality (proper watering, mulching and fertilization).

A new, systemic fungicide has been labeled for treatment of the oak wilt fungus in Illinois. The fungicide, named Alamo® by the Ciba-Geigy Corporation, can be injected into red and pin oak trees for both preventative and therapeutic treatments. It is not yet labeled for oak species in our area other than red and pin oak. Alamo has been used successfully for the treatment of oak wilt in Texas live oaks. Hendricksen, the Care of Trees has begun to inject red oaks to help prevent oak wilt in red oaks. Unfortunately, we do not yet have a history to base the potential effectiveness of these injections. Research done by the University of Minnesota does look promising, but only time will give an accurate picture.

Rubberized Turf: Old Tires Can Give New Life to Turf!

by Dan Banks, Benham Chemical Corp.

Every one of us can think of some areas where we can't grow grass due to traffic. It's human nature to take the most direct path to a destination, which is not always on a defined walkway or cart path. The result is soil compaction, which does not allow root penetration or sustain turf. Now you can grow turf in these bare areas!

Rubber cannot be compacted. Hence, when rubber is incorporated into a soil mix it also cannot be compacted and root penetration is achieved. Chopped rubber, made from used car tires, is a perfect rubber source for this use.

For three years, Trey Rogers of Michigan State University and Michael Venota, a graduate student, have been incorporating chopped rubber into turf. Last year they tilled 10,000 pounds of rubber into 10,000 square feet of Michigan State University's football players' practice field. The Michigan Turfgrass Foundation has supported a graduate assistantship for this research. Much of the final data has still not been collected, but we have some general guidelines for its use.

The shredded rubber is available in three sizes and has three different uses:

1. 3/8" — Soil Integration
2. 1/4" — Aerification
3. #10 — Topdressing

Keep in mind the object is to prevent compaction so the larger the particle the better the performance.

Those who have successfully installed the rubber recommend that 25-30% of soil be rubber. This rubber has been tilled into a depth of one foot. Here's an example of how to figure how much rubber is needed:

Rate: 25 to 30% rubber in soil tilled into a depth of 12".

How Much: 1 cubic yd = 800 lbs. of rubber

Example: a 5' wide x 20' long x 1' deep area

5'x 20' x 1' = 100 cubic feet
(27 cubic feet in a cubic yard)
100 cubic feet divided by 27 = 3.7 cubic yards
For 30% rubber mix:
3.7 (cubic yards) x .30 (30%) = 1.11 cubic yards of rubber needed or 800 lbs.

The rubber is packaged in a gaylord shipping container. This container holds 800 lbs. or 1 cubic yard. This material is shipped direct from the shredding facility to you and a minimum of 3 gaylords or 2,400 lbs. is required for delivery. The cost is relatively inexpensive, approximately $.18 a pound delivered to most areas in Michigan.