Bur Oak Blight (BOB) – There's a New Kid in Town

Jill D. Pokorny, Plant Pathologist, US Forest Service

Minnesota tree care companies, their arborists and urban forestry professionals are advised to be on the lookout for a newly discovered disease of bur oaks.

The first bonafide case of bur oak blight (BOB), confirmed by Dr. Tom Harrington of Iowa State University, has been identified in Minnesota. Previously, symptoms of BOB were reported to occur in portions of southern Minnesota, however, the disease was then called Tubakia leafspot and was cited to be caused by the fungus, *Tubakia dryina*. Since then, Dr. Harrington, Professor at Iowa State University, has completed DNA and pathogencity testing that confirms this disease is caused by a new, and yet unnamed, species of *Tubakia*, and he has named the disease bur oak blight (BOB).

It is not clear if this new species of *Tubakia* is a recent arrival to this region or if a shift in climate (more early-season rain events) have made this disease more noticeable over the last two decades. To date, BOB is known to occur from eastern Nebraska to central Minnesota and southwestern Wisconsin, and it appears to be spread across all of Iowa

Plant pathologists and arborists have been on the lookout for the new BOB *Tubakia* species in Minnesota, particularly in central and more northern counties. Jill Pokorny, plant pathologist with the US Forest Service located symptomatic bur oak trees in Mille Lacs and Sherburne counties, collected leaf samples, and identified the fungus, *Tubakia*, to be present. To determine if it was the new species of *Tubakia* that causes BOB, she submitted samples to Dr. Harrington for further laboratory testing. The samples tested positive for BOB.

In recent weeks, symptoms of BOB have also been reported on bur oaks located in Hennepin and Ramsey counties. These samples have also been submitted for species-level DNA testing, and we are awaiting test results. Jill Pokorny predicts, "As we continue to investigate symptomatic bur oak trees and more samples are tested, it is expected that BOB will be found in additional Minnesota counties."

Symptoms

BOB occurs only on bur oaks. Leaf symptoms typically first appear in late July or August, however, this year symptoms began to show up by early July (perhaps because of the frequent rainfall). Infected leaves develop necrotic (brown) lesions that are wedge-shaped and often delimited by leaf veins. It is also common for the leaf veins, themselves, to turn brown (Figure 1). Individual lesions may coalesce and cause large areas of the leaf to turn brown, resulting in an overall wilted or scorched appearance to the leaves. Smaller brown lesions may also be present, but are less common.

During the summer, black, pimple-like fruiting structures of the fungus form along the leaf veins and petioles and can be easily seen with the aid of 10X magnifying lens. Leaf symptoms are usually more severe on the bottom half of the affected tree's crown, but over time, symptoms may spread throughout the crown

A unique feature of BOB is that some infected leaves will remain on the tree during the winter (healthy bur oak trees shed all of their leaves in the fall). It is important to note, however, that not all infected leaves will remain attached; some leaves will drop off during the growing season and some will be blown off by winter winds. But the fact that some leaves, even a small number, are retained

over the winter is an indication that BOB may be present. Also, if leaves are blown off by winter winds, BOB-infected leaf petioles will remain intact. Fruiting bodies that form in late fall on infected leaf petioles are believed to be overwintering stage of the fungus.

BOB appears to be a slow spreading disease, particularly as it relates to disease spread from tree to tree. It remains a mystery as to why BOB does not spread more rapidly because the spores that cause BOB are produced in great abundance and are spread by rain. Within an individual tree, the disease tends to intensify year to year, generally starting in the bottom of the crown and moving upwards. If a tree is seriously affected one year, it tends to be severely affected the next year.

Over time, severely affected trees may die. In Iowa, BOB has been reported to cause tree death, particularly in upland sites. Within a grove or group of bur oak trees, some trees may be severely infected while adjacent trees appear healthy. This is likely due to variation in the degree of resistance individual bur oak trees possess to this disease.

Management

Because BOB is a late season disease, the impact on the foliage is reduced since the majority of photosynthetic activity has already occurred for the growing season. Although most infected trees will leaf out normally the following spring, they will develop leaf symptoms by late summer, and successive years of heavy leaf damage can result in branch dieback and eventual tree death. Efforts to boost tree vigor may prolong the life of affected trees and ward off invasion by secondary pests such as two-lined Chestnut borer and Armillaria root rot.

Since the fungus overwinters on infected leaf petioles that remain on the tree, removal of fallen leaves is not an effective management tool.

In preliminary studies, injections of the fungicide propiconazole (Alamo formulation) in early June (prior to leaf symptoms) have reduced symptom development in the fall and the following year. With further study, fungicide treatments may prove to be a valuable management tool for use on high-value landscape trees. “I’m not usually a big fan of fungicide treatments, but with this disease we are finding very good results. A single treatment may benefit the trees for several years,” Harrington says.

Sample Submission

Urban forestry professionals, now is your chance to have some of those mystery bur oak trees tested for BOB. Many of you have dealt with bur oaks that have eluded a positive diagnosis because they have exhibited unusual leaf symptoms and/or decline. Samples can be submitted to the University of Minnesota’s Plant Disease Clinic for diagnostic testing. A routine processing fee will be charged.

For BOB testing:
Collect branch tips with symptomatic and healthy leaves from several locations on the tree, wrap them in dry paper toweling (no plastic bags, please), and send them to:

Plant Disease Clinic
Department of Plant Pathology
495 Borlaug Hall
1991 Buford Circle
St. Paul, MN 55108

Enclose a description of the symptoms observed, when they were first noticed and enclose a photo, if possible. Please ship samples early in the week so they arrive at the Clinic before Friday.

Samples that test positive for Tubakia species and represent a new county record will be forwarded to Dr. Harrington for species-specific DNA testing. This data will assist him in developing a BOB distribution map for the Upper Midwest states.

The link below will take you to an 18 minute video on the symptoms and other characteristics of BOB
http://fms.extension.iastate.edu/vod/video/2010BobPresentCIC.html?

Figure 1. Bur oak leaves exhibiting large, wedge-shaped lesions and necrotic (brown) veins.