



## Signs and Symptoms of Forest Health Issues

Signs and symptoms are key to early detection of potential forest health issues whether they are bark beetles, defoliators, diseases, diebacks, declines, or any of a number of other factors that can impact the forests of Mississippi. Signs are the causal organism in question in their various life forms (egg, larva, adult, spore, fruiting bodies, etc.) and anything that they produce such as frass (insect excrement) or silk for enclosing foliage. A symptom is the reaction of the host to an invading organism. A symptom may be as simple as the canopy is not as full as it once was or not as green. The key is "normal", what should the tree look like in a healthy condition. Early detection of the abnormal is critical and in many, many cases it is the landowner on the ground that discovers these conditions and then wants to know what is causing the abnormality and what can be done about it. The key is to understand what is normal in the growth pattern of the trees being observed and what is not.

It is at this time year when the dogwoods bloom and pine pollen is abundant that the Mississippi Forestry Commission begins their annual survey, trapping for damaging agents such as the southern

pine beetle (SPB). The SPB has begun to emerge from their overwintering sites and colonizing new hosts. The trees that the SPB has overwintered in will be dead. Most likely the bark has begun to slip or is absent from the foraging activity of woodpeckers during the winter. It is also at this time that these trees that the SPB attacked late last fall and overwintered in will begin to fade, not maintaining their normal green appearance and a color change in the canopy will begin to appear. It is not normal for a pine tree to have red needles nor is it normal for the needles to be yellow.

It is also at this time of year that the pines are most vulnerable to attack. They are putting all their energy into reproduction, growth (height and increment) with little going into defensive compounds. This is also true of the hardwood trees such as the oaks when the leaves are young the primary defensive compound, tannin, is at lower levels than in mature leaves. Hence, spring is an excellent time of year to begin looking for the signs and symptoms of issues relating to forest health. Issues of particular concern are damaging agents like the SPB.

Signs of insect activity are the insects themselves in their

various stages of development. When a pine tree is just coming under attack hundreds if not thousands of beetles are arriving at the tree during the attack process. Trees just coming under attacked by the SPB are difficult to recognize at first. Usually the first sign will be boring dust on the upper surfaces of the understory vegetation. This boring dust is a mixture of the fecal material of the insect and the material being removed as the adult beetle begins tunneling into the tree and is commonly referred to as frass. Once the beetles penetrate the outer bark and hit the inner bark resin canals are cut and resin flow will begin. At first the resin will be clear and the beetles are working to over come this initial resin flow that turns a reddish color as boring dust is mixed in. In time, the resin begins to harden and the result is a pitch tube and is a good sign to look for. For the SPB this pitch tube is about the size of a piece of popcorn usually with a hole in it hence the term pitch tube. The first attacks by the SPB begin about half way between the base of the tree and the first live limbs in the canopy. Also arriving at this time are the checkered clerid beetles that are predators of the SPB as well as various other insects that utilize the trees being colonized

by the SPB. Many of these can be seen running around on the surface of the trees just coming under attack.

In time the pine trees that have been successfully attacked by the SPB will die. In the process there is a change in the color of the canopy that is referred to as fading. Needles fade from green to dull green, yellowish, and finally reddish-brown before falling. Hence canopy color is a good indicator of overall health. Pines in yards around homes that tend to be yellow most of the year are often the result of some nutritional factor. Soil pH is very important and pines prefer a more acid soil and in our landscaping efforts we often remove the pine straw from around the base of these trees that provide elements necessary for maintaining the soil pH at the optimum for healthy pines in the urban environment.

In the previous paragraphs I have focused a bit on the SPB because of its history as a damaging agent in the forests of Mississippi. It also offers good examples of what to be looking for in the way of signs and symptoms when trying to determine if one has the SPB on their property. Early detection and a management plan are critical in managing this or any other forest health issue.

In the publication "Managing the Family Forest in Mississippi" edited by Mary Jo Wallace and Andrew Londo and put out by

the Department of Forestry, Mississippi State University, Mississippi State Extension Service, U.S. Forest, and the Mississippi Forestry Commission Publication 2470, 99pp., offers landowners a great deal of information including information on forest health issues. Specifically chapter 13 covers primary Forest Health issues facing forest landowners and managers in Mississippi.

**For additional information contact:**

[Mississippi Forestry Commission Local Office](#)

or

T. Evan Nebeker  
[tevannebeker@bellsouth.net](mailto:tevannebeker@bellsouth.net)