COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Plant Pathology Fact Sheet PPFS-GEN-11

Diagnosis of "No Disease"

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Extension Agents and growers may occasionally receive diagnostic reports from the University of Kentucky Plant Disease Diagnostic Laboratory that indicate "no disease was found." One or both of the following explanations may account for the diagnosis of "No Disease."

The Sample Is Insufficient

Often the causes of tree and shrub disorders cannot be confirmed based on limited amounts of leaf or twig material (Figure 1). Even if a plant is diseased, the disease-causing pathogen may be absent in the particular sample, yet present in another part of the plant. Leaf symptoms or "flagged" branches (dead or dying branches that are surrounded by otherwise healthy branches) may be the result of a problem located further back on a branch or on the main trunk. Follow-up samples and photos may help verify a disease problem in lower plant parts. When diagnosticians assess symptoms and speculate that there is a problem elsewhere on a plant, the agent or grower should re-examine the entire plant as follows:

- Trace affected branches back toward the trunk, looking for cankers (localized dead areas, Figures 2 & 3), insect injuries or other wounds (Figure 4) that might be present either on major branches or trunk.

- Examine the interior of affected branches. Some tree diseases cause vascular discoloration inside the branches, which is only visible in branch cross sections (Figure 5).

Figure 1. Small twigs and dead leaves are often inadequate samples for diagnosis.

- Examine the base of the trunk or roots. Basal cankers (Figure 6A) or wounds (Figures 6B & 6C), or root diseases often produce symptoms of overall decline, wilting, browning or leaf/needle scorch.

The Problem Is Not Caused by an Infectious Disease

Many environmental or cultural conditions can cause symptoms that are similar to those of infectious diseases. Weather events such as frost/freeze, sunscald, drought stress (even from previous years), flood, and hailstorms can produce disease-like symptoms on leaves and branches.

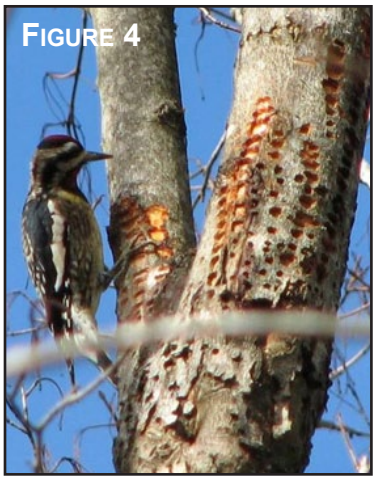

FIGURE 2. CANKERS MAY BE PRESENT ON LARGER LIMBS FURTHER BACK FROM SYMPTOMATIC TWIGS OR BRANCHES. **FIGURE 3**. FUNGAL STRUCTURES IN CANKERS ARE OFTEN INDICATIVE OF A DISEASE-CAUSING AGENT. **FIGURE 4**. INJURIES OR WOUNDS, SUCH AS THOSE CAUSED BY SAPSUCKER FEEDING, CAN RESULT IN SYMPTOMS RESEMBLING DISEASE. **FIGURE 5**. DISCOLORATION OF INTERNAL TISSUE MAY INDICATE A VASCULAR WILT DISEASE.

Likewise, soil compaction, poor drainage, improper planting depth, adverse soil pH and other cultural factors can affect tree appearance and health. Mechanical damage (e.g., mower, string trimmer damage, etc., FIGURES 6B & 6C) and herbicide exposure (FIGURE 11) are also common causes of landscape plant disorders. Including pictures and detailed information about the growing site can be helpful. Diagnosticians evaluate whether symptoms are suggestive of one or more environmental/cultural factors and suggest possible causes. Some examples are illustrated below (FIGURES 7 to 11).

Keep in mind that the symptoms may be the result of events that occurred during previous seasons. It can take several years for adverse conditions (stresses) to produce noticeable symptoms in landscape plants. Stresses often are alleviated or moderated by proper plant care; for example, watering during dry periods, fertilizing according to soil test results, and applying mulch to protect the base of trees from injury and to retain moisture in root zones.

FIGURE 6. CANKERS ON LOWER TRUNKS (**A**) MAY BE CAUSED BY DISEASE CAUSING PATHOGENS (e.g. COLLAR ROT DISEASES), WHILE WOUNDS (**B** & **C**) CAN RESULT FROM MECHANICAL DAMAGE (e.g. MOWER OR STRING TRIMMER INJURY). GIRDLING DUE TO CANKERS/WOUNDS OFTEN CAUSE LEAF/NEEDLE LOSS (**A**) OR DIEBACK (**C**) THROUGHOUT TREES.

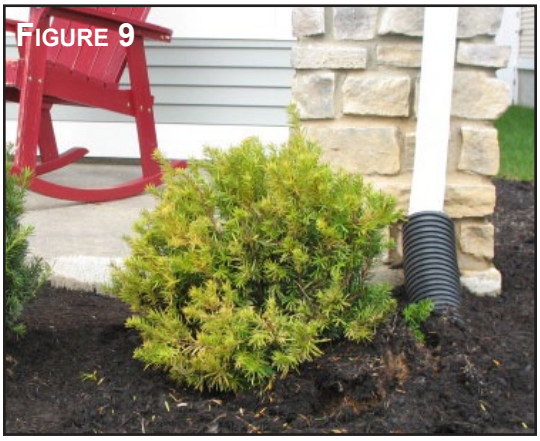

FIGURE 7. GIRDLING ROOTS RESTRICT TRANSPORT OF WATER AND NURIENTS TO UPPER BRANCHES, RESULTING IN LEAF SCORCH, DEFOLIATON, OR DIEBACK. **FIGURE 8**. HAIL CAN CREATE WOUNDS IN TWIGS AND BRANCHES THAT RESEMBLE CANKERS. **FIGURE 9**. PLANTS PLACED IN A POORLY DRAINED SITE, SUCH AS NEAR A DOWNSPOUT, SUFFER FROM LACK OF OXYGEN (WET FEET) AND/OR ROOT ROT, RESULTING IN YELLOWED FOLIAGE.

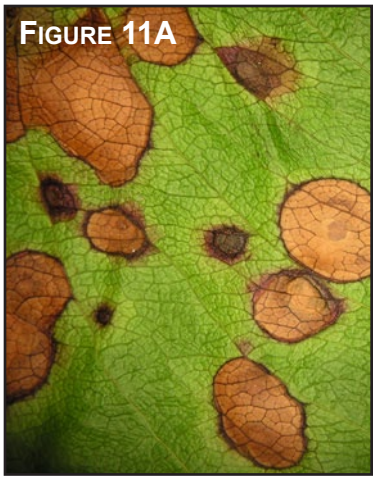

FIGURE 10. COLD TEMPERATURES AND WINTER DRYING CAN INJURE SENSITIVE LANDSCAPE PLANTS. **FIGURE 11.** CONTACT HERBICIDES MAY CAUSE SPOTTING (**A**), WHILE GLYPHOSATE OR GROWTH REGULAR HERBICIDE EXPOSURE MAY RESULT IN DISTORTION OF PLANT TISSUES (**B**).

Do not hesitate to contact your local county Extension office or Extension specialist for assistance in plant health assessment and sample collection. For more information on submitting plant specimens for disease diagnosis, refer to PPFS-GEN-09.

ADDITIONAL RESOURCES

- Submitting Plant Specimens for Disease Diagnosis, PPFS-GEN-09 (University of Kentucky) http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GEN-09.pdf

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Photos: Julie Beale (Figures 1, 3, 5, 9 & 10), Nicole Ward Gauthier (Figures 2, 6B, 6C), John Hartman (Figures 6A & 7), and Brenda Kennedy (Figure 11A), University of Kentucky; Alan Windham (Figure 4), University of Tennessee; Minnesota Department of Natural Resources, Bugwood.org (Figure 8); and Nancy J. Taylor, The Ohio State University (Figure 11B)

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