The Plant Doctor's LANDSCAPE TIPS

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THE TREE CARE PROFESSIONAL VS. FOLIAR DISEASES

INTRODUCTION:

Foliar diseases represent a perplexing and important component of plant health care in the tree care industry for a couple of reasons: 1) foliar diseases result in leaf spot/blighting and defoliation, which are very conspicuous to consumers, and 2) variable environmental conditions and the unpredictable nature of biological systems ensure that the professional arborist will not always achieve good management of foliar diseases.

Today's consumers are increasingly particular for results from investments they make in their landscapes and trees. However, with little understanding of foliar diseases, they may also panic when they witness leaf problems, often erroneously believing their trees are dying. Following are some of the major groups of foliar diseases that challenge us every year and some tips on their management.

MAJOR TYPES OF FOLIAR DISEASES:

Monocyclic Leaf Spots: Some fungi that cause foliar diseases may only infect during a limited time during the year, usually spring. Tar Spot of Maple, caused by the fungus Rhytisma, is one of the preeminent examples. Rhytisma spores are released during a period in the early spring and infect the foliage during damp periods. Each of the subsequent spots that develop was caused by a single spore infection (Photo 1). Another example of a monocyclic disease is cedar apple rust (see below).

Multicyclic Leaf Spots: Apple scab (Photo 2) is the classical archetype of the multicyclic disease. The apple scab fungus, Venturia, infects foliage during damp periods in the early spring. However, unlike monocyclic diseases, Venturia continues to produce spores from leaf infections, and these spores continue to infect foliage in multiple cycles throughout the warm season.

Anthracnose: Anthracnose (Photo 3) represents a huge class of diseases caused by various species of several genera of fungi. Anthracnose is characterized by nebulous, blotchy necrotic areas on leaves as opposed to well defined spots caused by other disease agents.

Mildews: Many trees are infected by fungi known as Powdery Mildews (Photo 4), easily recognized by the powdery appearance on the upper surface of foliage. PMs are obligate parasites and, except for some cases, are generally specific for their host plant. PMs mainly discolor foliage and, in rare instances, may cause leaf drop.

Conifer Foliar Diseases: As with foliar problems on deciduous plants, conifers also have their own particular foliar problems that may result in needle (leaf) discoloration, blight and defoliation. Many of these conifer foliar diseases are called needlecasts because after infection by fungi, the needles are "cast" from the trees. Other conifer foliar infections result in blighted needles (Photo 5 and Inset).

Rusts: An interesting group of foliar diseases are the rust diseases. Classed as obligate parasites, rust fungi often require two completely different host plants to complete their life cycle (Photo 6).

Photo 1: Tar spot is a typical example of a monocyclic disease.

Photo 2: Apple/Crabapple scab is a classic example of a multicyclic disease.

Photo 3: Anthracnose is a common problem on sycamore. Note the irregular lesion caused by the anthracnose fungus.

Photo 4: This upper surface of the foliage of this serviceberry is coated with a powdery substance, typical of powdery mildew.

Abiotic: Abiotic problems may mimic foliar diseases (Photos 5 & Inset). Hence, it is very important to accurately diagnose foliar problem and differentiate foliar diseases from other problems.

MANAGING FOLIAR PROBLEMS:

It is important to understand that most foliar diseases do not cause long-term health concerns on trees. When foliar diseases are noticed by the public, it is generally too late in current season to treat for the disease. Hence, one of the greatest challenges is educating our clientele about the importance of foliar diseases and when control efforts are most efficacious.

Diagnosis: While many foliar diseases are easily diagnosed, others are confused with a variety of other foliar problems (Photo 7). Obviously, accurate diagnosis and understanding of the disease (including disease cycle) are essential for proper management.

Do Nothing: For most foliar diseases, especially during certain periods of the year, nothing can be done or is advisable to be done. Most foliar diseases do not cause long-term or life-threatening situations for plants. If management is desired, proper timing of the procedure is vital.

Cultural Practices: Theoretically, removal (ex. disposing of leaves in the fall) of infected leaves (sanitation) that carry the disease agent for next year's infection should be effective. However, infectious propagules of disease agents can travel from great distances so sanitation is not necessarily effective. Excess irrigation may maintain high humidity and leaf wetness in landscapes, promoting infection by foliar disease agents. Hence, carefully managing the moisture conditions in landscapes is a practical contribution to foliar disease management. Utilization of disease resistant trees is also a valuable practice.

Biological: There have been efforts to apply natural occurring or engineered microorganisms to leaf surfaces that can provide some protection from infection by disease agents. While not widely utilized at this time, biological management holds some promise for the future.

Chemical: Treatment with chemicals (primarily fungicides) should be the last resort. Applications should be administered when the disease agent is susceptible; hence, the disease cycle must be understood. Chemical applications should be aimed at prohibiting that earliest, first infection in the case of monocyclic and multicyclic diseases. If the initial infection by a monocyclic disease is not prevented, subsequent applications of a fungicide are generally useless. Subsequent applications of chemicals for a multicyclic disease may slow or prevent repeating stages, thereby decreasing the likelihood of early leaf drop. In either case, chemical applications may reduce the incidence of infections but will not often result in 100% control of the disease.

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.

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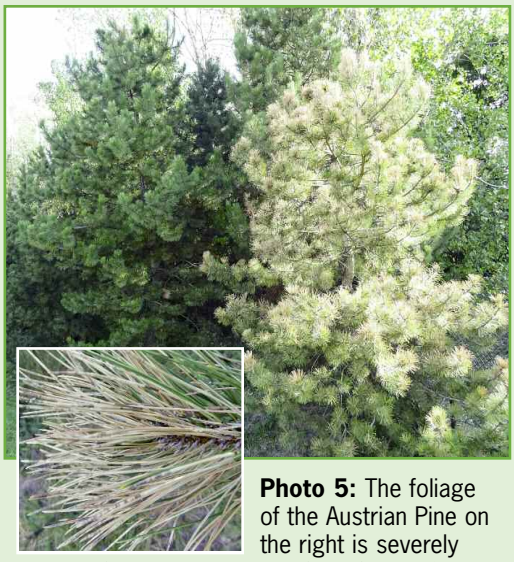

Photo 5: The foliage of the Austrian Pine on the right is severely blighted. Close examination of the foliage (Inset) discloses symptoms typical of Dothistroma needle blight. However, because every needle on the tree is "blighted," the most likely problem is needle desiccation from the 2012 drought.

Photo 6: Cedar-apple rust is typical of the rust group of diseases. The fungi that cause rusts often require two different host plants to complete the disease cycle—therein may lay the key for management.

Photo 7: Although, the foliage of this dogwood appears to have blight symptoms typical of a disease, the most likely problem is "scorch," an abiotic disorder resulting from drought.