

6 quick rules for diagnosing plant problems

by JAMES CHATFIELD / Ohio State Extension Service

Diagnosing plant problems is difficult and requires discipline and diverse knowledge. Yet everyone wants an instant and simple answer, not to mention an inexpensive and certain solution.

Is there a sure fire way to make diagnosis easy? Not really. But the following rules will lead to improved diagnostic success:

Rule 1: Know your plants.



Normal fall color on larch, a deciduous conifer. If you do not know it loses its needles each year, this would appear alarming.



Oak leaf blister: it looks serious, but rarely is significant to plant health.

Sometimes a homeowner cuts down a larch or bald cypress because he or she doesn't realize that these are deciduous conifers that drop needles in the fall. Likewise, a homeowner may notice brown needles on their white pines and believe the trees are diseased when, in fact, they're healthy. As horticulturists, not only do you know a larch from a pine (that's not too tough), but you know that loss of third-year needles is typical of white pine.

Another example that's not that uncommon is the severe yellowing between veins of the leaves of the pin oak. This may or may not be due to unavailability of iron in alkaline soil. But you know that that's a good place to start your diagnosis.

Certain plants are almost known by certain problems, such as black locusts in late summer skeletonized by locust leafminer adults, or sycamores with clusters of browned leaves and twig dieback, accompanied by leaf drop in June. They could be infected by sycamore anthracnose.

Finally, if you know your plants and where they should be placed, you will have an idea why taxus in a low, wet area is turning off-color and browning. Or why a European birch in the Midwest heat is losing upper branches from bronze birch borers.

Good diagnosis begins with plant knowledge.

Rule 2: Look for patterns.

First, determine the range of plants affected. If widely different species are damaged, it's unlikely that the problem is an infectious plant disease. Most disease-causing fungi and bacteria affect a limited number of plant types. If all the trees and shrubs in an area are dying, the problem is more likely environmental or cultural.

Check to see if problems are more widespread in low areas where poor drainage may be the key factor. Ask whether soil was disturbed by construction—trenching, soil grade changes, soil compaction. If contamination or overdoses of a pesticide are suspected, review what properties were sprayed and in what order. (If the problem is contamination of a hose line with a fertilizer or herbicide, the first properties sprayed should show the greatest damage.)

Also, notice the pattern of damage on the individual plant and plant parts. Diplodia tip blight of pine generally starts on the lower parts of the pine, spreading upward over the years due to splash of spores which cause new infections.

Dutch elm disease generally starts with flagging of upper branches where elm bark beetles have transmitted the fungus to vascular tissue of upper tree branches.

Rule 3: Learn the symptom profile.

An easy trap is to make a diagnosis on the basis of only one symptom. Diagnosis is not that simple.

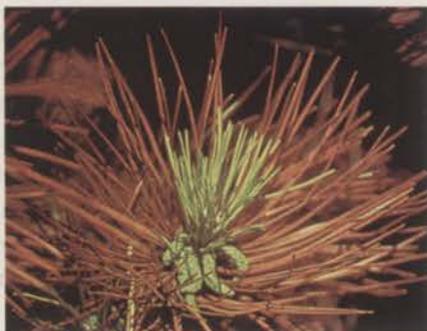
For example, new leaves curling on a crabapple can be due to many different causes: aphid feeding, powdery mildew disease, growth regulator herbicide injury, moisture stress. Take the next step and match the symptom with further evidence. Unfurl the leaf to look for the aphids or their white cast skins. Look for evidence of powdery mildew with your hand lens.

Recognize that many problems have a whole set of characteristic symptoms. Verticillium wilt of maple causes leaf wilting and browning, dieback of branches (often one at a time), and discolored streakings in the wood. Each symptom alone is not sufficient for good diagnosis. But with a full profile of all the above symptoms you have enough to suspect verticillium wilt, which can then be verified by fungal isolation in the laboratory.

Rule 4: Perspective is valuable.

You can probably find at least one pest or disease problem on any tree. That does not mean that the maple bladder gall mite on the silver maple or the oak leaf blister on the red oak is important to plant health. This is a crucial perspective to relate to customers.

This brings us to an important realization. Although insects, mites and diseases harm trees, the majority of tree



Diplodia tip blight of pine: the pattern of damage is on new growth each spring, and gradually spreads over the years from lower to upper branches.



Powdery mildew on London planetree: note typical powdery white fungal growth and less typical (for powdery mildew) leaf distortion.

problems aren't caused by pests. They're caused by environmental and cultural factors such as drainage, improper plant siting (particularly in terms of sun and wind exposure), construction damage, storm damage, improper pruning, drought, and winter damage.

Be aware that if you do not constantly work at it, you will lose perspective. If you focus on only one symptom, if you always look for the easy answer like an identifiable leaf spot when the real problem is root decline, if you diagnose tree decline by simply asking if the customer has a lawn care service—you will not only be wrong most of the time, you will also soon lose the ability to even know what you are seeing.

Rule 5: Timing is everything.

One of the challenges of diagnosis is properly factoring time into the equation. Large, older trees that decline five

years after a new subdivision is put in are often dying from soil compaction by construction equipment, changes in soil grade which bury root systems, and outright root destruction by trenching. These trees do not typically fall overnight from this abuse.

Rarely does a customer want to hear about the role of these earlier stresses, that droughts stressed the tree, that a tree has been declining for years. Nevertheless, it's often true.

Try to be proactive by keeping records and informing customers of existing conditions when you start maintaining their trees. Set proper expectations based on a clear-headed estimate of tree health and the underlying history of the plants you will maintain. Estimate if tree health is declining by measuring annual growth increments using the bud scale scars.

Take your time when diagnosing. Everyone wants an instant answer, and someone is always willing to give one. However, step back, look for the pattern of damage, assemble the symptom profile, factor in what might have happened on the planting site in the past, and ask as many questions as possible.

Rule 6: Nothing is surefire.

The best diagnosticians, the best horticulturists, learn every time they go onto a landscape. There are always new things to learn about plants. Diagnosis is both an art and a science. There are the occasional "gimmies," but more often than not, your diagnosis will not be proven or certain.

A more reasonable goal is to arrive at the best evaluation of cause and effect from what is almost always incomplete information. **LM**

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