

Stop #5: So, You Think Your Turf or Landscape Plants Have a Disease. What's Next?

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Accurate diagnosis of plant problems is a cornerstone of the economically and environmentally sustainable management of turf and landscapes. A disease is often suspected when unhealthy plants are observed, but abiotic factors such as improper cultural practices, environmental stress, and/or accidental damage are the primary cause of a large percentage of problems. Considering the following questions in roughly this order can help you or someone else piece together what is happening to your turf or plants.

- 1. What do the plant parts look like up close?** Examine the leaves and stems closely, and dig up roots. Diseases often form their own distinctive lesions with certain colors, shapes, and borders between healthy tissue. In the early morning, you may see the pathogen itself in the form of a fuzz or fluffy mass. Abiotic problems often exhibit less distinct symptoms without borders.
- 2. What is the overall pattern?** Take a step back to see how the unhealthy appearance is distributed among a turf area or adjacent plants.
 - a.** Affects a large area equally or in straight lines? Might be phytotoxicity or other human error.
 - b.** Occurs in diffuse blotches? May be a foliar disease, insect, or nematode.
 - c.** Occurs in defined patches? Probably a soilborne or foliar patch disease.
 - d.** Follows the water in low areas? Could be an abiotic problem or pathogen brought on by excessive soil moisture.
- 3. What is the host?** Key to understanding which pathogens it is commonly susceptible to, how it responds to cultural practices or stresses, and the normal appearance of a healthy plant.
- 4. When did the symptoms appear, and what was happening before that time?**
 - a.** What was the weather like before symptoms appeared? Such as a sudden shift to moist or humid and warm or cool conditions.
 - b.** What management has been done on the plants before symptoms appeared? Includes irrigation, fertility or pesticide application, or cultural practices. Dropping the mowing height is probably the leading contributor to damage from pathogens or environmental stress in the summer.
- 5. Was the previous winter marked by unusual precipitation or temperature?** Winter conditions can affect the population levels of pathogens, insects, and nematodes and therefore the damage caused by these agents during the

following summer. Some pathogens actually infect plants long before symptoms are observed, such as for spring dead spot.

- 6. What are the soil and irrigation source like?** Understanding the pH, salinity, and nutrient status of the soil and water source could identify the primary source of the problem or point the diagnostic process toward a disease that is favored by one of those stresses.

Often common diseases or abiotic problems can be diagnosed by answering a few of these questions. If not, use the following procedures to submit a sample to a diagnostic laboratory:

General Instructions

1. Take photos of individual plant parts and the overall pattern from a standing position at about a 45° angle (for turf) or showing whole plants (for landscape) that are in focus and with optimal light (avoid glare during mid-day).
2. Collect samples before applying a pesticide.
3. Place the plugs (turfgrass) or bagged samples (landscape) in a sturdy cardboard box, surround with any good packing material (e.g., paper, bubble wrap), and close well with shipping tape.
4. Fill out the submission form provided by the lab to the best of your ability and enclose with sample if not submitted electronically with photos.
5. Overnight the package. If today is Friday or Saturday, place the sample in a refrigerator and wait until Sunday to ship for Monday arrival.

Turf Samples

1. Take 2-4 cup cutter samples. Each plug surface should contain approximately two-thirds diseased and one-third healthy turf.
2. Shake or cut off soil below the maximum root depth.
3. Wrap the soil snugly in tin foil, leaving the foliage exposed.

North Carolina State University Turf Diagnostics Lab form and instructional videos:
<https://turfpathology.plantpath.ncsu.edu/diagnostics-lab/how-to-submit-a-sample/>

Landscape Samples

1. Dig up the plant and the bulk of the root system, keeping the root ball intact. Select plants that are partially diseased and partially healthy.
2. Enclose the root ball in a plastic bag, securing the bag around the stem.
3. Enclose the entire plant and root ball in another bag. If the plant is too large, cut portions of leaves, stems, and/or roots representing healthy and diseased and enclose separately.

North Carolina State University Plant Disease and Insect Clinic forms, instructions, videos:

<https://projects.ncsu.edu/cals/plantpath/extension/clinic/submit-sample.html>