How to Collect and Send Plant Specimens for Disease Diagnosis

Cooperative Extension Service
College of Agriculture and Home Economics

Guide H-158

Natalie P. Goldberg, Extension Plant Pathologist

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Good plant specimens are needed to diagnose plant problems accurately. It is difficult, if not impossible, to determine the cause of death from a single leaf, dried or old specimen, or (especially) a dead plant. Healthy plants from the same area are also helpful to a diagnostician. It is also important to include the margin of the disease (where healthy and diseased tissue come together) in the sample, especially with stem and branch disorders.

GUIDELINES FOR SUBMITTING SPECIMENS TO THE EXTENSION PLANT PATHOLOGIST FOR DIAGNOSIS

Please read and follow these instructions before submitting specimens.

Collecting

1. Provide as much information regarding the specimen as possible. Fill out a "Plant Specimen Submission" form.

   A. Identify the plant material (variety), acreage (when applicable), and indicate the percentage of plants affected.

   B. Indicate when the symptoms first started and whether or not the symptoms are continuing to develop or spread.

   C. List all cultural practices such as irrigation frequency, rate and time of chemical application (herbicides, insecticides, fungicides, etc.), fertilizer regime, and crop rotation over the previous three years when applicable.

   D. Try to give an estimate of the weather conditions preceding and during symptom development.

   E. For home or urban plantings, indicate the type of environment in which the plant is growing (lawn, flower bed, pot, house, greenhouse, etc.). A photograph of the plant in its environment, when available, can be extremely helpful to the diagnostician.

2. Select material showing the symptoms. If possible, it is best to send several samples showing various stages of the problem. Early stages of symptom development are especially important.

3. Send samples of all plant parts, including roots whenever possible. Aboveground symptoms may be caused by root or stem diseases; thus examining all parts can be essential for an accurate diagnosis. Dig plants (do not pull them) out of the soil. Pulling plants out of the soil will generally break off the roots, especially if they are rotten. Retain a small amount of soil around the roots. *Do not wash roots.* Keep the roots and soil separate from the aboveground parts of the plant by placing them in a plastic bag and sealing them off with a rubber band.

4. When the entire plant cannot be sent, send several affected portions of the plant. Remember to include the margin of disease on stem and branch samples.

5. If you suspect vascular wilt diseases, such as Verticillium wilt, send a sample from dying or wilted branches with yellow leaves. Remember, *do not send dead wood*. Place several branch sections 1/4–1" in diameter and approximately 6" in length in a plastic bag. This will prevent the sample from drying in transit.

6. Turfgrass samples should be taken from the edge of the affected area and include both dying and healthy plants. Again, *do not send dead grass.* Send several 3" x 3" squares of sod including at least 1" of soil.

Wrap the sample in a thin layer of damp (not wet) paper toweling, then wrap in dry newspaper.

7. Fleshy specimens such as fruit, mushrooms, or other fungal fruiting bodies should be as firm as possible and show both early and intermediate symptoms. Wrap specimens separately in dry paper toweling or dry newspaper. *Do not put in plastic*. Pack specimens so they are not crushed during shipping.

Packing

1. Keep plants cool and moist prior to shipping. Use an ice chest when collecting samples, then place them in the refrigerator until they can be sent.

2. Pack in a sturdy container to prevent crushing during transit. Use newspaper to pack specimen firmly in the container.

3. Identify the package with labels both outside and inside. Be sure to include your name, mailing address, and phone number. Don't forget to include an explanation of the diseased material.

4. Mail specimens as soon as possible after collection. Mail early in the week to avoid delivery delays over weekends and be aware of holidays that also might delay delivery.

Address packages to:
Natalie Goldberg, Extension Plant Pathologist
NMSU–CES
Box 3AE
Las Cruces, NM 88003–8003

The diagnosis you receive is only as good as the sample you send. In some cases, diagnoses may require tests or equipment that are not available in our facility. In those cases, commercial laboratories specializing in plant disease diagnosis may be recommended. While time devoted to individual samples is limited, diagnosis reports will reflect considered opinion and best judgement based on all the information available. Accurate information regarding the sample and diseased material that is submitted properly will help the diagnostician provide an accurate diagnosis. For some problems, such as insect damage, other professionals may be consulted. Specimens may be forwarded to scientists more qualified to analyze the material.

Remember, proper diagnosis begins with you. Submitting good-quality specimens accompanied by complete and accurate information is the first step in identifying and solving the problem. Your satisfaction may depend on it!

PLANT SPECIMEN SUBMISSION FORM

Sample No. (To be filled out by plant pathologist) _____

PLEASE REMEMBER...Successful plant disease diagnosis is a team effort. Please follow the guidelines and submit the best sample possible. Answer to the best of your ability.

Grower/Homeowner
Name, Address, and Phone Number

_____
_____
_____
County _____

Submitted by: (If different from grower)

_____
_____
_____

Variety (Genus and species, and/or common name of plant) _____

Symptoms (Circle all that apply)

Plant parts affected: roots, crowns, stems, branches, leaves, fruit
Symptoms: spots, tipburn, distortion, mosaic or mottle, chlorosis (yellowing), necrosis, mildew, blisters, defoliation, wilt, dieback, blight, stunting, canker, gall rot
Other: _____
_____
Symptoms (circle one): spreading or localized
When did symptoms first appear? _____

Number or Percent of Plant(s) Infected _____

Soil Type (circle all that apply)

Sand, silt, clay, well-drained, poorly-drained, heavy, light

Growing Conditions (circle all that apply)

Indoors (home/office), greenhouse, home garden, lawn, landscape, organic garden, commercial field, other _____

Weather Conditions immediately prior to and during development of symptoms

(Circle all that apply) Wet, dry, humid, windy, dusty, hail
Temperature (°F) _____ Other Conditions _____

Irrigation History (Circle all that apply)

Furrow, flood, drip, sprinkler, hand
How often _____

Fertilization History (type, nutrient ratio, amount applied, and frequency of application) _____
_____

Chemicals Applied (Chemical name, method of application, frequency of application, and amount applied)
_____

Cropping History (for agricultural fields or home gardens)

Rotation (previous 3 years) _____
Past problems (in field) _____
Acreage _____
Percent plants affected _____

Other Information:_____

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