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## Submitting a Sample for Turfgrass Problem Diagnosis

*This bulletin was made possible through the collaboration of Dr. Lee Miller, David McCall, and the 2013 STMA Information Outreach Committee.*

Turfgrass managers often encounter problems on athletic surfaces that are difficult to identify. Common turfgrass problems include fungal diseases, insect pests, nematodes, misapplication of fertilizer or pesticides, extreme temperatures, too much or too little water or nutrients, and other

cultural or environmental problems. Identification can be difficult when problems appear similar from a distance. For the photos below, which is gray leaf spot and which is Pythium blight?



Pythium blight – Photo courtesy of Lane Tredway, Ph.D.



Gray leaf spot – Photo courtesy of Lane Tredway, Ph.D.

Accurate diagnosis of a problem is a critical first step in controlling it quickly and economically. If you cannot diagnose a problem, or need a second opinion, consider contacting a diagnostics lab or turfgrass pathology lab. These labs are often located at your state university and specialize in rapid and accurate diagnosis of turfgrass diseases and other problems. Your local Cooperative Extension may also have resources for whom to contact when turfgrass problems arise. A listing of diagnostic labs has been provided at the end of the bulletin. This bulletin outlines steps and recommendations to submit a quality sample to expedite the identification process. Accurate diagnosis re-

quires both a representative sample and sufficient information about the cultural practices and environmental conditions associated with the problem. In addition, quality digital photos are recommended to assist in the identification process. It is difficult to make an accurate diagnosis using pictures alone. Therefore, submit physical samples to have a problem diagnosed with 100% confidence.

# Submitting a Sample for Turfgrass Problem Diagnosis

## What information should I include on the sample submission form?

Fill out a sample submission form provided by the lab legibly and as completely as possible. The form requires information about the submitter/client, turfgrass species, and timing of the problem. Information about the age of the stand, location, drainage, pesticides and management inputs, as well as a full description of the problem including plant symptoms, patterns, and affected plant parts.

Be as detailed as possible to help diagnosticians. For example, list any and all pesticide applications including date and rate of application. Keeping accurate and up-to-date records of all pesticide and fertilizer inputs is important for all aspects of maintenance, but is especially beneficial when diagnosing problems. An example of a submission form can be found at the end of the document.

## How do I take a quality sample?

Do not apply chemicals before taking a sample as this can impede the diagnosis. Plugs should be at least 4-6 inches across and 3-4 inches deep, or the extent of the rootzone. Do not send smaller samples, or samples collected with a soil probe. Two plugs per sample is the preferred amount to send to the lab as it provides the best chance for successful identification. More than two is often unnecessary.

The sample should be taken from the outer margins of affected areas. One third to one half of the sample should contain healthy turfgrass and one half to two thirds of the sample should contain symptomatic turfgrass. Since most pathogen activity occurs along the margin of larger ring or patch symptoms, samples with both healthy and symptomatic turfgrass will aid diagnosis. Taking a sample too far in the middle of the patch will have the least amount of activity from the pathogen, and make proper diagnosis difficult.

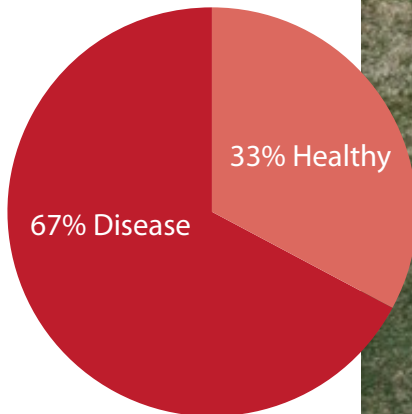


Photo courtesy of Lee Miller, Ph.D.

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## How do I package the sample?



Photo courtesy of Lee Miller, Ph.D.

Shake off any excess soil before packaging. Wrap the bottom of the sample (soil and roots) in aluminum foil to stabilize the rootzone, and pack tightly into the shipping box with newspaper or packing material. Leave the turfgrass foliage exposed. Make sure the samples are well packed and secure as shipping can be rough and break plugs apart. Be sure to include the sample submission form and pack it so it will not get wet or damaged.

**DO NOT** place turfgrass samples in plastic bags. **DO NOT** add wet paper towels or excess moisture to packages. This can lead to proliferation of non-pathogens and increase decay of the turfgrass samples during transit.

## How do I mail or deliver the samples?

Obtain samples the same day you plan to mail or deliver them to the diagnostic lab. Avoid exposing the samples to excess heat. For example, do not leave the samples in a closed vehicle on a hot day. If the sample is being mailed, collect and send the samples as early in the week as possible to avoid weekend delays in shipping and/or diagnosis. For best results and the most accurate diagnosis, ship the samples overnight. A next day service or delivering the sample in person is the best way to assure the samples arrive in good order.



Photo courtesy of Lee Miller, Ph.D.



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## How do I take quality photos of the problem?

Gather evidence of the problem by taking quality photos and emailing them to the diagnostician. Submission of digital photographs is highly recommended to aid in identification. In order to take a quality photo that will assist with diagnosis, take images that illustrate the overall damage

from standing height. In general, close-up images are not helpful unless you are clearly attempting to show a lesion, fruiting body, or other structure. A physical sample should enable the diagnostician to evaluate these characteristics.

Examples of quality sample photos taken from varying distances:

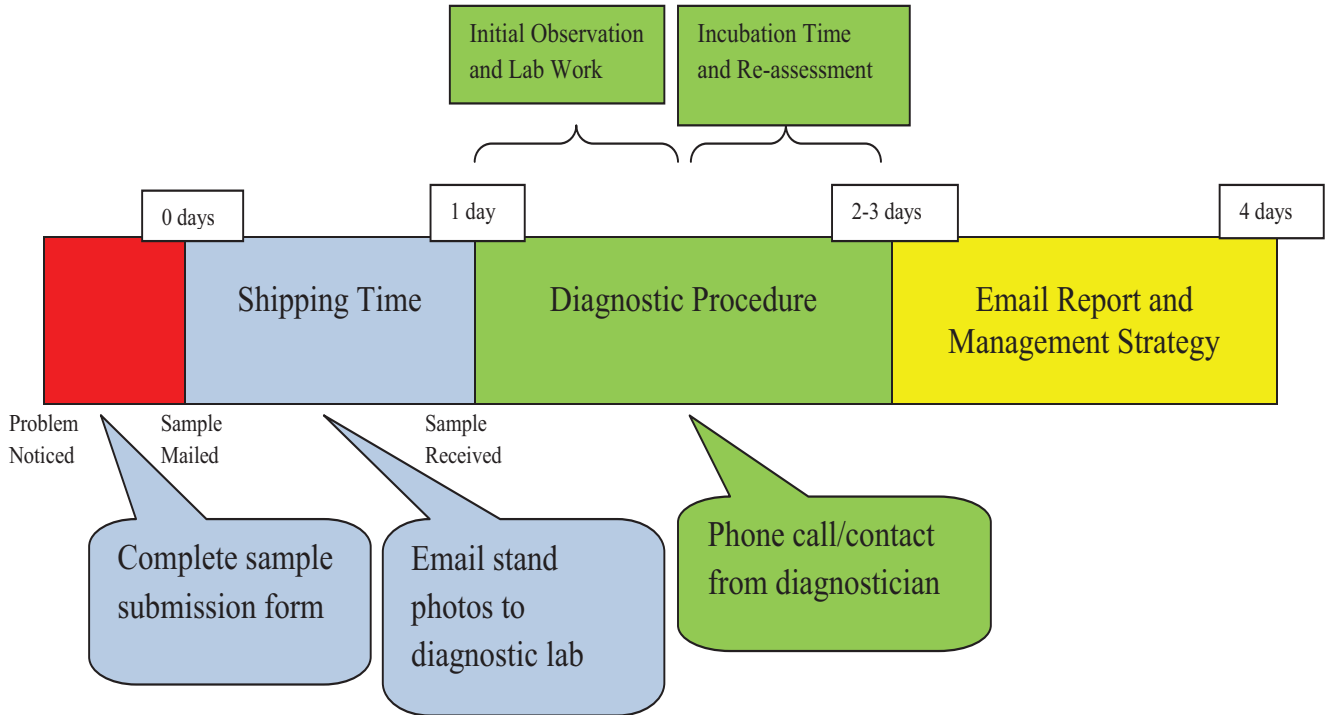


Photos courtesy of Lee Miller, Ph.D.

# Submitting a Sample for Turfgrass Problem Diagnosis

## Example Timeline for Problem Diagnosis

\*If received Monday-Thursday of business week.



Timeline courtesy of Lee Miller, Ph.D.

# Submitting a Sample for Turfgrass Problem Diagnosis

## Turfgrass Diagnostic Labs

This list is not comprehensive. Check with your local university to see if turfgrass diagnostic services are available.

### University of Connecticut

Diagnostic Center  
Phone: 877-486-6328  
<http://www.turf.uconn.edu/diagnosticcenter.shtml>

### University of Florida

The UF/IFAS Plant Diagnostic Center  
Phone: 352-392-1795  
<http://plantpath.ifas.ufl.edu/clinic/>

### Iowa State University

Plant and Insect Diagnostic Clinic  
Phone: 515-294-0581  
<http://www.ent.iastate.edu/pidc/>

### Kansas State University

Plant Disease Diagnostic Lab  
Phone: 785-532-5810  
<http://www.plantpath.ksu.edu/p.aspx?tabid=725>

### University of Maryland

Plant Diagnostic Laboratory  
<http://www.clfs.umd.edu/entm/pdiag/index.html>

### University of Massachusetts

UMass Extension Plant Diagnostic Lab  
Phone: 413-545-3208  
<http://ag.umass.edu/plant-problem-diagnostics/turf-disease-diagnostics-insect-diagnostics-nematode-assay>

### Michigan State University

Diagnostic Services  
<http://www.pestid.msu.edu/samplesubmission/samplinginstructions/tabid/59/default.aspx>

### University of Connecticut

Diagnostic Center  
Phone: 877-486-6328  
<http://www.turf.uconn.edu/diagnosticcenter.shtml>

### University of Missouri

Mizzou Turfgrass Pathology  
Phone: 573-882-5623  
<http://turfpath.missouri.edu/>

### North Carolina State University

Turf Diagnostics Lab  
Phone: 919-513-3878  
<http://www.turfpathology.org/Pages/diagnostics.aspx>

### Oklahoma State University

Turfgrass Diagnostic Laboratory  
<http://turf.okstate.edu/turfgrass-diagnostic-laboratory-1>

### Penn State University

Turfgrass Disease Clinic  
<http://plantpath.psu.edu/facilities/turfgrass-disease-clinic>

### Rutgers

Plant Diagnostic Laboratory  
<http://njaes.rutgers.edu/plantdiagnosticlab/>

### Virginia Tech

Plant Disease Clinic  
Phone: 540-231-6758  
<http://www.ppws.vt.edu/~clinic/>

### Washington State University

Plant and Insect Diagnostic Laboratory  
Phone: 253-445-4582  
<http://puyallup.wsu.edu/plantclinic/samples/td.html>

# Submitting a Sample for Turfgrass Problem Diagnosis

## Sample Submission Form

### Turfgrass Disease Identification Form



#### Turfgrass Disease Identification

23 Mumford Hall  
University of Missouri  
Columbia, Missouri 65211

Lab No. \_\_\_\_\_ **For Lab Use Only**

Condition on arrival

Excellent  Good  Fair  Poor

Check \$ \_\_\_\_\_ No. \_\_\_\_\_ Date \_\_\_\_\_

Cash \$ \_\_\_\_\_ Amount Due \$ \_\_\_\_\_

Contact us at: 573-882-5623 Fax 573-882-1467 E-mail: [turfpath@missouri.edu](mailto:turfpath@missouri.edu) <http://turfpath.missouri.edu/>

Mail reply to: <input type="checkbox"/> Submitter <input type="checkbox"/> Client Fax reply to: <input type="checkbox"/> Submitter <input type="checkbox"/> Client E-mail reply to: <input type="checkbox"/> Submitter <input type="checkbox"/> Client Bill to: <input type="checkbox"/> Submitter <input type="checkbox"/> Client	<b>Charges:</b> \$100/out-of-state \$50/in-state golf \$25/in-state commercial (lawn and landscape, sod production) \$15/in-state homeowner	<b>Make check payable to the University of Missouri</b> Please use a separate form for each sample
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Submitted By: _____	Submitted For (Client): _____
Business Name _____	Business Name _____
Address _____	Address _____
City/State/Zip _____	City/State/Zip _____
Phone (____) _____ Fax (____) _____	Phone (____) _____ Fax (____) _____
E-mail _____	E-mail _____

<b>Information about</b>	Submitter	Client	Submitter	Client	Submitter	Client
<b>Submitter/Client</b>	<input type="checkbox"/>	<input type="checkbox"/> Superintendent	<input type="checkbox"/>	<input type="checkbox"/> Dealer/Industry Rep	<input type="checkbox"/>	<input type="checkbox"/> Professional Lawn Care Company
	<input type="checkbox"/>	<input type="checkbox"/> Homeowner	<input type="checkbox"/>	<input type="checkbox"/> Landscaper	<input type="checkbox"/>	<input type="checkbox"/> Extension Educator

<b>Turfgrass Species</b> _____	<b>Date noticed</b> _____	<b>Symptoms developed in:</b>
<b>Cultivar</b> _____	<b>Date collected</b> _____	_____ Days _____ Weeks _____ Months
<b>County of origin</b> _____	<b>Date sent</b> _____	_____ Occurred in previous years

**Turfgrass:** When established \_\_\_\_\_  Sod  Seed  Plugs **Greens:** Age (when constructed) \_\_\_\_\_

<b>Location</b> <input type="checkbox"/> Putting green <input type="checkbox"/> Tees <input type="checkbox"/> Fairway <input type="checkbox"/> Surrounds <input type="checkbox"/> Athletic field <input type="checkbox"/> Sod Farm <input type="checkbox"/> Home lawn <input type="checkbox"/> Park/cemetery <input type="checkbox"/> Commercial property	<b>Soil pH</b> _____  <b>Soil Drainage</b> <input type="checkbox"/> Good <input type="checkbox"/> Poor	<b>Pesticides/Management Inputs within last 30 days (rates and date)</b> Fertilizer _____ Growth regulators _____ Herbicides _____ Fungicides _____ Insecticides _____ Aerification _____
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Please describe the problem. Include symptom (i.e. rings, patches, spots, etc), pattern (i.e. clustered, random, in lines), and plant parts affected. Email photos to [turfpath@missouri.edu](mailto:turfpath@missouri.edu).

<b>Diagnosis</b>	<b>Lab use only</b>
_____	_____
Diagnostician	

Resources:  
 Dr. Lee Miller – University of Missouri  
 David McCall – Virginia Tech  
 STMA Information Outreach Committee  
 NCSU - <http://www.turfpathology.org/Pages/diagnostics.aspx>