

PDC

Not Just A Catchy Acronym

by

Brett Arenz, Director Plant Disease Clinic

Greetings esteemed readers! Please allow me to introduce myself, my name is Brett Arenz and I am the new director of the Plant Disease Clinic at the University of Minnesota. Although I was born in the homeland of golf, Scotland, I spent most of my life growing up near Bemidji, Minnesota. I have much respect for those with the skill and dedication to succeed in this sport, but must confess to being bestowed with neither. Indeed, the most time I've spent lately on a golf course is in the winter on skis.

However there is something I'll wager we do have in common: a mutual interest in plant diseases and more importantly, a desire for their effects to be minimized. For any effective and efficient management strategy to be developed and implemented, the first priority must be placed on accurate disease diagnosis. To that end, I feel that the PDC provides an essential component to the long term goal of healthy and

beautiful fairways and greens. With this in mind, I am excited to announce that the PDC will be partnering with Dr. Angela Orshinsky, a new faculty member in the Department of Plant Pathology, in diagnosis of turfgrass samples. To take advantage of her expertise, simply submit your turfgrass sample to the PDC.

At the risk of stating the obvious, it should also be acknowledged that a golf course for which the only plants are grass species would be exceedingly monotonous. High value shade trees, shrubs, flowers and other ornamentals all contribute to an enjoyable day out on the links and make your course memorable to patrons. Don't be resigned to suffer the effects of chronic plant diseases that deplete your time and budget. Accurate diagnosis can allow you to develop a management plan that reduces sleepless nights (perhaps having a 9 month old child is causing me to project here).

The PDC at the University of Minnesota accepts all types of plant samples and utilizes both traditional and cutting-edge molecular techniques in disease diagnosis. In some cases, the combination of signs (visible evidence of the pathogen) and symptoms (damage to the plant) are enough to make a conclusive diagnosis. In other

cases, diseased tissue needs to be isolated on growth media that allow causative pathogens to sporulate and be subsequently identified.

However, there are many other pathogens that require additional steps to arrive at reliable diagnosis.

Bacterial pathogens lack discernible morphological characteristics that can be used to easily separate them from one another. In many of these cases, specialized types of growth media and other chemical tests must be used to distinguish individual species. For example, many bacterial pathogens in the genus *Pseudomonas*

will produce a pigment that fluoresces under ultraviolet light when grown on a particular type of media.

Some pathogens, such as viruses and phytoplasmas, do not grow at all in artificial growth media and more advanced techniques must be used to identify them. In some of the cases, serological tests that work much

like over-the-counter pregnancy tests are available that specifically target antigens of these organisms. Otherwise the DNA itself can be used as a basis for identification and, as sequencing technologies have

dramatically improved in the last two decades, so too has our capacity to accurately diagnose a wider range of pathogens.

When submitting plant disease samples to the clinic, please bear in mind that the accuracy of diagnosis can be very dependent on the quality of samples received.



PDC director, Brett Arenz, analyzing a leaf sample for signs and symptoms.

First, it is almost impossible to diagnose plants that are completely dead as decomposer microorganisms have likely begun to take over the plant material.

Second, if possible, it is always best to submit multiple plants or parts of plants representing different stages of the disease to show the full range of symptoms.

Third, in many cases, above-ground symptoms are caused by pathogens affecting the roots of the plant, but this can't be discovered unless the roots (along with some soil) are also submitted with the rest of the plant. If possible, it is always best to submit the whole plant. Obviously this is not feasible with many tree diseases. In

suspected cases of Dutch Elm Disease or Oak Wilt, symptomatic branches with a diameter of at least 1/2 inch should be submitted.

For instructions on how to submit turfgrass samples, you can refer to Angela Orshinsky's article on

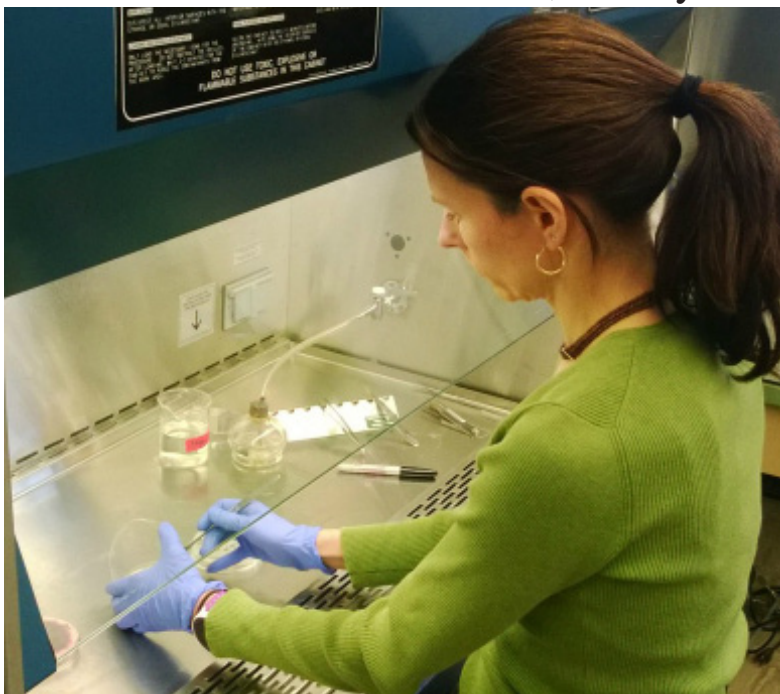
turf grass diagnostics in this issue. You are always welcome to personally drop off samples at the Plant Disease Clinic and our lab is easily accessible on the 1st floor of Stakman Hall just off Gortner Avenue on the Saint Paul Campus of the University of Minnesota.

We also welcome samples sent by mail, but bear in mind that samples can deteriorate significantly if left in the mail system for too long. Avoid sending samples at the end of the week, as they will not be delivered

until Monday. When sending samples by mail it is best to use cardboard boxes and to cushion or wrap above ground tissues in newspaper. Only root tissue should be wrapped in plastic to prevent them from drying out. Wrapping the

whole plant in plastic will cause the sample to decompose rapidly due to high humidity and saprophytic fungi.

Finally, it is important to provide as much background information as possible about the potential disease when submitting a sample. How



Jennifer Flynn, transfers a culture in a laminar flow hood to avoid contamination

long and how many plants have been affected? Are nearby plants of different species affected in a similar way? What types of pesticides and fertilizers have been used recently? All of this information will be considered by the diagnostician and will contribute to the accuracy of the final diagnosis.

For more complete information on available tests, how to submit samples, and the most current rates for service, please visit our website at pdc.umn.edu or feel free to contact us by phone or email. Thank you for your time and we look forward to helping you with your plant health problems!

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