

2007 Delaware Plant Diagnostic Clinic Report
UD Cooperative Extension
Department of Plant and Soil Sciences
University of Delaware

Nancy F. Gregory, Plant Diagnostician
Bob Mulrooney, Extension Plant Pathologist

The Plant Diagnostic Clinic at the University of Delaware is housed in the Department of Plant and Soil Sciences, and is located in Townsend Hall, Room 151. The clinic serves the public through Delaware Cooperative Extension and the Master Gardener program, serving commercial growers, nurserymen, gardens, and private homeowners. Some clients are also served directly by the clinic. The clinic is the National Plant Diagnostic Network (NPDN) laboratory for Delaware. The lab is also the plant pathology laboratory for USDA/APHIS CAPS diagnostics and the ipmPIPE lab for Delaware. The clinic operates with two staff, the Plant Diagnostician, the Extension Plant Pathologist, and some part-time student help.

During 2007, the Plant Diagnostic Clinic processed over 650 samples. Those sample numbers include some survey samples for Asian soybean rust and potato cyst nematode. There were 408 routine clinic samples processed. Some samples were diagnosed in field situations, and not brought in for analysis. Phone responses and email requests for information concerning plant problems numbered around 45, in addition to physical specimens submitted to the lab. Soil samples for nematode assays were also processed in the lab, but are not included here. A late freeze in April (following drought in the fall of 2006) and wet spring weather stressed some plants and opened avenues for some pathogens early in the season. Dry weather late in the season exacerbated plant stress, and favored pathogens on many hosts.

Of the 408 routine samples received, the sources were as follows:

Extension*	391	95.8%
Delaware Department of Ag	7	1.7%
University	10	2.5%

*Extension category included all commercial, homeowner, and public garden samples

There were many different diagnoses, from six different crop areas. The crop sources for those were:

Field crops	41	10%
Fruit	19	5%
Ornamentals	262	64%
Turf	22	5%
Vegetables	51	13%
Other*	13	3%

*Other includes greenhouse, home/office, marsh grass, insect, fungus, plant/weed ID

Of the varied diagnoses, pest and pathogen incidence was approximately as follows:

Fungal Diseases	164
Bacterial Diseases	21
Viral Diseases	15
Nematodes	10
Environmental/Physiological	126
Insect (Damage and ID's)	64
Plant/Weed ID	15
Fungal ID	5

Percentages were not determined due to many specimens having more than one diagnosis. For example, insect damage and fungal dieback were common on physiologically stressed trees.

New reports for the year 2007 include Chrysanthemum white rust caused by *Puccinia horiana* on container stock in September. Downy mildew was seen for the first time on *Buddleia* caused by *Peronospora harioti*, as well as a leaf spot on sunflower caused by *Septoria helianthi*, and an *Alternaria* leaf spot on collards. The urediniospore and teliospore stage of a *Puccinia* was found on marsh grass (*Spartina patens*). This observation may have been the teliospore stage representing the alternate host for ash rust. A ringspot symptom was observed on ash leaves in July, and presumed to be tobacco ringspot virus, but could not be confirmed by ELISA. *Phomopsis* was found causing a zonate lesion on pepper fruit, similar to that on eggplant. Foliar nematodes were found on interrupted fern (*Osmunda claytoniana*), *Scutellaria*, *Tiarella*, *Trillium* and *Actaea*. Bacterial leaf scorch was confirmed on southern red oak (*Q. falcata*) in the Tabor State Forest. In November, green house micro-green kohlrabi seedlings were diagnosed with downy mildew (*Hyaloperonospora*) and red amaranth seedlings were diagnosed with *Pythium* root rot.

Asian soybean rust was not found in Delaware on any host. Bean pod mottle virus (BPMV) was confirmed on soybean as a part of the national ipmPIPE legume virus survey. This is a **new report** for this virus in Delaware. Foliage diseases on soybean such as brown spot (*Septoria*), downy mildew, and frog-eye leafspot caused by *Cercospora sojina* were common, but severity was low. Mite damage was extremely high in mid-season as weather became hot and dry. In August, *Alternaria* leaf spot, *Phyllosticta* (*phaseolina*?) leaf spot and other fungal leaf spots were seen on soybean in conjunction with drought stress and nutritional problems.

Only one sample of ash anthracnose caused by *Puccinia sparganioides* was brought into the clinic, following the large outbreak in 2006. Salt marsh grass (*Spartina*) was examined for the telial stage of ash rust, with one find in a Lewes, DE private yard. A number of samples of

Spartina were submitted by DE Natural Resources personnel investigating dieback in Delaware coastal zones, but very little was found except some *Pythium*.

Weather conditions in the spring of 2007 were favorable for seedling diseases in row crops and vegetables, with unusually wet conditions promoting bacterial infections. In June, irrigation of corn from pond water led to severe bacterial stalk rot caused by *Pectobacterium* (*Erwinia*) on young corn plants 1 to 2 foot in height. Stalk rots were common on corn late in the season, and *Colletotrichum* was found associated with the lower nodes of lodged stalks. Fungal leaf spots on corn were at a low level. Wheat leaf rust (*P. recondita*), virus (wheat spindle streak), and *Septoria tritici* were seen in April and May along with barley rust, powdery mildew and spot blotch. In June, *Pythium* root and stem rot was found on peppers and squash, as well as *Verticillium* wilt of okra. In July, bacterial stem and root rot was diagnosed on sweet potato, pith necrosis on tomato, followed by *Cercospora* leaf spot on spinach and basil in September and scurf on sweet potato in October. Downy mildew on cucurbits appeared in early August but was not as severe as in past seasons.

Notable diseases on ornamentals included evergreens with tip dieback following winter injury. This was often difficult to accurately diagnose, but *Phomopsis*, *Pestalotiopsis*, *Kabatina* and *Seiridium* were among the pathogens found. Rhabdocline was seen on Douglas fir in May, when bacterial blight was diagnosed on lilac, and fire blight became prevalent on pear. From a public garden pest walk, *Alternaria* leaf spot on *Petasites*, *Mycosphaerella* leaf spot on *Leucothoe*, and *Coniothyrium* leaf spot on yucca were all confirmed. *Cylindrocladium* root rot was found on blueberry, as well as *Xanthomonas campestris* causing a leaf spot on oakleaf hydrangea. Later in the season, *Cercospora* leaf spot was found on hydrangeas (including oakleaf), as well as black spot on elm, *Puccinia* on hibiscus and hollyhock, *Coleosporium* rust on goldenrod and bluestar (*Amsonia*), CMV on cardinal flower (*Lobelia*), *Phytophthora* root rot on *Heuchera* and *Leucothoe*, and *Verticillium* wilt of smoke tree (*Cotinus*).

The survey for bacterial leaf scorch (BLS) was continued in 2007 in cooperation with the Delaware Forest Service, and concentrated on state forest lands. The survey revealed that *Xylella fastidiosa* is widespread throughout forest sites in Delaware. Over 20 samples were tested in the Clinic lab by ELISA and all symptomatic samples were positive. Urban species most commonly affected were northern red oak and pin oak. Rural and forest species most commonly affected include northern red oak, black oak, and scarlet oak. Southern red oak was confirmed with *Xylella* for a **new report** in 2007. Willow oak did not appear to be susceptible.

The fifth year survey for rose rosette disease (RRD) indicated the disease to be widespread throughout Delaware on multiflora rose. The find near Milford in Sussex County that marked the southernmost incidence of RRD continues to spread slowly. The 2007 survey concentrated on cultivated plantings of *Rosa* in city street islands and home gardens. RRD was not found in any of the cultivated rose inspected. The disease limits the multiflora host, but doesn't eradicate it, due to the vigorous sprouting of new shoots and new seedlings. RRD may provide some biological control in areas where physical control and herbicides are used.

The UD Plant Diagnostic Clinic gratefully acknowledges the following University of Delaware colleagues who assisted with diagnoses and identifications as Advisory Consultants for samples in 2007:

Brian Kunkel, Tom Pizzolato, Joanne Whalen, John Frett, and Caroline Golt