

The Plant Disease Clinic and Weed Identification Lab Annual Report 2010



**Department of Plant Pathology, Physiology, and Weed Science
Virginia Polytechnic Institute and State University
Blacksburg, Virginia**

**The Plant Disease Clinic
2010 Annual Report**

Table of Contents

Acknowledgements	2
Introduction	3
Some Highlights from 2010.....	4
Plant Disease Clinic Summaries	
Monthly Submission Report	9
Crop Category Report	10
Diagnostic Category Report	11
Samples by Diagnostic Category	12
Plant Pathogens, Other Assistance	12
Other Agents.....	12
Distribution of Samples by County	13
Summary of Diagnoses by Plant	
Field Crops	14
Herbaceous Ornamentals and Indoor Plants	16
Small Fruits	23
Tree Fruits and Nuts	26
Trees	29
Turf	38
Vegetables and Herbs	40
Woody Ornamentals	47
Nonplant Material	55
Summary of Plant and Fungal Identifications	56

Acknowledgements

The Plant Disease Clinic depends on a industrious staff of both full-time and part-time employees to prepare culture media, isolate pathogens from plant tissue, measure soil pH, extract nematodes from plant tissue, maintain records, answer the telephone, keep track of samples, and send out reports. In 2010, diagnoses in the Plant Disease Clinic in Blacksburg were performed by Mary Ann Hansen and Elizabeth Bush, with valuable assistance from Charlotte Oliver.

Plant Clinic staff consult with many faculty and staff in various departments in order to make complete, accurate diagnoses and recommendations. We would like to thank the following people for their helpful assistance during the past year:

Plant Pathology, Physiology, and Weed Science

Dr. Shawn Askew
Dr. Anton Baudoin
Dr. Jeff Derr
Dr. Jon Eisenback
Dr. Gary Griffin
Dr. Scott Hagood
Mr. Lloyd Hipkins
Dr. Chuan Hong
Dr. Charles Johnson
Mr. David McCall
Dr. Pat Phipps
Ms. Angela Post
Ms. Diane Reaver
Dr. Steven Rideout
Dr. Curt Roane
Dr. Jay Stipes
Dr. Erik Stromberg
Dr. Sue Tolin
Dr. Keith Yoder
Mr. Dawen Xie

Entomology

Mr. Eric Day
Dr. Doug Pfeiffer
Dr. Rod Youngman

Horticulture

Dr. Roger Harris
Dr. Joyce Latimer
Dr. Ron Morse
Dr. Alex Niemiera
Dr. Mizuho Nita
Dr. Holly Scoggins
Dr. Richard Veilleux
Dr. Greg Welbaum
Dr. Jerry Williams
Dr. Tony Wolf

Crop, Soil, and Environmental Sciences

Dr. Erik Ervin
Dr. John Fike
Dr. Michael Goatley
Mr. Steve Heckendorn
Ms. Pat Hipkins

Biology

Mr. Tom Wieboldt

Fisheries and Wildlife

Dr. Jim Parkhurst

Alumni

Dr. Rebecca Abler

The Weed Identification Clinic is operated by Dr. Scott Hagood with the assistance of Ms. Angela Post and Mr. Lloyd Hipkins. Mr. Tom Wieboldt, curator of the Herbarium in the Biology Department, performs many of the plant and weed identifications.

We would also like to thank Mr. Todd Powell of TSP Software for designing and continuing to support the Plant Clinic database ("PClinic"). The database has given us the ability to keep complete records of Plant Clinic samples and to mail reports to Extension Offices electronically. Information on purchasing PClinic can be obtained from the Clinic at <clinic@vt.edu>. We are also especially grateful to Mr. Dawen Xie for IT support during the year.

Charlotte Oliver painstakingly compiled the annual report. The annual report can be viewed on-line at <<http://oak.ppws.vt.edu/~clinic/>>.

Introduction

The annual report for the Plant Disease Clinic and the Weed Identification Clinic located on the Virginia Tech campus in Blacksburg is presented in the following pages. Plant specimens that were submitted to and diagnosed at the Agricultural Research and Extension Centers throughout the Commonwealth are not included in this report. Note that the number of diagnoses performed was higher than the number of samples received because some samples are diagnosed with more than one problem.

For pathogens that could be identified to species or for which only one species is known to occur on the host plant in question, the species name is listed. For those diseases in which one of several species could have been involved, the epithet is listed as "sp." The Plant Disease Clinic does not routinely identify pathogens to species because species identification can sometimes be a very time-consuming process and often has little bearing on control recommendations. Most pathogens were assumed to be disease incitants if they were cultured in high numbers from the plant tissue, if they were reported in the literature to be pathogens of the particular host plant, and if they were reported to cause the observed symptoms.

Viral problems were, for the most part, either diagnosed by an antibody test involving "immunostrips" or they were sent to a private lab for antibody testing at a cost to the grower. In some cases, identification of the specific virus was not desired by the client. In those cases, if symptoms indicated a virus infection, the diagnosis is listed simply as "virus".

Soil samples for nematode assays were forwarded to the Nematode Assay Laboratory. Nematode diseases were diagnosed by extracting nematodes from soil or plant tissue. Samples must include at least 1 pint of soil for nematode assays. Nematode assays were routinely performed on samples of plant species known to be affected by nematodes, e. g. boxwood. Nematode populations in the sample were compared to damage threshold levels for making a control recommendation. Threshold levels have been developed in research trials for many, but not all, crops grown in Virginia.

The phrase "Cause of Problem Unknown" is used for plant samples from which no pathogen could be isolated and for which no obvious environmental or cultural condition could be associated with the problem. Trees have more samples in this category and in the category "Insufficient Sample" than any other type of plant. Tree problems are more difficult to diagnose in a clinic setting than problems of annual plants for several reasons. First, tree problems often develop over the course of several years and current symptoms may be related to stressful conditions that occurred in previous years. Also, it is difficult for growers to supply an appropriate plant specimen for diagnosis since the causes of many tree diseases are in the trunk or roots.

Some insect problems are also listed in this report. Insect damage is often mistaken for disease, and samples with insect damage are sometimes submitted to the Plant Disease Clinic rather than the Insect Identification Lab. We make a preliminary diagnosis of insect damage on these samples and refer them to Mr. Eric Day in the Insect Identification Lab. The final diagnosis on all samples of insect damage is performed by Mr. Day. Samples with known insect problems should be sent directly to the Insect ID Lab with the appropriate form.

We occasionally receive digital images or email messages regarding plant problems. For the most part, it is difficult to diagnose diseases without a plant sample; however, diseases that cause unique symptoms can sometimes be diagnosed from an image or a description. Images are most useful when submitted in addition to a plant sample. Total numbers of email and digital image inquiries are listed on p.12.

Reports are mailed electronically to the local Extension Office from which the sample originated. Upon request, we will simultaneously send electronic reports to one or more individual Extension personnel. Since implementing electronic mailing, we have discontinued faxing or mailing hard copies of reports. Relevant fact sheets for some diseases are available on the Web at <http://pubs.ext.vt.edu/category/plant-diseases.html>. Images of plant diseases can be found on the Plant Problem Image Gallery (<http://ppwsidlab.contentsrvr.net/plant.vesh>).

DISEASE HIGHLIGHTS 2010

The 2010 growing season began with drought, which extended through much of the summer in most parts of Virginia. Heavy rains came to some areas in late summer. Sample numbers were down from 2009, likely due to the drought, but possibly also influenced by the retirement of many VCE agents, who responded to the Commonwealth's offer of early retirement. A total of 1243 samples were received by the Plant Disease Clinic in 2010.

Field Crops

Disease highlights in field crops:

- Bean pod mottle virus
- Charcoal rot of soybean (*Macrophomina phaseoli*)
- Frogeye leaf spot of tobacco (*Cercospora nicotianae*)
- Ascochyta leaf spot of small grains (*Ascochyta* sp.)

Bean Pod Mottle Virus (BPMV) is vectored by the bean leaf beetle and harbored by certain weeds. BPMV results in reduction of yield and seed quality. Seeds from diseased plants may be streaked and mottled on the hilum. Seed transmission of this disease is low (<1 of 1000 seeds). The main control is to time planting to avoid peak beetle populations. In Virginia this virus appears to be mainly located on the Eastern Shore and no farther west than Appomattox.

Charcoal rot was a problem in drought-stressed soybeans. This disease was also a problem in soybeans in 2008 when drought was also prevalent.

Frogeye leaf spot of tobacco was diagnosed on Burley tobacco late in the season. Leaves developed spotting and yellowing within one week after topping, and five days later, plants were 2/3 defoliated. This disease is common in tobacco. Mature leaves are more susceptible than young leaves; thus, presence of frogeye has long been considered an indicator that leaves are mature when harvested. However, severe infections can lead to extensive losses. Frogeye can be controlled with Quadris fungicide applied at lay-by and again 14 days later.

Ascochyta leaf spot, a fungal disease that occurs early in the season, was diagnosed in both barley and wheat. This pathogen is harbored on plant debris. Development of leaf spotting, yellowing and necrosis of lower leaves is favored by high humidity, dense plant canopy, and leaves in contact with soil.

Fruit Crops

Fruit crop disease highlights:

- Downy mildew of blackberry (*Peronospora sparsa*)
- Leaf rust (*Pucciniastrum americanum*)
- Raspberry leaf spot (*Cylindrosporium rubi*)
- Tomato Ringspot Virus
- Macrophoma rot of grape (*Macrophoma* sp.)
- Ripe rot of grape (*Colletotrichum gloeosporioides*)
- Bitter rot of grape (*Greeneria uvicola*)
- Pierce's disease of grape (*Xylella fastidiosa*)
- Fire blight on apple and pear (*Erwinia amylovora*)
- Popcorn disease of mulberry (*Ciboria carunculoides*)

An unusual find in small fruits was downy mildew of blackberry cultivar 'Black Satin', caused by the oomycete, *Peronospora sparsa*. Although the disease is commonly found in Mexico, it is not common in the United States. The disease can be systemic in the plant, and in such cases causes stunting, in addition to the angular leaf spots that are typical for downy mildews. The disease on the plant we received did not appear to be systemic in the plants. The most likely explanation for the occurrence of this disease in Virginia was that it came in on propagation material received from Florida.



Downy mildew of blackberry; sporangia pictured on right

Diseases detected on raspberry included late leaf rust, raspberry leaf spot, and Tomato Ringspot Virus. Late leaf rust has become a more serious problem on red and purple raspberry cultivars in recent years. The fungal pathogen may colonize leaves, flowers, petioles, canes and fruit of red and purple raspberries, but the disease is not systemic. When the disease is severe, defoliation can make the canes more susceptible to winter injury and/or make fruit unmarketable. The alternate host for this pathogen is white spruce, but presence of the alternate host does not appear to be necessary for disease development, since the disease has been observed to occur annually in areas devoid of white spruce. Frequent rain showers, overhead irrigation and high humidity favor disease development. Cultural practices that promote foliar drying and sunlight penetration (i.e. thinning canes, narrow rows, weed control) are recommended to make conditions less favorable for this and other raspberry leaf diseases.

Tomato Ringspot Virus is the most widespread of the nematode-transmitted viruses in brambles. In red raspberry, damage can range from none in some cultivars to production of crumbly fruit and death of plants in other cultivars. The virus has a wide host range and can be present in many symptomless weed species, such as dandelion and chickweed. It is transmitted by the dagger nematode, *Xiphinema*. Dagger nematodes move slowly through the soil in films of moisture and tend to infect plants in a roughly circular pattern from the initial site of infection. Controls include preplant soil testing for dagger nematodes and fumigation with a registered nematicide if dagger nematodes are found, controlling weeds, and roguing infected raspberry plants and an additional 5 symptomless plants in each direction beyond the symptomatic plants to eliminate latent infections.

Due to rainy weather during ripening, several different berry rot diseases, including *Macrophoma* rot, ripe rot, and bitter rot, were prevalent in grapes. Several of these fruit rot pathogens can overwinter on the pedicels (fruit stems) or on shriveled fruit (mummies) on the ground or on the plants. Dark-skinned grapes are more resistant to ripe rot than white grapes. Late season rots are difficult to control. Cultural practices for mitigating the problem include: canopy management to promote leaf and fruit drying, removing plant debris at the end of the season, pruning out any mummies or pedicels clinging to the vines to avoid overwintering inoculum, and avoiding overwatering late in the season. Application of protectant fungicides at bloom and post-bloom can also help avoid late-season rots.

Pierce's disease, caused by the xylem-limited bacterium *Xylella fastidiosa*, was also diagnosed in grapes. (See also bacterial scorch of oak below.) This bacterium colonizes the xylem or water-conducting vessels of the vine, eventually clogging the xylem. It is transmitted by leafhoppers. Symptoms of this disease vary with the season and variety, but may include stunting, delayed bud break, leaf scorch, wilting, uneven maturation of shoots, premature color development on berries, and decline of the roots and vine. Vines that are stressed (e.g. drought-stressed) show the most severe symptoms. Control of leafhoppers is generally not effective since these insects have a broad host range. Mildly affected vines may recover in locations where freezing temperatures occur.

The bacterial disease, fire blight, was prevalent on apple and pear fruit trees, as well as on ornamental crabapples and pears in 2010.

The unusual "popcorn disease" was diagnosed on mulberry. The fungal pathogen, *Ciboria carunculoides*, infects the fruit and prevents normal ripening. Individual carpels of the fruit develop into sclerotia, which are survival structures of the fungus. The enlarged, light colored sclerotia give the mulberry fruit the appearance of popcorn. The fungus overwinters as sclerotia, so harvesting, removing, and/or burying infected fruit help reduce fungal inoculum for the following season.

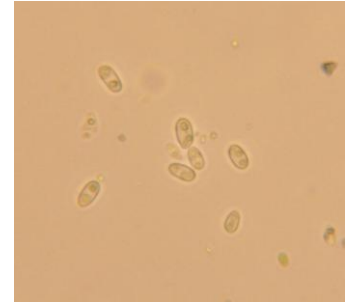
Herbaceous Ornamentals

Highlighted diseases of herbaceous ornamentals:

- Phomopsis blight on amaranth (*Phomopsis amaranthicola*)
- Cercospora leaf spot of bells-of-Ireland (*Cercospora* sp.)
- Charcoal rot of lavender (*Macrophomina* sp.)
- Phytophthora blight and root rot of various herbaceous and woody species (*Phytophthora nicotianae*, *P. cinnamomi*)



Phomopsis blight on stems of amaranth



Spores of Phomopsis amaranthicola

Although several species of amaranth are considered weeds (e.g. pigweed, Palmer amaranth), many other species have uses as food or ornamentals. A sample of *Amaranthus tricolor* with severe dieback from an ornamental planting on the Virginia Tech campus was diagnosed with the disease, Phomopsis blight. The pathogen is an unusual species of Phomopsis that was first reported on amaranth in Florida in 2000. The fungus infects both stems and leaves, and causes girdling stem lesions that can cause plants to fall over. We could find very little information on control of this disease on amaranth, except for the fact that the pathogen has been recommended as a biocontrol agent for weedy amaranth species.

Several other diagnoses that were new to our lab included Cercospora leaf spot of bells-of-Ireland and charcoal rot of lavender. We suspect that the severe leaf spotting on bells-of-Ireland was a result of high humidity in the tunnel where plants were grown. Drought stress likely predisposed the lavender to charcoal rot, a root disease that is common in other plant species following drought.

Phytophthora species, which are common causes of root rot and, in some cases, foliar blighting in Virginia, were detected in the following ornamental plant species in 2010: chelone, hellebore, larkspur, Madagascar periwinkle, pansy, petunia, blueberry, fir, sage, boxwood, holly and rhododendron.

Trees

Common tree problems in 2010:

- Bacterial scorch of oak (*Xylella fastidiosa*)
- Black flagging on arborvitae (abiotic)



Marginal scorch with yellow halo caused by Xylella fastidiosa on oak

Bacterial scorch was widespread in oaks in 2010. Our lab has diagnosed many more tree samples with this disease in the past decade than in previous years. The pathogen is spread by leafhoppers and has a wide host range, including many tree species and grapes. No practical control methods are available and trees may die from the disease. Several mature oak trees that died from this disease have been removed from the Virginia Tech campus.

“Black flagging” or blackening of foliage of arborvitae was prevalent in 2010. This phenomenon has been observed in many states, but a specific cause has not been identified. Sometimes the fungus Pestalotiopsis is found on affected foliage; however, this fungus is not always present and, because it is a common secondary invader of stressed plant tissue, it is not likely to be the sole cause of the problem. The cause of black flagging is not known, but abiotic problems, such as water stress, drying winds, high temperatures, or injury to the roots or lower stem, are possible causes. Plants with black flagging are not permanently injured and the condition does not always recur on an individual plant.

Turf

We confirmed the disease, Pythium root dysfunction, on several golf course bentgrass samples in 2010. The oomycete, *Pythium volutum*, usually attacks roots at cooler temperatures, but foliar symptoms do not appear until later in the summer during periods of heat or drought stress. Cultural management practices have a major impact on the development and severity of the disease. Regular hollow-tine aerification and topdressing are important for managing this disease. The fungicide, Insignia, can also be used for curative control.

Vegetables

Vegetable disease highlights:

- Leaf curl of celery (*Colletotrichum acutatum*)
- Yeast soft rot of onion (*Kluyveromyces marxianus*)
- Fusarium basal plate rot on onion (*Fusarium* sp.)
- White rot of garlic (*Sclerotium cepivorum*)
- Silver scurf of potato (*Helminthosporium solanum*)
- Late blight of tomato (*Phytophthora infestans*)
- Chemical injury from residues of growth regulator herbicides

Vegetable diseases diagnosed in 2010 that were previously unreported in Virginia include leaf curl of celery and yeast soft rot of onion. Symptoms of leaf distortion in celery, caused by the fungus, *Colletotrichum acutatum*, are easily confused with those of a virus or phytoplasma disease. It was only after samples tested negative for virus and phytoplasma that we realized the symptoms might be caused by a fungus. Isolations from cracks on the petioles confirmed presence of this fungal pathogen, previously



unreported in the United States. Coincidentally, Steve Rideout, VCE Vegetable Pathologist, reported that the same disease had been found in the same cultivar of celery ('Tango') in Pennsylvania in 2010, raising the question of whether the pathogen was seed-borne. Further research with this pathogen is being conducted in Florida.

Symptoms of leaf curl, caused by Colletotrichum acutatum, on celery

Soft rot diseases are typically caused by bacteria, so we were surprised to recover a yeast when culturing from a soft rotted onion sample. Symptoms of the yeast disease are very similar to bacterial soft rot. Diseased bulbs are usually evident after harvest, but infection can occur either before or after harvest. Little is known about how the pathogen is transported from plant to plant, but infection probably occurs through wounds and openings in the neck tissues. The main control recommendation is to prevent bruising of bulbs during harvest, handling and storage, and to store onions at cool temperatures.

Both onion and garlic bulbs may be infected by the *Fusarium* basal plate rot pathogen at any time during their growth in the field. Leaves turn yellow and necrotic beginning at tips and progressing downward and plants may wilt. Infected bulb tissues appear brown and watery. Bulbs may appear to have no decay at harvest but subsequently rot in storage. Storing bulbs at 4°C helps to minimize losses.



Bulb rot caused by Sclerotium cepivorum on garlic

We received several garlic samples with white rot, caused by the fungus *Sclerotium cepivorum*, which produces overwintering structures, called sclerotia, that can survive in the soil for many years. When infestations are low, affected plants and the soil around them can be removed and/or burned and the field carefully monitored for new infections. A 4- to 5-year rotation to non-allium crops is recommended, as sclerotia are very long-lived. Hot water seed treatment can help avoid introducing the disease to a field.

Silver scurf, caused by the fungus *Helminthosporium solanum*, was diagnosed on organically grown potatoes. The disease is transmitted on seed potatoes. The fungal pathogen can survive on plant debris and in the soil and it can be washed onto newly forming tubers from the infected seed potato. It can also overwinter in the soil and infect subsequent crops if rotation is not practiced. Disease is more severe when harvest is delayed and the disease can continue to develop in storage. Low storage temperatures and adequate ventilation are important to prevent further disease development in storage.

Only one case of late blight of tomato was received in 2010, as compared to the many samples received during the late blight outbreak in 2009.

Chemical injury from residues of growth regulator herbicides in straw mulch and manure was common on tomatoes and other garden vegetables again in 2010. Some of the newer growth regulator herbicides have a longer residual and can remain in compost, mulch or manure for over a year, causing damage to broadleaf plants when applied in gardens.

Woody Ornamentals

Two uncommon diseases of woody ornamentals diagnosed in 2010:

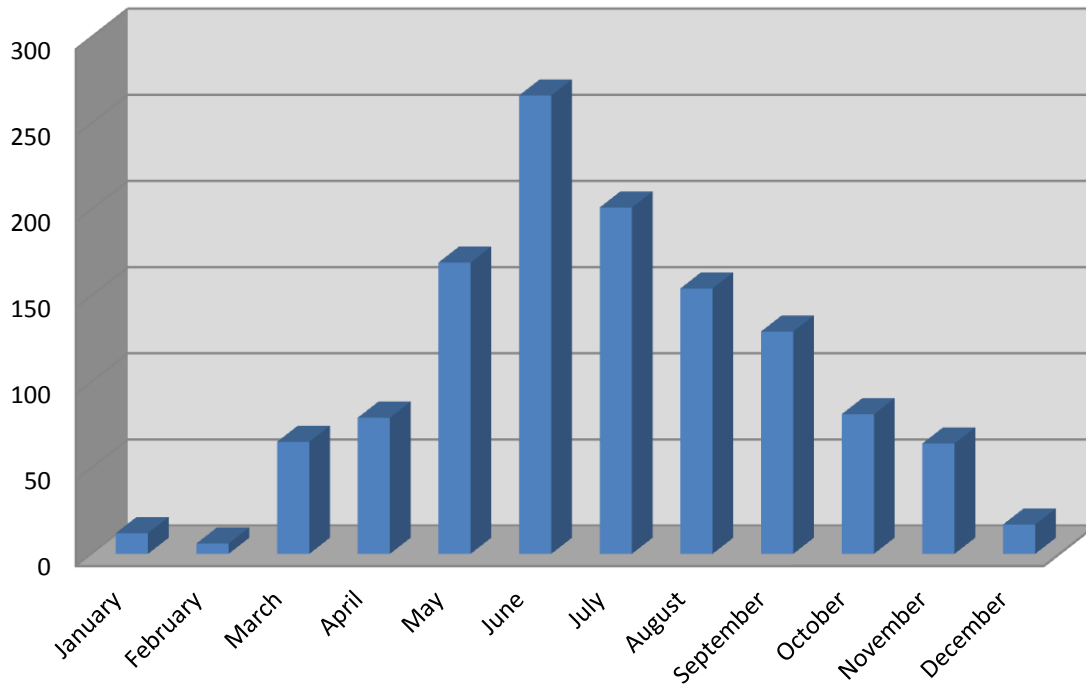
- *Cylindrocladium* stem canker of leucothoe (*Cylindrocladium* sp.)
- *Guignardia* leaf spot of Pieris (*Guignardia* sp.)

Cylindrocladium disease development is favored by high humidity, warm temperatures (75°F-80°F), overhead irrigation and overfertilization. Avoid this disease by using disease-free transplants. The pathogen is readily spread during propagation and in propagation beds. Use clean potting mix and pots. Remove fallen leaves and stems from the production area to reduce inoculum available for future infections. Fungicides are also available for preventative use for *Cylindrocladium* stem canker, as well as for *Guignardia* leaf spot of Pieris.

Monthly Submission Summary

Month	# Samples
January	12
February	6
March	65
April	79
May	169
June	266
July	201
August	154
September	129
October	81
November	64
December	17
Grand Total	1,243

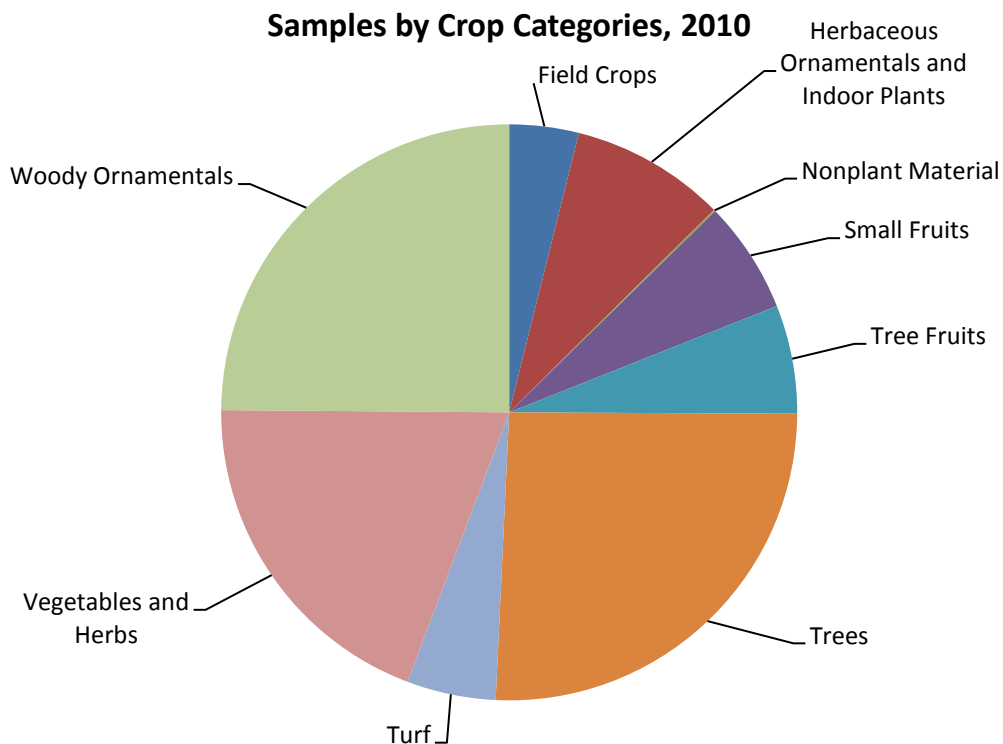
Number of Samples by Month



Crop Category Summary for Diagnostic Samples

Sample totals by major crop categories excluding plant identifications

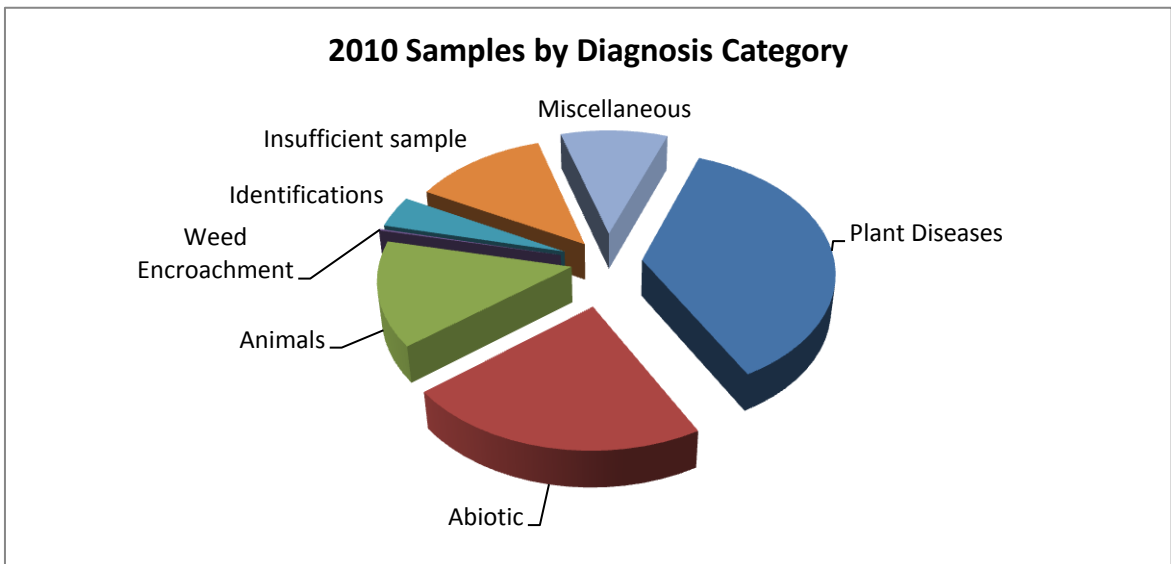
Crop Category	# of Samples	% of Total
Field Crops	46	3.9
Herbaceous Ornamentals and Indoor Plants	103	8.7
Small Fruits	75	6.3
Tree Fruits and Nuts	72	6.1
Trees	304	25.7
Turf	59	5
Vegetables and Herbs	230	19.4
Woody Ornamentals	295	24.9
Nonplant Material	1	0.1
Total	1,185	



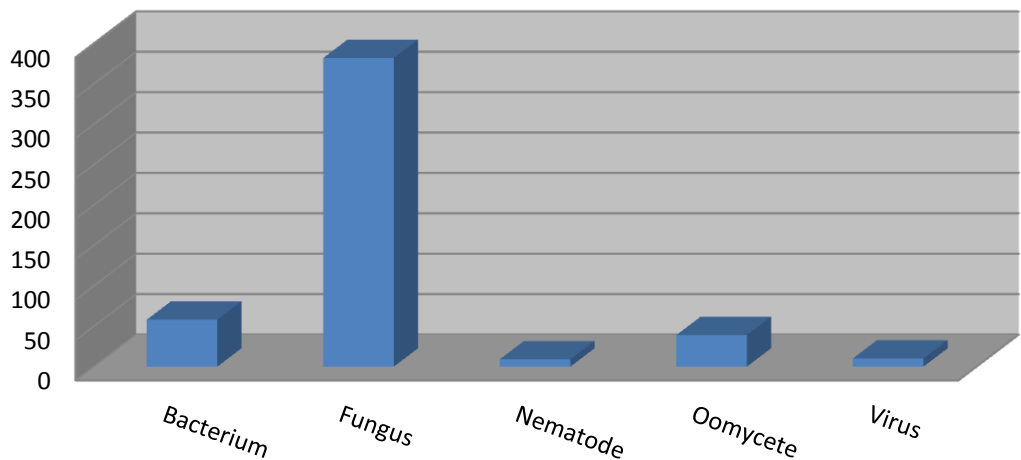
Diagnosis/Identification Category Summary

	# of Diagnoses/IDs	% of Total
Plant Diseases - Biotic Agents	498	36.4
Bacterium	58	
Fungus	382	
Nematode	9	
Oomycete	39	
Virus	10	
Plant Injury - Abiotic Agents	306	22.4
Chemical	67	
Environmental/Cultural	233	
Mechanical	6	
Plant Injury - Animals	193	14.1
Birds	4	
Insects or Mites	189	
Weed Encroachment	3	0.2
Weed	3	
Identifications	57	4.2
Fungi	17	
Lichen	1	
Plant	37	
Slime Molds	2	
Insufficient Sample or Cause Unknown	172	12.6
Insufficient sample or information	163	
Unknown	9	
Miscellaneous	138	10.1
Allelopathy	1	
Lichen	7	
Normal Condition	8	
Other	95	
Physiological/Genetic	26	
Saprophyte	1	
Total	1367	

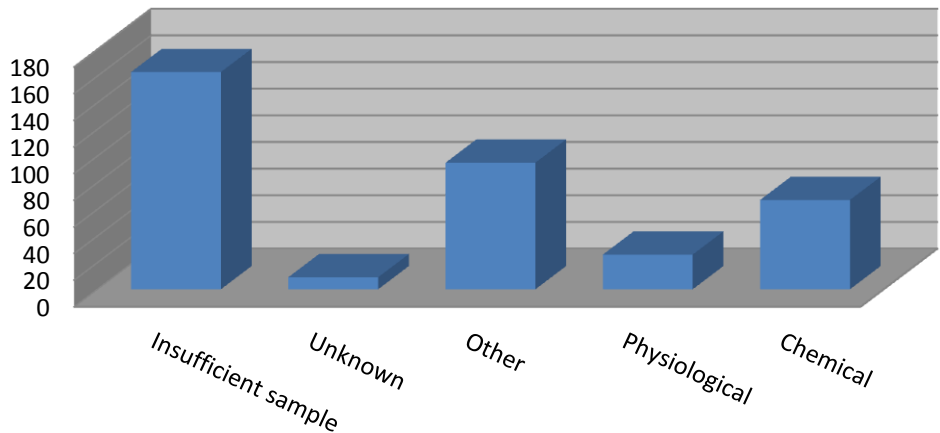
Other Assistance, 2010	
Type	# of Inquires
Email	65
Digital Images	62
Phone Calls	88



Plant Pathogens, 2010



Other Agents, 2010



Plant Disease Clinic

County	# of Samples	County	# of Samples
Accomack	1	Louisa	22
Albemarle	46	Lunenburg	2
Alleghany	13	Lynchburg City	26
Amelia	2	Madison	5
Appomattox	17	Mathews	5
Arlington	9	Mecklenburg	5
Augusta	30	Middlesex	10
Bath	9	Montgomery	90
Bedford	9	Nelson	41
Botetourt	8	New Kent	15
Brunswick	3	Newport News City	6
Buckingham	5	Norfolk City	9
Campbell	18	Northampton	1
Caroline	3	Northumberland	17
Carroll	8	Nottoway	9
Charlotte	3	Orange	5
Chesapeake	13	Out of State	1
Chesterfield	1	Page	2
Clarke	5	Patrick	3
Craig	5	Petersburg City	1
Culpeper	1	Pittsylvania	26
Cumberland	3	Portsmouth City	10
Danville	6	Powhatan	6
Dickenson	3	Prince Edward	2
Dinwiddie	7	Prince George	5
Essex	6	Prince William	14
Fairfax	18	Pulaski	6
Fauquier	9	Rappahannock	19
Floyd	23	Richmond	1
Fluvanna	16	Richmond City	5
Franklin	28	Roanoke	30
Fredrick	72	Rockbridge	7
Giles	10	Rockingham	44
Gloucester	3	Russell	3
Goochland	13	Scott	8
Grayson	5	Shenandoah	9
Greene	13	Spotsylvania	26
Halifax	7	Stafford	25
Hampton City	15	Suffolk City	1
Hanover	27	Sussex	2
Henrico	24	Tazewell	16
Henry	2	Virginia Beach	10
Highland	3	Warren	5
James City	61	Washington	11
King George	2	Westmoreland	14
Lancaster	4	Wise	21
Lee	8	Wythe	4
Loudoun	17	York	24
		Total	1,243

Diagnosis Appendix

Information about diseases/pests diagnosed by the laboratory

Field Crops	
Alfalfa	
1 Spring Black Stem and Leaf Spot	<i>Phoma medicaginis</i>
1 Total for Alfalfa	
Barley	
1 Ascochyta Leaf Spot	<i>Ascochyta hordei</i>
1 Cultural Problem	
1 Frost Injury	
1 Physiological Leaf Spot	
3 Spot Blotch	<i>Bipolaris sorokiniana</i>
3 Suspect Nutrient Deficiency	
10 Total for Barley	
Clover	
1 Insufficient Sample	
1 Total for Clover	
Fescue	
1 Brown Patch	<i>Rhizoctonia solani</i>
1 Environmental Stress	
1 Insufficient Sample	
1 Suspect Environmental Stress	
4 Total for Fescue	
Oats	
1 High pH	
1 Total for Oats	
Orchardgrass	
2 Anthracnose	<i>Colletotrichum graminicola</i>
1 Aphids	
3 Leaf Streak	<i>Cercosporidium graminis</i>
1 Suspect Environmental Stress	
7 Total for Orchardgrass	

Soybean

1 Anthracnose	<i>Colletotrichum sp.</i>
1 Bean Pod Mottle Virus	
4 Charcoal Rot	<i>Macrophomina phaseolina</i>
1 Chemical Injury	
4 Environmental Stress	
1 Insects	
1 Insufficient Sample	
1 Mites	
1 Negative for Disease	
2 Rhizoctonia Stem and Root Rot	<i>Rhizoctonia solani</i>

17 Total for Soybean

Tobacco

1 Frogeye Leaf Spot	<i>Cercospora nicotianae</i>
1 Insufficient Sample	
1 Nutrient Deficiency	

3 Total for Tobacco

Wheat

1 Ascochyta Leaf Spot	<i>Ascochyta sp.</i>
1 Environmental Stress	
1 High pH	
3 Low pH	
1 Negative for Disease	
1 Suspect Chemical Injury	
1 Suspect Frost Injury	
1 Suspect Nutrient Deficiency	
1 Suspect Wheat Spindle Streak Mosaic	
1 Take-all	<i>Gaeumannomyces graminis</i>

12 Total for Wheat

Herbaceous Ornamentals and Indoor Plants

Ageratum

1 Southern Blight *Sclerotium rolfsii*

1 Total for Ageratum

Amaranth

1 Phomopsis Stem Blight *Phomopsis amaranthicola*

1 Pythium Root and Stem Rot *Pythium sp.*

2 Total for Amaranth

Bedding Plants, Miscellaneous

1 Insects

1 Total for Bedding Plants, Miscellaneous

Begonia

1 Negative for Disease

1 Total for Begonia

Bellflower

1 Cultural Problem

1 Total for Bellflower

Bells-of-Ireland

1 Cercospora Leaf Spot *Cercospora sp.*

1 Suspect Chemical Injury

1 Suspect Nutrient Deficiency

3 Total for Bells-of-Ireland

Black-eyed Susan

1 Insects

1 Insufficient Sample

2 Total for Black-eyed Susan

Browallia

1 Physiological Problem

1 Total for Browallia

Brunnera

1 Suspect Environmental Stress

1 Total for Brunnera

Cactus

1 Cause of Problem Unknown

1 Insufficient Sample

1 Suspect Cultural Problem

3 Total for Cactus

Chelone

1 Phytophthora Root Rot *Phytophthora sp.*

1 Total for Chelone

Chrysanthemum

1 Bacterial Blight *Erwinia chrysanthemi*

1 Physiological Problem

1 Pythium Root Rot *Pythium sp.*

1 Suspect Chemical Injury

4 Total for Chrysanthemum

Clematis

1 Cultural Problem

1 Phoma Leaf Spot and Stem Canker *Phoma clematidina*

2 Total for Clematis

Clivia

1 Cultural Problem

1 Total for Clivia

Coneflower

1 Botrytis Blight *Botrytis cinerea*

1 Total for Coneflower

Coral Bells

1 Negative for Disease

1 Total for Coral Bells

Dahlia

1 Suspect Frost Injury

1 Suspect Insects

1 Thrips

3 Total for Dahlia

Daisy

1 Fusarium Stem Rot *Fusarium oxysporum*

1 Negative for Disease

2 Total for Daisy

Daylily

1 Mites

1 Suspect Cultural Problem

2 Total for Daylily

Dianthus

1 Fusarium Stem Rot *Fusarium sp.*

1 Total for Dianthus

Dracaena

1 Cultural Problem

1 Total for Dracaena

Elephant's Ear

1 Negative for Disease

1 Total for Elephant's Ear

Gardenia

1 Insufficient Sample

1 Mites

1 Suspect Cultural Problem

3 Total for Gardenia

Geranium

1 Cause of Problem Unknown

1 Cultural Problem

1 Low pH

1 Pythium Root Rot *Pythium ultimum*

4 Total for Geranium

Geum

1 Downy Mildew *Peronospora potentillae*

1 Total for Geum

Hellebore

2 Negative for Disease

1 Phytophthora Root Rot *Phytophthora nicotianae*

1 Pythium Root Rot *Pythium sp.*

4 Total for Hellebore

Hollyhock

1 Rust *Puccinia malvacearum*

1 Total for Hollyhock

Hosta

1 Hosta Virus X

1 Total for Hosta

Impatiens

- 1 Alternaria Leaf Spot *Alternaria sp.*
- 1 Rhizoctonia Stem Rot *Rhizoctonia solani*

2 Total for Impatiens

Indoor Plants, Miscellaneous

- 1 Insects

1 Total for Indoor Plants, Miscellaneous

Jade

- 1 Powdery Mildew *Oidium sp.*

1 Total for Jade

Joe-pye Weed

- 1 Mites

1 Total for Joe-pye Weed

Lantana

- 1 Physiological Problem

1 Total for Lantana

Larkspur

- 1 Phytophthora Root Rot *Phytophthora cinnamomi*
- 1 Southern Blight *Sclerotium rolfsii*
- 1 Suspect Root Problem

3 Total for Larkspur

Lavender

- 1 Charcoal Rot *Macrophomina sp.*
- 1 Fusarium Stem Rot *Fusarium sp.*
- 1 Negative for Disease

3 Total for Lavender

Lemon, Meyer

- 1 Scales

1 Total for Lemon, Meyer

Lipstick Plant

- 1 Mites

1 Total for Lipstick Plant

Liriope

- 1 Anthracnose *Colletotrichum sp.*
- 1 Environmental Stress
- 3 Fusarium Crown and Leaf Rot *Fusarium sp.*

5 Total for Liriope

Lupine

- 1 Septoria Leaf Spot *Septoria sp.*
- 1 Thrips

2 Total for Lupine

Madagascar Periwinkle

- 1 Phytophthora Blight *Phytophthora nicotianae*

1 Total for Madagascar Periwinkle

Mandevilla

- 1 Suspect Cultural Problem

1 Total for Mandevilla

Marigold

- 1 Insects

1 Total for Marigold

Moss Rose

- 1 Normal Condition

1 Total for Rose Moss

Pachysandra

- 1 Volutella Blight *Volutella pachysandrae*

1 Total for Pachysandra

Pansy

- 1 Black Root Rot *Thielaviopsis basicola*
- 1 High pH
- 1 Low Soluble Salts
- 1 Negative for Black Root Rot
- 1 Phytophthora Crown Rot *Phytophthora nicotianae*
- 1 Pythium Root Rot *Pythium sp.*
- 2 Suspect Chemical Injury
- 1 Suspect Cultural Problem

9 Total for Pansy

Peony

- 1 Botrytis Blight *Botrytis cinerea*
- 1 Slime Mold

2 Total for Peony

Periwinkle

- 1 Environmental Stress
- 3 Phoma Dieback *Phoma sp.*

4 Total for Periwinkle

Petunia

- 1 Phytophthora Root Rot *Phytophthora nicotianae*

1 Total for Petunia

Phlox

- 1 Nutrient Deficiency
- 1 Powdery Mildew *Oidium sp.*
- 1 Suspect Environmental Stress

3 Total for Phlox

Pitcher Plant

- 1 Slime Mold

1 Total for Pitcher Plant

Plants, Miscellaneous

- 1 Fertilizer Burn
- 1 Insufficient Sample

2 Total for Plants, Miscellaneous

Poinsettia

- 1 Cause of Problem Unknown
- 1 Negative for Disease

2 Total for Poinsettia

Sarcococca

- 1 Negative for Disease

1 Total for Sarcococca

Scabiosa

- 1 Botrytis Blight *Botrytis cinerea*

1 Total for Scabiosa

Sedum

- 1 Anthracnose *Colletotrichum sp.*
- 1 Chemical Injury
- 1 Fusarium Stem Rot *Fusarium sp.*

3 Total for Sedum

Snail Vine

- 1 Suspect Environmental Stress

1 Total for Snail Vine

Snapdragon

- 1 Cercospora Leaf Spot *Cercospora antirrhini*

1 Total for Snapdragon

Sunflower

- 1 Insects
- 1 Sunflower Rust *Puccinia helianthi*

2 Total for Sunflower

Verbena

- 1 Physiological Problem

1 Total for Verbena

Woodrose

- 1 Insufficient Sample

1 Total for Woodrose

Small Fruits

Blackberry

- 3 Borers
- 1 Cane and Leaf Rust *Kuehneola uredinis*
- 1 Cane Blight *Coniothyrium fuckellii*
- 1 Crown Gall *Agrobacterium tumefaciens*
- 1 Downy Mildew *Peronospora sparsa*
- 1 Environmental Stress
- 2 Mites
- 1 Spur Blight *Didymella applanata*
- 1 Suspect Environmental Stress

12 Total for Blackberry

Blueberry

- 1 Borers
- 2 Botryosphaeria Dieback *Botryosphaeria sp.*
- 2 Environmental Stress
- 1 Insects
- 3 Insufficient Sample
- 1 Negative for Blueberry Virus Screen
- 1 Negative for Disease
- 1 Phomopsis Twig Blight *Phomopsis vaccinii*
- 1 Phytophthora Root Rot *Phytophthora cinnamomi*
- 1 Scorch
- 1 Suspect Cultural Problem
- 1 Suspect Environmental Stress
- 1 Suspect Frost Injury
- 1 Winter Injury

18 Total for Blueberry

Grape

2 Alternaria	<i>Alternaria sp.</i>
2 Anthracnose	<i>Elsinoe ampelina</i>
1 Aspergillus	<i>Aspergillus sp.</i>
1 Bitter Rot	<i>Greeneria uvicola</i>
4 Black Rot	<i>Guignardia bidwellii</i>
1 Botryosphaeria	<i>Botryosphaeria sp.</i>
1 Botryosphaeria Canker	<i>Botryosphaeria sp.</i>
1 Colletotrichum	<i>Colletotrichum sp.</i>
1 Crown Gall	<i>Agrobacterium vitis</i>
1 Downy Mildew	<i>Plasmopara viticola</i>
1 Frost Injury	
1 Insect Galls	
2 Insects	
3 Insufficient Sample	
1 Leaf Blight	<i>Pseudocercospora vitis</i>
1 Macrophoma Rot	<i>Macrophoma sp.</i>
1 Negative for Disease	
3 Negative for Pierce's Disease	
2 Pierce's Disease	<i>Xylella fastidiosa</i>
6 Ripe Rot	<i>Colletotrichum gloeosporioides</i>
1 Suspect Black Rot	<i>Guignardia bidwellii</i>
1 Suspect Chemical Injury	

38 Total for Grape

Raspberry

1 Chemical Injury	
3 Environmental Stress	
1 Insects	
3 Insufficient Sample	
1 Late Leaf Rust	<i>Pucciniastrum americanum</i>
1 Mites	
1 Negative for Fungal Disease	
1 Raspberry Leaf Spot	<i>Cylindrosporium rubi</i>
1 Tomato Ringspot Virus	

13 Total for Raspberry

Strawberry

1 Abiotic Problem	
1 Angular Leaf Spot	<i>Xanthomonas fragariae</i>
1 Crown Miners	
2 Dendrophoma Leaf Blight	<i>Dendrophoma obscurans</i>
3 Environmental Stress	
2 Insufficient Sample	
1 Negative for Disease	
1 Penicillium Contaminant	<i>Penicillium sp.</i>
2 Rootworms	

14 Total for Strawberry

Tree Fruits and Nuts

Almond

1 Cultural Problem

1 Total for Almond

Apple

1 Abiotic Problem

2 Bitter Rot

Glomerella cingulata

1 Burrknot

2 Cedar-Apple Rust

Gymnosporangium juniperi-virginianae

1 Cultural Problem

1 Curculios

12 Fire Blight

Erwinia amylovora

2 Insects

1 Negative for Root Disease

1 Plum Curculios

1 Scab

Venturia inaequalis

1 Suspect Environmental Stress

1 Suspect Fire Blight

Erwinia amylovora

1 White Rot

Botryosphaeria dothidea

1 Woolly Apple Aphids

29 Total for Apple

Cherry

1 Blumeriella Leaf Spot

Blumeriella jaapii

1 Cicada Injury

1 Insects

1 Insufficient Sample

1 Mycosphaerella Leaf Spot

Mycosphaerella sp.

1 Phomopsis Dieback

Phomopsis sp.

1 Suspect Nutrient Deficiency

7 Total for Cherry

Chestnut

1 Insects

1 Total for Chestnut

Crabapple

1 Fire Blight

*Erwinia amylovora***1 Total for Crabapple**

Filbert

1 Insufficient Sample

1 Negative for Bacterial Scorch

2 Total for Filbert

Fruit Trees, Misc.

1 Insects

1 Total for Fruit Trees, Misc.

Goji berry

1 Mites

1 Total for Goji berry

Mulberry

1 Popcorn Disease

Ciboria carunculoides

1 Total for Mulberry

Peach

1 Abiotic Problem

3 Brown Rot

Monilinia fructicola

1 Cause of Problem Unknown

1 Cultural Problem

1 Curculios

4 Insects

1 Insufficient Sample

1 Negative for Bacterial Spot

1 Negative for Disease

1 Negative for Phytophthora Root Rot

3 Peach Leaf Curl

Taphrina deformans

1 Scab

Cladosporium carpophilum

1 Suspect Brown Rot

Monilinia fructicola

1 Suspect Cultural Problem

2 Suspect Nutrient Deficiency

23 Total for Peach

Pear

1 Curculios

2 Fire Blight

Erwinia amylovora

1 Insufficient Sample

1 Negative for Fire Blight

1 Suspect Cultural Problem

6 Total for Pear

Pecan

1 Pops

1 Stinkbugs

2 Total for Pecan

Persimmon

1 Insects

1 Total for Persimmon

Plum

1 Black Knot

Dibotryon morbosum

1 Botryosphaeria Canker

Botryosphaeria sp.

2 Insects

4 Total for Plum

Trees

Arborvitae

- 3 Abiotic Problem
- 2 Blackened Foliage
- 1 Botrytis Blight *Botrytis cinerea*
- 2 Cultural Problem
- 4 Mites
- 1 Negative for Disease
- 1 Negative for Root Rot
- 1 Pestalotiopsis Twig Blight *Pestalotiopsis funerea*
- 2 Seasonal Needle Drop
- 1 Suspect Seasonal Needle Drop

18 Total for Arborvitae

Ash

- 2 Anthracnose *Gnomoniella fraxini*
- 1 Flower Galls
- 1 Insufficient Sample
- 1 Mechanical Injury
- 1 Physiological Leaf Spot
- 1 Suspect Frost Injury

7 Total for Ash

Baldcypress

- 1 Suspect Cold Injury

1 Total for Baldcypress

Beech

- 1 Insufficient Sample
- 1 Negative for Beech Bark Disease
- 1 Sooty Mold *Scorias spongiosa*

3 Total for Beech

Birch

- 1 Aphids
- 1 Marssonina Blight *Marssonina betulae*

2 Total for Birch

Black Gum

- 2 Dermatella on Bark *Dermatella sp.*

2 Total for Black Gum

Buckeye

- 1 Powdery Mildew *Oidium sp.*

1 Total for Buckeye

Cedar

- 1 Cold Injury
- 1 Suspect Winter Injury

2 Total for Cedar

Cherry

- 1 Cercospora Leaf Spot *Cercospora circumscissa*

1 Total for Cherry

Cryptomeria

- 3 Environmental Stress
- 1 Insects
- 1 Pestalotiopsis Tip Blight *Pestalotiopsis sp.*

5 Total for Cryptomeria

Cypress

- 1 Bagworms
- 1 Botryosphaeria Canker *Botryosphaeria stevensii*
- 1 Botryosphaeria Dieback *Botryosphaeria sp.*
- 1 Environmental Stress
- 2 Insects
- 11 Insufficient Sample
- 1 Kabatina Tip Blight *Kabatina sp.*
- 1 Macrophoma Needle Blight *Macrophoma sp.*
- 2 Mites
- 1 Negative for Disease
- 1 Negative for Seiridium Canker
- 1 Pestalotiopsis Tip Blight *Pestalotiopsis sp.*
- 1 Scales
- 2 Seasonal Needle Drop
- 4 Seiridium Canker *Seiridium unicorne*
- 1 Suspect Environmental Stress
- 12 Suspect Seiridium Canker *Seiridium sp.*
- 1 Winter Injury

45 Total for Cypress

Dogwood

- 1 Cultural Problem
- 1 Environmental Stress
- 1 Insects
- 6 Insufficient Sample
- 1 Negative for Disease
- 1 Negative for Foliar Disease
- 2 Negative for Root Disease
- 4 Powdery Mildew *Oidium sp.*
- 1 Scorch
- 2 Suspect Frost Injury

20 Total for Dogwood

Douglasfir

- 1 Environmental Stress
- 1 Negative for Disease
- 1 Swiss Needle Cast *Phaeocryptopus gaeumannii*

3 Total for Douglasfir

Eastern Red Cedar

- 1 Cedar-Apple Rust *Gymnosporangium juniperi-virginianae*
- 1 Cedar-Quince Rust *Gymnosporangium clavipes*
- 1 Pestalotiopsis Needle Blight *Pestalotiopsis sp.*

3 Total for Eastern Red Cedar

Elm

- 1 Black Spot *Asteroma ulmeum*
- 1 Botryosphaeria Canker *Botryosphaeria dothidea*
- 1 Botryosphaeria Canker *Botryosphaeria sp.*
- 1 Dutch Elm Disease *Ophiostoma ulmi*
- 1 Insects
- 1 Leaf Blister *Taphrina ulmi*
- 1 Negative for Dutch Elm Disease

7 Total for Elm

Falsecypress

- 1 Environmental Stress
- 1 Insufficient Sample
- 1 Seiridium Canker *Seiridium unicorne*

3 Total for Falsecypress

Fir

- 1 Abiotic Problem
- 1 Frost Injury
- 1 Lichens
- 1 Phytophthora Root Rot *Phytophthora sp.*

4 Total for Fir

Hackberry

- 1 Cultural Problem
- 1 Insects
- 1 Scales

3 Total for Hackberry

Hawthorn

- 1 Cedar-Quince Rust *Gymnosporangium clavipes*

1 Total for Hawthorn

Hickory

- 1 Cultural Problem

1 Total for Hickory

Hornbeam

- 1 Insufficient Sample
- 1 Sapsucker Injury

2 Total for Hornbeam

Lagerstroemia

- 1 Negative for Root Rot

1 Total for Lagerstroemia

Magnolia

- 1 Adventitious Shoots
- 1 Frost Injury
- 1 Insufficient Sample
- 2 Suspect Environmental Stress
- 1 Winter Injury
- 1 Wood Decay

7 Total for Magnolia

Maple

1 Adventitious Shoots	
2 Anthracnose	<i>Discula sp.</i>
1 Anthracnose	<i>Kabatiella sp.</i>
1 Botryosphaeria Dieback	<i>Botryosphaeria sp.</i>
2 Environmental Stress	
1 Ganoderma Root and Butt Rot	<i>Ganoderma sp.</i>
2 Insects	
6 Insufficient Sample	
2 Leafhoppers	
1 Lichens	
1 Negative for Bacterial Scorch	
1 Negative for Disease	
1 Negative for Verticillium Wilt	<i>Verticillium sp.</i>
7 Purple-eye Leaf Spot	<i>Phyllosticta minima</i>
1 Sapsucker Injury	
3 Scales	
1 Suspect Cultural Problem	
1 Suspect Frost Injury	
1 Venturia Leaf Blight	<i>Venturia acerina</i>
1 Wood Decay	
3 Zonate Leaf Spot	<i>Cristulariella pyramidalis</i>

40 Total for Maple

Oak

4 Anthracnose	<i>Apiognomonina errabunda</i>
1 Anthracnose	<i>Discula sp.</i>
6 Bacterial Scorch	<i>Xylella fastidiosa</i>
2 Bacterial Wetwood	
2 Chemical Injury	
1 Endothia Canker	<i>Endothia gyrosa</i>
1 Environmental Stress	
1 Eriophyid Mites	
2 Gall Insects	
1 Gall Midges	
1 Ganoderma Butt Rot	<i>Ganoderma sp.</i>
3 Insects	
4 Insufficient Sample	
1 Iron Chlorosis	
1 J-rooted	
2 Mites	
2 Negative for Bacterial Scorch	
1 Negative for Oak Wilt	
1 Negative for Ramorum Blight	
1 Oak Leaf Blister	<i>Taphrina caerulescens</i>
2 Oak Leaf Button Galls	
1 Phoma	<i>Phoma sp.</i>
1 Saprophytic Fungus	
1 Scales	
1 Skeletonizers	
1 Suspect Bacterial Wetwood	
1 Suspect Chemical Injury	
2 Tubakia Leaf Spot	<i>Tubakia dryina</i>
1 Unable to identify	
1 Vein Pocket Galls	
1 Wood Decay	
1 Wool Sower Galls	

52 Total for Oak

Ornamental Cherry

1 Black Knot	<i>Dibotryon morbosum</i>
2 Cercospora Leaf Spot	<i>Cercospora circumscissa</i>
5 Insufficient Sample	
1 Scales	
1 Suspect Botryosphaeria Canker	<i>Botryosphaeria sp.</i>
1 Suspect Frost Injury	

11 Total for Ornamental Cherry

Ornamental Pear

- 1 Cultural Problem
- 4 Fire Blight *Erwinia amylovora*
- 2 Insufficient Sample
- 1 Suspect Cultural Problem
- 1 Suspect Fire Blight *Erwinia amylovora*

9 Total for Ornamental Pear

Pine

- 1 Abiotic Problem
- 1 Artillery Fungus *Sphaerobolus stellatus*
- 1 Cause of Problem Unknown
- 2 Diplodia Tip Blight *Diplodia pinea*
- 1 Dothistroma Needle Blight *Dothistroma pini*
- 2 Environmental Stress
- 1 Eriophyid Mites
- 1 Fusiform Rust *Cronartium fusiforme*
- 3 Insects
- 3 Insufficient Sample
- 1 Male Cones
- 1 Negative for Disease
- 1 Pales Weevils
- 1 Pestalotiopsis Needle Blight *Pestalotiopsis sp.*
- 1 Pine Bark Adelgids
- 1 Pine Sawyers
- 1 Sawflies
- 1 Scales
- 1 Seasonal Needle Drop
- 1 White Pine Weevils

26 Total for Pine

Poplar

- 1 Bark Beetles
- 1 Botryosphaeria Canker *Botryosphaeria sp.*

2 Total for Poplar

Prunus

- 1 Black Knot *Dibotryon morbosum*

1 Total for Prunus

Pussywillow

- 1 Wood Decay

1 Total for Pussywillow

Redbud

- 1 Cultural Problem
- 1 Eriophyid Mites
- 1 Insects

3 Total for Redbud

Serviceberry

- 1 Sooty Mold

1 Total for Serviceberry

Snowbell

- 1 Insufficient Information

1 Total for Snowbell

Sourwood

- 1 Insects

1 Total for Sourwood

Spruce

- 1 Environmental Stress
- 3 Frost Injury
- 6 Insufficient Sample
- 1 Lichens
- 2 Mechanical Injury
- 3 Mites
- 5 Negative for Disease
- 2 Rhizosphaera Needle Blight *Rhizosphaera kalkhoffii*
- 1 Sapsucker Injury
- 1 Seasonal Needle Drop
- 1 Sooty Mold
- 8 Stigmina Needle Cast *Stigmina lautii*
- 1 Suspect Cytospora Canker *Cytospora sp.*
- 1 Suspect Frost Injury

36 Total for Spruce

Sycamore

- 2 Anthracnose *Gnomonia platani*

2 Total for Sycamore

Trees, Miscellaneous

- 1 Environmental Stress
- 1 Insufficient Sample

2 Total for Trees, Miscellaneous

Willow

- 1 Cercospora Leaf Spot *Cercospora salicina*
- 1 Insufficient Sample
- 1 Sooty Mold *Scorias spongiosa*

3 Total for Willow

Yellowwood

- 1 Anthracnose *Gloeosporium sp.*
- 1 Suspect Virus

2 Total for Yellowwood

Zelkova

- 1 Environmental Stress

1 Total for Zelkova

Turf

Bentgrass

- 1 Environmental Stress
- 1 Insufficient Sample
- 2 Pythium Root Dysfunction *Pythium volutum*

4 Total for Bentgrass

Bermudagrass

- 1 Leaf Blight *Exserohilum (Setosphaeria) halodes (rostrata)*

1 Total for Bermudagrass

Bluegrass

- 3 Abiotic Problem
- 2 Brown Patch *Rhizoctonia solani*
- 1 Insufficient Sample
- 2 Melting Out *Drechslera poae*
- 1 Suspect Environmental Stress

9 Total for Bluegrass

Fescue

- 1 Abiotic Problem
- 4 Brown Patch *Rhizoctonia solani*
- 1 Cultural Problem
- 2 Environmental Stress
- 4 Insufficient Sample
- 1 Low pH
- 1 Negative for Disease
- 1 Suspect Fairy Ring
- 1 Uneven Mowing Deck
- 1 Weed Encroachment
- 1 Weed Encroachment *Poa trivialis*

18 Total for Fescue

Ryegrass

- 1 Brown Patch *Rhizoctonia solani*

1 Total for Ryegrass

St. Augustinegrass

- 1 Take-All *Gaeumannomyces graminis var. graminis*
- 1 Weed Encroachment

2 Total for St. Augustinegrass

Turfgrass

- 1 Abiotic Problem
- 6 Brown Patch *Rhizoctonia solani*
- 1 Dull Mower Injury
- 4 Environmental Stress
- 3 Insufficient Sample
- 1 Low pH
- 1 Negative for Disease
- 1 Slime Mold
- 2 Suspect Environmental Stress
- 1 Weed Encroachment

21 Total for Turfgrass

Zoysia

- 1 Brown Patch *Rhizoctonia sp.*
- 1 Cultural Problem
- 1 Environmental Stress
- 1 Insects
- 1 Low pH
- 1 Spring Dead Spot *Ophiosphaerella korrae*
- 1 Take-all *Gaeumannomyces graminis var. graminis*

7 Total for Zoysia

Vegetables and Herbs

Asparagus

1 Insufficient Sample

1 Total for Asparagus

Basil

1 Insects

1 Pythium Root Rot

Pythium sp.

1 Thrips

3 Total for Basil

Bean

1 Anthracnose

Colletotrichum lindemuthianum

1 Bean Beetles

1 Charcoal Rot

Macrophomina phaseolina

1 Insufficient Sample

1 Mites

1 Negative for Disease

2 Rhizoctonia Root Rot

Rhizoctonia solani

1 Rhizoctonia Stem and Root Rot

Rhizoctonia solani

1 Thrips

10 Total for Bean

Beet

1 Root Knot Nematodes

*Meloidogyne arenaria***1 Total for Beet**

Cabbage

1 Abiotic Problem

2 Cabbage Maggot

1 Negative for Disease

4 Total for Cabbage

Cantaloupe

1 Abiotic Problem

1 Mites

1 Negative for Disease

3 Total for Cantaloupe

Carrot

1 Southern Blight

*Sclerotium rolfsii***1 Total for Carrot**

Celery

1 Leaf Curl

*Colletotrichum acutatum***1 Total for Celery**

Chives

1 Thrips

1 Total for Chives

Cilantro

1 Cultural Problem

1 Total for Cilantro

Collards

2 Cercospora Leaf Spot

Cercospora brassicicola

2 Total for Collards

Cowpea

1 Chemical Injury

1 Total for Cowpea

Cucumber

1 Alternaria Leaf Spot

Alternaria cucumerina

1 Bacterial Wilt

Erwinia tracheiphila

1 Chemical Injury

1 Cultural Problem

1 Environmental Stress

1 Fusarium Wilt

Fusarium oxysporum

1 Insufficient Sample

1 Mechanical Injury

1 Mites

1 Powdery Mildew

Sphaerotheca fuliginea

10 Total for Cucumber

Eggplant

1 Insects

2 Mites

1 Negative for Disease

1 Sooty Mold

5 Total for Eggplant

Garlic

1 Insects

1 Rhizoctonia Rot

Rhizoctonia sp.

2 White Rot

Sclerotium cepivorum

4 Total for Garlic

Greens

1 Physiological Leaf Spot

1 Total for Greens

Herbs, Miscellaneous

1 Cultural Problem

1 Four-lined Plant Bugs

1 Negative for Disease

3 Total for Herbs, Miscellaneous

Lavender

1 Fusarium Stem Rot

Fusarium sp.

1 Total for Lavender

Lima Bean

1 Stinkbugs

1 Yeast Spot

Nematospora coryli

2 Total for Lima Bean

Melon

1 Powdery Mildew

Golovinomyces cichoracearum

1 Total for Melon

Mint

1 Powdery Mildew

Oidium sp.

1 Pythium Root Rot

Pythium sp.

2 Total for Mint

Onion

1 Fusarium Basal Plate Rot

Fusarium sp.

1 Thrips

1 Yeast Soft Rot

Kluyveromyces marxianus

3 Total for Onion

Oregano

1 Environmental Stress

1 Insects

2 Total for Oregano

Pea

2 Ascochyta Blight

Ascochyta pinodes

2 Ascochyta Blight

Phoma medicaginis var. pinodella

4 Total for Pea

Pepper

1 Bacterial Spot	<i>Xanthomonas campestris pv. vesicatoria</i>
3 Chemical Injury	
1 Fertilizer Burn	
1 Pythium Root Rot	<i>Pythium sp.</i>
2 Sunscald	
1 Suspect Bacterial Spot	<i>Xanthomonas campestris pv. vesicatoria</i>
1 Suspect Environmental Stress	
2 Thrips	

12 Total for Pepper**Plants, Miscellaneous**

1 Chemical Residue Injury	
---------------------------	--

1 Total for Plants, Miscellaneous**Potato**

1 Blackheart	
1 Chemical Injury	
2 Common Scab	<i>Streptomyces scabies</i>
2 Insects	
1 Insufficient Sample	
1 Negative for Disease	
1 Negative for Early Blight	
1 Negative for Late Blight	
2 Normal Condition	
1 Oedema	
1 Physiological Problem	
1 Rhizoctonia Canker	<i>Rhizoctonia solani</i>
1 Silver Scurf	<i>Helminthosporium solanum</i>
1 Suspect Chemical Injury	
1 Tuber Malformation	
1 Walnut Wilt	

19 Total for Potato**Pumpkin**

1 Abiotic Problem	
1 Fusarium Fruit Rot	<i>Fusarium sp.</i>
1 Low pH	
1 Mites	
1 Negative for Disease	
1 Rhizoctonia Petiole Rot	<i>Rhizoctonia solani</i>
1 Suspect Environmental Stress	

7 Total for Pumpkin

Rosemary

- 1 Hairy Root *Agrobacterium rhizogenes*
- 1 Insects
- 1 Negative for Disease
- 1 Rhizoctonia Stem Rot *Rhizoctonia solani*
- 1 Suspect Cultural Problem

5 Total for Rosemary

Sage

- 1 Phytophthora Root Rot *Phytophthora sp.*
- 1 Thrips

2 Total for Sage

Spinach

- 1 Cultural Problem
- 1 Environmental Stress

2 Total for Spinach

Squash

- 1 Anthracnose *Colletotrichum orbiculare*
- 1 Borers
- 1 Insects
- 1 Insufficient Sample
- 1 Powdery Mildew *Oidium sp.*

5 Total for Squash

Sweet Corn

- 1 Environmental Stress
- 1 Gray Leaf Spot *Cercospora zea-maydis*
- 1 Insects
- 1 Northern Corn Leaf Blight *Helminthosporium turcicum*

4 Total for Sweet Corn

Tomato

2 Abiotic Problem	
2 Aphids	
1 Bacterial Canker	<i>Clavibacter michiganensis</i>
1 Bacterial Stem Rot	<i>Erwinia carotovora</i>
6 Bacterial Wilt	<i>Ralstonia solanacearum</i>
2 Black Shoulder	<i>Alternaria alternata</i>
4 Blossom End Rot	
1 Buckeye Rot	<i>Phytophthora sp.</i>
1 Catfacing	
2 Cause of Problem Unknown	
25 Chemical Injury	
6 Chemical Residue Injury	
1 Cucumber Mosaic Virus	
3 Cultural Problem	
1 Early Blight	<i>Alternaria solani</i>
2 Environmental Stress	
1 Excess Soluble Salts	
1 Fasciation - Physiological Problem	
1 Fertilizer Burn	
3 Fusarium Basal Stem Rot	<i>Fusarium oxysporum</i>
3 Fusarium Crown and Root Rot	<i>Fusarium oxysporum</i>
4 Fusarium Wilt	<i>Fusarium oxysporum</i>
1 Growth Cracks	
1 Insects	
7 Insufficient Sample	
1 Late Blight	<i>Phytophthora infestans</i>
2 Leaf Mold	<i>Fulvia fulva</i>
2 Mites	
2 Negative for Disease	
2 Negative for Late Blight	
3 Nutrient Deficiency	
1 Physiological Leaf Roll	
1 Physiological Spotting	
1 Pith Necrosis	<i>Pseudomonas corrugata</i>
1 Powdery Mildew	<i>Oidium sp.</i>
1 Pythium Stem and Root Rot	<i>Pythium sp.</i>
6 Septoria Leaf Spot	<i>Septoria lycopersici</i>
1 Slime Mold	<i>Fuligo muscorum</i>
2 Southern Blight	<i>Sclerotium rolfsii</i>
6 Stinkbugs	
1 Suspect Air Pollution Injury	
1 Suspect Bacterial Stem Rot	<i>Erwinia carotovora</i>
6 Suspect Chemical Injury	
1 Suspect Cold Injury	

Plant Disease Clinic

- 2 Suspect Fusarium Crown and Root Rot *Fusarium oxysporum*
- 1 Suspect Nutrient Deficiency
- 1 Suspect Physiological Problem
- 2 Thrips
- 2 Tomato Spotted Wilt Virus
- 1 Yellow Shoulder

132 Total for Tomato

Turnip

- 1 Alternaria Leaf Spot *Alternaria brassicae*
- 1 Insects

2 Total for Turnip

Vegetables, miscellaneous

- 1 Chemical Injury
- 1 Cultural Problem
- 1 Environmental Stress
- 1 Insufficient Sample
- 1 Suspect Fertilizer Burn

5 Total for Vegetables, miscellaneous

Watermelon

- 1 Abiotic Problem
- 2 Insufficient Sample
- 2 Mites
- 1 Suspect Chemical Injury

6 Total for Watermelon

Zucchini

- 1 Cultural Problem

1 Total for Zucchini

Woody Ornamentals

Aucuba

- 1 Botryosphaeria Dieback *Botryosphaeria sp.*
- 1 Cause of Problem Unknown
- 1 Insufficient Sample
- 1 Negative for Root Disease

4 Total for Aucuba

Azalea

- 2 Environmental Stress
- 2 Insufficient Sample
- 3 Lacebugs
- 1 Leaf and Flower Gall *Exobasidium vaccinii*
- 1 Lichens
- 1 Mites
- 2 Negative for Disease
- 2 Negative for Root Disease
- 1 Nutrient Deficiency
- 1 Phomopsis Dieback *Phomopsis sp.*
- 1 Rootbound
- 1 Suspect Crown Gall *Agrobacterium tumefaciens*

18 Total for Azalea

Bay Laurel

- 1 Suspect Winter Injury

1 Total for Bay Laurel

Boxwood

- 2 Cultural Problem
- 1 Deep Planting
- 18 English Boxwood Decline *Paecilomyces buxi*
- 2 Environmental Stress
- 1 Excess Soluble Salts
- 1 Frost Injury
- 1 Insects
- 15 Insufficient Sample
- 2 Leafminers
- 1 Lichens
- 8 Mites
- 1 Negative for Phytophthora Root Rot
- 2 Negative for Root Disease
- 1 Negative for Root Rot
- 13 Negative for Root Rot Fungi
- 4 Nematodes
- 8 Phytophthora Root Rot *Phytophthora nicotianae*
- 3 Possible Nematode Problem
- 1 Spiral Nematodes *Rotylenchus buxophilus*
- 1 Suspect Environmental Stress
- 1 Suspect Frost Injury
- 4 Volutella Blight *Volutella buxi*
- 1 Winter Injury

92 Total for Boxwood

Burning Bush

- 1 Insects

1 Total for Burning Bush

Butterfly Bush

- 1 Chemical Injury

1 Total for Butterfly Bush

Camellia

- 1 Insects
- 3 Insufficient Sample
- 1 Negative for Disease
- 3 Negative for Phytophthora ramorum
- 1 Pestalotia Flower Blight *Pestalotia sp.*
- 1 Scales
- 1 Suspect Virus

11 Total for Camellia

Cherrylaurel

- | | |
|-----------------------------|--------------------------------|
| 1 Anthracnose | <i>Colletotrichum sp.</i> |
| 1 Botryosphaeria Dieback | <i>Botryosphaeria dothidea</i> |
| 1 Environmental Stress | |
| 2 Insects | |
| 1 Insufficient Sample | |
| 1 Mycosphaerella Leaf Spot | <i>Mycosphaerella sp.</i> |
| 1 Negative for Disease | |
| 1 Negative for Root Disease | |
| 2 Physiological Shothole | |

11 Total for Cherrylaurel

Cleyera

- 1 Suspect Environmental Stress

1 Total for Cleyera

Crape Myrtle

- | | |
|--------------------|--------------------------------|
| 1 Phomopsis Canker | <i>Phomopsis sp.</i> |
| 1 Powdery Mildew | <i>Erysiphe lagerstroemiae</i> |
| 1 Sooty Mold | |

3 Total for Crape Myrtle

Edgeworthia

- 1 Suspect Environmental Stress

1 Total for Edgeworthia

English Ivy

- | | |
|-----------------------|----------------------------------|
| 1 Anthracnose | <i>Colletotrichum trichellum</i> |
| 1 Bacterial Leaf Spot | <i>Xanthomonas hederae</i> |

2 Total for English Ivy

Euonymus

- 1 Scales

1 Total for Euonymus

Filbert

- 1 Insufficient Sample

1 Total for Filbert

Forsythia

- | | |
|------------------|----------------------|
| 1 Phomopsis Gall | <i>Phomopsis sp.</i> |
|------------------|----------------------|

1 Total for Forsythia

Hibiscus

- 1 Cultural Problem
- 1 Thrips
- 1 Tobacco Mosaic Virus

3 Total for Hibiscus

Holly

- 1 Anthracnose *Gloeosporium sp.*
- 22 Black Root Rot *Thielaviopsis basicola*
- 1 Botryosphaeria Dieback *Botryosphaeria sp.*
- 1 Cultural Problem
- 16 Insufficient Sample
- 1 Lichens
- 4 Negative for Disease
- 1 Negative for Root Disease
- 1 Phomopsis Canker *Phomopsis sp.*
- 1 Phomopsis Dieback *Phomopsis sp.*
- 1 Phytophthora Root Rot *Phytophthora nicotianae*
- 1 Rootbound
- 1 Sapsucker Injury
- 3 Scales
- 1 Sooty Mold
- 2 Suspect Black Root Rot *Thielaviopsis basicola*
- 1 Suspect Nutrient Deficiency

59 Total for Holly

Hydrangea

- 1 Environmental Stress
- 3 Insufficient Sample

4 Total for Hydrangea

Indian Hawthorn

- 1 Entomosporium Leaf Spot *Entomosporium mespili*
- 1 Insufficient Sample

2 Total for Indian Hawthorn

Japanese Yew

- 1 Negative for Disease

1 Total for Japanese Yew

Jasmine

- 1 Abiotic Problem

1 Total for Jasmine

Juniper

- 2 Abiotic Problem
- 1 Crystalline Residue
- 2 Cultural Problem
- 3 Environmental Stress
- 1 Insufficient Sample
- 1 Kabatina Tip Blight *Kabatina juniperi*
- 7 Mites
- 2 Negative for Disease
- 1 Negative for Root Disease
- 1 Negative for Tip Blight
- 1 Normal Condition
- 2 Pestalotiopsis Twig Blight *Pestalotiopsis sp.*
- 1 Stem Girdling Roots
- 1 Suspect Environmental Stress

26 Total for Juniper

Laurel

- 1 Insufficient Sample

1 Total for Laurel

Leucothoe

- 1 Cylindrocladium Blight *Cylindrocladium scoparium*

1 Total for Leucothoe

Lilac

- 1 Cultural Problem
- 2 Insufficient Sample
- 1 Phytophthora Root Rot *Phytophthora nicotianae*
- 1 Stem Girdling Roots
- 1 Suspect Cultural Problem

6 Total for Lilac

Mahonia

- 1 Insufficient Sample
- 1 Spine Spot

2 Total for Mahonia

Mountain Laurel

- 1 Cercospora Leaf Spot *Cercospora kalmiae*
- 1 Insects

2 Total for Mountain Laurel

Osmanthus

- 1 Insects
- 1 Insufficient Sample

2 Total for Osmanthus

Photinia

- 3 Entomosporium Leaf Spot *Entomosporium mespili*
- 1 Powdery Mildew *Oidium sp.*

4 Total for Photinia

Pieris

- 1 Botryosphaeria Dieback *Botryosphaeria sp.*
- 1 Guignardia Leaf Spot *Guignardia sp.*

2 Total for Pieris

Plants, Miscellaneous

- 1 Insects

1 Total for Plants, Miscellaneous

Privet

- 1 Botryosphaeria Dieback *Botryosphaeria sp.*
- 1 Lichens
- 1 Pseudocercospora Leaf Spot *Pseudocercospora ligustri*

3 Total for Privet

Pyracantha

- 1 Abiotic Problem
- 1 Lacebugs

2 Total for Pyracantha

Rhododendron

1 Borers	
4 Botryosphaeria Dieback	<i>Botryosphaeria sp.</i>
3 Cercospora Leaf Spot	<i>Cercospora handelii</i>
1 Environmental Stress	
2 Insects	
7 Insufficient Sample	
1 Lacebugs	
1 Negative for Disease	
4 Negative for Root Disease	
1 Normal Condition	
1 Pestalotia Twig Blight	<i>Pestalotia sp.</i>
1 Phomopsis Dieback	<i>Phomopsis sp.</i>
1 Phytophthora Root Rot	<i>Phytophthora cinnamomi</i>
1 Scorch	
1 Sunscald	
1 Suspect Botryosphaeria Dieback	<i>Botryosphaeria sp.</i>

31 Total for Rhododendron

Rose

1 Borers	
1 Botrytis Blight	<i>Botrytis cinerea</i>
1 Common Canker	<i>Coniothyrium fuckelii</i>
1 Japanese Beetles	
3 Mites	
1 Physiological Problem	
1 Powdery Mildew	<i>Sphaerotheca pannosa</i>
1 Rose Rosette	
1 Suspect Rose Rosette	

11 Total for Rose

Stewartia

1 Environmental Stress

1 Total for Stewartia

Sumac

1 Insufficient Sample

1 Total for Sumac

Sweetspire

1 Chemical Injury

1 Total for Sweetspire

Viburnum

- 1 Aphids
- 1 Cultural Problem
- 1 Insects
- 2 Insufficient Sample
- 2 Suspect Environmental Stress

7 Total for Viburnum

Wax Myrtle

- 2 Insufficient Sample

2 Total for Wax Myrtle

Wisteria

- 1 Crown Gall *Agrobacterium tumefaciens*
- 1 Insufficient Sample

2 Total for Wisteria

Yew

- 1 Abiotic Problem
- 1 Insects
- 2 Insufficient Sample
- 1 Negative for Disease

5 Total for Yew

No Crop Type Specified

Wood

1 Brown Rot

1 Total for Wood

Nonplant Material

Mulch

1 Insects

1 Total for Mulch

Identification Appendix

Information about samples submitted to the laboratory for identification

1. Higher Plants

Family: Aceraceae		
Acer negundo		Boxelder
Acer sp.		Maple
Family: Apiaceae		
Conium maculatum		Poison Hemlock
Family: Aquifoliaceae		
Ilex crenata		Japanese Holly
Family: Asclepiadaceae		
Asclepias variegata		White Milkweed
Family: Asteraceae		
Ambrosia trifida		Giant Ragweed
Family: Berberidaceae		
Mahonia aquifolium		Oregon Grapeholly
Family: Caprifoliaceae		
Lonicera sp.		Honeysuckle
Family: Celastraceae		
Euonymus alatus Compacta		Winged Euonymus
Euonymus americanus		Bleeding Heart Euonymus
Family: Cyperaceae		
Cyperus sp.		Nutsedge
Family: Ebenaceae		
Diospyros virginiana		Persimmon
Family: Fabaceae		
Medicago lupulina		Balck Medick
Senna obtusifolia		Sicklepod
Family: Fagaceae		
Quercus bicolor		Swamp White Oak
Family: Lamiaceae		
Origanum vulgare subsp. hirtum		Greek Oregano

Plant Disease Clinic

Family: Leguminosae		
Phaseolus vulgaris	Kentucky Wonder	Bean
Family: Malvaceae		
Hibiscus syriacus		Rose-of-sharon
Family: Myricaceae		
Myrica cerifera		Waxmyrtle
Family: Nyctaginaceae		
Mirabilis myctaginea		Wild Four O'Clock
Family: Oleaceae		
Fraxinus sp.		Ash
Family: Poaceae		
Lolium multiflorum		Wild Oat
Phalaris arundinacea		Reed Canarygrass
Setaria italica		Foxtail Millet
Family: Polygonaceae		
Polygonum persicaria		Lady's Thumb
Family: Rosaceae		
Prunus sp.		Prunus
Pyrus sp.		Pear
Spiraea sp.		Spirea
Family: Salicaceae		
Populus sp.		Poplar
Family: Solanaceae		
Solanum carolinense		Horsenettle
Family: Verbenaceae		
Duranta erecta		Golden Dewdrops

2. Fungi

Family: Agaricaceae		
Agaricus sp.		Agaricus
Family: Marasmiaceae		
Omphalotus olearius		Jack-o-Lantern Mushroom
Family: Bolbitiaceae		
Agrocybe pediades		Common Agrocybe

Plant Disease Clinic

Family: Lepiotaceae

Lepiota lutea

Flower Pot Parasol

Lepiota sp.

Lepiota

Family: Physaraceae

Fuligo septica

Slime Mold

Family: Russulaceae

Lactarius chrysorheus

Yellow-staining Milk Cap

Family: Tricholomataceae

Hohenbuehelia sp.

Shoehorn Oyster Mushroom

Family: Ganodermataceae

Ganoderma lucidum

Varnished Conk

Family: Nidulariaceae

Cyathus sp.

Bird's Nest Fungus

Family: Phallaceae

Mutinus caninus

Dog Stinkhorn

Family: Unknown

Unknown (5)

3. Unknown

Class: Ascomycetes

Lichens