

UNIVERSITY OF KENTUCKY  
*College of Agriculture*

# **Plant Diseases in Kentucky**

**Plant Disease Diagnostic Laboratory  
Summary**

**2001**

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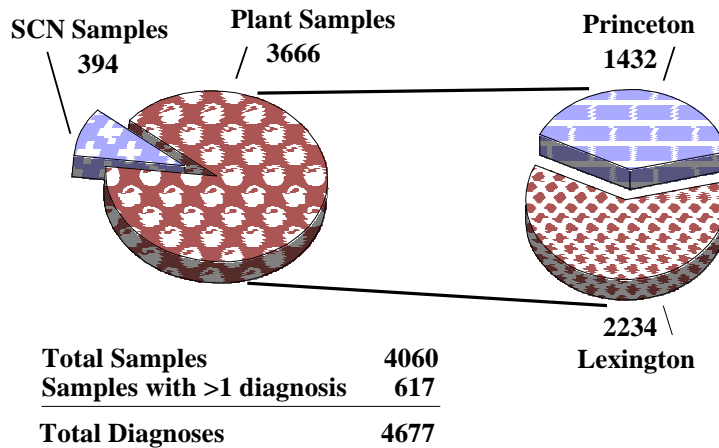
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## INTRODUCTION

The Plant Disease Diagnostic Laboratory (Lexington and Princeton) handled 3666 plant samples and 394 nematode soil samples during 2001. Samples with more than one problem numbered 617, bringing the total number of actual diagnoses to 4677. The Lexington Laboratory diagnosed 2234 specimens. The Princeton Laboratory's specimens totaled 1826; of this number 1432 were plant samples and 394 were soil samples submitted exclusively for soybean cyst nematode analysis. Samples for soybean cyst nematode analysis have dropped dramatically since funding from the Kentucky Soybean Association, that had offset the cost of analysis for farmers submitting samples through the County Extension Offices, was cut and a charge of \$8.50 per sample had to be imposed in 2000.

These numbers are summarized in Figure 1 below:

### Plant Disease Diagnostic Laboratory -2001



## NATURE OF WORK

Plant disease diagnosis is an ongoing educational and research activity of the U.K. Department of Plant Pathology. We maintain two branches of the Plant Disease Diagnostic Laboratory, one on the U.K. campus in Lexington, and one at the U.K. Research and Education Center in Princeton.

Making a diagnosis involves a great deal of research into the possible causes of the plant problem. Most visual diagnoses involve microscopy to determine what plant parts are affected and to identify the microbe involved. In addition, many specimens require special tests such as moist chamber incubation, culturing, enzyme-linked immunosorbent assay (ELISA), electron microscopy, nematode extraction, or soil pH and soluble salts tests. Computer-based laboratory records are maintained to provide information used for conducting plant disease surveys, identifying new disease outbreaks, and formulating educational programs.

## HIGHLIGHTS

### *Weather:*

**January:** After a very cold December, January 2001 was more seasonal. Departure from normal high temperatures ranged from -2 degrees BELOW NORMAL in the West to 3 degrees ABOVE NORMAL in the East. Departure from normal low temperatures ranged from NEAR NORMAL in the West to +3 degrees ABOVE NORMAL in the East.

Precipitation (liq. equ.) for the month totaled 2.21 inches statewide which was 1.16 inch BELOW NORMAL.

**February:** Temperatures for February 2001 averaged 41.5 degrees across the state which was 5.4 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from NEAR NORMAL in the West to 8 degrees ABOVE NORMAL in the East. Departure from normal low temperature ranged from 6 degrees ABOVE NORMAL in the West to 8 degrees ABOVE NORMAL in the East.

Precipitation (liq. equ.) for February 2001 totaled 4.20 inches statewide which was 0.55 inches ABOVE NORMAL.

**March:** Temperatures for March 2001 averaged 41 degrees across the state which was 5 degrees BELOW NORMAL. Departure from normal high temperatures ranged from 7 degrees BELOW NORMAL in the West to 2 degrees BELOW NORMAL in the East. Departure from normal low temperature ranged from 3 degrees BELOW NORMAL in the West to 1 degree BELOW NORMAL in the East.

Precipitation (liq. equ.) for March 2001 totaled 2.80 inches statewide which was 1.79 inches BELOW NORMAL.

**April:** Temperatures for April 2001 averaged 60 degrees across the state which was 4.1 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from 3 degrees ABOVE NORMAL in the West to 7 degrees ABOVE NORMAL in the East. Departure from normal low temperature ranged from 5 degrees ABOVE NORMAL in the West to 3 degrees ABOVE NORMAL in the East.

Rainfall for April 2001 totaled 1.99 inches statewide which was 2.26 inches BELOW NORMAL.

**May:** Temperatures for May 2001 averaged 66.3 degrees across the state which was 1.9 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from 1 degree BELOW NORMAL in the West to 1 degree ABOVE NORMAL in the East. Departure from normal low temperatures ranged from 1 degree ABOVE NORMAL in the West to 1 degree BELOW NORMAL in the East.

Rainfall for May 2001 totaled 4.60 inches statewide which was 0.10 inches BELOW NORMAL.

**June:** Temperatures for June 2001 averaged 71.3 degrees across the state which was 1.7 degree BELOW normal. Departure from normal high temperatures ranged from 3 degrees BELOW normal in the West to 2 degrees BELOW normal in the East. Departure from normal low temperature ranged from 1 degree BELOW normal in the West to 2 degrees BELOW normal in the East.

Rainfall for June 2001 totaled 3.99 inches statewide which was 0.07 inches ABOVE normal.

**July:** Temperatures for the period averaged 76 degrees across the state which was NEAR NORMAL. Departure from normal high temperatures ranged from -1 degrees from

normal in the West to -2 degrees from normal in the East. Departure from normal low temperature ranged from +2 degrees from normal in the West to +0 degrees from normal in the East.

Precipitation (liq. equ.) for the period totaled 6.22 inches statewide which was 1.54 inches ABOVE NORMAL.

*August:* Temperatures for the period averaged 76.5 degrees across the state which was 1.8 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from 0 degrees from normal in the West to +1 degrees from normal in the East. Departure from normal low temperature ranged from +4 degrees from normal in the West to +4 degrees from normal in the East.

Precipitation for the period totaled 3.63 inches statewide which was 0.12 inches BELOW NORMAL.

*September:* Temperatures for September 2001 averaged 66 degrees across the state which was 2 degrees BELOW NORMAL. Departure from normal high temperatures ranged from 1 degree BELOW NORMAL in the West to 0 degrees from normal in the East. Departure from normal low temperature ranged from 2 degrees BELOW NORMAL in the West to 0 degrees from normal in the East.

Rainfall for the month totaled 2.31 inches statewide which was 1.26 inches BELOW NORMAL which was about 70 percent of normal rainfall.

*October:* Temperatures for October 2001 averaged 56 degrees across the state which was 1 degree BELOW NORMAL. Departure from normal high temperatures ranged from -1 degree from normal in the West to +1 degree from normal in the East. Departure from normal low temperature ranged from -2 degrees from normal in the West to -2 degrees from normal in the East.

Precipitation (liq. equ.) for October 2001 totaled 4.35 inches statewide which was 1.41 inches ABOVE NORMAL.

*November:* Temperatures for November 2001 averaged 51.4 degrees across the state which was 4.8 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from 5 degrees ABOVE NORMAL in the West to 10 degrees ABOVE NORMAL in the East. Departure from normal low temperature ranged from 2 degrees ABOVE NORMAL in the West to 6 degrees ABOVE NORMAL in the East.

Rainfall for the month totaled 4.19 inches statewide which was 0.21 inches ABOVE NORMAL.

*December:* Temperatures for December 2001 averaged 42.1 degrees across the state which was 5.1 degrees ABOVE NORMAL. Departure from normal high temperatures ranged from 2 degrees ABOVE NORMAL in the West to 7 degrees ABOVE NORMAL in the East. Departure from normal low temperature ranged from 4 degrees ABOVE NORMAL in the West to 11 degrees ABOVE NORMAL in the East. Extreme high temperatures were in the low to mid 70's on the 5th of the month and extreme low temperatures were in the single digits on the 30/31st of December.

Precipitation (liq. equ.) for the month totaled 4.77 inches statewide which was 0.50 inches ABOVE NORMAL.

*Overall:* With mostly normal rainfall, except for early spring, much of the 2001 growing season was favorable for root, stem, and foliar diseases of plants.

### ***Tobacco:***

The number of tobacco samples stayed at their decreased level from 1999 and were nearly identical to the number for 2000. The incidence of Blue Mold (*Peronospora tabacina*) was relatively low, similar to 2000. Black Shank (*Phytophthora parasitica* var. *nicotianae*) sample numbers dropped slightly from 2000. The number of cases of Fusarium Wilt Complex dropped significantly from the number in 2000. The number of cases of Tomato Spotted Wilt virus doubled from the number in 2000 (which was already at an elevated level like that seen in 1999).

### ***Other agronomic crops:***

***Corn:*** The number of corn samples with diseases were relatively few .

***Soybean:*** Charcoal Rot (*Macrophomina phaseolina*) samples increased with the dry weather seen in several areas for significant periods of time. Two samples of Seed Decay caused by the same fungus were diagnosed, a rare occurrence. Samples diagnosed with Sudden Death (*Fusarium solani*, A strain) were down significantly from 2000. No samples were diagnosed with Stem Canker (*Diaporthe phaseolorum*). Soybean Cyst Nematode (*Heterodera glycines*) still remains the major yield-limiting disease factor in the majority of soybean producing acreage.

***Small Grains:*** The number of small grain samples were relatively low.

***Forages:*** The number of samples with diseases were at their usual low frequency.

### ***Fruit and Vegetable Disease Observations:***

Diagnosing fruit and vegetable diseases involves a great deal of research into the possible causes of the problem. Diagnoses which require consultation with U.K. faculty plant pathologists and horticulturists, and which need culturing and ELISA are common for commercial fruits and vegetables. The laboratory also has a role in monitoring pathogen resistance to fungicides and bactericides. These exceptional measures are efforts well-spent because fruits and vegetables are high value crops for Kentucky.

### ***New and Emerging Fruit and Vegetable Diseases in Kentucky:***

Pierce's Disease of grapes caused by *Xylella fastidiosa*

Cucurbit yellow vine disease caused by *Serratia marsescens*

### ***Tree Fruit Diseases:***

Dry weather in March and April reduced the occurrence of primary infections of apple scab (*Venturia inaequalis*). Nevertheless, there was just enough moisture to favor significant cedar rust (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, and *G. globosum*) infections. Unusually warm April weather and occasional showers during apple and pear bloom resulted in devastating fire blight (*Erwinia amylovora*) outbreaks statewide. Spring frosts, which may have exacerbated fire blight, also caused apple fruits to show russeted equatorial bands later in the season. Seasonal summer rains (actually, excess rain in July, with 7.3 inches) and long leaf wetness periods increased the incidence and severity of peach scab (*Cladosporium carpophilum*), secondary apple scab, apple frog-eye leaf spot (*Sphaeropsis malorum*), apple sooty blotch (*Peltaster fructicola*, *Geastrumia polystigmatis*, *Leptodontium elatius*, and other fungi) and flyspeck (*Zygothiala jamaicensis*), all of which are enhanced by long leaf wetness periods. By season's end, susceptible unsprayed apples

had less scab than usual but fruits were covered with sooty blotch and flyspeck. Bitter rot (*Colletotrichum gloeosporioides*) was found in some apple orchards.

#### *Small Fruit Diseases:*

Blackberries in some regions of Kentucky suffered winter injury. Systemic orange rust (*Gymnoconia nitens*) was devastating to blackberries in some locations. Blackberry rosette (*Cercospora rubi*) was also observed. Tobacco ring spot virus causing mosaic symptoms and crumbly, unproductive berries was found infecting blackberries in eastern and western Kentucky. A possible outbreak of impatiens necrotic spot or another related virus is under investigation. Wet July weather and poorly drained soils stimulated root rot (*Phytophthora* spp.) of raspberries. Grape crown gall (*Agrobacterium tumefaciens*) incidence was up and black rot (*Guignardia bidwellii*) and anthracnose (*Elsinoe ampelina*) were also prevalent. Pierce's disease (*X. fastidiosa*) was discovered for the first time in western Kentucky. This disease can be devastating to grape production - much more Kentucky research is needed. Strawberry anthracnose (*Colletotrichum acutatum*) and strawberry leaf spot (*Mycosphaerella fragariae*) occurred early in the season.

#### *Vegetable Diseases:*

TMV (Tomato Mosaic Virus) was found in greenhouse tomatoes and INSV (Impatiens Necrotic Spot Virus) was found in tomato transplants. The TMV virus likely came from other plants being grown in the same greenhouse. INSV may have developed as a result of vegetable transplants being produced in the same greenhouse with virus-susceptible ornamental plants such as petunia and impatiens.

Cabbage developed wirestem (*Rhizoctonia solani*) disease early in the season and stem rot caused by the same fungus later.

Tomatoes in commercial plantings were infected by several bacterial diseases including bacterial canker (*Clavibacter michiganensis*), bacterial spot (*Xanthomonas campestris* pv. *vesicatoria*), bacterial speck (*Pseudomonas syringae* pv. *tomato*), bacterial wilt (*Ralstonia solanacearum*) and pith necrosis (*Pseudomonas corrugata*). Fungal diseases such as early blight (*Alternaria solani*), Septoria leaf spot (*Septoria lycopersici*), Fusarium wilt (*Fusarium oxysporum* f.sp. *lycopersici*), buckeye rot (*Phytophthora* spp.), southern stem blight (*Sclerotium rolfsii*), and timber rot (*Sclerotinia sclerotiorum*) occurred on tomato as well. Viral diseases such as TSWV (Tomato Spotted Wilt Virus) and CMV (Cucumber Mosaic Virus) caused some losses as did root knot nematode (*Meloidogyne incognita*). Septoria leaf spot and TSWV were especially common this year.

Peppers developed bacterial leaf spot (*Xanthomonas campestris* pv. *vesicatoria*), fruit anthracnose (*Colletotrichum* spp.) and occasionally southern stem blight (*Sclerotium rolfsii*) and stem rot (*Rhizoctonia solani*). Late in the season, Phytophthora blight (*Phytophthora capsici*) was devastating in a few pepper fields.

Pumpkins and other cucurbits are becoming more popular in Kentucky, and their diseases continue to be economically important. A new disease, Phytophthora fruit rot (*Phytophthora capsici*) was found to be widespread. Like many other diseases, pumpkin fruit rot incidence is associated with a failure to use crop rotation away from other vegetables or tobacco. Fusarium fruit rots (*Fusarium* spp.) were a common problem again this year. Gummy stem blight/black rot (*Mycosphaerella melonis*), Microdochium blight (*Microdochium* sp.), and powdery mildew, (*Sphaerotheca fuliginea* or *Erysiphe*

*cichoracearum*) were found at serious levels. Pumpkin (and squash) was found to be a host to a complex of viruses including Watermelon Mosaic Virus 2 and to bacterial diseases including angular leaf spot (*Pseudomonas syringae* pv. *lachrymans*), a bacterial fruit rot (*Xanthomonas cucurbitae*), and bacterial wilt (*Erwinia tracheiphila*), which was also widespread on other cucurbits such as cantaloupe, cucumber, and squash.

Sweet corn rust (*Puccinia graminis*) was widespread and Stewart's wilt (*Pantoea [Erwinia] stewartii* subsp. *stewartii*) was observed. Asparagus crown rot (*Fusarium* sp.), bean root and stem rot (*Rhizoctonia solani* and *Fusarium solani* f.sp. *phaseoli*), and potato scab (*Streptomyces scabies*) were also frequently observed this year.

The laboratory has been conducting a survey of the viruses infecting commercial vegetables in Kentucky for the past several years. Using ELISA tests and host range assays, a broad range of virus diseases was found; no new viruses were detected in 2001. Growers are urged to bring to the attention of their County Extension Agent any observations of new outbreaks and disease trends in their fields. We want to be especially watchful of the new spectrum of microbes and diseases that may occur with changes in fungicide use patterns from broad-spectrum, protectant fungicides such as Mancozeb and Bravo to new chemicals such as Quadris and Abound, which present a greater risk of pathogen resistance to the fungicide while incurring reduced risks to human health and the environment. For example, we have noted an increasing number of bacterial diseases in tomatoes and now want to know if this is due to how we raise our crops, manage other diseases, or import seeds and transplants.

Because fruits and vegetables are high value crops, the Plant Disease Diagnostic Laboratory should be a great value to commercial growers. However, many growers are not using the Plant Disease Diagnostic Laboratory often enough or they are waiting until their disease problem has become well established, at which controls may be ineffectual and in some cases correct diagnosis is impossible. Growers should consistently consult with their County Extension Agents so that appropriate plant specimens are sent to the laboratory in a timely manner. We are urging County Extension Agents to stress in their Extension programming the need for accurate diagnosis of diseases of high-value crops. Growers can work with their Agents to see that Kentucky growers have the best possible information on fruit and vegetable diseases.

#### *Landscape Plant Disease Observations:*

Woody plants that were not fully hardened before cold temperatures in December, 2000, suffered winter injury symptoms the following summer. The dry early spring weather reduced the levels of primary infections for some foliar diseases. However, with the return of mostly normal rainfall, the rest of the 2001 growing season was favorable for foliar diseases of landscape plants.

#### *Deciduous tree diseases:*

Winter injury was seen on twigs and branches of a variety of woody landscape plants as browning of cambial and phloem tissues. Affected plants showed branch dieback as the weather warmed up in spring. Warm April weather and timely light showers during bloom provided conditions for severe and widespread fire blight (*Erwinia amylovora*) outbreaks on flowering pears and crabapples. A spring freeze on April 17-18 injured pears and crabapples during bloom making fire blight more serious. Below normal rainfall in April



was not enough to thwart widespread infections of the cedar rust (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, *G. globosum*) fungi. Hawthorn leaves, fruits and shoots were especially heavily infected with cedar-quince and -hawthorn rust. Flowering crabapple scab (*Venturia inaequalis*) was less active due to the dry April and the maple, dogwood, ash, and sycamore anthracnose fungi (*Kabatella*, *Discula*, and *Apiognomonina*) were also less active this year. Dogwood powdery mildew (*Microsphaera*, *Phyllactinia* spp.) continues to be a problem. Bacterial leaf scorch (*Xylella fastidiosa*) was easily detected visually on red and pin oaks in late summer. ELISA and real-time PCR tests showed that *Xylella fastidiosa* also resides in symptomless grasses, shrubs, and vines in the landscape. Significant numbers of large, mature pin oaks in most Kentucky urban areas are dying from bacterial leaf scorch. Bacterial leaf scorch was also diagnosed in American elm. Verticillium wilt (*Verticillium dahliae*) appeared especially on catalpa, and also on golden raintree, maple, redbud, smoke-tree, and tulip poplar. Tuliptree tar spot (*Rhytisma liriodendri*) appeared in several instances.

#### *Needle evergreen tree diseases:*

Maturing Austrian and Scots pines continue to die from tip blight (*Sphaeropsis sapinea*) and pine wilt nematode (*Bursaphelenchus xylophilus*). Juniper twig blight (*Kabatina juniperi*) was evident in some locations.

#### *Shrub diseases:*

Boxwood shoot blight (*Volutella buxi*) was especially widespread this year. Black root rot (*Thielaviopsis basicola*) of holly, inkberry, Japanese holly, and boxwood remains a serious problem. Roses this year were diagnosed with rose rosette disease. Rhododendron root rot (*Phytophthora* sp.) and canker (*Botryosphaeria* sp.) were significant.

#### *Perennial and annual plant diseases:*

Daylily rust (*Puccinia hemerocallidis*), a new disease in the U.S., was found in four Kentucky locations. Black root rot (*Thielaviopsis basicola*) of annuals such as petunia and pansy was a problem in many flower beds as well as in some commercial bedding plant operations in spring and again in fall. Southern blight (*Sclerotium rolfsii*) appeared on Rudbeckia. Root rot (*Pythium* sp.) also affected many landscape flowers, especially impatiens, geranium, daylily, begonia, and liriopse. Bacterial blight (*Xanthomonas pelargonii*) was observed on geranium.

#### *Turfgrass diseases:*

The usual spectrum of turfgrass diseases appeared throughout the growing season. Perennial ryegrass gray leaf spot (*Pyricularia grisea*) was fairly serious this year.

***A Shift in Sample Types:***

As noted above the number of tobacco samples for 2001 stayed at their dramatically decreased level from 1999 and were nearly identical to the number for 2000. This drop in the number of tobacco samples was mostly offset by increases in the number of samples of woody and herbaceous ornamentals, fruits, and vegetables. An increasing number of these samples are of plant types which are less common and therefore require more work, testing, and time to provide an accurate diagnosis. Along with the diversification of crops we are seeing a diversification of diseases.

***Disease Monitoring:***

In addition to the day-to-day diagnosis of samples, monitoring of several organisms and the diseases they cause is conducted by the diagnostic laboratory during the year. A new disease of grapes, Pierce's Disease (*Xylella fastidiosa*), was diagnosed for the first time in Kentucky. This potentially devastating disease will be closely monitored and research on several aspects of the disease will be conducted. Monitoring a newly emerging disease of squash, pumpkin, watermelon, and cantaloupe, Cucurbit yellow vine (*Serratia marsecens*) will also be conducted.

In addition to those mentioned above, the detection of soybean cyst nematodes in new areas of the state and in soil on commercial ornamental stock for export (e.g. to Canada and California) is also conducted.

***Educational Resource:***

A major activity of the laboratory is to serve as an educational resource to County Extension Agents and Extension Specialists for assistance in the diagnosis of plant diseases, common, complex, and new.

## ACKNOWLEDGMENTS

Technicians within the department of Plant Pathology continued to make significant contributions. Ed Dixon, research technician in Lexington, worked with specialists in conducting research in turf, ornamentals, corn, forages, and fruits. Bernadette Amsden conducted laboratory research on tobacco and ornamentals. Bernadette and Ed both helped in conducting diagnostic tests on many plant samples. Colette Laurent works part-time with soybean cyst nematode samples. Linda Overfield provided very capable, part-time assistance in the Lexington Laboratory this past year.

Thanks also go to Pat Yancey and Sandie Waddell, staff assistants in Lexington and Princeton, respectively, for their work in mailing thousands of diagnostic forms and IPM/PDDL Surveys. Tom Priddy, Ag. Engineering - Meteorology, and his staff provided information for the summary of weather conditions for 2001.

Support from the Kentucky Integrated Pest Management Program for supplemental funding of additional diagnostic testing and part-time laboratory assistance and support from the Pesticide Safety Education Program for resource books is gratefully acknowledged.

We also wish to thank the College of Agriculture's extension specialists and researchers who served as consultants to the diagnostic laboratory in 2001. Their services ranged from making diagnoses to assisting the diagnosticians with plant, insect, weed or pesticide questions. These individuals are too numerous to mention here (see Table 9) but we are grateful nonetheless to each for their valuable assistance.

## EXPLANATORY REMARKS

As you examine the main body of this report, you will notice three columns of numbers following the diagnosis and causal agent sections. The first column indicates the number of primary diagnoses, the second column the number of secondary diagnoses and the third column is the total of the previous two. The primary diagnosis is the main, or frequently, the only problem observed on a plant sample. If a second problem of equal or lesser importance was observed, it was entered as the secondary diagnosis. Occasionally, a problem may have only been diagnosed as a secondary problem, and not as a primary problem for this year thus a zero (0) will appear in the primary diagnosis column.

**Referrals and consultations:** Insect problems were generally identified or verified by a specialist in the Entomology Department. Chemical injuries on all commercially grown crops were diagnosed by a weed control specialist or by the crop specialist in the Agronomy or Horticulture Departments. On a number of occasions we also consulted with crop specialists in other departments to diagnose or verify abiotic problems.

**Table 1.****SUMMARY OF DIAGNOSES<sup>1</sup> BY CROP CATEGORY AND CAUSAL AGENT TYPE.**

<b>Crop Category</b>	<b>Abiotic Problems</b>	<b>Biotic<sup>2</sup> Problems</b>	<b>Chemical Injury</b>	<b>Inadequate Specimen</b>	<b>Insect Injury</b>	<b>Other<sup>3</sup></b>	<b>Total Diagnoses</b>
<b><u>Agronomic</u></b>							
Corn	57	21	8	2	9	29	126
Forages	23	15	0	3	4	9	54
Rapeseed	0	2	0	0	0	0	2
Small grains	6	14	2	1	0	6	29
Soybeans	34	431*	14	2	8	55*	544
Tobacco	248	663	67	20	5	62	1065
<b><u>Fruit</u></b>							
Small fruit	15	49	9	5	12	31	121
Tree fruit	43	120	1	2	32	12	210
<b><u>Herbs</u></b>							
	9	17	0	1	1	4	32
<b><u>Identification</u></b>							
	0	57	0	5	0	0	62
<b><u>Ornamentals</u></b>							
Herbaceous and Houseplants	52	150	11	15	24	64	316
Turfgrass	31	71	5	3	0	36	146
Woody	415	381	50	31	232	266	1375
<b><u>Vegetables</u></b>							
	98	302	57	23	24	73	577
<b><u>Miscellaneous</u></b>							
	7	7	0	2	0	2	18
<b><u>Total</u></b>	<b>1036</b>	<b>2296</b>	<b>224</b>	<b>115</b>	<b>351</b>	<b>649</b>	<b>4677</b>

<sup>1</sup> All counts and totals include primary diagnoses plus secondary diagnoses.

<sup>2</sup> Refer to Table 2 for a further breakdown of this category.

<sup>3</sup> "Other" includes the causal agent categories: No disease and Unknown.

\* Numbers include samples from the Nematode Analysis Laboratory, Princeton: 353 with SCN; 41 without SCN.

**Table 2.****SUMMARY OF BIOTIC PROBLEMS BY CROP CATEGORY.**

<b>Crop Category</b>	<b>Bacterial</b>	<b>Fungal</b>	<b>Nematode</b>	<b>Virus</b>	<b>Other<sup>1</sup></b>
<b><u>Agronomic</u></b>					
Corn	0	19	0	2	0
Forages	0	15	0	0	0
Rapeseed	1	1	0	0	0
Small grains	0	5	0	9	0
Soybeans	0	65	361	5	0
Tobacco	31	456	1	175	0
<b><u>Fruit</u></b>					
Small fruit	8	38	0	3	0
Tree fruit	73	47	0	0	0
<b><u>Herbs</u></b>					
	1	16	0	0	0
<b><u>Identification</u></b>					
	0	25	0	0	32
<b><u>Ornamentals</u></b>					
Herbaceous and Houseplants	20	123	1	5	1
Turfgrass	0	69	0	0	2
Woody	74	284	2	15	6
<b><u>Vegetables</u></b>					
	103	156	5	38	0
<b><u>Miscellaneous</u></b>					
	1	5	0	0	1
<b>Total</b>	<b>312</b>	<b>1324</b>	<b>370</b>	<b>252</b>	<b>42</b>

<sup>1</sup> Other includes these categories: Animal (rodent and bird damage), Plant (plant identifications), and Algae, Lichen and Phytoplasma.

**Table 3.****NUMBER OF PLANT SPECIMENS BY CROP CATEGORY, EXPRESSED AS PERCENTAGES**

<b>Crop Category</b>	<b>Number of Specimens</b>	<b>Percentage of Total Specimens</b>
Agronomic (-Tobacco)	295	8.0
Tobacco	855	23.3
Fruit	291	7.9
Herbs	24	0.7
Identifications	62	1.7
Ornamentals	1619	44.2
Vegetables	503	13.7
Miscellaneous	17	0.5
<b>Total Specimens</b>	<b>3666</b>	<b>100.0</b>

**Table 4.****SUMMARY OF DIAGNOSES BY CROP CATEGORY AND CROP.**

<b>Crop Category and Crop</b>	<b>Number of Primary Diagnoses<sup>1</sup></b>	<b>Number of Secondary Diagnoses<sup>2</sup></b>	<b>Total Diagnoses<sup>3</sup></b>
<b><u>Agronomic</u></b>			
Corn	108	18	126
Forages	46	8	54
Rapeseed	2	0	2
Small grains	26	3	29
Soybeans	507	37	544
Tobacco	855	210	1065
<b><u>Fruit</u></b>			
Small fruit	115	6	121
Tree fruit	176	34	210
<b><u>Herbs</u></b>			
	24	8	32
<b><u>Identification</u></b>			
	62	0	62
<b><u>Ornamentals</u></b>			
Herbaceous and Houseplants	265	51	316
Turfgrass	137	9	146
Woody	1217	158	1375
<b><u>Vegetables</u></b>			
	503	74	577
<b><u>Miscellaneous</u></b>			
	17	1	18
<b><u>Total</u></b>			
	4060	617	4677

<sup>1</sup> The number of primary diagnoses corresponds to the number of different specimens examined.

<sup>2</sup> If a second problem was evident on the plant specimen it was considered the secondary diagnosis. See "Explanatory Remarks."

<sup>3</sup> Total diagnoses equals the number of primary plus the number of secondary diagnoses.

**Table 5.****SUMMARY OF SAMPLES RECEIVED BY GROWER TYPE AND CROP GROUP.**

Institution Crop Group	Grower Type								
	Commercial		Homeowner		Research				
	Ext <sup>1</sup>	Non-Ext <sup>2</sup>	Ext <sup>1</sup>	Non-Ext <sup>2</sup>	Ext <sup>1</sup>	Non-Ext <sup>2</sup> Non-Ext <sup>2</sup>	Ext <sup>1</sup>		
<b><u>Agronomic</u></b>									
Corn	102	4	0	0	0	0	0	2	
Forages	42	1	0	0	0	2	1	0	
Rapeseed	2	0	0	0	0	0	0	0	
Small grains	23	0	0	0	0	3	0	0	
Soybeans	262	8	0	0	3	234	0	0	
Tobacco	802	35	0	0	0	17	0	1	
<b><u>Fruit</u></b>									
Small Fruit	41	9	50	3	0	11	0	1	
Tree Fruit	32	1	130	9	0	3	0	1	
<b><u>Herbs</u></b>	20	0	3	0	0	1	0	0	
<b><u>Identifications</u></b>	0	4	44	12	1	1	0	0	
<b><u>Ornamental</u></b>									
Herbaceous and Houseplants	91	18	127	10	1	7	7	4	
Turfgrass	32	21	61	1	0	2	12	8	
Woody	96	68	952	52	1	3	35	10	
<b><u>Vegetable</u></b>	268	16	200	9	2	7	1	0	
<b><u>Miscellaneous</u></b>	5	0	9	1	0	1	1	0	
<b><u>Total</u></b>	1818	185	1576	97	8	292	57	27	
<b><u>Total/Grower Type</u></b>	2003		1673		300			84	

**Total number of samples received = 4060**

<sup>1</sup> Ext = Extension samples submitted via County Extension Agents or Extension Specialists.

<sup>2</sup> Non-Ext = Non-extension samples submitted directly by the grower or other non-extension clients.

**Table 6.**

**NUMBER OF SAMPLES REFERRED TO OTHER DEPARTMENTS,  
UK LABORATORY FACILITIES OR OUTSIDE AGENCIES FOR DIAGNOSIS.\***

<b>Department, Facility or outside agency</b>	<b>Crop Category</b>					<b>Total</b>
	<b>Agronomic</b>	<b>Fruit</b>	<b>Ornamental</b>	<b>Vegetable</b>	<b>Other</b>	
<b>AgDia, Inc.</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>
<b>Agronomy Department</b>	<b>39</b>	<b>0</b>	<b>3</b>	<b>14</b>	<b>0</b>	<b>56</b>
<b>Animal Science Department</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>Entomology Department</b>	<b>9</b>	<b>18</b>	<b>47</b>	<b>8</b>	<b>3</b>	<b>94</b>
<b>Horticulture Department</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>9</b>
<b>USDA at Ohio State</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
					<b><u>Total</u></b>	<b>173</b>
					<b><u>Total number of plant samples</u></b>	<b>3666</b>
					<b><u>Percent of plant samples referred outside Diagnostic Lab for diagnosis</u></b>	<b>4.7</b>

\* Numbers do not reflect the total number of diagnoses and/or consultations conducted by other departments (See Table 9).



**Table 7.**

**SPECIAL LABORATORY TESTS PERFORMED  
BY PLANT DISEASE DIAGNOSTIC LABORATORY.**

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<b>Test</b>	<b>Number of Cases</b>
<b>Culturing</b>	<b>21</b>
<b>Enzyme-linked Immunosorbent Assay (ELISA)</b>	<b>138</b>
<b>Grow out</b>	<b>8</b>
<b>Incubation</b>	<b>314</b>
<b>Indicator plants</b>	<b>8</b>
<b>Nematode extraction (total = 402)</b>	
<b>Miscellaneous</b>	<b>0</b>
<b>Pinewood nematode</b>	<b>8</b>
<b>Soybean cyst nematode</b>	<b>394</b>
<b>Soil tests (total = 220)</b>	
<b>pH</b>	<b>146</b>
<b>Saturated Media Extract/pH</b>	<b>2</b>
<b>Soluble salts</b>	<b>10</b>
<b>pH/Soluble Salts</b>	<b>62</b>
<b>Tissue Test (total = 2)</b>	
<b>Quick Nitrate Test</b>	<b>2</b>
<b>Quick Nitrate/ Soluble Salts</b>	<b>0</b>

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**Table 8.**

**NUMBER OF PLANT SAMPLES RECEIVED BY COUNTY AND CROP CATEGORY  
(KY AND OUT-OF-STATE SOURCES).**

<b>COUNTY</b>	<b>Total</b>	<b>Agronomic<sup>1</sup></b>	<b>Tobacco</b>	<b>Fruit</b>	<b>Ornamental</b>	<b>Vegetable</b>	<b>Other</b>
ADAIR	1	0	1	0	0	0	0
ALLEN	21	1	3	3	4	10	0
ANDERSON	10	0	1	1	7	1	0
BALLARD	28	5	8	1	11	1	2
BARREN	21	4	6	0	10	1	0
BATH	30	1	11	2	7	9	0
BELL	29	0	0	3	19	4	3
BOONE	23	0	3	0	17	3	0
BOURBON	21	3	2	2	10	4	0
BOYD	11	0	1	0	9	1	0
BOYLE	46	2	10	0	29	5	0
BRACKEN	10	0	6	0	4	0	0
BREATHITT	12	0	2	3	1	6	0
BRECKINRIDGE	88	8	46	8	19	5	2
BULLITT	41	2	4	4	24	4	3
BUTLER	9	2	2	2	3	0	0
CALDWELL	79	8	25	12	16	8	10
CALLOWAY	110	4	58	6	25	16	1
CAMPBELL	6	0	1	2	3	0	0
CARLISLE	29	7	2	6	11	2	1
CARROLL	10	1	5	1	3	0	0
CARTER	9	0	4	1	3	1	0
CASEY	29	4	3	6	1	15	0
CHRISTIAN	106	13	22	11	40	19	1
CLARK	22	0	8	0	12	2	0
CLAY	2	0	1	1	0	0	0
CLINTON	5	0	4	0	0	1	0
CRITTENDEN	39	4	0	11	19	5	0
CUMBERLAND	5	0	2	1	0	2	0
DAVISS	198	36	35	24	68	31	4
EDMONSON	15	0	9	1	3	2	0
ELLIOTT	23	0	10	2	6	5	0
ESTILL	15	0	4	0	8	2	1
FAYETTE	386	6	29	23	296	23	9
FLEMING	46	3	12	2	24	2	3
FLOYD	7	0	0	0	4	3	0
FRANKLIN	75	0	20	2	41	11	1
FULTON	2	1	0	0	1	0	0
GALLATIN	10	0	3	0	7	0	0
GARRARD	9	2	3	0	4	0	0
GRANT	24	1	7	2	10	4	0
GRAVES	37	3	17	1	12	3	1
GRAYSON	30	0	14	3	7	5	1
GREEN	3	0	2	0	0	1	0
GREENUP	32	0	3	5	22	2	0
HANCOCK	33	4	15	3	5	3	3
HARDIN	14	4	5	1	3	0	1
HARLAN	16	0	1	5	8	1	1
HARRISON	25	1	7	0	7	8	2
HART	11	1	1	2	2	5	0
HENDERSON	53	7	9	1	27	9	0
HENRY	20	2	11	1	6	0	0
HICKMAN	6	1	1	0	2	2	0
HOPKINS	65	6	11	7	28	8	5
JACKSON	25	0	5	5	10	4	1
JEFFERSON	41	1	0	1	37	1	1
JESSAMINE	21	0	0	3	14	3	1
JOHNSON	8	1	2	0	5	0	0
KENTON	58	0	9	2	44	3	0
KNOTT	0	0	0	0	0	0	0
KNOX	7	1	2	0	1	1	2

COUNTY	Total	Agronomic <sup>1</sup>	Tobacco	Fruit	Ornamental	Vegetable	Other
LARUE	18	0	9	1	4	4	0
LAUREL	14	1	3	2	5	3	0
LAWRENCE	4	0	2	0	1	1	0
LEE	5	0	0	0	1	4	0
LESLIE	0	0	0	0	0	0	0
LETCHER	12	0	0	0	6	6	0
LEWIS	19	1	7	2	3	6	0
LINCOLN	9	3	1	0	5	0	0
LIVINGSTON	10	4	1	1	4	0	0
LOGAN	76	11	37	4	19	5	0
LYON	10	1	1	5	2	1	0
McCRACKEN	51	3	3	3	33	9	0
McCREARY	1	0	0	1	0	0	0
McLEAN	5	0	1	0	1	3	0
MADISON	36	1	10	0	24	0	1
MAGOFFIN	1	0	0	0	1	0	0
MARION	31	4	4	5	17	1	0
MARSHALL	48	3	6	2	33	3	1
MARTIN	2	0	0	0	2	0	0
MASON	7	0	5	0	2	0	0
MEADE	62	6	12	8	32	4	0
MENIFEE	3	1	0	1	1	0	0
MERCER	12	1	4	0	4	3	0
METCALFE	6	0	2	1	3	0	0
MONROE	24	0	13	2	3	6	0
MONTGOMERY	29	0	8	3	10	4	4
MORGAN	45	1	17	5	9	10	3
MUHLENBERG	28	6	12	1	6	1	2
NELSON	45	2	6	5	28	4	0
NICHOLAS	11	0	2	0	3	6	0
OHIO	17	2	8	3	3	1	0
OLDHAM	26	1	3	1	15	6	0
OWEN	8	1	3	1	2	0	1
OWSLEY	4	1	3	0	0	0	0
PENDELTON	2	0	2	0	0	0	0
PERRY	4	0	1	0	2	1	0
PIKE	8	0	0	1	7	0	0
POWELL	5	0	2	1	2	0	0
PULASKI	55	3	4	0	25	8	15
ROBERTSON	23	0	15	3	3	1	1
ROCKCASTLE	1	0	0	1	0	0	0
ROWAN	40	0	5	4	20	10	1
RUSSELL	24	0	5	1	6	9	3
SCOTT	75	1	9	4	7	54	0
SHELBY	74	3	18	2	43	6	2
SIMPSON	18	6	6	0	3	3	0
SPENCER	14	0	9	1	4	0	0
TAYLOR	17	6	6	0	2	3	0
TODD	58	20	16	2	10	10	0
TRIGG	57	12	13	6	15	8	3
TRIMBLE	5	1	1	1	1	1	0
UNION	33	14	2	3	11	3	0
WARREN	138	10	8	6	106	5	3
WASHINGTON	29	0	6	7	13	3	0
WAYNE	35	4	15	2	7	7	0
WEBSTER	27	8	5	2	6	4	2
WHITLEY	17	1	3	1	7	5	0
WOLFE	5	0	4	0	1	0	0
WOODFORD	33	2	11	3	13	4	0
Out-of-State	23	0	18	0	4	0	1
<b>TOTALS</b>	<b>3666</b>	<b>295</b>	<b>855</b>	<b>291</b>	<b>1619</b>	<b>503</b>	<b>103</b>

<sup>1</sup> Agronomic crops include corn, soybeans, forages, and small grains but in this particular case, it excludes tobacco.

**Table 9.**

**THE NUMBER OF CASES IN WHICH EXTENSION SPECIALISTS, DIAGNOSTICIANS OR RESEARCHERS WERE INVOLVED IN MAKING A PRIMARY DIAGNOSIS AND THE NUMBER OF CASES IN WHICH THEY SERVED AS CONSULTANTS.**

Specialists, Researchers, Diagnosticians	Department	Number of cases	
		Primary Diagnosis <sup>1</sup>	Consultations <sup>2</sup>
<b>LEXINGTON</b>			
Anderson, RG	Horticulture	3	15
Beale, JW (Diagnostician)	Plant Pathology	1799	12
Bessin, RT	Entomology	12	7
Bitzer, MJ	Agronomy	0	1
Coleman, RJ	Animal Science	0	1
Durham, RE	Horticulture	0	1
Fountain, WM	Horticulture	0	1
Ghabrial, SA	Plant Pathology	1	1
Green, JD	Agronomy	13	17
Hartman, JR	Plant Pathology	88	18
Henning, JC	Agronomy	1	2
Johns, JT	Animal Science	0	1
Nesmith, WC	Plant Pathology	148	93
Overfield, LB	Plant Pathology	2	0
Palmer, GK	Agronomy	25	1
Pearce, RC	Agronomy	0	4
Phillips, TD	UK Arboretum	0	1
Powell, AJ	Agronomy	3	0
Rowell, AB	Horticulture	2	9
Strang, JG	Horticulture	4	8
Townsend, LH	Entomology	47	17
Vincelli, P	Plant Pathology	97	26
<b>PRINCETON</b>			
Bachi, PR (Diagnostician)	Plant Pathology	1272	63
Dunwell, WC	Horticulture	22	24
Herbek, JH	Agronomy	5	7
Hershman, DE	Plant Pathology	35	12
Johnson, DW	Entomology	10	11
Lacefield, GD	Agronomy	4	4
Martin, JR	Agronomy	46	19
Murdock, LW	Agronomy	23	13
Rasnake, M	Agronomy	4	3

<sup>1</sup> The specialist or diagnostician signing the Plant Diagnostic Form was considered the primary diagnoser.

<sup>2</sup> In some cases, more than one person was consulted, however, only one name can be entered into the computer database. Therefore, these numbers may indicate fewer consultations than were actually performed.

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<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
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**AGRONOMIC CROPS**

**CORN (Zea)** (includes Popcorn)

Anthracnose	- Colletotrichum	0	1	1
Chemical injury	- herbicide	7	0	7
	- unknown	1	0	1
	- Fusarium	1	0	1
Ear/Kernel rots	- Stenocarpella	2	0	2
	- stresses	5	8	13
Environmental	- Cercospora	4	0	4
Gray leaf spot		31		31
Inadequate specimen, no disease		7	2	9
Insect injury		9	0	9
Nutritional	- acid soil	2	0	2
	- fertilizer burn	3	0	3
	- general	0	1	1
	- magnesium deficiency	2	1	3
	- nitrogen deficiency	5	0	5
	- phosphorus deficiency	4	1	5
	- potassium deficiency	14	1	15
	- zinc deficiency	1	0	1
Root rot	- unknown	1	1	2
Southern leaf blight	- Cochilobulus	0	1	1
Stalk rot	- Nigrospora	6	0	6
	- Stenocarpella	0	1	1
	- unknown	0	1	1
Virus	- Maize chlorotic dwarf	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>FORAGES</u>					
<b>ALFALFA (Medicago)</b>					
	Environmental stresses		3	1	4
	Inadequate specimen, no disease		3		3
	Insect injury		3	0	3
	Leaf spot	- Leptosphaerulina	1	0	1
	Nutritional	- acid soil	3	0	3
		- boron deficiency	0	1	1
		- nitrogen deficiency	3	0	3
	Root rot	- Pythium	1	0	1
		- unknown	1	0	1
	Summer black stem	- Cercospora	1	0	1
	Stem canker	- Rhizoctonia	0	1	1
	Wilt	- Fusarium	1	0	1
<b>BERMUDAGRASS (Cynodon)</b>					
	No disease		1		1
<b>BLUEGRASS (Poa)</b>					
	Nutritional	- pH high	1	0	1
<b>CLOVER (Trifolium)</b>					
	Inadequate specimen		1		1
	Insect injury		1	0	1
	Powdery mildew	- Erysiphe	1	0	1
<b>FESCUE (Fescuta)</b>					
	Brown patch	- Rhizoctonia	1	0	1
	No disease		1		1
	Nutritional	- acid soil	1	0	1
	Stripe smut	- Ustilago	1	0	1
<b>HAY (various)</b>					
	Moldy	- saprophytes	2	0	2
<b>JOHNSONGRASS and SORGHUM (Sorghum)</b>					
	Inadequate specimen		1		1
	Nutritional	- potassium deficiency	1	0	1
<b>MILLET (Panicum)</b>					
	Environmental	- drought	1	0	1
	Gray leaf spot	- Pyricularia	1	0	1
<b>ORCHARDGRASS (Dactylis)</b>					
	Brown stripe	- Cercosporidium	1	0	1
	Environmental	- compaction	0	1	1
	Leaf spot	- Cercospora	0	1	1
		- Drechslera	0	1	1
	No disease		3		3
	Nutritional	- acid soil	3	0	3
		- Nitrogen deficiency	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>RAPESEED</u>					
<b>“CANOLA” and RAPE (Brassica)</b>					
	Black rot	- Xanthomonas	1	0	1
	Root/stem rot	- Rhizoctonia	1	0	1
<u>SOYBEAN</u>					
<b>SOYBEAN (Glycine)</b>					
	Anthracnose	- Colletotrichum	2	1	3
	Charcoal rot	- Macrophomina	10	1	11
	Chemical injury	- herbicide, growth reg.	13	1	14
	Downy mildew	- Peronospora	1	0	1
	Environmental stresses		13	4	17
	Frogeye	- Cercospora	9	6	15
	Inadequate specimen, no disease		16		16
	Insect injury		5	3	8
	Nutritional	- acid soil	2	2	4
		- manganese deficiency	3	2	5
		- nitrogen deficiency	1	0	1
		- potassium deficiency	4	3	7
	Pod and stem blight	- Diaporthe	0	6	6
	Powdery mildew	- Microsphaera	1	0	1
	Purple seed	- Cercospora	0	1	1
	Root rot	- fungal	2	0	2
		- Fusarium	1	0	1
		- Pythium	0	1	1
	Root/stem rot	- Rhizoctonia	5	1	6
	Seed decay	- Macrophomina	2	0	2
	Soybean cyst nematode - on plant samples		6	2	8
	Heterodera	* in soil samples	353		353
		* absent in soil samples	41		41
	(*soil submitted to Nematode Analysis Laboratory)				
	Sudden death	- Fusarium	10	2	12
	Virus	- Bean pod mottle	4	0	4
	Wilt	- Phytophthora	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>SMALL GRAINS</u>					
<b>BARLEY (Hordeum)</b>					
	Inadequate specimen, no disease		2		2
<b>MILLET (Panicum)</b>					
	Gray leaf spot	- Pyricularia	0	1	1
	Root problem	- unknown	1	0	1
<b>OAT (Avena)</b>					
	Root rot	- Fusarium	1	0	1
	Semi-loose smut	- Ustilago	1	0	1
<b>SORGHUM (Sorghum)</b>					
	Root problem	- unknown	1	0	1
	Virus	- Maize dwarf mosaic	1	1	2
<b>WHEAT (Triticum)</b>					
	Chemical injury	- herbicide	2	0	2
	Environmental stresses		6	0	6
	Leaf blotch	- Staganospora	1	0	1
	No disease		3		3
	Rust/leaf	- Puccinia	1	0	1
	Virus	- Barley yellow dwarf	2	0	2
		- unknown	1	0	1
		- Wheat soil-borne mosaic	1	0	1
		- Wheat spindle streak mosaic	1	1	1
		- Wheat streak mosaic	1	0	1



<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
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TOBACCO

**TOBACCO (*Nicotiana*)**

Angular leaf spot	- Pseudomonas	0	2	2
Bacterial soft rot	- Erwinia	4	2	6
Black root rot	- Thielaviopsis	16	0	16
Black shank	- Phytophthora	140	3	143
Blackleg	- Erwinia	12	6	18
Blue mold	- Peronospora	41	19	60
Brown spot	- Alternaria	2	6	8
Canker	- Fusarium	0	1	1
Chemical injury	- antibiotic	1	1	2
	- chlorine	1	0	1
	- fungicide	8	2	10
	- growth regulator	12	0	12
	- herbicide	22	4	26
	- unknown	16	0	16
	Collar rot	- Sclerotinia	3	0
Cultural	- various problems	26	3	29
Damping-off	- Rhizoctonia	2	4	6
Early flowering	- environmental	2	0	2
Environmental	- cold injury	36	9	45
	- compaction	1	1	2
	- drought	4	0	4
	- high temperature	6	1	7
	- lightning	3	0	3
	- stress	5	2	7
	- weather scald	13	1	14
	- wet feet	7	0	7
	Frogeye	- Cercospora	34	15
Hollow stalk	- Erwinia	3	2	5
Inadequate specimen, no disease		82		82
Insect injury		4	1	5
Nutritional	- acid soil	15	6	21
	- boron deficiency	2	0	2
	- fertilizer burn	6	1	7
	- general	6	2	8
	- manganese toxicity	33	3	36
	- nitrogen deficiency	5	2	7
	- potassium deficiency	6	6	12
	- pH high	0	1	1
	- soluble salts	2	1	3
	- temp. phosphorus def.	20	1	21
Physical injuries		3	0	3
Physiological	- leaf breakdown	1	0	1
	- oedema	1	0	1
Root knot nematode	- Meloidogyne	0	1	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>(Tobacco, continued)</b>					
Root rot		- complex	2	1	3
		- Fusarium	0	1	1
		- Pythium	53	13	66
Root/stem rot		- Rhizoctonia	7	10	17
Sore shin		- Rhizoctonia	12	22	34
Stem rot		- Fusarium	1	9	10
Suckering		- unknown	1	0	1
Target spot		- Rhizoctonia	21	9	30
Variegation		- genetic	1	1	2
		- Alfalfa mosaic	5	1	6
Virus		- Cucumber mosaic	2	0	2
		- Impatiens necrotic spot	0	3	3
		- Poty virus	1	1	2
		- Tobacco mosaic	4	1	5
		- Tobacco ringspot	3	2	5
		- Tobacco streak	0	6	6
		- Tobacco vein mottling	3	1	4
		- Tomato spotted wilt	124	16	140
		- TOSPO	1	0	1
		- unknown	4	0	4
Weather fleck		- ozone	1	0	1
Wilt		- Fusarium	5	3	8

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>FRUIT CROPS</b>					
<u>SMALL FRUITS</u>					
<b>BLUEBERRY (Vaccinium)</b>					
	Crown rot	- Phytophthora	1	0	1
	Insect injury		1		1
	Nutritional	- pH high	1	0	1
<b>BRAMBLES - BLACKBERRY, and RASPBERRY (Rubus)</b>					
	Anthrachnose	- Elsinoe	3	0	3
	Chemical injury	- growth regulator	1	0	1
	Double blossom	- Cercospora	2	0	2
	Environmental stresses		2	0	2
	Fire blight	- Erwinia	3	0	3
	Inadequate specimen, no disease		7		7
	Insect injury		4	1	5
	Leaf spot	- Sphaerulina	2	0	2
	Root rot	- Phytophthora	1	0	1
		- Rhizoctonia	0	1	1
	Rust, orange	- Gymnoconia	1	0	1
	Virus	- Tobacco ringspot virus	1	0	1
		- unknown	2	0	2
<b>GOOSEBERRY (Ribes)</b>					
	Cultural	- transplant shock	1	0	1
	Leaf spot	- Mycosphaerella	1	0	1
	Powdery mildew	- Sphaerotheca	1	0	1
<b>GRAPE (Vitis)</b>					
	Anthrachnose	- Elsinoe	2	0	2
	Black rot	- Guignardia	14	0	14
	Chemical injury	- growth regulator	4	1	5
		- herbicide	1	0	1
	Crown gall	- Agrobacterium	3	0	3
	Downy mildew	- Plasmopora	1	0	1
	Environmental stresses		3	0	3
	Inadequate specimen, no disease		25		25
	Insect injury		5	0	5
	Leaf scorch	- unknown	1	0	1
	Mutation	- genetic	1	0	1
	Physical injury	- unknown	2	0	2
	Pierce's Disease	- Xylella	2	0	2
	Tar spot	- Rhytisma	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>STRAWBERRY (<i>Fragaria</i>)</b>					
	Anthracnose	- Colletotrichum	1	0	1
	Black root rot	- Rhizoctonia	2	0	2
	Chemical injury	- growth regulator	1	0	1
		- insecticide	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental	- stress	1	0	1
	Inadequate specimen, no disease		3		3
	Insect injury		1	0	1
	June yellows	- unknown	1	0	1
	Leaf blight	- Phomopsis	0	1	1
	Leaf spot	- Mycosphaerella	1	1	2
	Leather rot	- Phytophthora	1	0	1
	Mutation	- genetic	0	1	1
	Nutritional	- general	1	0	1
<u><b>TREE FRUITS</b></u>					
<b>APPLE (<i>Malus</i>)</b>					
	Bitter rot	- Glomerella	1	1	2
	Blister spot	- Pseudomonas	1	0	1
	Burr knot	- unknown	1	0	1
	Canker	- Nectria	1	0	1
	Cedar apple rust	- Gymnosporangium	1	2	3
	Chemical injury	- unknown	1	0	1
	Cork spot	- calcium deficiency	1	0	1
	Cultural	- transplant shock	1	0	1
	Dieback	- unknown	0	1	1
	Environmental stresses		11	6	17
	Fire blight	- Erwinia	51	1	52
	Flyspeck	- Schizothyrium	0	3	3
	Frogeye	- Botryosphaeria	4	1	5
	Inadequate specimen, no disease		5		5
	Insect injury		6	4	10
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Alternaria	0	1	1
	Nutritional	- nitrogen deficiency	0	1	1
	Physical injury	- bird	1	0	1
	Powdery mildew	- Podosphaera	1	0	1
	Russet	- unknown	1	0	1
	Scab	- Venturia	1	1	2
	Sooty blotch	- Gloeodes	0	2	2
	Wood decay	- Basidiomycete	1	0	1
<b>CHERRY (<i>Prunus</i>)</b>					
	Black knot	- Apiosporina	3	0	3
	Cultural	- transplant shock	1	0	1
	Dieback	- unknown	1	0	1
	Environmental stresses		2	0	2
	Insect injury		3	0	3

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>PEACH, and APRICOT (Prunus)</b>					
	Bacterial spot	- Xanthomonas	2	0	2
	Brown rot	- Monilinia	4	1	5
	Canker	- Leucostoma	0	1	1
	Cultural	- transplant shock	3	0	3
	Decline	- unknown	0	1	1
	Environmental stresses		5	0	5
	Insect injury		6	0	6
	Leaf spot	- unknown	1	0	1
	No disease		4		4
	Scab	- Fusicladium	4	2	6
<b>PEAR (Pyrus)</b>					
	Environmental	- hail injury	0	1	1
	Fire blight	- Erwinia	18	0	18
	Fruit rot	- fungal	1	0	1
	Insect injury		5	2	7
<b>PECAN (Carya)</b>					
	Chemical injury	- growth regulator	1	0	11
	Insect injury		4	1	5
	Leaf scorch	- unknown	1	0	1
	No disease		2		2
	Physiological	- internal breakdown	2	0	2
	Scab	- Cladosporium	1	1	2
<b>PLUM (Prunus)</b>					
	Black knot	- Apiosporina	2	0	2
	Brown rot	- Monilinia	1	0	1
	Canker	- Cytospora	1	0	1
	Cultural	- transplant shock	1	0	1
	Insect injury		2	0	2
	Plum pockets	- Taphrina	2	0	2
<b>HERBS</b>					
<b>BASIL (Ocimum)</b>					
	Blight	- Botrytis	2	0	2
	Root rot	- Pythium	0	1	1
<b>GINSENG (Panax)</b>					
	Blight	- Alternaria	1	0	1
	Mildew/Root rot	- Phytophthora	1	1	2
	Root rot	- Fusarium	1	0	1
		- Rhizoctonia	1	0	1
<b>GOLDENSEAL (Hydrastis)</b>					
	No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>JASMINE (<i>Jasminum</i>)</b>					
	No disease		1		1
<b>LAVENDER (<i>Lavandula</i>)</b>					
	Environmental	- wet feet	1	0	1
<b>MINT (<i>Mentha</i>)</b>					
	Blight	- Rhizoctonia	1	0	1
	Nutritional	- soluble salts	0	1	1
<b>OREGANO (<i>Origanum</i>)</b>					
	No disease		1		1
<b>ROSEMARY (<i>Rosemarinus</i>)</b>					
	Black root rot	- Thielaviopsis	1	0	1
	Blight	- Botrytis	1	2	3
	Crown gall	- Agrobacterium	1	0	1
	Environmental	- wet feet	4	0	4
	No disease		1		1
	Nutritional	- soluble salts	2	1	3
	Powdery mildew	- Oidium	0	1	1
<b>ST. JOHN'S WORT (<i>Hypericum</i>)</b>					
	Root/Stem rot	- Rhizoctonia	1	1	2
<b>THYME (<i>Thymus</i>)</b>					
	Inadequate specimen		1		1

#### IDENTIFICATIONS

##### FUNGAL IDENTIFICATION

Agaricus	- campestris	1	1
Amanita	- chlorinosma	1	1
	- species	1	1
Ascomycete	- species	1	1
Basidiomycete	- species	1	1
Chorophyllum	- molybdites	1	1
Ganoderma	- species	1	1
Hypoxylon	- species	1	1
Inadequate specimen		3	3
Lepiota	- species	1	1
Lycoperdon	- pyriforme	1	1
Mutinus	- caninus	5	5
Penicillium	- species	1	1
Peziza	- species	1	1
Polyporus	- species	1	1
Russula	- species	1	1
Scleroderma	- aurantium	1	1
Slime mold	- species	4	4
Sphaerobolus	- stellatus	1	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>LICHEN</b>					
		- species		2	2
<b>PLANT IDENTIFICATIONS</b>					
	Agrostis	- species	1		1
	Algae	- green	1		1
	Aralia	- species	1		1
	Arisaema	- species	2		2
	Chaenomeles	- species	1		1
	Cladrastis	- lutea	1		1
	Cucurbita	- species	1		1
	Cyperus	- brevifolius	1		1
	Euonymus	- species	1		1
	Eupatorium	- fistulosum	1		1
	Fraxinus	- americana	1		1
		- pennsylvanica	1		1
	Gaura	- filipies	1		1
	Gleditsia	- triacanthos	1		1
	Helinium	- amarum	1		1
	Inadequate specimen		2		2
	Liverwort	- species	2		2
	Oenothera	- biennis	1		1
	Passiflora	- incarnata	1		1
	Physalis	- subglabrata	1		1
	Picea	- abies	1		1
	Prunella	- vulgaris	1		1
	Pueraria	- lobata	1		1
	Sabatia	- angularus	1		1
	Solanum	- species	1		1
	Ulmus	- alata	2		2
	unknown		1		1
	Viburnum	- rufidulum	1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>MISCELLANEOUS</b>					
<b>CUPHEA (Cuphea)</b>					
	Root/Stem rot	- Fusarium	1	0	1
<b>MICROBIAL IDENTIFICATION</b>					
	Actinomycete	- Streptomyces	1		1
<b>MOSS</b>					
	No disease		1		1
<b>MULCH</b>					
	Inadequate specimen		1		1
	Slime mold	- species	2	0	2
<b>POND WATER</b>					
	Algae	- species	1	0	1
<b>SOIL</b>					
	Inadequate specimen, no disease		2		2
	Nutritional	- acid soil	4	0	4
		- pH high	2	0	2
		- soluble salts	0	1	1
<b>WEED</b>					
	Powdery mildew	- Oidium	1	0	1
<b>WOOD</b>					
	Fungus	- unknown	1	0	1



<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
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**ORNAMENTALS**

HERBACEOUS ORNAMENTALS and INDOOR PLANTS

**AFRICAN VIOLET (Saintpaulia)**

Cultural	- water damage	3	1	4
Insect injury		2	0	2
No disease		1		1
Root rot	- Pythium	2	0	2

**AGERATUM (Ageratum)**

Cultural	- overwatering	1	0	1
Slime mold	- species	0	1	1

**AJUGA (Ajuga)**

Southern blight	- Sclerotium	1	0	1
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**ANGELONIA (Angelonia)**

Gray mold	- Botrytis	1	0	1
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**ASTER (Aster)**

Stem rot	- Rhizoctonia	1	0	1
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**ASTILBE (Astilbe)**

Leaf spot	- Cercospora	1	0	1
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**AUCUBA (Aucuba)**

Cultural	- transplant shock	1	0	1
Environmental	- stress	0	1	1

**BANANA PLANT (Nymphoides)**

No disease		1		1
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**BEE BALM (Monarda)**

Powdery mildew	- Oidium	1	0	1
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**BEGONIA (Begonia)**

Environmental	- sunscald	1	0	0
Gray mold	- Botrytis	1	0	1
No disease		4		4
Root rot	- Pythium	0	1	1
Root/Stem rot	- Rhizoctonia	1	1	2

**BENJAMIN FIG (Ficus)**

Dieback	- unknown	1	0	1
Insect injury		1	0	1

**BISHOP'S WEED (Ptilimnium)**

No disease		1		1
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<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>CACTUS (various)</b>					
	Basal rot	- Fusarium	1	0	1
	Insect injury		2	0	2
<b>CALIBRAHOA (Calibrachoa)</b>					
	No disease		1		1
<b>CARDINAL FLOWER (Lobelia)</b>					
	No disease		1		1
<b>CARYOPTERIS (Caryopteris)</b>					
	Inadequate specimen		1		1
<b>CHRYSANTHEMUM (Chrysanthemum)</b>					
	Bacterial leaf spot	- Pseudomonas	1	1	2
	Dieback	- unknown	1	0	1
	Environmental	- stress	1	0	1
	Inadequate specimen, no disease		3		3
	Nutritional	- calcium deficiency	1	0	1
		- general	0	1	1
		- magnesium deficiency	0	1	1
		- soluble salts	2	1	3
	Root rot	- Pythium	2	1	3
	Root/stem rot	- Rhizoctonia	3	1	4
<b>CLEMATIS (Clematis)</b>					
	Leaf/Stem rot	- Glomerella	1	0	1
	No disease		3		3
<b>COLEUS (Coleus)</b>					
	Inadequate specimen		1		1
<b>CONEFLOWER, PURPLE (Echinacea)</b>					
	Crown rot	- Sclerotinia	1	0	1
	Environmental	- stress	1	0	1
	Inadequate specimen		2		2
	Powdery mildew	- Erysiphe	0	1	1
<b>COREOPSIS (Coreopsis)</b>					
	Insect injury		1	0	1
<b>CYCLAMEN (Cyclamen)</b>					
	No disease		1		1
<b>DAHLIA (Dahlia)</b>					
	No disease		1		1
	Powdery mildew	- Erysiphe	0	1	1
<b>DAISY (Gerbera)</b>					
	Inadequate specimen		1		1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>DAYLILY (Hemerocallis)</b>					
	Chemical injury	- herbicide	0	2	2
	Crown rot	- Fusarium	0	1	1
	Inadequate specimen, no disease		7		7
	Insect injury		1	0	1
	Leaf spot	- Aureobasidium	2	0	2
	Root rot	- Phytophthora	1	0	1
		- Pythium	5	2	7
	Root/Stem rot	- Rhizoctonia	2	3	5
<b>DELPHINIUM (Delphinium)</b>					
	Root/Stem rot	- Rhizoctonia	1	1	2
<b>DIANTHUS (Dianthus)</b>					
	Root/Stem rot	- Rhizoctonia	1	0	1
<b>DRACAENA (Dracaena)</b>					
	No disease		1		1
<b>FERN (various)</b>					
	Environmental	- stress	0	1	1
	No disease		4		4
	Nutritional	- acid soil	1	0	1
		- fertilizer burn	1	0	1
		- soluble salts	1	0	1
<b>FIG (Ficus)</b>					
	No disease		1		1
<b>FOXGLOVE (Aureolaria)</b>					
	Inadequate specimen		1		1
	Insect injury		1		1
<b>FUCHSIA (Fuchsia)</b>					
	Black root rot	- Thielaviopsis	1	0	1
<b>GAILLARDIA (Gaillardia)</b>					
	Chemical injury	- herbicide	0	1	1
	No disease		1		1
<b>GARDENIA (Gardenia)</b>					
	Insect injury		1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>GERANIUM (Pelargonium)</b>					
	Bacterial blight	- Xanthomonas	2	0	2
	Blackleg	- Pythium	4	0	4
	Cultural	- oedema	2	0	2
	Environmental	- cold injury	1	0	1
	Gray mold	- Botrytis	1	0	1
	No disease		3		3
	Nutritional	- acid soil	2	0	2
		- general	3	0	3
		- pH high	0	1	1
	Root rot	- Pythium	1	1	2
<b>GLADIOLUS (Gladiolus)</b>					
	Bacterial blight	- Xanthomonas	1	0	1
	Corm rot	- Erwinia	1	0	1
		- Fusarium	0	1	1
	Insect injury		0	1	1
<b>HIPPEASTRUM (Hippeastrum)</b>					
	No disease		1		1
<b>HOLLYHOCK (Althaea)</b>					
	Insect injury		1	0	1
	Rust	- Puccinia	1	0	1
<b>HORSETAIL (Equisetum)</b>					
	Cultural	- transplant shock	1	0	1
<b>HOSTA (Hosta)</b>					
	Bacterial blight	- Xanthomonas	0	1	1
	Leaf spot	- Colletotrichum	1	0	1
	No disease		3		3
<b>HOUTTUYNIA (Houttuynia)</b>					
	Inadequate specimen		1		1
	Root rot	- Rhizoctonia	1	0	1
<b>IMPATIENS (Impatiens)</b>					
	Bacterial soft rot	- Erwinia	1	0	1
	Cultural	- overwatering	0	1	1
		- too much light	1	0	1
	Gray mold	- Botrytis	0	1	1
	Inadequate specimen, no disease		4		4
	Insect injury		4	0	4
	Root knot	- Meloidogyne	0	1	1
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Rhizoctonia	1	1	2
	Stem rot	- Rhizopus	1	0	1
	Virus	- Impatiens necrotic spot	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>INDIAN GRASS (Sorghastrum)</b>					
	No disease		1		1
<b>IRIS (Iris)</b>					
	No disease		1		1
	Southern blight	- Sclerotium	1	0	1
<b>IVY (Hedera and others)</b>					
	Bacterial spot	- Xanthomonas	3	3	6
	Environmental	- winter injury	3	0	3
	Leaf spot	- Colletotrichum	1	0	1
	No disease		1		1
	Root rot	- Rhizoctonia	2	0	2
<b>JADE PLANT (Crassula)</b>					
	No disease		1		1
<b>JASMINE (Jasminum)</b>					
	Virus	- unknown	1	0	1
<b>KALANCHOE (Kalanchoe)</b>					
	Gray mold	- Botrytis	1	0	1
<b>LADY'S MANTLE (Alchemilla)</b>					
	No disease		1		1
<b>LILY (Lilium)</b>					
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
	No disease		1		1
	Virus	- impatiens necrotic spot	1	0	1
<b>LIME (Citrus)</b>					
	Insect injury		0	1	1
	Sooty mold	- species	1	0	1
<b>LIRIOPE (Liriope)</b>					
	Anthraxnose	- Colletotrichum	0	1	1
	Environmental	- cold injury	1	0	1
	Root rot	- Pythium	1	0	1
		- Rhizoctonia	0	1	1
<b>MANDEVILLA (Mandevilla)</b>					
	No disease		1		1
<b>MARIGOLD (Tagetes)</b>					
	Insect injury		1	0	1
	Physical injury	- unknown	1	0	1
<b>MEADOW RUE (Thalictrum)</b>					
	Chemical injury	- herbicide	1	0	1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>MISCANTHUS (Miscanthus)</b>					
	Anthracnose	- Colletotrichum	1	0	1
<b>MOCK STRAWBERRY (Duchesnea)</b>					
	Rust	- Frommella	1	0	1
<b>MORNING GLORY (Ipomoea)</b>					
	White rust	- Albugo	1	0	1
<b>ORCHID (various)</b>					
	Anthracnose	- Colletotrichum	1	0	1
	Insect injury		1	1	2
	No disease		1		1
	Virus	- unknown	1	0	1
<b>PAMPAS GRASS (Cortaderia)</b>					
	Chemical injury	- herbicide	1	0	1
<b>PANSY (Viola)</b>					
	Black root rot	- Thielaviopsis	4	1	5
	Inadequate specimen		1		1
	Leaf spot	- Cercospora	1	0	1
	Nutritional	- boron deficiency	1	0	1
		- general	1	0	1
		- iron deficiency	1	0	1
		- magnesium deficiency	0	1	1
		- pH high	1	0	1
		- soluble salts	1	0	1
	Root rot	- Pythium	0	1	1
<b>PEONY (Paeonia)</b>					
	Leaf/Stem spot	- Phyllosticta	1	0	1
	No disease		2		2
	Red spot	- Cladosporium	2	0	2
	Wilt	- Verticillium	1	0	1
<b>PETUNIA (Petunia)</b>					
	Black root rot	- Thielaviopsis	2	0	2
	Environmental	- sunscald	1	0	1
	No disease		1		1
	Nutritional	- acid soil	0	1	1
		- general	2	0	2
		- pH high	1	0	1
	Root rot	- Pythium	0	2	2
	Root/stem rot	- Rhizoctonia	3	0	3
<b>PHLOX (Phlox)</b>					
	Chemical injury	- herbicide	0	2	2
	Inadequate specimen, no disease		4		4
	Powdery mildew	- Erysiphe	1	0	1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>POINSETTIA (Euphorbia)</b>					
	Bacterial leaf spot	- Xanthomonas	1	0	1
	Chemical injury	- unknown	1	0	1
	No disease		2		2
	Root rot	- Pythium	6	0	6
		- Rhizoctonia	0	1	1
<b>ROSE, miniature (Rosa)</b>					
	Powdery mildew	- Sphaerotheca	1	0	1
<b>RUDBECKIA (Rudbeckia)</b>					
	Bacterial leaf spot	- Pseudomonas	1	0	1
	Chemical injury	- herbicide	1	0	1
	Inadequate specimen, no disease		2		2
	Insect injury		1	0	1
	Leaf spot	- Septoria	1	0	1
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Fusarium	1	0	1
<b>SALVIA (Salvia)</b>					
	Bacterial leaf spot	- Pseudomonas	1	0	1
<b>SCABIOSA (Scabiosa)</b>					
	Root rot	- Phythium	0	1	1
	Root/Stem rot	- Rhizoctonia	1	0	1
<b>SCHEFFLERA (Brassaia)</b>					
	Insect injury		3	0	3
	No disease		1		1
<b>SEDUM (Sedum)</b>					
	Powdery mildew	- Erysiphe	2	0	2
<b>SNAPDRAGON (Antirrhinum)</b>					
	Root rot	- Pythium	0	1	1
	Root/Stem rot	- Rhizoctonia	2	0	2
<b>SPATHIPHYLLUM (Spathiphyllum)</b>					
	No disease		1		1
<b>STREPTOCARPUS (Streptocarpus)</b>					
	Environmental	- cold injury	1	0	1
	No disease		1		1
<b>SUNFLOWER (Helianthus)</b>					
	Leaf spot	- Septoria	1	0	1
<b>SWEET POTATO (Ipomoea)</b>					
	No disease		1		1
<b>SWITCH GRASS (Panicum)</b>					
	No disease		1		1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>TRADESCANTIA (Tradescantia)</b>					
	Inadequate specimen		1		1
	Insect injury		1	0	1
<b>UNKNOWN</b>					
	Inadequate specimen		1		1
	Root/Stem rot	- Rhizoctonia	1	0	1
<b>VINCA (Vinca)</b>					
	Aerial blight	- Phytophthora	1	0	1
	Bacterial soft rot	- Erwinia	0	1	1
	Leaf/Stem blight	- Alternaria	1	0	1
	No disease		2		2
	Root/Stem rot	- Rhizoctonia	1	0	1
	Stem canker	- Phoma	2	0	2
<b>ZINNIA (Zinnia)</b>					
	Powdery mildew	- Oidium	1	0	1
<u><b>TURFGRASS</b></u>					
<b>BENTGRASS (Agrostis)</b>					
	Algae	- blue-green	1	0	1
	Anthracnose	- Colletotrichum	2	0	2
	Blight	- Pythium	1	0	1
	Brown patch	- Rhizoctonia	1	0	1
	Cultural	- heavy thatch	1	0	1
		- overwatering	1	0	1
	Dollar spot	- Sclerotinia	8	0	8
	Environmental stresses		6	0	6
	Fairy ring	- Basidiomycete	1	0	1
	Leaf spot	- Bipolaris	1	0	1
	No disease		7		7
	Nutritional	- fertilizer burn	0	1	1
	Physical injury	- mechanical	1	0	1
		- unknown	1	0	1
	Root rot	- Pythium	2	0	2
		- unknown	0	1	1
	Take-all	- Gaeumannomyces	2	0	2
	Yellow patch	- Rhizoctonia	3	0	3
<b>BERMUDAGRASS (Cynodon)</b>					
	Chemical injury	- herbicide	3	0	3
	Dollar spot	- Sclerotinia	1	0	1
	Environmental	- stress	1	0	1
	Large patch	- Rhizoctonia	1	0	1
	Loose smut	- Ustilago	1	0	1
	No disease		1		1



<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>BLUEGRASS (Poa)</b>					
	Anthracnose	- Colletotrichum	1	0	1
	Brown patch	- Rhizoctonia	1	0	1
	Cultural	- heavy thatch	4	0	4
	Dollar spot	- Sclerotinia	1	0	1
	Environmental	- heat injury	1	0	1
	Leaf spot	- Bipolaris	0	1	1
	Necrotic ring spot	- Leptosphaeria	2	0	2
	No disease		6		6
	Nutritional	- nitrogen deficiency	1	0	1
	Summer patch	- Magnaporthe	8	0	8
<b>FESCUE (Festuca)</b>					
	Anthracnose	- Colletotrichum	0	1	1
	Brown patch	- Rhizoctonia	6	1	7
	Chemical injury	- herbicide	1	0	1
	Dormancy	- normal	1	0	1
	Environmental stresses		1	1	2
	Inadequate specimen, no disease		10		10
	Nutritional	- acid soil	1	0	1
		- soluble salts	1	0	1
	Rust	- Puccinia	1	1	2
	Slime mold	- species	2	0	2
<b>RYEGRASS (Lolium)</b>					
	Anthracnose	- Colletotrichum	1	0	1
	Blight	- Pythium	1	1	2
	Brown patch	- Rhizoctonia	1	0	1
	Environmental	- stress	1	0	1
	Gray leaf spot	- Pyricularia	5	0	5
	Leaf blight	- Bipolaris	1	0	1
<b>TURF (unspecified)</b>					
	Brown patch	- Rhizoctonia	2	0	2
	Chemical injury	- dog urine	1	0	1
	Cultural	- heavy thatch	1	0	1
	Dollar spot	- Sclerotinia	1	0	1
	Environmental	- stress	2	1	3
	Inadequate specimen, no disease		13		13
	Nutritional	- pH high	1	0	1
	Rust	- Puccinia	2	0	2
	Slime mold	- species	1	0	1
	Weed	- Nimblewill	1	0	1
<b>ZOYSIA (Zoysia)</b>					
	Environmental	- frost injury	1	0	1
	Inadequate specimen		1		1
	Nutritional	- acid soil	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
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WOODY ORNAMENTALS

**ALMOND (Prunus)**

Insect injury			1	0	1
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**ARBORVITAE (Thuja)**

Blight	- Fusarium		0	1	1
Cultural	- transplant shock		2	0	2
Environmental stresses			3	1	4
Insect injury			4	1	5
Needle drop	- normal		2	0	2
No disease			6		6
Twig blight	- Phomopsis		1	0	1

**ASH (Fraxinus)**

Anthracnose	- Apiognomonia		1	0	1
Cultural	- transplant shock		1	0	1
Environmental	- cold injury		0	1	1
Insect injury			1	0	1
Leaf scorch	- Cercospora		1	0	1
	- fungal		1	0	1
	- unknown		1	0	1
No disease			4		4
Virus	- unknown		1	0	1

**AUSTREE (Salix, hybrid)**

No disease			2		2
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**AZALEA - See listing under RHODODENDRON**

**BALD CYPRESS (Taxodium)**

Insect injury			1	0	1
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**BARBERRY (Berberis)**

Cultural	- transplant shock		1	0	1
Environmental stresses			4	0	4
Inadequate specimen, no disease			3		3
Insect injury			0	1	1
Nutritional	- soluble salts		0	1	1

**BAYBERRY (Myrica)**

Environmental	- wet feet		1	0	1
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**BEECH (Fagus)**

Canker	- fungal		1	0	1
Leaf scorch	- drought		1	0	1
Sooty mold	- Scorias		1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>BIRCH (Betula)</b>					
	Chemical injury	- growth regulator	1	0	1
		- herbicide	4	0	4
	Decline	- unknown	1	0	1
	Environmental	- stress	1	2	3
	Insect injury		1	0	1
	Leaf spot	- Marssonina	1	1	2
	No disease		4		4
<b>BLACK JETHEAD (Rhodotypos)</b>					
	No disease		1		1
<b>BLACKGUM (Nyssa)</b>					
	Canker	- Botryosphaeria	1	0	1
<b>BOXELDER (Acer)</b>					
	Leaf scorch	- environmental	1	0	1
	No disease		1		1
<b>BOXWOOD (Buxus)</b>					
	Canker	- Pseudonectria	27	3	30
	Cultural	- transplant shock	1	1	2
	Dieback	- unknown	1	0	1
	Environmental stresses		19	2	21
	Inadequate specimen, no disease		11		11
	Insect injury		5	1	6
	Leaf spot	- Macrophomina	0	1	1
	Nutritional	- fertilizer burn	1	0	1
	Physical injury	- pruning	1	0	1
	Wilt	- Verticillium	1	0	1
<b>BUTTERFLY BUSH (Buddleja)</b>					
	Environmental	- frost injury	1	0	1
	Insect injury		3	0	3
<b>CATALPA (Catalpa)</b>					
	Wilt	- Verticillium	5	0	5
<b>CEDAR (Calocedrus)</b>					
	No disease		1		1
<b>CHERRY (Prunus)</b>					
	Bacterial spot	- Xanthomonas	0	1	1
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		3	0	3
	Insect injury		2	0	2
	Leaf spot	- Cocomyces	1	1	2
	No disease		6		6
	Nutritional	- iron deficiency	1	0	1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
<b>CHERRYLAUREL (Prunus)</b>					
	Bacterial spot	- Xanthomonas	1	0	1
	Environmental	- wet feet	1	0	1
<b>CHESTNUT (Castanea)</b>					
	Cultural	- transplant shock	1	0	1
	Inadequate specimen		1		1
<b>COTONEASTER (Cotoneaster)</b>					
	Inadequate specimen, no disease		2		2
<b>COTTONWOOD (Populus)</b>					
	Leaf spot	- Septoria	1	0	1
<b>CRABAPPLE (Malus)</b>					
	Cedar/Apple rust	- Gymnosporangium	1	0	1
	Cultural	- transplant shock	0	1	1
	Decline	- unknown	1	0	1
	Environmental stresses		2	1	3
	Fire blight	- Erwinia	9	0	9
	Frogeye	- Sphaeropsis	1	0	1
	Inadequate specimen		1		1
	Insect injury		1	0	1
	Lichen	- species	1	0	1
	Nutritional	- general	0	1	1
	Powdery mildew	- Oidium	1	0	1
	Scab	- Venturia	1	0	1
<b>CRAPEMYRTLE (Lagerstroemia)</b>					
	No disease		1		1
	Sooty mold	- species	1	0	1
<b>CYPRESS (Cupressocyparis)</b>					
	Environmental	- cold injury	2	0	2
	Insect injury		1	0	1
	No disease		1		1
<b>DOGWOOD (Cornus)</b>					
	Anthracnose	- Discula	1	0	1
	Chemical injury	- growth regulator	1	2	3
	Cultural	- transplant shock	4	0	4
	Decline	- unknown	4	0	4
	Environmental stresses		12	1	13
	Inadequate specimen, no disease		12		12
	Leaf scorch	- drought	1	0	1
		- unknown	4	0	4
	Leaf spot	- Septoria	4	0	4
	Powdery mildew	- Oidium	7	1	8
	Spot anthracnose	- Elsinoe	1	0	1
<b>ELDER (Sambucus)</b>					
	Cultural	- transplant shock	1	0	1

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<b>ELM (Ulmus)</b>					
	Anthracnose	- Gloeosporium	0	1	1
	Bacterial scorch	- Xylella	1	0	1
	Black leaf spot	- Stegophora	1	0	1
	Canker	- Nectria	1	0	1
	Insect injury		1	0	1
	No disease		8		8
<b>EUONYMUS (Euonymus)</b>					
	Crown gall	- Agrobacterium	1	0	1
	Dieback	- unknown	1	0	1
	Environmental stresses		3	0	3
	Insect injury		9	0	9
	Leaf scorch	- unknown	1	0	1
	No disease		4		4
	Powdery mildew	- Microsphaera	1	0	1
<b>FILBERT (Corylus)</b>					
	Cultural	- transplant shock	1	0	1
<b>FIR (Abies)</b>					
	No disease		5		5
<b>FORSYTHIA (Forsythia)</b>					
	Environmental	- freeze	1	0	1
	Inadequate specimen		1		1
<b>FRINGE-FLOWER (Loropetalum)</b>					
	Leaf spot	- fungal	1	0	1
<b>GINGKO (Ginkgo)</b>					
	Environmental	- freeze	1	0	1
<b>GOLDENRAINTREE (Koelreuteria)</b>					
	Environmental	- wet feet	1	0	1
	Insect injury		1	0	1
	Wilt	- Verticillium	1	0	1
<b>HACKBERRY (Celtis)</b>					
	Insect injury		2	0	2
	Sooty mold	- species	0	1	1
<b>HAWTHORN (Crataegus)</b>					
	Cedar-quince rust	- Gymnosporangium	2	0	2
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>HEMLOCK (Tsuga)</b>					
	Canker	- Cytospora	0	1	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		5	1	6
	Inadequate specimen, no disease		4		4
	Insect injury		6	0	6
<b>HIBISCUS (Hibiscus)</b>					
	Bacterial spot	- Pseudomonas	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental	- wet feet	1	0	1
	No disease		1		1
<b>HICKORY (Carya)</b>					
	Inadequate specimen, no disease		2		2
	Insect injury		1	0	1
<b>HOLLY and INKBERRY (Ilex)</b>					
	Anthracnose	- Gloeosporium	1	0	1
	Bacterial blight	- Corynebacterium	1	0	1
	Black root rot	- Thielaviopsis	15	0	15
	Chemical injury	- unknown	1	0	1
	Cultural	- insufficient water	0	1	1
		- transplant shock	4	3	7
	Environmental stresses		13	0	13
	Inadequate specimen, no disease		27		27
	Insect injury		2	1	3
	Leaf spot	- fungal	3	2	5
		- Phyllosticta	2	0	2
	Root rot	- Phytophthora	1	0	1
		- Pythium	1	0	1
		- Rhizoctonia	1	1	2
	Sooty mold	- species	0	2	2
<b>HONEYLOCUST (Gleditsia)</b>					
	Cultural	- transplant shock	1	0	1
	Insect injury		2	0	2
	No disease		1		1
<b>HONEYSUCKLE (Lonicera)</b>					
	Inadequate specimen, no disease		2		2
	Insect injury		2	0	2
<b>HYDRANGEA (Hydrangea)</b>					
	Environmental stresses		4	0	4
	Insect injury		1	0	1
	Leaf spot	- Cercospora	3	0	3
		- Phyllosticta	1	0	1
	No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>JUNIPER and RED CEDAR (Juniperus)</b>					
	Cedar/Apple rust	- Gymnosporangium	1	0	1
	Cultural	- transplant shock	5	0	5
	Environmental stresses		15	1	16
	Inadequate specimen, no disease		9		9
	Insect injury		5	1	6
	Root rot	- Phytophthora	1	0	1
	Twig blight	- Kabatina	3	3	6
<b>KATSURA (Katsura)</b>					
	Canker	- Botryosphaeria	1	0	1
	Environmental	- drought	1	0	1
	Insect injury		1	0	1
<b>LARCH (Larix)</b>					
	Insect injury		1	0	1
<b>LAUREL (Laurus)</b>					
	Environmental stresses		2	0	2
<b>LILAC (Syringa)</b>					
	Cultural	- transplant shock	2	0	2
	Environmental	- freeze	2	0	2
	Insect injury		1	0	1
	Leaf scorch	- unknown	1	1	2
	No disease		1		1
	Powdery mildew	- Microsphaera	5	0	5
<b>LOCUST (Robinia)</b>					
	No disease		1		1
<b>MAGNOLIA (Magnolia)</b>					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	1	2	3
	Environmental stresses		10	0	10
	Insect injury		2	2	4
	Leaf scorch	- drought	1	0	1
	Leaf spot	- fungal	2	2	4
	No disease		4		4
	Powdery mildew	- species	1	0	1
	Sooty mold	- species	2	0	2
	Wilt	- Verticillium	1	0	1
<b>MAHONIA (Mahonia)</b>					
	No disease		1		1

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<b>MAPLE (Acer)</b>					
	Anthracnose	- Discula	0	1	1
		- Kabatiella	4	5	9
	Canker	- Botryosphaeria	1	0	1
	Chemical injury	- growth regulator	2	1	3
		- herbicide	3	2	5
		- unknown	2	0	2
	Cultural	- transplant shock	11	1	12
	Decline	- environmental	7	0	7
		- unknown	8	0	8
	Environmental stresses		28	4	32
	Inadequate specimen, no disease		33		33
	Insect injury		14	4	18
	Leaf drop	- normal	1	0	1
	Leaf scorch	- environmental	1	0	1
		- unknown	2	0	2
	Leaf spot	- Marssonina	2	0	2
		- Phyllosticta	4	1	5
	Lichen	- species	1	0	1
	Nutritional	- iron deficiency	0	2	2
	Sooty mold	- species	0	2	2
	Wilt	- Verticillium	6	0	6
<b>MIMOSA (Albizzia)</b>					
	No disease		1		1
<b>MOUNTAIN ASH (Sorbus)</b>					
	Fire blight	- Erwinia	1	0	1
<b>MULBERRY (Morus)</b>					
	Decline	- unknown	1	0	1
	Leaf spot	- Cercospora	3	0	3
		- Cyindrosporium	1	0	1
	Popcorn disease	- Ciboria	0	1	1
<b>NANDINA (Nandina)</b>					
	Root rot	- Rhizoctonia	1	0	1



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<b>OAK (Quercus)</b>					
	Bacterial scorch	- Xylella	14	0	14
	Canker	- Hypoxylon	2	0	2
	Chemical injury	- growth regulator	11	1	12
		- herbicide	1	0	1
		- unknown	1	1	2
		- transplant shock	1	0	1
	Cultural	- transplant shock	1	0	1
	Decline	- environmental	1	0	1
	Environmental stresses		9	1	10
	Insect injury		57	19	76
	Leaf blister	- Taphrina	1	0	1
	Leaf scorch	- drought	1	0	1
		- unknown	3	0	3
		- Tubakia	2	8	10
	Leaf spot	- cold injury	1	0	1
	No disease		26		26
	Nutritional	- iron deficiency	11	0	11
		- construction	1	0	1
		- squirrel	1	1	2
	Powdery mildew	- species	3	0	3
		- Elsinoe	1	1	2
	Spot anthracnose	- Basidiomycete	1	0	1
	Wood decay				
<b>OSAGE ORANGE (Maclura)</b>					
	Inadequate specimen		1		1
<b>PAGODATREE (Sophora)</b>					
	Canker	- Macrophoma	1	0	1
<b>PEAR (Pyrus)</b>					
	Chemical injury	- growth regulator	1	1	2
		- herbicide	2	0	2
	Cultural	- girdling root	1	0	1
		- transplant shock	1	1	2
	Decline	- unknown	2	0	2
	Environmental stresses		5	2	7
	Fire blight	- Erwinia	41	2	43
	Inadequate specimen, no disease		7		7
	Insect injury		1	1	2
	Leaf scorch	- environmental	1	0	1
		- unknown	1	0	1
	Leaf spot	- Phyllosticta	2	0	2
	Rust	- Gymnosporangium	1	0	1
<b>PERSIMMON (Diospyros)</b>					
	Environmental	- cold injury	1	0	1
	No disease		2		2
<b>PHOTINIA (Photinia)</b>					
	Environmental	- cold injury	1	0	1
	Leaf spot	- Entomosporium	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>PIERIS (Pieris)</b>					
	Leaf spot	- Cercospora	1	0	1
	Insect injury		0	1	1
	No disease		1		1
<b>PINE (Pinus)</b>					
	Brown spot	- Mycosphaerella	3	0	3
	Chemical injury	- road salt	1	0	1
		- unknown	1	0	1
	Cultural	- transplant shock	4	0	4
	Environmental stresses		7	1	8
	Insect injury		11	5	16
	Needle drop	- normal	1	1	1
	No disease		20		20
	Physical injury	- vole	1	0	1
	Pinewood nematode	- Bursaphelencus	2	0	2
	Rust	- Coleosporium	0	1	1
		- Cronartium	1	0	1
	Sooty mold	- species	2	0	2
	Tip blight	- Sphaeropsis	9	0	9
	Tip burn	- unknown	4	0	4
	White pine decline	- environmental	14	0	14
<b>PLUM (Prunus)</b>					
	Black knot	- Apiosporina	6	0	6
	Environmental stresses		1	1	2
	Insect injury		1	0	1
	No disease		1		1
<b>POPLAR (Populus)</b>					
	Insect injury		1	1	2
	No disease		2		2
	Sooty mold	- species	1	0	1
<b>PRIVET (Ligustrum)</b>					
	Cultural	- transplant shock	1	0	1
	Environmental	- cold injury	1	0	1
	No disease		1		1
<b>REDBUD (Cercis)</b>					
	Anthracnose	- Monostichella	1	0	1
	Cultural	- oedema	1	0	1
		- transplant shock	1	0	1
	Environmental	- cold injury	1	0	1
	Leaf spot	- Cercospora	1	0	1
	No disease		1		1
	Wilt	- Verticillium	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>RHODODENDRON and AZALEA (Rhododendron)</b>					
	Crown rot	- Phytophthora	1	0	1
	Cultural	- improper depth	1	0	1
		- transplant shock	8	0	8
	Dieback	- Botryosphaeria	9	0	9
	Environmental stresses		6	3	9
	Inadequate specimen, no disease		13		13
	Insect injury		15	2	17
	Leaf/flower gall	- Exobasidium	1	0	1
	Leaf spot	- fungal	1	1	2
		- Pestalotia	0	1	1
	Nutritional	- iron deficiency	1	0	1
		- nitrogen deficiency	1	0	1
	Root rot	- Phytophthora	4	0	4
		- Rhizoctonia	1	0	1
<b>ROSE (Rosa)</b>					
	Black spot	- Diplocarpon	3	0	3
	Chemical injury	- herbicide	1	0	1
	Crown gall	- Agrobacterium	1	0	1
	Cultural	- transplant shock	0	1	1
	Environmental	- stress	1	0	1
	Insect injury		7	1	8
	No disease		8		8
	Nutritional	- general	1	0	1
	Powdery mildew	- Sphaerotheca	3	1	4
	Stem canker	- Coniothyrium	1	0	1
	Virus	- Rose mosaic	2	0	2
		- Rose rosette	12	0	12
<b>SERVICEBERRY (Amelanchier)</b>					
	Cultural	- transplant shock	2	0	2
	Leaf spot	- Entomosporium	1	0	1
<b>SMOKETREE (Cotinus)</b>					
	Wilt	- Verticillium	2	0	2
<b>SOURWOOD (Oxydendrum)</b>					
	No disease		1		1
<b>SPIREA (Spirea)</b>					
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	No disease		3		3

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>SPRUCE (Picea)</b>					
	Canker	- Leucostoma	1	0	1
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	2	0	2
	Dieback	- unknown	1	0	1
	Environmental stresses		17	2	19
	Inadequate specimen, no disease		23		23
	Insect injury		11	2	13
	Lichen	- species	1	0	1
	Needle cast	- Rhizosphaera	2	2	4
<b>SWEETGUM (Liquidambar)</b>					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	1	0	1
	Leaf spot	- Phyllosticta	1	0	1
		- Tubakia	1	0	1
	No disease		4		4
<b>SYCAMORE (Platanus)</b>					
	Anthracnose	- Apiognomonina	1	0	1
	Environmental	- stress	1	1	2
	Insect injury		0	1	1
	Powdery mildew	- Microsphaera	1	0	1
<b>TAXUS (Taxus)</b>					
	Chemical	- growth regulator	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		7	0	7
	Inadequate specimen, no disease		12		12
	Nutritional	- acid soil	1	0	1
		- pH high	0	1	1
	Root rot	- Phytophthora	1	0	1
<b>TREE-TOMATO (Cyphomandra)</b>					
	No disease		1		1
<b>TULIPTREE (Liriodendron)</b>					
	Air pollution	- ozone	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	0	1	1
	Environmental stresses		3	1	4
	Insect injury		5	2	7
	Leaf spot	- fungal	1	0	1
	No disease		1		1
	Nutritional	- iron deficiency	1	0	1
	Physical injury	- unknown	1	0	1
	Powdery mildew	- species	2	1	3
	Sooty mold	- species	0	2	2
	Tar spot	- Rhytisma	2	0	2
	Wilt	- Verticillium	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>VIBURNUM (Viburnum)</b>					
	Chemical injury	- herbicide	1	0	1
	Collar rot	- Phytophthora	1	0	1
	Environmental	- stress	1	0	1
	Inadequate specimen, no disease		3		3
	Insect injury		3	0	3
	Root problem	- unknown	1	0	1
	Root rot	- Pythium	1	0	1
		- Rhizoctonia	0	1	1
	Southern blight	- Sclerotium	1	0	1
<b>WALNUT (Juglans)</b>					
	Anthraco nose	- Gnomonia	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Decline	- unknown	1	0	1
	Insect injury		1	2	3
	Leaf spot	- Cylindrocladium	2	0	2
<b>WILLOW (Salix)</b>					
	Canker	- Botryosphaeria	3	0	3
	Cultural	- transplant shock	1	0	1
	Environmental stresses		2	0	2
	Insect injury		1	0	1
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Cercospora	1	0	1
		- Septoria	1	0	1
	No disease		2		2
	Root problem	- unknown	0	1	1
	Sooty mold	- species	1	0	1
<b>YELLOWWOOD (Cladrastis)</b>					
	Anthraco nose	- Discula	3	0	3
	Bacterial scorch	- Xylella	1	0	1
	Leaf scorch	- unknown	1	0	1

<b>CROP</b>	<b>DIAGNOSIS</b>	<b>CAUSAL AGENT</b>	<b>#1° DIAGs</b>	<b>#2° DIAGs</b>	<b>TOTAL</b>
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**VEGETABLES**

**ARRUGALA (Arrugala)**

Inadequate specimen			1		1
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**ASPARAGUS (Asparagus)**

No disease			1		1
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**BEAN (Phaseolus)**

Angular leaf spot	- Isariopsis		3	0	3
Anthracnose	- Colletotrichum		3	0	3
Bacterial spot	- Pseudomonas		1	0	1
Chemical injury	- growth regulator		1	0	1
	- herbicide		1	0	1
Common blight	- Xanthomonas		1	0	1
Environmental stresses			5	0	5
Inadequate specimen, no disease			7		7
Nutritional	- general		1	0	1
	- zinc deficiency		1	0	1
Root rot	- Fusarium		0	1	1
Root/stem rot	- Pythium		2	0	2
	- Rhizoctonia		3	0	3
Rust	- Uromyces		1	0	1

**BROCCOLI - See listing under CRUCIFERS**

**CABBAGE - See listing under CRUCIFERS**

**CANTALOUPE - See listing under CUCURBITS**

**COLLARD - See listing under CRUCIFERS**

**CORN, SWEET (Zea)**

Anthracnose	- Colletotrichum		1	0	1
Chemical injury	- herbicide		2	0	2
	- unknown		1	0	1
Genetic	- no ear		1	0	1
Inadequate specimen, no disease			3		3
Insect injury			3	0	3
Leaf spot	- fungal		0	1	1
Nutritional	- fertilizer burn		1	1	2
	- general		1	0	1
	- phosphorus		1	1	2
	- potassium		1	0	1
	- zinc deficiency		6	1	7
Southern leaf blight	- Cochliobolus		0	1	1
Stewart's wilt	- Erwinia		2	0	2
Virus	- complex		0	1	1
	- maize dwarf mosaic		1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
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**CRUCIFERS - BROCCOLI, CABBAGE, CAULIFLOWER, KALE, COLLARD and TURNIP (Brassica)**

Anthracnose	- Colletotrichum	1	0	1
Bacterial leaf spot	- Pseudomonas	1	1	2
Bacterial soft rot	- Erwinia	1	0	1
Black rot	- Xanthomonas	3	0	3
Chemical injury	- herbicide	1	0	1
Cultural	- oedema	1	0	1
	- spiral root	1	0	1
Environmental stresses		2	2	4
Insect injury		1	1	2
Leaf spot	- Alternaria	1	1	2
	- Cercospora	2	0	2
	- Pseudocercospora	2	0	2
No disease		7		7
Nutritional	- acid soil	1	0	1
	- boron deficiency	1	0	1
	- nitrogen deficiency	2	0	2
Physical injury	- unknown	1	0	1
Root rot	- Pythium	1	0	1
Wire stem	- Rhizoctonia	4	1	5
Virus	- complex	0	1	1
	- Turnip mosaic	0	1	1

**CUCUMBER - See listing under CUCURBITS**

**CUCURBITS - CANTALOUPE, CUCUMBER, MELON (Cucumis), PUMPKIN, SQUASH, GOURD (Cucurbita) and WATERMELON (Citrullis)**

Angular leaf spot	- Pseudomonas	1	0	1
Anthracnose	- Colletotrichum	5	0	5
Bacterial soft rot	- Erwinia	0	2	2
Bacterial wilt	- Erwinia	32	0	32
Black root rot	- Thielaviopsis	1	0	1
Blight	- Microdochium	11	0	11
	- Phytophthora	4	0	4
Chemical injury	- herbicide	5	3	8
	- unknown	1	0	1
Downy mildew	- Pseudoperonospora	1	0	1
Environmental stresses		5	1	6
Fruit rot	- Alternaria	1	0	1
	- Fusarium	2	0	2
Inadequate specimen, no disease		26		26
Insect injury		2	1	3
Leaf blight	- Alternaria	1	0	1
Leaf spot	- Cercospora	1	0	1
Nutritional	- manganese toxicity	1	0	1
Pollination problem	- unknown	1	0	1
Root knot nematode	- Meloidogyne	0	2	2
Root rot	- Fusarium	1	0	1
	- Phytophthora	1	1	2
	- Pythium	1	1	2
Virus	- complex	1	0	1
	- Poty	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>KALE - See listing under CRUCIFERS</b>					
<b>MELON, honeydew - See listing under CUCURBITS</b>					
<b>OKRA (Hibiscus)</b>					
	Bacterial leaf spot	- bacterial	1	0	1
	Black root rot	- Thielaviopsis	1	0	1
	Chemical injury	- herbicide	1	0	1
		- unknown	1	0	1
	No disease		2		2
	Root/Stem rot	- Rhizoctonia	1	0	1
<b>ONION (Allium)</b>					
	Black mold	- Aspergillus	1	0	1
	Chemical injury	- herbicide	1	0	1
<b>PEA (Pisum)</b>					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- oedema	1	0	1
	Insect injury		1	0	1
	No disease		3		3
	Root/Stem rot	- Rhizoctonia	1	1	2
<b>PEPPER (Capsicum)</b>					
	Anthracnose	- Colletotrichum	2	0	2
	Bacterial canker	- Clavibacter	2	1	3
	Bacterial soft rot	- Erwinia	0	1	1
	Bacterial spot	- Xanthomonas	12	2	14
	Blight	- Phytophthora	3	0	3
	Chemical injury	- herbicide	1	0	1
	Damping-off	- Rhizoctonia	1	1	2
	Environmental stresses		8	0	8
	Flecking	- unknown	1	0	1
	Fruit rot	- Alternaria	0	2	2
	Inadequate specimen, no disease		8		8
	Insect injury		2	1	3
	Leaf spot	- Phyllosticta	1	0	1
	Physical injury	- unknown	5	0	5
	Poor germination	- environmental	1	0	1
	Root/stem rot	- Fusarium	1	0	1
		- Pythium	3	1	4
		- Rhizoctonia	4	0	4
	Southern blight	- Sclerotium	1	0	1
	Variegation	- genetic	1	0	1
	Virus	- Alfalfa mosaic	3	1	4
		- Cucumber mosaic	2	0	2
		- Potyvirus	0	1	1
		- Tobacco mosaic	0	2	2
		- Tomato spotted wilt	4	0	4
		- Tospo	1	1	2



<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<b>POTATO (Solanum)</b>					
	Bacterial soft rot	- Erwinia	1	0	1
	Blackleg	- Erwinia	1	1	2
	Chemical injury	- herbicide	1	0	1
	No disease		2		2
	Scab	- Streptomyces	3	0	3
<b>PUMPKIN - See listing under CUCURBITS</b>					
<b>RHUBARB (Rheum)</b>					
	Crown rot	- Erwinia	1	0	1
<b>SQUASH - See listing under CUCURBITS</b>					
<b>SWEET POTATO (Ipomoea)</b>					
	No disease		1		1
	Scurf	- Monilochaetes	2	0	2
<b>TOMATO (Lycopersicon)</b>					
	Air pollution	- ethylene	0	1	1
	Anthracnose	- Colletotrichum	1	0	1
	Bacterial canker	- Clavibacter	13	0	13
	Bacterial speck	- Pseudomonas	3	0	3
	Bacterial spot	- Xanthomonas	13	2	15
	Bacterial wilt	- Pseudomonas	1	0	1
	Blossom end rot	- calcium deficiency/dry	7	1	8
	Buckeye rot	- Phytophthora	3	0	3
	Canker	- Botrytis	1	0	1
	Catfacing	- environmental	1	2	3
	Chemical injury	- growth regulator	11	1	12
		- herbicide	14	1	15
		- unknown	2	1	3
	Early blight	- Alternaria	12	4	16
	Environmental stresses		7	1	8
	Fruit rot	- Alternaria	1	0	1
	Growth crack	- environmental	0	1	1
	Inadequate specimen, no disease		34		34
	Insect injury		7	5	12
	Leaf roll	- physiological	2	0	2
	Leaf spot	- Septoria	21	1	22
	Nutritional	- fertilizer burn	1	0	1
		- general	2	0	2
		- magnesium deficiency	2	1	3
		- nitrogen deficiency	3	0	3
		- phosphorus deficiency	0	1	1
		- potassium deficiency	1	0	1
		- soluble salts	0	1	1
	Physical injury	- unknown	1	0	1
	Physiological	- internal white tissue	1	0	1
		- rain check	1	0	1
		- yellow shoulder	2	0	2
	Physical injury	- unknown	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
	Physiological	- internal white tissue	1	0	1
		- rain check	1	0	1
		- yellow shoulder	2	0	2
	Pith necrosis	- Pseudomonas	1	0	1
	Powdery mildew	- Oidium	1	0	1
	Root knot nematode	- Meloidogyne	2	1	3
	Root rot	- Fusarium	1	1	2
		- Pythium	1	1	2
		- Rhizoctonia	1	0	1
	Southern blight	- Sclerotium	2	1	3
	Stem canker	- Rhizoctonia	1	0	1
	Stem rot	- Fusarium	3	0	3
		- Sclerotinia	1	0	1
	Virus	- Cucumber mosaic	2	0	2
		- Impatiens necrotic spot	0	1	1
		- Tomato mosaic	1	1	2
		- Tomato spotted wilt	10	1	11
		- unknown	1	0	1
	Walnut wilt	- juglone	4	0	4
	Wilt	- Fusarium	7	1	8

**TURNIP - See listing under CRUCIFERS**

**WATERMELON - See listing under CUCURBITS**

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**TOTALS** **4060** **617** **4677**