



COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF KENTUCKY • COLLEGE OF AGRICULTURE



Plant Diseases in Kentucky

**Plant Disease Diagnostic Laboratory
Summary**

1999

by:

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TABLE OF CONTENTS

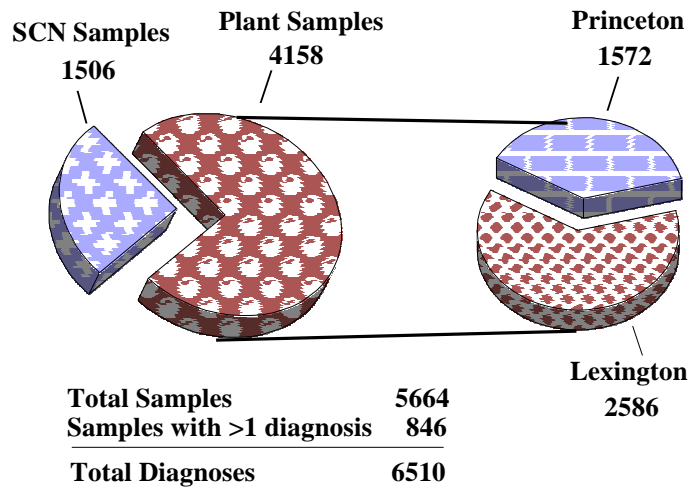
INTRODUCTION	2
HIGHLIGHTS	2
ACKNOWLEDGMENTS	6
EXPLANATORY REMARKS	6
SUMMARY TABLES	
Table 1. Summary of diagnoses by crop category and causal agent type	7
Table 2. Summary of biotic problems by crop category	8
Table 3. Number of plant specimens by crop category	8
Table 4. Summary of diagnoses by crop category and crop	9
Table 5. Summary of samples received by grower type and crop group	10
Table 6. Number of samples referred for diagnosis	11
Table 7. Special laboratory tests performed	12
Table 8. Number of specimens received by county and crop category (KY and out-of-state sources)	13
Table 9. Summary of specialists and diagnosticians making primary diagnoses and consultations	15
DIAGNOSIS OF INDIVIDUAL SAMPLES BY CROP AND DISEASE/DISORDER	
Agronomic crops	16
Corn	16
Forages	16
Soybeans	17
Small grains	18
Tobacco	19
Fruit crops	21-23
Small fruits	21
Tree fruits	22
Herbs	23
Identifications	24
Miscellaneous	25
Ornamentals	26-44
Herbaceous Ornamentals and Indoors Plants	26
Turfgrass	32
Woody Ornamentals	34
Vegetables	45-49

INTRODUCTION

The Plant Disease Diagnostic Laboratory (Lexington and Princeton) handled 4158 plant samples and 1506 nematode soil samples during 1999. Samples with more than one problem numbered 846, bringing the total number of actual diagnoses to 6511. The Lexington Laboratory diagnosed 2586 specimens. The Princeton Laboratory's specimens totaled 3058; of this number 1572 were plant samples and 1507 were soil samples submitted exclusively for soybean cyst nematode analysis. A total of 899 of the nematode samples were submitted by researchers and 607 were submitted by commercial growers through the county Extension offices, Total Ag Services of KY, Precision Ag Services of KY, or through a program funded by the Kentucky Soybean Association.

These numbers are summarized in Figure 1 below:

Disease Diagnostic Plant Laboratory - 1999



HIGHLIGHTS

Weather:

After a relatively mild winter, the 1999 growing season in Kentucky was very dry. For the 26-week growing season (April 1 - October 1), 21 weeks received below normal rainfall and the rainfall deficit statewide averaged about 9 inches. Some stations recorded deficits of over 13 inches, receiving less than half of the 25 inches of rain which would normally fall during the growing season. Although drought was a season-long problem, progressing from severe to extreme in the central and eastern regions of the state, the months of July, August, and September were especially dry; indeed; they were the driest reported in Kentucky for the past century. Exacerbating the drought, 18 of the 26 weeks of the growing season recorded above normal temperatures, and some weeks were as much as 8-10 degrees (F) above normal.

Tobacco:

The incidence of Blue Mold was down dramatically over the very high number in 1998. A 24c, Special Local Needs Supplement to the national label, was granted for the field use of the fungicide "Acrobat MZ" on April 30. Black Shank (*Phytophthora parasitica* var. *nicotianae*) samples were up significantly over the high levels seen in 1998 and 1997 and the link with infection by the fungus, *Rhizoctonia*, continues to be seen. Over 300 isolates of the Black Shank fungus were and are still

being tested for race and 'metalaxyl' sensitivity. Fusarium Wilt Complex was a big problem this year due to the drought stress and the lack of resistance of most of the varieties planted. For the first time in four years the number of cases of Tomato Spotted Wilt virus were up dramatically. Samples with aphid-borne virus complex in burley were once again very low due to the widespread planting of resistant varieties, especially 'Tennessee 90'. In the float production system, samples with Pythium Root Rot (*Pythium* spp.) continued at a high level because of the lack of available fungicides and poor sanitary practices. Target Spot (*Rhizoctonia solani*), Rhizoctonia Root/Stem Rot (*Rhizoctonia solani*), and Collar Rot (*Sclerotinia sclerotiorum*) were also seen but at more moderate levels.

Other agronomic crops:

Corn diseases were relatively few with 2 samples infected with Maize Dwarf Mosaic virus and 3 samples with Gray Leaf Spot (*Cercospora zea-maydis*) maintaining the trend of the last two years. Samples with ear/kernel rots were down significantly. Soybean diseases were again very low and Stem Canker (*Diaporthe phaseolorum*) samples were non-existent reversing the trend of the last two years. There were also no samples of Sudden Death (*Fusarium solani*, stain A), down from the elevated levels of 1998. Soybean Cyst Nematode (*Heterodera glycines*) still remains the major yield-limiting disease factor in the majority of soybean producing acreage. Problems in small grain, primarily wheat, were at very low levels, but there were more samples with Barley Yellow Dwarf virus than any year since 1995. Only one sample was found with Fusarium Head Blight. Leaf Complex (*Septoria tritici* and *Stagonospora nodorum*), and Glume Blotch (*Stagonospora nodorum*) levels were even lower than the low levels seen in the last five years. Forages showed an increase in the number of Crown and Stem Canker (*Rhizoctonia* sp.) samples.

Fruit and Vegetable Disease Observations:

Tree Fruit diseases:

Although spring weather in Kentucky was not particularly rainy, the brief showers that did occur were well-timed for the cedar rusts (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, *G. globosum*). Rust susceptible apples showed significant cedar-apple rust leaf spots and calyx-end fruit infections caused by cedar-quince rust. Showers during bloom were sufficient to initiate primary infections of fire blight in most parts of the state; considerable secondary shoot infections ensued on susceptible apples and pears. Lack of continued rain and long leaf wetness periods reduced the incidence and severity of apple scab (*Venturia inaequalis*) and fruit diseases such as 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. The "Show-Me" and "Spectrum Watchdog" orchard weather stations with leaf wetness monitors, used for plant disease management, were used by a Scott County grower in the apple IPM program and for fruit defects research at the U.K. Horticultural Research Farm in Lexington.

Small fruit diseases:

Grape black rot (*Guignardia bidwellii*) was prevalent early in the season. Strawberry leaf spot (*Mycosphaerella fragariae*) occurred early and black root rot (*Rhizoctonia solani*), occurring later, enhanced vulnerability of strawberries to drought. Systemic orange rust (*Gymnoconia nitens*) was damaging to blackberries in some locations.

Vegetable diseases:

TMV (Tomato Mosaic Virus) and INSV (Impatiens Necrotic Spot Virus) were found in tomato and pepper transplants. Usually, the virus came from other plants being grown in the same greenhouse. For example, TMV came from “heirloom” varieties being grown for transplants in the same house as the commercial tomato varieties. Similarly, INSV developed as a result of vegetable transplants being produced in the same greenhouse with virus-susceptible ornamental plants.

Tomatoes in commercial plantings were infected by bacterial canker (*Clavibacter michiganensis*) and some fungal diseases such as early blight (*Alternaria solani*) Septoria leaf spot (*Septoria lycopersici*), and timber rot (*Sclerotinia sclerotiorum*). Gray mold (*Botrytis cinerea*) and leaf mold (*Cladosporium fulvum*) were observed on Kentucky greenhouse tomatoes.

Peppers developed bacterial leaf spot (*Xanthomonas campestris* pv. *vesicatoria*), but less than in rainy seasons. Where used, resistant varieties have greatly reduced the disease potential.

Pumpkins and other cucurbits are becoming more popular in Kentucky, and their diseases continue to be economically important. Microdochium blight (*Microdochium* sp.) was found at serious levels. Powdery mildew, caused by two different fungi, (*Sphaerotheca fuliginea* or *Erysiphe cichoracearum*) is serious every year. For the first time in Kentucky, the more common of the two fungi, *S. fuliginea* was found to be resistant to Benlate; this occurrence is in addition to Bayleton resistance which was already present. Downy mildew (*Pseudoperonospora cubensis*) was present in some fields in the fall. Fusarium (*Fusarium* sp.) fruit rots were a common, but difficult to diagnose problem this year.

Southern blight (*Sclerotium rolfsii*) was more commonly observed this year on vegetables such as beans, potatoes, pumpkins, and tomatoes. The laboratory has also uncovered several complex root and stem rots and wilt diseases involving the fungus *Fusarium* on peppers, pumpkins, and tomatoes (and tobacco), especially where transplants are used.

Sweet corn bacterial top and stalk rot (*Erwinia chrysanthemi* pathovar. *zeae*) was found in some commercial fields.

The laboratory has been conducting a survey of the viruses infecting commercial vegetables in Kentucky for the past several years. Using ELISA tests, a broad range of virus diseases were found; no new viruses were detected in 1999. 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.

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. By then, it may be too late to do anything about it, or in some cases to correctly diagnose the sequence of diseases that may have led to the final outcome. Growers need to consult consistently 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:

Deciduous tree diseases: Although spring weather in Kentucky was not particularly rainy, the brief showers that did occur were well-timed for the cedar rusts (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, *G. globosum*). Rust-susceptible crabapples showed significant leaf spots and hawthorn fruits were heavily infected with cedar-quince rust. Showers during flowering pear and crabapple bloom in most of Kentucky were sufficient to initiate primary and then heavy secondary fire blight infections. Flowering crabapple scab (*Venturia inaequalis*) and the various shade tree anthracnose fungi were much less active because of the drought. This was one of the few years that one could observe fall color of scab-susceptible flowering crabapples because they finally retained their leaves. Dogwood powdery mildew (*Microsphaera*, *Phyllactinia* spp.), a disease which has become important in recent years, was not very serious in many landscapes; the weather was apparently so dry that high relative humidity levels needed for infection did not exist much of the time. Bacterial leaf scorch (*Xylella fastidiosa*) was easily detected visually in late summer because of the increased water stress imposed by the drought. Branch dieback continues to follow many years of bacterial leaf scorch symptoms in large, mature pin oaks. Verticillium wilt appeared on maples and catalpa.

Needle evergreen tree diseases: Maturing Austrian and Scots pines continue to die from tip blight (*Sphaeropsis sapinea*) and pine wilt nematode (*Bursaphelenchus xylophilus*). White pine root decline (*Verticicladiella procera*) continues to be a problem in Christmas tree and landscape plantings. White pine decline (associated with soils having high clay content, high pH levels, heavy compaction, or with root disturbance) continues to take its toll.

Shrub diseases: Black root rot (*Thielaviopsis basicola*) of hollies remains a problem. Rhododendrons facing environmental stresses such as cold, heat, drought, or poor soils showed cankers (*Botryosphaeria dothidea* and others) which caused wilt and branch dieback. Azalea leaf and flower gall (*Exobasidium vaccinii*) was common in spring.

Perennial and annual plant diseases: Black root rot (*Thielaviopsis basicola*) of annuals such as petunias and pansies was a problem in many flower beds in spring and again in fall. Southern blight (*Sclerotium rolfsii*) was more commonly observed this year on Hosta, Portulaca, Rudbeckia, and Vinca. Stem rot (*Rhizoctonia solani*) also affected landscape flowers.

Landscape lawn diseases: Many lawns were killed by the dry weather; many communities imposed bans on lawn watering. Yellow patch and southern blight appeared on *Poa annua* turfgrasses, but perennial ryegrass gray leaf spot (*Pyricularia grisea*) did not appear; additional cases of DMI-resistant bentgrass dollar spot were documented.

Disease Monitoring:

In addition to the day to day diagnosis of samples, monitoring of several organisms and the diseases they cause are conducted by the diagnostic laboratory during the year. 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

Two technicians within the department of Plant Pathology continued to make significant contributions. Shari Dutton was working with the specialists in Lexington providing laboratory support for special research projects and demonstrations until she transferred to the Department of Horticulture in February 2000. Shari and her diligent work ethic will be sorely missed. As the technician in charge of performing all soybean cyst nematode extractions and counting, Debbie Morgan has been dutifully carrying out her responsibilities since 1985 when the Nematode Laboratory was moved from Lexington to Princeton. In the fall of 1999, Debbie transferred to Regulatory Services; she will be sorely missed as well.

Ed Dixon, our new research technician in Lexington, joined us in April, 1999. Ed worked most recently as a Biologist for the Ricerca Company located near Cleveland, Ohio developing fungicides, insecticides, nematocides and microbial pesticides. Before that, he worked as a Forestry Technician for the USDA Forest Service in Athens, Georgia.

Colette Laurent starting working part-time with soybean cyst nematode samples in the fall of 1999. Jill Howard provided very capable, part-time assistance in the Lexington Laboratory this past year.

Thanks also go to Tom Priddy, Ag. Engineering - Meteorology, for providing the summary of weather conditions for 1999.

Support from the Kentucky Integrated Pest Management program for supplemental funding of additional diagnostic testing and part-time laboratory assistance 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 1999. Their services ranged from making actual diagnoses to providing answers to 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 DIAGNOSES¹ BY CROP CATEGORY AND CAUSAL AGENT TYPE.**

Crop Category	Abiotic Problems	Biotic² Problems	Chemical Injury	Inadequate Specimen	Insect Injury	Other³	Total Diagnoses
<u>Agronomic</u>							
Corn	56	16	16	6	14	26	134
Forages	9	15	0	1	0	3	28
Rapeseed (Canola)	0	0	0	0	0	0	0
Small grains	26	40	3	2	0	8	79
Soybeans	22	1445*	10	2	3	99*	1581
Tobacco	402	1353	159	35	23	111	2083
<u>Fruit</u>							
Small fruit	18	48	2	3	9	15	95
Tree fruit	25	141	5	3	28	17	219
<u>Herbs</u>							
	3	11	1	0	2	1	18
<u>Identification</u>							
	0	43	0	3	0	0	46
<u>Ornamentals</u>							
Herbaceous and							
Houseplants	51	129	20	6	23	46	275
Turfgrass	21	81	1	4	0	39	146
Woody	476	284	61	39	215	265	1340
<u>Vegetables</u>							
	64	180	58	35	39	72	448
<u>Miscellaneous</u>							
	1	10	0	0	0	7	18
<u>Total</u>	1174	3796	336	139	356	709	6510

¹ All counts and totals include primary diagnoses plus secondary diagnoses.

² Refer to Table 2 for a further breakdown of this category.

³ "Other" includes the causal agent categories: No disease and Unknown.

* Samples at the Nematode Analysis Laboratory in Princeton. 2351 with SCN; 412 without SCN.

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

Crop Category	Bacterial	Fungal	Nematode	Virus	Other¹
<u>Agronomic</u>					
Corn	4	10	0	2	0
Forages	0	15	0	0	0
Rapeseed (Canola)	0	0	0	0	0
Small grains	0	13	0	27	0
Soybeans	0	26	1418	1	0
Tobacco	15	1175	2	161	0
<u>Fruit</u>					
Small fruit	0	47	0	1	0
Tree fruit	53	87	0	0	1
<u>Herbs</u>					
	0	11	0	0	0
<u>Identification</u>					
	0	19	0	0	24
<u>Ornamentals</u>					
Herbaceous and Houseplants	13	114	0	2	0
Turfgrass	0	80	0	0	1
Woody	32	240	6	4	2
<u>Vegetables</u>					
	45	106	2	27	0
<u>Miscellaneous</u>					
	0	3	7	0	0
Total	162	1946	1435	225	28

¹ 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**

Crop Category	Number of Specimens	Percentage of Total Specimens
Agronomic (-Tobacco)	261	6.3
Tobacco	1581	38.0
Fruit	274	6.6
Herbs	14	0.3
Identifications	46	1.1
Ornamentals	1566	37.7
Vegetables	398	9.6
Miscellaneous	18	0.4
Total Specimens	4158	100.0

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

Crop Category and Crop	Number of Primary Diagnoses¹	Number of Secondary Diagnoses²	Total Diagnoses³
<u>Agronomic</u>			
Corn	113	21	134
Forages	22	6	28
Rapeseed (Canola)	0	0	0
Small grains	63	16	79
Soybeans	1569	12	1581
Tobacco	1581	502	2083
<u>Fruit</u>			
Small fruit	83	12	95
Tree fruit	191	28	219
<u>Herbs</u>			
	14	4	18
<u>Identification</u>			
	46	0	46
<u>Ornamentals</u>			
Herbaceous and Houseplants	248	27	275
Turfgrass	132	14	146
Woody	1186	154	1340
<u>Vegetables</u>			
	398	50	448
<u>Miscellaneous</u>			
	18	0	18
<u>Total</u>			
	5664	846	6510

¹ The number of primary diagnoses corresponds to the number of different specimens examined.

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

³ 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.

Crop Group	Grower Type							
	Commercial		Homeowner		Research		Institution	
	Ext ¹	Non-Ext ²	Ext ¹	Non-Ext ²	Ext ¹	Non-Ext ²	Ext ¹	Non-Ext ²
<u>Grain</u>								
Corn	98	10	0	0	2	3	0	0
Forages	19	3	0	0	0	0	0	0
Small grains	54	7	0	0	0	2	0	0
Soybeans	653	16	0	0	0	900	0	0
Tobacco	1518	57	0	0	0	6	0	0
<u>Fruit</u>								
Small Fruit	15	1	61	4	0	1	1	0
Tree Fruit	32	2	142	12	1	1	1	0
<u>Herbs</u>								
	3	1	8	0	0	2	0	0
<u>Identifications</u>								
	1	1	37	3	0	1	3	0
<u>Ornamental</u>								
Herbaceous and								
Houseplants	77	11	142	8	0	4	5	1
Turfgrass	45	10	62	0	0	4	7	4
Woody	78	7	1013	43	1	6	30	8
<u>Vegetable</u>								
	145	3	220	7	3	20	0	0
<u>Miscellaneous</u>								
	11	0	7	0	0	0	0	0
<u>Total</u>	2747	129	1692	77	7	950	47	13
<u>Total/Grower Type</u>	2878		1769		957		60	

Total number of samples received = 5664

Ext = Extension samples submitted via County Extension Agents or Extension Specialists.

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.***

Department, Facility or outside agency	Crop Category					Total
	Agronomic	Fruit	Ornamental	Vegetable	Other	
AgDia, Inc.	32	0	2	24	0	58
Agronomy Department	68	1	3	2	1	75
Entomology Department	13	9	42	7	3	74
Horticulture Department	0	0	8	5	2	15
Regulatory Services	0	0	1	0	0	1
					<u>Total</u>	223
					<u>Total number of plant samples</u>	4158
					<u>Percent of plant samples referred outside Diagnostic Lab for diagnosis</u>	5.4

* 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.**

Test	Number of Cases
Culturing	71
Enzyme-linked Immunosorbent Assay (ELISA)	57
Incubation	822
Indicator plants	3
Nematode extraction (total = 1526)	
Miscellaneous	11
Pinewood nematode	9
Soybean cyst nematode	1506
Soil tests (total = 369)	
Alkalinity	5
pH	217
Saturated Media Extract/pH	3
Soluble salts	14
pH/Soluble Salts	130
Tissue Test (total = 3)	
Quick Nitrate Test	2
Quick Nitrate/ Soluble Salts	1

Table 8.

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

COUNTY	Total	Agronomic¹	Tobacco	Fruit	Ornamental	Vegetable	Other
ADAIR	3	3	0	0	0	0	0
ALLEN	24	0	12	1	5	6	0
ANDERSON	12	0	10	0	1	0	1
BALLARD	16	4	9	0	3	0	0
BARREN	25	2	12	0	9	2	0
BATH	41	2	24	1	11	3	0
BELL	21	0	0	3	16	2	0
BOONE	39	0	10	1	18	9	0
BOURBON	41	0	23	0	16	2	0
BOYD	11	0	0	2	9	1	1
BOYLE	42	3	18	2	19	0	0
BRACKEN	9	0	6	0	3	0	0
BREATHITT	26	0	9	1	7	9	0
BRECKINRIDGE	109	5	62	12	24	3	3
BULLITT	45	0	11	5	24	4	1
BUTLER	30	6	13	1	6	3	1
CALDWELL	89	14	29	9	23	10	4
CALLOWAY	97	8	55	0	28	6	0
CAMPBELL	21	0	4	1	15	1	0
CARLISLE	35	2	12	6	10	4	1
CARROLL	21	0	7	0	12	2	0
CARTER	39	0	20	1	16	2	0
CASEY	16	1	7	3	2	3	0
CHRISTIAN	96	9	25	16	43	4	0
CLARK	59	0	46	1	11	1	0
CLAY	13	1	8	0	0	4	0
CLINTON	29	0	22	2	4	1	0
CRITTENDEN	31	3	0	6	12	7	3
CUMBERLAND	11	0	4	1	1	5	0
DAVIESS	227	13	54	19	80	59	2
EDMONSON	21	1	12	2	3	3	0
ELLIOTT	7	0	2	1	4	0	0
ESTILL	28	0	20	2	4	2	0
FAYETTE	355	10	55	14	244	22	10
FLEMING	25	0	15	1	7	1	1
FLOYD	9	0	0	2	7	0	0
FRANKLIN	75	1	21	5	40	7	1
FULTON	4	2	0	0	1	1	0
GALLATIN	10	0	8	1	0	1	0
GARRARD	6	0	5	0	1	0	0
GRANT	19	0	13	0	6	0	0
GRAVES	71	8	32	14	15	12	0
GRAYSON	8	0	3	0	3	1	1
GREEN	22	0	19	3	0	0	0
GREENUP	7	0	0	0	7	0	0
HANCOCK	36	1	24	5	5	1	0
HARDIN	50	0	18	1	27	3	1
HARLAN	1	0	0	0	1	0	0
HARRISON	18	1	12	0	2	0	3
HART	23	3	10	4	3	3	0
HENDERSON	65	14	9	9	25	6	0
HENRY	38	1	24	0	9	4	0
HICKMAN	0	0	0	0	0	0	0
HOPKINS	30	5	6	3	13	2	1
JACKSON	30	1	9	7	8	2	3
JEFFERSON	60	0	1	0	51	4	4
JESSAMINE	42	1	24	2	12	1	2
JOHNSON	0	0	0	0	0	0	0
KENTON	31	0	6	1	23	0	1
KNOTT	0	0	0	0	0	0	0
KNOX	17	0	8	1	6	2	0

COUNTY	Total	Agronomic ¹	Tobacco	Fruit	Ornamental	Vegetable	Other
LARUE	32	4	17	1	8	2	0
LAUREL	25	0	9	1	14	0	1
LAWRENCE	6	0	3	0	2	1	0
LEE	4	1	3	0	0	0	0
LESLIE	12	0	0	3	8	1	0
LETCHER	9	0	0	2	4	3	0
LEWIS	17	1	13	0	1	2	0
LINCOLN	14	0	7	0	5	2	0
LIVINGSTON	19	0	0	2	15	1	1
LOGAN	47	3	27	6	10	1	0
LYON	17	1	8	2	5	1	0
McCRACKEN	46	3	6	3	24	9	1
McCREARY	8	0	0	2	4	2	0
McLEAN	13	5	6	0	2	0	0
MADISON	53	0	23	1	25	3	1
MAGOFFIN	0	0	0	0	0	0	0
MARION	42	0	20	2	16	4	0
MARSHALL	70	2	8	7	48	5	0
MARTIN	1	0	0	0	1	0	0
MASON	17	0	11	0	5	1	0
MEADE	53	4	12	8	27	2	0
MENIFEE	10	1	5	0	1	4	0
MERCER	21	2	8	0	6	5	0
METCALFE	9	1	4	0	4	0	0
MONROE	12	0	8	0	1	2	1
MONTGOMERY	51	0	31	0	14	3	3
MORGAN	25	0	13	1	4	7	0
MUHLENBERG	15	0	4	0	8	2	1
NELSON	36	3	13	1	14	5	0
NICHOLAS	13	0	12	0	1	0	0
OHIO	10	1	6	0	2	1	0
OLDHAM	19	0	3	0	13	3	0
OWEN	20	0	18	1	1	0	0
OWSLEY	9	0	4	0	4	1	0
PENDELTON	3	1	1	0	1	0	0
PERRY	4	0	3	1	0	0	0
PIKE	2	0	0	0	2	0	0
POWELL	4	0	2	1	1	0	0
PULASKI	66	5	11	5	34	9	2
ROBERTSON	1	0	0	1	0	0	0
ROCKCASTLE	16	0	12	0	2	1	1
ROWAN	24	0	10	1	11	2	0
RUSSELL	25	0	7	2	8	8	0
SCOTT	33	0	10	1	9	13	0
SHELBY	133	9	43	9	61	10	1
SIMPSON	35	3	17	2	10	3	0
SPENCER	30	2	16	1	10	1	0
TAYLOR	31	7	14	1	5	4	0
TODD	89	15	47	2	18	6	1
TRIGG	45	5	20	4	15	1	0
TRIMBLE	17	0	16	0	1	0	0
UNION	24	14	0	2	5	2	1
WARREN	135	15	36	13	55	7	9
WASHINGTON	28	2	11	4	9	2	0
WAYNE	92	9	45	1	18	12	7
WEBSTER	34	9	12	3	9	1	0
WHITLEY	21	0	5	4	8	4	0
WOLFE	8	1	6	0	0	0	1
WOODFORD	38	5	12	2	15	3	1
Out-of-State	71	3	55	1	8	4	0
TOTALS	4158	261	1581	274	1566	398	78

¹ 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 ¹	Consultations ²
LEXINGTON			
Anderson, RG	Horticulture	4	18
Beale, JW (Diagnostician)	Plant Pathology	2137	5
Bessin, RT	Entomology	17	6
Bitzer, MJ	Agronomy	11	0
Durham, RE	Horticulture	0	2
Fountain, WM	Horticulture	3	7
Ghabrial, SA	Plant Pathology	1	0
Green, JD	Agronomy	16	15
Hartman, JR	Plant Pathology	115	32
Henning, JC	Agronomy	0	1
McNiel, RE	Horticulture	0	2
Nesmith, WC	Plant Pathology	81	164
Palmer, GK	Agronomy	56	5
Pearce, RC	Agronomy	1	5
Potter, MF	Entomology	0	1
Powell, AJ	Agronomy	2	0
Rowell, AB	Horticulture	3	9
Strang, JG	Horticulture	1	9
Townsend, LH	Entomology	39	14
Vincelli, PC	Plant Pathology	108	19
Wells, KL	Agronomy	0	1
Witt, WW	Horticulture	1	2
PRINCETON			
Bachi, PR (Diagnostician)	Plant Pathology	1215	188
Brown, GR	Horticulture	10	7
Dunwell, WC	Horticulture	37	32
Herbek, JH	Agronomy	5	7
Hershman, DE	Plant Pathology	43	14
Johnson, DW	Entomology	8	7
Lacefield, GD	Agronomy	3	3
Martin, JR	Agronomy	64	22
Murdock, LW	Agronomy	37	9
Maksymowicz, WC	Agronomy	137	23
Rasnake, M	Agronomy	3	3

¹ The specialist or diagnostician signing the Plant Diagnostic Form was considered the primary diagnoser.

² 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.

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
AGRONOMIC CROPS					
CORN (Zea)					
	Bacterial soft rot	- Erwinia	0	1	1
	Bacterial top rot	- Erwinia	1	0	1
	Chemical injury	- herbicide	13	0	13
		- unknown	3	0	3
	Ear/Kernel rots	- Fusarium	1	1	2
	Environmental	- stresses	21	6	27
	Gray leaf spot	- Cercospora	3	0	3
	Inadequate specimen, no disease		32		32
	Insect injury		10	4	14
	Nutritional	- acid soil	10	0	10
		- fertilizer burn	1	1	2
		- magnesium deficiency	1	0	1
		- manganese toxicity	0	2	2
		- nitrogen deficiency	1	1	2
		- phosphorus deficiency	1	1	2
		- potassium deficiency	1	1	2
		- zinc deficiency	7	1	8
	Root rot	- Fusarium	1	1	2
		- Rhizoctonia	1	0	1
	Seedling blight	- fungal	1	0	1
	Rust, common	- Puccinia	1	0	1
	Stewart's wilt	- Erwinia	1	1	2
	Virus	- Maize dwarf mosaic	2	0	2
FORAGES					
ALFALFA (Medicago)					
	Charcoal rot	- Macrophomina	1	0	1
	Crown/root rot	- Fusarium	0	1	1
		- Rhizoctonia	1	0	1
	Crown/stem rot	- Sclerotinia	4	0	4
	Environmental stresses		3	3	6
	Inadequate specimen, no disease		3		3
	Insect injury		0	1	1
	Leaf spot, common	- Pseudopeziza	0	1	1
		- Leptosphaerulina	1	0	1
	Nutritional	- acid soil	1	0	1
	Rust	- Uromyces	1	0	1
	Stem canker	- Rhizoctonia	3	0	3
CLOVER (Trifolium)					
	Environmental stresses		1	1	2
	Powdery mildew	- Erysiphe	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
HAY					
	No disease		1		1
MILLET (Setaria)					
	Gray leaf spot	- Pyricularia	1	0	1
<u>SOYBEAN</u>					
SOYBEAN (Glycine)					
	Brown spot	- Septoria	3	0	3
	Charcoal rot	- Macrophomina	1	1	2
	Chemical injury	- herbicide, growth reg.	9	1	10
	Cultural	- planted too deep	1	0	1
	Environmental stresses		7	5	12
	Frogeye	- Cercospora	1	0	1
	Inadequate specimen, no disease		9		9
	Insect injury		2	1	3
	Nutritional	- acid soil	0	1	1
		- manganese deficiency	3	0	3
		- potassium deficiency	3	1	4
	Root problem	- unknown	1	0	1
	Root rot	- Fusarium	1	0	1
		- unknown	1	0	1
	Root/stem rot	- Rhizoctonia	14	1	15
	Soybean cyst nematode - on plant samples		3	1	3
	Heterodera	* in soil samples	1414		1414
		* absent in soil samples	92		92
	(*soil submitted to Nematode Analysis Laboratory)				
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Fusarium	2	0	2
	Virus	- Soybean mosaic	1	0	1

SMALL GRAINS

OAT (Avena)					
No disease			2		2
Virus	- Barley yellow dwarf		1	0	1
RYE (Secale)					
Chemical injury	- herbicide		1	0	1
Environmental	- stress		1	0	1
Virus	- Barley yellow dwarf		1	0	1
SORGHUM (Sorghum)					
Chemical injury	- unknown		0	1	1
No disease			1		1
Seed decay	- Pythium		1	0	1
WHEAT (Triticum)					
Chemical injury	- herbicide		0	1	1
Cultural	- sowed too thick		1	0	1
Downy Mildew	- Sclerophthora		1	1	2
Environmental stresses			13	4	17
Flecking	- physiological		0	2	2
Head blight	- Fusarium		1	0	1
Leaf spot	- Septoria		0	1	1
Inadequate specimen, no disease			7		7
Moldy head	- Cladosporium		1	0	1
Nutritional	- acid soil		1	0	1
	- nitrogen deficiency		3	1	4
Powdery mildew	- Erysiphe		1	0	1
Take-all	- Gaeumannomyces		5	0	5
Virus	- Barley yellow dwarf		16	2	18
	- Wheat spindle streak mosaic		4	3	7

TOBACCO

TOBACCO (Nicotiana)

Angular leaf spot	- Pseudomonas	5	1	6	
Black root rot	- Thielaviopsis	6	1	7	
Black shank	- Phytophthora	279	231	510	
Blackleg	- Erwinia	3	5	8	
Blue mold	- Peronospora	49	2	51	
Brown spot	- Alternaria	4	1	5	
Chemical injury	- antibiotic	1	1	2	
	- burn	3	0	3	
	- disinfectant	3	0	3	
	- fertilizer burn	2	1	3	
	- fungicide	8	0	8	
	- growth regulator	26	2	28	
	- herbicide	68	4	72	
	- unknown	41	2	43	
	Collar rot	- Sclerotinia	3	0	3
	Cultural	- various problems	46	7	53
Damping-off	- Rhizoctonia	4	2	6	
Early flowering	- environmental	1	0	1	
Environmental	- cold injury	18	3	21	
	- compaction	7	5	12	
	- drought	1	0	1	
	- freeze injury	1	0	1	
	- heat injury	0	2	2	
	- lightning	3	0	3	
	- weather scald	12	7	19	
	- others	27	9	36	
	False broomrape	- unknown	1	0	1
	Frenching	- metabolites	2	0	2
Frogeye	- Cercospora	12	4	16	
Hollow stalk	- Erwinia	1	0	1	
Inadequate specimen, no disease		144		144	
Insect injury		16	7	23	
Leaf scorch	- unknown	2	0	2	
Nutritional	- acid soil	27	38	65	
	- alkalinity	2	0	2	
	- boron deficiency	0	1	1	
	- fertilizer burn	5	1	6	
	- general	7	1	8	
	- magnesium deficiency	1	0	1	
	- manganese toxicity	52	4	56	
	- nitrogen deficiency	9	3	12	
	- potassium deficiency	19	6	25	
	- phosphorus deficiency	24	0	24	
	- pH high	0	1	1	
	- soluble salts	7	3	10	
	- temp. phosphorus def.	13	2	15	
Physical injuries		1	1	2	

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
	Physiological	- leaf breakdown	6	0	6
		- leaf spot	2	0	2
		- oedema	2	2	4
	Root knot nematode	- Meloidogyne	0	2	2
	Root problem	- unknown	3	1	4
	Root rot	- fungal	0	1	1
		- Pythium	105	15	120
		- Rhizoctonia	2	0	2
	Root/stem rot	- Pythium	4	0	4
		- Rhizoctonia	0	5	5
	Soft rot	- Pythium	1	2	3
	Soreshin	- Rhizoctonia	159	48	207
	Stem girdling	- Rhizoctonia	3	0	3
	Stem rot	- Fusarium	132	17	149
	Target spot	- Rhizoctonia	27	14	41
	Variegation	- genetic	1	0	1
	Virus	- Alfalfa mosaic	13	1	14
		- Cucumber mosaic	2	0	2
		- complex	5	0	5
		- Potato virus Y	0	1	1
		- Tobacco etch	1	0	1
		- Tobacco mosaic	4	0	4
		- Tobacco ringspot	6	3	9
		- Tobacco streak	15	5	20
		- Tomato mosaic	0	2	2
		- Tomato spotted wilt	88	15	103
	Weather fleck	- ozone	3	2	5
	Wilt	- Fusarium	34	8	42

FRUIT CROPS

SMALL FRUITS

BLUEBERRY (*Vaccinium*)

Cultural	- deep mulch	0	1	1
Environmental	- stress	1	0	1
Leaf scorch	- environmental	1	0	1
Leaf spot	- fungal	1	0	1
Mummy berry	- Monilinia	1	0	1
No disease		1		1

BRAMBLES - BLACKBERRY, and RASPBERRY (*Rubus*)

Anthracnose	- Elsinoe	1	1	2
Chemical injury	- herbicide	1	0	1
Cultural	- transplant shock	1	0	1
Environmental stresses		0	2	2
Gray mold	- Botrytis	0	1	1
Inadequate specimen, no disease		5		5
Insect injury		1	1	2
Leaf spot	- Phyllosticta	1	0	1
	- Septoria	0	1	1
	- Sphaerulina	2	0	2
Physiological	- white drupelet	3	0	3
Pollination problem	- unknown	1	0	1
Root problem	- unknown	1	0	1
Root rot	- Phytophthora	1	0	1
Rust, orange	- Gymnoconia	3	0	3
Virus	- sterility	1	0	1
Wilt	- Verticillium	1	0	1

GRAPE (*Vitis*)

Black rot	- Guignardia	16	1	17
Cane blight/spot	- Phomopsis	1	0	1
Cultural	- transplant shock	0	1	1
Environmental	- stress	1	1	2
Insect injury		4	1	5
No disease		5		5
Nutritional	- magnesium deficiency	1	0	1
	- manganese deficiency	1	0	1
	- unknown	1	0	1

STRAWBERRY (*Fragaria*)

Anthracnose	- Colletotrichum	1	0	1
Black root rot	- Rhizoctonia	5	0	5
Chemical injury	- growth regulator	1	0	1
Inadequate specimen, no disease		7		7
Insect injury		2	0	2
Leaf blight	- Phomopsis	1	0	1
Leaf spot	- Mycosphaerella	4	1	5
Powdery mildew	- Sphaerotheca	1	0	1
Red stele	- Phytophthora	1	0	1
Root problem	- unknown	1	0	1
Southern blight	- Sclerotium	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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TREE FRUITS

APPLE (Malus)

Bitter rot	- Glomerella	4	1	5
Black rot	- Botryosphaeria	2	1	3
Blotch	- Phyllosticta	1	0	1
Burr knot	- physiological	1	0	1
Canker	- Botryosphaeria	1	0	1
Cedar apple rust	- Gymnosporangium	22	5	27
Chemical injury	- growth regulator	0	1	1
	- herbicide	1	0	1
	- unknown	2	0	2
Collar rot	- Phytophthora	1	0	1
Environmental	- sunscald	1	0	1
Fire blight	- Erwinia	44	0	44
Flyspeck	- Schizothyrium	0	2	2
Frogeye	- Botryosphaeria	2	1	3
Inadequate specimen, no disease		5		5
Insect injury		5	3	8
Physical injury	- rodent	0	1	1
Powdery mildew	- Oidium	1	0	1
Root problem	- unknown	1	0	1
Sooty blotch	- Gloeodes	1	0	1
Southern blight	- Sclerotium	1	0	1
Thread blight	- Corticium	1	0	1
Wood decay	- Basidiomycete	1	0	1

BANANA (Musa)

No disease		1		1
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CHERRY (Prunus)

Bacterial blight	- Pseudomonas	1	0	1
Black knot	- Dibotryon	1	0	1
Cultural	- transplant shock	1	0	1
Dieback	- unknown	1	0	1
Environmental	- stress	0	1	1
Insect injury		1	0	1
Leaf spot	- Cocomyces	2	0	2
No disease		4		4
Nutritional	- manganese deficiency	0	1	1
	- nitrogen deficiency	1	0	1

KIWI (Actinidia)

Insect injury		1	0	1
Leaf scorch	- unknown	1	0	1

PAWPAW (Asimina)

Environmental	- stress	0	1	1
Leaf spot	- Alternaria	1	0	1
Stem rot	- Fusarium	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
PEACH and NECTARINE (Prunus)					
	bacterial canker	- Pseudomonas	1	0	1
	Brown rot	- Monilinia	9	0	9
	Canker	- Leucostoma	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		2	1	3
	Inadequate specimen, no disease		5		5
	Insect injury		8	1	9
	Leaf curl	- Taphrina	3	0	3
	Nutritional	- nitrogen deficiency	1	0	1
	Physical injury	- unknown	0	1	1
	Scab	- Fusicladium	5	4	9
PEAR (Pyrus)					
	Cultural	- transplant shock	1	0	1
	Environmental stresses		1	2	3
	Fire blight	- Erwinia	10	0	10
	Insect injury		2	0	2
PECAN (Carya)					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	2	0	2
	Insect injury		4	0	4
	No disease		1		1
	Physiological	- internal breakdown	1	0	1
	Powdery mildew	- Microsphaera	1	0	1
PLUM (Prunus)					
	Black knot	- Apiosporina	7	0	7
	brown rot	- Monilinia	1	0	1
	Inadequate specimen, no disease		2		2
	Insect injury		2	0	2
HERBS					
ECHINACEA (Echinacea)					
	No disease		3		3
GINSENG (Panax)					
	Blight	- Alternaria	1	0	1
GOLDENSEAL (Hydrastis)					
	Environmental	- stress	1	0	1
	Leaf spot	- Botrytis	0	1	1
	Root/stem rot	- Rhizoctonia	1	1	2
		- unknown	1	0	1
LAMB'S EAR (Stachys)					
	Insect injury		1	0	1
	Root rot	- Pythium	0	1	1
	Stem rot	- Fusarium	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
LAVENDER (Lavandula)					
	Root rot	- Rhizoctonia	1	0	1
MINT (Mentha)					
	Air pollution	- ozone	1	0	1
	Insect injury		0	1	1
	Rust	- Puccinia	1	0	1
OREGANO (Origanum)					
	Slime mold	- species	1	0	1
ROSEMARY (Rosemarinus)					
	Root rot	- Pythium	1	0	1
SAGE (Salvia)					
	Nutritional	- fertilizer burn	1	0	1
SWEET WOODRUFF (Galium)					
	Root rot	- Pythium	1	0	1

IDENTIFICATIONS

FUNGAL IDENTIFICATION

Agaricus	- campestris	1	1
Agrocybe	- pediades	1	1
Basidiomycete	- species	1	1
Calvatia	- gigantea	1	1
Cyathus	- striatus	1	1
Fomes	- pini	1	1
Ganaderma	- lucidium	1	1
Gyrodon	- meruliodes	1	1
Inadequate specimen		3	3
Leucoagaricus	- naucina	1	1
Mutinus	- caninus	1	1
	- species	1	1
Psilocybe	- coprophila	1	1
Slime mold	- species	7	7
LICHEN	- species	1	1

PLANT IDENTIFICATIONS

Celtis	- occidentalis	1		1
Chaenomeles	- species	1		1
Cocculus	- carolinus	1		1
Conopholis	- americana	1		1
Cretagus	- phaenopyrum	1		1
Cucurbita	- maxima	1		1
	- pepo	1		1
Eriobotrya	- japonica	1		1
Hoya	- motoskei	1		1
Kerria	- japonica	1		1
Liverwort	- species	1		1
Malus	- species	1		1
Pancirus	- trifoliata	1		1
Pyrus	- species	1		1
Rosa	- species	1		1
Rubus	- idaeobatus	1		1
Solanum	- carolinense	1		1
Tilia	- americana	1		1
Viburnum	- juddi	1		1
	- opulus	1		1
Vitis	- labrusca	1		1
Zoysia	- species	1		1

MISCELLANEOUS

MAY-APPLE (Podophyllum)

Rust	- Puccinia	1	0	1
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MORNING GLORY (Ipomoea)

White rust	- Albugo	1	0	1
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SOIL

No disease		6		6
Nutritional	- acid soil	1	0	1
Root knot nematode	- Meloidogyne	1	0	1

UNKNOWN

No disease		1		1
Wood decay	- Basidiomycete	1	0	1

ORNAMENTALS

HERBACEOUS ORNAMENTALS and INDOOR PLANTS

ACHILLEA (Achillea)					
	Nutritional	- fertilizer burn	1	0	1
AFRICAN VIOLET (Saintpaulia)					
	Bacterial soft rot	- Erwinia	1	0	1
	Insect injury		1	0	1
	No disease		1		1
	Root rot	- Pythium	1	0	1
AJUGA (Ajuga)					
	No disease		1		1
	Southern blight	- Sclerotium	1	0	1
ANTHERIUM (Antherium)					
	No disease		1		1
ASTER (Aster)					
	Chemical injury	- growth regulator	1	0	1
	Environmental	- stress	1	0	1
	No disease		1		1
	Nutritional	- fertilizer burn	1	0	1
	Root rot	- Rhizoctonia	2	0	2
ASTILBE (Astilbe)					
	Chemical injury	- growth regulator	1	0	1
	Insect injury		1	0	1
	Leaf scorch	- environmental	1	0	1
BALLOON-FLOWER (Platycodon)					
	Root rot	- Rhizoctonia	1	0	1
BEGONIA (Begonia)					
	Environmental	- sunscald	1	0	1
	Inadequate specimen		1		1
	Nutritional	- chlorine toxicity	1	0	1
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Rhizoctonia	1	0	1
BENJAMIN FIG (Ficus)					
	Environmental	- stress	0	1	1
	Leaf spot	- fungal	1	0	1
BERGENIA (Bergenia)					
	Anthracnose	- Colletotrichum	1	0	1
	Chemical injury	- growth regulator	0	1	1
BLACK-EYED SUSAN (Rudbeckia)					
	Southern blight	- Sclerotium	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
BROMELIAD (unknown)					
	Insect injury		1	0	1
BRUGMANSIA (Dicentra)					
	Stem rot	- Fusarium	1	0	1
CALLA-LILY (Zantedeschia)					
	Bacterial soft rot	- Erwinia	1	0	1
CHRYSANTHEMUM (Chrysanthemum)					
	Chemical injury	- herbicide	1	0	1
	No disease		2		2
	Leaf spot	- Pseudomonas	1	0	1
	Nutritional	- acid soil	1	0	1
		- general	0	1	1
		- pH high	3	0	3
	Root rot	- Pythium	6	0	6
	Root/stem rot	- Rhizoctonia	3	1	4
COLEUS (Coleus)					
	Blight	- Botrytis	1	0	1
	Chemical injury	- herbicide	1	0	1
COREOPSIS (Coreopsis)					
	Downy Mildew	- Plasmopara	1	0	1
DAHLIA (Dahlia)					
	Chemical injury	- herbicide	1	0	1
DAPHNE (Daphne)					
	No disease		1		1
DAYLILY (Hemerocallis)					
	Chemical injury	- herbicide	1	0	1
	Stem rot	- Rhizoctonia	2	0	2
DIANTHUS (Dianthus)					
	Stem rot	- Alternaria	1	0	1
		- Fusarium	2	0	2
DRACAENA (Dracaena)					
	No disease		2		2
	Physical injury	- unknown	1	0	1
FERN (various)					
	Cultural	- insufficient water	1	0	1
	No disease		1		1
FICUS (Ficus)					
	Insect injury		2	0	2
	Root rot	- Rhizoctonia	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
FLAX (Camelina)					
	Powdery mildew	- species	1	0	1
FOXGLOVE (Digitalis)					
	Insect injury		1	0	1
FUCHSIA (Fuchsia)					
	Black root rot	- Thielaviopsis	1	0	1
GARDENIA (Gardenia)					
	Root rot	- Pythium	1	0	1
GERANIUM (Pelargonium)					
	Bacterial blight	- Xanthomonas	5	0	5
	Blackleg	- Pythium	3	2	5
	Chemical injury	- fungicide	1	0	1
	Cultural	- oedema	0	1	1
	Environmental	- stress	1	0	1
	Inadequate specimen, no disease		3		3
	Nutritional	- fertilizer burn	1	0	1
		- iron toxicity	5	0	5
		- general	1	0	1
	Root rot	- Rhizoctonia	2	0	2
GERMANDER (Teucrium)					
	Environmental	- stress	1	0	1
GLADIOLUS (Gladiolus)					
	Insect injury		1	0	1
	No disease		2		2
GOMPHRENA (Gomphrena)					
	Chemical injury	- herbicide	1	0	1
	No disease		1		1
HEPTAPLEURUM (Heptapluerum)					
	Insect injury		1	0	1
HOSTA (Hosta)					
	Cultural	- transplant shock	1	0	1
	Environmental	- stresses	3	0	3
	Inadequate specimen, no disease		4		4
	Insect injury		1	0	1
	Southern blight	- Sclerotium	1	0	1
IMPATIENS (Impatiens)					
	Chemical injury	- herbicide	2	0	2
	Crown rot	- Rhizoctonia	5	3	8
	Cultural	- overwatering	3	0	3
	Insect injury		2	0	2
	No disease		1		1
	Slime mold	- species	1	0	1
	Virus	- Impatiens necrotic spot	2	0	2

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IRIS (Iris)					
	Bacterial soft rot	- Erwinia	1	0	1
	Environmental	- freeze injury	1	0	1
IVY (Hedera and others)					
	Bacterial spot	- Xanthomonas	1	0	1
	Leaf spot	- Colletotrichum	1	0	1
		- Guignardia	1	0	1
	No disease		2		2
	Root rot	- fungal	1	0	1
		- Pythium	1	0	1
JASMINE (Jasminum)					
	No disease		1		1
LARKSPUR (Delphinium)					
	Black leg	- Erwinia	1	0	1
LILY (Lilium)					
	Cultural	- overwatering	1	0	1
	Insect injury		1	0	1
LILY-OF-THE-VALLEY (Convallaria)					
	No disease		1		1
LIRIOPE (Liriope)					
	No disease		1		1
MANDAVILLA (Mandavilla)					
	No disease		1		1
MARIGOLD (Tagetes)					
	Blight	- Botrytis	0	1	1
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
	Cultural	- overwatering	0	1	1
	Insect injury		1	0	1
	No disease		1		1
	Nutritional	- acid soil	1	0	1
		- iron toxicity	1	0	1
		- nitrogen deficiency	0	1	1
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Rhizoctonia	1	0	1
MOCK-STRAWBERRY (Duchesnea)					
	Rust	- Frommeella	1	0	1
MONARDA (Monarda)					
	No disease		1		1
NARCISSUS (Narcissus)					
	Blight	- Botrytis	1	0	1

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ORCHID (various)					
	Antracnose	- Colletotrichum	2	0	2
	No disease		1		1
PACHYSANDRA (Pachysandra)					
	Leaf/stem blight	- Pseudonectria	3	0	3
PALM (various)					
	Chemical injury	- unknown	1	0	1
PANSY (Viola)					
	Black root rot	- Thielaviopsis	3	0	3
	Blight	- Botrytis	1	0	1
	Downy mildew	- Peronospora	1	0	1
	No disease		3		3
	Root rot	- Pythium	1	0	1
PASSION FLOWER (Passiflora)					
	Insect injury		1	1	2
PENNISETUM (Pennisetum)					
	No disease		1		1
PEONY (Paeonia)					
	Anthracnose	- Gloeosporium	1	0	1
	Bud blast	- physiological	1	1	2
	Environmental	- cold injury	1	0	1
	Gray mold	- Botrytis	2	0	2
	Insect injury		1		1
	Red spot	- Cladosporium	1	0	1
	Stem rot	- Rhizoctonia	1	0	1
PETUNIA (Petunia)					
	Black root rot	- Thielaviopsis	1	0	1
	Blight	- Botrytis	1	0	1
	Chemical injury	- growth regulator	2	0	2
	Cultural	- high temperature	1	0	1
	Environmental	- stress	1	0	1
	Inadequate specimen, no disease		4		4
	Insect injury		1	0	1
	Nutritional	- fertilizer burn	2	0	2
		- soluble salts	0	1	1
	Powdery mildew	- Oidium	1	0	1
	Stem rot	- Rhizoctonia	5	2	7
PHILODENDRON (Philodendron)					
	Environmental	- sunscald	1	0	1
	No disease		1		1
PHLOX (Phlox)					
	Bacterial spot	- Xanthomonas	1	0	1
	Root rot	- Rhizoctonia	1	0	1
	Stem rot	- Fusarium	1	0	1

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POINSETTIA (Euphorbia)					
	Environmental	- stress	1	0	1
	No disease		1		1
	Root rot	- Pythium	4	1	5
	Root/stem rot	- Rhizoctonia	1	1	2
PORTULACA (Portulaca)					
	Southern blight	- Sclerotium	1	0	1
PRIMROSE (Primula)					
	Bacterial spot	- Pseudomonas	1	0	1
RUDBECKIA (Rudbeckia)					
	Chemical injury	- growth regulator	1	0	1
	Environmental	- drought	1	0	1
	No disease		1		1
SALVIA (Salvia)					
	Inadequate specimen, no disease		2		2
SCAVEOLA (Scaveola)					
	Chemical injury	- herbicide	1	0	1
SCHIEFLERA (Brassaia)					
	Cultural	- oedema	1	0	1
	Insect injury		3	2	5
STREPTOCARUS (Streptocarpus)					
	No disease		3		3
	Root rot	- Pythium	1	0	1
TOMATO TREE (Cyphomandra)					
	Inadequate specimen		1		1
UNKNOWN					
	Chemical injury	- herbicide	1	0	1
VALERIAN (Valeriana)					
	Southern blight	- Sclerotium	1	0	1
VERONICA (Veronica)					
	Charcoal blight	- Macrophomina	1	0	1
	No disease		1		1
	Stem rot	- Rhizoctonia	1	0	1

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VINCA (Vinca)					
	Aerial blight	- Phytophthora	1	0	1
	Canker/dieback	- Phoma	4	0	4
	Chemical injury	- unknown	1	0	1
	Crown rot	- Rhizoctonia	3	0	3
	Environmental	- stress	1	0	1
	Leaf stem blight	- Alternaria	1	2	3
	No disease		2		2
	Root rot	- Pythium	1	1	2
	Root/stem rot	- Rhizoctonia	0	2	2
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Fusarium	1	0	1
ZINNIA (Zinnia)					
	No disease		2		2
<u>TURFGRASS</u>					
BENTGRASS (Agrostis)					
	Brown patch	- Rhizoctonia	1	0	1
	Dollar spot	- Lanzia/Moell	4	0	4
	Environmental	- stress	4	0	4
		- wet feet	1	0	1
	Inadequate specimen, no disease		20		20
	Pink snow mold	- Microdochium	2	0	2
	Root rot	- Pythium	2	0	2
	Southern blight	- Sclerotium	2	0	2
	Summer patch	- Magnaporthe	2	0	2
	Yellow patch	- Rhizoctonia	2	2	4
BERMUDAGRASS (Cynodon)					
	Environmental	- drought	1	0	1
	Inadequate specimen, no disease		3		3
	Large patch	- Rhizoctonia	0	1	1
	Leaf blight	- Bipolaris	1	0	1
	Root rot	- Bipolaris	1	0	1
	Spring dead spot	- fungal	1	0	1
		- Leptosphaeria	1	0	1
	Stolon rot	- Bipolaris	0	1	1
BLUEGRASS (Poa)					
	Anthracnose	- Colletotrichum	1	0	1
	Blight	- Nigrospora	1	0	1
	Brown patch	- Rhizoctonia	3	0	3
	Environmental	- drought	0	2	2
	Necrotic ring spot	- Leptosphaeria	1	0	1
	No disease		3		3
	Nutritional	- soluble salts	1	0	1
	Physical injury	- rodent	1	0	1
	Southern blight	- Sclerotium	1	0	1
	Summer patch	- Magnaporthe	6	0	1
	Yellow patch	- Rhizoctonia	1	0	1

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FESCUE (Festuca)					
	Anthracnose	- Colletotrichum	1	0	1
	Brown patch	- Rhizoctonia	11	2	13
	Chemical injury	- unknown	1	0	1
	Cultural	- fermenting bark	1	0	1
	Environmental stresses		6	0	6
	No disease		4		4
	Necrotic ring spot	- Leptosphaeria	2	0	2
	Nutritional	- fertilizer burn	1	0	1
	Red thread	- Laetisaria	1	1	2
	Root rot	- Pythium	1	1	2
	Rust	- Puccinia	1	0	1
	Slime mold	- species	2	0	2
	Stripe rust	- Ustilago	0	1	1
	Summer patch	- Magnaporthe	1	0	1
RYEGRASS (Lolium)					
	Anthracnose	- Colletotrichum	2	0	2
	Brown patch	- Rhizoctonia	2	0	2
	No disease		5		5
	Pink snow mold	- Microdochium	1	0	1
TURF (unspecified)					
	Anthracnose	- Colletotrichum	0	1	1
	Blight	- Nigrospora	0	1	1
	Brown patch	- Rhizoctonia	2	0	2
	Cultural	- heavy thatch	2	0	2
	Environmental	- drought	2	0	2
	Inadequate specimen, no disease		6		6
	Loose smut	- Ustilago	1	0	1
	Necrotic ring spot	- Leptosphaeria	2	0	2
	Rust	- Puccinia	1	0	1
	Slime mold	- species	3	0	3
ZOYSIA (Zoysia)					
	Environmental	- drought	1	0	1
	No disease		2		2

WOODY ORNAMENTALS

ALMOND (Prunus)					
Insect injury			1	0	1
ARBORVITAE (Thuja)					
Cultural	- transplant shock		2	3	5
Environmental stresses			4	1	5
Insect injury			6	0	6
Needle drop	- normal		0	1	1
No disease			7		7
Root rot	- Phytophthora		1	0	1
	- Rhizoctonia		0	1	1
ASH (Fraxinus)					
Anthracnose	- Apiognomonina		3	0	3
Chemical injury	- growth regulator		1	0	1
	- herbicide		1	0	1
Environmental stresses			2	0	2
Insect injury			2	0	2
No disease			3		3
AZALEA - See listing under RHODODENDRON					
BALD CYPRESS (Taxodium)					
Insect injury			1	0	1
BARBERRY (Berberis)					
Black root rot	- Thielaviopsis		1	0	1
Cultural	- transplant shock		1	0	1
Environmental	- stress		3	0	3
No disease			3		3
BAYBERRY (Myrica)					
Environmental	- wet feet		1	0	1
BEARBERRY (Arctostaphylos)					
Cultural	- transplant shock		1	0	1
BEECH (Fagus)					
Cultural	- transplant shock		1	0	1
Insect injury			2	0	2
No disease			1		1
BIRCH (Betula)					
Cultural	- transplant shock		2	0	2
Environmental	- stress		2	0	2
Insect injury			4	0	4
Leaf scorch	- unknown		1	0	1
Leaf spot	- Cryptocline		1	0	1
	- Marssonina		1	0	1
No disease			3		3
Nutritional	- general		1	0	1

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BOXELDER (Acer)					
	Insect injury		1	0	1
BOXWOOD (Buxus)					
	Canker	- Pseudonectria	2	0	2
	Cultural	- transplant shock	2	1	3
	Environmental stresses		3	0	3
	Inadequate specimen, no disease		3		3
	Insect injury		2	0	2
	Leaf spot	- Macrophoma	1	0	1
	Root problem	- unknown	1	0	1
	Twig blight	- Macrophoma	0	1	1
CATALPA (Catalpa)					
	Wilt	- Verticillium	2	0	2
CHAMAECYPARIS (Chamaecyparis)					
	Environmental	- stress	3	0	3
	No disease		1		1
CHERRY (Prunus)					
	Black knot	- Dibotryon	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	2	1	3
	Environmental stresses		3	0	3
	Insect injury		6	0	6
	Leaf curl	- Taphrina	1	0	1
	No disease		2		2
	Wood decay	- Basidiomycete	1	0	1
CHERRYLAUREL (Prunus)					
	Environmental	- stress	1	0	1
	Leaf spot	- fungal	0	1	1
CLEMATIS (Clematis)					
	No disease		2		2
CORK TREE (Phellodendron)					
	No disease		1		1
CRABAPPLE (Malus)					
	Cedar/Apple rust	- Gymnosporangium	2	3	5
	Chemical injury	- herbicide	1	0	1
	Environmental	- stress	1	0	1
	Fire blight	- Erwinia	7	0	7
	Frogeye	- Botryosphaeria	1	0	1
	Insect injury		5	1	6
	Lichen	- species	1	0	1
	No disease		2		2
	Physical injury	- steam lines	1	0	1
	Scab	- Venturia	1	0	1

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CRAPEMYRTLE (Lagerstroemia)					
	Environmental	- cold injury	1	0	1
	Powdery mildew	- Erysiphe	1	0	1
CYPRESS (Cupressocyparis)					
	Environmental	- sunscald	2	0	2
	Inadequate specimen		1	0	1
DOGWOOD (Cornus)					
	Anthracnose	- Discula	1	0	1
	Canker	- Cryptodiaporthe	1	0	1
	Chemical injury	- growth regulator	2	0	2
		- herbicide	1	0	1
		- unknown	1	0	1
	Cultural	- transplant shock	4	2	6
	Decline	- unknown	2	0	2
	Environmental stresses		9	3	12
	Gall	- Phomopsis	1	0	1
	Insect injury		1	1	2
	Leaf scorch	- unknown	5	0	5
	Powdery mildew	- Oidium	13	6	19
	Spot anthracnose	- Elsinoe	2	0	2
DOUGLAS FIR (Pseudotsuga)					
	No disease		2		2
ELM (Ulmus)					
	Black spot	- Stegophora	3	0	3
	Canker	- Botryodiplodia	1	0	1
		- Sphaeropsis	1	0	1
	Dutch elm disease	- Ceratocystis	3	0	3
	Inadequate specimen, no disease		6		6
	Insect injury		2	1	3
EUONYMUS (Euonymus)					
	Environmental	- stress	1	0	1
	Insect injury		3	1	4
	No disease		1		1
	Powdery mildew	- Microsphaera	2	1	3
FILBERT and HAZELNUT (Corylus)					
	No disease		2		2
FIR (Abies)					
	Environmental stresses		2	0	2
	Insect injury		0	1	1
	No disease		1		1
	Tip blight	- Sphaeropsis	1	0	1
FORSYTHIA (Forsythia)					
	Chemical injury	- growth regulator	1	0	1
	Gall	- Phomopsis	1	0	1
	No disease		1		1

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FOTHERGILLA (Fothergilla)	No disease		1		1
FRANKLINIA (Franklinia)	No disease		1		1
FRINGETREE (Chionanthus)	Cultural	- transplant shock	1	0	1
GINKO (Ginko)	Leaf scorch	- environmental	1	0	1
	Wood decay	- Basidiomycete	1	0	1
GOLDENRAINTREE (Koelreuteria)	No disease		1		1
GOOSEBERRY (Actinidia)	No disease		1		1
HAWTHORN (Crataegus)	Cedar-quince rust	- Gymnosporangium	3	0	3
	Cultural	- transplant shock	1	0	1
	Insect injury		1	0	1
HEMLOCK (Tsuga)	Chemical injury	- unknown	1	0	1
	Crown rot	- Phytophthora	1	2	3
	Cultural	- transplant shock	3	0	3
	Environmental stresses		5	0	5
	No disease		4		4
HEPTACODIUM (Heptacodium)	No disease		1		1
HIBISCUS (Hibiscus)	Chemical injury	- growth regulator	2	0	2
	Environmental	- cold injury	1	0	1
	Insect injury		2	0	2
	No disease		1		1
HICKORY (Carya)	Environmental	- stress	1	0	1
	Inadequate specimen		1		1
	Insect injury		2	0	2
HOLLY and INKBERRY (Ilex)	Black root rot	- Thielaviopsis	19	0	19
	Chemical injury	- growth regulator	1	0	1
	Cultural	- improper depth	2	0	2
		- transplant shock	7	0	7
		- wet feet	1	0	1
	Environmental stresses		5	8	13
	Inadequate specimen, no disease		29		29

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HOLLY and INKBERRY (Ilex) (cont)					
	Insect injury		4	0	4
	Leaf drop	- normal	1	0	1
	Leaf spot	- fungal	2	0	2
		- Phyllosticta	2	0	2
		- unknown	2	0	2
	Nutritional	- iron deficiency	1	0	1
	Root problem	- unknown	2	0	2
	Root rot	- Rhizoctonia	0	1	1
	Sooty mold	- species	0	1	1
HONEYLOCUST (Gleditsia)					
	Insect injury		1	0	1
HONEYSUCKLE (Lonicera)					
	Chemical injury	- herbicide	1	0	1
	Inadequate specimen		1		1
	Powdery mildew	- Oidium	1	0	1
HYDRANGEA (Hydrangea)					
	Chemical injury	- growth regulator	0	1	1
	Environmental	- stress	1	0	1
	No disease		1		1
	Powdery mildew	- Erysiphe	1	0	1
	Root rot	- Rhizoctonia	1	0	1
HYPERICUM (Hypericum)					
	Insect injury		1	0	1
JUNIPER and RED CEDAR (Juniperus)					
	Cedar/Apple rust	- Gymnosporangium	2	0	2
	Chemical injury	- unknown	2	0	2
	Cultural	- transplant shock	4	0	4
	Environmental stresses		14	2	16
	Inadequate specimen, no disease		18		18
	Insect injury		9	3	12
	Root rot	- Phytophthora	1	0	1
	Twig blight	- Kabatina	3	1	4
		- Phomopsis	1	0	1
KUMQUAT (Fortunella)					
	Powdery mildew	- Sphaerotheca	1	0	1
LAUREL (Laurus)					
	No disease		1		1
LILAC (Syringa)					
	Environmental	- stress	1	0	1
	Leaf scorch	- unknown	1	0	1
	No disease		2		2
LINDEN (Tilia)					
	Canker	- Botryosphaeria	1	0	1

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LOCUST (Robinia)					
	Insect injury		1	0	1
MAGNOLIA (Magnolia)					
	Cultural	- transplant shock	2	0	2
	Environmental stresses		5	3	8
	Inadequate specimen, no disease		6		6
	Insect injury		2	1	3
	Leaf scorch	- winter drying	2	0	2
	No disease		7		7
	Physical injury	- broken limb	0	1	1
MAPLE (Acer)					
	Anthracnose	- Discula	5	1	6
		- Kabatiella	9	2	11
	Chemical injury	- herbicide	3	0	3
	Cultural	- girdling root	1	0	1
		- insufficient water	1	0	1
		- transplant shock	7	1	8
		- environmental	4	0	4
	Decline	- unknown	6	0	6
			28	6	34
	Environmental stresses		28	6	34
	Inadequate specimen, no disease		24		24
	Insect injury		9	2	11
	Leaf scorch	- environmental	1	0	1
		- unknown	2	2	4
		- winter drying	1	0	1
		- Phyllosticta	4	1	5
	Leaf spot	- acid soil	0	1	1
		- pH high	0	1	1
		- iron deficiency	1	0	1
	Tar spot	- Rhytisma	1	0	1
	Wilt	- Verticillium	4	0	4
	Wood decay	- Basidiomycete	2	0	2
MIMOSA (Albizzia)					
	Environmental	- stress	1	0	1
	Inadequate specimen		1		1
MOUNTAIN LAUREL (Kalmia)					
	Leaf spot	- Cercospora	1	0	1
		- fungal	1	0	1
	No disease		1		1
MULBERRY (Morus)					
	Cultural	- transplant shock	1	0	1
	Leaf spot	- Cercospora	3	0	3
	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>
OAK (Quercus)					
	Bacterial scorch	- Xylella	12	0	12
	Chemical injury	- growth regulator	10	0	10
		- herbicide	4	1	5
	Cultural	- transplant shock	2	1	3
	Decline	- unknown	1	0	1
	Environmental stresses		9	2	11
	Insect injury		48	5	53
	Leaf blister	- Taphrina	2	0	2
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- Tubakia	1	0	1
	No disease		13		13
	Nutritional	- iron deficiency	4	1	5
	Physical injury	- unknown	1	0	1
	Powdery mildew	- species	1	2	3
PAGODA TREE (Sophora)					
	Chemical injury	- growth regulator	1	0	1
PEAR (Pyrus)					
	Chemical injury	- growth regulator	2	0	2
		- herbicide	2	0	2
	Cultural	- deep planting	0	1	1
		- transplant shock	0	3	3
	Environmental stresses		3	1	4
	Fire blight	- Erwinia	12	1	13
	Insect injury		3	0	3
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- Entomosporium	1	0	1
		- physiological	1	0	1
	No disease		9		9
	Physical injury	- mower	1	0	1
PERSIMMON (Diospyros)					
	Insect injury		1	0	1
PIERIS (Pieris)					
	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>
PINE (Pinus)					
	Air pollution	- ozone	7	0	7
	Brown spot	- Mycosphaerella	2	0	2
	Canker	- Atropellis	1	0	1
		- Cytospora	1	0	1
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
		- unknown	2	0	2
	Cultural	- improper depth	1	0	1
		- transplant shock	6	3	9
	Damping-off	- Fusarium	1	0	1
	Environmental stresses		12	8	20
	Inadequate specimen, no disease		35		35
	Insect injury		12	6	18
	Nutritional	- iron toxicity	1	0	1
		- pH high	1	0	1
	Physical injury	- mower	1	0	1
		- topping	1	0	1
	Pinewood nematode	- Bursaphelencus	5	0	5
	Root rot	- Cylindrocladium	1	0	1
		- Phytophthora	1	0	1
	Sooty mold	- species	1	1	2
	Tip blight	- Sphaeropsis	8	1	9
	Tip burn	- unknown	1	0	1
	White pine decline	- environmental	50	0	50
	White pine root decline	- Verticicladiella	4	0	4
PLUM (Prunus)					
	Black knot	- Apiosporina	9	0	9
	Environmental	- stresses	1	1	2
	Inadequate specimen		1		1
POPLAR (Populus)					
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	Leaf spot	- Phyllosticta	1	0	1
	No disease		1		1
PRIVET (Ligustrum)					
	Chemical injury	- herbicide	1	0	1
	Environmental	- stress	1	0	1
	Leaf spot	- Phyllosticta	1	0	1
	No disease		1		1
QUINCE (Chaenomeles)					
	Lichen	- species	1	0	1
REDBUD (Cercis)					
	Anthraco-nose	- Kabatiella	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental stresses		2	0	2
	Insect injury		2	1	3
	Leaf spot	- Mycosphaerella	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
RHODODENDRON and AZALEA (Rhododendron)					
	Blight/Dieback	- Phytophthora	1	0	1
	Canker	- Botryosphaeria	1	0	1
	Cultural	- transplant shock	4	2	6
	Dieback	- Botryosphaeria	2	0	2
	Environmental stresses		11	3	14
	Inadequate specimen, no disease		10		10
	Insect injury		2	0	2
	Leaf/flower gall	- Exobasidium	1	0	1
	Leaf scorch	- environmental	1	0	1
		- unknown	1	0	1
	Leaf spot	- Pestalotiopsis	4	0	4
		- Septoria	2	0	2
		- unknown	1	0	1
	Nutritional	- acid soil	1	0	1
		- iron deficiency	4	0	4
		- pH high	1	1	2
	Root problem	- unknown	1	0	1
	Root rot	- Phytophthora	1	0	1
	Sooty mold	- species	0	1	1
	Twig blight	- Pestalotiopsis	1	0	1
ROSE (Rosa)					
	Black spot	- Diplocarpon	2	0	2
	Canker	- Botryosphaeria	1	0	1
	Chemical injury	- herbicide	4	0	4
		- unknown	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		1	1	2
	Gall	- Phomopsis	1	0	1
		- unknown	1	0	1
	Inadequate specimen, no disease		8		8
	Insect injury		5	0	5
	Nutritional	- general	1	1	2
	Powdery mildew	- Sphaerotheca	1	0	1
	Root rot	- Phytophthora	1	0	1
	Virus	- Rose mosaic	2	0	2
		- rosette	1	1	2
RUSSIAN-OLIVE (Eleagnus)					
	No disease		1		1
SASSAFRAS (Sassafras)					
	Decline	- unknown	1	0	1
SERVICEBERRY (Amelanchier)					
	Environmental	- drought	1	0	1
	Insect injury		1	0	1
	No disease		1		1
SEVEN-SON FLOWER (Heptacodium)					
	Canker	- Botryosphaeria	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
SMOKETREE (Cotinus)					
	Wilt	- Verticillium	1	0	1
SOURWOOD (Oxydendrum)					
	No disease		1		1
SPIREA (Spirea)					
	Cultural	- oedema	1	0	1
	Inadequate specimen		1		1
	Powdery mildew	- Oidium	1	0	1
	Root rot	- unknown	1	0	1
SPRUCE (Picea)					
	Blight	- Botrytis	1	0	1
	Canker	- Leucostoma	7	1	8
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	9	4	13
	Environmental stresses		27	8	35
	Inadequate specimen, no disease		39		39
	Insect injury		29	8	37
	Needle cast	- Rhizosphaera	9	0	9
	Physical injury	- twine	1	0	1
STEWARTIA (Stewartia)					
	Chemical injury	- herbicide	0	1	1
	Environmental	- drought	1	0	1
	Insect injury		1	0	1
SWEETGUM (Liquidambar)					
	Burr knot	- unknown	1	0	1
	Chemical injury	- herbicide	1	0	1
	Environmental stresses		2	0	2
	No disease		3		3
	Physical injury	- ice storm	0	1	1
SYCAMORE and PLANETREE (Platanus)					
	Anthracoese	- Apiognomonina	0	1	1
	Canker	- Hypoxylon	1	0	1
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
TAXUS (Taxus)					
	Chemical	- growth regulator	1	0	1
		- unknown	1	0	1
	Cultural	- improper depth	1	0	1
		- transplant shock	4	1	5
		- wet feet	2	0	2
	Environmental stresses		12	6	18
	Inadequate specimen, no disease		20		20
	Insect injury		3	0	3
	Physiological	- oedema	1	0	1
	Root problem	- unknown	1	0	1
	Root rot	- Phytophthora	4	0	4

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
TOMATO-TREE (Cythomandra)					
	Nutritional	- general	1	0	1
TULIPTREE (Liriodendron)					
	Chemical injury	- growth regulator	1	0	1
	Insect injury		1	0	1
VIBURNUM (Viburnum)					
	Cultural	- transplant shock	1	0	1
	Cutting rot	- Cephalosporium	1	0	1
		- Fusarium	0	1	1
	Environmental	- drought	1	1	2
	Insect injury		1	0	1
	Root knot nematode	- Meloidogyne	1	0	1
	Wood decay	- Trametes	1	0	1
WALNUT (Juglans)					
	Anthracnose	- Gnomonia	1	0	1
	Bacterial blight	- Xanthomonas	2	0	2
	Insect injury		4	0	4
	No disease		1		1
WILLOW (Salix)					
	Chemical injury	- herbicide	1	0	1
	Environmental stresses		3	0	3
	Insect injury		1	0	1
	No disease		2		2
WISTERIA (Wisteria)					
	Crown gall	- Agrobacterium	1	0	1
	No disease		1		1
YELLOWWOOD (Cladrastis)					
	No disease		2		2

VEGETABLES

ASPARAGUS (Asparagus)

Crown rot	- Fusarium	1	0	1
No disease		1		1

BEAN (Phaseolus)

Angular leaf spot	- Isariopsis	1	0	1
Bacterial leaf spot	- Pseudomonas	1	0	1
Chemical injury	- growth regulator	1	0	1
	- herbicide	2	0	2
Common blight	- Xanthomonas	1	0	1
Environmental	- sunscald	1	0	1
Inadequate specimen, no disease		5		5
Insect injury		2	2	4
Leaf spot	- Cercospora	1	0	1
Nutritional	- general	1	0	1
Pod splitting	- physiological	1	0	1
Root/stem rot	- Fusarium	4	0	4
	- Rhizoctonia	3	0	3
Southern blight	- Sclerotium	4	0	4
Stem canker	- Rhizoctonia	3	0	3
Stem rot	- Fusarium	0	2	2

BROCCOLI - See listing under CRUCIFERS

BRUSSEL SPROUTS - See listing under CRUCIFERS

CABBAGE - See listing under CRUCIFERS

CANTALOUPE - See listing under CUCURBITS

CORN, SWEET (Zea)

Bacterial stalk rot	- Erwinia	2	0	2
	- Pseudomonas	1	0	1
Chemical injury	- burn	1	0	1
	- herbicide	2	0	2
	- unknown	1	0	1
Environmental	- compaction	1	0	1
Inadequate specimen, no disease		6		6
Insect injury		2	0	2
Nutritional	- zinc deficiency	5	0	5

CROP DIAGNOSIS CAUSAL AGENT #1° DIAGs #2° DIAGs TOTAL

CRUCIFERS - BROCCOLI, BRUSSEL SPROUTS, CABBAGE, KALE and TURNIP (Brassica)

Black rot	- Xanthomonas	2	1	3
Chemical injury	- growth regulator	2	0	2
	- unknown	2	0	2
Environmental stresses		4	0	4
Inadequate specimen, no disease		2		2
Nutritional	- general	0	1	1
	- nitrogen deficiency	1	0	1
	- phosphorus deficiency	0	1	1
	- potassium deficiency	1	0	1
Powdery mildew	- Erysiphe	2	0	2
Stem rot	- Sclerotinia	0	1	1
Wirestem	- Rhizoctonia	1	0	1

CUCUMBER - See listing under CUCURBITS

CUCURBITS - CANTALOUPE, CUCUMBER (Cucumis), PUMPKIN, SQUASH, GOURD (Cucurbita) and WATERMELON (Citrulis)

Bacterial wilt	- Erwinia	9	0	9
Blight	- Microdochium	2	0	2
Chemical injury	- growth regulator	5	0	5
	- herbicide	1	0	1
	- unknown	3	0	3
Environmental stresses		1	1	2
Fruit decay	- Alternaria	1	0	1
	- Fusarium	3	0	3
Gummy stem blight	- Didymella	1	0	1
Inadequate specimen, no disease		23		23
Insect injury		5	6	11
Leaf blight	- Alternaria	1	0	1
Nutritional	- magnesium deficiency	1	0	1
Powdery mildew	- Erysiphe	2	1	3
	- Sphaerotheca	4	1	5
Root rot	- Pythium	1	0	1
Root/stem rot	- Fusarium	4	1	5
Stem blight	- Fusarium	1	0	1
Stem rot	- Pythium	0	1	1
Virus	- complex	4	0	4
	- Cucumber mosaic	0	1	1
	- potyvirus	5	0	5
	- Watermelon mosaic II	1	3	4

EGGPLANT (Solanum)

Chemical	- herbicide	1	0	1
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GOURD - See listing under CUCURBITS

KALE - See listing under CRUCIFERS

LETTUCE (Lactuca)

Chemical injury	- growth regulator	1	0	1
No disease		1		1

MELON, honeydew - See listing under CUCURBITS

OKRA (Hibiscus)

Chemical injury	- herbicide	1	0	1
Damping-off	- Pythium	1	0	1
No disease		2		2
Nutritional	- general	1	0	1
Wilt	- Verticillium	1	0	1

ONION (Allium)

Insect injury		1	0	1
No disease		1		1

PEA (Pisum)

Chemical injury	- growth regulator	1	0	1
Damping-off	- Rhizoctonia	1	0	1
Inadequate specimen		1		1

PEPPER (Capsicum)

Air pollution	- unknown	1	0	1
Bacterial spot	- Xanthomonas	7	0	7
Blossom end rot	- calcium deficiency/dry	1	0	1
Chemical injury	- growth regulator	2	0	2
Environmental	- sunscald	1	0	1
Inadequate specimen, no disease		9		9
Insect injury		1	0	1
Physical injury	- unknown	1	0	1
Root/stem rot	- Rhizoctonia	2	0	2
Soft rot	- Pythium	0	1	1
Southern blight	- Sclerotium	2	0	2
Stem rot	- Fusarium	2	0	2
Virus	- Impatiens necrotic spot	1	0	1
	- Tomato mosaic	1	0	1
	- Tomato spotted wilt	1	0	1
Walnut wilt	- juglone	1	0	1
Wilt	- Fusarium	0	2	2

POTATO (Solanum)

Bacterial soft rot	- Erwinia	1	0	1
Chemical injury	- herbicide	1	0	1
Dry rot	- Fusarium	1	0	1
Early blight	- Alternaria	1	0	1
Environmental	- freeze injury	1	0	1
Inadequate specimen, no disease		7		7
Insect injury		3	1	4
Scab	- Streptomyces	5	0	5
Southern blight	- Sclerotium	1	0	1

PUMPKIN - See listing under CUCURBITS

RHUBARB (Rheum)

Crown rot	- Erwinia	2	0	2
No disease		1		1

SQUASH - See listing under CUCURBITS

SWEET POTATO (Ipomoea)

Insect injury		1	1	2
No disease		1		1
Pox	- Streptomyces	2	0	2

TOMATO (Lycopersicon)

Bacterial canker	- Clavibacter	6	0	6
Bacterial spot	- Xanthomonas	2	1	3
Bacterial wilt	- Pseudomonas	1	0	1
Blossom end rot	- calcium deficiency/dry	4	1	5
Buckeye rot	- Phytophthora	2	0	2
Canker	- Botrytis	1	0	1
Chemical injury	- burn	1	0	1
	- growth regulator	14	2	16
	- herbicide	6	0	6
	- insecticide	1	0	1
	- unknown	3	2	5
Cultural	- high temperature	2	0	2
Early blight	- Alternaria	12	2	14
Environmental stresses		6	3	9
Gray mold	- Botrytis	1	1	2
Growth crack	- environmental	1	0	1
Inadequate specimen, no disease		47		47
Insect injury		8	5	13
Leaf mold	- Cladosporium	1	0	1
Leaf scorch	- unknown	1	0	1
Leaf spot	- Septoria	4	0	4
Nutritional	- acid soil	1	0	1
	- fertilizer burn	4	0	4
	- general	2	0	2
	- magnesium deficiency	1	0	1
	- manganese toxicity	1	0	1
	- phosphorus deficiency	0	1	1
	- potassium deficiency	2	0	2
Physiological	- internal white tissue	1	0	1
	- leaf roll	2	1	3
Root knot nematode	- Meloidogyne	2	0	2
Root rot	- Pythium	2	0	2
Russet	- environmental	0	1	1
Southern blight	- Sclerotium	3	0	3
Stem rot	- Fusarium	2	1	3
	- Rhizoctonia	1	0	1
	- Sclerotinia	5	0	5
Uneven ripening	- high temperature	3	0	3
Virus	- Potato virus Y	1	0	1
	- Tobacco mosaic	2	0	2
	- Tomato mosaic	3	0	3
	- Tomato spotted wilt	4	0	4
Walnut wilt	- juglone	1	0	1
Wilt	- Fusarium	5	0	5

<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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TURNIP - See listing under **CRUCIFERS**

WATERMELON - See listing under **CUCURBITS**

TOTALS			5664	846	6510
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