



COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF KENTUCKY • COLLEGE OF AGRICULTURE



Plant Diseases in Kentucky

**Plant Disease Diagnostic Laboratory
Summary**

1998

by:

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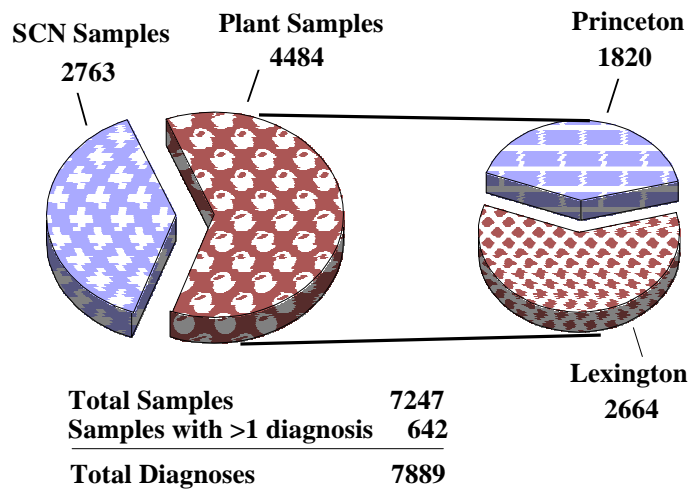
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INTRODUCTION

The Plant Disease Diagnostic Laboratory (Lexington and Princeton) handled 4484 plant samples and 2763 nematode soil samples during 1998. Samples with more than one problem numbered 672, bringing the total number of actual diagnoses to 5156. The Lexington Laboratory diagnosed 2664 specimens. The Princeton Laboratory's specimens totaled 4583; of this number 1820 were plant samples and 2763 were soil samples submitted exclusively for soybean cyst nematode analysis. A total of 1582 of the nematode samples were submitted by researchers and 1181 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 - 1998



HIGHLIGHTS

Weather:

Weather for 1998, as for 1997, was extremely variable, in temperatures and precipitation. The first half of the year was driven by “El Nino” and the second half by “La Nina” which resulted in a very mild winter, cool and wet spring all the way through July, and dry and mild the latter half of the year. Early mild conditions had some producers moving to the fields in March but an extended cool, wet spring and summer (through July) interrupted planting and slowed growth and development of most crops. Conditions reversed during the first half of August with drought-like dryness developing for the remainder of the growing season.

Temperatures for the year averaged 3 degrees above normal across the state. High temperatures averaged from 70 in the west to 68 in the east with a departure from normal ranging from 1 degree to 4 degrees above normal, respectively. Low temperatures averaged from 50 in the west to 48 in the east with a departure from normal at 4 degrees above normal for both west and east.

Precipitation totaled 49.29 inches statewide which was 2.21 inches above normal. Precipitation totals by climate division were West 47.84 inches, Central 51.14 inches, Bluegrass 48.30 inches, and East 49.87 inches which was -0.24, +2.11, +3.78, and +3.21 inches from normal, respectively. By weather station, precipitation totals ranged from a low of 37.62 inches at Henderson to a high of 60.71 inches at Somerset.

Tobacco:

Blue Mold was once again a widespread problem and sample numbers jumped dramatically over the already high numbers of 1997 and 1996. The main problem this year was the early (first week of April) arrival of infected Florida transplants into many greenhouses in the western and southern portions of the state. Many tests were run to determine if the 'metalaxyl' ("Ridomil") resistant strain of the fungus, *Peronospora tabacina*, was once again present in the state. A Section 18 Specific Emergency Exemption was granted for the field use of the fungicide "Acrobat MZ" on April 30. Black Shank (*Phytophthora parasitica* var. *nicotianae*) samples remained at the high level seen in 1997 and the link with infection by the fungus, *Rhizoctonia*, continued to be seen. The lack of sunny and dry weather early in the season, caused a delay of typical symptoms of this disease. For the third year in a row there were very few cases of Tomato Spotted Wilt virus. Samples with aphid-borne virus complex in burley were once again very low due to the widespread planting of resistant varieties, especially 'Tennessee 90'. No samples with Black Root Rot (*Thielaviopsis basicola*) were diagnosed. Besides Blue Mold, samples from the float production system were found, in order of decreasing sample numbers, with Pythium Root Rot (*Pythium* spp.), Target Spot (*Rhizoctonia solani*), Rhizoctonia Root/Stem Rot (*Rhizoctonia solani*), and Collar Rot (*Sclerotinia sclerotiorum*).

Other agronomic crops:

Corn diseases were relatively few with 1 sample infected with a virus and Gray Leaf Spot (*Cercospora zea-maydis*) numbers low as in 1997. The ear rots, especially Fusarium (*Fusarium subglutans*) and Stenocarpella Ear Rot (*Stenocarpella maydis*), were a notable problem in some areas. Soybean diseases were again very low, but Stem Canker (*Diaporthe phaseolorum*) samples, as in 1997, were much higher than normal. There were also an elevated number of Sudden Death (*Fusarium solani*, stain A) samples. 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 low levels, even with numbers of samples with Head Scab (now called Fusarium Head Blight) very low. Leaf Complex (*Septoria tritici* and *Stagonospora nodorum*), and Glume Blotch (*Stagonospora nodorum*) levels were similar to the low levels seen the last five. Due to the wet, cool spring weather, samples infected with Wheat Spindle Streak Mosaic Virus were more numerous than normal. There were no samples diagnosed with Downy Mildew (*Sclerophthora macrospora*) a reversal of last year. Forages showed a minor increase in Crown/Stem Rot (*Sclerotinia trifoliorum*) samples in 1998.

Fruit and Vegetable Disease Observations:

Tree fruit diseases. An abiotic weather-related problem of tree fruits in some locations was the sudden collapse of shoots and foliage at the first onset of warm spring weather. This dieback could be attributed to temperatures below 10 degrees F on March 12, at which time most plants had broken dormancy; many peaches were in full bloom. Browning of phloem tissues was observed in cold-injured trees and it was followed by a variety of canker diseases. Mild winter temperatures and wet spring weather resulted in abundant peach leaf curl (*Taphrina deformans*). Peaches later showed considerable brown rot (*Monilinia fructicola*) fruit decay. Rainy spring weather favored apple scab (*Venturia inaequalis*) and cedar-apple rust (*Gymnosporangium juniperi-virginianae*). Rust susceptible apples showed significant leaf spotting while unsprayed apples were practically defoliated by August. In many apple orchards, white rot (*Botryosphaeria dothidia*) was the major fruit rot in late summer. Different types of leaf wetness monitors, used for plant disease management, were compared at the U.K. Experiment Farm orchard in west Kentucky.

Small fruit diseases. Strawberry leaf spot (*Mycosphaerella fragariae*) and strawberry scorch (*Diplocarpon earlianum*), affecting stolons and petioles, were apparently favored by wet spring and early summer weather. Similarly, wet weather and poorly drained soils stimulated root rot (*Phytophthora* spp.) of raspberries.

Vegetable diseases. Black rot (*Xanthomonas campestris* pv. *campestris*) was observed from commercial cabbage fields in the spring.

Tomatoes in commercial plantings were infected by several different bacterial diseases this year. Bacterial spot (*Xanthomonas campestris* pv. *vesicatoria*) and bacterial speck (*Pseudomonas syringae* pv. *tomato*) were found in transplants and in the field. Bacterial canker (*Clavibacter michiganensis*) and pith necrosis (*Pseudomonas corrugata*) caused serious tomato losses. Powdery mildew (*Leveillula taurica*), a disease only recently found in the U.S., was observed on Kentucky greenhouse tomatoes.

Peppers continue to develop bacterial leaf spot (*Xanthomonas campestris* pv. *vesicatoria*), and the plant disease diagnostic laboratory is monitoring for possible breakdown of the 'Boynton Bell' type of leaf spot resistance by the bacteria. The laboratory has also uncovered a root and stem rot complex of pepper involving the fungus *Fusarium*; it is possibly a new disease.

Pumpkins and other cucurbits are becoming more popular in Kentucky, and their diseases continue to be economically important. Powdery mildew, caused by two different fungi, (*Sphaerotheca fuliginea* or *Erysiphe cichoracearum*) is serious every year, so the laboratory is monitoring for development of powdery mildew strains that may be resistant to currently available fungicides. Downy mildew (*Pseudoperonospora cubensis*) was present at high levels in some fields in the fall.

The laboratory has been conducting a survey of the viruses infecting commercial vegetables in Kentucky for the past three years. Using ELISA tests, a broad range of virus diseases were found; no new viruses were detected in 1998.

The plant disease diagnostic laboratory has been shown to be of great value to some fruit and vegetable growers. However, many commercial 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.

Landscape Plant Disease Observations:

A widely observed abiotic weather-related problem of crabapples, callery pears, junipers, arborvitae, and other woody plants was the sudden collapse of shoots and foliage at the first onset of warm spring weather. This dieback could be attributed to temperatures below 10 degrees F on March 12, at which time most plants had broken dormancy; flowering crabapples were at the stage of pink bud and callery pears were in bloom. Browning of phloem tissues was observed in injured plants. A variety of canker diseases could later be found on many of these same cold-injured woody plants.

Deciduous tree diseases. Mild winter temperatures and wet spring weather resulted in high levels of peach leaf curl (*Taphrina deformans*). Rainy spring weather favored flowering crabapple scab (*Venturia inaequalis*) and cedar-apple rust (*Gymnosporangium juniperi-virginianae*). Rust susceptible apples showed significant leaf spots while scab susceptible crabapples were practically defoliated by August. Following a dry period, many of these same crabapples produced blooms in October. The various anthracnose fungi were very active on ash (*Discula*), maple (*Kabatiella* and

Discula), and sycamore (*Apiognomonina*). At one point in late spring, most sycamores only had a few tufts of green leaves in the top of the tree. Dogwood powdery mildew (*Microsphaera*, *Phyllactinia* spp.), a disease which has become important in recent years, continues to be very serious in many landscapes. Oak leaf spot (*Tubakia* sp.) along with oak anthracnose is severely affecting some established, but young red oaks, causing twig and branch dieback. Bacterial leaf scorch (*Xylella fastidiosa*) was detected by ELISA in a callery pear, but the causal agent could not be found microscopically. Branch dieback continues to follow many years of bacterial leaf scorch symptoms in large, mature pin oaks.

Needle evergreen tree diseases. Early spring, 1998 defoliation of landscape Japanese black pines was noted due to infections of brown spot (*Mycosphaerella dearnesii*) which occurred in 1997. Spring, 1998 rains, and apparently favorable infection conditions in the summer of 1996, resulted in unusually high levels of telia production by cedar rusts (*Gymnosporangium* spp.) on junipers. White pine root decline (*Verticicladiella procera*) usually only a Christmas tree problem, has been found in several landscapes. In groups of white pines approximately 15-20 years old, the disease appears to move from tree to tree, killing individuals in one season. Maturing Austrian and Scots pines continue to die from tip blight (*Sphaeropsis sapinea*) and pine wilt nematode (*Bursaphelenchus xylophilus*). White pine decline (associated with soils with high clay content, high pH levels, heavy compaction, or with root disturbance) continues to take its toll.

Shrub diseases. Black root rot (*Chalara elegans*) of hollies remains a problem. Taxus, junipers, and other shrubs suffered root rot (most likely *Phytophthora* spp.) worsened by high soil moisture levels. 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.

Perennial and annual plant diseases. Rhizoctonia root and stem rot in annual and perennial beds was common.

Landscape lawn diseases. Perennial ryegrasses suffered a devastating attack of gray leaf spot (*Pyricularia grisea*) in late summer.

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 have continued to make significant contributions to the Plant Diagnostic Laboratories. Shari Dutton is working with the specialists in Lexington providing laboratory support for special research projects and demonstrations and was extremely valuable in running the assay for the "Ridomil-resistant" strain of the fungus which causes blue mold. 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 in the Nematode Laboratory at Princeton. Jack Doney, our research technician, left us in August to take a job with the US Agricultural Statistics Service in Sioux Falls, South Dakota. We thank him for his many contributions in the areas of applied research and to the performance of the laboratories. Thanks also go to Tom Priddy, Ag. Engineering - Meteorology, for providing the summary of weather conditions for 1998.

Support from the Kentucky Integrated Pest Management program for supplemental funding in support 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 1998. 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 never as a primary problem (e.g. *Lophodermium* needlecast on Pine). In these cases, a zero (0) will appear in the primary diagnosis column to indicate the absence of samples with that particular problem.

No disease: This indicates that no pathogen was observed on the specimen submitted, and that based on the sample and information provided, we were unable to pinpoint an exact abiotic or biotic cause of the problem, if there was one.

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.

Root problems: Samples designated as having a "root problem" had above ground symptoms suggestive of root dysfunction and/or evidence of root degeneration, however, a specific biotic or abiotic cause could not be determined.

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	34	38	28	1	5	18	124
Forages	16	32	0	2	1	5	56
Rapeseed (Canola)	0	0	0	0	0	0	0
Small grains	24	28	2	0	0	20	74
Soybeans	28	2428*	21	3	3	432*	2915
Tobacco	442	1256	176	58	13	171	2116
<u>Fruit</u>							
Small fruit	18	56	0	2	11	13	100
Tree fruit	36	85	2	4	24	17	168
<u>Herbs</u>							
	1	9	0	2	0	4	16
<u>Identification</u>							
	0	39	0	4	0	0	43
<u>Ornamentals</u>							
Herbaceous and							
Houseplants	72	111	8	12	21	50	274
Turfgrass	30	69	7	7	0	34	147
Woody	471	393	29	22	196	305	1416
<u>Vegetables</u>							
	92	217	30	17	16	71	443
<u>Miscellaneous</u>							
	18	4	1	1	0	3	27
<u>Total</u>	1282	4759	304	135	290	1143	7919

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	1	36	0	1	0
Forages	1	31	0	0	0
Rapeseed (Canola)	0	0	0	0	0
Small grains	1	15	0	12	0
Soybeans	0	70	2353	4	1
Tobacco	102	1100	3	50	1
<u>Fruit</u>					
Small fruit	0	55	0	0	1
Tree fruit	5	78	0	0	2
<u>Herbs</u>					
	0	8	0	0	1
<u>Identification</u>					
	0	20	0	0	19
<u>Ornamentals</u>					
Herbaceous and Houseplants	13	92	0	6	0
Turfgrass	0	69	0	0	0
Woody	33	346	5	1	8
<u>Vegetables</u>					
	58	142	2	15	0
<u>Miscellaneous</u>					
	0	2	0	0	2
Total	214	2064	2363	88	35

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)	337	7.5
Tobacco	1760	39.3
Fruit	233	5.2
Herbs	15	0.3
Identifications	42	0.9
Ornamentals	1684	37.6
Vegetables	386	8.6
Miscellaneous	27	0.6
Total Specimens	4484	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	109	15	124
Forages	45	11	56
Rapeseed (Canola)	0	0	0
Small grains	62	12	74
Soybeans	2884	31	2915
Tobacco	1760	356	2116
<u>Fruit</u>			
Small fruit	84	16	100
Tree fruit	149	19	168
<u>Herbs</u>			
	15	1	16
<u>Identification</u>			
	42	1	43
<u>Ornamentals</u>			
Herbaceous and Houseplants	252	22	274
Turfgrass	138	9	147
Woody	1294	122	1416
<u>Vegetables</u>			
	386	57	443
<u>Miscellaneous</u>			
	27	0	27
<u>Total</u>			
	7247	672	7919

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>Agronomic</u>								
Corn	93	15	0	0	0	1	0	0
Forages	42	1	0	0	0	2	0	0
Small grains	55	4	0	0	2	1	0	0
Soybeans	1204	94	0	0	0	1586	0	0
Tobacco	1597	130	0	0	0	33	0	0
<u>Fruit</u>								
Small Fruit	27	5	45	6	0	1	0	0
Tree Fruit	28	0	109	9	0	3	0	0
<u>Herbs</u>								
	6	4	5	0	0	0	0	0
<u>Identification</u>								
	3	3	33	1	0	0	2	0
<u>Ornamental</u>								
Herbaceous and								
Houseplants	64	21	138	16	0	6	6	1
Turfgrass	18	29	78	2	0	1	8	2
Woody	67	28	1095	60	0	1	41	2
<u>Vegetable</u>								
	138	7	212	13	0	12	4	0
<u>Miscellaneous</u>								
	17	0	6	2	0	1	1	0
<u>Total</u>	3359	341	1721	109	2	1648	62	5
<u>Total/Grower Type</u>	3700		1830		1650		67	

Total number of samples received = 7247

¹ Ext = Extension samples submitted via County Extension Agents or Extension Specialists.

² 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.	22	0	1	10	0	33
Agronomy Department	59	1	4	3	5	72
Animal Diagnostic Laboratory	1	0	0	0	0	1
Entomology Department	9	11	49	3	0	72
Forestry Department	0	1	0	0	1	2
Horticulture Department	0	1	11	5	0	17
Regulatory Services	2	1	1	0	0	4
Texas A & M University	0	0	0	1	0	1
					Total	202
					Total number of plant samples	4484
					Percent of plant samples referred outside Diagnostic Lab for diagnosis	4.5

* 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	74
Enzyme-linked Immunosorbent Assay (ELISA)	69
Incubation	493
Indicator plants	1
Metalaxyl susceptible/resistant	19
Metalaxyl & Dimethomorph susceptible/resistant	24
Nematode extraction (total = 2774)	
Miscellaneous	2
Pinewood nematode	9
Soybean cyst nematode	2763
Soil tests (total = 434)	
Alkalinity	2
pH	199
Saturated Media Extract	1
Saturated Media Extract/pH	3
Soluble salts	28
pH/Soluble Salts	170
soil bioassay	31
Tissue Test (total = 7)	
Quick Nitrate Test	6
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	1	0	1	0	0	0	0
ALLEN	35	0	20	2	2	11	0
ANDERSON	11	0	8	0	1	2	0
BALLARD	25	6	18	0	0	1	0
BARREN	36	6	14	3	9	4	0
BATH	40	1	27	4	2	5	1
BELL	15	0	0	3	11	1	0
BOONE	37	1	6	0	24	5	1
BOURBON	43	1	24	5	9	2	2
BOYD	56	0	0	2	48	6	0
BOYLE	24	1	12	0	9	2	0
BRACKEN	11	0	6	0	4	1	0
BREATHITT	27	0	11	0	9	7	0
BRECKINRIDGE	72	6	48	0	10	7	1
BULLITT	43	0	8	0	31	1	3
BUTLER	18	4	9	1	3	1	0
CALDWELL	104	17	38	7	34	6	2
CALLOWAY	161	16	91	9	34	10	1
CAMPBELL	20	0	7	0	10	3	0
CARLISLE	42	8	20	1	9	4	0
CARROLL	16	1	12	0	2	1	0
CARTER	38	0	16	3	13	2	4
CASEY	40	10	10	5	5	10	0
CHRISTIAN	114	9	44	5	45	9	2
CLARK	37	0	20	2	12	3	0
CLAY	3	0	2	0	1	0	0
CLINTON	14	1	9	0	3	1	0
CRITTENDEN	29	5	0	2	14	8	0
CUMBERLAND	3	0	2	0	0	1	0
DAVISS	260	32	90	15	79	41	3
EDMONSON	25	0	13	1	7	4	0
ELLIOTT	4	0	3	0	1	0	0
ESTILL	9	0	6	0	2	1	0
FAYETTE	380	9	54	20	270	23	4
FLEMING	38	2	21	2	12	1	0
FLOYD	4	0	0	0	2	2	0
FRANKLIN	70	1	9	7	45	7	1
FULTON	16	14	0	0	1	1	0
GALLATIN	3	0	3	0	0	0	0
GARRARD	15	1	8	0	2	1	3
GRANT	27	1	14	3	9	0	0
GRAVES	103	11	69	3	15	5	0
GRAYSON	10	1	5	0	4	0	0
GREEN	19	0	9	1	6	2	1
GREENUP	22	0	1	0	20	1	0
HANCOCK	34	1	26	1	5	1	0
HARDIN	33	4	12	1	15	1	0
HARLAN	3	0	0	0	3	0	0
HARRISON	36	5	24	1	2	4	0
HART	27	0	15	0	3	9	0
HENDERSON	70	10	25	4	18	12	1
HENRY	62	4	33	4	17	4	0
HICKMAN	2	1	0	0	0	0	1
HOPKINS	39	6	6	3	21	3	0
JACKSON	25	0	16	6	2	0	1
JEFFERSON	48	0	2	2	38	4	2
JESSAMINE	35	1	13	4	15	2	0
JOHNSON	2	0	1	1	0	0	0
KENTON	26	0	2	4	16	1	3
KNOTT	1	0	0	0	1	0	0
KNOX	1	0	0	0	1	0	0

COUNTY	Total	Agronomic ¹	Tobacco	Fruit	Ornamental	Vegetable	Other
LARUE	20	0	14	0	5	1	0
LAUREL	29	1	8	4	10	1	2
LAWRENCE	5	0	4	0	1	0	0
LEE	8	0	2	3	2	1	0
LESLIE	9	0	0	2	7	0	0
LETCHER	10	0	0	1	6	2	1
LEWIS	8	0	2	0	2	4	0
LINCOLN	21	0	11	0	7	3	0
LIVINGSTON	17	10	3	0	2	2	0
LOGAN	71	3	34	3	26	4	1
LYON	26	1	17	2	5	1	0
McCRACKEN	41	1	5	1	33	0	1
McCREARY	7	0	0	0	0	7	0
McLEAN	10	1	5	2	2	0	0
MADISON	80	1	41	8	28	1	1
MAGOFFIN	4	0	2	0	1	1	0
MARION	39	6	14	3	16	0	0
MARSHALL	86	7	19	0	48	12	0
MARTIN	3	0	0	0	2	1	0
MASON	18	1	9	2	4	2	0
MEADE	19	1	8	0	8	1	1
MENIFEE	3	1	0	0	2	0	0
MERCER	25	2	14	0	5	4	0
METCALFE	16	0	11	2	3	0	0
MONROE	15	1	10	0	3	1	0
MONTGOMERY	63	1	17	5	34	5	1
MORGAN	14	0	1	2	3	8	0
MUHLENBERG	27	4	8	1	7	5	2
NELSON	34	4	11	0	17	2	0
NICHOLAS	24	1	20	0	1	2	0
OHIO	16	1	11	1	1	0	2
OLDHAM	16	0	4	1	9	2	0
OWEN	27	1	19	0	6	1	0
OWSLEY	10	0	8	1	1	0	0
PENDELTON	7	0	4	0	3	0	0
PERRY	7	0	3	0	4	0	0
PIKE	0	0	0	0	0	0	0
POWELL	0	0	0	0	0	0	0
PULASKI	88	4	28	2	48	4	2
ROBERTSON	7	0	5	1	1	0	0
ROCKCASTLE	4	0	3	0	1	0	0
ROWAN	46	0	19	7	14	5	1
RUSSELL	37	1	7	2	16	5	6
SCOTT	28	0	4	1	16	7	0
SHELBY	124	7	34	7	54	6	16
SIMPSON	47	5	18	2	21	1	0
SPENCER	40	1	22	4	12	0	1
TAYLOR	21	1	15	1	3	1	0
TODD	83	12	46	1	14	10	0
TRIGG	65	13	28	3	16	2	3
TRIMBLE	15	0	11	2	1	0	1
UNION	21	13	0	0	7	0	1
WARREN	142	8	52	8	67	5	2
WASHINGTON	33	1	5	0	23	4	0
WAYNE	76	2	44	5	11	13	1
WEBSTER	60	18	28	1	12	1	0
WHITLEY	17	1	12	0	4	0	0
WOLFE	7	0	6	0	1	0	0
WOODFORD	63	2	19	5	35	1	1
Out-of-State	61	2	52	0	7	0	0
TOTALS	4484	337	1760	233	1684	386	84

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 Diagnosis¹	Consultations²
LEXINGTON			
Anderson, RG	Horticulture	9	15
Barnes, TG	Forestry	1	0
Beale, JW (Diagnostician)	Plant Pathology	2154	24
Bessin, RT	Entomology	16	6
Bitzer, MJ	Agronomy	8	1
Fountain, WM	Horticulture	2	7
Ghabrial, SA	Plant Pathology	1	0
Green, JD	Agronomy	29	20
Hartman, JR	Plant Pathology	167	26
Henning, JC	Agronomy	3	0
Hill, DB	Forestry	0	1
McNiel, RE	Horticulture	0	1
Nesmith, WC	Plant Pathology	178	138
Palmer, GK	Agronomy	57	9
Pearce, RC	Agronomy	3	12
Potter, DA	Entomology	1	0
Powell, AJ	Agronomy	1	2
Roberts, CR	Horticulture (Emeritus)	1	0
Rowell, AB	Horticulture	3	5
Siegel, MR	Plant Pathology	0	2
Strang, JG	Horticulture	7	6
Thom, WO	Agronomy	0	1
Townsend, LH	Entomology	39	7
Vincelli, PC	Plant Pathology	16	11
Witt, WW	Horticulture	4	0
PRINCETON			
Bachi, PR (Diagnostician)	Plant Pathology	1471	187
Brown, GR	Horticulture	5	9
Dunwell, WC	Horticulture	30	37
Herbek, JH	Agronomy	16	15
Hershman, DE	Plant Pathology	44	16
Johnson, DW	Entomology	18	4
Kirkland, DL	Regulatory Services	1	0
Lacefield, GD	Agronomy	2	0
Martin, JR	Agronomy	56	19
Murdock, LW	Agronomy	24	6
Maksymowicz, WC	Agronomy	112	38
Rasnake, M	Agronomy	4	1
Wurts, WA	Kentucky State	1	0

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.

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

CORN (Zea)

Anthracnose	- Colletotrichum	0	1	1
Chemical injury	- herbicide	24	4	28
Ear/Kernel rots	- Aspergillus	1	1	2
	- Fusarium	9	1	10
	- Giberella	3	0	3
	- Nigrospora	1	0	1
	- Penicillium	2	1	3
	- Stenocarpella	5	0	5
	- stresses	11	3	14
Environmental	- Cercospora	4	1	5
Gray leaf spot		19		19
Inadequate specimen, no disease		5	0	5
Insect injury		5	0	5
Nutritional	- acid soil	5	0	5
	- aluminum toxicity	1	0	1
	- nitrogen deficiency	0	2	2
	- phosphorus deficiency	2	0	2
	- potassium deficiency	3	0	3
	- zinc deficiency	3	0	3
Physiological	- barren stalk	0	1	1
	- red leaf	1	0	1
Poor pollination	- unknown	1	0	1
Root rot	- Pythium	3	0	3
	- Rhizoctonia	1	0	1
Rootless	- environmental	1	0	1
Stalk Rot	- Gibberella	2	0	2
Stewart's wilt	- Erwinia	1	0	1
Virus	- Maize dwarf mosaic	1	0	1

FORAGES

ALFALFA (Medicago)

Crown/root rot	- complex	1	0	1
	- Fusarium	1	0	1
	- Rhizoctonia	1	2	3
Crown/stem rot	- Sclerotinia	5	0	5
Environmental stresses		4	1	5
Inadequate specimen, no disease		3		3
Insect injury		0	1	1
Leaf spot	- Leptosphaerulina	7	2	9
Nutritional	- nitrogen deficiency	2	0	2
	- potassium deficiency	1	0	1
	- poor nodulation	0	1	1
	- Phytophthora	2	0	2
Root rot	- Pythium	1	0	1
	- Rhizoctonia	1	0	1
	- Phoma	1	2	3
Spring Black Stem	- Pseudomonas	1	0	1
Stem Blight		1	0	1
Wilt	- Fusarium	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
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CLOVER (Trifoliorum)				
Crown/stem rot	- Sclerotinia	2	0	2
FESCUE (Fescuta)				
Environmental	- stress	1	0	1
MATUA (Bromus)				
Powdery mildew	- Erysiphe	1	0	1
OAT (Avena)				
Environmental stresses		1	1	2
Nutritional	- potassium deficiency	1	0	1
ORCHARDGRASS (Dactylis)				
Foliage blight	- Rhizoctonia	1	0	1
Inadequate specimen, no disease		3		3
SUDEX (Sorghum)				
Nutritional	- nitrogen deficiency	2	0	2
	- pH high	0	1	1
TRITICALE (Triticum)				
No disease		1		1

SOYBEAN

SOYBEAN (Glycine)				
Anthracnose	- Colletotrichum	0	4	4
Blight	- Fusarium	1	0	1
Breakover	- unknown	1	0	1
Brown spot	- Septoria	1	1	2
Charcoal rot	- Macrophomina	4	1	5
Chemical injury	- herbicide, growth reg.	20	1	21
Cultural	- late planting	1	0	1
Downy mildew	- Peronospora	1	1	2
Environmental stresses		5	8	13
Frogeye	- Cercospora	6	4	10
Inadequate specimen, no disease		23		23
Insect injury		1	2	3
Nutritional	- acid soil	4	0	4
	- magnesium deficiency	1	0	1
	- manganese deficiency	1	1	2
	- potassium deficiency	6	0	6
Physical injury	- deer	0	1	1
Powdery mildew	- Microsphaera	2	0	2
Pod stem blight	- Diaporthe	0	1	1
Root rot	- Pythium	2	0	2
Root/stem rot	- Phytophthora	3	0	3
	- Rhizoctonia	3	3	6
Slime mold	- species	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
	Soybean cyst nematode - on plant samples		1	1	2
	Heterodera	* in soil samples	2351		2351
		* absent in soil samples	412		412
	(*soil submitted to Nematode Analysis Laboratory)				
	Stem canker	- Diaporthe	13	1	14
	Sudden death syndrome	- Fusarium	15	0	15
	Virus	- Bean pod mottle	1	0	1
		- Soybean mosaic	1	1	2
		- Tobacco ringspot	1	0	1
	Wilt	- Fusarium	2	0	2
<u>SMALL GRAINS</u>					
BARLEY (Hordeum)					
	Environmental	- frost injury	0	1	1
	Nutritional	- nitrogen deficiency	1	0	1
	Scald	- Rhynchosporium	1	1	2
	Smut, loose	- Ustilago	1	0	1
OAT (Avena)					
	Environmental	- cold injury	1	0	1
	Virus	- Barley yellow dwarf	1	0	1
SORGHUM (Sorghum)					
	Environmental	- stress	1	0	1
	No disease		1		1
WHEAT (Triticum)					
	Ascomycete	- species	1	0	1
	Bacterial streak	- Xanthomonas	0	1	1
	Chemical injury	- herbicide, growth reg.	1	1	2
	Cultural	- poor seed	1	0	1
	Environmental stresses		15	0	15
	Flecking	- physiological	1	1	2
	Glume blotch	- Stagonospora	2	1	3
	Head scab	- Fusarium	2	2	4
	Leaf blotch	- Stagonospora	0	1	1
	No disease		19		19
	Nutritional	- acid soil	1	0	1
		- nitrogen deficiency	1	0	1
	Powdery mildew	- Erysiphe	1	1	2
	Tan spot	- Pyrenophora	0	1	1
	Virus	- Barley yellow dwarf	5	1	6
		- Wheat spindle streak mosaic	5	0	5

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

TOBACCO (Nicotiana)

Algae	- blue green	0	1	1
Angular leaf spot	- Pseudomonas	47	4	51
Anthracnose	- Colletotrichum	0	1	1
Bacterial leaf spot	- unknown	1	0	1
Bacterial soft rot	- Erwinia	0	4	4
Black shank	- Phytophthora	244	5	249
Blackleg	- Erwinia	4	4	8
Blue mold	- Peronospora	306	14	320
Chemical injury	- antibiotic	2	0	2
	- burn	3	0	3
	- disinfectant	2	0	2
	- fungicide	11	2	13
	- growth regulator	14	3	17
	- herbicide	87	10	97
	- insecticide	0	1	1
	- sucker agent	2	0	2
	- unknown	38	1	39
	Collar rot	- Sclerotinia	15	3
Cultural	- various problems	33	8	41
Damping-off	- Rhizoctonia	25	5	30
Early flowering	- environmental	1	1	2
Environmental	- cold injury	13	3	16
	- compaction	13	9	22
	- drowning	1	0	1
	- freeze injury	2	0	2
	- hail injury	2	0	2
	- heat injury	6	1	7
	- lightning	8	1	9
	- poor soil	11	14	25
	- wet feet	26	19	45
	- weather scald	10	0	10
	- others	20	11	31
Frenching	- metabolites	8	1	9
Frogeye	- Cercospora	27	10	37
Hollow stalk	- Erwinia	10	0	10
Improper curing	- piebald	2	0	2
Inadequate specimen, no disease		229		229
Insect injury		8	5	13
Leaf spot	- physiological	6	0	6
Mold	- Penicillium	1	0	1
Mutation	- genetic	3	0	3
Nutritional	- acid soil	16	16	32
	- alkalinity	2	0	2
	- fertilizer burn	16	4	20
	- general	21	1	22
	- potassium deficiency	9	3	12
	- magnesium deficiency	1	0	1
	- manganese toxicity	44	4	48
	- nitrogen deficiency	8	3	11
- phosphorus deficiency	9	0	9	

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
Nutritional [cont]		- soluble salts	4	1	5
		- temporary phosphorus	13	4	17
Physical injuries			5	1	6
Physiological		- leaf breakdown	1	0	1
		- oedema	3	0	3
		- unknown	1	0	1
Ragged spot		- Ascochyta	0	1	1
Root knot nematode		- Meloidogyne	1	2	3
Root problem		- unknown	4	0	4
Root rot		- Fusarium	0	1	1
		- Pythium	103	14	117
		- Rhizoctonia	2	2	4
Root/stem rot		- Fusarium	0	1	1
		- Rhizoctonia	7	0	7
Ruffles		- genetic	1	0	1
Soft rot		- Pythium	2	0	2
Soreshin		- Rhizoctonia	67	0	67
Stem girdling		- Rhizoctonia	0	101	101
Stem rot		- Fusarium	1	3	4
		- Rhizoctonia	4	5	9
		- Alternaria	1	0	1
Storage mold		- Aspergillus	2	0	2
		- Fusarium	0	1	1
		- environmental	1	0	1
Suckering		- Rhizoctonia	78	11	89
Target spot		- genetic	1	1	2
Variegation		- Alfalfa mosaic	3	1	4
Virus		- Cucumber mosaic	4	0	4
		- complex	6	2	8
		- Peanut stunt	0	2	2
		- poty virus	2	5	7
		- Tobacco etch	4	1	5
		- Tobacco mosaic	1	0	1
		- Tobacco ringspot	5	1	6
		- Tobacco streak	4	0	4
		- Tomato spotted wilt	6	1	7
		- Tobacco vein mottling	0	2	2
	Weather fleck		- ozone	8	2
Wilt		- Fusarium	19	17	36
		- unknown	1	0	1

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

SMALL FRUITS

BLUEBERRY (Vaccinium)

Cultural	- transplant shock	1	0	1
Environmental stresses		0	2	2
Inadequate specimen, No disease		4		4
Insect injury		2	0	2
Leaf spot	- Phyllosticta	1	0	1
Nutritional	- iron deficiency	1	0	1
	- pH high	0	1	1
Root rot	- Phytophthora	1	0	1

BRAMBLES - BLACKBERRY, and RASPBERRY (Rubus)

Anthracnose	- Elsinoe	5	0	5
Cane canker	- Gnomonia	1	1	2
Double blossom	- Cercospora	1	0	1
Environmental stresses		4	0	4
Insect injury		1	2	3
Leaf scorch	- unknown	1	0	1
Leaf spot	- Septoria	1	1	2
	- Sphaerulina	2	0	2
No disease		2		2
Nutritional	- fertilizer burn	1	0	1
Pollination problem	- environmental	1	0	1
Root rot	- Phytophthora	2	0	2
Root problem	- unknown	1	1	2
Rust, orange	- Gymnoconia	3	0	3

GRAPE (Vitis)

Anthracnose	- Elsinoe	1	0	1
Black rot	- Guignardia	17	1	18
Cane blight/spot	- Phomopsis	0	1	1
Downy mildew	- Plasmopora	1	0	1
Inadequate specimen, no disease		4		4
Insect injury		2	0	2
Nutritional	- excess nitrogen	1	0	1
Physical injury	- rodent	0	1	1
Powdery mildew	- Uncinula	1	0	1

STRAWBERRY (Fragaria)

Anthracnose	- Colletotrichum	1	0	1
Black root rot	- complex	3	0	3
Crown rot	- Fusarium	0	1	1
Environmental	- wet feet	2	0	2
Insect injury		2	2	4
Leaf scorch	- Diplocarpon	2	1	3
Leaf spot	- Mycosphaerella	4	1	5
No disease		4		4
Nutritional	- soluble salts	1	0	1
Slime mold	- species	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
<u>TREE FRUITS</u>					
APPLE (Malus)					
	Bitter pit	- calcium deficiency	1	0	1
	Bitter rot	- Glomerella	2	0	2
	Bur knot	- unknown	1	0	1
	Cedar apple rust	- Gymnosporangium	11	1	12
	Chemical injury	- growth regulator	1	0	1
		- unknown	1	0	1
	Cork spot	- calcium deficiency	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		8	0	8
	Fire blight	- Erwinia	1	0	1
	Flyspeck	- Schizothyrium	1	0	1
	Frogeye	- Botryosphaeria	5	4	9
	Inadequate specimen, no disease		9		9
	Insect injury		11	2	13
	Necrotic leaf blotch	- Glomerella	1	0	1
	Nutritional	- fertilizer burn	1	0	1
	Physical injury	- hail	0	1	1
		- rodent	1	0	1
	Root rot	- Pythium	1	0	1
	Scab	- Venturia	9	3	12
	Sooty blotch	- Gloeodes	0	2	2
	White root rot	- Scytinostroma	1	0	1
	White rot	- Botryosphaeria	1	0	1
CHERRY (Prunus)					
	Bacterial canker	- Pseudomonas	1	1	2
	Cultural	- insufficient water	0	1	1
		- transplant shock	1	0	1
	Environmental	- freeze injury	6	1	7
	Leaf spot	- Blumeriella	3	0	3
	No disease		4		4
	Powdery mildew	- Podosphaera	1	0	1
PEACH and NECTARINE (Prunus)					
	Brown rot	- Monilinia	10	0	10
	Environmental stresses		4	0	4
	Fruit drop	- normal	1	0	1
	Gummosis	- unknown	1	0	1
	Inadequate specimen, no disease		5		5
	Insect injury		5	2	7
	Leaf curl	- Taphrina	13	0	13
	Nutritional	- nitrogen deficiency	1	0	1
	Scab	- Fusicladium	2	1	3
PEAR (Pyrus)					
	Environmental	- freeze injury	5	0	5
	Fire blight	- Erwinia	3	0	3
	Insect injury		4	0	4

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
	Physical injury	- rodent	1	0	1
HERBS					
PLUM (Prunus)					
	Black knot	- Apiosporina	4	0	4
	No disease		1		1
	Plum pockets	- Taphrina	1	0	1
BASIL (Ocimum)					
	Crown/stem rot	- Fusarium	1	0	1
DILL (Anethum)					
	Dodder	- Cuscuta	1	0	1
GINSENG (Panax)					
	Blight	- Alternaria	1	0	1
		- Phytophthora	1	0	1
	Inadequate specimen, no disease		3		3
	Physical injury	- stem collapse	1	0	1
LAVENDER (Lavandula)					
	Inadequate specimen		1		1
	Crown/root rot	- Rhizoctonia	1	0	1
MINT (Mentha)					
	No disease		1		1
ROSEMARY (Rosmarinus)					
	Blight	- Botrytis	3	0	3
	Root problem	- unknown	0	1	1
THYME (Thymus)					
	Crown/stem rot	- Rhizoctonia	1	0	1
IDENTIFICATIONS					
FUNGAL IDENTIFICATION					
	Armillaria	- species	2		2
	Auricularia	- auricula	1		1
	Basidiomycete	- unknown	2		2
	Calvatia	- gigantea	1		1
	Helvella	- species	2		2
	Morchela	- esculenta	1		1
	Mutinus	- caninus	3		3
	Penicillium	- species	1		1
	Polyporus	- frondosus	1		1
	Scleroderma	- anyantium	1		1
	Shitaki	- species	1		1
	Slime mold	- Physarum	1		1
LICHEN		- species	5		5

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

Armelandhier	- canadensis	1		1
Aralia	- spinosa	1		1
Bromus	- species	1		1
Cornus	- racemosa	1		1
Gleocapsa	- species	1		1
Inadequate specimen		4		4
Ipomoea	- species	1		1
Liverwort	- unknown	2		2
Lolium	- multiflorum	1		1
Lunaria	- biennis	1		1
Muhlenbergia	- schreberi	1		1
Nyssa	- sylvatica	1		1
Paspalum	- dilatatum	1		1
Poa	- pratensis	1		1
Quercus	- nigra	1		1
Rhamnus	- frangula	1		1
Taxodium	- distichum	1		1
Unknown		1		1

MISCELLANEOUS

DOCK (Rumex)					
Leaf spot	- Ramularia	1	0		1
EGG MASS					
Amphibian	- salamander	1	0		1
LEAF MULCH					
No disease		1			1
SOIL					
Algae	- species	1	0		1
No disease		2			2
Nutritional	- acid soil	18	0		18
UNKNOWN					
Chemical	- residue	1	0		1
inadequate specimen		1			1
WILD RYE (Elymus)					
Rust	- Puccinia	1	0		1

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

HERBACEOUS ORNAMENTALS and INDOOR PLANTS

AGERATUM (Ageratum)

Cultural	- transplant shock	1	0	1
Nutritional	- fertilizer burn	1	0	1

AJUGA (Ajuga)

No disease		1		1
Southern blight	- Sclerotium	1	0	1

ARTEMISIA (Artemisia)

Cultural	- wet feet	1	0	1
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ASTER (Aster)

No disease		2		2
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ASTILBE (Astilbe)

Stem rot	- Rhizcotonia	1	0	1
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BEGONIA (Begonia)

Bacterial blight	- Xanthomonas	1	0	1
Environmental	- stress	1	0	1
Inadequate specimen		1		1
Powdery mildew	- Oidium	1	0	1
Virus	- Impatiens necrotic spot	1	0	1

BERGENIA (Bergenia)

Leaf spot	- Alternaria	1	0	1
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BISHOP'S WEED (Aegopodium)

Leaf spot	- Septoria	1	0	1
No disease		1		1

BLEEDING HEART (Dicentra)

Stem rot	- Fusarium	2	0	2
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CALADIUM (Caladium)

Environmental	- sunscald	1	0	1
No disease		1		1

CARNATION (Dianthus)

Blight	- Botrytis	1	0	1
Wilt	- Fuarium	1	0	1

CELOSIA (Celosia)

Bacterial blight	- bacterial	1	0	1
Chemical injury	- herbicide	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
CHRYSANTHEMUM (Chrysanthemum)					
	Bacterial blight	- Erwinia	1	0	1
	Chemical injury	- unknown	1	0	1
	Cultural	- overwatering	0	1	1
	Environmental	- drought	1	0	1
	Inadequate specimen, no disease		2		2
	Leaf spot	- Septoria	1	0	1
	Nutritional	- acid soil	0	1	1
		- calcium deficiency	1	0	1
		- general	2	0	2
		- nitrogen deficiency	1	0	1
		- soluble salts	1	0	1
	Root rot	- Pythium	2	0	2
	Root/stem rot	- Rhizoctonia	1	0	1
	Wilt	- Fusarium	2	0	2
DAHLIA (Dahlia)					
	Chemical injury	- herbicide	1	0	1
	No disease		3		3
DAISY (Leucanthemum)					
	Anthraxnose	- Colletotrichum	1	0	1
	No disease		1		1
	Nutritional	- phosphorus deficiency	1	0	1
	Stem rot	- Fusarium	1	0	1
DAYLILY (Hemerocallis)					
	Blight	- Fusarium	1	0	1
DIANTHUS (Dianthus)					
	Crown rot	- Fusarium	1	0	1
	Nutritional	- fertilizer burn	1	0	1
DICENTRA (Dicentra)					
	No disease		2		2
FALSE ARALIA (Dizygotheca)					
	No disease		1		1
FERN (various)					
	No disease		3		3
	Nutritional	- calcium deficiency	1	0	1
		- fertilizer burn	1	0	1
FICUS (Ficus)					
	Insect injury		1	0	1
FLAX (Camelina)					
	Cultural	- wet feet	1	0	1
	Nutritional	- soluble salts	0	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
GARDENIA (Gardenia)					
	No disease		1	0	1
	Nutritional	- fertilizer burn	1	0	1
GERANIUM (Pelargonium)					
	Bacterial blight	- Xanthomonas	2	0	2
	Blackleg	- Pythium	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- oedema	1	1	2
		- over watering	0	1	1
	Environmental	- poor media	1	0	1
		- wet feet	1	0	1
	Gray mold	- Botrytis	1	0	1
	No disease		3		3
	Nutritional	- fertilizer burn	1	0	1
		- iron toxicity	2	0	2
		- general	1	0	1
	Root rot	- Pythium	2	0	2
	Rust	- Puccinia	2	0	2
GLADIOLUS (Gladiolus)					
	Insect injury		1		1
GRASS (Ornamental)					
	Leaf spot	- Alternaria	1	0	1
HEATHER (Calluna)					
	Nutritional	- fertilizer burn	1	0	1
HELIOTROPE (Heliotropium)					
	Nutritional	- fertilizer burn	1	0	1
HEUCHERA (Heuchera)					
	Cultural	- oedema	1	0	1
	Root rot	- Pythium	1	0	1
HOLLYHOCK (Althaea)					
	Insect injury		1	1	2
	Leaf spot	- Cercospora	1	0	1
		- fungal	1	0	1
	Rust	- Puccinia	1	0	1
HOSTA (Hosta)					
	Leaf spot	- Colletotrichum	1	0	1
	No disease		2		2
	Physical injury	- burn	1	0	1
	Southern blight	- Sclerotium	0	2	2

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
IMPATIENS (Impatiens)					
	Insect injury		1	1	2
	Nutritional	- fertilizer burn	3	0	3
		- general	1	0	1
		- nitrogen deficiency	1	0	1
	Root/stem rot	- Rhizoctonia	2	0	2
	Virus	- Impatiens necrotic spot	2	0	2
		- Tomato spotted wilt	0	1	1
IRIS (Iris)					
	Bacterial soft rot	- Erwinia	1	0	1
	Insect injury		1	0	1
	Leaf spot	- Heterosporium	1	0	1
	Rust	- Puccinia	1	0	1
IVY (various)					
	Anthracnose	- Colletotrichum	1	0	1
	Bacterial spot	- Xanthomonas	7	0	7
	Inadequate specimen, no disease		3		3
	Leaf spot	- Phyllosticta	1	0	1
	Nutritional	- fertilizer burn	1	0	1
	Root rot	- Pythium	0	1	1
JADE PLANT (Crassula)					
	Cultural	- oedema	1	0	1
	Insect injury		1	0	1
JASMINE (Jasminum)					
	Insect injury		1	0	1
	No disease		1		1
	Root rot	- Pythium	1	0	1
LEADWORT (Plumbago)					
	Inadequate specimen		1		1
LILY (Lilium)					
	Insect injury		1	0	1
	No disease		1		1
	Nutritional	- fertilizer burn	1	0	1
	Root rot	- Fusarium	1	0	1
	Stem rot	- Rhizoctonia	1	0	1
LYSIMACHIA (Lysimachia)					
	Nutritional	- fertilizer burn	1	0	1
MANDAVILLA (Mandavilla)					
	Insect injury		1	0	1
	No disease		1		1
MARIGOLD (Tagetes)					
	Gray mold	- Botrytis	0	1	1
	Leaf spot	- Alternaria	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
MOONSEED (Cocculus)					
	Leaf spot	- Alternaria	1	0	1
NICOTIANA (Nicotiana)					
	Insect injury		1	0	1
ORANGE (Citrus)					
	Insect injury		2	0	2
	No disease		1		1
ORCHID (various)					
	Environmental	- sunscald	0	1	1
	Leaf spot	- Cercospora	1	0	1
	Inadequate specimen, no disease		3		3
OXALIS (Oxalis)					
	Cultural	- low light	0	1	1
		- wet feet	1	0	1
PACHYSANDRA (Pachysandra)					
	Environmental	- cold injury	1	3	4
	Leaf/stem blight	- Pseudonectria	5	0	5
PALM (various)					
	Insect injury		1	0	1
	No disease		2		2
PANSY (Viola)					
	Crown rot	- Rhizoctonia	0	1	1
	Cultural	- high temperature	1	0	1
	Environmental	- wet feet	1	0	1
	Leaf spot	- Colletotrichum	1	0	1
	Root rot	- Pythium	4	0	4
PENSTEMON (Penstemon)					
	Southern blight	- Sclerotium	1	0	1
PEONY (Paeonia)					
	Bud blast	- physiological	1	0	1
	Inadequate specimen, no disease		4		4
	Leaf spot	- Septoria	1	0	1
	Physical injury	- burn	1	0	1
	Red spot	- Cladosporium	5	0	5
PETUNIA (Petunia)					
	Black root rot	- Thielaviopsis	1	0	1
	Chemical injury	- herbicide	2	0	2
	Environmental	- wet feet	1	0	1
	No disease		1		1
	Nutritional	- iron deficiency	1	0	1
		- nitrogen deficiency	1	0	1
	Root rot	- Pythium	1	1	2
	Root/stem rot	- Rhizoctonia	3	1	4

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
PHLOX (Phlox)					
	Cultural	- oedema	1	0	1
	Environmental stresses		2	0	2
	Inadequate specimen, no disease		5		5
	Insect injury		1	0	1
	Powdery mildew	- Erisyphe	1	0	1
	Virus	- Impatiens necrotic spot	1	0	1
		- Tomato spotted wilt	0	1	1
POINSETTIA (Euphorbia)					
	Insect injury		0	1	1
	Nutritional	- general	1	0	1
		- nitroen deficiency	1	0	1
	Root rot	- Pythium	2	0	2
	Root/stem rot	- Rhizoctonia	1	0	1
PRIMROSE (Primula)					
	Inadequate specimen		1		1
RUDBECKIA (Rudbeckia)					
	Root/stem rot	- unknown	1	0	1
	No disease		1		1
SALVIA (Salvia)					
	Chemical injury	- herbicide	1	0	1
SCHEFFLERA (Brassaia)					
	Cultural	- overwatering	1	0	1
	Insect injury		1	0	1
SEDUM (Sedum)					
	Crown rot	- Pellicularia	1	0	1
	No disease		1		1
	Stem rot	- Colletotrichum	1	0	1
SNAKEROOT (Asarum)					
	Inadequate specimen		1		1
	Stem rot	- Fusarium	1	0	1
SNAPDRAGON (Antirrhinum)					
	No disease		1		1
	Root/stem rot	- Rhizoctonia	2	0	2
SPATHIPHYLLUM (Spathiphyllum)					
	Insect injury		1	0	1
	Root rot	- Pythium	1	0	1
SUNFLOWER (Helianthus)					
	Environmental stresses		2	0	2
	No disease		1		1
	Nutritional	- acid soil	0	1	1
TOMATO TREE (Cyphomandra)					
	Powdery mildew	- species	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
VERBENA (Verbena)					
	Nutritional	- fertilizer burn	2	0	2
	Powdery mildew	- Erysiphe	1	0	1
	Root rot	- Pythium	1	0	1
VINCA (Vinca)					
	Aerial blight	- Phytophthora	2	0	2
	Canker/dieback	- Phoma	2	0	2
	Gray mold	- Botrytis	1	0	1
	No disease		2		2
	Nutritional	- fertilizer burn	1	0	1
		- iron deficiency	1	0	1
	Root rot	- Pythium	1	0	1
VIOLET (Viola)					
	No disease		1		1
WATER LILY (Victoria)					
	No disease		3	0	3
ZINNIA (Zinnia)					
	Insect injury		2	0	2
	No disease		1		1
<u>TURFGRASS</u>					
BENTGRASS (Agrostis)					
	Anthracnose	- Colletotrichum	3	0	3
	Blight	- Pythium	2	0	2
	Brown patch	- Rhizoctonia	2	1	3
	Cultural	- black layer	1	0	1
		- poor drainage	1	0	1
	Environmental	- root deterioration	1	0	1
		- wet feet	2	0	2
	No disease		10		10
	Pink patch	- Lymonomyces	1	0	1
	Pink snow mold	- Microdochium	1	0	1
	Root rot	- Pythium	1	1	2
	Take-all patch	- Gaeumannomyces	1	0	1
BERMUDA (Cynodon)					
	Brown patch	- Rhizoctonia	3	0	3
	Pink patch	- Limonomyces	2	0	2
	Slime mold	- species	1	0	1
BLUEGRASS (Poa)					
	Anthracnose	- Colletotrichum	1	1	2
	Chemical injury	- dog urine	1	0	1
	Decline	- environmental	1	0	1
	Fading out	- Curvularia	1	0	1
	Inadequate specimen, no disease		5		5

Nutritional	- soluble salts	1	0	1
	- uneven fertilizer	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
	Powdery mildew	- species	1	0	1
	Red thread	- Laetisaria	1	0	1
	Slime mold	- species	1	0	1
	Summer patch	- Magnaporthe	1	0	1
CENTIPEDEGRASS (Eremochloa)					
	No disease		1		1
FESCUE (Festuca)					
	Anthracnose	- Colletotrichum	1	0	1
	Brown patch	- Rhizoctonia	10	1	11
	Chemical injury	- dog urine	2	0	2
		- herbicide	2	0	2
	Cultural	- spring fertilization	1	0	1
	Environmental stresses		9	2	11
	Fading out	- Curvularia	1	1	2
	Inadequate specimen, no disease		14		14
	Leaf spot	- Drechslera	1	0	1
		- Septoria	0	1	1
	Local dry spot	- environmental	2	0	2
	Melting out	- Drechslera	1	0	1
	Nutritional	- acid soil	1	1	2
	Physical injury	- burn	1	0	1
	Pink snow mold	- Microdochium	1	0	1
	Red thread	- Laetisaria	1	0	1
	Yellow patch	- Rhizoctonia	2	0	2
RYEGRASS (Lolium)					
	Blight	- Fusarium	2	0	2
		- Pythium	5	0	5
	Brown patch	- Rhizoctonia	1	0	1
	Gray leaf spot	- Pyricularia	3	0	3
	No disease		3		3
	Pink snow mold	- Microdochium	1	0	1
	Red thread	- Laetisaria	1	0	1
	Rust	- Puccinia	1	0	1
TURF (unspecified)					
	Brown patch	- Rhizoctonia	4	0	4
	Chemical injury	- dog urine	1	0	1
		- unknown	1	0	1
	Environmental	- stress	2	0	2
	Inadequate specimen, no disease		6		6
	Nutritional	- acid soil	1	0	1
		- fertilizer burn	1	0	1
		- soluble salts	1	0	1
	Red thread	- Laetisaria	2	0	2
	Summer patch	- Magnaporthe	2	0	2

ZOYSIA (Zoysia)				
Inadequate specimen, no disease			2	2

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

ANDROMEDA (Andromeda)					
	Physical injury	- unknown	1	0	1
ARBORVITAE (Thuja)					
	Chemical injury	- dog urine	2	0	2
		- driveway sealer	1	0	1
	Cultural	- transplant shock	4	0	4
	Environmental stresses		14	1	15
	Insect injury		1	0	1
	Needle drop	- normal	0	1	1
	No disease		5		5
ASH (Fraxinus)					
	Anthracnose	- Apiognomonia	7	0	7
	Cultural	- transplant shock	1	0	1
	Environmental stresses		2	0	2
	Insect injury		3	0	3
	Lichen	- species	0	1	1
	No disease		4		4
AUSTREE (Salix matsudana x S. alba)					
	Insect injury		1	0	1
AZALEA - See listing under RHODODENDRON					
BARBERRY (Berberis)					
	Cultural	- transplant shock	1	0	1
	Environmental	- cold injury	3	0	3
	Insect injury		1	0	1
	No disease		3		3
BAYBERRY (Myrica)					
	Environmental	- compaction	1	0	1
BEECH (Fagus)					
	Canker	- Hypoxylon	1	0	1
	Cultural	- transplant shock	1	0	1
BIRCH (Betula)					
	Environmental	- cold injury	1	0	1
	Insect injury		3	0	3
	Leaf spot	- Discula	2	0	2
		- Marssonina	1	0	1
		- Phyllosticta	2	0	2

No disease			2		2
Root problem	- unknown		1	0	1
BLACKGUM (Nyssa)					
Environmental	- wet feet		1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
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BOXELDER (Acer)

Insect injury			2	0	2
No disease			1		1

BOXWOOD (Buxus)

Canker	- Fusarium		1	0	1
	- Pseudonectria		4	0	4
Environmental stresses			7	0	7
Inadequate specimen, no disease			4		4
Insect injury			1	1	2
Physical injury	- burn		1	0	1
Root problem	- unknown		1	0	1
Root/stem rot	- Rhizoctonia		1	0	1

CHAMAECYPARIS (Chamaecyparis)

Twig blight	- Phomopsis		1	0	1
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CHERRY (Prunus)

Bacterial spot	- Pseudomonas		2	0	2
Brown rot	- Monilinia		1	0	1
Cultural	- transplant shock		1	0	1
Environmental stresses			6	0	6
Leaf spot	- Coccomyces		0	1	1
	- fungal		2	0	2
	- Pestalotia		0	1	1
No disease			3		3
Pollination problem	- unknown		1	0	1

CHESTNUT (Castanea)

Anthraxnose	- Gloeosporium		1	0	1
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CLEMATIS (Clematis)

Chemical injury	- unknown		1	0	1
Leaf spot	- Ascochyta		2	0	2
No disease			2		2
Nutritional	- general		2	0	2

COTONEASTER (Cotoneaster)

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

CRABAPPLE (Malus)

Environmental stresses			3	0	3
Insect injury			2	1	3
Leaf spot	- Phyllosticta		1	0	1
No disease			2		2

Nutritional	- fertilizer burn	1	0	1
Scab	- Venturia	10	0	10
CRAPEMYRTLE (Lagerstroemia)				
Environmental	- stress	1	0	1
Insect injury		1	0	1
No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
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CYPRESS (Cupressocyparis)

Environmental	- drought	1	0	1
No disease		1	0	1

DAWN REDWOOD (Metasequoia)

Nutritional	- fertilizer burn	1	0	1
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DOGWOOD (Cornus)

Anthracnose	- Discula	4	1	5
Blight	- Botrytis	1	0	1
Chemical injury	- unknown	2	0	2
Cultural	- transplant shock	6	1	7
Decline	- unknown	3	0	3
Environmental stresses		11	1	12
Inadequate specimen, no disease		13		13
Insect injury		1	0	1
Leaf scorch	- environmental	2	0	2
	- unknown	2	0	2
Leaf spot	- Septoria	3	0	3
Physical injury	- mower	1	0	1
	- wound	1	0	1
Powdery mildew	- Oidium	11	3	14
Spot anthracnose	- Elsinoe	4	2	6

ELM (Ulmus)

Canker	- Tubercularia	1	0	1
Environmental stresses		3	0	3
Insect injury		1	0	1
No disease		2		2

EUONYMUS (Euonymus)

Anthracnose	- Gloeosporium	1	0	1
Crown gall	- Agrobacterium	5	0	5
Environmental stresses		4	1	5
Insect injury		18	5	23
No disease		2		2
Powdery mildew	- Microsphaera	5	0	5
	- Oidium	6	0	6

FIR (Abies)

Environmental stresses		1	1	2
No disease		1		1
Root rot	- fungal	1	0	1
	- Phytophthora	1	0	1

FORSYTHIA (Forsythia)

Cultural	- transplant shock	1	0	1
Inadequate specimen		1		1

FOTHERGILLA (Fothergilla)

Cultural	- transplant shock	2	0	2
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CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
FRINGETREE (Chionanthus)					
	Leaf spot	- Phyllosticta	1	0	1
GINKO (Ginko)					
	No disease		1		1
GOLDENRAIN TREE (Koelreuteria)					
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
HACKBERRY (Celtis)					
	Wood decay	- Perinniporia	1	0	1
HAWTHORN (Crataegus)					
	Cedar-quince rust	- Gymnosporangium	1	1	2
	Inadequate specimen		1		1
	Insect injury		2	0	2
	Leaf blight	- Entomosporium	1	0	1
	Sooty mold	- species	0	1	1
HEMLOCK (Tsuga)					
	Cultural	- transplant shock	2	0	2
	Environmental stresses		7	1	8
	Inadequate specimen, no disease		6		6
	Insect injury		4	1	5
HIBISCUS (Hibiscus)					
	Cultural	- low humidity	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		1	2	3
	No disease		1		1
	Physiological	- oedema	1	0	1
HICKORY (Carya)					
	Insect injury		5	0	5
	White mold	- Microstroma	1	0	1
HOLLY and INKBERRY (Ilex)					
	Anthracnose	- Colletotrichum	1	0	1
		- Gloeosporium	1	0	1
	Black root rot	- Thielaviopsis	14	0	14
	Cultural	- transplant shock	8	1	9
	Environmental stresses		13	3	16
	Inadequate specimen, no disease		24		24
	Insect injury		4	0	4
	Leaf drop	- normal	1	0	1
	Leaf spot	- fungal	4	0	4
	Nutritional	- iron deficiency	1	0	1
		- soluble salts	1	0	1
	Physiological	- oedema	2	1	3
		- poor pollination	1	1	2

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
HONEYLOCUST (Gleditsia)					
	Dieback	- Botryosphaeria	1	0	1
	No disease		1		1
HONEYSUCKLE (Lonicera)					
	Chemical injury	- herbicide	1	0	1
	Environmental	- wet feet	1	0	1
	Insect injury		0	1	1
	No disease		2		2
	Powdery mildew	- Oidium	1	0	1
	Stem canker	- Phoma	1	0	1
HORECHESTNUT (Aesculus)					
	Leaf blotch	- Guignardia	1	0	1
HYDRANGEA (Hydrangea)					
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	2	0	2
	Leaf spot	- bacterial	1	0	1
		- Cercospora	1	0	1
	No disease		3		3
JUNIPER and RED CEDAR (Juniperus)					
	Blight	- Cercospora	1	0	1
	Cedar/apple rust	- Gymnosporangium	2	0	2
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	5	0	5
	Environmental stresses		38	3	41
	Inadequate specimen, no disease		16		16
	Insect injury		5	0	5
	Root rot	- Phytophthora	2	0	2
	Twig blight	- Kabatina	2	0	2
		- Phomopsis	4	1	5
KERRIA (Kerria)					
	Canker	- Nectria	1	0	1
LILAC (Syringa)					
	Bacterial blight	- Pseudomonas	1	0	1
	Environmental stresses		4	0	4
	Leaf blight	- Heterosporium	1	0	1
	Leaf roll necrosis	- unknown	1	0	1
	Leaf spot	- Cercospora	1	0	1
	No disease		5		5
	Powdery mildew	- Microsphaera	1	2	3
LINDEN (Tilia)					
	No disease		1		1
LOCUST (Robinia)					
	Insect injury		4	1	5

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
MAGNOLIA (Magnolia)					
	Blight	- Botrytis	0	1	1
	Chemical injury	- insecticide	1	0	1
		- unknown	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		6	0	6
	Insect injury		2	0	2
	No disease		7		7
	Powdery mildew	- species	5	0	5
	Root rot	- Pythium	0	1	1
		- Rhizoctonia	1	0	1
MAHONIA (Mahonia)					
	Powdery mildew	- Oidium	1	0	1
MAPLE (Acer)					
	Anthracnose	- Discula	8	2	10
		- Kabatiella	20	1	21
	Bacterial scorch	- Xylella	2	0	2
	Bleeding necrosis	- Phytophthora	1	0	1
	Canker	- Botryosphaeria	2	0	2
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	7	3	10
	Decline	- root	1	0	1
		- unknown	7	0	7
MAPLE (Acer) (cont)					
	Environmental stresses		21	3	24
	Insect injury		10	6	16
	Leaf blister	- Taphrina	6	0	6
	Leaf scorch	- environmental	1	0	1
		- unknown	3	0	3
	Leaf spot	- Cercospora	1	0	1
		- Monostichella	1	0	1
		- Phyllosticta	5	2	7
	No disease		32		32
	Nutritional	- general	1	0	1
	Root problem	- unknown	4	1	5
	Tar spot	- Rhytisma	2	1	3
	Wilt	- Verticillium	3	0	3
	Wood decay	- unknown	1	0	1
MOCKORANGE (Philadelphus)					
	Insect injury		1	0	1
MOUNTAIN ASH (Sorbus)					
	No disease		2		2
MOUNTAIN LAUREL (Kalmia)					
	Environmental	- stress	1	0	1
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
MULBERRY (Morus)					
	Insect injury		1	0	1
	Leaf spot	- Cercospora	5	0	5
	Root problem	- unknown	1	0	1
OAK (Quercus)					
	Anthracnose	- Apiognomonia	4	0	4
	Bacterial scorch	- Xylella	13	0	13
	Chemical injury	- growth regulator	2	0	2
		- herbicide	1	0	1
		- unknown	3	0	3
	Cultural	- transplant shock	1	0	1
	Decline	- unknown	3	0	3
	Environmental stresses		7	1	8
	Inadequate specimen, no disease		17		17
	Insect injury		28	10	38
	Leaf blister	- Taphrina	3	0	3
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Elsinoe	2	1	3
		- fungal	1	0	1
		- Tubakia	6	3	9
	Nutritional	- alkalinity	0	1	1
		- iron deficiency	5	1	6
	Physical injury	- construction	1	0	1
		- squirrel	1	0	1
	Powdery mildew	- species	3	1	4
	Wetwood	- bacterial	1	0	1
PAW PAW (Asimina)					
	Leaf spot	- fungal	1	0	1
PEAR (Pyrus)					
	Bacterial spot	- Pseudomonas	1	0	1
	Bacterial scorch	- Xylella	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental	- cold injury	5	0	5
	Fire blight	- Erwinia	1	0	1
	No disease		2		2
	Nutritional	- fertilizer burn	1	0	1
PECAN (Carya)					
	Insect injury		2	0	2
	No disease		1		1
PERSIMMON (Diospyros)					
	Leaf spot	- Sphaceloma	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
PINE (Pinus)					
	Air pollution	- ozone	1	0	1
	Brown spot	- Mycosphaerella	13	1	14
	Canker	- Atropellis	1	0	1
		- Cytospora	1	0	1
	Chemical injury	- herbicide	3	0	3
	Cultural	- transplant shock	7	0	7
	Environmental stresses		15	7	22
	Girdling root	- cultural	1	0	1
	Inadequate specimen, no disease		61		61
	Insect injury		11	5	16
	Needle blight	- Dothistroma	1	0	1
	Needle drop	- normal	4	2	6
	Needle rust	- Coleosporium	1	0	1
	Nutritional	- acid soil	1	0	1
		- pH high	0	1	1
	Physical injury	- mower	0	1	1
		- unknown	1	0	1
	Pinewood nematode	- Bursaphelencus	5	0	5
	Root problem	- unknown	0	1	1
	Root rot	- Phytophthora	1	0	1
	Sooty mold	- species	2	0	2
	Tip blight	- Sphaeropsis	18	0	18
	White pine decline	- environmental	35	0	35
	White pine root decline	- Verticicladiella	2	0	2
PLUM (Prunus)					
	Bacterial spot	- Xanthomonas	1	0	1
	Black knot	- Apiosporina	10	0	10
	Environmental	- cold injury	1	0	1
	No disease		2		2
POPLAR (Populus)					
	Environmental	- cold injury	1	0	1
	No disease		1		1
PRIVET (Ligustrum)					
	Cultural	- transplant shock	1	0	1
PYRACANTHA (Pyracantha)					
	Environmental	- cold injury	1	0	1
	Fire blight	- Erwinia	1	0	1
	Scab	- Venturia	1	0	1
REDBUD (Cercis)					
	Anthracnose	- Kabatiella	1	0	1
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
	Cultural	- transplant shock	2	0	2
	Insect injury		1	2	3
	Leaf spot	- Cercospora	2	0	2
	No disease		2		2
	Wilt	- Verticillium	2	0	2

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
REDWOOD (Sequoia)					
	Blight	- Botrytis	1	0	1
	No disease		1		1
RHODODENDRON and AZALEA (Rhododendron)					
	Cultural	- transplant shock	9	3	12
	Dieback	- Botryosphaeria	1	0	1
	Environmental stresses		6	1	7
	Insect injury		6	0	6
	Leaf/flower gall	- Exobasidium	5	0	5
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Colletotrichum	1	0	1
		- Pestalotia	1	0	1
	No disease		12		12
	Nutritional	- general	1	0	1
		- iron deficiency	1	0	1
	Physical injury	- girdling	1	0	1
		- unknown	2	0	2
	Root rot	- Phytophthora	2	0	2
ROSE (Rosa)					
	Black spot	- Diplocarpon	6	0	6
	Brand canker	- Coniothyrium	1	0	1
	Canker	- Botryosphaeria	1	0	1
	Cultural	- poor planting	1	0	1
		- transplant shock	1	0	1
	Environmental	- cold injury	1	0	1
	Insect injury		1	1	2
	No disease		4		4
	Nutritional	- general	1	0	1
	Physical injury	- rodent	1	0	1
	Powdery mildew	- Sphaerotheca	1	1	2
	Rosette	- unknown	3	0	3
	Virus	- Rose mosaic	1	0	1
RUSSIAN-OLIVE (Eleagnus)					
	No disease		2		2
SASSAFRAS (Sassafras)					
	Decline	- unknown	1	0	1
SERVICEBERRY (Amelanchier)					
	Leaf spot	- Entomosporium	1	0	1
	Wood decay	- unknown	1	0	1
SKIMMIA (Skimmia)					
	Cultural	- transplant shock	1	0	1
SPIREA (Spirea)					
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	0	1	1
	Environmental	- cold injury	1	0	1

Powdery mildew	- Oidium	0	1	1
Root rot	- Pythium	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
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SPRUCE (Picea)

Chemical injury	- unknown	2	0	2
Cultural	- transplant shock	11	0	11
Environmental stresses		8	4	12
Inadequate specimen, no disease		37		37
Insect injury		23	2	25
Needle cast	- Rhizosphaera	7	0	7
Physical injury	- unknown	1	0	1
Root decline	- Verticicladiella	1	0	1
Root rot	- Phytophthora	1	0	1
Tip blight	- Sphaeropsis	1	0	1

SWEETGUM (Liquidambar)

Cultural	- transplant shock	3	0	3
Environmental	- cold injury	1	0	1
Insect injury		0	1	1
Leaf spot	- physiological	1	0	1
No disease		4		4
Sooty mold	- species	1	0	1

SYCAMORE and PLANETREE (Platanus)

Anthracnose	- Apiognomonia	5	0	5
Environmental	- cold injury	1	1	2
Powdery mildew	- Microsphaera	1	0	1

TAXUS (Taxus)

Chemical	- herbicide	1	0	1
	- unknown	1	0	1
Cultural	- transplant shock	3	0	3
Environmental stresses		15	1	16
Inadequate specimen, no disease		23		23
Nutritional	- fertilizer burn	1	0	1
Physical injury	- pruning	1	0	1
Root problem	- unknown	2	0	2
Root rot	- Phytophthora	1	0	1

TULIPTREE (Liriodendron)

Canker	- Botryosphaeria	1	0	1
Chemical injury	- herbicide	1	0	1
Cultural	- improper depth	2	0	2
Environmental stresses		1	1	2
Inadequate specimen		1		1
Insect injury		6	0	6
Sooty mold	- species	0	2	2

VIBURNUM (Viburnum)

Canker	- Botryosphaeria	1	0	1
Crown gall	- Agrobacterium	1	0	1
Environmental	- stress	1	0	1
Insect injury		1	0	1

No disease		5		5
Southern blight	- Sclerotium	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
WALNUT (Juglans)					
	Anthracnose	- Gnomonia	2	0	2
	Canker	- Diaporthe	1	0	1
	Chemical injury	- unknown	1	0	1
	Environmental	- cold injury	1	0	1
	Insect injury		4	0	4
WILLOW (Salix)					
	Canker	- Botryosphaeria	1	0	1
		- Cryptodiaporthe	1	0	1
	Crown gall	- Agrobacterium	3	0	3
	Cultural	- transplant shock	1	0	1
	Environmental	- cold injury	2	0	2
	Insect injury		1	0	1
	Leaf spot	- Sphaceloma	1	0	1
	Rust	- Melampsora	0	1	1
WISTERIA (Wisteria)					
	No disease		2		2
WITCHHAZEL (Hamamelis)					
	Environmental	- drought	1	0	1
	Insect injury		1	0	1
	Leaf spot	- Phyllosticta	1	0	1
YELLOWWOOD (Cladrastis)					
	Environmental	- wet feet	1	0	1
VEGETABLES					
BEAN (Phaseolus)					
	Air pollution	- ozone	2	0	2
	Anthracnose	- Colletotrichum	3	0	3
	Common blight	- Xanthomonas	2	0	2
	Environmental	- sunscald	0	1	1
	Insect injury		3	2	5
	Leaf spot	- Isariopsis	1	0	1
	No disease		6		6
	Nutritional	- fertilizer burn	1	0	1
		- zinc deficiency			
	Root knot nematode	- Meloidogyne	1	0	1
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Fusarium	2	2	4
		- Rhizoctonia	9	2	11
	Southern blight	- Sclerotium	4	0	4
	Stem canker	- Rhizoctonia	1	0	1
	Virus	- complex	1	0	1
BEET (Beta)					
	Cultural	- too crowded	1	0	1

BROCCOLI - See listing under CRUCIFERS

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
CABBAGE - See listing under CRUCIFERS					
CANTALOUPE - See listing under CUCURBITS					
CARROT (Daucus)					
	Chemical injury	- herbicide	1	0	1
CAULIFLOWER - See listing under CUCURBITS					
COLLARDS - See listing under CRUCIFERS					
CORN, SWEET (Zea)					
	Bacterial stalk rot	- Erwinia	1	1	2
	Environmental stresses		1	1	2
	Insect injury		1	0	1
	No disease		7		7
	Nutritional	- acid soil	2	0	2
		- fertilizer burn	1	0	1
		- organic matter toxicity	1	0	1
		- pH high	0	1	1
		- zinc deficiency	2	0	2
	Physiological	- no ear	1	0	1
		- runting	1	0	1
	Stewart's wilt	- Erwinia	1	0	1
	Virus	- Maize dwarf mosaic	1	0	1
CRUCIFERS - BROCCOLI, CABBAGE, CAULIFLOWER, COLLARS, KALE and TURNIP (Brassica)					
	Anthracnose	- Colletotrichum	1	0	1
	Black rot	- Xanthomonas	4	0	4
	Bacterial soft rot	- Erwinia	1	1	2
	Chemical injury	- herbicide	1	0	1
		- unknown	2	0	2
	Environmental stresses		2	0	2
	Leaf spot	- Alternaria	1	2	3
	No disease		1		1
	Nutritional	- boron deficiency	1	0	1
		- fertilizer burn	1	0	1
	Wirestem	- Rhizoctonia	2	0	2
CUCUMBER - See listing under CUCURBITS					
CUCURBITS - CANTALOUPE, CUCUMBER (Cucumis), PUMPKIN, SQUASH, GOURD (Cucurbita) and WATERMELON (Citrullis)					
	Angular leaf spot	- Pseudomonas	0	1	1
	Anthracnose	- Colletotrichum	3	0	3
	Bacterial wilt	- Erwinia	9	0	9
	Crown/root rot	- Fusarium	1	0	1
	Cultural	- high temperature	1	0	1
	Downy mildew	- Pseudoperonospora	6	0	6
	Environmental stresses		3	0	3
	Fruit decay	- Fusarium	2	0	2
	Inadequate specimen, no disease		17		17

Insect injury		3	2	5
Leaf spot	- Alternaria	0	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
Mutation		- genetic	1	0	1
Nutritional		- fertilizer burn	1	0	1
		- general	1	0	1
		- magnesium deficiency	1	0	1
		- nitrogen deficiency	1	0	1
		- Erysiphe	5	0	5
Powdery mildew		- Sphaerotheca	2	1	3
		- Fusarium	1	0	1
Root rot		- Pythium	0	1	1
Root/stem rot		- Rhizoctonia	2	0	2
		- Fusarium	1	0	1
Stem blight		- Alternaria	0	1	1
Storage decay		- complex	4	1	5
Virus		- Choanephora	0	3	3
Wet rot		- Fusarium	0	2	2
EGGPLANT (Solanum)					
Chemical		- unknown	1	0	1
Nutritional		- fertilizer burn	1	0	1
GOURD - See listing under CUCURBITS					
KALE - See listing under CRUCIFERS					
ONION (Allium)					
Chemical		- herbicide	1	0	1
PEA (Pisum)					
Chemical injury		- growth regulator	1	0	1
No disease			2		2
Nutritional		- acid soil	1	0	1
Root/stem rot		- Rhizoctonia	1	0	1
PEPPER (Capsicum)					
Anthracnose		- Colletotrichum	1	0	1
Bacterial spot		- Pseudomonas	0	1	1
		- Xanthomonas	8	0	8
		- calcium deficiency/dry	1	0	1
Blossom end rot		- unknown	4	0	4
Chemical injury		- sunscald	0	1	1
Environmental		- Alternaria	1	0	1
		- Phoma	0	1	1
			14		14
Inadequate specimen, no disease					
Leaf spot		- Phyllosticta	1	0	1
		- fertilizer burn	2	0	2
Nutritional		- iron deficiency	1	0	1
		- magnesium deficiency	1	0	1
		- nitrogen deficiency	0	1	1
		- Pythium	1	0	1
Root rot					

Root/stem rot	- Rhizoctonia	1	0	1
Southern blight	- Sclerotium	1	0	1
Stem rot	- Fusarium	3	0	3
	- Sclerotinia	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
POTATO (Solanum)					
	Environmental	- cold injury	1	0	1
	Inadequate specimen, no disease		3		3
PUMPKIN - See listing under CUCURBITS					
SQUASH - See listing under CUCURBITS					
SWEET POTATO (Ipomoea)					
	Insect injury		2	0	2
	Dry rot	- Diaporthe	0	1	1
	Scurf	- Monilochaete	1	0	1
	Virus	- unknown	1	0	1
TOMATO (Lycopersicon)					
	Air pollution	- ethylene	2	0	2
	Bacterial canker	- Clavibacter	5	1	6
	Bacterial soft rot	- Erwinia	0	1	1
	Bacterial speck	- Pseudomonas	3	2	5
	Bacterial spot	- Xanthomonas	2	2	4
	Bacterial wilt	- Pseudomonas	2	0	2
	Blossom end rot	- calcium deficiency/dry	1	1	2
	Buckeye rot	- Phytophthora	6	0	6
	Catfacing	- environmental	2	0	2
	Chemical injury	- burn	1	0	1
		- growth regulator	6	0	6
		- herbicide	5	0	5
		- unknown	5	0	5
	Collar rot	- Sclerotinia	1	0	1
	Cultural	- low light	1	0	1
	Early blight	- Alternaria	17	3	20
	Environmental stresses		9	5	14
	Fruit decay	- Alternaria	1	0	1
	Gray mold	- Botrytis	1	0	1
	Inadequate specimen, no disease		39		39
	Insect injury		3	1	4
	Late blight	- Phytophthora	1	1	2
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- bacterial	0	1	1
		- Botrytis	1	0	1
		- Pseudomonas	7	0	7
		- Septoria	14	0	14
	Nutritional	- acid soil	1	0	1
		- fertilizer burn	8	1	9
		- general	1	1	2
		- magnesium deficiency	0	2	2
		- phosphorus deficiency	1	0	1
		- pH high	1	0	1

Physical injury	- soluble salts	1	0	1
	- bruising	1	0	1
	- weather	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
Physiological		- internal white tissue	1	0	1
		- leaf roll	2	0	2
		- puffiness	1	0	1
		- unknown	1	0	1
		- yellow top	2	0	2
Pith necrosis		- Pseudomonas	0	1	1
Poor pollination		- unknown	1	0	1
Powdery mildew		- Oidiopsis	5	0	5
Root knot nematode		- Meloidogyne	1	0	1
Root rot		- fungal	1	0	1
		- Pythium	2	0	2
Root/stem rot		- Rhizoctonia	2	0	2
Southern blight		- Sclerotium	1	0	1
Stem canker		- Alternaria	2	0	2
Stem rot		- Botrytis	1	0	1
		- Fusarium	2	0	2
		- Sclerotinia	1	0	1
Virus		- Potato virus X	0	1	1
		- Tobacco mosaic	1	0	1
		- Tomato mosaic	5	0	5
Walnut wilt		- juglone	2	0	2

TURNIP - See listing under CRUCIFERS

WATERMELON - See listing under CUCURBITS

TOTALS **7236** **642** **7878**