

UK UNIVERSITY OF KENTUCKY
College of Agriculture

Plant Diseases in Kentucky

**Plant Disease Diagnostic Laboratory
Summary**

2002

by:

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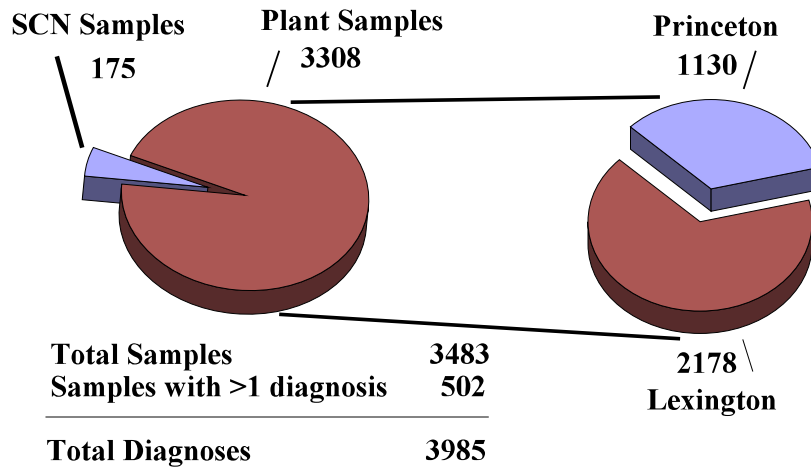
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INTRODUCTION

The Plant Disease Diagnostic Laboratory (Lexington and Princeton) handled 3308 plant samples and 175 nematode soil samples during 2002. Samples with more than one problem numbered 502, bringing the total number of actual diagnoses to 3985. The Lexington Laboratory diagnosed 2178 specimens. The Princeton Laboratory's specimens totaled 1305; of this number 1130 were plant samples and 175 were soil samples submitted exclusively for soybean cyst nematode analysis. Samples for soybean cyst nematode analysis have dropped dramatically since funding from the Kentucky Soybean Association, that had offset the cost of analysis for farmers submitting samples through the County Extension Offices, was cut and a charge of \$8.50 per sample had to be imposed in 2000.

These numbers are summarized in Figure 1 below:

Disease Diagnostic Plant Laboratory -2002



NATURE OF WORK

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

Making a diagnosis involves a great deal of research into the possible causes of the plant problem. Most visual diagnoses involve microscopy to determine what plant parts are affected and to identify the microbe(s) involved. In addition, many specimens require special tests such as moist chamber incubation, culturing, enzyme-linked immunosorbent assay (ELISA), electron microscopy, nematode extraction, or soil pH and soluble salts tests. This year, the laboratory is gearing up for polymerase-chain-reaction (PCR) testing which, although very expensive, will allow more rapid and definitive diagnosis of certain diseases. Computer-based laboratory records are maintained to provide information used for conducting plant disease surveys, identifying new disease outbreaks, and formulating educational programs.

WEATHER SUMMARY

Weather:

January: Ranked as the 23rd warmest January and the 51 wettest January on record.

Temperatures for January 2002 averaged 38.4 degrees across the state which was 5 degrees ABOVE normal and nearly 4 degrees colder than the previous month. Departure from normal high temperatures ranged from 7 degrees ABOVE normal in the West to 11 degrees ABOVE normal in the East. Departure from normal low temperature ranged from 8 degrees ABOVE normal in the West to 11 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the period totaled 4.06 inches statewide which was 0.38 inches ABOVE normal. Precipitation totals by climate division, West 4.08 inches, Central 3.67 inches, Bluegrass 2.99 inches and East 5.16 inches, which was +0.38, -0.35, -0.46 and +1.46 inches respectively from normal.

February: Ranked as the 12th driest February and the 43rd warmest February on record.

Temperatures for the month averaged 38 degrees across the state which was 2 degrees ABOVE normal. High temperatures averaged from 50 in the West to 49 in the East. Departure from normal high temperatures ranged from 1 degrees BELOW normal in the West to 4 degrees ABOVE normal in the East. Low temperatures averaged from 30 degrees in the West to 29 degrees in the East. Departure from normal low temperature ranged from 3 degrees ABOVE normal in the West to 4 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the month totaled 1.85 inches statewide which was 1.90 inches BELOW normal. Precipitation totals by climate division, West 2.28 inches, Central 1.93 inches, Bluegrass 1.49 inches and East 1.69 inches, which was 1.76, 2.19, 1.94 and 1.77 inches respectively BELOW normal.

March: The 9th wettest March in the past 108 years.

Temperatures for the month averaged 46 degrees across the state which was 1 degree BELOW normal. High temperatures averaged from 56 in the West to 58 in the East. Departure from normal high temperatures ranged from 4 degrees BELOW normal in the West to 4 degrees ABOVE normal in the East. Low temperatures averaged from 37 degrees in the West to 38 degrees in the East. Departure from normal low temperature ranged from 1 degree ABOVE normal in the West to 4 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the month totaled 7.71 inches statewide which was 3.14 inches ABOVE normal. Precipitation totals by climate division, West 7.86 inches, Central 7.62 inches, Bluegrass 8.00 inches and East 7.45 inches, which was 3.18, 2.75, 3.65 and 3.04 inches respectively ABOVE normal.

April: The 9th warmest and 24th wettest April in the past 108 years.

Temperatures for the period averaged 59 degrees across the state which was 3.4 degrees ABOVE normal and 13 degrees warmer than March 2002. High temperatures averaged from 71 in the West to 70 in the East. Departure from normal high temperatures ranged from NEAR normal in the West to 5 degrees ABOVE normal in the East. Low temperatures averaged from 50 degrees in the West to 49 degrees in the East. Departure from normal low temperature ranged from 3 degrees ABOVE normal in the West to 4 degrees ABOVE normal in the East.

Rainfall for the month of April 2002 totaled 5.25 inches statewide which was 1.15 inches ABOVE normal. Rainfall totals for April 2002 by climate division, West 5.74 inches, Central 5.70 inches, Bluegrass 5.35 inches and East 4.47 inches, which was 1.21, 1.50, 1.46 and 0.65 inches respectively ABOVE normal.

May: Temperatures for May 2002 averaged 63 degrees across the state which was 2 degrees BELOW normal. High temperatures averaged from 78 in the West to 75 in the East. Departure from normal high temperatures ranged from 4 degrees BELOW normal in the West to 2 degrees BELOW normal in the East. Low temperatures averaged from 57 degrees in the West to 54 degrees in the East. Departure from normal low temperature ranged from 1 degree BELOW normal in the West to 2 degrees BELOW normal in the East.

Rainfall for the month totaled 6.29 inches statewide which was 1.30 inches ABOVE normal. Rainfall totals by climate division, West 7.34 inches, Central 6.70 inches, Bluegrass 5.81 inches and East 5.50 inches, which was 2.36, 1.44, 0.90 and 0.64 inches respectively ABOVE normal.

June: Temperatures for June 2002 averaged 75 degrees across the state which was 2 degrees ABOVE normal. High temperatures averaged from 87 in the West to 84 in the East. Departure from normal high temperatures ranged from near normal in the West to 1 degree ABOVE normal in the East. Low temperatures averaged from 66 degrees in the West to 64 degrees in the East. Departure from normal low temperatures ranged from 3 degrees ABOVE normal in the West to 2 degrees above normal in the East.

Rainfall for June 2002 totaled 3.72 inches statewide which was 0.54 inches BELOW normal. Precipitation totals by climate division, West 2.85 inches, Central 3.88 inches, Bluegrass 3.86 inches and East 4.18 inches, which was 1.13, 0.48, 0.49 and 0.15 inches respectively BELOW normal.

July: Temperatures for July 2002 averaged 79 degrees across the state which was 3 degrees ABOVE normal and ranked this month as the 17th warmest July in the past 108 years. High temperatures averaged from 91 in the West to 86 in the East. Departure from normal high temperatures ranged from 1 degree ABOVE normal in the West to near normal in the East. Low temperatures averaged from 70 degrees in the West to 68 degrees in the East. Departure from normal low temperature ranged from 4 degrees ABOVE normal in the West to 3 degrees ABOVE normal in the East.

Rainfall for July 2002 totaled 4.02 inches statewide which was 0.74 inches BELOW normal. Rainfall totals by climate division, West 2.75 inches, Central 4.31 inches, Bluegrass 3.68 inches and East 5.03 inches, which was -1.36, -0.20, -0.83 and +0.58 inches respectively from normal.

August: 10th Hottest and 40th Driest August in past 108 years.

Temperatures for the month averaged 78 degrees across the state which was 3 degrees ABOVE normal. High temperatures averaged from 89 in the West to 87 in the East. Departure from normal high temperatures ranged from 2 degrees ABOVE normal in the West to 3 degrees ABOVE normal in the East. Low temperatures averaged from 67 degrees in the West to 66 degrees in the East. Departure from normal low temperature ranged from 4 degrees ABOVE normal in the West to 3 degrees ABOVE normal in the East.

Precipitation for August 2002 totaled 2.90 inches statewide which was 0.71 inches BELOW normal. Precipitation totals by climate division, West 2.27 inches, Central 4.30 inches, Bluegrass 3.05 inches and East 2.26 inches, which was -0.91, +0.78, -0.67 and -1.64 inches respectively from normal.

September: The 5th wettest and 15th warmest September in the past 108 years.

Temperatures for September 2002 averaged 72 degrees across the state which was 4 degrees ABOVE normal. High temperatures averaged from 85 in the West to 82 in the East. Departure from normal high temperatures ranged from 4 degrees ABOVE normal in the West to 5 degrees above normal in the East. Low temperatures averaged from 61 degrees in the West to 61 degrees in the East. Departure from normal low temperature ranged from 3 degrees ABOVE normal in the West to 5 degrees ABOVE normal in the East.

Rainfall for September 2002 period totaled 5.81 inches statewide which was 2.33 inches ABOVE normal. Rainfall totals by climate division, West 6.49 inches, Central 6.82 inches, Bluegrass 5.82 inches and East 4.56 inches, which was 3.12, 2.92, 2.56 and 1.15 inches respectively ABOVE normal.

October: Temperatures for October 2002 averaged 57.8 degrees across the state which was about 1 degree ABOVE normal. High temperatures averaged from 64 in the West to 64 in the East. Departure from normal high temperatures ranged from 4 degrees BELOW normal in the West to 3 degrees BELOW normal in the East. Low temperatures averaged from 48 degrees in the West to 50 degrees in the East. Departure from normal low temperature ranged from 2 degrees ABOVE normal in the West to 5 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the month totaled 5.89 inches statewide which was 2.84 inches above normal and the 3rd wettest October in the past century. Precipitation totals by climate division, West 5.36 inches, Central 6.45 inches, Bluegrass 6.39 inches and East 5.57 inches, which was 2.19, 3.25, 3.45 and 2.64 inches respectively from normal.

November: 32nd coolest and the 43rd wettest November in the past 108 years.

Temperatures for the month averaged 44 degrees across the state which was 2.6 degrees BELOW normal. High temperatures averaged from 53 in the West to 52 in the East. Departure from normal high temperatures ranged from 6 degrees BELOW normal in the West to 4 degrees BELOW normal in the East. Low temperatures averaged from 36 degrees in the West to 36 degrees in the East. Departure from normal low temperature ranged from 1 degree BELOW normal in the West to 3 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the month totaled 3.89 inches statewide which was -0.15 inches from normal. Central, Bluegrass and Eastern Kentucky received normal to ABOVE normal rainfall. Western Kentucky only received about half of its normal rainfall. Precipitation totals by climate division, West 2.73 inches, Central 4.45 inches, Bluegrass 4.30 inches and East 4.11 inches, which was -1.80, +0.15, +0.62 and +0.38 inches respectively from normal.

December: The 27th wettest and 51st coolest December in the past 108 years.

Temperatures for the period averaged 37 degrees across the state which was near normal. High temperatures averaged from 45 in the West to 45 in the East. Departure from normal high temperatures ranged from 2 degrees BELOW normal in the West to NEAR normal in the East. Low temperatures averaged from 31 degrees in the West to 32 degrees in the East. Departure from normal low temperature ranged from 2 degrees ABOVE normal in the West to 8 degrees ABOVE normal in the East.

Precipitation (liq. equ.) for the period totaled 5.02 inches statewide which was 0.74 inches above normal. Rainfall totals by climate division, West 5.75 inches, Central 5.38 inches, Bluegrass 4.39 inches and East 4.62 inches, which was 1.18, 0.55, 0.41 and 0.76 inches respectively ABOVE normal.

CROP SUMMARIES

Tobacco:

The number of tobacco samples stayed at their decreased level from 1999 and were very similar to the numbers for 2000 and 2001. The incidence of Blue Mold (*Peronospora tabacina*) was even lower, about half, than the relatively low years of 2000 and 2001. Black Shank (*Phytophthora parasitica* var. *nicotianae*) sample numbers increased more than two fold over 2001. The number of cases of Fusarium Wilt Complex were at a low number similar to 2001. The number of cases of Tomato Spotted Wilt virus dropped significantly reversing a trend of elevated numbers that had occurred since 1999.

Other agronomic crops:

Corn: The number of corn samples with diseases were relatively few but a few cases of Brown Spot (*Physoderma maydis*) which had not been seen for several years, were noted.

Soybean: Charcoal Rot (*Macrophomina phaseolina*) sample numbers were similar to those of 2001. Samples diagnosed with Sudden Death (*Fusarium solani*, A strain) were down below 2001 levels, which was significantly lower than 2000. Only one sample was diagnosed with Stem Canker (*Diaporthe phaseolorum*). Soybean Cyst Nematode (*Heterodera glycines*) still remains the major yield-limiting disease factor in the majority of soybean producing acreage.

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

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

Fruit and Vegetable Disease Observations:

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

New and Emerging Fruit and Vegetable Diseases in Kentucky:

- Pierce's disease of grapes caused by *Xylella fastidiosa*
- Grape crown gall caused by *Agrobacterium tumefaciens* emerges with more grapes grown
- Cucurbit yellow vine disease caused by *Serratia marsescens*
- Root, stem and fruit diseases of solanaceous and cucurbit vegetables caused by *Phytophthora* spp.
- Bacterial canker of peppers caused by *Clavibacter michiganensis* subsp. *michiganensis*
- Copper-resistant bacterial speck of tomatoes caused by *Pseudomonas syringae* pv. *tomato*

Tree Fruit Diseases:

Rain and long periods of spring leaf wetness increased the occurrence of primary infections of apple scab (*Venturia inaequalis*) and cedar rust (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, and *G. globosum*). Periodically mild spring weather and showers during apple and pear bloom resulted in significant fire blight (*Erwinia amylovora*) in those areas of the state where bloom, warm weather, and rain coincided. Some Asian pears were hard hit. Spring frosts occurred and may have exacerbated fire blight. Spring rains also favored apple frog-eye leaf spot

(*Sphaeropsis malorum*). Dry summer weather reduced incidence of secondary apple scab and apple sooty blotch (*Peltaster fructicola*, *Geastrumia polystigmatis*, *Leptodontium elatius*, and other fungi) and flyspeck (*Zygophiala jamaicensis*), all of which are enhanced by long leaf wetness periods. Bitter rot (*Colletotrichum gloeosporioides*) was found in some apple orchards. Apple southern blight (*Sclerotium rolfsii*) was found in a newly planted orchard.

Winter and spring freezes resulted in some tree fruit injury that could have exacerbated stone fruit Cytospora (*Leucostoma peroonii*) cankers. As leaves emerged, peach leaf curl disease (*Taphrina deformans*) appeared. Spring rains favored peach scab (*Cladosporium carpophilum*) bacterial canker (*Pseudomonas mors-prunorum*), bacterial leaf spot (*Xanthomonas campestris* pv. *pruni*) and brown rot (*Monilinia fructicola*).

Small Fruit Diseases:

Greenhouse strawberries were subject to powdery mildew (*Sphaerotheca macularis* f.sp. *fragariae*) and in the field strawberry leaf spot (*Mycosphaerella fragariae*) was common. In brambles, systemic orange rust (*Gymnoconia nitens*) and blackberry rosette (*Cercospora rubi*) were frequently observed. Grape crown gall (*Agrobacterium tumefaciens*) continues to be a very serious problem for growers. Wet spring weather favored black rot (*Guignardia bidwellii*) and anthracnose (*Elsinoe ampelina*). Several cases of grape downy mildew (*Plasmopara viticola*) were observed. Pierce's disease (*Xylella fastidiosa*) in western Kentucky was confirmed. Summer air stagnation caused ozone injury to many plants and was especially noticeable on grapes.

Vegetable Diseases:

In accord with a wet spring and hot, dry summer in many areas of the state, infectious diseases played a significant role in production of commercial vegetable crops.

Vegetable transplants. Several diseases were diagnosed from vegetable transplant production within the state, including: Pythium root rot (*Pythium* sp.) of tomato, pepper, broccoli, and cantaloupe seedlings and transplants. Pythium root rot was diagnosed mainly from transplant operations involving the float system. Pepper transplants with gray mold blight (*Botrytis cinerea*) were also observed.

Cole crops. Bacterial soft rot (*Erwinia carotovora*) was observed on cabbage. This disease sometimes follows infection by black rot (*Xanthomonas campestris*) bacteria. Another disease diagnosed was wirestem (*Rhizoctonia solani*) on transplants and newly set cole crops, including cabbage, and cauliflower, plus the *Rhizoctonia* fungus caused stem and head rots later in the season.

Tomatoes. Commercial tomato plantings were infected by several bacterial diseases including bacterial canker (*Clavibacter michiganensis*), bacterial spot (*Xanthomonas campestris* pv. *vesicatoria*), and bacterial speck (*Pseudomonas syringae* pv. *tomato*). Pythium root rot from the transplants carried over into the field. Two fungal leaf spots, early blight (*Alternaria solani*) and Septoria leaf spot (*Septoria lycopersici*) and two fruit rots, buckeye rot (*Phytophthora cactorum*) and blossom end rot also occurred. Other fruit diseases included the fungal and bacterial leaf diseases listed above. Tomato fruit also experienced a number of physiological disorders such as catfacing, growth cracks, yellow shoulders, and sunscald. Fusarium wilt (*Fusarium oxysporum* f.sp. *lycopercici*), timber rot (*Sclerotinia sclerotiorum*), southern blight (*Sclerotium rolfsii*) and root knot nematode (*Meloydogyne incognita*) were problems in some fields. A number of viral

diseases caused losses, particularly TSWV (Tomato Spotted Wilt Virus) and ToMV/TMV (Tomato Mosaic Virus/Tobacco Mosaic).

Peppers. Bacterial leaf spot (*Xanthomonas campestris* pv. *vesicatoria*) remains an important problem. Important virus diseases of pepper included pepper mottle and TSWV (tomato spotted wilt virus). Occasionally southern stem blight (*Sclerotium rolfsii*) and stem rot (*Rhizoctonia solani*) were problems. Pythium root rot (*Pythium* spp.) was found, especially where associated with already-infected transplants.

Cucurbits. Cucurbits are becoming more popular in Kentucky, and their diseases are increasing in economic importance. Phytophthora root rot, stem rot, leaf blight and fruit rot (*Phytophthora capsici*) is widespread in the state and causes losses in many fields of pumpkins, squash, and cucumbers. Microdochium blight (*Microdochium* sp. recently renamed *Plectosporium*) caused some damage in some fields that were not being sprayed well; poor spraying practices, even when regular applications are made, can include inappropriate timing, poor coverage, or use of the wrong fungicides for the diseases present. Watermelon and squash showed, respectively, Fusarium root rot and root and crown rot (*Fusarium* spp.) diseases. Nutritional disorders were also common, including several cases of manganese toxicity and blossom end rot. Anthracnose (*Colletotrichum* spp.), gummy stem blight/black rot (*Mycosphaerella melonis*), and Cercospora leaf spot (*Cercospora melonis*) were found at serious levels in some fields on many of the cucurbits. The potyvirus complex, dominated by Watermelon Mosaic Virus 2, was widespread in pumpkin and winter squash, while several cases of Cucumber Mosaic Virus were also found in melon crops. Bacterial diseases of cucurbits included angular leaf spot (*Pseudomonas syringae* pv. *lachrymans*) and bacterial wilt (*Erwinia tracheiphila*). Symptoms of a newly emerging bacterial disease, Cucurbit Yellow Vine Decline caused by *Serratia marsescens*, were found in watermelon, muskmelon, summer squash, and winter squash.

Other vegetables. Bean root and stem rot (*Pythium* spp., *Rhizoctonia solani* and *Fusarium solani* f.sp. *phaseoli*), bean anthracnose (*Colletotrichum lindemuthianum*), and pea stem rot (*Rhizoctonia solani*) were observed this year. Dry rot (*Fusarium* sp.) occurred on potato tubers.

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 Chlorothalonil to new chemicals such as Quadris and Abound, which present a greater risk of pathogen resistance to the fungicide while incurring reduced risks to human health and the environment. For example, we have noted increased incidence of bacterial diseases in tomatoes and now want to know if this is due to how we raise our crops, manage other diseases, or import seeds and transplants.

Because fruits and vegetables are high value crops, the Plant Disease Diagnostic Laboratory should be a great value to commercial growers. However, many growers are not using the Plant Disease Diagnostic Laboratory often or soon enough. If growers wait until their disease problem has become well established, correct diagnosis may be impossible and, even if a diagnosis is made, controls may no longer be effective. Growers should consistently consult with their County Extension Agents so that appropriate plant specimens are sent to the laboratory in a timely manner. We are urging County Extension Agents to stress in their Extension programming the need for accurate diagnosis of diseases of high-value crops. Growers can work with their Agents to see that Kentucky growers have the best possible information on fruit and vegetable diseases.

Landscape Plant Disease Observations:

Wet spring weather favored many foliar diseases such as anthracnose, leaf spots, and scab. Extremely warm temperatures in April favored severe fire blight in the central and eastern portions of the state. Summer heat and drought were hard on all plants, especially those with inadequate root systems.

Deciduous tree diseases:

- Woody landscape plants, especially flowering fruits had winter or spring freeze injury on twigs and branches
- Crabapples, serviceberries, and flowering pears: fire blight (*Erwinia amylovora*)
- Hawthorn and crabapple: cedar rust (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, *G. globosum*) fungi
- Flowering crabapple scab (*Venturia inaequalis*) began in early spring
- Maple, ash, and sycamore anthracnose (*Kabatiella*, *Discula*, and *Apiognomonina*), and dogwood spot anthracnose (*Elsinoe*)
- Dogwood powdery mildew (*Microsphaera*, *Phyllactinia* spp.)
- Red, scarlet and pin oak bacterial leaf scorch (*Xylella*) in late summer
- Hackberry bacterial leaf scorch (*Xylella*) found for the first time
- Catalpa, maple, redbud, and magnolia wilt (*Verticillium*)
- Ash, dogwood, maple, redbud, and yellowwood canker (*Botryosphaeria*)
- Flowering plum black knot (*Apiosporina*) from previous year's infection
- Elm Dutch elm disease (*Ophiostoma*)
- Birch cv. 'Renaissance' leaf spot (*Septoria*)

Needle evergreen tree diseases:

- Pine tip blight (*Sphaeropsis*), pine wilt nematode (*Bursaphelenchus*), needle casts (*Dothistroma*, *Lophodermium*), needle rust (*Coleosporium*), and ozone injury
- Juniper tip blight (*Kabatina*) and rusts (*Gymnosporangium*)

Shrub diseases:

- Azalea gall (*Exobasidium*)
- Boxwood shoot blight (*Volutella*) and cutting rot (*Rhizoctonia*)
- Euonymus crown gall (*Agrobacterium*) and powdery mildew (*Erysiphe*)
- Holly, and boxwood black root rot (*Thielaviopsis*)
- Photinia leaf spot (*Entomosporium*)
- Rose black spot (*Diplocarpon*), powdery mildew (*Sphaerotheca*), and canker (*Leptosphaeria*)
- Rose rosette disease (possible leaf curl mite-transmitted virus) was very prevalent
- Rhododendron canker (*Botryosphaeria* sp.)

Perennial and annual plant diseases:

- English ivy bacterial leaf spot (*Xanthomonas*)
- Iris leaf spot (*Heterosporium*)
- Peony gray mold (*Botrytis*) and red spot (*Cladosporium*)
- Periwinkle blight (*Phytophthora*)
- Petunia, and pansy black root rot (*Thielaviopsis*)
- Pansy leaf spot (*Cercospora*)

Turfgrass diseases:

- Perennial ryegrass gray leaf spot (*Pyricularia grisea*)

A Shift in Sample Types:

As noted above the number of tobacco samples for 2002 stayed at their dramatically decreased level seen since 2000, as compared to years up to and including 1999. This drop in the number of tobacco samples was mostly offset by increases in the number of woody and herbaceous ornamental samples as well as commercial vegetable samples. An increasing number of these samples are of plant types which are less common and therefore require more work, testing, and time to provide an accurate diagnosis. Along with the diversification of crops we are seeing a diversification of diseases.

Disease Monitoring:

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

- Pierce's disease of grapes caused by *Xylella fastidiosa*
- Grape crown gall caused by *Agrobacterium tumefaciens* emerges with more grapes grown
- Cucurbit yellow vine disease caused by *Serratia marsescens*
- Root, stem and fruit diseases of solanaceous and cucurbit vegetables caused by *Phytophthora* spp.
- Bacterial canker of peppers caused by *Clavibacter michiganensis subsp. michiganensis*
- Copper-resistant bacterial speck of tomatoes caused by *Pseudomonas syringae pv. tomato*

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

Educational Resource:

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

ACKNOWLEDGMENTS

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

Thanks also go to Pat Yancey and Sandie Waddell, staff assistants in Lexington and Princeton, respectively, for their work in mailing thousands of diagnostic forms and IPM/PDDL Surveys. Tom Priddy, Ag. Engineering - Meteorology, and his staff provided information for the summary of weather conditions for 2002.

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

We also wish to thank the College of Agriculture's extension specialists and researchers who served as consultants to the diagnostic laboratory in 2002. Their services ranged from making diagnoses to assisting the diagnosticians with plant, insect, weed or pesticide questions. These individuals are too numerous to mention here (see Table 9) but we are grateful nonetheless to each for their valuable assistance.

EXPLANATORY REMARKS

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

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

Table 1.**SUMMARY OF 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	21	12	19	3	7	9	71
Forages	7	16	0	1	4	7	35
Small grains	9	6	2	4	0	6	27
Soybeans	29	205*	16	0	0	41*	291
Tobacco	181	655	60	19	3	71	989
<u>Fruit</u>							
Small fruit	31	75	12	7	16	22	163
Tree fruit	23	94	1	4	25	9	156
<u>Herbs</u>							
	1	5	1	3	4	7	21
<u>Identification</u>							
	0	45	0	7	0	3	55
<u>Ornamentals</u>							
Herbaceous and							
Houseplants	45	144	16	10	18	47	280
Turfgrass	30	73	1	3	0	25	132
Woody	313	290	26	37	201	286	1153
<u>Vegetables</u>							
	146	242	38	38	61	76	601
<u>Miscellaneous</u>							
	2	2	0	0	0	7	11
<u>Total</u>							
	838	1864	192	136	339	616	3985

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.

* Numbers include samples from the Nematode Analysis Laboratory, Princeton: 139 with Soybean Cyst Nematodes; 36 without Soybean Cyst Nematodes.

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

Crop Category	Bacterial	Fungal	Nematode	Virus	Other¹
<u>Agronomic</u>					
Corn	1	11	0	0	0
Forages	0	16	0	0	0
Small grains	0	2	0	4	0
Soybeans	0	58	181	2	0
Tobacco	15	598	0	42	0
<u>Fruit</u>					
Small fruit	7	65	0	0	3
Tree fruit	39	54	0	0	1
<u>Herbs</u>					
	0	4	1	0	0
<u>Identification</u>					
	0	26	0	0	19
<u>Ornamentals</u>					
Herbaceous and Houseplants	13	128	0	3	0
Turfgrass	0	70	1	0	2
Woody	28	239	1	19	3
<u>Vegetables</u>					
	74	140	4	22	1
<u>Miscellaneous</u>					
	0	1	0	0	1
Total	177	1412	188	92	30

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 Plant Specimens	Percentage of Total Plant Specimens
Agronomic (-Tobacco)	202	6.1
Tobacco	816	24.7
Fruit	282	8.5
Herbs	21	0.6
Identifications	55	1.7
Ornamentals	1419	42.9
Vegetables	502	15.2
Miscellaneous	11	0.3
Total Plant Specimens	3308	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	66	5	71
Forages	29	6	35
Small grains	25	2	27
Soybeans	257*	34	291
Tobacco	816	173	989
<u>Fruit</u>			
Small fruit	148	15	163
Tree fruit	134	22	156
<u>Herbs</u>			
	21	0	21
<u>Identification</u>			
	55	0	55
<u>Ornamentals</u>			
Herbaceous and Houseplants	253	27	280
Turfgrass	121	11	132
Woody	1045	108	1153
<u>Vegetables</u>			
	502	99	601
<u>Miscellaneous</u>			
	11	0	11
<u>Total</u>	3483	502	3985

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.

* Soybean plant samples + 175 Soybean Cyst Nematode samples.

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	54	11	0	0	0	1	0	0
Forages	26	1	0	0	0	2	0	0
Small grains	23	1	0	0	0	1	0	0
Soybeans	204	1	0	0	3	49	0	0
Tobacco	757	41	0	0	0	18	0	0
<u>Fruit</u>								
Small Fruit	54	9	68	9	0	8	0	0
Tree Fruit	23	2	101	8	0	0	0	0
<u>Herbs</u>								
	8	0	6	5	0	2	0	0
<u>Identifications</u>								
	9	4	35	6	0	0	1	0
<u>Ornamental</u>								
Herbaceous and								
Houseplants	98	25	90	22	0	15	0	3
Turfgrass	39	16	50	1	0	1	7	7
Woody	206	32	753	30	1	6	13	4
<u>Vegetable</u>								
	317	7	165	5	1	7	0	0
<u>Miscellaneous</u>								
	2	0	4	0	0	0	0	5
<u>Total</u>	1820	150	1272	86	5	110	21	19
<u>Total/Grower Type</u>	1970		1358		115		40	

Total number of samples received = 3483

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.	4	0	2	5	0	11
Agronomy Department	44	0	2	4	0	50
Entomology Department	4	6	27	8	0	44
Horticulture Department	0	1	7	4	3	15
<u>Total</u>						120
<u>Total number of plant samples</u>						3308
<u>Percent of plant samples referred outside Diagnostic Lab for diagnosis</u>						3.6

* 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	20
Enzyme-linked Immunosorbent Assay (ELISA)	89
Grow out	9
Incubation	425
Indicator plants	1
Nematode extraction (total = 182)	
Miscellaneous	1
Pinewood nematode	6
Soybean cyst nematode	175
Soil tests (total = 188)	
pH	118
Saturated Media Extract/pH	3
Soluble salts	18
pH/Soluble Salts	49

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	1	1	0	1	0	0
ALLEN	12	1	2	1	1	7	0
ANDERSON	2	0	1	0	1	0	0
BALLARD	28	5	9	4	6	4	0
BARREN	22	2	5	2	13	0	0
BATH	20	0	12	2	3	3	0
BELL	16	0	0	1	13	2	0
BOONE	41	1	7	0	27	3	3
BOURBON	35	2	20	1	7	4	1
BOYD	12	0	0	0	9	2	1
BOYLE	45	2	18	0	21	3	1
BRACKEN	10	0	8	0	0	0	2
BREATHITT	22	0	3	8	3	7	1
BRECKINRIDGE	75	4	40	10	17	4	0
BULLITT	28	0	3	5	17	3	0
BUTLER	25	9	3	4	6	3	0
CALDWELL	75	7	16	10	22	11	9
CALLOWAY	110	13	47	3	41	6	0
CAMPBELL	7	1	0	0	6	0	0
CARLISLE	10	2	2	3	2	1	0
CARROLL	2	0	1	0	1	0	0
CARTER	9	0	3	0	6	0	0
CASEY	29	4	7	3	5	10	0
CHRISTIAN	80	11	9	6	33	20	1
CLARK	32	1	12	0	6	12	1
CLAY	2	0	0	0	0	2	0
CLINTON	21	3	6	1	8	2	1
CRITTENDEN	32	0	0	11	14	5	2
CUMBERLAND	6	0	1	0	4	1	0
DAVIESS	171	7	51	13	44	53	3
EDMONSON	18	2	1	5	8	2	0
ELLIOTT	15	0	9	3	2	1	0
ESTILL	24	0	14	1	5	4	0
FAYETTE	389	9	32	13	286	30	19
FLEMING	24	1	17	3	2	0	1
FLOYD	17	0	0	7	8	2	0
FRANKLIN	36	0	4	1	22	7	2
FULTON	7	2	0	1	3	1	0
GALLATIN	2	0	2	0	0	0	0
GARRARD	2	0	1	0	1	0	0
GRANT	13	0	7	0	5	1	0
GRAVES	38	3	12	4	15	4	0
GRAYSON	13	1	4	0	7	1	0
GREEN	16	0	7	2	5	1	1
GREENUP	22	0	0	3	17	2	0
HANCOCK	17	2	5	4	4	2	0
HARDIN	25	5	4	4	9	1	2
HARLAN	12	0	1	1	6	2	2
HARRISON	30	3	5	0	5	14	3
HART	7	1	2	1	0	3	0
HENDERSON	34	8	2	1	15	8	0
HENRY	39	2	20	4	12	1	0
HICKMAN	6	4	0	1	0	1	0
HOPKINS	60	3	8	5	39	4	1
JACKSON	12	0	8	0	3	0	1
JEFFERSON	35	0	0	1	29	3	2
JESSAMINE	34	0	3	3	27	0	1
JOHNSON	2	0	1	0	1	0	0
KENTON	34	1	2	1	28	2	0
KNOTT	0	0	0	0	0	0	0
KNOX	7	0	3	2	2	0	0

COUNTY	Total	Agronomic ¹	Tobacco	Fruit	Ornamental	Vegetable	Other
LARUE	15	1	5	2	6	0	1
LAUREL	11	0	2	4	4	1	0
LAWRENCE	5	0	3	0	0	2	0
LEE	4	1	1	0	2	0	0
LESLIE	0	0	0	0	0	0	0
LETCHER	14	0	0	4	5	4	1
LEWIS	29	0	19	3	5	2	0
LINCOLN	16	2	9	0	4	1	0
LIVINGSTON	6	0	0	2	2	0	2
LOGAN	32	2	5	4	16	4	1
LYON	9	0	3	0	4	1	1
McCRACKEN	33	1	2	4	18	8	0
McCREARY	3	0	0	1	2	0	0
McLEAN	15	3	9	0	2	1	0
MADISON	40	0	11	0	25	4	0
MAGOFFIN	0	0	0	0	0	0	0
MARION	15	1	4	0	6	3	1
MARSHALL	34	0	1	2	27	4	0
MARTIN	4	0	0	2	2	0	0
MASON	15	0	12	0	3	0	0
MADE	28	0	6	3	17	1	1
MENIFEE	5	0	3	0	1	1	0
MERCER	11	0	1	0	7	3	0
METCALFE	7	0	3	1	1	1	1
MONROE	31	0	16	1	11	3	0
MONTGOMERY	46	1	20	3	12	9	1
MORGAN	43	0	15	11	6	11	0
MUHLENBERG	20	2	9	0	5	3	1
NELSON	40	4	3	3	22	7	1
NICHOLAS	14	0	6	0	5	2	1
OHIO	13	3	8	0	2	0	0
OLDHAM	16	1	4	0	9	2	0
OWEN	7	0	3	1	3	0	0
OWSLEY	3	1	2	0	0	0	0
PENDELTON	2	0	1	0	1	0	0
PERRY	5	0	2	0	3	0	0
PIKE	2	0	0	2	0	0	0
POWELL	6	0	2	0	3	1	0
PULASKI	50	7	1	11	26	2	3
ROBERTSON	17	0	10	1	5	1	0
ROCKCASTLE	5	0	1	2	0	0	2
ROWAN	27	0	8	2	13	4	0
RUSSELL	19	4	5	0	4	5	1
SCOTT	110	0	4	2	14	90	0
SHELBY	68	1	8	4	52	3	0
SIMPSON	20	4	6	1	7	2	0
SPENCER	10	0	5	0	2	3	0
TAYLOR	21	3	13	3	1	1	0
TODD	39	7	13	4	11	3	1
TRIGG	67	8	21	7	28	2	1
TRIMBLE	11	0	7	2	2	0	0
UNION	11	3	0	2	5	1	0
WARREN	76	3	6	6	45	16	0
WASHINGTON	24	1	1	18	4	0	0
WAYNE	42	2	15	2	5	17	1
WEBSTER	31	9	7	1	10	2	2
WHITLEY	8	1	2	0	3	1	1
WOLFE	5	0	3	0	1	1	0
WOODFORD	28	2	7	3	13	2	1
Out-of-State	48	1	22	1	24	0	0
TOTALS	3666	295	855	291	1619	503	103

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	1	8
Beale, JW (Diagnostician)	Plant Pathology	1712	5
Bessin, RT	Entomology	9	11
Fountain, WM	Horticulture	0	2
Ghabrial, SA	Plant Pathology	0	2
Green, JD	Agronomy	21	10
Hartman, JR	Plant Pathology	143	21
Lee, CD	Agronomy	1	0
Nesmith, WC	Plant Pathology	166	38
Newton, BL	Entomology	2	0
Palmer, GK	Agronomy	23	5
Pearce, RC	Agronomy	0	2
Powell, AJ	Agronomy	0	1
Rowell, AB	Horticulture	10	6
Strang, JG	Horticulture	3	1
Townsend, LH	Entomology	26	11
Van Sanford, DA	Agronomy	0	2
Vincelli, P	Plant Pathology	88	22
Williams, DW	Agronomy	0	1
PRINCETON			
Bachi, PR (Diagnostician)	Plant Pathology	1010	32
Dunwell, WC	Horticulture	16	19
Herbek, JH	Agronomy	6	6
Hershman, DE	Plant Pathology	14	3
Johnson, DW	Entomology	4	2
Lacefield, GD	Agronomy	1	2
Masabni, JG	Horticulture	0	5
Martin, JR	Agronomy	47	9
Murdock, LW	Agronomy	4	5
Rasnake, M	Agronomy	1	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>
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AGRONOMIC CROPS

CORN

CORN (Zea) (includes Popcorn)

Brown spot	- Physoderma	4	0	4
Chemical injury	- growth regulator	1	0	1
	- herbicide	13	2	15
	- unknown	3	0	3
	- Sclerophthora	1	0	1
Crazy top	- Fusarium	1	0	1
Ear/Kernel rots	- stresses	8	0	8
Environmental	- Cercospora	2	0	2
Gray leaf spot	- Pseudomonas	1	0	1
Holcus spot		12		12
Inadequate specimen, no disease		7	0	7
Insect injury	- Setosphaeria	1	0	1
Northern leaf blight	- acid soil	1	0	1
Nutritional	- general	1	0	1
	- pH high	1	0	1
	- phosphorus deficiency	1	0	1
	- potassium deficiency	2	1	3
	- zinc deficiency	3	0	3
	- environmental	0	1	1
Poor pollination	- complex (fungus)	1	0	1
Purple leaf sheath	- fungal	1	0	1
Stalk rot				

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>FORAGES</u>					
ALFALFA (Medicago)					
	Crown/stem rot	- Sclerotinia	2	0	2
	Crown rot	- Fusarium	0	1	1
	Environmental stresses		4	1	5
	Inadequate specimen, no disease		7		7
	Insect injury		2	2	4
	Leaf spot	- Leptosphaerulina	1	0	1
	Nutritional	- boron deficiency	1	0	1
	Root rot	- Aphanomyces	1	0	1
		- Pythium	1	0	1
	Spring black stem	- Phoma	2	0	2
BIG BLUESTEM (Andropogon)					
	Foliar rust	- Puccinia	1	0	1
CLOVER (Trifolium)					
	Crown/stem rot	- Sclerotinia	1	0	1
HAY (various)					
	No disease		1		1
LITTLE BLUESTEM (Schizachyrium)					
	Root rot	- Pythium	1	0	1
ORCHARDGRASS (Dactylis)					
	Anthraxnose	- Colletotrichum	2	0	2
	Brown stripe	- Cercosporidium	2	0	2
	Environmental	- cold injury	0	1	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>SOYBEAN</u>					
SOYBEAN (Glycine)					
	Black root rot	- Thielaviopsis	1	0	1
	Brown spot	- Septoria	1	1	2
	Charcoal rot	- Macrophomina	9	2	11
	Chemical injury	- herbicide, growth reg.	14	2	16
	Chimera	- genetic	1	0	1
	Downy mildew	- Peronospora	1	2	3
	Environmental stresses		4	7	11
	Frogeye	- Cercospora	1	4	5
	Leaf blight	- Cercospora	1	1	2
	Leaf spot	- Alternaria	1	0	1
	No disease		5		5
	Nutritional	- acid soil	2	0	2
		- manganese deficiency	2	0	2
		- poor nodulation	1	0	1
		- potassium deficiency	8	2	10
	Physical injury	- unknown	1	0	1
	Pod and stem blight	- Diaporthe	1	1	2
	Purple seed	- Cercospora	1	1	2
	Root knot nematode	- Meloidogyne	1	0	1
	Root rot	- Fusarium	2	0	2
		- Pythium	0	1	1
	Root/stem rot	- fungal	0	1	1
		- Rhizoctonia	5	8	13
	Seed decay	- Macrophomina	2	0	2
	Soybean cyst nematode - on plant samples		5	0	5
	Heterodera	* in soil samples	139		139
		* absent in soil samples	36		36
	(*soil submitted to Nematode Analysis Laboratory)				
	Stem rot	- Fusarium	1	1	2
	Storage mold	- fungal	1	0	1
	Sudden death	- Fusarium	4	0	4
	Virus	- Bean pod mottle	1	0	1
		- Soybean mosaic	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>SMALL GRAINS</u>					
BARLEY (<i>Hordeum</i>)					
	Environmental	- cold injury	1	0	1
OAT (<i>Avena</i>)					
	Environmental stresses		1	1	2
WHEAT (<i>Triticum</i>)					
	Chemical injury	- herbicide	1	1	2
	Downy mildew	- <i>Sclerophthora</i>	1	0	1
	Environmental	- cold injury	6	0	6
	Inadequate specimen, no disease		10		10
	Take-all	- <i>Gaeumannomyces</i>	1	0	1
	Virus	- Barley yellow dwarf	3	0	3
		- Wheat spindle streak mosaic	1	0	1
<u>TOBACCO</u>					
TOBACCO (<i>Nicotiana</i>)					
	Angular leaf spot	- <i>Pseudomonas</i>	2	1	3
	Bacterial soft rot	- <i>Erwinia</i>	2	2	4
	Bacterial spot	- bacteria	1	0	1
	Black leg	- <i>Erwinia</i>	4	2	6
	Black root rot	- <i>Thielaviopsis</i>	8	0	8
	Black shank	- <i>Phytophthora</i>	292	1	293
	Blue mold	- <i>Peronospora</i>	23	2	25
	Brown spot	- <i>Alternaria</i>	3	5	8
	Canker	- <i>Fusarium</i>	1	0	1
	Charcoal rot	- <i>Macrophomina</i>	0	2	2
	Chemical injury	- antibiotic	1	0	1
		- chlorine	1	0	1
		- fungicide	4	1	5
		- growth regulator	11	0	11
		- herbicide	21	1	22
		- petroleum product	0	2	2
		- spray burn	1	0	1
		- sucker agent	1	0	1
		- unknown	14	2	16
	Collar rot	- <i>Sclerotinia</i>	2	0	2
	Cultural	- transplant shock	21	5	26
	Damping-off	- <i>Rhizoctonia</i>	1	0	1
	Early flowering	- environmental	0	1	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
(Tobacco, continued)					
Environmental		- cold injury	18	4	22
		- compaction	1	1	2
		- drought	3	0	3
		- high temperature	1	0	1
		- lightning	9	0	9
		- stress	13	2	15
		- weather scald	2	0	2
		- wet feet	8	2	10
	Frenching	- metabolites	5	0	5
	Frogeye	- Cercospora	17	8	25
Hollow stalk	- Erwinia	1	0	1	
Inadequate specimen, no disease		90		90	
Insect injury		1	2	3	
Nutritional		- acid soil	6	9	15
		- fertilizer burn	4	1	5
		- general	3	2	5
		- high alkalinity	1	0	1
		- manganese toxicity	17	0	17
		- nitrogen deficiency	7	2	9
		- phosphorus deficiency	5	3	8
		- potassium deficiency	8	3	11
		- pH high	1	0	1
		- soluble salts	2	0	2
	- temp. phosphorus def.	20	1	21	
Physical injuries		2	0	2	
Physiological	- leaf breakdown	3	0	3	
Ragged leaf spot	- Ascochyta	0	1	1	
Root rot	- Fusarium	3	0	3	
	- Pythium	53	8	61	
Root/stem rot	- Rhizoctonia	9	11	20	
Slime mold	- species	1	0	1	
Sore shin	- Rhizoctonia	21	55	76	
Stem rot	- Fusarium	2	0	2	
Storage mold	- Aspergillus	2	0	2	
	- Botrytis	1	0	1	
	- fungal	3	0	3	
Target spot	- Rhizoctonia	26	11	37	
Variegation	- genetic	1	1	2	
Virus	- Alfalfa mosaic	2	0	2	
	- Cucumber mosaic	1	0	1	
	- Tobacco mosaic	2	0	2	
	- Tobacco ringspot	1	0	1	
	- Tobacco streak	2	0	2	
	- Tomato spotted wilt	27	8	35	
Weather fleck	- ozone	4	0	4	
Wilt	- Fusarium	11	10	21	

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
FRUIT CROPS					
<u>SMALL FRUITS</u>					
BLUEBERRY (Vaccinium)					
	Canker	- Botryosphaeria	1	0	1
	Environmental stresses		3	2	5
	No disease		3		3
	Nutritional	- acid soil	1	0	1
		- iron deficiency	2	0	2
	Root rot	- Phytophthora	1	0	1
BRAMBLES - BLACKBERRY, and RASPBERRY (Rubus)					
	Anthraxnose	- Elsinoe	2	0	2
	Chemical injury	- herbicide	4	0	4
	Double blossom	- Cercospora	3	0	3
	Environmental stresses		6	0	6
	Fruit rot	- Botrytis	1	0	1
	Inadequate specimen, no disease		9		9
	Insect injury		7	1	8
	Leaf spot	- Septoria	1	0	1
	Root rot	- Phytophthora	3	1	3
	Rust, orange	- Gymnoconia	2	0	2
	Wilt	- Verticillium	2	0	2
CURRENT and GOOSEBERRY (Ribes)					
	Leaf spot	- Drepanopeziza	1	0	1
	Wilt	- Verticillium	1	0	1
ELDERBERRY (Sambucus)					
	Insect injury		1	0	1
	No disease		1		1
GRAPE (Vitis)					
	Air pollution	- ozone	4	0	4
	Anthraxnose	- Elsinoe	3	2	5
	Black rot	- Guignardia	20	1	21
	Cane blight	- Phomopsis	0	1	1
	Chemical injury	- growth regulator	1	0	1
		- unknown	6	0	6
	Crown gall	- Agrobacterium	6	0	6
	Downy mildew	- Plasmopora	6	1	7
	Environmental stresses		6	1	7
	Inadequate specimen, no disease		13		13
	Insect injury		3	2	5
	Nutritional	- general	1	1	2
	Physical injury	- deer	3	0	3
	Pierce's Disease	- Xylella	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
STRAWBERRY (Fragaria)					
	Anthracnose	- Colletotrichum	1	0	1
	Chemical injury	- unknown	1	0	1
	Environmental	- stress	1	0	1
	Fruit rot	- Rhizoctonia	1	0	1
	Inadequate specimen, no disease		2		2
	Insect injury		2	0	2
	Leaf blight	- Phomopsis	2	1	3
	Leaf spot	- Mycosphaerella	6	0	6
	Nutritional	- pH high	1	0	1
	Physical injury	- unknown	0	1	1
	Pollination problem	- environmental	1	0	1
	Powdery mildew	- Sphaerotheca	1	0	1

TREE FRUITS

APPLE (Malus)					
	Bitter rot	- Glomerella	1	1	2
	Black root rot	- Xylaria	1	0	1
	Burr knot	- unknown	1	0	1
	Canker	- Botryosphaeria	0	2	2
	Cedar apple rust	- Gymnosporangium	13	0	13
	Collar rot	- Phytophthora	2	0	2
	Cork spot	- calcium deficiency	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		2	0	2
	Fire blight	- Erwinia	28	1	29
	Flyspeck	- Schizothyrium	1	2	3
	Frogeye	- Botryosphaeria	4	0	4
	Inadequate specimen, no disease		6		6
	Insect injury		12	4	16
	Leaf spot	- Alternaria	1	0	1
	Root rot	- Fusarium	0	1	1
	Scab	- Venturia	1	0	1
	Sooty blotch	- Gloeodes	3	3	6
	Southern blight	- Sclerotium	1	0	1
CHERRY (Prunus)					
	Bacterial canker	- Pseudomonas	1	0	1
	Canker, fungal	- Cytospora	1	0	1
	Environmental	- cold injury	1	0	1
	Fruit distortion	- cold injury	1	0	1
KIWI (Actinidia)					
	Environmental	- cold injury	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
PEACH, APRICOT and NECTARINE (Prunus)					
	Bacterial canker	- Pseudomonas	1	0	1
	Bacterial spot	- Xanthomonas	3	1	4
	Brown rot	- Monilinia	2	2	4
	Chemical injury	- unknown	1	0	1
	Environmental	- cold injury	1	0	1
	Gummosis	- unknown	1	0	1
	Inadequate specimen, no disease		3		3
	Insect injury		4	0	4
	Leaf curl	- Taphrina	4	0	4
	Nutritional	- nitrogen deficiency	1	1	2
	Scab	- Fusicladium	4	0	4
PEAR (Pyrus)					
	Anthrachnose	- Gloeosporium	0	1	1
	Environmental stresses		3	0	3
	Fire blight	- Erwinia	4	0	4
	No disease		2		2
PECAN (Carya)					
	Environmental stresses		2	0	2
	Fruit decay	- fungal	0	1	1
	Insect injury		5	0	5
	No disease		1		1
	Nut fuzz	- normal	0	1	1
PLUM (Prunus)					
	Black knot	- Apiosporina	1	0	1
	Environmental stresses		2	0	2
	Thread blight	- Ceratobasidium	1	0	1
WALNUT (Juglans)					
	Internal breakdown	- physiological	0	1	1
	No disease		1		1
	Nut drop	- normal	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
HERBS					
BASIL (Ocimum)					
	Insect injury		1	0	1
	Physical injury	- unknown	1	0	1
COMFREY (Symphytum)	No disease		1		1
GINGER (Zingiber)	No disease		1		1
GINSENG (Panax)					
	Blight	- Alternaria	1	0	1
	Inadequate specimen		1		1
GOLDENSEAL (Hydrastis)					
	No disease		1		1
	Root knot nematode	- Meloidogyne	1	0	1
LAMB'S EAR [BETONY] (Stachys)	Inadequate specimen, no disease		2		2
MARJORAM (Origanum)	Insect injury		1	0	1
MEADOW BEAUTY, MARYLAND (Rhexia)	Root rot	- Rhizoctonia	1	0	1
MINT (Mentha)					
	Chemical injury	- unknown	1	0	1
	Insect injury		1	0	1
QUININE (Parthenium)	Root rot	- Rhizoctonia	1	0	1
SAGE (Salvia)					
	Inadequate specimen, no disease		2		2
	Insect injury		1	0	1
ST. JOHN'S WORT (Hypericum)	No disease		1		1
STEVIA (Piqueria)	Gray mold	- Botrytis	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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IDENTIFICATIONS

FUNGAL IDENTIFICATIONS

Agaricus	- species	1	1
Ascomycete	- species	1	1
Basidiomycete	- species	3	3
Chorophyllum	- molybdites	1	1
Conocybe	- tenera	1	1
Coprinus	- species	3	3
Cylindrocladium	- species	1	1
Ganoderma	- applanatum	1	1
Hericium	- erinaceus	1	1
Hyphomycete	- species	1	1
Inadequate specimen		7	7
Lepiota	- brunnea	1	1
Nigrospora	- species	1	1
Peziza	- badia	1	1
Pleurotus	- species	1	1
Scleroderma	- aurantium	1	1
Slime mold	- species	4	4
Sphaerobolus	- species	3	3

PLANT IDENTIFICATIONS

Algae	- green	1	1
Arisaema	- species	1	1
Cassia	- obtusifolia	1	1
Citrus	- species	1	1
Conopholis	- species	1	1
Cucumis	- species	1	1
Cucurbita	- species	1	1
Desmodium	- species	1	1
Diospyrus	- virginiana	1	1
Liverwort	- species	1	1
Lonicera	- tartarica	1	1
Muhlenbergia	- schreberi	1	1
	- species	1	1
Passiflora	- incarnata	1	1
Paulownia	- tomentosa	1	1
Polygonum	- cuspidatum	1	1
Rosa	- species	1	1
Rubus	- species	1	1
Rumex	- species	1	1
Ulmus	- alata	1	1
unknown		2	2
Verbascum	- thapsus	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
MISCELLANEOUS					
MULCH					
	No disease		5		5
	Nutritional	- pH high	1	0	1
ROCKS					
	Algae	- green	1	0	1
SIDING					
	Fungus	- unknown	1	0	1
SOIL					
	No disease		1		1
	Soil residue	- salts	1	0	1
UNKNOWN					
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
ORNAMENTALS					
<u>HERBACEOUS ORNAMENTALS and INDOOR PLANTS</u>					
AFRICAN VIOLET (Saintpaulia)	Inadequate specimen		1		1
ANEMONE (Anemone)	Inadequate specimen		2		2
AQUILEGIA (Aquilegia)	No disease		1		1
ASTILBE (Astilbe)	Black root rot	- Thielaviopsis	1	0	1
	Inadequate specimen		1		1
BABY'S BREATH (Galium)	Root rot	- Rhizoctonia	1	0	1
BEGONIA (Begonia)	Anthracnose	- Colletotrichum	1	0	1
	Blight	- Botrytis	0	1	1
	Inadequate specimen		1		1
	Powdery Mildew	- Oidium	1	0	1
	Root rot	- Pythium	0	1	1
	Root/Stem rot	- Rhizoctonia	4	0	4
BENJAMIN FIG (Ficus)	Stem gall	- Nectriella	1	0	1
BLOODROOT (Sanguinaria)	No disease		1		1
CACTUS (various)	Cultural	- over watering	1	0	1
CALIBRAHOA (Calibrachoa)	No disease		1		1
CANNA (Canna)	Bacterial blight	- Xanthomonas	1	0	1
	No disease		1		1
CARNATION (Dianthus)	Crown rot	- Fusarium	1	0	1
CARYOPTERIS (Caryopteris)	Root rot	- Pythium	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
CELOSIA (Celosia)					
	Cultural	- insufficient water	1	0	1
CHRYSANTHEMUM (Chrysanthemum)					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- wet feet	1	0	1
	Environmental	- high temperature	1	0	1
	Inadequate specimen, no disease		4		4
	Insect injury		2	0	2
	Mutation	- genetic	0	1	1
	Nutritional	- acid soil	1	0	1
		- calcium deficiency	1	0	1
		- general	1	0	1
	Root rot	- Pythium	7	0	7
	Root/stem rot	- Rhizoctonia	2	1	3
CLEMATIS (Clematis)					
	Blight	- Ascochyta	1	0	1
	Canker	- fungal	2	0	2
CLIVIA (Clivia)					
	No disease		1		1
COLEUS (Coleus)					
	Root rot	- Pythium	1	0	1
CONEFLOWER, PURPLE (Echinacea)					
	No disease		2		2
	Nutritional	- general	1	0	1
	Root/stem rot	- Rhizoctonia	1	0	1
	Virus	- unknown	1	0	1
DAFFODIL (Narcissus)					
	No disease		1		1
DAHLIA (Dahlia)					
	Air pollution	- ethylene	1	0	1
	Bud blight	- Botrytis	1	0	1
	Insect injury		1	0	1
DAISY (Gerbera)					
	Root/stem rot	- Rhizoctonia	1	0	1
DAYLILY (Hemerocallis)					
	Anthraxnose	- Colletotrichum	2	0	2
	Insect injury		1	1	2
	Leaf streak	- Aureobasidium	2	1	3
	No disease		2		2
	Root/stem rot	- Rhizoctonia	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
DELPHINIUM (Delphinium)					
	Inadequate specimen		1		1
	Nutritional	- general	1	0	1
DIANTHUS (Dianthus)					
	Black root rot	- Thielaviopsis	1	0	1
	Environmental	- stress	1	0	1
DRACAENA (Dracaena)					
	Bacterial crown rot	- Erwinia	1	0	1
FERN (various)					
	No disease		3		3
	Physical injury	- unknown	1	0	1
FIG (Ficus)					
	Nutritional	- soluble salts	1	0	1
FUCHSIA (Fuchsia)					
	Crown gall	- Agrobacterium	1	0	1
	Inadequate specimen, no disease		2		2
GAILLARDIA (Gaillardia)					
	Black root rot	- Thielaviopsis	1	0	1
GARDENIA (Gardenia)					
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
GERANIUM (Pelargonium)					
	Bacterial blight	- Xanthomonas	3	0	3
	Chemical injury	- growth regulator	1	0	1
		- unknown	1	0	1
	Insect injury		1	0	1
	Leaf spot	- Cercospora	1	0	1
	No disease		7		7
	Nutritional	- acid soil	1	1	2
		- iron toxicity	1	0	1
	Oedema	- physiological	0	1	1
GERMANDER (Teucrium)					
	Environmental	- drought	1	0	1
GRAPE FERN (Botrychium)					
	No disease		1		1
HELLIBORUS (Helliborus)					
	Southern blight	- Sclerotium	1	0	1
HOLLYHOCK (Althaea)					
	Rust	- Puccinia	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
HOSTA (Hosta)					
	Chemical injury	- unknown	1	0	1
	Environmental	- cold injury	1	0	1
	Nutritional	- soluble salts	1	0	1
HOUTTUYNIA (Houttuynia)					
	Inadequate specimen		1		1
	Root rot	- Rhizoctonia	1	0	1
HYACINTH (Hyacinthus)					
	Chemical injury	- growth regulator	1	0	1
	Insect injury		0	1	1
IMPATIENS (Impatiens)					
	Bacterial leaf spot	- Pseudomonas	1	0	1
	Environmental stresses		1	1	2
	Gray mold	- Botrytis	1	1	2
	Insect injury		1	0	1
	Leaf spot	- Alternaria	1	0	1
	No disease		2		2
	Nutritional	- nitrogen deficiency	0	1	1
	Root rot	- Pythium	1	1	2
	Root/stem rot	- Rhizoctonia	2	1	3
IRIS (Iris)					
	Chemical injury	- unknown	1	0	1
	Environmental	- cold injury	0	1	1
	Leaf spot	- Heterobasidium	6	1	7
IVY (Hedera and others)					
	Bacterial spot	- Xanthomonas	3	0	3
	Chemical injury	- unknown	1	0	1
	Leaf spot	- Phyllosticta	1	0	1
	No disease		1		1
	Root problem	- unknown	1	0	1
JADE PLANT (Crassula)					
	Stem rot	- fungal	1	0	1
LEMON (Citrus)					
	Scab	- Elsinoe	1	0	1
LILY (Lilium)					
	Blight	- Botrytis	1	0	1
	No disease		2		2
	Nutritional	- calcium deficiency	1	0	1
LILY-OF-THE-VALLEY (Convallaria)					
	Leaf spot	- fungal	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
LOOSESTRIFE (Lysimachia)					
	Nutritional	- general	1	0	1
LUPINE (Lupine)					
	Leaf spot	- Entomosporium	1	0	1
MANDEVILLA (Mandevilla)					
	No disease		1		1
MARIGOLD (Tagetes)					
	Chemical injury	- growth regulator	1	0	1
		- unknown	1	0	1
	Insect injury		0	1	1
	Root/stem rot	- Rhizoctonia	1	0	1
MAY APPLE (Podophyllum)					
	Leaf rust	- Puccinia	1	0	1
MERRY BELLS (Uvularia)					
	No disease		1		1
MIMULUS (Mimulus)					
	Blight	- Botrytis	1	0	1
MONEY PLANT (Lunaria)					
	Chemical injury	- unknown	1	0	1
NICOTIANA (Nicotiana)					
	Blight	- Botrytis	1	0	1
NORFOLK ISLAND PINE (Araucaria)					
	Insect injury		1	0	1
OBEDIENT PLANT (Maranta)					
	No disease		1		1
OENOTHERA (Oenothera)					
	Insect injury		1	0	1
	Chemical injury	- unknown	1	0	1
	Leaf spot	- Septoria	1	0	1
ORANGE (Citrus)					
	Insect injury		1	0	1
ORCHID (various)					
	No disease		1		1
PACHYSANDRA (Pachysandra)					
	Leaf/stem blight	- Pseudonectria	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
PANSY (Viola)					
	Black root rot	- Thielaviopsis	1	0	1
	Blight	- Botrytis	1	0	1
	Root rot	- Pythium	3	0	3
PASSIONFLOWER (Passiflora)					
	Chemical injury	- herbicide	1	0	1
	Inadequate specimen, no disease		2		2
PEONY (Paeonia)					
	Blight	- Botrytis	2	0	2
	Red spot	- Cladosporium	3	1	4
	Root rot	- Fusarium	1	0	1
	Virus	- unknown	1	0	1
PETUNIA (Petunia)					
	Black root rot	- Thielaviopsis	2	0	2
	Crown rot	- Phytophthora	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		3	0	3
	Gray mold	- Botrytis	2	0	2
	No disease		2		2
	Nutritional	- boron deficiency	2	0	2
		- pH high	1	0	1
	Root rot	- Fusarium	0	1	1
		- Pythium	1	2	3
	Root/stem rot	- Rhizoctonia	3	1	4
	Stem rot	- Colletotrichum	1	0	1
PHLOX (Phlox)					
	Black root rot	- Thielaviopsis	0	1	1
	Nutritional	- general	1	0	1
	Powdery mildew	- Oidium	1	0	1
	Root rot	- Pythium	2	0	2
	Southern blight	- Sclerotium	1	0	1
POINSETTIA (Euphorbia)					
	Air pollution	- ethylene	1	0	1
	Bacterial stem rot	- Erwinia	1	0	1
	Chemical injury	- fungicide	1	0	1
	No disease		2		2
	Root rot	- Pythium	6	0	6
POPPY (Stylophorum)					
	No disease		1		1
PORTULACA (Portulaca)					
	Virus	- potyvirus	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
RUDBECKIA (Rudbeckia)					
	Air pollution	- ozone	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		0	1	1
	Leaf spot	- Cercospora	1	0	1
	No disease		1		1
	Nutritional	- general	1	0	1
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Rhizoctonia	2	0	2
SALVIA (Salvia)					
	Bacterial leaf spot	- Pseudomonas	1	0	1
	No disease		2		2
SCABIOSA (Scabiosa)					
	Root rot	- Pythium	1	0	1
SCHEFFLERA (Brassaia)					
	Insect injury		1	0	1
	Nutritional	- general	1	0	1
SEDUM (Sedum)					
	No disease		1		1
SNAPDRAGON (Antirrhinum)					
	Root rot	- Fusarium	0	1	1
		- Pythium	2	0	2
	Root/Stem rot	- Rhizoctonia	1	0	1
SOLOMAN'S SEAL (Polygonatum)					
	No disease		1		1
SPATHIPHYLLUM (Spathiphyllum)					
	Leaf spot	- Cercospora	1	0	1
	Root rot	- Pythium	1	0	1
STATICE (Limonium)					
	Cultural	- insufficient water	1	0	1
SUNFLOWER (Helianthus)					
	Nutritional	- general	1	0	1
TEA (Camellia)					
	No disease		1		1
TIRELLA (Tirella)					
	Insect injury		1		1
	No disease		1		1
TRADESCANTIA (Tradescantia)					
	Leaf spot	- Cercospora	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
TWINLEAF (Jeffersonia)					
	No disease		1		1
UMBRELLA PLANT (Cyperus)					
	No disease		1		1
VERBENA (Verbena)					
	Gray mold	- Botrytis	1	0	1
	Insect injury		0	1	1
VINCA (Vinca)					
	Aerial blight	- Phytophthora	2	0	2
	Black root rot	- Thielaviopsis	1	0	1
	Gray mold	- Botrytis	2	0	2
	Root rot	- Pythium	0	1	1
	Root/Stem rot	- Rhizoctonia	1	0	1
VIOLET (VIOLA)					
	No disease		1		1
ZINNIA (Zinnia)					
	Powdery mildew	- Oidium	1	0	1
<u>TURFGRASS</u>					
BENTGRASS (Agrostis)					
	Algae	- blue-green	1	0	1
	Anthraxnose	- Colletotrichum	4	0	4
	Blight	- Pythium	1	1	2
	Brown patch	- Rhizoctonia	3	0	3
	Chemical injury	- unknown	1	0	1
	Cultural	- black layer	1	0	1
		- heavy thatch	1	0	1
	Decline	- environmental	1	0	1
	Dollar spot	- Sclerotinia	5	1	6
	Inadequate specimen, no disease		8		8
	Nutritional	- fertilizer burn	0	1	1
	Pink snow mold	- Microdochium	1	0	1
	Root deterioration	- environmental	1	0	1
	Root disfunction	- Pythium	1	0	1
	Root problem	- unknown	1	0	1
	Take-all	- Gaeumannomyces	3	0	3
	Yellow patch	- Rhizoctonia	4	0	4
BERMUDAGRASS (Cynodon)					
	Large patch	- Rhizoctonia	2	0	2
	Leaf spot	- Bipolaris	0	1	1
	Nematode	- unknown	1	0	1
	No disease		2		2

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BLUEGRASS (Poa)					
	Cultural	- heavy thatch	1	0	1
	Environmental	- stress	1	0	1
	Leaf spot	- Drechslera	0	1	1
	Local dry spot	- environmental	1	0	1
	Melting out	- Drechslera	1	0	1
	Necrotic ring spot	- Leptosphaeria	1	0	1
	No disease		5		5
	Physical injury	- car	1	0	1
		- mower	1	0	1
	Powdery mildew	- Erysiphe	2	0	2
	Summer patch	- Magnaporthe	4	1	5
	Yellow patch	- Rhizoctonia	1	0	1
FESCUE (Festuca)					
	Brown patch	- Rhizoctonia	7	0	7
	Cultural	- heavy thatch	2	0	2
		- under watering	1	0	1
	Environmental stresses		4	1	5
	No disease		6		6
	Nutritional	- acid soil	2	0	2
	Physical injury	- mower	2	0	2
	Red thread	- Laetisaria	6	0	6
	Slime mold	- species	2	0	2
	Weed competition	- crabgrass	0	1	1
RYEGRASS (Lolium)					
	Brown patch	- Rhizoctonia	3	0	3
	Dollar spot	- Sclerotinia	0	1	1
	Gray leaf spot	- Pyricularia	2	1	3
	Leaf blight	- Bipolaris	1	0	1
	No disease		1		1
	Nutritional	- acid soil	1	0	1
TURF (unspecified)					
	Anthraxnose	- Colletotrichum	1	0	1
	Environmental stresses		4	0	4
	Inadequate specimen, no disease		6		6
	Necrotic ringspot	- Leptosphaeria	3	0	3
	Nutritional	- acid soil	0	1	1
	Physical injury	- mower	1	0	1
	Slime mold	- species	3	0	3
	Take-all	- Gaeumannomyces	0	1	1
	Weed	- Nimblewill	1	0	1
	Yellow patch	- 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>
<u>WOODY ORNAMENTALS</u>					
ARBORVITAE (Thuja)					
	Cultural	- transplant shock	2	0	2
	Environmental stresses		2	0	2
	Inadequate specimen, no disease		4		4
	Insect injury		2	0	2
	Needle drop	- normal	2	0	2
ASH (Fraxinus)					
	Anthracnose	- Apiognomonina	5	0	5
	Canker	- Botryosphaeria	3	0	3
		- Fusicoccum	1	0	1
	Environmental stresses		3	1	4
	Insect injury		1	0	1
	Leaf spot	- Microsphaerella	2	0	2
	No disease		5		5
	Wetwood	- bacterial	1	0	1
ASPEN (Populus)					
	Insect injury		1	0	1
AZALEA - See listing under RHODODENDRON					
BAMBOO (Bambusa)					
	No disease		1		1
BARBERRY (Berberis)					
	Cultural	- transplant shock	1	0	1
	Environmental stresses		0	1	1
	Inadequate specimen, no disease		2		2
	Physical injury	- unknown	1	0	1
BASSWOOD (Tilia)					
	Canker	- Nectria	1	0	1
	Insect injury		1	0	1
BEECH (Fagus)					
	Bleeding canker	- Phytophthora	1	0	1
BIRCH (Betula)					
	Cultural	- transplant shock	0	1	1
	Insect injury		6	0	6
	Leaf spot	- Cryptocline	0	1	1
		- Septoria	2	0	2
		- unknown	2	0	2
	No disease		1		1
BITTERSWEET (Celatrus)					
	Leaf spot	- Marssonina	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
BOXELDER (Acer)					
	Chemical injury	- growth regulator	0	1	1
	Insect injury		1	0	1
BOXWOOD (Buxus)					
	Canker	- Pseudonectria	5	1	6
	Chemical injury	- unknown	1	0	1
	Cultural	- over watering	1	0	1
		- transplant shock	1	1	2
	Environmental stresses		9	1	10
	Inadequate specimen, no disease		2		2
	Insect injury		1	0	1
	Nutritional	- fertilizer burn	0	1	1
	Physical injury	- pruning	1	0	1
	Root rot	- Rhizoctonia	1	0	1
BUCKEYE (Aesculus)					
	No disease		1		1
BUDDLEIA (Buddleia)					
	Insect injury		1	0	1
CALLICARPA (Callicarpa)					
	No disease		1		1
CALYCANTHUS (Calycanthus)					
	Stem rot	- Rhizoctonia	1	0	1
CATALPA (Catalpa)					
	Insect		1	0	1
	Wilt	- Verticillium	1	0	1
CHAMAECYPARIS (Chamaecyparis)					
	Needle browning	- normal	1	0	1
CHASTETREE (Vitex)					
	No disease		1		1
CHERRY (Prunus)					
	Canker	- Phomopsis	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	2	0	2
	Dieback	- unknown	1	0	1
	Environmental stresses		4	1	5
	Fire blight	- Erwinia	1	0	1
	Inadequate specimen, no disease		14		14
	Insect injury		1	1	2
	Physical injury	- hail	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
CHESTNUT (<i>Castanea</i>)					
	No disease		3		3
	Root rot	- Phytophthora	1	0	1
CLEMATIS (<i>Clematis</i>)					
	No disease		1		1
CRABAPPLE (<i>Malus</i>)					
	Cedar/Apple rust	- Gymnosporangium	1	0	1
	Canker	- Botryosphaeria	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental stresses		2	2	4
	Fire blight	- Erwinia	2	2	4
	Insect injury		0	2	2
	Leaf spot	- fungal	1	0	1
	No disease		2		2
	Physical injury	- hail	1	0	1
		- mower	1	0	1
	Powdery mildew	- Oidium	1	0	1
	Scab	- Venturia	7	1	8
CRAPEMYRTLE (<i>Lagerstroemia</i>)					
	Sooty mold	- species	1	0	1
CYPRESS (<i>Cupressocyparis</i>)					
	No disease		1		1
	Root rot	- Phytophthora	1	0	1
DOGWOOD (<i>Cornus</i>)					
	Anthraxnose	- Discula	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	8	2	10
	Decline	- unknown	3	0	3
	Environmental stresses		10	2	12
	Inadequate specimen, no disease		8		8
	Insect injury		1	2	3
	Leaf scorch	- environmental	5	0	5
		- unknown	5	0	5
	Leaf spot	- Septoria	1	0	1
	Lichen	- species	1	0	1
	Physical injury	- unknown	1	0	1
	Powdery mildew	- Oidium	16	2	18
	Spot anthracnose	- Elsinoe	6	0	6
	Wood decay	- fungal	1	0	1
ELM (<i>Ulmus</i>)					
	Dutch elm disease	- Ophiostoma	2	0	2
	Environmental	- stress	2	0	2
	Insect injury		2	1	3
	No disease		7		7
	Physical injury	- construction	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
EUONYMUS (Euonymus)					
	Anthracnose	- Gloeosporium	1	0	1
	Chemical injury	- unknown	1	0	1
	Crown gall	- Agrobacterium	2	1	3
	Insect injury		20	1	21
	No disease		5		5
	Powdery mildew	- Microsphaera	1	0	1
		- Oidium	1	0	1
	Root problem	- unknown	1	0	1
	Sooty mold	- species	0	1	1
FILBERT (Corylus)					
	Canker	- Botryosphaeria	1	0	1
		- Didymaria	1	0	1
	Insect injury		1	0	1
FIR (Abies)					
	Canker	- Cytospora	0	1	1
	Environmental stresses		3	0	3
	No disease		1		1
	Root decay	- Basidiomycete	0	1	1
	Root rot	- Phytophthora	1	0	1
FORSYTHIA (Forsythia)					
	Cultural	- transplant shock	1	0	1
	No disease		2		2
FOTHERGILLA (Fothergilla)					
	Inadequate specimen		1		1
FRINGETREE (Chianoanthus)					
	Anthracnose	- Discula	1	0	1
	No disease		1		1
GINGKO (Gingko)					
	Environmental	- wet feet	1	0	1
	No disease		1		1
HAWTHORN (Crataegus)					
	Cedar-quince rust	- Gymnosporangium	3	1	4
	Insect injury		3	1	4
HEMLOCK (Tsuga)					
	Cultural	- transplant shock	1	0	1
	Decline	- environmental	1	0	1
	Environmental stresses		3	1	4
	No disease		7		7
	Root rot	- Phytophthora	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
HIBISCUS (Hibiscus)					
	Bacterial spot	- Pseudomonas	1	0	1
	Cultural	- general	1	0	1
	Insect injury		1	0	1
	No disease		3		3
	Root rot	- Pythium	1	0	1
HICKORY (Carya)					
	Insect injury		1	0	1
	No disease		1		1
HOLLY and INKBERRY (Ilex)					
	Black root rot	- Thielaviopsis	11	0	11
	Canker	- Botryosphaeria	1	0	1
		- Cytospora	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	4	1	5
	Environmental stresses		9	0	9
	Inadequate specimen, no disease		28		28
	Insect injury		6	0	6
	Leaf spot	- fungal	0	1	1
	Nutritional	- pH high	2	0	2
		- soluble salts	1	0	1
	Root rot	- fungal	0	1	1
	Spine spot	- spine injury	0	1	1
HONEYLOCUST (Gleditsia)					
	Insect injury		4	0	4
	No disease		8		8
HONEYSUCKLE (Lonicera)					
	Blight	- Botrytis	1	0	1
	Chemical	- unknown	1	0	1
	Environmental	- wet feet	2	0	2
	Inadequate specimen, no disease		4		4
	Insect injury		1	0	1
	Powdery mildew	- Oidium	0	1	1
HORNBEAM (Carpinus)					
	Environmental	- stress	1	0	1
	Leaf spot	- Phyllosticta	1	0	1
HYDRANGEA (Hydrangea)					
	Canker	- Phomopsis	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		2	0	2
	Leaf spot	- Alternaria	1	0	1
		- Cercospora	2	0	2
	No disease		1		1
	Virus	- unknown	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
ITEA (Itea)					
	Anthraco nose	- Discula	1	0	1
JUNIPER and RED CEDAR (Juniperus)					
	Cedar/Apple rust	- Gymnosporangium	3	0	3
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	1	0	1
	Dieback	- unknown	1	1	2
	Environmental stresses		4	0	4
	Insect injury		5	2	7
	No disease		8		8
	Physical injury	- vole	1	0	1
	Root rot	- Phytophthora	1	0	1
	Twig blight	- Kabatina	1	0	1
LARCH (Larix)					
	Environmental	- cold injury	1	0	1
LILAC (Syringa)					
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		1	1	2
	No disease		6		6
	Physical injury	- unknown	1	0	1
LOCUST (Robinia)					
	Insect injury		1	0	1
MAGNOLIA (Magnolia)					
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	0	1
	Cultural	- transplant shock	1	1	2
	Environmental stresses		4	0	4
	Inadequate specimen, no disease		8		8
	Insect injury		3	0	3
	Leaf drop	- normal	1	0	1
	Leaf spot	- Colletotrichum	1	0	1
		- fungal	2	0	2
	Powdery mildew	- species	1	0	1
	Sooty mold	- species	1	2	3
	Wilt	- Verticillium	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
MAPLE (Acer)					
	Anthracnose	- Discula	3	0	3
		- Kabatiella	3	1	4
	Canker	- Botryosphaeria	1	1	2
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	9	0	9
	Decline	- unknown	4	0	4
	Environmental stresses		12	1	13
	Inadequate specimen, no disease		32		32
	Insect injury		15	3	18
	Leaf scorch	- environmental	1	0	1
		- unknown	1	1	2
	Leaf spot	- Phyllosticta	6	1	7
	Physical injury	- topping	0	1	1
		- unknown	1	0	1
	Wood decay	- Basidiomycete	1	0	1
		- Trametes	1	0	1
MIMOSA (Albizzia)					
	Insect injury		2	0	2
MULBERRY (Morus)					
	Bacterial blight	- Pseudomonas	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental	- cold injury	1	0	1
NANDINA (Nandina)					
	Bacterial spot	- Xanthomonas	1	0	1
OAK (Quercus)					
	Anthracnose	- Apiognomonia	1	0	1
	Bacterial scorch	- Xylella	7	0	7
	Canker	- Nectria	0	1	1
	Chemical injury	- growth regulator	0	1	1
		- unknown	1	0	1
	Cultural	- transplant shock	2	0	2
	Decline	- environmental	1	0	1
	Environmental stresses		5	1	6
	Inadequate specimen, no disease		29		29
	Insect injury		20	4	24
	Leaf spot	- Gloeosporium	1	0	1
		- Tubakia	5	1	6
	Nutritional	- iron deficiency	4	1	5
	Powdery mildew	- species	1	0	1
	Wilt	- Ceratocytis	1	0	1
OSMANTHUS (Osmanthus)					
	No disease		1		1
PAULOWNIA (Paulownia)					
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
PAWPAW (Asimina)					
	Leaf spot	- Phyllosticta	1	0	1
PEAR (Pyrus)					
	Bitter rot	- Colletotrichum	1	0	1
	Chemical injury	- growth regulator	2	0	2
		- unknown	1	0	1
	Cultural	- improper depth	0	1	1
		- transplant shock	6	1	7
	Environmental stresses		4	0	4
	Fire blight	- Erwinia	5	0	5
	Inadequate specimen, no disease		15		15
	Insect injury		0	1	1
	Leaf scorch	- environmental	2	0	2
	Leaf spot	- Septoria	1	0	1
PECAN (Carya)					
	Insect injury		2	0	2
PERSIMMON (Diospyros)					
	Environmental	- cold injury	1	0	1
PHOTINIA (Photinia)					
	Leaf scorch	- environmental	0	1	1
	Leaf spot	- Entomosporium	6	0	6
PIERIS (Pieris)					
	Environmental	- drought	1	0	1
PINE (Pinus)					
	Air pollution	- ozone	3	0	3
	Chemical injury	- unknown	1	1	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		5	1	6
	Inadequate specimen, No disease		22		22
	Insect injury		10	2	12
	Needle blight	- Dothistroma	2	0	2
	Needle cast	- Lophodermium	1	0	1
	Needle drop	- normal	4	0	4
	Needle rust	- Coleosporium	2	0	2
	Nutritional	- fertilizer burn	1	0	1
	Physical injury	- unknown	3	0	3
		- woodpecker	0	1	1
	Pinewood nematode	- Bursaphelencus	1	0	1
	Sooty mold	- species	0	2	2
	Tip blight	- Sphaeropsis	8	0	8
	Tip burn	- unknown	1	0	1
	Walnut wilt	- juglone	0	1	1
	White pine decline	- environmental	18	0	18

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PLUM (Prunus)					
	Anthracnose	- Discula	0	1	1
	Bacterial canker	- Pseudomonas	1	0	1
	Black knot	- Apiosporina	2	0	2
	Environmental stresses		2	1	3
	Insect injury		0	1	1
	Leaf spot	- Phyllosticta	1	0	1
	No disease		1		1
POPLAR (Populus)					
	Cultural	- transplant shock	1	0	1
	Leaf spot	- Marssonina	1	0	1
PRIVET (Ligustrum)					
	Chemical injury	- herbicide	1	0	1
		- unknown	1	0	1
	Inadequate specimen, No disease		3		3
	Environmental	- cold injury	1	0	1
	Leaf spot	- fungal	1	0	1
PUSSY WILLOW (Salix)					
	Cultural	- transplant shock	1	0	1
PYRACANTHA (Pyracantha)					
	Insect injury		1	0	1
QUINCE (Chaenomeles)					
	Cedar/Quince rust	- Gymnosporangium	1	0	1
	No disease		1		1
REDBUD (Cercis)					
	Anthracnose	- Kabatiella	1	0	1
	Canker	- Botryosphaeria	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		3	0	3
	Insect injury		1	1	2
	Leaf spot	- Cercospora	1	0	1
	No disease		1		1
	Wilt	- Verticillium	2	0	2
REDWOOD (Sequoia)					
	No disease		1		1

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RHODODENDRON and AZALEA (Rhododendron)					
	Chemical injury	- unknown	1	0	1
	Cultural	- transplant shock	2	1	3
	Dieback	- Botryosphaeria	2	0	2
	Environmental stresses		8	0	8
	Inadequate specimen, no disease		10		10
	Insect injury		15	2	17
	Leaf/flower gall	- Exobasidium	2	0	2
	Leaf spot	- fungal	0	1	1
	Nutritional	- iron deficiency	1	0	1
		- pH high	1	0	1
	Root rot	- Phytophthora	1	0	1
		- Rhizoctonia	1	0	1
	Sooty mold	- species	1	0	1
	Stunting	- unknown	1	0	1
ROSE (Rosa)					
	Black spot	- Diplocarpon	8	0	8
	Blossom blight	- Botrytis	1	0	1
	Chemical injury	- herbicide	1	1	2
	Common canker	- Leptosphaeria	1	0	1
	Cultural	- transplant shock	0	1	1
	Environmental stresses		2	1	3
	Inadequate specimen, no disease		10		10
	Insect injury		8	1	9
	Powdery mildew	- Sphaerotheca	2	0	2
	Root problem	- unknown	1	0	1
	Virus	- Rose mosaic	2	0	2
		- Rose rosette	15	0	15
		- unknown	1	0	1
SERVICEBERRY (Amelanchier)					
	Cedar/Quince rust	- Gymnosporangium	1	0	1
	Environmental	- drought	1	0	1
	Fire blight	- Erwinia	1	0	1
SPRUCE (Picea)					
	Canker	- Leucostoma	1	0	1
	Cultural	- transplant shock	7	1	8
	Environmental stresses		9	2	11
	Insect injury		14	2	16
	Needle cast	- Rhizosphaera	2	0	2
	No disease		23		23
	Root rot	- Phytophthora	1	0	1
SUMAC (Rhus)					
	Canker	- Amphiporthe	1	0	1
	Cultural	- transplant shock	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
SWEETGUM (Liquidambar)					
	Canker	- Botryosphaeria	2	0	2
	Environmental	- stress	0	1	1
	No disease		1		1
SYCAMORE and PLANETREE (Platanus)					
	Bacterial scorch	- Xylella	3	0	3
	No disease		2		2
TAXUS (Taxus)					
	Cultural	- transplant shock	2	0	2
		- wet feet	1	0	1
	Dieback	- unknown	2	0	2
	Environmental stresses		2	0	2
	Inadequate specimen, no disease		20		20
	Insect injury		0	1	1
	Root rot	- Phytophthora	2	0	2
TULIPTREE (Liriodendron)					
	Environmental stresses		2	0	2
	Insect injury		12	1	13
	No disease		1		1
	Powdery mildew	- Oidium	0	1	1
	Sooty mold	- species	0	4	4
VIBURNUM (Viburnum)					
	Canker	- Botryosphaeria	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		2	1	3
	Inadequate specimen, no disease		4		4
	Insect injury		1	0	1
WALNUT (Juglans)					
	Anthracnose	- Gnomonia	1	0	1
	Chemical injury	- growth regulator	1	0	1
	Environmental	- stress	2	0	2
	Insect injury		1	2	3
WILLOW (Salix)					
	Canker	- Cytospora	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		0	1	1
	No disease		2		2
WITCH-HAZEL (Hamamelis)					
	Leaf blight	- fungal	2	0	2
YELLOWWOOD (Cladrastis)					
	Canker	- Botryosphaeria	1	0	1
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
VEGETABLES					
ARTICHOKE (Cynara)					
	Bacterial soft rot	- Erwinia	1	0	1
ASPARAGUS (Asparagus)					
	Root rot	- Fusarium	1	0	1
BEAN (Phaseolus)					
	Anthrachnose	- Colletotrichum	4	1	5
	Chemical injury	- growth regulator	1	0	1
	Environmental	- sunscald	1	0	1
	Inadequate specimen, no disease		7		7
	Insect injury		7	0	7
	Leaf spot	- Cercospora	1	0	1
	Nutritional	- general	2	0	2
		- zinc deficiency	1	0	1
	Root/stem rot	- Fusarium	1	1	2
		- Rhizoctonia	2	0	2
	Southern blight	- Sclerotium	3	0	3
BROCCOLI - See listing under CRUCIFERS					
CABBAGE - See listing under CRUCIFERS					
CANTALOUPE - See listing under CUCURBITS					
CAULIFLOWER - See listing under CRUCIFERS					
CORN, SWEET (Zea)					
	Chemical injury	- fertilizer burn	1	0	1
		- unknown	1	0	1
	Inadequate specimen		1		1
	Insect injury		1	0	1
	Nutritional	- magnesium	1	0	1
		- zinc deficiency	1	0	1
CRUCIFERS - BROCCOLI, CABBAGE, CAULIFLOWER, KALE, and TURNIP (Brassica)					
	Anthrachnose	- Colletotrichum	1	0	1
	Bacterial soft rot	- Erwinia	1	0	1
	Black rot	- Xanthomonas	2	0	2
	Damping-off	- Rhizoctonia	1	0	1
	Environmental stresses		3	0	3
	Inadequate specimen, no disease		3	0	3
	Leaf spot	- Cercospora	1	1	2
	Nutritional	- acid soil	1	0	1
		- boron deficiency	1	0	1
		- nitrogen deficiency	2	0	2
	Physical injury	- unknown	1	0	1
	Root rot	- Pythium	1	0	1
	Wire stem	- Rhizoctonia	3	0	3

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
CUCUMBER - See listing under CUCURBITS					
CUCURBITS - CANTALOUPE, CUCUMBER, MELON (Cucumis), PUMPKIN, SQUASH, GOURD (Cucurbita) and WATERMELON (Citrullis)					
	Air pollution	- ozone	3	1	4
	Angular leaf spot	- Pseudomonas	4	0	4
	Anthracnose	- Colletotrichum	2	1	3
	Bacterial soft rot	- Erwinia	1	0	1
	Bacterial wilt	- Erwinia	3	1	4
	Black rot	- Didymella	3	2	5
	Blight	- Microdochium	2	0	2
	Blossom end rot	- calcium deficiency/dry	2	0	2
	Charcoal rot	- Macrophomina	1	1	2
	Chemical injury	- herbicide	3	0	3
		- unknown	1	0	1
	Cultural	- early harvest	1	0	1
	Downy mildew	- Pseudoperonospora	1	0	1
	Environmental stresses		6	1	7
	Fruit blight	- Phytophthora	4	0	4
	Fruit rot	- Alternaria	1	0	1
		- Choanephora	0	1	1
		- fungal	1	0	1
		- Fusarium	1	0	1
		- Phomopsis	2	0	2
	Gummy stem blight	- Didymella	2	3	5
	Inadequate specimen, no disease		37		37
	Insect injury		22	11	33
	Leaf blight	- Alternaria	2	0	2
	Leaf blotch	- physiological	2	0	2
	Leaf spot	- Cercospora	2	0	2
	Nutritional	- fertilizer burn	1	1	2
		- general	2	1	3
		- magnesium deficiency	0	1	1
		- manganese toxicity	1	0	1
		- potassium deficiency	1	1	2
		- soluble salts	2	0	2
	Physical injury	- unknown	2	0	2
	Pollination problem	- environmental	1	1	2
	Powdery mildew	- Sphaerotheca	2	0	2
	Root knot nematode	- Meloidogyne	0	2	2
	Root rot	- Fusarium	4	0	4
		- Phytophthora	1	0	1
		- Pythium	3	1	4
	Silver blotch	- physiological	1	0	1
	Stem rot	- Rhizoctonia	0	1	1
	Virus	- complex	1	2	3
		- cucumber mosaic	0	1	1
		- poty	1	1	2
		- tobacco mosaic	0	1	1
		- watermelon mosaic II	3	0	3
	Wilt	- Fusarium	1	0	1
	Yellow vine	- Serratia	8	1	11

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
EGGPLANT (Solanum)					
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	No disease		1		1
GOURD - See listing under CUCURBITS					
KALE - See listing under CRUCIFERS					
LETTUCE (Lactuca)					
	Root rot	- Pythium	1	0	1
MELON, honeydew - See listing under CUCURBITS					
MUSTARD - See listing under CRUCIFERS					
PEA (Pisum)					
	Bacterial blight	- Pseudomonas	1	0	1
	Cultural	- oedema	1	0	1
	Inadequate specimen		1		1
	Root/Stem rot	- Rhizoctonia	1	1	2
PEANUT (Arachis)					
	Insect injury		1	0	1
PEPPER (Capsicum)					
	Anthracnose	- Colletotrichum	0	1	1
	Bacterial soft rot	- Erwinia	1	0	1
	Bacterial spot	- Xanthomonas	17	3	20
	Blight	- Botrytis	1	0	1
	Blossom end rot	- calcium deficiency/dry	6	2	8
	Chemical injury	- growth regulator	1	0	1
		- herbicide	1	1	2
		- insecticide	1	0	1
		- unknown	4	1	5
	Environmental stresses		21	5	26
	Fruit rot	- Alternaria	1	0	1
		- Phoma	0	1	1
	Inadequate specimen, no disease		19		19
	Insect injury		6	1	7
	Leaf spot	- Cercospora	0	1	1
	Physical injury	- plastic burn	1	0	1
		- unknown	2	1	3
	Poor damage	- unknown	1	0	1
	Root rot	- Phytophthora	1	0	1
		- Pythium	4	1	5
	Root/stem rot	- Fusarium	2	0	2
		- Rhizoctonia	6	0	6
	Southern blight	- Sclerotium	3	0	3
	Virus	- Pepper mild mottle	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
POTATO (Solanum)					
	Chemical injury	- herbicide	1	0	1
	Dry rot	- Fusarium	1	0	1
	Environmental stresses		1	1	2
	Inadequate specimen, no disease		5		5
	Physical injury	- unknown	1	0	1
	Scab	- Streptomyces	1	0	1
PUMPKIN - See listing under CUCURBITS					
RHUBARB (Rheum)					
	Bacterial crown rot	- Erwinia	1	0	1
SQUASH - See listing under CUCURBITS					
SWEET POTATO (Ipomoea)					
	No disease		1		1
	Scurf	- Monilochaetes	1	0	1
TOMATO (Lycopersicon)					
	Air pollution	- ethylene	0	1	1
	Bacterial canker	- Clavibacter	6	0	6
	Bacterial soft rot	- Erwinia	0	1	1
	Bacterial speck	- Pseudomonas	5	1	6
	Bacterial spot	- Xanthomonas	11	3	14
	Blossom end rot	- calcium deficiency/dry	4	2	6
	Buckeye rot	- Phytophthora	1	1	2
	Canker	- Alternaria	1	0	1
	Catfacing	- environmental	1	1	21
	Chemical injury	- growth regulator	13	0	13
		- herbicide	1	1	2
		- spreader/sticker	1	0	1
		- unknown	3	0	3
	Cultural	- insufficient watering	1	0	1
		- over watering	1	0	1
	Early blight	- Alternaria	3	2	5
	Environmental stresses		10	3	13
	Gray wall	- physiological	2	0	2
	Inadequate specimen, no disease		33		33
	Insect injury		10	2	12
	Internal white tissue	- physiological	2	0	2
	Leaf spot	- Cristulariella	1	0	1
		- Septoria	13	3	16
	Nutritional	- acid soil	2	0	1
		- fertilizer burn	1	0	1
		- general	5	1	6
		- magnesium deficiency	4	1	5
		- manganese toxicity	1	0	1
		- nitrogen deficiency	2	0	2
		- phosphorus deficiency	1	0	1
		- potassium deficiency	1	0	1
		- soluble salts	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
	Rain check	- physiological	1	0	1
	Root knot nematode	- Meloidogyne	4	0	4
	Root rot	- Fusarium	2	0	2
		- Pythium	6	0	6
	Root/stem rot	- Rhizoctonia	1	2	3
	Sour rot	- Geotrichum	1	0	1
	Southern blight	- Sclerotium	2	0	2
	Stem canker	- Rhizoctonia	1	0	1
	Stem rot	- Sclerotinia	1	1	2
	Virus	- Impatiens necrotic spot	1	0	1
		- Tobacco mosaic	1	1	2
		- Tomato mosaic	1	0	1
		- Tomato spotted wilt	5	1	6
		- unknown	1	0	1
	Walnut wilt	- juglone	2	0	2
	Wilt	- Fusarium	4	3	7
	Yellow shoulder	- physiological	2	1	3

TURNIP - See listing under CRUCIFERS

WATERMELON - See listing under CUCURBITS

TOTALS **3483** **502** **3985**