

UK UNIVERSITY OF KENTUCKY
College of Agriculture

**Plant Diseases
in
Kentucky**

**Plant Disease Diagnostic Laboratory
Summary**

2003

by:

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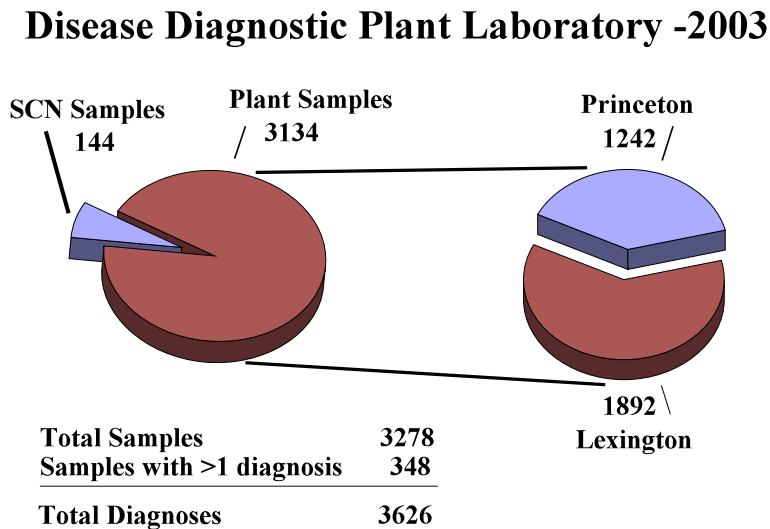
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INTRODUCTION

The Plant Disease Diagnostic Laboratory (Lexington and Princeton) handled 3134 plant samples and 144 nematode soil samples during 2003. Samples with more than one problem numbered 348, bringing the total number of actual diagnoses to 3626. The Lexington Laboratory diagnosed 1892 specimens. The Princeton Laboratory's specimens totaled 1386; of this number 1242 were plant samples and 144 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:



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. The laboratory has begun use of the polymerase-chain-reaction (PCR) technique for identification of certain pathogens. Computer-based laboratory records are maintained to provide information used for conducting plant disease surveys, identifying new disease outbreaks, and formulating educational programs.

New homeland security rules now require reporting of all diagnoses of plant diseases to USDA-APHIS on a real-time basis and our laboratories are working to meet that requirement.

WEATHER SUMMARY

Weather:

January: Ranked as 14th coldest and 18th driest January in the past century.

Temperatures for January 2003 averaged 28.4 degrees across the state which was 3.4 degrees below normal. High temperatures averaged from 38 in the West to 36 in the East. Departure from normal high temperatures ranged from 6 degrees below normal in the West to 3 degrees below normal in the East. Low temperatures averaged from 21 degrees in the West to 23 degrees in the East. Departure from normal low temperature ranged from 3 degrees below normal in the West to near normal in the East.

Precipitation (liq. equ.) for the period totaled 2.08 inches statewide which was 1.30 inches below normal. Precipitation totals by climate division, West 2.13 inches, Central 2.39 inches, Bluegrass 1.80 inches and East 2.02 inches, which was 1.57, 1.63, 1.65 and 1.68 inches, respectively, below normal.

February: Ranked as the 30th coldest and 7th wettest February in the past century.

Temperatures for the period averaged 33.7 degrees across the state which was 3.7 degrees below normal. High temperatures averaged from 40 in the West to 41 in the East. Departure from normal high temperatures ranged from 10 degrees below normal in the West to 3 degrees below normal in the East. Low temperatures averaged from 28 degrees in the West to 30 degrees in the East. Departure from normal low temperature ranged from 1 degrees above normal in the West to 4 degrees above normal in the East.

Precipitation (liq. equ.) for the period totaled 7.33 inches statewide which was 3.58 inches above normal. Precipitation totals by climate division, West 6.67 inches, Central 7.71 inches, Bluegrass 6.44 inches and East 8.10 inches, which was 2.72, 3.59, 3.00 and 4.64 inches respectively above normal.

March: The 26th warmest and 11th driest March in the past 108 years.

Temperatures for the month averaged 48.7 degrees across the state which was 2.2 degrees above normal and 3.2 degrees warmer than March 2002. High temperatures averaged from 60 in the West to 61 in the East. Departure from normal high temperatures ranged from near normal in the West to 7 degrees above normal in the East. Low temperatures averaged from 37 degrees in the West to 39 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 2.24 inches statewide which was 2.32 inches below normal...which was less than half of the normal rainfall for the month and ranked the month as the 11th driest March in the past 108 years. Precipitation totals by climate division, West 2.27 inches, Central 2.47 inches, Bluegrass 2.50 inches and East 1.89 inches, which was 2.41, 2.40, 1.85 and 2.51 inches respectively below normal.

April: The 27th warmest and 11th wettest April in the past century.

Temperatures for April 2003 averaged 57.8 degrees across the state which was 2.2 degrees above normal and 10 degrees warmer than the previous month. High temperatures averaged from 70 in the West to 70 in the East. Departure from normal high temperatures ranged from 1 degree below normal in the West to 4 degrees above normal in the East. Low temperatures averaged from 48 degrees in the West to 49 degrees in the East. Departure from normal low temperature ranged from 2 degrees above normal in the West to 4 degrees above normal in the East.

Rainfall for April 2003 totaled 6.06 inches statewide which was 1.96 inches above normal and considerably wetter than the previous month. Rainfall totals by climate division, West 5.89 inches, Central 6.32 inches, Bluegrass 4.77 inches and East 6.86 inches, which was 1.36, 2.12, 0.88 and 3.04 inches respectively above normal.

May: The 53rd coolest and 8th wettest May in the past century.

Temperatures for May 2003 averaged 64.5 degrees across the state which was near normal (0.6 degrees). High temperatures averaged from 75 in the West to 72 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 57 degrees in the West to 56 degrees in the East. Departure from normal low temperature ranged from near normal in the West to near normal in the East.

Rainfall for the month of May totaled 7.35 inches statewide which was 2.36 inches above normal. Rainfall totals by climate division, West 7.39 inches, Central 7.08 inches, Bluegrass 8.35 inches and East 6.83 inches, which was 2.40, 1.82, 3.44 and 1.98 inches respectively above normal.

June: The 7th coolest and 8th wettest June in the past 108 years.

The 5th wettest April, May and June period.

Temperatures for June 2003 averaged 69 degrees across the state which was 3.4 degrees below normal and 5 degrees warmer than the previous month. High temperatures averaged from 81 in the West to 78 in the East. Departure from normal high temperatures ranged from 6 degrees below normal in the West to 5 degrees below normal in the East. Low temperatures averaged from 60 degrees in the West to 59 degrees in the East. Departure from normal low temperature ranged from 3 degrees below normal in the West to 3 degrees below normal in the East.

Rainfall for June 2003 totaled 6.40 inches statewide which was 2.14 inches above normal. Rainfall totals by climate division, West 5.00 inches, Central 6.43 inches, Bluegrass 6.39 inches and East 7.45 inches, which was 1.01, 2.07, 2.04 and 3.12 inches respectively above normal.

July: 37th coolest and 27th wettest July in the past 108 years.

Temperatures for the month of July 2003 averaged 75.6 degrees across the state which was 0.8 degrees below normal and was nearly 7 degrees warmer than the previous month. Yet, July temperatures for the state ranked as the 37th coolest on record. When combined with the very cool temperatures of June...the two months ranked the state as the 2nd coolest on record. High temperatures averaged from 88 in the West to 83 in the East. Departure from normal high temperatures ranged from 2 degrees below normal in the West to 3 degrees below normal in the East. Low temperatures averaged from 68 degrees in the West to 66 degrees in the East.

Rainfall for July 2003 totaled 5.38 inches statewide which was 0.98 inches above normal. Greatest rainfall totals occurred in Central, Bluegrass and Eastern sections of the state...with Western KY receiving lesser amounts but still slightly above normal. Rainfall totals by climate division, West 4.65 inches, Central 5.56 inches, Bluegrass 5.48 inches and East 5.74 inches, which was 0.54, 1.05, 0.96 and 1.29 inches respectively from normal.

August: 27th warmest and 11th wettest August on record.

2nd wettest April through August on record.

Temperatures for August 2003 averaged 76.3 degrees across the state which was 1.3 degree above normal. High temperatures averaged from 88 in the West to 84 in the East. Departure from normal high temperatures ranged from 1 degree above normal in the West to 1 degree 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 3 degrees above normal in the West to 4 degrees above normal in the East.

Rainfall for the month totaled 5.23 inches statewide which was 1.63 inch above normal. Rainfall totals by climate division, West 4.06 inches, Central 5.35 inches, Bluegrass 6.04 inches and East 5.51 inches, which was 0.87, 1.82, 2.32 and 1.60 inches respectively above normal.

September: 22nd coolest and 4th wettest September on record.

Temperatures for September 2003 averaged 66.6 degrees across the state which was 1.6 degrees below normal, nearly 10 degrees cooler than the previous month...ranking September as the 22nd coolest on record (109 years)...and the 26th coolest combined April through September on record. High temperatures averaged from 79 in the West to 76 in the East. Departure from normal high temperatures ranged from 3 degrees below normal in the West to 2 degrees below normal in the East. Low temperatures averaged from 56 degrees in the West to 57 degrees in the East. Departure from normal low temperature ranged from 2 degrees below normal in the West to 2 degrees above normal in the East.

Rainfall for September 2003 totaled 6.22 inches statewide which was 2.62 inches above normal...ranking September as the 4th wettest on record... and the 2nd wettest April through September (34.77 inches) on record. Rainfall for September by climate division, West 5.70 inches, Central 7.88 inches, Bluegrass 6.35 inches and East 5.33 inches, which was 2.33, 3.98, 3.09 and 1.91 inches respectively above normal.

October: Near normal temperatures and below average rainfall.

Temperatures for the period averaged 57 degrees across the state which was near normal. High temperatures averaged from 72 in the West to 70 in the East. Departure from normal high temperatures ranged from 2 degrees above normal in the West to 4 degrees above normal in the East. Low temperatures averaged from 49 degrees in the West to 48 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.

Rainfall for the period totaled 2.42 inches statewide which was 0.49 inches below normal. Rainfall totals by climate division: West 2.68 inches, Central 2.32 inches, Bluegrass 2.34 inches and East 2.36 inches, which was 1.17, 0.98, 0.88 and 0.81 inches respectively below normal.

November: 8th warmest and 11th wettest November on record.

Temperatures for the period averaged 50.5 degrees across the state which was 3.9 degrees above normal and 6.5 degrees cooler than the previous month. High temperatures averaged from 60 in the West to 61 in the East. Departure from normal high temperatures ranged from 0 degrees from normal in the West to 5 degrees above normal in the East. Low temperatures averaged from 43 degrees in the West to 42 degrees in the East. Departure from normal low temperature ranged from 5 degrees above normal in the West to 9 degrees above normal in the East.

Precipitation (liq. equ.) for the period totaled 5.88 inches statewide which was 1.84 inches above normal. Precipitation totals by climate division, West 5.33 inches, Central 5.38 inches, Bluegrass 6.13 inches and East 6.50 inches, which was 0.81, 1.09, 2.46 and 2.77 inches respectively above normal.

December: Near normal temperatures and below normal precipitation.

Temperatures for the period averaged 37.2 degrees across the state which was 0.5 degrees above normal and 13.3 degrees cooler than November 2003. High temperatures averaged from 49 in the West to 47 in the East. Departure from normal high temperatures ranged from 3 degrees above normal in the West to 4 degrees above normal in the East. Low temperatures averaged from 33 degrees in the West to 32 degrees in the East. Departure from normal low temperature ranged from 5 degrees above normal in the West to 9 degrees above normal in the East.

Precipitation (liq. equ.) for the period totaled 3.51 inches statewide which was -0.77 inches from normal. Precipitation totals by climate division, West 2.87 inches, Central 3.99 inches, Bluegrass 3.64 inches and East 3.57 inches, which was 1.71, 0.83, 0.34 and 0.30 inches respectively below normal.

CROP SUMMARIES

Tobacco:

The number of tobacco samples were significantly below numbers for 2000 through 2002, which have been dramatically lower since 1999. The incidence of Blue Mold (*Peronospora tabacina*) was much greater by at least a factor of four over the low years of 2000 through 2002. Black Shank (*Phytophthora parasitica* var. *nicotianae*) sample numbers decreased by more than three fold from 2002 which is odd for such a wet growing season. The number of cases of Fusarium Wilt Complex were significantly lower than the last two years. The number of cases of Tomato Spotted Wilt virus were almost non-existent.

Other agronomic crops:

Corn: The number of corn samples with diseases were relatively few but a few cases of Northern Corn Leaf Blight (*Exserohilum turcicum*) were seen due to the wet, and at times, cooler weather.

Soybean: Charcoal Rot (*Macrophomina phaseolina*) sample numbers were similar to those of 2001. Samples diagnosed with Sudden Death (*Fusarium solani*, A strain) were similar to that of 2001 levels, which was significantly higher than 2002 and predictable with the wet growing season. Soybean Cyst Nematode (*Heterodera glycines*) still remains the major yield-limiting disease factor in the majority of soybean producing acreage. There is increasing concern about Australasian Soybean Rust (*Phakopsora pachyrhizi*) moving up from South America and its potential for greatly reducing soybean yields and driving up the cost of production.

Small Grains: Several samples of wheat with Bacterial Streak (*Xanthomonas translucens* f.sp. *undulosa*) were seen due to the wet growing conditions.

Forages: Leaf spot diseases were common due to the wet growing conditions.

Fruit and Vegetable Plant Disease Observations:

Diagnosing fruit and vegetable diseases involves a great deal of research into the possible causes of the problem. Most visual diagnoses include microscopy to determine what plant parts are affected and to identify the microbe involved. In addition, many specimens require special tests such as moist chamber incubation, culturing, enzyme-linked immunosorbent assay (ELISA), polymerase chain reaction (PCR) assay, electron microscopy, nematode extraction, or soil pH and soluble salts tests. Diagnoses which require consultation with U.K. faculty plant pathologists and horticulturists, and which need culturing, PCR and ELISA are common for commercial fruits and vegetables. The Extension plant pathology group has tested protocols for using PCR to detect several pathogens of interest to fruit and vegetable growers. These include the difficult-to-diagnose pathogens causing bacterial wilt, bacterial leaf spot, yellow vine decline and Pierce's disease. 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.

Results and Discussion

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
- Peach fruit rot caused by a species of either *Phoma* or *Phyllosticta*.
- 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*
- Bacterial fruit blotch of melons caused by *Acidovorax avenae subsp. citrulli*.
- Root knot nematode (*Meloidogyne* spp.) is becoming a major problem on several crops due to reduced crop rotation and use of old tobacco fields as vegetable sites.
- Virus disease incidence, especially in legume crops, could change significantly with recent introduction of the soybean aphid, a virus vector.
- Soybean rust is expected to arrive in the U.S. at anytime and many vegetable legumes are also hosts.

Tree Fruit Diseases

Rain and long periods of spring leaf wetness increased the occurrence of primary infections of apple scab (*Venturia inaequalis*) and promoted infections by the cedar rust fungi (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, and *G. globosum*). Spring rains also favored apple frog-eye leaf spot (*Sphaeropsis malorum*). Due to relatively cool weather during bloom, fire blight (*Erwinia amylovora*) levels were reduced, but still present occasionally. Summer wetness favored 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.

Season-long rains, especially those in late spring, favored peach scab (*Cladosporium carpophilum*) and brown rot (*Monilinia fructicola*). Peach rusty spot (powdery mildew, *Sphaerotheca pannosa*, *Podosphaera clandestina*, or *P. tridactyla*) was also observed. Peach fruit rot (*Phoma* or *Phyllosticta* sp.) was identified in the laboratory and is a new disease in at least one orchard. Cherry leaf spot (*Coccomyces hiemalis*) and plum black knot (*Apiosporina morbosum*) occurred widely.

Small Fruit Diseases

Anthracnose (*Elsinoe veneta*) was widespread on raspberry and black raspberry canes. On blackberry, systemic orange rust (*Gymnoconia nitens*) and blackberry rosette (*Cercospora rubi*) were frequently observed. Phytophthora root rot (*Phytophthora* spp.) and Sphaerulina leaf spot (*Sphaerulina rubi*) of raspberry could be attributed to the added wetness of the season.

Grape crown gall (*Agrobacterium tumefaciens*) continues to be a very serious problem for growers. Wet spring weather favored black rot (*Guignardia bidwellii*), anthracnose (*Elsinoe ampelina*), and Phomopsis cane and leaf spot (*Phomopsis viticola*). These diseases continued to build throughout the summer, particularly black rot. Grape downy mildew (*Plasmopara viticola*) and powdery mildew (*Uncinula necator*) were observed at high levels, especially late in the season. No new cases of Pierce's disease (*Xylella fastidiosa*) were found.

Wet weather favored Phytophthora root rot (*Phytophthora* spp.) of blueberries.

Strawberry foliar diseases including leaf spot (*Mycosphaerella fragariae*) and leaf blight (*Phomopsis obscurans*) were common. Botrytis and anthracnose fruit rots (*Botrytis cinerea*, *Colletotricum acutatum*) were also observed.

Vegetable Diseases

In accord with a wet spring and a cool, moist summer in most areas of the state, infectious diseases played a significant role in successful 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. Cabbage damping-off (*Rhizoctonia solani*) was also observed.

Cole crops. Unusual occurrences or high levels of cole crop diseases were not found this year.

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, and was sometimes accompanied by “wet feet.” Septoria leaf spot (*Septoria lycopersici*), favored by cool, wet weather was especially widespread this year. Early blight (*Alternaria solani*) and leaf mold (*Cladosporium fulvum*) also occurred frequently. Fruit maladies in addition to blossom end rot included the fruit infection stages of the fungal and bacterial leaf diseases listed above and also gray mold (*Botrytis cinerea*). Tomato fruit also experienced other physiological disorders such as catfacing, green shoulders and stem-end internal greening. Fusarium wilt (*Fusarium oxysporum* f.sp. *lycopercici*), and root knot nematode (*Meloidogyne* sp.) were problems in some fields. Magnesium and phosphorus deficiencies and physiological leaf roll were also observed.

Peppers. Bacterial leaf spot (*Xanthomonas campestris* pv. *vesicatoria*) remains an important problem. Phytophthora stem and fruit rot (*Phytophthora capsici*) were important this wet season. Pythium root rot (*Pythium* spp.), and Rhizoctonia root rot (*Rhizoctonia solani*) were 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*) are widespread in the state and cause losses in pumpkin, watermelon, squash, and cucumber. Anthracnose (*Colletotrichum* spp.), gummy stem blight/black rot (*Mycosphaerella melonis*), and Cercospora leaf spot (*Cercospora melonis*) were found at serious levels in fields of several different cucurbit crops.. Pumpkin and squash powdery mildew (*Erysiphe cichoracearum*) also caused losses. Bacterial diseases of cucurbits included bacterial wilt (*Erwinia tracheiphila*) and cucurbit yellow vine decline caused by *Serratia marsescens*. However, the incidence of yellow vine decline was much lower than in the previous two years. Bacterial fruit blotch of melons (*Acidovorax avenae* subsp. *citrulli*) was confirmed for the first time in Kentucky, but it probably has been present before. Foliar disease in cucurbits is often attributed to poor spraying techniques. The causes of poor spraying, even if being sprayed regularly, are poor timing, poor coverage, or use of the wrong fungicides.

Other vegetables. Bean root and stem rot (*Rhizoctonia solani*), anthracnose (*Colletotrichum lindemuthianum*) and angular leaf spot (*Phaeoisariopsis griseola*) were observed this year. Black leg (*Erwinia atroseptica*) and root knot nematode (*Meloidogyne incognita*) diseases occurred on potatoes. Asparagus was infected with leaf spot (*Cercospora asparagi*) and stem canker (*Phoma media*). Sweet corn bacterial disease outbreaks included stalk rot (*Erwinia chrysanthemi* pv. *zetae*) and holcus leaf spot (*Pseudomonas syringae*).

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 bacterial diseases in tomatoes and now want to know if this is due to how we raise our crops, manage other diseases, or import seeds and transplants.

Because fruits and vegetables are high value crops, the plant disease diagnostic laboratory should be a great value to commercial growers. However, many growers are not using the plant disease diagnostic laboratory often enough or they are waiting until their disease problem has become well established. By then, it may be too late to do anything about it, or in some cases to correctly diagnose the sequence of diseases that may have led to the final outcome. Growers need to consult consistently with their County Extension Agents so that appropriate plant specimens are sent to the laboratory in a timely manner. We are urging County Extension Agents to stress in their Extension programming the need for accurate diagnosis of diseases of high-value crops. Growers can work with their Agents to see that Kentucky growers have the best possible information on fruit and vegetable diseases.

Landscape Plant Disease Observations:

For 2003 the following important diseases or diseases that were unusual or increased due to the wet weather were observed:

Deciduous trees

- Birch leaf spot (*Septoria*)
- Dogwood powdery mildew (*Microsphaera*, *Phyllactinia*) and leaf spot (*Septoria*)
- Flowering crabapple scab (*Venturia*)
- Flowering plum black knot (*Apiosporina*)
- Hawthorn leaf spot (*Entomosporium*)
- Hawthorn, serviceberry and crabapple cedar rusts (*Gymnosporangium juniperi-virginianae*, *G. clavipes*, *G. globosum*)
- Maple, ash, dogwood, oak and sycamore anthracnose (*Kabatiella*, *Discula*, and *Apiognomonina*)
- Maple, walnut zonate leaf spots (*Cristulariella*)
- Oak bacterial leaf scorch (*Xylella*)
- Tulip poplar, maple and magnolia wilt (*Verticillium*)

Needle Evergreens

- Juniper tip blight (*Phomopsis*) and rusts (*Gymnosporangium* spp.)
- Pine tip blight (*Sphaeropsis*), needle casts (*Dothistroma*, *Lophodermium*), needle rust (*Coleosporium*) and ozone injury
- Spruce needle cast (*Rhizosphaera*) and canker (*Cytospora*)

Shrubs

- Hibiscus and spicebush leaf spots (*Cristulariella*)
- Holly and inkberry black root rot (*Thielaviopsis*)
- Photinia leaf spot (*Entomosporium*)
- Rose black spot (*Diplocarpon*) and rosette (possible leaf curl mite-transmitted virus)
- Rhododendron root rot (*Phytophthora*)

Herbaceous Annuals and Perennials

- Aster web blight (*Rhizoctonia*) and rust (*Coleosporium*, *Puccinia*)
- Chrysanthemum, snapdragon, geranium, English ivy, petunia, hydrangea and bedding plants root rots (*Pythium*, *Rhizoctonia*, *Phytophthora*)
- Chrysanthemum bacterial leaf spot (*Pseudomonas*)
- Coreopsis and foxglove downy mildews (*Plasmopara*)
- Daylily leaf streak (*Aureobasidium*)
- Geranium bacterial wilt (*Ralstonia solanacearum* race 3, biovar 2 - one confirmed case)
- Geranium, vinca, peony, petunia and annual bedding plants gray mold blight (*Botrytis*)
- Hollyhock rust (*Puccinia*)
- Pansy root rot and black root rot (*Pythium*, *Thielaviopsis*)
- Rudbeckia leaf spots (*Cercospora*, *Septoria*)
- Vinca black root rot (*Thielaviopsis*) and aerial blight (*Phytophthora*)
- Zinnia flower rot (*Choanephora*)

A Shift in Sample Types:

As noted above the number of tobacco samples for 2003 dropped even lower than the already dramatically decreased levels seen since 2000. This drop in the number of tobacco samples has been mostly offset by increases in the number of woody and herbaceous ornamental samples, both commercial and homeowner, 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. Stephanie Breitmeyer and Claudia Cotton provided very capable, part-time assistance in the Lexington Laboratory as did Meghan Travis in the Princeton Laboratory.

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 2003.

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 2003. 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	15	13	4	1	6	12	51
Forages	6	41	2	1	4	15	69
Small grains	2	11	1	0	1	1	16
Soybeans	23	142*	3	1	0	51*	220
Tobacco	148	351	52	5	5	86	647
<u>Fruit</u>							
Small fruit	21	52	8	2	4	34	121
Tree fruit	30	79	2	4	19	24	158
<u>Herbs</u>							
	1	2	0	1	1	2	7
<u>Identification</u>							
	0	58	0	1	0	3	62
<u>Ornamentals</u>							
Herbaceous and							
Houseplants	83	124	9	8	10	52	286
Turfgrass	7	70	4	0	0	62	143
Woody	302	302	37	16	172	292	1121
<u>Vegetables</u>							
	91	121	36	18	19	79	364
<u>Miscellaneous</u>							
	4	4	0	0	0	5	13
<u>Total</u>	733	1370	158	58	241	718	3278

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: 107 with Soybean Cyst Nematodes; 37 without Soybean Cyst Nematodes.

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

Crop Category	Bacterial	Fungal	Nematode	Virus	Other¹
<u>Agronomic</u>					
Corn	0	13	0	0	0
Forages	0	41	0	0	0
Small grains	5	3	0	3	0
Soybeans	0	29	110	2	1
Tobacco	13	315	0	22	1
<u>Fruit</u>					
Small fruit	5	46	0	1	0
Tree fruit	11	68	0	0	0
<u>Herbs</u>					
	0	2	0	0	0
<u>Identification</u>					
	0	26	0	0	32
<u>Ornamentals</u>					
Herbaceous and Houseplants	8	114	0	2	0
Turfgrass	1	68	0	0	1
Woody	23	269	1	6	3
<u>Vegetables</u>					
	26	89	4	1	1
<u>Miscellaneous</u>					
	0	2	1	0	1
Total	92	1085	116	37	40

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)	212	6.8
Tobacco	647	20.6
Fruit	279	8.9
Herbs	7	0.2
Identifications	62	2.0
Ornamentals	1550	49.5
Vegetables	364	11.6
Miscellaneous	13	0.4
Total Plant Specimens	3134	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	51	5	56
Forages	69	16	85
Small grains	16	4	20
Soybeans	220*	28	248
Tobacco	647	86	733
<u>Fruit</u>			
Small fruit	121	10	131
Tree fruit	158	27	185
<u>Herbs</u>			
	7	0	7
<u>Identification</u>			
	62	0	62
<u>Ornamentals</u>			
Herbaceous and Houseplants	286	36	322
Turfgrass	143	6	149
Woody	1121	93	1214
<u>Vegetables</u>			
	364	37	401
<u>Miscellaneous</u>			
	13	0	13
<u>Total</u>	3278	348	3626

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 + 144 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	44	5	0	0	1	1	0	0
Forages	66	2	0	0	0	1	0	0
Small grains	15	1	0	0	0	0	0	0
Soybeans	189	6	0	0	1	24	0	0
Tobacco	609	27	0	0	5	6	0	0
<u>Fruit</u>								
Small Fruit	60	0	47	2	4	8	0	0
Tree Fruit	34	2	112	6	2	2	0	0
<u>Herbs</u>								
	5	0	2	0	0	0	0	0
<u>Identifications</u>								
	6	0	50	5	0	1	0	0
<u>Ornamental</u>								
Herbaceous and								
Houseplants	151	14	84	7	2	26	1	1
Turfgrass	67	13	43	1	1	3	11	4
Woody	218	24	816	27	3	23	9	1
<u>Vegetable</u>								
	215	5	126	5	4	9	0	0
<u>Miscellaneous</u>								
	6	0	3	0	1	0	3	0
<u>Total</u>								
	1685	99	1283	53	24	104	24	6
<u>Total/Grower Type</u>								
	1784		1336		128		30	

Total number of samples received = 3278

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 SPECIMENS 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	0	2	0	6
Agronomy Department	13	0	3	0	0	16
Entomology Department	3	5	37	5	0	50
Horticulture Department	0	1	5	0	1	7
Clemson Univ.	0	0	0	0	1	1
Univ. of Georgia	0	0	0	0	1	1
					Total	81
					Total number of specimens	3278
					Percent of specimens referred outside Diagnostic Lab for diagnosis	2.5

* 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
Polymerase Chain Reaction (PCR)	1
Culturing	18
Enzyme-linked Immunosorbent Assay (ELISA)	70
Grow out	3
Incubation	238
Indicator plants	1
Nematode extraction (total = 182)	
Miscellaneous	2
Pinewood nematode	2
Soybean cyst nematode	144
Soil tests (total = 188)	
pH	87
pH/Soluble Salts	63
Soluble salts	7
Quick nitrate test	9

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	12	2	3	1	3	3	0
ANDERSON	4	0	0	1	3	0	0
BALLARD	19	3	9	1	3	0	3
BARREN	31	4	5	2	16	4	0
BATH	17	2	7	1	6	1	0
BELL	14	0	0	2	10	2	0
BOONE	32	4	5	1	17	4	1
BOURBON	27	7	8	3	7	1	1
BOYD	4	0	0	0	4	0	0
BOYLE	36	2	4	0	27	3	0
BRACKEN	6	0	4	0	2	0	0
BREATHITT	14	0	4	1	5	4	0
BRECKINRIDGE	62	2	42	4	10	3	1
BULLITT	40	0	0	3	29	3	5
BUTLER	18	4	5	2	7	0	0
CALDWELL	97	8	11	20	37	15	6
CALLOWAY	152	7	41	8	83	11	2
CAMPBELL	10	0	2	2	5	1	0
CARLISLE	4	0	0	1	3	0	0
CARROLL	10	1	2	1	6	0	0
CARTER	16	1	3	3	9	0	0
CASEY	38	4	7	3	4	20	0
CHRISTIAN	134	15	23	15	48	31	2
CLARK	24	1	11	1	6	4	1
CLAY	3	0	2	0	0	1	0
CLINTON	15	1	6	0	5	2	1
CRITTENDEN	34	2	0	5	19	4	4
CUMBERLAND	11	1	4	0	2	4	0
DAVIESS	162	13	22	20	56	50	1
EDMONSON	15	1	7	2	2	3	0
ELLIOTT	14	0	3	3	6	2	0
ESTILL	18	2	9	2	3	2	0
FAYETTE	342	16	20	13	271	18	4
FLEMING	22	0	11	1	8	1	1
FLOYD	4	0	0	0	4	0	0
FRANKLIN	51	4	11	3	25	4	4
FULTON	6	2	0	0	2	1	1
GALLATIN	4	0	3	1	0	0	0
GARRARD	15	0	6	1	5	1	2
GRANT	25	0	2	5	15	3	0
GRAVES	34	1	11	7	13	2	0
GRAYSON	16	1	5	1	6	2	1
GREEN	11	0	2	4	4	0	1
GREENUP	25	3	3	2	17	0	0
HANCOCK	16	2	5	2	3	1	3
HARDIN	15	1	5	1	5	3	0
HARLAN	25	0	0	4	17	3	1
HARRISON	9	0	2	1	5	0	1
HART	16	0	5	5	6	0	0
HENDERSON	43	2	5	2	23	11	0
HENRY	24	2	9	3	9	1	0
HICKMAN	12	4	1	2	3	2	0
HOPKINS	46	3	3	1	26	10	3
JACKSON	19	0	4	3	12	0	0
JEFFERSON	33	0	0	0	31	1	1
JESSAMINE	14	0	4	1	6	1	2
JOHNSON	4	0	2	0	0	2	0
KENTON	44	0	3	0	38	1	2
KNOTT	0	0	0	0	0	0	0
KNOX	3	1	1	0	1	0	0

COUNTY	Total	Agronomic ¹	Tobacco	Fruit	Ornamental	Vegetable	Other
LARUE	15	0	6	4	3	2	0
LAUREL	22	0	1	4	14	2	1
LAWRENCE	4	0	2	0	1	1	0
LEE	2	0	1	0	1	0	0
LESLIE	0	0	0	0	0	0	0
LETCHER	7	0	0	0	5	2	0
LEWIS	19	2	10	0	4	2	1
LINCOLN	7	1	2	1	2	1	0
LIVINGSTON	9	1	0	1	6	1	0
LOGAN	36	6	13	1	12	4	0
LYON	10	1	1	2	5	0	1
McCRACKEN	54	0	0	6	40	7	1
McCREARY	16	0	0	10	5	1	0
McLEAN	16	5	2	1	0	7	1
MADISON	53	0	11	5	37	0	0
MAGOFFIN	5	0	2	1	1	1	0
MARION	18	2	3	2	8	1	2
MARSHALL	54	3	2	4	35	10	0
MARTIN	2	0	0	0	1	1	0
MASON	5	2	1	0	0	2	0
MEADE	29	2	8	6	10	3	1
MENIFEE	9	1	1	4	3	0	0
MERCER	11	2	4	1	4	0	0
METCALFE	3	0	0	0	3	0	0
MONROE	30	1	14	1	10	4	0
MONTGOMERY	36	0	4	5	24	3	0
MORGAN	29	1	7	3	8	9	1
MUHLENBERG	20	4	4	3	6	2	1
NELSON	31	0	6	0	23	2	0
NICHOLAS	7	0	4	0	1	1	1
OHIO	7	0	5	1	0	1	0
OLDHAM	17	0	1	1	13	1	1
OWEN	10	1	5	2	1	1	0
OWSLEY	3	0	2	0	1	0	0
PENDELTON	4	0	2	0	2	0	0
PERRY	5	0	2	0	3	0	0
PIKE	2	0	0	0	1	0	1
POWELL	1	0	1	0	0	0	0
PULASKI	45	6	6	7	20	3	3
ROBERTSON	9	0	4	1	4	0	0
ROCKCASTLE	2	0	1	0	1	0	0
ROWAN	13	0	2	1	7	2	1
RUSSELL	28	2	5	2	8	10	1
SCOTT	18	1	6	1	6	4	0
SHELBY	75	2	6	0	64	1	2
SIMPSON	23	4	5	2	12	0	0
SPENCER	21	1	12	0	6	0	2
TAYLOR	29	5	11	4	7	2	0
TODD	40	7	10	2	14	7	0
TRIGG	41	4	11	1	20	4	1
TRIMBLE	16	1	9	0	5	0	1
UNION	18	8	0	2	8	0	0
WARREN	55	3	11	4	33	3	1
WASHINGTON	12	0	2	1	9	0	0
WAYNE	20	2	11	2	1	4	0
WEBSTER	13	1	6	0	2	3	1
WHITLEY	10	0	1	3	5	0	1
WOLFE	2	0	2	0	0	2	0
WOODFORD	35	1	7	4	21	1	1
Out-of-State	27	0	19	2	6	0	0
TOTALS	3134	212	647	279	1550	364	82

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	5	10
Barnes, TG	Forestry	1	0
Beale, JW (Diagnostician)	Plant Pathology	1488	6
Bessin, RT	Entomology	5	3
Bogle, S	Horticulture	0	1
Durham, RE	Horticulture	1	0
Fountain, WM	Horticulture	0	2
Ghabrial, SA	Plant Pathology	0	1
Green, JD	Agronomy	6	5
Hartman, JR	Plant Pathology	81	8
Henning, JC	Agronomy	1	0
Jones, RT	Horticulture	1	0
Lee, CD	Agronomy	1	2
Nesmith, WC	Plant Pathology	145	29
Newton, BL	Entomology	0	0
Palmer, GK	Agronomy	27	3
Pearce, RC	Agronomy	0	2
Powell, AJ	Agronomy	1	3
Regan, RP	Oregon State	1	1
Rowell, AB	Horticulture	1	5
Scwab, GJ	Agronomy	1	0
Strang, JG	Horticulture	9	5
Townsend, LH	Entomology	41	12
Vincelli, P	Plant Pathology	95	9
PRINCETON			
Bachi, PR (Diagnostician)	Plant Pathology	1120	30
Bailey, WA	Agronomy	19	9
Dunwell, WC	Horticulture	15	26
Fulcher, A	Horticulture	5	5
Herbek, JH	Agronomy	3	3
Hershman, DE	Plant Pathology	10	4
Johnson, DW	Entomology	3	5
Lacefield, GD	Agronomy	6	4
Masabni, JG	Horticulture	16	14
Martin, JR	Agronomy	20	8
Murdock, LW	Agronomy	3	3
Rasnake, M	Agronomy	2	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)

Chemical injury	- herbicide	3	0	3
	- unknown	1	0	1
Crazy top	- Sclerophthora	1	0	1
Ear/Kernel rots	- Cladosporium	1	0	1
	- Penicillium	0	1	1
	- Stenocarpella	2	0	2
Environmental	- stresses	6	1	7
Gray leaf spot	- Cercospora	1	1	2
Inadequate specimen, no disease		13		13
Insect injury		6	1	7
Northern leaf blight	- Setosphaeria	3	1	4
Nutritional	- acid soil	2	0	2
	- nitrogen	1	0	1
	- potassium deficiency	1	0	1
	- zinc deficiency	3	0	3
Physical injury	- wind	1	0	1
Purple leaf sheath	- complex (fungus)	1	0	1
Root rot	- Fusarium	1	0	1
	- Pythium	1	0	1
Smut	- Ustilago	1	0	1
Southern rust	- Puccinia	1	0	1
Stalk rot	- fungal	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
<u>FORAGES</u>					
ALFALFA (Medicago)					
	Chemical injury	- herbicide	1	1	2
	Crown rot	- fungal	2	0	2
	Crown/root rot	- Rhizoctonia	1	1	2
	Crown/stem rot	- Sclerotinia	5	1	6
	Environmental	- stress	0	1	1
	Inadequate specimen, no disease		14		14
	Insect injury		3	4	7
	Leaf spot	- Cercospora	3	2	5
		- Leptosphaerulina	14	3	17
		- Pseudopeziza	1	0	1
	Nutritional	- acid soil	3	0	3
		- boron deficiency	2	0	2
	Root rot	- Aphanomyces	1	0	1
		- Phytophthora	1	1	2
		- Pythium	2	0	2
		- unknown	1	0	1
	Spring black stem	- Phoma	1	1	2
	Summer black stem	- Cercospora	3	0	3
CLOVER (Trifoliorum)					
	Crown/root rot	- Rhizoctonia	1	0	1
	Damping-off	- Rhizoctonia	1	0	1
	Insect injury		1	0	1
	Mutation	- genetic	1	0	1
	Root rot	- Pythium	0	1	1
MILLET (Panicum)					
	Gray leaf spot	- Pyricularia	1	0	1
ORCHARDGRASS (Dactylis)					
	Leaf spot	- fungal	1	0	1
	No disease		1		1
	Root rot	- unknown	1	0	1
RYEGRASS (Lolium)					
	Root/stem rot	- Rhizoctonia	1	0	1
SORGHUM (Sorghum)					
	Root rot	- Fusarium	1	0	1
TIMOTHY (Phleum)					
	Chemical injury	- herbicide	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>SOYBEAN</u>					
SOYBEAN (Glycine)					
	Brown spot	- Septoria	2	0	2
	Charcoal rot	- Macrophomina	2	1	3
	Chemical injury	- herbicide, growth reg.	3	0	3
	Cultural	- high temperature	1	0	1
	Downy mildew	- Peronospora	3	2	5
	Environmental stresses		3	2	5
	Frogeye	- Cercospora	5	7	12
	Inadequate specimen, no disease		15		15
	Insect injury		0	1	1
	Nutritional	- acid soil	1	0	1
		- manganese deficiency	2	1	3
		- phosphorus deficiency	0	1	1
		- poor nodulation	0	1	1
		- potassium deficiency	16	1	17
	Physical injury	- deer	1	0	1
	Pod and stem blight	- Diaporthe	1	2	3
	Root rot	- Rhizoctonia	1	4	5
	Root/stem rot	- Phytophthora	1	0	1
		- Rhizoctonia	3	0	3
	Southern blight	- Sclerotium	0	1	1
	Soybean cyst nematode - on plant samples		3	2	5
	Heterodera	* in soil samples	107		107
		* absent in soil samples	37		37
	(*soil submitted to Nematode Analysis Laboratory)				
	Sudden death	- Fusarium	11	1	12
	Virus	- Tobacco ringspot	2	0	2

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>SMALL GRAINS</u>					
BARLEY (Hordeum)					
	Head blight	- Fusarium	1	0	1
OAT (Avena)					
	Leaf spot	- physiological	1	0	1
	Virus	- Barley yellow dwarf	2	0	2
SORGHUM (Sorghum)					
	Insect injury		1	0	1
	Physical injury	- bird	0	1	1
	Virus	- Maize dwarf mosaic	1	0	1
WHEAT (Triticum)					
	Bacterial streak	- Xanthomonas	5	0	5
	Glume blotch	- Stagonospora	1	1	2
	Environmental	- wet feet	1	0	1
	Leaf blotch	- Stagonospora	1	0	1
	Leaf blotch, speckled	- Septoria	0	1	1
	No disease		1		1
<u>TOBACCO</u>					
TOBACCO (Nicotiana)					
	Algae	- blue-green	1	0	1
	Angular leaf spot	- Pseudomonas	6	1	6
	Black leg	- Erwinia	5	0	5
	Black root rot	- Thielaviopsis	5	0	5
	Black shank	- Phytophthora	87	2	89
	Blue mold	- Peronospora	114	8	122
	Chemical injury	- burn	1	0	1
		- disinfectant	1	0	1
		- fungicide	1	4	5
		- growth regulator	5	2	7
		- herbicide	31	2	33
		- petroleum product	2	0	2
		- sucker agent	1	0	1
		- unknown	10	0	10
	Collar rot	- Sclerotinia	3	0	3
	Cultural stresses		12	0	12
	Damping-off	- Rhizoctonia	6	4	10
	Early flowering	- environmental	2	0	2

<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	25	2	27
		- compaction	1	0	1
		- drought	3	0	3
		- high temperature	2	0	2
		- lightning	2	0	2
		- stress	3	1	4
		- weather scald	2	0	2
		- wet feet	17	4	21
Frenching		- metabolites	1	0	1
Frogeye		- Cercospora	21	15	36
Hollow stalk		- Erwinia	2	0	2
Hormonal imbalance		- unknown	1	0	1
Improper curing		- piebald	1	0	1
Inadequate specimen, no disease			89		89
Insect injury			5	0	5
Nutritional		- acid soil	8	1	9
		- calcium deficiency	1	0	1
		- fertilizer burn	8	0	8
		- low fertility	5	0	5
		- high nitrates	0	1	1
		- manganese toxicity	26	1	27
		- nitrogen deficiency	11	2	13
		- organic matter toxicity	1	0	1
		- phosphorus deficiency	2	0	2
		- potassium deficiency	6	0	6
		- soluble salts	1	0	1
		- temp. phosphorus def.	1	3	4
	Physiological		- suckering	1	0
Ragged leaf spot		- Ascochyta	1	0	1
Root rot		- Pythium	34	5	39
Root/stem rot		- Rhizoctonia	0	9	9
Sore shin		- Rhizoctonia	5	4	9
Stem rot		- Fusarium	1	1	2
Target spot		- Rhizoctonia	33	9	42
Variegation		- genetic	0	1	1
Virus		- Alfalfa mosaic	7	0	7
		- complex	1	0	1
		- Impatiens necrotic spot	1	0	1
		- potyvirus	1	1	2
		- Tobacco ringspot	3	0	3
		- Tobacco streak	3	0	3
		- Tobacco vein banding mosaic	1	1	2
		- Tobacco vein mottling	1	0	1
		- Tomato spotted wilt	4	0	4
Weather fleck		- ozone	4	0	4
Wilt		- Fusarium	3	0	0

<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)					
	Cultural	- transplant shock	1	0	1
	Environmental stresses		2	0	2
	Insect injury		1	0	1
	Leaf scorch	- unknown	1	0	1
	No disease		4		4
	Root rot	- Phytophthora	1	0	1
BRAMBLES - BLACKBERRY, and RASPBERRY (Rubus)					
	Anthraxnose	- Elsinoe	2	0	2
	Canker	- unknown	1	0	1
	Chemical injury	- herbicide	2	0	2
	Crown gall	- Agrobacterium	1	0	1
	Cultural	- transplant shock	1	0	1
	Double blossom	- Cercospora	3	0	3
	Environmental stresses		3	1	4
	Gray mold	- Botrytis	1	0	1
	Insect injury		1	3	4
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- Sphaerulina	1	0	1
	No disease		13		13
	Physical injury	- wind	1	0	1
	Physiological	- white druplet	1	0	1
	Root rot	- Phytophthora	1	0	1
	Rust, orange	- Gymnoconia	1	0	1
	Virus	- sterility	1	0	1
CURRENT and GOOSEBERRY (Ribes)					
	Insect		1	0	1
	Leaf spot	- Drepanopeziza	1	0	1
GRAPE (Vitis)					
	Anthraxnose	- Elsinoe	5	2	7
	Black rot	- Guignardia	11	0	11
	Chemical injury	- growth regulator	1	0	1
		- herbicide	3	0	1
	Crown gall	- Agrobacterium	3	0	3
	Downy mildew	- Plasmopora	1	0	1
	Environmental	- wet feet	1	0	1
	Inadequate specimen, no disease		15		15
	Leaf blight	- Pseudocercospora	3	2	5
	Leaf spot	- Phomopsis	1	0	1
	Nutritional	- general	1	0	1
	Poor pollination	- environmental	2	0	2
	Powdery mildew	- Uncinula	2	0	2
	Ripe rot	- Colletotrichum	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
STRAWBERRY (Fragaria)					
	Anthracnose	- Colletotrichum	2	0	2
	Bacterial leaf spot	- Xanthomonas	1	0	1
	Black root rot	- Pythium	1	0	1
		- Rhizoctonia	1	0	1
	Chemical injury	- herbicide	2	0	2
	Environmental	- wet feet	1	0	1
	Gray mold	- Botrytis	1	1	2
	Insect injury		1	0	1
	Leaf blight	- Phomopsis	3	2	5
	Leaf spot	- Mycosphaerella	3	0	3
	No disease		3		3
	Nutritional	- pH high	1	0	1
	Scorch	- Diplocarpon	0	1	1
<u>TREE FRUITS</u>					
APPLE (Malus)					
	Bitter rot	- Glomerella	3	0	3
	Blotch	- Phyllosticta	1	0	1
	Burr knot	- unknown	2	1	3
	Canker	- Botryosphaeria	0	2	2
	Cedar apple rust	- Gymnosporangium	18	3	21
	Cedar quince rust	- Gymnosporangium	0	1	1
	Chemical injury	- fungicide	1	0	1
		- surfactant	1	0	1
	Environmental stresses		3	0	3
	Fire blight	- Erwinia	7	0	7
	Flyspeck	- Schizothyrium	1	4	5
	Frogeye	- Botryosphaeria	9	2	11
	Inadequate specimen, no disease		17		17
	Insect injury		11	2	13
	Nutritional	- potassium deficiency	1	0	1
	Powdery mildew	- Podosphaera	1	0	1
	Root problem	- unknown	0	1	1
	Root rot	- Phytophthora	1	0	1
	Russet	- unknown	0	1	1
	Sooty blotch	- Gloeodes	2	1	3
	Thread blight	- Corticium	1	0	1
	White rot	- Botryosphaeria	1	0	1
CHERRY (Prunus)					
	Environmental	- cold injury	1	0	1
	Insect injury		1	0	1
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Coccoomyces	3	0	3
	Nutritional	- nitrogen deficiency	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
LEMON (Citrus)					
	Nutritional	- nitrogen deficiency	1	0	1
PEACH, APRICOT and NECTARINE (Prunus)					
	Bacterial spot	- Xanthomonas	2	0	2
	Brown rot	- Monilinia	10	0	10
	Canker	- Leucostoma	0	1	1
	Environmental stresses		5	0	5
	Fruit decay	- Phoma	1	0	1
	Gummosis	- unknown	1	0	1
	Insect injury		5	1	6
	Leaf curl	- Taphrina	2	0	2
	No disease		3		3
	Nutritional	- nitrogen deficiency	11	0	11
	Powdery mildew	- Podosphaera	1	0	1
	Scab	- Cladosporium	2	4	6
PEAR (Pyrus)					
	Bitter rot	- Glomerella	1	0	1
	Environmental	- wet feet	1	0	1
	Fire blight	- Erwinia	2	0	2
	No disease		2		2
PECAN (Carya)					
	Insect injury		2	0	2
	No disease		5		5
PLUM (Prunus)					
	Black knot	- Apiosporina	8	0	8
	Brown rot	- Monilinia	1	0	1
	Insect injury		0	3	3
	Nutritional	- nitrogen deficiency	1	0	1
WALNUT (Juglans)					
	Environmental	- wet feet	1	0	1
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
HERBS					
BASIL (Ocimum)					
	Gray mold	- Botrytis	1	0	1
ECHEVARIA (Echevaria)					
	Nutritional	- fertilizer burn	1	0	1
LAVENDER (Lavandula)					
	Inadequate specimen		1		1
MINT (Mentha)					
	Insect injury		1	0	1
ROSEMARY (Rosmarinus)					
	Gray mold	- Botrytis	1	0	1
	No disease		1		1
SALVIA (Salvia)					
	Leaf scorch	- unknown	1	0	1
MISCELLANEOUS					
MULCH					
	Fermented bark	- pH low	1	0	1
	Nutritional	- pH high	2	0	2
SHEPARD'S PURSE (Capsella)					
	Downy mildew	- Peronospora	1	0	1
SWIMMING POOL					
	Contamination	- algae	1	0	1
SOIL					
	No disease		3		3
	Nutritional	- soluble salts	1	0	1
	Root knot nematode	- Meloidogyne	1	0	1
UNKNOWN					
	No disease		2		2
WOOD					
	Wood decay	- Basidiomycete	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

Aspergillus	- species	1	1
Basidiomycete	- species	2	2
Cladosporium	- species	1	1
Coprinus	- species	1	1
Ganoderma	- species	5	5
Gymnosporangium	- juniperi-viginianae	1	1
Lepiota	- species	1	1
Mutinus	- caninus	1	1
Omphalotus	- olearius	1	1
Pleurotus	- species	1	1
Slime mold	- species	5	5
Sooty mold	- species	1	1
Sphaerobolus	- species	3	3
Trichoderma	- species	1	1
unknown		1	1

LICHEN IDENTIFICATIONS

Lichen	- species	4	4
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PLANT IDENTIFICATIONS

Acer	- rubrum	1	1
Arisaema	- species	1	1
Chaenomeles	- species	1	1
Cornus	- obliqua	1	1
Cucurbita	- pepo	1	1
Cyperus	- esculentus	1	1
Deutzia	- species	1	1
Epiphyllum	- species	1	1
Inadequate specimen		1	1
Ipomoea	- coccinea	1	1
Liverwort	- species	6	6
Maclura	- pomifera	1	1
no determination		2	2
Passiflora	- species	1	1
Paulownia	- tomentosa	2	2
Polygonum	- cuspidatum	1	1
	- persicaria	1	1
Pyrus	- calleryana	2	2
Rhamnus	- frangula	1	1
Smilax	- species	1	1
Spigelia	- marilandica	1	1
Trifolium	- aurium	1	1
unknown		1	1
Viburnum	- prunifolium	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
ORNAMENTALS					
<u>HERBACEOUS ORNAMENTALS and INDOOR PLANTS</u>					
AFRICAN VIOLET (Saintpaulia)	No disease		2		2
AJUGA (Ajuga)	Crown rot	- Sclerotium	1	0	1
ALLAMANDA (Allamanda)	Inadequate specimen		1		1
ALYSSUM (Alyssum)	Chemical	- herbicide	1	0	1
ANGELONIA (Angelonia)	No disease		1		1
	Nutritional	- soluble salts	1	0	1
	Root rot	- Pythium	1	0	1
ASTER (Aster)	Rust	- Puccinia	0	1	1
	Web blight	- Rhizoctonia	1	0	1
ASTILBE (Astilbe)	Bacterial spot	- bacterial	0	1	1
	Insect injury		1	0	1
BEGONIA (Begonia)	No disease		2		2
	Physical injury	- unknown	1	0	1
CALIBRAHOA (Calibrachoa)	Environmental	- heat injury	0	1	1
	Nutritional	- low fertility	1	0	1
	Root rot	- Fusarium	1	0	1
		- Pythium	2	0	2
CARNATION (Dianthus)	No disease		1		1

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CHRYSANTHEMUM (Chrysanthemum)					
	Bacterial leaf spot	- Pseudomonas	2	0	2
	Charcoal rot	- Macrophomina	1	0	1
	Chemical injury	- growth regulator	0	1	1
	Cultural	- over watering	6	0	6
	Environmental	- wet feet	1	0	1
	No disease		2		2
	Nutritional	- calcium deficiency	1	0	1
		- fertilizer burn	1	0	1
		- general	8	0	8
		- iron deficiency	1	0	1
		- pH high	0	1	1
	Root rot	- Pythium	1	6	7
	Root rot	- Rhizoctonia	3	1	4
CLEMATIS (Clematis)					
	Chemical injury	- herbicide	1	0	1
	No disease		2		2
	Stem rot	- Ascochyta	1	0	1
	Wilt	- unknown	1	0	1
COLEUS (Coleus)					
	No disease		1		1
	Root rot	- Rhizoctonia	1	0	1
COLUMBINE (Aquilegia)					
	Insect injury		1	0	1
	Stem rot	- Sclerotinia	1	0	1
COREOPSIS (Coreopsis)					
	Downy mildew	- Plasmopora	1	0	1
COSMOS (Cosmos)					
	Chemical injury	- herbicide	1	0	1
DAHLIA (Dahlia)					
	No disease		1		1
DAISY (Gerbera)					
	Insect injury		1	0	1
DAYLILY (Hemerocallis)					
	Anthracnose	- Colletotrichum	0	1	1
	Leaf streak	- Aureobasidium	6	0	6
	No disease		4		4
	Nutritional	- general	1	0	1
	Russet	- unknown	1	0	1
	Rust	- Puccinia	1	0	1
DELPHINIUM (Delphinium)					
	Inadequate specimen		1		1

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DIANTHUS (Dianthus)					
	Environmental	- wet feet	1	0	1
	Inadequate specimen		1		1
DIEFFENBACHIA (Dieffenbachia)					
	No disease		1		1
DIPLODINA (Diplodina)					
	Nutritional	- fertilizer burn	1	0	1
DRACAENA (Dracaena)					
	Bacterial crown rot	- Erwinia	1	0	1
DUSTY-MILLER (Centaurea)					
	No disease		1		1
	Southern blight	- Sclerotium	1	0	1
EUCALYPTUS (Eucalyptus)					
	Root rot	- Pythium	1	0	1
FERN (various)					
	Cultural	- over watering	1	0	1
	Environmental	- cold injury	1	0	1
	No disease		2		2
	Nutritional	- fertilizer burn	1	0	1
	Root rot	- Rhizoctonia	0	1	1
FIG (Ficus)					
	Insect injury		1	0	1
FOXGLOVE (Digitalis)					
	Downy mildew	- Peronospora	1	0	1
	No disease		1		1
GARDENIA (Gardenia)					
	Insect injury		1	0	1
GERANIUM (Pelargonium)					
	Bacterial spot	- bacterial	1	0	1
	Bacterial wilt	- Ralstonia	1	0	1
	Blight	- Botrytis	6	2	8
	Cultural stresses		6	1	7
	Environmental stresses		3	0	3
	Inadequate specimen, no disease		6		6
	Nutritional	- iron toxicity	2	0	2
		- general	1	3	4
	Oedema	- cultural	2	0	2
	Root rot	- Pythium	5	1	6
	Rust	- Puccinia	1	0	1
HEATHER (Cuphea)					
	Cultural	- over watering	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
HELICHRYSUM (Helichrysum)					
	Environmental	- wet feet	1	0	1
	Nutritional	- phosphorus deficiency	1	0	1
	Root rot	- Rhizoctonia	1	0	1
HOLLYHOCK (Althaea)					
	Rust	- Puccinia	3	0	3
HOSTA (Hosta)					
	Anthraxnose	- Colletotrichum	1	0	1
	Environmental stresses		2	0	2
	No disease		1		1
	Oedema	- cultural	1	0	1
	Root rot	- Rhizoctonia	1	0	1
	Virus	- Impatiens necrotic spot	1	0	1
HYPOTESSES (Hypoteses)					
	Nutritional	- fertilizer burn	1	0	1
IMPATIENS (Impatiens)					
	Blight	- Botrytis	1	1	2
	Chemical injury	- unknown	1	0	1
	Leaf spot	- Alternaria	1	0	1
	No disease		2		2
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Rhizoctonia	2	0	2
IRIS (Iris)					
	Environmental	- wet feet	1	0	1
	Inadequate specimen		1		1
	Leaf spot	- Heterobasidium	1	0	1
IVY (Hedera and others)					
	Bacterial spot	- Xanthomonas	2	0	2
	Environmental	- wet feet	1	0	1
	No disease		2		2
	Root/stem rot	- Rhizoctonia	1	1	2
JADE PLANT (Crassula)					
	Stem rot	- fungal	1	0	1
LANTANA (Lantana)					
	No disease		1		1
LARKSPUR (Delphinium)					
	Nutritional	- general	1	0	1
LILY (Lilium)					
	No disease		1		1
LIRIOPE (Liriope)					
	Cultural	- unknown	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
MANDEVILLA (Mandevilla)					
	Bacterial spot	- bacterial	1	0	1
	Insect injury		1	0	1
MELAMPODIUM (Melampodium)					
	Cultural	- over watering	1	0	1
MISCANTHUS (Miscanthus)					
	Leaf spot	- Leptosphaeria	2	0	2
MONKEY GRASS (Liriope)					
	Anthraxnose	- Colletotrichum	1	0	1
PACHYSANDRA (Pachysandra)					
	Leaf scald	- unknown	1	0	1
PANSY (Viola)					
	Black root rot	- Thielaviopsis	22	0	22
	Blight	- Botrytis	1	0	1
	Cultural	- over watering	1	0	1
	Environmental	- frost injury	1	0	1
	No disease		1		1
	Nutritional	- boron deficiency	1	0	1
		- iron deficiency	1	1	2
	Root rot	- Pythium	2	2	4
PENTAS (Pentas)					
	No disease		1		1
PEONY (Paeonia)					
	Blight	- Botrytis	2	0	2
	Leaf blotch	- Cladosporium	1	1	2
	Nutritional	- general	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

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
PETUNIA (Petunia)					
	Black root rot	- Thielaviopsis	2	0	2
	Blight	- Botrytis	0	1	1
	Chemical injury	- herbicide	1	0	1
	Cultural	- insufficient light	1	0	1
	Insect injury		1	0	1
	No disease		2		2
	Nutritional	- fertilizer burn	4	0	4
		- general	3	0	3
		- iron deficiency	2	0	2
		- pH high	1	1	2
	Powdery mildew	- Oidium	0	1	1
	Root rot	- Pythium	1	0	1
	Root/stem rot	- Rhizoctonia	2	0	2
PHLOX (Phlox)					
	Leaf spot	- Cercospora	1	0	1
	No disease		1		1
	Nutritional	- fertilizer burn	1	0	1
		- general	2	0	2
POINSETTIA (Euphorbia)					
	Chemical injury	- fungicide	1	0	1
	Cultural	- over watering	1	0	1
	No disease		2		2
	Root rot	- Pythium	1	0	1
		- Rhizoctonia	1	0	1
POPPY (Stylophorum)					
	Soft rot	- Erwinia	1	0	1
PORTULACA (Portulaca)					
	No disease		1		1
RUDBECKIA (Rudbeckia)					
	Inadequate specimen, no disease		5		5
	Insect injury		0	1	1
	Leaf spot	- Cercospora	1	0	1
		- Septoria	1	0	1
	Root/stem rot	- Rhizoctonia	6	0	6
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Sclerotinia	1	0	1
	Virus	- Tomato spotted wilt	1	0	1
SCHEFFLERA (Brassaia)					
	Cultural	- Oedema	1	0	1
	Insect injury		1	0	1
SCINDAPSIS (Scindapsus)					
	Inadequate specimen		1		1

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SEDUM (Sedum)					
	No disease		1		1
SNAPDRAGON (Antirrhinum)					
	Cultural	- over watering	1	0	1
	Root rot	- Pythium	1	1	2
	Root/Stem rot	- Rhizoctonia	1	0	1
SPATHIPHYLLUM (Spathiphyllum)					
	Bacterial spot	- Pseudomonas	1	0	1
SPILANTHES (Spilanthes)					
	Cultural	- over watering	1	0	1
SUNFLOWER (Helianthus)					
	Chemical injury	- growth regulator	1	0	1
SWEET POTATO (Ipomoea)					
	Chemical injury	- herbicide	1	0	1
	Cultural	- insufficient light	1	0	1
	Intumescence	- physiological	1	0	1
	Nutritional	- general	0	1	1
TULIP (Tulipa)					
	Chemical injury	- herbicide	1	0	1
	No disease		2		2
UNKNOWN					
	No disease		1		1
VERBENA (Verbena)					
	No disease		1		1
	Powdery mildew	- Oidium	1	0	1
VINCA (Vinca)					
	Aerial blight	- Phytophthora	2	0	2
	Black root rot	- Thielaviopsis	1	0	1
	Blight	- Botrytis	2	0	2
	Cultural	- over watering	0	1	1
	Environmental stresses		2	0	2
	Nutritional	- fertilizer burn	1	0	1
	Root rot	- Pythium	2	0	2
	Root/stem rot	- Rhizoctonia	1	1	2
	Stem canker	- Phoma	1	0	1
ZINNIA (Zinnia)					
	Flower blight	- Choanephora	1	0	1

TURFGRASS

BENTGRASS (Agrostis)

Anthracnose	- Colletotrichum	5	2	7
Basidiomycete	- unknown	1	0	1
Chemical injury	- growth regulator	2	0	2
Crown rot	- fungal	1	0	1
Dollar spot	- Sclerotinia	5	0	5
Environmental stresses		2	0	2
Leaf spot	- Rhizoctonia	1	0	1
No disease		21		21
Root disfunction	- Pythium	1	0	1
Root rot	- Pythium	8	0	8
Summer patch	- Magnaporthe	1	0	1
Yellow patch	- Rhizoctonia	2	0	2

BERMUDAGRASS (Cynodon)

No disease		3		3
Smut	- Ustilago	1	0	1
Spring dead spot	- Ophiosphaerella	2	0	2

BLUEGRASS (Poa)

Anthracnose	- Colletotrichum	0	1	1
Brown patch	- Rhizoctonia	1	1	2
Leaf spot	- Drechslera	1	0	1
Necrotic ring spot	- Leptosphaeria	2	0	2
No disease		6		6
Red thread	- Laetisaria	1	0	1
Root rot	- unknown	1	0	1
Rust	- Puccinia	3	0	3
Summer patch	- Magnaporthe	3	0	3

FESCUE (Festuca)

Algae	- Gleocapsa	1	0	1
Anthracnose	- Colletotrichum	2	0	2
Brown patch	- Rhizoctonia	10	0	10
Chemical injury	- unknown	1	0	1
Cultural	- heavy thatch	1	0	1
	- poor establishment	1	0	1
Environmental	- localized dry spot	0	1	1
	- stress	0	1	1
Fairy ring	- Basidiomycete	1	0	1
Gray leaf spot	- Pyricularia	1	0	1
No disease		11		11
Nutritional	- nitrogen deficiency	1	0	1
Rust	- Puccinia	1	0	1

RYEGRASS (Lolium)

Brown patch	- Rhizoctonia	2	0	2
Gray leaf spot	- Pyricularia	1	0	1
No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
TURF (unspecified)					
	Brown patch	- Rhizoctonia	1	0	1
	Chemical injury	- herbicide	1	0	1
	Crown rot	- bacterial	1	0	1
	Environmental	- localized dry spot	1	0	1
		- wet feet	1	0	1
	No disease		18		18
	Necrotic ringspot	- Ophiobolus	1	0	1
	Red thread	- Laetisaria	1	0	1
	Root rot	- Pythium	2	0	2
	Rust	- Puccinia	1	0	1
	Summer patch	- Magnaporthe	1	0	1
	Take-all	- Gaeumannomyces	1	0	1
	Yellow patch	- Rhizoctonia	1	0	1
ZOYSIA (Zoysia)					
	Brown patch	- Rhizoctonia	1	0	1
	No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
<u>WOODY ORNAMENTALS</u>					
ARBORVITAE (Thuja)					
	Cultural	- transplant shock	4	1	5
	Environmental stresses		3	1	4
	Insect injury		5	2	7
	No disease		9		9
ASH (Fraxinus)					
	Anthracnose	- Apiognomonia	4	0	4
	Canker	- Botryosphaeria	1	0	1
		- Fusicoccum	0	1	1
		- Phytophthora	1	1	2
	Chemical injury	- herbicide	4	0	4
	Cultural	- storage conditions	1	0	1
	Environmental	- drought	1	0	1
	Insect injury		2	2	4
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- fungal	2	0	2
		- unknown	1	0	1
	No disease		3		3
	Wood decay	- unknown	1	0	1
ASPEN (Populus)					
	Sooty mold	- species	1	0	1
AZALEA - See listing under RHODODENDRON					
BALDCYPRESS (Taxodium)					
	Insect injury		1	0	1
	No disease		1		1
BAMBOO (Bambusa)					
	No disease		1		1
BARBERRY (Berberis)					
	Cultural	- transplant shock	2	0	2
BAYBERRY (Myrica)					
	No disease		1		1
BEECH (Fagus)					
	Anthracnose	- Discula	1	0	1
	No disease		1		1
	Physical injury	- deer	1	0	1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
BIRCH (Betula)					
	Cultural	- transplant shock	1	0	1
	Insect injury		3	0	3
	Leaf spot	- Phyllosticta	0	1	1
		- Septoria	2	0	2
	No disease		4		4
BITTERSWEET (Celatrus)					
	Canker	- Botryosphaeria	1	0	1
	Insect injury		1	0	1
BOXELDER (Acer)					
	Cultural	- transplant shock	1	0	1
	Leaf scorch	- unknown	1	0	1
BOXWOOD (Buxus)					
	Environmental stresses		5	0	5
	Insect injury		1	0	1
	No disease		3		3
	Nutritional	- potassium deficiency	1	0	1
	Root rot	- Rhizoctonia	1	0	1
BREYNIA (Breynia)					
	Twig canker	- Colletotrichum	1	0	1
BUDDLEIA (Buddleia)					
	Cultural	- over watering	1	0	1
CHERRY (Prunus)					
	Chemical injury	- herbicide	1	0	1
	Cultural	- over watering	1	0	1
		- transplant shock	3	0	3
	Dieback	- unknown	3	0	3
	Environmental stresses		4	2	6
	Insect injury		0	1	1
	Leaf spot	- Cercospora	1	0	1
		- Coccoomyces	2	0	2
	No disease		11		11
	Physical injury	- unknown	1	0	1
	Powdery mildew	- Oidium	1	0	1
CHERRYLAUREL (Prunus)					
	Insect injury		1	0	1
	No disease		2		2
	Shot hole	- fungal	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 (Castanea)					
	Chemical injury	- unknown	1	0	1
	Cultural	- insufficient water	1	0	1
	Environmental	- wet feet	0	1	1
	Frogeye	- Botryosphaeria	0	1	1
	No disease		5		5
	Root rot	- Phytophthora	13	0	13
		- Pythium	1	0	1
CHOKEBERRY (Aronia)					
	Cultural	- transplant shock	1	0	1
CLEMATIS (Clematis)					
	Inadequate specimen, no disease		4		4
CLEYERA (Cleyera)					
	Environmental	- winter injury	1	0	1
CRABAPPLE (Malus)					
	Canker	- Botryosphaeria	1	0	1
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	1	0	1
	Environmental stresses		2	0	2
	Fire blight	- Erwinia	0	1	1
	Frogeye	- Botryosphaeria	1	0	1
	Insect injury		2	0	2
	No disease		5		5
	Scab	- Venturia	4	0	4
	Wood decay	- Basidiomycete	1	0	1
CRAPEMYRTLE (Lagerstroemia)					
	No disease		1		1
	Powdery mildew	- Oidium	3	0	3
CYPRESS (Cupressocyparis)					
	Environmental	- cold injury	1	0	1
	Insect injury		2	1	3
	Leaf scorch	- environmental	1	0	1
	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>
DOGWOOD (Cornus)					
	Anthraxnose	- Discula	4	0	4
	Canker	- Botryosphaeria	2	0	2
	Chemical injury	- growth regulator	2	0	2
	Cultural	- transplant shock	7	1	8
		- unknown	1	0	1
	Decline	- unknown	4	0	4
	Environmental stresses		7	1	8
	Inadequate specimen, no disease		8		8
	Insect injury		0	1	1
	Leaf scorch	- environmental	1	0	1
		- unknown	1	0	1
	Leaf spot	- Septoria	5	0	5
	Nutritional	- general	1	0	1
	Powdery mildew	- Oidium	15	0	15
	Root rot	- Pythium	1	0	1
	Sooty mold	- species	0	1	1
	Spot anthracnose	- Elsinoe	1	0	1
ELM (Ulmus)					
	Black spot	- Stegophora	0	3	3
	Canker	- Botryosphaeria	2	0	2
	Cultural	- transplant shock	1	0	1
	Dieback	- unknown	1	0	1
	Insect injury		2	0	2
	Leaf spot	- fungal	1	0	1
	No disease		4		4
EUONYMUS (Euonymus)					
	Black root rot	- Thielaviopsis	1	0	1
	Crown gall	- Agrobacterium	2	1	3
	Cultural	- transplant shock	1	0	1
	Inadequate specimen, no disease		4		4
	Insect injury		18	0	18
	Powdery mildew	- Microsphaera	1	0	1
FIR (Abies)					
	Cultural	- transplant shock	1	0	1
	No disease		3		3
FORSYTHIA (Forsythia)					
	Canker	- Botryosphaeria	1	0	1
	Environmental stresses		2	0	2
	Gall	- Phomopsis	1	0	1
	No disease		2		2
	Twig blight	- Sclerotinia	2	0	2
FOTHERGILLA (Fothergilla)					
	Cultural	- transplant shock	1	0	1
	No disease		1		1

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GINGKO (Ginkgo)					
	Environmental	- drought	1	0	1
	No disease		2		2
GOLDENRAINTREE (Koelreuteria)					
	Inadequate specimen, no disease		3		3
HACKBERRY (Celtis)					
	Chemical injury	- herbicide	1	0	1
HAWTHORN (Crataegus)					
	Cedar-quince rust	- Gymnosporangium	5	0	5
	Environmental	- drought	1	0	1
	Leaf spot	- Entomosporium	1	0	1
	No disease		2		2
HAZELNUT (Corylus)					
	No disease		1		1
HEMLOCK (Tsuga)					
	Cultural	- transplant shock	1	0	1
	Decline	- environmental	2	0	2
	No disease		3		3
HIBISCUS (Hibiscus)					
	Bulls eye spot	- Cristulariella	1	0	1
	Inadequate specimen, no disease		5		5
	Insect injury		1	0	1
	Sooty mold	- species	1	0	1
HICKORY (Carya)					
	Basidiomycete	- species	1	0	1
	Lichen	- species	1	0	1
	No disease		2		2
HOLLY and INKBERRY (Ilex)					
	Bacterial blight	- Corynebacterium	1	0	1
	Black root rot	- Thielaviopsis	13	1	14
	Chemical injury	- herbicide	1	0	1
	Cultural	- transplant shock	4	1	5
	Decline	- unknown	2	0	2
	Environmental stresses		5	0	5
	Insect injury		1	0	1
	Leaf drop	- normal	0	1	1
	Leaf spot	- fungal	3	0	3
	No disease		20		20
	Nutritional	- general	1	0	1
		- iron deficiency	1	0	1
	Physical injury	- girdling	1	0	1
	Root rot	- Rhizoctonia	1	0	1
	Sooty mold	- species	0	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
HONEYLOCUST (Gleditsia)					
	Leaf spot	- Cercospora	1	0	1
	No disease		2		2
HONEYSUCKLE (Lonicera)					
	No disease		1		1
HYDRANGEA (Hydrangea)					
	Chemical injury	- growth regulator	1	0	1
	Environmental	- drought	1	0	1
	Insect injury		2	0	2
	Leaf spot	- bacterial	1	0	1
		- fungal	1	0	1
		- Phyllosticta	1	0	1
	No disease		1		1
	Nutritional	- pH high	1	0	1
	Root rot	- Phytophthora	1	0	1
JUNIPER and RED CEDAR (Juniperus)					
	Cedar/Apple rust	- Gymnosporangium	4	0	4
	Cultural	- over watering	2	0	2
		- transplant shock	1	0	1
	Environmental stresses		2	0	2
	Insect injury		2	0	2
	No disease		10		10
	Twig blight	- Phomopsis	3	1	4
	Wood decay	- Heterobasidium	1	0	1
KATSURA (Katsura)					
	No disease		2		2
KERRIA (Kerria)					
	Leaf blight	- Coccoomyces	1	0	1
KENTUCKY COFFEETREE (Gymnocladus)					
	No disease		1		1
	Root rot	- Ganoderma	1	0	1
LARCH (Larix)					
	Insect injury		1	0	1
LILAC (Syringa)					
	Environmental stresses		3	0	3
	Inadequate specimen, no disease		6		6
	Insect injury		1	0	1
	Leaf scorch	- unknown	1	0	1
	Wilt	- Verticillium	1	0	1
LINDEN (Tilia)					
	Cultural	- transplant shock	1	0	1
	Insect injury		1	0	1

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MAGNOLIA (Magnolia)					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	2	0	2
	Environmental stresses		8	0	8
	Insect injury		5	0	5
	Leaf spot	- fungal	0	1	1
	No disease		10		10
	Powdery mildew	- species	1	0	1
	Sooty mold	- species	1	1	2
	Wilt	- Verticillium	1	0	1
MAPLE (Acer)					
	Anthracnose	- Discula	4	0	4
		- Kabatiella	5	0	5
	Bacterial blight	- Pseudomonas	1	0	1
	Bacterial scorch	- Xylella	2	0	2
	Bulls eye spot	- Cristulariella	8	0	8
	Canker	- Fusarium	2	0	2
		- Hypoxylon	2	0	2
	Chemical injury	- growth regulator	4	0	4
		- herbicide	3	0	3
		- unknown	1	0	1
	Cultural	- transplant shock	8	0	8
	Decline	- unknown	5	0	5
	Environmental stresses		14	0	14
	Inadequate specimen, no disease		36		36
	Insect injury		11	1	12
	Leaf scorch	- unknown	1	1	2
	Leaf spot	- Cercospora	0	1	1
		- Phyllosticta	1	2	3
	Nutritional	- iron deficiency	1	0	1
		- manganese deficiency	1	0	1
	Physical injury	- topping	1	0	1
		- unknown	1	0	1
	Wilt	- Verticillium	8	0	8
MIMOSA (Albizzia)					
	Insect injury		2	0	2
MOUNTAIN ASH (Sorbus)					
	No disease		1		1
MOUNTAIN LAUREL (Kalmia)					
	Insect injury		1	0	1
MULBERRY (Morus)					
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- Cercospora	2	0	2
		- Cylindrosporium	1	0	1
		- Phloeospora	0	1	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
NANDINA (Nandina)					
	Environmental	- winter drying	1	0	1
OAK (Quercus)					
	Anthraxnose	- Apiognomonia	5	0	5
	Bacterial scorch	- Xylella	10	0	10
	Chemical injury	- growth regulator	3	0	3
		- unknown	1	0	1
	Cultural	- transplant shock	2	0	2
	Decline	- unknown	3	1	4
	Environmental stresses		5	0	5
	Insect injury		53	11	64
	Leaf scorch	- environmental	1	0	1
		- unknown	1	0	1
	Leaf spot	- Marssonina	2	0	2
		- physiological	1	0	1
		- Tubakia	9	4	13
		- unknown	1	1	2
	Lichen	- species	0	1	1
	No disease		12		12
	Nutritional	- iron deficiency	3	2	5
	Physical injury	- animal	1	0	1
		- unknown	1	0	1
	Powdery mildew	- Phyllactinia	1	0	1
		- species	1	1	2
	Rust	- Cronartium	1	0	1
	Wet wood	- bacterial	1	0	1
PAULOWNIA (Paulownia)					
	Leaf spot	- Phyllosticta	1	0	1
PAWPAW (Asimina)					
	No disease		1		1
PEACH (Prunus)					
	Leaf curl	- Taphrina	1	0	1
PEAR (Pyrus)					
	Chemical injury	- growth regulator	2	0	2
		- herbicide	1	0	1
		- unknown	1	0	1
	Cultural	- transplant shock	5	0	5
	Decline	- unknown	3	0	3
	Environmental stresses		7	0	7
	Fire blight	- Erwinia	3	1	4
	Insect injury		3	1	4
	Leaf spot	- Phyllosticta	2	1	3
	No disease		23		23

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
PECAN (Carya)					
	Insect injury		2	0	2
	No disease		1		1
PERSIMMON (Diospyros)					
	No disease		1		1
PHILADELPHUS (Philadelphus)					
	Bacterial spot	- Pseudomonas	1	0	1
PHOTINIA (Photinia)					
	Environmental	- frost injury	1	0	1
	Leaf spot	- Entomosporium	5	0	5
		- fungal	1	0	1
PIERIS (Pieris)					
	Cultural	- over watering	1	0	1
		- transplant shock	1	0	1
PINE (Pinus)					
	Brown spot	- Mycosphaerella	1	0	1
	Cultural	- deep planting	0	1	1
		- transplant shock	4	0	4
	Decline	- unknown	1	0	1
	Environmental stresses		8	0	8
	Inadequate specimen, no disease		22		22
	Insect injury		3	4	7
	Needle bend	- environmental	1	0	1
	Needle blight	- Dothistroma	1	0	1
	Needle drop	- normal	7	0	7
	Needle rust	- Coleosporium	2	0	2
	Pinewood nematode	- Bursaphelencus	1	0	1
	Root rot	- Phytophthora	2	0	2
	Sooty mold	- species	1	1	2
	Tip blight	- Sphaeropsis	12	0	12
	Tip burn	- environmental	1	0	1
		- unknown	1	1	2
	White pine decline	- environmental	22	0	22
PLUM (Prunus)					
	Black knot	- Apiosporina	3	0	3
	Chemical injury	- unknown	1	0	1
	Environmental	- cold injury	2	0	2
POPLAR (Populus)					
	Wet wood	- bacterial	1	0	1
PRIVET (Ligustrum)					
	Environmental	- frost injury	1	0	1
	Insect injury		1	0	1
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
PYRACANTHA (Pyracantha)					
	Scab	- Venturia	1	0	1
QUINCE (Chaenomeles)					
	Insect injury		1	0	1
REDBUD (Cercis)					
	Anthraxnose	- Kabatiella	2	0	2
	Cultural	- storage	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	No disease		5		5
REDWOOD (Sequoia)					
	Insect injury		1	0	1
	No disease		1		1
RHODODENDRON and AZALEA (Rhododendron)					
	Cultural	- transplant shock	2	0	2
	Dieback	- Botryosphaeria	2	0	2
	Environmental stresses		7	3	10
	Insect injury		9	0	9
	Leaf/flower gall	- Exobasidium	2	0	2
	Leaf scorch	- unknown	1	0	1
	Leaf spot	- Pestalotia	2	1	3
	No disease		4		4
	Nutritional	- fertilizer burn	1	0	1
		- iron deficiency	1	1	2
	Root rot	- Phytophthora	1	0	1
ROSE (Rosa)					
	Black spot	- Diplocarpon	5	1	6
	Blight	- Botrytis	1	0	1
	Canker	- fungal	1	0	1
	Chemical injury	- unknown	2	0	2
	Crown gall	- Agrobacterium	1	0	1
	Cultural	- transplant shock	0	1	1
	Environmental stresses		1	1	2
	Insect injury		8	1	9
	No disease		4		4
	Nutritional	- soluble salts	1	0	1
	Powdery mildew	- Oidium	1	0	1
	Senescence	- normal	1	0	1
	Virus	- Rose rosette	5	0	5
		- unknown	1	0	1
SAMBUCUS (Sambucus)					
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
SASSAFRAS (Sassafras)					
	No disease		1		1
SERVICEBERRY (Amelanchier)					
	Cedar/Quince rust	- Gymnosporangium	1	0	1
	Chemical injury	- herbicide	2	0	2
	Environmental	- drought	1	0	1
	No disease		4		4
SPRUCE (Picea)					
	Brown felt blight	- Septobasidium	1	0	1
	Canker	- Leucostoma	3	0	3
	Cultural	- transplant shock	6	1	7
	Decline	- unknown	1	0	1
	Environmental stresses		6	1	7
	Inadequate specimen, no disease		18		18
	Insect injury		10	2	12
	Needle cast	- Rhizosphaera	10	1	11
	Needle drop	- normal	4	0	4
	Needle yellowing	- unknown	1	0	1
	Nutritional	- magnesium deficiency	1	0	1
	Physical injury	- unknown	1	0	1
STEWARTIA (Stewartia)					
	No disease		1		1
SWEETGUM (Liquidambar)					
	Chemical injury	- growth regulator	1	0	1
	Leaf scorch	- environmental	1	0	1
	Leaf spot	- fungal	2	0	2
SWEETSHRUB (Calycanthus)					
	Bulls eye spot	- Cristulariella	1	0	1
SYCAMORE and PLANETREE (Platanus)					
	Decline	- unknown	1	0	1
	Leaf spot	- Septoria	2	0	2
	No disease		1		1
	Powdery mildew	- Microsphaera	1	0	1
TAXUS (Taxus)					
	Chemical injury	- growth regulator	1	0	1
	Cultural	- transplant shock	1	0	1
	Dieback	- unknown	2	0	2
	Environmental stresses		7	1	8
	Insect injury		1	0	1
	No disease		15		15
	Root rot	- Phytophthora	1	0	1
	Tip dieback	- unknown	1	0	1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
TULIPTREE (Liriodendron)					
	Environmental stresses		6	0	6
	Inadequate specimen, no disease		2		2
	Insect injury		7	1	8
	Powdery mildew	- Oidium	1	1	2
	Sooty mold	- species	3	2	5
UNKNOWN					
	Inadequate specimen, no disease		2		2
VIBURNUM (Viburnum)					
	Blight	- Botrytis	1	0	1
	Insect injury		11	2	13
	Leaf spot	- Septoria	1	0	1
	No disease		2		2
	Physical injury	- unknown	1	0	1
	Root rot	- Phytophthora	1	0	1
	Wilt	- Verticillium	1	0	1
WALNUT (Juglans)					
	Bulls eye spot	- Cristulariella	1	0	1
	Environmental	- stress	1	0	1
	Insect injury		1	0	1
	Leaf spot	- Cercospora	1	0	1
	Root rot	- Phytophthora	1	0	1
WILLOW (Salix)					
	Black canker	- Glomerella	1	0	1
	Canker	- Cytospora	2	1	3
	Chemical injury	- herbicide	1	0	1
	Environmental stresses		2	1	3
	Inadequate specimen, no disease		3		3
	Insect injury		1	0	1
	Leaf spot	- Cercospora	2	0	2
	Physical injury	- unknown	1	0	1
WISTERIA (Wisteria)					
	Nutritional	- general	1	0	1
WITCH-HAZEL (Hamamelis)					
	Insect injury		1	0	1
	Leaf spot	- Phyllosticta	1	0	1
YELLOWWOOD (Cladrastis)					
	Leaf blight	- Cryptodiaporthe	1	0	1
	No disease		1		1
ZELKOVA (Zelkova)					
	No disease		1		1

CROP	DIAGNOSIS	CAUSAL AGENT	#1° DIAGs	#2° DIAGs	TOTAL
VEGETABLES					
ASPARAGUS (Asparagus)					
	Cultural	- shallow planting	1	0	1
	Leaf spot	- Cercospora	1	0	1
	No disease		1		1
	Nutritional	- general	1	0	1
	Physical injury	- rodent	1	0	1
	Stem canker	- Phoma	0	1	1
BEAN (Phaseolus)					
	Angular leaf spot	- Isariopsis	1	0	1
	Anthrachnose	- Colletotrichum	3	0	3
	Chemical injury	- growth regulator	1	1	2
	Environmental stresses		5	1	6
	Insect injury		1	0	1
	Leaf scorch	- unknown	2	0	2
	No disease		3		3
	Nutritional	- nitrogen deficiency	1	0	1
		- pH low	1	0	1
	Root/stem rot	- Fusarium	1	0	1
		- Rhizoctonia	6	1	7
	Rust	- Uromyces	2	0	2
BEET (Beta)					
	Root problem	- unknown	1	0	1
BROCCOLI - See listing under CRUCIFERS					
CABBAGE - See listing under CRUCIFERS					
CANTALOUPE - See listing under CUCURBITS					
CORN, SWEET (Zea)					
	Bacterial stalk rot	- Erwinia	1	0	1
	Holcus spot	- Pseudomonas	1	0	1
	Inadequate specimen		1		1
	Insect injury		1	0	1
	Nutritional	- fertilizer burn	1	0	1
		- zinc deficiency	3	0	3
	Smut	- Ustilago	2	0	2
CRUCIFERS - BROCCOLI, CABBAGE, TURNIP (Brassica) and RADISH (Raphanus)					
	Damping-off	- Rhizoctonia	1	0	1
	Environmental stresses		2	0	2
	Inadequate specimen, no disease		7		7
	Insect injury		5	0	5
	Root/stem rot	- Rhizoctonia	1	0	1
CUCUMBER - See listing under CUCURBITS					

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
CUCURBITS - CANTALOUPE, CUCUMBER, MELON (Cucumis), PUMPKIN, SQUASH, GOURD (Cucurbita) and WATERMELON (Citrulus)					
	Anthracnose	- Colletotrichum	4	0	4
	Bacterial leaf spot	- Xanthomonas	1	0	1
	Bacterial wilt	- Erwinia	4	0	4
	Blight	- Microdochium	1	0	1
	Chemical injury	- growth regulator	1	0	1
		- herbicide	3	1	4
		- unknown	1	0	1
	Environmental stresses		3	1	4
	Fruit blight	- Phytophthora	1	0	1
	Gummy stem blight	- Didymella	4	0	4
	Inadequate specimen, no disease		40		40
	Insect injury		5	3	8
	Leaf scorch	- unknown	2	0	2
	Leaf spot	- Cercospora	1	1	2
		- physiological	1	0	1
	Nubbins	- pollination problem	2	0	2
	Nutritional	- general	2	1	3
		- magnesium deficiency	1	1	2
		- manganese toxicity	1	0	1
		- soluble salts	1	0	1
		- unknown	1	0	1
	Physiological	- unknown	1	0	1
	Powdery mildew	- Oidium	4	0	4
		- Sphaerotheca	2	0	2
	Root rot	- Pythium	4	1	5
	Stem rot	- Fusarium	1	0	1
	Virus	- complex	0	1	1
		- squash mosaic	0	1	1
		- watermelon mosaic II	1	0	1
EGGPLANT (Solanum)					
	Physical injury	- unknown	1	0	1
	Wilt	- Verticillium	1	0	1
GOURD - See listing under CUCURBITS					
LETTUCE (Lactuca)					
	Blight	- Botrytis	1	0	1
	Environmental	- high temperature	1	0	1
	No disease		1		1
MELON, honeydew - See listing under CUCURBITS					
ONION (Allium)					
	Damping-off	- Rhizoctonia	1	0	1
	Environmental	- wet feet	1	0	1
	Insect injury		1	0	1
	No disease		1		1

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
PEPPER (Capsicum)					
	Bacterial canker	- Clavibacter	1	0	1
	Bacterial spot	- Xanthomonas	3	0	3
	Blossom end rot	- calcium deficiency/dry	3	0	3
	Chemical injury	- herbicide	4	0	4
	Environmental stresses		7	0	7
	Insect injury		1	0	1
	No disease		7		7
	Nutritional	- nitrogen deficiency	2	0	2
	Physical injury	- wind	2	0	2
	Root rot	- Pythium	2	0	2
	Root/stem rot	- Rhizoctonia	2	1	3
	Stem blight	- Phytophthora	1	0	1
POTATO (Solanum)					
	Black leg	- Erwinia	4	0	4
	Chemical injury	- herbicide	1	0	1
	Early blight	- Alternaria	0	1	1
	Environmental	- wet feet	1	0	1
	Hollow heart	- environmental	1	0	1
	Inadequate specimen, no disease		2		2
	Insect injury		1	0	1
	Root knot nematode	- Meloidogyne	2	0	2
	Scurf	- Monilochaetes	1	0	1
PUMPKIN - See listing under CUCURBITS					
RADISH - See listing under CRUCIFERS					
RHUBARB (Rheum)					
	No disease		2		2
SPINACH (Spinacea)					
	Inadequate specimen		1		1
	Root rot	- Pythium	1	0	1
SQUASH - See listing under CUCURBITS					

<i>CROP</i>	<i>DIAGNOSIS</i>	<i>CAUSAL AGENT</i>	<i>#1° DIAGs</i>	<i>#2° DIAGs</i>	<i>TOTAL</i>
TOMATO (Lycopersicon)					
	Air pollution	- Ethylene	1	0	1
	Bacterial canker	- Clavibacter	5	0	5
	Bacterial speck	- Pseudomonas	2	0	2
	Bacterial spot	- Xanthomonas	4	0	4
	Blossom drop	- unknown	1	0	1
	Blossom end rot	- calcium deficiency/dry	6	0	6
	Catfacing	- environmental	1	0	1
	Chemical injury	- fungicide	1	0	1
		- growth regulator	10	1	11
		- herbicide	11	1	12
		- unknown	1	0	1
	Early blight	- Alternaria	11	6	17
	Environmental stresses		8	1	9
	Fruit decay	- Botrytis	1	0	1
		- Fusarium	0	1	1
	Gray mold	- Botrytis	0	1	1
	Inadequate specimen, no disease		29		29
	Insect injury		4	4	8
	Leaf curl	- physiological	1	0	1
	Leaf mold	- Fulvia	4	1	5
	Leaf roll	- physiological	2	0	2
	Leaf spot	- Septoria	15	1	16
	Nutritional	- fertilizer burn	2	0	2
		- general	4	0	4
		- magnesium deficiency	2	0	2
		- nitrogen deficiency	1	0	1
		- phosphorus deficiency	1	1	2
		- potassium deficiency	1	1	2
		- soluble salts	1	0	1
		- unknown	1	0	1
	Physical injury	- wind	1	0	1
		- unknown	1	0	1
	Root knot nematode	- Meloidogyne	2	0	2
	Root rot	- Pythium	4	0	4
	Southern blight	- Sclerotium	1	0	1
	Stem rot	- Sclerotinia	1	1	2
	Wilt	- Fusarium	4	0	4
		- unknown	1	0	1
	Yellow shoulder	- unknown	5	0	5

TURNIP - See listing under CRUCIFERS

WATERMELON - See listing under CUCURBITS

TOTALS **3278** **348** **3626**