A Compilation of Plant Diseases and Disorders in Indiana - 1981

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Introduction

The Plant Diagnostic Clinic in the Department of Botany and Plant Pathology at Purdue University is a service of the Cooperative Extension Service, Purdue Agricultural Experiment Station. The clinic provides a free service for accurate identification of weeds, plant diseases, and plant disorders for farmers, commercial growers, homeowners, and other interested persons. Control measures for the diagnosed problems are also offered.

This paper is a compilation of the plant disease and disorder specimens received in the Purdue Plant Diagnostic Clinic from January 1 through October 30, 1981. Such a compilation is an invaluable tool to identify problem areas in which extension personnel need to concentrate. Ultimately, comparisons of yearly disease/disorder compilations will give additional insight to plant disease epidemiological studies in Indiana.

Methods

Plant specimens are received in the Plant Diagnostic Clinic from county extension agents, homeowners, growers, nursery operators, consultants, and others. Specimens are diagnosed visually or by culturing the pathogen on selected media. Once diagnosed, appropriate control measures are suggested for each sample submitted. A computerized log system is utilized to summarize data, to provide an information base for epidemiological studies, and to provide readily accessible reference material on samples submitted. A breakdown of the specimens by crop, handled from January 1 through October 30, 1981 is given in Table 1.

Results

Weather and site related problems were commonplace in Indiana during the 1981 growing season. Intermittent, yet frequent, rainfall throughout the growing season resulted in an increase in foliar and fruit diseases throughout the growing season. Tables 2-8 show the host plant, the disease or disorder diagnosed, the pathogen or cause of disorder, and the number of samples received.

Shade and Ornamental Trees

Disease: Sycamore anthraconse was exceptionally severe throughout Indiana. The disease occurred in all phases, i.e. leaf, twig, stem, and bud blight. Many sycamores were heavily defoliated and developed extensive twig and branch cankers. The disease was most noticeable in late spring (May-June); however, as the season progressed and new growth emerged, anthracnose was less evident. Anthracnose on oak, maple, and ash were common but less severe than sycamore anthracnose (Table 2).

Wet weather, which started at bud break and continued throughout the spring and summer, contributed significantly to the widespread outbreak of anthracnose and many other fungal leaf diseases: examples include scab on crabapple, which caused extensive mid-summer defoliation; *Diplodia* tip blight, which caused lower branch death on many landscape pines; tar spot of maple; and *Botrytis* blight

TABLE 1. *Plant Samples received in the Purdue Plant Diagnostic Clinic Jan. 1 through Oct. 30, 1981.*

Plant Specimen	Number of Samples	Disease[1]	Disorder[2]	Chemical[3]	Nutritional[4]
AGRONOMIC (19%)					
Corn	118	55	32	13	9
Soybeans	67	36	18	6	6
Small Grain	77	59	10	4	4
Forage Grasses and Legumes	52	37	24	2	9
ORNAMENTAL (36%)					
Trees-Shade and Ornamental	406	149	201	7	9
Shrubs and Groundcover	100	36	52	7	1
Flowers	47	29	11	2	2
House plants	41	11	17	1	3
FRUIT (11%)					
Tree Fruit	108	55	42	4	0
Small Fruit	62	37	18	5	0
VEGETABLE (12%)	193	80	50	32	14
TURFGRASS (3%)	50	26	27	0	0
PLANT IDENTIFICATION '12%)	199	–	–	–	–
FORWARDED TO ENTOMOLOGY (7%)	115	–	–	–	–
Total	1635	610	502	83	57

[1]Problem caused by an infectious disease causing agent, e.g. fungus, bacterium, virus, mycoplasma, nematode.
[2]Problem caused by noninfectious environmental stress, e.g. wind, drought, heat, soil compaction.
[3]Problem caused by herbicide/pesticide misuse.
[4]Problem caused by fertilizer misuse.

TABLE 2. *Shade and Ornamental Trees—Diseases and Disorders*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Abies (FIR)		
Miscellaneous Disorders		
Needle Tip Burn	Stress factor(s)	4
Needle Yellowing/Drop	Normal needle drop	1
Acer (MAPLE)		
Anthracnose	*Gloeosporium apocryptum*	10
Leaf Spot	*Phyllosticta* sp.	1
Canker	*Nectria* sp.	1
Tar Spot	*Rhytisma acerinum*	1
Canker	*Strumella* sp.	1
Powdery Mildew	*Uncinula circinata*	1
Miscellaneous Disorders		
Scorch	Stress factor(s)	25
Leaf Spot	Physiological	3
Decline	Stress factor(s)	23
Herbicide Injury	Spray drift	4
Sooty Mold	Insect honeydew secretions	3
Dieback	Transplant shock	1
Canker	Hail	1
Leaf mottle	Genetic	1

TABLE 2. — Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Betula (BIRCH)		
Leaf Spot	*Phyllosticta betulina*	1
Miscellaneous Disorders		
Scorch	Heat, wind, and drought	2
Chlorosis	Stress factor(s)	2
Leaf Spot	Nutrient imbalance	1
Carya (HICKORY)		
Downy Spot	*Microstroma juglandis*	4
Anthracnose	*Gnomonia caryae*	1
Leaf Spot	*Phyllosticta caryae*	1
Miscellaneous Disorder		
Canker	Stress factor(s)	1
Carya illinoensis (PECAN)		
Miscellaneous Disorder		
Poor Seed Development	Improper pollination	1
Castanea (CHESTNUT)		
Wood Rotter	*Polyporus cinnabarinis*	1
Catalpa (CATALPA)		
Miscellaneous Disorder		
Leaf Scorch	Stress factor(s)	1
Cercis (RED BUD)		
Canker	*Botryosphaeria* sp.	1
Miscellaneous Disorders		
Leaf Scorch	Heat, wind, drought	4
Bark Shedding	Natural	1
Leaf Spot	Stress factor(s)	2
Sooty mold	Insect honeydew secretions	1
Cornus (DOGWOOD)		
Canker	*Botryosphaeria* sp.	2
Miscellaneous Disorders		
Winter damage	Desiccation	1
Chlorosis	Stress factor(s)	2
Leaf Scorch	Heat, wind, drought	2
Crataegus (HAWTHORN)		
Leaf Spot	*Fabraea maculata*	1
Cedar-Hawthorn Rust	*Gymnosporangium globosum*	1
Elaeagnus (RUSSIAN OLIVE)		
Canker	*Fusicoccum elaeagni*	2
Fagus (BEECH)		
Miscellaneous Disorders		
Dieback	Stress factor(s)	1
Decline	Stress factor(s)	1
Fraxinus (ASH)		
Anthracnose	*Gloeosporium aridum*	8
Rust	*Puccinia sparganoides*	1
Miscellaneous Disorders		
Leaf Drop	Stress factor(s)	1
Leaf Scorch	Heat, wind, drought	1
Ginkgo (GINKGO)		
Miscellaneous Disorder		
Scorch	Heat, wind, drought	1
Gleditsia (HONEY LOCUST)		
Fireblight	*Erwinia amylovora*	1
Miscellaneous Disorder		
Scorch	Improper root establishment	1

TABLE 2.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Juniperus virginiana (RED CEDAR)		
Twig Blight	*Phomopsis juniperovora*	2
Cedar-apple Rust	*Gymnosporangium juniperi-virginianae*	1
Larix (LARCH)		
Miscellaneous Disorder		
Scorch	Improper root establishment	1
Liquidambar (SWEET GUM)		
Leaf Spot	*Cladosporium* sp.	1
Miscellaneous Disorder		
Scorch	Stress factor(s)	3
Liriodendron (TULIP TREE)		
Powdery Mildew	*Erysiphe polygoni*	1
Miscellaneous Disorders		
Leaf Yellowing/Spotting	Natural stress	7
Scorch	Heat, wind, drought	1
Herbicide injury	Spray drift	1
Sooty mold	Insect honeydew secretions	1
Decline	Stress factor(s)	1
Magnolia (MAGNOLIA)		
Leaf Spot	*Phyllosticta* sp.	1
Miscellaneous Disorders		
Dieback	Stress factor(s)	1
Scorch	Heat, wind	1
Malus (CRABAPPLE)		
Scab	*Venturia inaequalis*	4
Canker	*Botryosphaeria* sp.	1
Cedar-Apple Rust	*Gymnosporangium juniperi-virginianae*	1
Miscellaneous Disorder		
Scorch	Stress factor(s)	1
Morus (MULBERRY)		
Leaf Spot	*Mycosphaerella mori*	1
Miscellaneous Disorder		
Scorch/Leaf Drop	Stress factor(s)	1
Picea (SPRUCE)		
Canker	*Cytospora kunzei*	6
Needlecast	*Rhizosphaera kalkoffii*	2
Miscellaneous Disorders		
Dieback	Stress factor(s)	18
No growth	Transplant shock	1
Needle Tip Burn	Poor root establishment	3
Chlorosis	Stress factor(s)	2
Pinus (PINE)		
Tip Blight	*Diplodia pinea*	27
Needle Blight	*Dothistroma pini*	2
Needle Cast	*Lophodermium pinastri*	2
Pinewood Nematode	*Bursaphelenchus lignicolus*	3
Miscellaneous Disorders		
Decline	Poor drainage, site-stress	27
Winter damage	Desiccation	7
Dieback	Poor root establishment	4
Needle Tip Burn	Heat, wind, drought	7
Chlorosis	Stress factor(s)	5
Mechanical damage	Unidentified	1
Sap	Normal	1
Yellowing/Needle drop (previous years growth)	Natural	4

TABLE 2.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Platanus (SYCMORE)		
Anthracnose	*Gnomonia veneta*	2
Powdery Mildew	*Oidium obductum*	1
Populus (POPULAR)		
Canker	*Cytospora* sp.	4
Rust	*Melampsora* sp.	1
Miscellaneous Disorders		
Leaf Drop	Flood shock	1
Scorch	Stress factor(s)	1
Prunus (PURPLE LEAF PLUM)		
Leaf Spot	Unidentified fungus	1
Miscellaneous Disorder		
Winter damage	Desiccation	1
Prunus (ORIENTAL CHERRY)		
Miscellaneous Disorder		
Scorch	Stress factor(s)	1
Quercus (OAK)		
Anthracnose	*Gnomonia quercina*	7
Leaf Blister	*Taphrina coerulescens*	4
Leaf Spot	*Actinopelte dryina*	21
Hedgehog fungus	*Hydnum erinaceus*	1
Powdery Mildew	*Phyllactinia corylea*	2
Powdery Mildew	*Microsphaera alni*	2
Miscellaneous Disorders		
Chlorosis	Iron deficiency	10
Decline (Dieback)	Stress factor(s)	2
Scorch	Wind, heat, and stress	7
Bark Proturberances	Unknown	1
Split bark	Lightning	1
Early leaf drop	Stress	1
Heart discoloration	Unidentified bacteria	1
Salix (WILLOW)		
Crown Gall	*Agrobacterium tumefaciens*	1
Canker	*Nectria* sp.	1
Canker	*Cytospora chrysosperma*	1
Canker	*Botrydiplodia* sp.	1
Miscellaneous Disorder		
Dieback	Stress factor(s)	1
Sorbus (MOUNTAIN ASH)		
Canker Complex	Sunscald/unidentified fungus	4
Leaf Spot	*Phyllosticta* sp.	3
Scab	*Venturia inaequalis*	1
Miscellaneous Disorders		
Scorch	Heat, wind, drought	7
Herbicide injury	Unidentified chemical	1
Tsuga (HEMLOCK)		
Miscellaneous Disorder		
Dieback	Improper root establishment	1
Ulmus (ELM)		
Dutch Elm Disease	*Ceratocystis ulmi*	2
Miscellaneous Disorders		
Scorch	Stress factor(s)	3
Wilt	Stress factor(s)	2

(grey mold), a frequent problem on a number of ornamentals. Late season infections of sycamore and other trees by powdery mildew and of oak by *Actinopelte* leaf spot were also common.

Pine wilt nematode, a disease first reported in 1980 (2), was identified on samples of pine from 23 counties; however, no widespread outbreak of this potentially serious disease was reported.

Disorders: Leaf scorch and tree decline were the most common disorders of shade and ornamental trees, especially maple, mountain ash, and oak. However, these disorders were less severe than in previous years due to adequate rainfall in most areas of Indiana. Herbicide injury was also noted on several tree species, especially redbud. During early fall many pines yellowed extensively and dropped older, inner needles. This late season needle drop is natural on most pines, but caused concern due to the simultaneous, widespread yellowing.

Ornamentals

Diseases: Although juniper tip blight was prevalent from early to mid-spring, only the early season growth was damaged. Other commonly diagnosed shrub diseases included honeysuckle leaf blight and crown gall on euonymous (Table 3). Powdery

TABLE 3.—*Diseases and Disorders*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Althaea (HOLLYHOCK)		
Rust	*Puccinia malvacearum*	1
Miscellaneous Disorder		
Leaf Spot	Environmental stress factor(s)	1
Antirrhinum (SNAPDRAGON)		
Root Rot	*Rhizoctonia solani*	1
Aralia (MING ARALIA)		
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Araucaria (NORFOLK ISLAND PINE)		
Root Rot	*Pythium* spp.	1
Berberis (BARBERRY)		
Miscellaneous Disorder		
Leaf Spot	Environmental stress factor(s)	1
Boxus (BOXWOOD)		
Miscellaneous Disorder		
Dieback	Stress factor(s)	1
Chrysalidocarpus (ARECA PALM)		
Root Rot	*Rhizoctonia solani*	1
Miscellaneous Disorder		
Leaf Scorch	Improper cultural care	1
Chrysanthemum (CHRYSANTHEMUM)		
Stem/Root Rot	*Rhizoctonia solani*	1
Root Rot	*Pythium* spp.	1
Stem Rot	*Fusarium solani*	1
Wilt	*Fusarium oxysporum*	3
Leaf Spot	*Alternaria* sp.	1
Bactrial Leaf Spot	*Pseudomonas cichorii*	2
Cissus (GRAPE IVY)		
Leaf Blight	*Botrytis cinerea*	1

TABLE 3.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Citrus (LEMON TREE)		
Leaf Spot	*Mycosphaerella* sp.	1
Anthracnose	*Glomerella cingulata*	1
Clematis (CLEMATIS)		
Chlorosis	Soil pH imbalance	1
Cornus (DOGWOOD)		
Miscellaneous Disorder		
Enlarged Lenticels	Stress factor(s)	1
Cotoneaster (COTONEASTER)		
Canker	*Phytophthora* sp.	1
Crassula (JADE PLANT)		
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Crataegus (HAWTHORN)		
Leaf Blight	*Fabraea thuemenii*	1
Fire Blight	*Erwinia amylovora*	1
Miscellaneous Disorder		
Dieback	Winter desiccation	2
Cydonia (QUINCE)		
Miscellaneous Disorder		
Scorch	Environmental stress	2
Dianthus (CARNATION)		
Miscellaneous Disorder		
Root Rot	Fertilizer burn	1
Dieffenbachia (DIEFFENBACHIA)		
Leaf Rot	*Erwinia dieffenbachia*	1
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Dracaena (SNAKE PLANT)		
Miscellaneous Disorder		
Leaf Spot	Flouride Toxicity	1
Euonymous (WINGED EUONYMOUS)		
Crown Gall	*Agrobacterium tumefaciens*	2
Miscellaneous Disorders		
Chlorosis	Improper root establishment	1
Leaf Distortion	Herbicide misuse	1
Exacum (EXACUM)		
Stem Canker	*Botrytis cinerea*	2
Ficus (WEEPING FIG)		
Root/Stem Rot	*Pythium* spp.	1
Miscellaneous Disorders		
Leaf Scorch	Improper cultural care	3
Bark Shedding	Improper cultural care	1
Filices (FERN)		
Miscellaneous Disorders		
Scorch	Improper site location	1
Scorch	Improper heater ventillation	1
Forsythia (FORSYTHIA)		
Miscellaneous Disorder		
Leaf Discoloration	Environmental stress	1
Geranium (GERANIUM)		
Root Rot	*Pythium* spp.	1
Miscellaneous Disorder		
Chlorosis	Soil pH imbalance	1

TABLE 3.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Hedera (ENGLISH IVY)		
Miscellaneous Disorder		
Dieback	Winter desiccation	1
Hemerocallis (DAYLILLY)		
Leaf Spot	*Cercospora hemerocallis*	1
Ilex (HOLLY)		
Miscellaneous Disorders		
Leaf Scorch	Winter injury	2
Leaf Blotch	Nonparasitic	1
Impatiens (IMPATIEN)		
Root Rot	*Rhizoctonia solani*	1
Iris (IRIS)		
Leaf Blotch	*Didymellina macrospora*	2
Soft Rot	*Erwinia carotovora*	1
Bulb Blight	*Fusarium* spp.	1
Juniperus (JUNIPER)		
Twig Blight	*Phomopsis juniperovora*	4
Tip Blight	*Diplodia* sp.	1
Miscellaneous Disorders		
Leaf Scorch	Herbicide misuse	1
Dieback	Site/stress	1
Lathyrus (SWEET PEA)		
Miscellaneous Disorder		
Leaf Scorch	Environmental stress factor(s)	1
Ligustrum (PRIVET)		
Stem/Root Rot	*Rhizoctonia solani*	1
Powdery Mildew	*Microsphaera alni*	1
Miscellaneous Disorders		
Dieback	Stress factor(s)	3
Leaf Discoloration	Clay site/root restriction	1
Lilium (LILY)		
Root Rot	*Pythium* spp.	1
Lonicera (HONEYSUCKLE)		
Leaf Blight	*Herpobasidium deformans*	2
Magnolia (MAGNOLIA)		
Miscellaneous Disorders		
Dieback	Cold injury	1
Chlorosis	Nutrient imbalance	1
Orchid (ORCHID)		
Cymbidium Mosaic	Cymbidium Mosaic Virus	1
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Pachysandra (JAPANESE SPURGE)		
Root Rot	*Rhizoctonia solani*	1
Paeonia (PEONY)		
Anthracnose	*Gloeosporium* sp.	1
Leaf Spot	*Alternaria* sp.	1
Leaf Blotch	*Cladosposium paeoniae*	1
Parthenocissus (BOSTON IVY)		
Leaf Spot	*Guignardia bidwelli*	1
Peperomia (PEPEROMIA)		
Miscellaneous Disorder		
Chlorosis	Improper fertilization	1

TABLE 3.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Petunia (PETUNIA)		
Root Rot	*Rhizoctonia solani*	2
Philadelphus (MOCK ORANGE)		
Miscellaneous Disorders		
Leaf Spot	Spray damage	1
Leaf Spot	Environmental stress	1
Philodendron (PHILODENDRON)		
Miscellaneous Disorder		
Leaf Spot	Improper cultural practices	1
Phlox (PHLOX)		
Powdery Mildew	*Erysiphe cichoracearum*	1
Physocarpus (NINEBARK)		
Powdery Mildew	*Sphaerotheca macularis*	1
Prunus (PLUM)		
Miscellaneous Disorders		
Dieback	Winter desiccation	1
Scorch	Improper root establishment	1
Pyracantha (FIRETHORN)		
Scab	*Fusicladium pyracanthae*	2
Rhamnus (BUCKTHORN)		
Miscellaneous Disorder		
Leaf Spot	Herbicide misuse	1
Rhododendron (AZALEA)		
Miscellaneous Disorder		
Leaf Scorch	Environmental stress	2
Rhododendron (RHODODENDRON)		
Twig Canker	*Phytophthora* sp.	1
Leaf Spot	*Pestalotia macrotricha*	1
Miscellaneous Disorders		
Leaf Scorch	Stress factor(s)	3
Stunted Flowers	Cultural	1
Rosa (ROSE)		
Rose Yellow Mosaic	Virus	2
Stem Canker	Unidentified	2
Black Spot	*Diplocarpon rosae*	2
Miscellaneous Disorders		
Scorch	Stress factor(s)	3
Herbicide Damage	Improper use	3
Chlorosis	Nutrient imbalance	1
Dieback	Stress factor(s)	3
Sansevieria (BIRD'S NEST SANSEVIERIA)		
Miscellaneous Disorder		
Root Rot	Improper cultural care	1
Schefflera (SCHEFFLERA)		
Miscellaneous Disorder		
Leaf Spot	Nutrient imbalance	1
Schlumbergera (CHRISTMAS CACTUS)		
Miscellaneous Disorder		
Dieback	Improper cultural care	1
Scindapsus (POTHOS)		
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Solanum (JERUSALEM CHERRY)		
Stem Canker	*Rhizoctonia solani*	1

TABLE 3.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Spathiphyllum (SPATHIPHYLLUM)		
Miscellaneous Disorder		
Leaf Spot	Improper cultural care	1
Syringa (LILAC)		
Powdery mildew	*Microsphaera alni*	2
Bacterial Blight	*Pseudomonas syringae*	1
Miscellaneous Disorders		
Dieback	Environmental stress	1
Leaf Scorch	Stress factor(s)	2
Stem Canker	Mechanical	1
Tagetes (MARIGOLD)		
Root Rot	*Rhizoctonia solani*	
Taxus (YEW)		
Yew Dieback	Poor site location/root rot complex	7
Miscellaneous Disorder		
Herbicide Injury	Spray drift	2
Thuja (ARBORVITAE)		
Canker	Unidentified	1
Twig Blight	*Pestalotia funerea*	2
Miscellaneous Disorders		
Inner branch browing	Natural needle death	2
Scorch	Environmental stress	2
Tulip (TULIP)		
Tulip Fine	*Botrytis tulipae*	1
Vaccinium (CRANBERRY)		
Wilt	Environmental stress factors	1
Viburnum (VIBURNUM)		
DEcline	Unidentified root rotter	1
Vinca (PERIWINKLE)		
Crown Canker	*Rhizoctonia solani*	3
Canker/Dieback	*Phoma exigua* var. *exigua*	1
Viola (VIOLET)		
Rust	*Puccinia violae*	1

mildew was severe during early fall on lilacs and annual flowers. *Fusarium* wilt of chrysanthemums occurred in a number of commercial greenhouses, apparently originating from stock plant sources. Rose diseases were frequent and varied; black spot, powdery mildew, canker, and virus diseases were the most common problems.

Disorders: Scorch and natural browning of inner foliage were common disorders of arborvitae. Numerous site-related and other cultural problems were recorded for rhododendrons. Herbicide injury was most common on euonymous. As in previous years (1, 2, 3), houseplant problems were primarily related to poor cultural conditions, e.g. overwatering, salt build-up, low humidity, etc.

Tree Fruits

Diseases: Excessive rainfall throughout the growing season resulted in a number of fungal leaf spot and fruit rot diseases (Table 4). Apple scab caused widespread injury in both commercial apple orchards and home plantings. Sooty blotch and

flyspeck were prevalent on fruit at harvest on most apple cultivars. The blossom blight phase of fire blight was sporadic but severe in a number of commercial apple orchards. Brown rot on peach, nectarine, and cherry was the most common and damaging early season disease of stone fruits.

TABLE 4. *Fruit Trees—Diseases and Disorders.*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Diospyros (PERSIMMON)		
Miscellaneous Disorder		
Decline	Stress factor(s)	1
Malus sylvestris (APPLE)		
Powdery Mildew	*Podosphaera oxyacanthae*	1
Crown Rot	*Phytophthora cactorum*	1
Stunting	Nematodes	2
Fireblight	*Erwinia amylovora*	3
Leaf Spot	*Fabraea maculata*	1
Leave Spot	*Phyllosticta* spp.	1
Frogeye Leaf Spot	*Physalospora obtusa*	5
Scab	*Venturia inaequalis*	8
Miscellaneous Disorders		
Scorch	Wind and drought	9
Herbicide Injury	Spray drift	2
Dieback	Stress factor(s)	2
Chemical Injury	Improper use	1
Measles	Boron deficiency	1
Prunvs americana (PLUM)		
Black Knot	*Dibotryon morbosum*	3
Brown Rot	*Monilinia fructicola*	1
Miscellaneous Disorders		
Cold Injury	Low temperature	1
Chemical Injury	Improper use	1
Prunus armeniaca (APRICOT)		
Dieback		
Scorch	Stress factor(s)	2
Slash Rotter	Unidentified fungus	1
Prunus avium (CHERRY)		
Cherry Leaf Spot	*Coccomyces hiemalis*	6
Brown Rot	*Monilinia fructicola*	3
Powdery Mildew	*Podosphaera oxyacanthae*	2
Bacterial Leaf Spot	*Xanthomonas pruni*	1
Miscellaneous Disorders		
Dieback	Stress factor(s)	6
Scorch	Wind, heat, and drought	2
Cold Injury	Low temperature	2
Prunus persica (PEACH)		
Bacterial Spot	*Xanthomonas pruni*	6
Scab	*Cladosporium carpophilum*	3
Leaf Curl	*Taphrina deformans*	3
Brown Rot	*Monilina fructicola*	3
Miscellaneous Disorders		
Fruit Rot	Stress factor(s)	2
Scorch	Wind, heat and drought	3
Dieback	Stress factor(s)	1
Prunus persica var. *nectarine* (NECTARINE)		
Bacterial Leaf Spot	*Xanthomonas pruni*	2
Brown Rot	*Monilina fructicola*	2
Miscellaneous Disorders		
Fruit split	Excess water	1

TABLE 4. — Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Pyrus communis (PEAR)		
Fire Bight	*Erwinia amylovora*	2
Canker	*Cytospora* spp.	1
Scab	*Venturia pyrina*	1
Miscellaneous Disorders		
Scorch	Wind, drought, and heat	9
Chemical Injury	Improper use	1
Dieback	Stress factor(s)	1
Fruit crack	Excess water	1
Sooty mold	Insect honeydew secretions	1

Disorders: Leaf scorch and decline were the most commonly recorded disorders (Table 4). A late spring frost in southeastern Indiana resulted in extensive frost ring injury on apples.

Small Fruits

Diseases: The most common disease of small fruits was black root rot of strawberry (Table 5). The cause of this disease is unknown, however, it is likely a complex interaction between environmental (cold injury plus heavy, wet soils) factors and certain soil borne fungi (*Pythium, Rhizoctonia*). The disease is more common in older strawberry plantings on heavy, poorly drained soil. Anthracnose was the most frequently recorded disease of brambles, especially raspberry. Various stem canker diseases occurred on blueberry, and black rot and downy mildew were the most common grape diseases. Downy mildew of grape was severe in both northern and southern counties due to the cool, wet spring conditions.

Disorders: Environmental and site related problems were the major disorders recorded for small fruits. Herbicide injury was common on grape.

Turfgrass

Diseases: As in previous years (1,2), *Helminthosporium* leaf spot and melting out caused by *Helminthosporium* spp. were the most widespread diseases of Kentucky bluegrass (Table 6). *Helminthosporium* melting out coupled with excessive thatch and environmental stress were responsible for killing areas of turf in many lawns. The unidentified problem reported last year (2) on Toronto C-15 bentgrass occurred on at least two Indiana golf courses this season. Cool weather brown patch caused by *Rhizoctonia* was observed in early spring. Red thread was also reported in Marion county.

Disorders: Improper cultural care and improper knitting of sod were common noninfectious problems.

Vegetables

Diseases: Weather conditions unfavorable for seedling maturation promoted an unusually high incidence of damping off disease of melon seedlings (Table 7). Most melon growers in southwestern Indiana observed damping off of watermelon and cantaloupe seedlings grown in cold frames for later transplanting to the field. Isolates of *Pythium* spp. were readily obtained from infected melon seedlings.

TABLE 5. *Small Fruits—Diseases and Disorders*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Fragaria grandiflora		
Black Root Rot	Specific pathogen(s) unknown site stress	8
Leaf Scorch	*Diplocarpon earliana*	2
Root Rot	*Fusarium* spp./*Rhizoctonia* app.	2
Leaf Blight	*Dendrophoma obscurans*	1
Common Leaf Spot	*Mycosphaerella fragariae*	1
Miscellaneous Disorders		
Slime Mold	*Physarum cinereum*	2
Chlorosis	Stress factor(s)	1
Malformed Fruit	Unidentitied	1
Root Rot	Poor site	1
Ribes sativum (CURRANT)		
Miscellaneous Disorder		
Dieback	Stress factor(s)	1
Rubus (RASPBERRY)		
Spur Blight	*Didymella applanata*	1
Anthracnose	*Elsinoe veneta*	1
Rust	*Gymnoconia peckiana*	1
Leaf Spot	*Septoria* spp.	1
Leaf Crinkle	Virus	1
Crumbly Berry	Virus	1
Miscellaneous Disorders		
Dieback	Stress factor(s)	6
Scorch	Heat, wind, and drought	2
Rubus (DEWBERRY)		
Rust	*Kunkelia nitens*	1
Vaccinium (BLUEBERRY)		
Twig Canker	*Phomospsis vaccinii*	1
Miscellaneous Disorder		
Dieback	Stress factor(s)	1
Vitis (GRAPE)		
Black Rot	*Guignardia bidwelli*	3
Downy Mildew	*Plasmopora viticola*	2
Miscellaneous Disorders		
Dieback	Stress factor(s)	2
Cold Injury	Low temperatures	1
Herbicide Injury	Spray drift	4

Watermelon seedlings appeared to be more severely affected than muskmelons. Some growers did not produce watermelons in 1981 because of widespread losses from damping off of seedlings and many others had greatly reduced acreages.

Cucurbit downy mildew occurred on muskmelon vines to a moderate degree throughout the state. Epidemic development was limited by the few consecutive days of disease favorable weather. Toward the later part of the season, powdery mildew was rampant among all cucurbits. Late season muskmelons and pumpkins sustained the most damage from powdery mildew. Bacterial wilt of muskmelon was observed in trace amounts except in fields where growers did not exercise proper vector control.

One of the major diseases affecting tomato production in Indiana was bacterial canker, caused by *Corynebacterium michiganense*. Both fresh market and process-

TABLE 6. *Turf—Diseases and Disorders.*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Poa pratensis (BLUEGRASS)		
Leaf Spot	*Helminthosporium* spp.	20
Fusarium Blight	*Fusarium roseum* complex	2
Brown Patch	*Rhizoctonia solani*	2
Dollar Spot	*Sclerotinia homeocarpa*	1
Stripe Smut	*Ustilago striiformis*	1
Slime Mold	*Physarum cinereum*	1
Cottony Blight	*Pythium aphanidermatum*	1
Anthracnose	*Colletotrichum graminicola*	1
Red Thread	*Corticium fuciforme*	2
Rust	*Puccinia* sp.	1
Miscellaneous Disorders		
Excessive Thatch	Improper cultural care	19
Scorch	Stress factor(s)	11
Dieback	Improper knitting of sod	2
Chemical Injury	Improper use	1

TABLE 7. *Vegetables—Diseases and Disorders*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Allium cepa (ONION)		
Botrytis Neck Rot	*Botrytis allii*	1
Asparagus officinalis (ASPARAGUS)		
Twig Dieback	*Alternaria* spp.	1
Beta vulgaris var. *cicla* (SWISS CHARD)		
Miscellaneous Disorder		
Canker	Environmental/mechanical	1
Brassica oleracea var. *botrytis* (CAULIFLOWER)		
Downy Mildew	*Peronospora parasitica*	1
Wirestem	*Rhizoctonia solani*	1
Leaf Spot	Unidentified bacterium	1
Brassica oleracea var. *capitata* (CABBAGE)		
Cabbage Yellows	Fusarium spp.	1
Wirestem	*Rhizoctonia solani*	1
Miscellaneous Disorders		
Interveinal Chlorosis	Environmental	1
Herbicide Injury	Spray drift	1
Wilt	Desiccation	1
Brassica rapa (TURNIP)		
Leaf Spot	*Cercosporella brassicae*	1
Miscellaneous Disorder		
Elongated tuber	Unidentified	1
Brasica ruvo (BROCCOLI)		
Leaf Spot	Unidentified bacterium	1
Capsicum frutescens (PEPPER)		
Bacterial Spot	*Xanthomonas vesicatoria*	1
Stem Canker	*Rhizoctonia solani*	1
Root Rot	*Pythium* spp.	1

TABLE 7.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Miscellaneous Disorders		
Leaf Scorch	Stress factor(s)	2
Edema	Environmental stress	1
Fruit Injury	Sunscald	2
Leaf Scorch	Nutritional imbalance	1
Herbicide Injury	Spray drift	1
Shrunken Fruit	Unidentified	1
Citrullus vulgaris (WATERMELON)		
Seedling Damping Off	*Pythium* spp.	1
Blossom Rot	*Pythium* spp.	1
Miscellaneous Disorders		
Leafspot	Fertilizer burn	1
Scorch	Stress factor(s)	1
Herbicide Injury	Atrazine carryover	1
Cucumis melo (CANTALOUPE)		
Downy Mildew	*Pseudoperonospora cubensis*	2
Damping off	*Pythium* spp.	1
Wilt	*Fusarium* spp.	3
Bacterial Wilt	*Erwinia tracheiphila*	1
Miscellaneous Disorders		
Scorch	Stress factor(s)	5
Scorch	Copper burn	4
Herbicide Injury	Atrazine carryover	1
Cucumis sativus (CUCUMBER)		
Bacterial Wilt	*Erwinia tracheiphila*	1
Powdery Mildew	*Erysiphe cichoracearum*	1
Leaf Blight	*Alternaria cucumerina*	1
Damping Off	*Pythium* spp.	1
Miscellaneous Disorder		
Leaf Scorch	Environmental stress	1
Cucurbita moschata (PUMPKIN)		
Powdery Mildew	*Erysiphe cichoracearum*	1
Cucurbita pepo (ZUCCHINI)		
Miscellaneous Disorder		
Herbicide Injury	Spray drift	1
Ipomoea batatas (SWEET POTATO)		
Scurf	*Monilochaetes infuscans*	2
Tuber Rot	*Fusarium* sp.	1
Miscellaneous Disorder		
Tuber Discoloration	Environmental stress	1
Lycopersicon esculentum (TOMATO)		
Gray Mold Leafspot (Hydroponics)	*Botrytis* sp.	5
Black Dot Root Rot	*Colletotrichum coccodes*	1
Double Streak Virus	TMV + PVX Virus	2
Tobacco Mosaic Virus	Tobacco Mosaic Virus	2
Damping Off	*Pythium* sp.	1
Stem Canker	*Rhizoctonia solani*	1
Septoria Leafspot	*Septoria lycopersici*	8
Bacterial Speck	*Pseudomonas syringae* (tomato)	3
Bacterial Wilt	*Pseudomonas solanacearum*	3
Bacterial Spot	*Xanthomonas vesicatoria*	2
Bacterial Canker	*Corynebacterium michiganense*	5
Stem Rot (Hydroponics)	*Erwinia* sp.	1
Root Knot Nematode	*Meloidogyne incognita*	1
Root Knot Nematode	*Meloidogyne hapla*	1

TABLE 7.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Miscellaneous Disorders		
Leaf Yellowing/Curling (Hydronponics)	Nutrient imbalance	6
Chemical Injury (Hydroponics)	Heater fumes	1
Dieback	Environmental stress	3
Corky Root	Salt build-up	2
Leaf Burn	Excess fertilizer	6
Herbicide Injury	Improper use	11
Walnut Wilt	Walnut toxin	2
Stunting	Nutrient deficiency	1
Leaf Scorch	Environmental stress	1
Leaf Roll	Physiological	1
Stem Bruise	Mechanical	1
Improper Stylar Closing	Genetic	1
Wilt	Lightning	1
Blotchy Ripening	Environmental stress	1
Fruit Crack	Excess water	1
Panax (GINSENG)		
Root Rot	*Rhizoctonia solani*	1
Leafspot	*Septoria* sp.	1
Phaseolus vulgaris (SNAP BEANS)		
Root Rot	*Rhizoctonia solani*	1
Stem Rot	*Sclerotinia sclerotiorum*	2
Common Bean Mosaic	Common Bean Mosaic Virus	2
Common Rust	*Uromyces phaseoli* var. *typica*	1
Miscellaneous Disorders		
Chemical Injury	Spray drift	5
Cupping of Leaves	Excess water	1
Stunted	Stress factor(s)	1
Pod Discoloration	Genetic/environmental	2
Pisum (PEA)		
Herbicide Injury	Spray drift	2
Rheum (RHUBARB)		
Leaf Spot	*Ascochyta rhei*	2
Root/Crown Rot	*Phytophthora* sp.	1
Solanum melongena (EGGPLANT)		
Miscellaneous Disorder		
Leafspot	Nutritional imbalance	
Solanum tuberosum (POTATO)		
Common Scab	*Streptomyces scabies*	4
Blackleg	*Erwinia atroseptica*	4
Root/Stem Rot	*Rhizoctonia solani*	1
Black Dot Root Rot	*Colletotrichum coccodes*	1
Miscellaneous Disorders		
Stem Canker	Herbicide injury	1
Enlarged Lenticels	Excess water	4
Tuber Necrosis	Cold injury	3
Leaf Scorch	Nutritional imbalance	1
Herbicide Injury	Spray drift	1
Tragopogon (SALSIFY)		
Root Knot Nematode	*Meloidogyne* sp.	1
Zea mays var. *saccharata* (SWEET CORN)		
Miscellaneous Disorders		
Leaf Discoloration	Nutritional imbalance	1
Leaf Spot	Paraquat	1
Leaf Blotch	Environmental	1

ing varieties were damaged by canker. In many cases the source of the inoculum was traced to shipments of transplants from southern states. However, several tomato producers with Indiana grown transplants also suffered losses from bacterial canker. Bacterial spot and speck on tomato were sporadic in Indiana fields this year. Plants infected with the southern blight fungus (*Sclerotium rolfsii*) and with the bacterial wilt pathogen (*Pseudomonas solanacearum*) were observed in a few fields of processing tomatoes.

Double Streak Virus, Tobacco Mosaic Virus, and leaf mold (*Cladosporium* sp.) plagued several hydroponic tomato growers.

Injury from driving spring rains predisposed onion sets to blast infection (*Botrytis* sp.). Weather conditions also favored development of onion downy mildew caused by *Peronospora destructor*.

Broccoli fields in Floyd and Clark counties in the south and Jasper County in the north were affected with a head rot of unknown cause. Soft rotting bacteria have been isolated from field samples, but these bacteria are believed to play a secondary role. (Unusual atmospheric conditions prior to symptom expression may be responsible for the initial injury.

Agronomic Crops

Diseases-Wheat: Wheat diseases were especially damaging in 1981. While disease losses varied from field to field, the average disease loss for the state was estimated at 20%. The state average yield of 43 bu/A was very good considering the disease pressure. Powdery mildew, *Septoria* leaf blotch, *Septoria* glume blotch, and scab were all present in nearly every field in the state. Leaf rust was also present in nearly all fields late in the season. Powdery mildew and *Septoria* leaf blotch were especially severe in fields planted to susceptible varieties and where high seeding rates (2 bu/A) and high nitrogen rates (90 lb/A or more actual N) were used. In many of these fields, the flag leaves were infected by heading time. Above normal precipitation during flowering throughout most areas of the state provided ideal conditions for the development of scab. In addition, Barley Yellow Dwarf Virus was prevalent in southern Indiana and wheat spindle streak virus occurred throughout the state but was especially evident in the northern part.

Diseases-Corn: In corn, leaf blights were common, but the most damaging corn diseases were the stalk rots and ear rots. Southern corn leaf blight (SCLB) was found throughout the state. This disease may have contributed to increased stalk rot severity, and in some late planted fields in southern Indiana, SCLB was sufficiently severe to cause significant yield reductions. *Bipolaris carbonum*, a foliar pathogen in corn, was found in many seed production fields. Other leaf blights were observed but caused little or no concern, e.g., races 1 and 2 of northern corn leaf blight, common rust, southern rust, and Stewart's bacterial leaf blight. Anthracnose top kill was observed in most areas of the state. *Gibberella*, *Fusarium*, and anthracnose stalk rots were common. *Gibberella* and *Fusarium* stalk rots appeared to be the most severe, with anthracnose stalk rot developing later. Severe lodging occurred in some fields. *Fusarium* and *Gibberella* ear rots were common and widespread. *Gibberella* ear rot was sufficiently severe in some fields to cause swine refusal and other feeding problems. *Diplodia* ear rot was found in several fields in Orange and Washington counties. The disease was severe, affecting 60% of the ears in at least one field. In all observed cases, *Diplodia* ear rot was found in fields where corn followed corn and the previous crop residues remained on the soil surfaces.

TABLE 8. *Agronomic Crops—Diseases and Disorders.*

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Triticum (WHEAT)		
Root Rot (see below)	Various (see below)	11
Rhizoctonia	*Rhizoctonia solani*	2
Take-all	*Ophiobolus graminis*	9
Wheat Spindle Streak	Wheat Spindle Streak Virus	9
Barley Yellow Dwarf	Barley Yellow Dwarf Virus	8
Septoria Glume Blotch	*Septoria nodorum*	9
Scab	*Gibberella zeae*	19
Septoria Leaf Blotch	*Septoria tritici*	7
Powdery Mildew	*Erysiphe graminis*	1
Rhizoctonia Leaf Blight	*Rhizoctonia solani*	4
Black Chaff	*Xanthomonas transluscens*	2
Tan Spot	*Helminthosporium sativum*	4
Leaf Rust	*Puccinia tritici*	2
Seedling Blight	*Gibberella zeae*	1
Miscellaneous Disorders		
Inhibited Germination	Soybean residue	1
Chlorosis	Nutrient imbalance	5
Root Restriction	Soil compaction	1
Poor Growth	Desiccation/drought	4
Leaf Discoloration	Frost	1
Avena (OAT)		
Barley Yellow Dwarf	Barley Yellow Dwarf Virus	1
Miscellaneous Disorders		
Herbicide Injury	Atrazine carryover	2
Bleached Heads	Unidentified	1
Sorghum (SORGHUM)		
Miscellaneous Disorder		
Herbicide Injury	Improper Use	1
Zea (DENT CORN)		
Pythium Seedling Blight	*Pythium aphanidermatum*	2
Anthracnose	*Colletotrichum graminicola*	5
Northern Corn Leaf Spot	*Bipolaris carbonum*	5
Southern Leaf Blight	*Bipolaris maydis* (Race 0)	20
Common Smut	*Ustilago maydis*	1
Common Rust	*Puccinia sorghi*	3
Stewart's Blight	*Erwinia stewartii*	6
Chocolate Spot	*Psdeuomonas atrofaciens* pathovar *zeae*	1
Leaf Spot	*Curvularia* spp.	1
Ear Rots (See below)	Various (See below)	19
Fusarium Kernel Rot	*Fusarium moniliforme*	5
Fusarium Kernel Rot	*Gibberella zeae*	11
Kernel Rot	*Cladosporium* spp.	1
Kernel Rot	*Diplodia maydis*	5
Stalk Rots (See below)	Various (See below)	6
Fusarium Stalk Rot	*Fusarium moniliforme*	3
Gib Stalk Rot	*Gibberella zeae*	1
Bipolaris Stalk Rot	*Bipolaris carbonum*	1
Anthracnose Stalk Rot	*Colletotrichum graminicola*	1
Miscellaneous Disorders		
Chlorosis/Striping	Nutrient imbalance	9
Root Restriction	Soil compaction	8
Leaf Spot	Paraquat spray drift	9
Leaf Spot	Environmental	12
Twisted Stem	Mechanical	3
Dieback	Fertilizer burn	2

TABLE 8.—Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Tall Corn/Short Corn	Environmental factors	1
Herbicide Injury	Improper use	6
Poor Ear Development	Stress factor(s)	1
Leaf Striping	Genetic	2
Glycine (SOYBEAN)		
Rhizoctonia Root Rot	*Rhizoctonia solani*	7
Phytophthora Root Rot	*Phytophthora megasperma* var. *sojae*	2
Pythium Root Rot	*Pythium aphanidermatum*	2
Pod and Stem Blight	*Diaporthe phaseolorum* var. *sojae*	5
Brown Stem Rot	*Cephalosporium gregatum*	5
Brown Spot	*Septoria glycines*	6
Charcoal Rot	*Macrophomina phaseolina*	2
Purple Seed Stain	*Cercospora kikuchii*	1
Anthracnose	*Colletotrichum graminicola*	2
Downy Mildew	*Peronospora manshurica*	4
Sclerotinia Stem Rot	*Sclerotinia sclerotiorum*	4
Stem Canker	*Diaporthe phaseolorum* var. *caulivora*	1
Soybean Cyst Nematode	*Heterodera glycines*	5
Miscellaneous Disorders		
Various Problems	Environmental factors	11
Chemical Injury	Various causes	6
Chlorosis	Nutrient imbalance	6
Root Restriction	Soil compaction	2
Leaf Discoloration	Sunscald	5
Stem/Root Splitting	Stress factor(s)	2
Slime Mold		1
Leaf Spot	Environmental	1
Trifolium (CLOVER)		
Alfalfa Mosaic	Alfalfa Mosaic Virus	2
Witches Broom	Witches Broom Virus	1
Miscellaneous Disorders		
Leaf Discoloration	Fertilizer burn	1
Medicago sativa (ALFALFA)		
Crown/Root Rot Complex	Variety of fungi and poor cultural conditions	20
Sclerotinia Crown & Stem Rot	*Sclerotinia trifoliorum*	2
Spring Blackstem	*Phoma medicaginis*	2
Root Rot	*Pythium* spp.	1
Root Rot	*Phytophthora* sp.	1
Root Rot	*Fusarium* sp.	2
Crown Rot	*Helminthosporium* sp.	1
Anthracnose	*Colletotrichum trifolii*	1
Summer Leaf Spot	*Cercospora* sp.	3
Root Rot	*Rhizoctonia solani*	5
Leptosphaerulina Leaf Spot	*Leptosphaerulina briosiana*	2
Leaf Spot	*Stemphylium* sp.	1
Miscellaneous Disorders		
Chlorosis	Nutrient imbalance	8
Leaf Discoloration	Environmental factors	1
Leaf Purpling	Boron deficiency	2
Root Restriction	Compaction	1
Dactylis glomerata (ORCHARD GRASS)		
Leaf Spot	*Helminthosporium sativum*	1
Festuca (FESCUE)		
Leaf Spot	*Helminthosporium sativum*	1
Miscellaneous Disorders		
Leaf Dieback	Environmental stress	1

TABLE 8. — Continued

Host Plant Diseases and/or Disorders	Causal Agent	Number of Samples
Leaf Discoloration	Fertilizer burn	1
Phleum pratense (TIMOTHY)		
Miscellaneous Disorder		
Stunted	Nutrient deficiency	1
Sorghum sudanense (SUDANGRASS)		
Miscellaneous Disorder		
Leaf Spot	Paraquat	1

Diseases-Soybean: Soybean planting was delayed to mid-June or later in many areas of the state as a result of the wet weather. *Rhizoctonia* root rot was the most commonly reported disease of seedling and young soybean plants. Brown spot and downy mildew were common mid and late season foliar diseases. Brown spot caused premature defoliation and yield reductions in some fields. *Sclerotinia* stem rot was reported in scattered fields. The disease was severe in a few fields. Brown stem rot was widespread and caused premature plant death. Pulaski county was added to the list of counties where the soybean cyst nematode was found. Pod and stem blight and purple seed stain were common seed diseases, but they were not as severe as might have been expected with the wet weather.

Diseases-Alflafa: *Leptosphaerulina* leaf spot, spring black stem, and anthracnose were widespread in alfalfa fields. However, the most damaging problem was the disease known as crown-root rot complex. The disease was prevalent in numerous fields in the state and especially severe in some eastern and northeastern Indiana fields. The disease reduced stands to subeconomic levels in many fields.

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