Plant Diseases In Indiana In 1972

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Abstract

Some diseases that appeared in 1972 were new or have been non-economic problems until this year. Maize Dwarf Mosaic Virus of corn was more prevalent and occurred over a wider area of the state than ever before. Anthracnose (*Colletotrichum graminicola*) which resulted in crop failure in three separate locations in Benton County, was observed on sweet corn for the first time. A canker disease of Siberian (Chinese) Elm appeared in epidemic proportions in the Gary, Indiana, area. Downy Mildew (*Peronospora manshurica*) and Brown Spot (*Septoria glycinea*) were found in 86 and 89 per cent, repsectively, of all soybean fields recently surveyed. Non-infectious diseases represented over 50 per cent of the problems observed in shade trees. Low temperatures and high winds in early and mid-June, respectively, caused considerable damage to corn and other crops.

Introduction

The Plant Disease Diagnostic Clinic was initiated in 1962 by extension personnel in the Botany and Plant Pathology Department of Purdue University. The purpose of the clinic is to provide accurate plant disease identification and control prescriptions to Area Extension Agents. It is a productive service used consistently by extension personnel and other interested clientele.

Over 2,000 disease specimens were received in the clinic from January 1 to August 31, 1972. Over 400 people visited the extension plant pathologists and over 1,000 telephone calls were received concerning the diagnosis of plant disease.

Methods

This paper is not a complete survey of all diseases in the state during 1972, but a listing of diseases observed at the clinic and in the field by extension personnel. Data presented in this paper were obtained from specimens received in the Plant Disease Diagnostic Clinic, office visits, and field visitations. Over 90% of specimens received were from area agents, with approximately 10% coming from homeowners and growers.

Shade Trees

More shade tree disease specimens were received than any other group (Table 1). Over 50% of these specimens were affected by a non-infectious disease. Unfavorable environmental conditions were responsible for the majority of these non-infectious diseases.

Much of this injury was related to unfavorable environmental conditions during the winter of 1971. Additional leaf scorch injury appeared during drought periods in the summer of 1972. Sugar and Norway

TABLE 1. *Diseases of shade trees received at Plant Disease Diagnostic Clinic.*

Specimen	Causal Agent	
	Infectious	Non-Infectious
Acer spp. (Maples)	*Gloeosporium apocryptum*	Iron Chlorosis
	Phyllosticta minima	Leaf Scorch
	Verticillium albo-atrum	Winter Injury
Aesculus hippocastanum (Horse Chestnut)		Leaf Scorch
Catalpa speciosa (Catalpa)		Leaf Scorch
Cercis canadensis (Redbud)	*Verticillum* sp.	Leaf Scorch
		Winter Injury
Cornus sp. (Dogwood)	*Ascochyta cornicola*	High pH
	Gnomonia ulmea	Leaf Scorch
		Winter Injury
Crataegus sp. (Hawthorn)	*Gymnosporangium globosum*	
Fraxinus spp. (Ash)	*Gloeosporium aridum*	Leaf Scorch
Ginkgo biloba (Ginkgo)		Winter Injury
Juglans cinerea (Butternut)		Leaf Scorch
Juglans regia (English Walnut)	*Gnomonia leptostyla*	Leaf Scorch
	Xanthomonas juglandis	
Liquidambar styraciflua (Sweetgum)		Leaf Scorch
Liriodendron tulipifera (Tuliptree)		Leaf Scorch
		Nitrate Deficiency
		Winter Injury
Malus sp. (Crabapple)	*Venturia inaequalis*	Winter Injury
Picea spp. (Spruces)	*Cytospora kunzei*	Winter Injury
	Lophodermium sp.	
Pinus spp. (Pines)	*Diplodia pinea*	Poor Vigor
	Dothistrome pini	Winter Injury
	Lophodermium pinastri	
Platanus occidentalis (Sycamore)	*Gnomonia veneta*	Leaf Scorch
Quercus spp. (Oaks)	*Gnomonia veneta*	Iron Chlorosis
	Taphrina caerulescens	Leaf Scorch
		Winter Injury
Robinia spp. (Locust)		Leaf Scorch
		Winter Injury
Salix spp. (Willow)		Winter Injury
Sorbus sp. (Mt. Ash)	*Erwinia amylovora*	Leaf Scorch
		Winter Injury
Taxodium distichum (Bald Cypress)		Leaf Scorch
		Winter Injury
Tsuga *canadensis* (Hemlock)	*Cytospora* sp.	
Ulmus pumila (Chinese Elm)	*Cytospora* spp.	Winter Injury

Maples were most severely affected by these non-infectious agents (Table 1).

Most infectious shade tree diseases in the state were found in similar numbers to those observed in past years (Dr. D. H. Scott,

personal communication). However, a fungus disease caused considerable damage to Chinese Elm (*Ulmus pumila*) in the Gary area. The causal agent has not been identified, but is thought to be a *Cytospora*

TABLE 2. *Diseases of ornamental plants received at the Plant Disease Diagnostic Clinic.*

Specimen	Causal Agent	
	Infectious	Non-Infectious
Bambusene spp. (Bamboo bush)		Leaf Scorch
Begonia spp.	*Botrytis cinerea*	
Berberis sp. (Barberry)		Winter Injury
Cornus spp. (Dogwood Hedge)		Winter Injury
Cotoneaster spp.	*Erwinia amylovora*	
Delphinium sp. (Larkspur)	*Pseudonomas delphinii*	
Dianthus caryophyllus (Carnation)	*Oidium* spp.	
Ilex opaca (Holly)	Unidentified Leaf Spot	
Iris spp.	*Didymellina macrospora* *Erwinia caratovora*	
Ligustrum vulgare (Privet Hedge)		Winter Injury
Myrica caroliniensis (Bayberry)		Winter Injury
Pachysandra spp.	*Septoria pachysandrae* *Volutella pachysandrae*	
Paeonio sp. (Peony)	*Botrytis cinerea*	
Parthenocissus tricuspidata	*Guignardia bidwellii*	
Poa pratensis (Bluegrass)	Fairy Ring *Fusarium roseum* *Helminthosporium* spp. *Sclerotinia homeocarpa* *Septoria macropoda* *Ustilago striiformis*	Thatch Build-up
Pyrancantha spp. (Firethorn)	*Erwinia amylovora*	
Rhododendron spp. (Azalea)	*Phytophthora* sp.	
Rosa spp. (Rose)	*Agrobacterium tumefaciens* *Botrytis cinerea* *Diplocarpon rosae* *Sphaerotheca pannosa*	
Spiraea spp.		Winter Injury
Syringa sp. (Lilac)	*Microsphaera alni* *Pseudonomas syringae*	
Tagetes sp. (Marigold)	*Botrytis cinerea*	
Taxus spp. (Yew)	*Phomopsis occulta*	Winter Injury
Thuja occidentalis (Arborvitae)	*Exobasidium vaccinii* *Phomopsis* sp.	Winter Desiccation
Tulip gesneriana	*Botrytis tulipae*	Winter Injury
Viburnum spp.	*Pseudomonas viburni*	
Vinca spp. (Mrytle)	*Phomopsis lirella* *Phyllosticta* sp.	

sp.. The disease is characterized by cankers varying in length from 3 inches to 3 feet on limbs which are 1 to 3 inches in diameter. This disease caused severe dieback of involved trees.

Ornamentals

Table 2 lists the herbaceous, woody ornamentals and Kentucky bluegrass specimens received and observed. Gray mold, caused by *Botrytis cinerea*, was the most common disease encountered on herbaceous ornamentals.

The largest number of ornamentals received were of the woody type. Several non-infectious diseases resulting in winter injury were observed on woody ornamentals.

While few turf specimens were received in the clinic, many diseased turf areas were visited by the extension staff. The *Helminthosporium* leaf spot (*Helminthosporium* spp.) and dollar spot (*Sclerotinia homeocarpa*) diseases of Kentucky bluegrass (*Poa pratensis*) were widespread throughout the state. Observations indicated that *Helminthosporium* leaf spot was considerably more widespread and severe in 1972 than in 1971 (D. H. Scott, personal communication).

TABLE 3. *Diseases of Vegetable Crops received at the Plant Disease Diagnostic Clinic.*

Specimen	Causal Agent	
	Infectious	Non-Infectious
Brassica oleracea (Cabbage)	*Fusarium oxysporum*	
Citrullus vulgaris (Watermelon)	*Colletotrichum lagenarium*	
Cucumis melo (Muskmelon)	*Alternaria cucumerina* *Fusarium solani* f. sp. *cucurbitae*	Leaf Scorch
Ipomoea batatas (Sweet Potato)	*Diaporthe batatatis* *Fusarium oxysporum* *Monilochaetes infuscans*	
Lycopersicon esculentum (Tomato)	*Fusarium oxysporum* *Gloeosporium phomoides* *Pseudomonas tomato* *Verticillium albo-atrum* *Xanthomonas vesicatoria*	Blossom-End Rot
Phaseolus vulgaris (Green Bean)	Unidentified Root Rot	Russetting Scorch
Rheum spp. (Rhubarb)	*Ascochyta rhei* *Pythium ultimum*	
Solanum melongena (Eggplant)	*Verticillium albo-atrum*	Heat Scorch
Zea mays var. *saceharata* (Sweet Corn)	*Colletotrichum graminicola* *Helminthosporium turcicum* *Xanthomonas stewartii*	Heat Scorch

Vegetable Crops

The majority of vegetable crop diseases were caused by soil-borne organisms (Table 3). *Verticillium albo-atrum* on eggplant (*Solanum melongena*) is becoming a serious problem in Lake County. Growers have been using *Verticillium*-suspectible crops in their rotations which has led to increased soil inoculum.

Anthracnose, caused by *Colletotrichum graminicola* was found on sweet corn in Indiana for the first time (4). Damage was extremely severe in three commercial sweet corn fields in Benton County. The disease was not observed in any other Inaiana location.

Fusarium wilt (*Fusarium solani* f. sp. *cucurbitae*) was observed in several muskmelon (*Cucumis melo*) fields in southern Indiana. This disease was more widespread and severe in 1972 than in 1971 (E. G. Sharvelle, personal communication).

Fruits

Strawberry accounted for almost half of the relatively few small fruit disease specimens received (Table 4). The major problem on strawberry was cortical root rot, a disease caused by a combination of fungi. This disease is a root rot complex with no single organism consistently

TABLE 4 *Diseases of fruit crops received at the Plant Disease Diagnostic Clinic.*

Specimen	Causal Agent	
	Infectious	Non-Infectious
Fragaria grandiflora (Strawberry)	Cortical Root Rot	
Malus sylvestris (Apple)	*Botryosphaeria ribis*	Hail Damage
	Erwinia amylovora	Leaf Scorch
	Physalospora obstusa	Winter Injury
	Venturia inaequalis	
Prunus americana (Plum)	*Coryneum carpophilium*	Leaf Scorch
	Dibotryon morbosum	Winter Injury
	Unidentified Leaf Spot	
Prunus avium	*Dibotryon morbosum*	Leaf Scorch
	Unidentified Leaf Spot	Winter Injury
Prunus persica (Nectarine & Peach)	*Monilinia fructicola*	Leaf Scorch
	Taphrina deformans	Winter Injury
	Xanthomonas pruni	
Pyrus communis (Pear)	*Erwinia amylovora*	
	Unidentified Leaf Spot	
	Venturia inaequalis	
Ribes sp. (Gooseberry)	Currant Mosaic	
	Pseudopezia ribis	
Rubus sp. (Raspberries)	*Elsinoe veneta*	
	Gymnoconia pechianna	
	Verticillium albo-atrum	
Vitis sp. (Grape)	*Guignardia bidwellii*	

isolated from diseased plants. A few of the organisms associated with the cortical root rot complex are *Ramularia* sp., *Leptosphaeria coniothyrium*, *Fusarium orthoceras*, and *Rhizoctonia* sp.

Problems of winter injury and leaf scorch in tree fruits were similar to those observed on shade trees and ornamentals. Winter injury to peach (*Prunus persien*) were severe. When temperatures fell below −20°F this past winter, flower buds were killed and the trees did not produce fruit. Economic losses were high from this non-infectious disease.

TABLE 5. *Diseases of field crops received at the Plant Disease Diagnostic Clinic.*

Specimen	Casal Agent	
	Infectious	Non-Infectious
Glycine max (Soybean)	Bud Blight	
	Cephalosporium gregatum	
	Diaporthe phaseolorum	
	f. sp. *caulivora*	
	D. phaseolorum	
	f. sp. *sojae*	
	Dodder	
	Phyllosticta glycinea	
	Phytophthora sojae	
	Pseudomonas glycinea	
	Rhizoctonia solani	
	Septoria glycinea	
Medicago sativa (Alfalfa)	*Cereospora medicaginis*	Boron Deficiency
	Phytophthora megasperma	
	Pseudopeziza medicaginis	
	Sclerotinia trifoliorum	
Triticum aestivum var. *vulgare* (Wheat)	Barley Yellow Dwarf Virus	Heaving-Frost
	Cephalosporium spp.	
	Erysiphe graminis	
	Ophiobolus graminis	
	Puccinia graminis	
	Puccinia recondita	
	Septoria tritici	
	Snow Mold	
Zea mays var. *indentata* (Corn)	*Colletotrichum graminicola*	Cold Injury
	Diplodia zeae	Wind Injury
	Helminthosporium carbonum	
	H. maydis	
	H. turcicum	
	Maize Dwarf Mosaic Virus	
	Pseudonomas syringae	
	Puccinia sorghi	
	Sclerophthora macrospora	
	Ustilago maydis	
	Xanthomonas stewartii	

Fireblight (*Erwinia amylovora*) and scab (*Venturia inaequalis*) continued to cause damage in Indiana. Problems were less severe in commercial orchards than in home orchards.

Field Crops

More than 75% of the corn specimens received were of the non-infectious type (Table 5). During the first 2 weeks of June, record low temperatures resulted in cold weather injury on corn in northern Indiana. During the next 3 weeks 24 specimens were received with cold and frost injury symptoms.

Another non-infectious disease on corn was wind damage. During three days, June 20-23, winds of 35-45 mph were recorded throughout the state causing a tattering at the terminal end of the leaves. Lesions were found on surfaces of leaves which were similar to lesions of Northern Corn Leaf Blight (*Helminthosporium turcicum*). However, these necrotic areas were caused by the tips of other leaves whipping against the leaf.

Maize Dwarf Mosaic Virus, was found over a wider area of the state since its discovery in Indiana in 1963 (E. G. Sharvelle, personal communication). This disease has been found in 25 counties since 1963. A survey ran this past summer found MDMV in seven additional counties. MDMV caused economic losses in a few fields, but total losses were minimal.

According to a survey (3), brown spot (*Septoria glycines*) and downy mildew (*Peronospora manshurica*) were the most prevalent soybean diseases found. There were 9% more fields infected with downy mildew and 13% more fields infected with brown spot than in 1971. The percentage of fields infected with downy mildew was the highest ever observed. Bacterial blight (*Pseudomonas glycinea*) was recorded in 63% of the fields surveyed, a 20% increase over 1971.

Previous research indicates that it is necessary to remove a minimum of 20% of the leaf area before yield reductions occur (3). Although bacterial blight, downy mildew, and brown spot were present in a large percentage of fields surveyed, infection was never severe enough to cause a 20% reduction in leaf area.

Only a few wheat specimens were received. Take-all (*Ophiobolus graminis*) represented over 50% of the problems observed. Take-all is a root or culm rot disease which is more prevalent when soils are deficient in nitrogen (2). During the fall of 1971, when most of the wheat crop was seeded, growing conditions were excellent. Warm temperatures and adequate moisture stimulated wheat growth until December. This growth utilized soil nutrients and provided for ideal conditions for Take-all the following spring.

Very few alfalfa specimens were received. Boron deficiency appeared to be a problem in alfalfa production. Boron, a micronutrient, is needed in very small amounts for good alfalfa growth. Stress during the growing season, because of poor weather conditions, may cause

boron deficiency to show up (1). Common leaf spot (*Pseudopeziza medicaginis*) was the alfalfa disease seen the most.

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