Plant Diseases and Disorders in Indiana—1976

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Abstract

This is a report of the plant diseases and disorders diagnosed in Indiana from September 1, 1975 to August 31, 1976. Anthracnose leaf blight, common rust, and Gibberella and Fusarium stalk rots were widespread corn diseases in the state during 1976. Brown spot, bacterial blight, and downy mildew were common soybean foliar diseases. Phytophthora and Rhizoctonia root rots of soybeans were common, but less severe in 1976 than in 1975. Barley yellow dwarf virus damaged barley, oats, and wheat. Take-all of wheat was widespread with yield losses in some fields of 30% or more. Phytophthora root rot, Fusarium root rot, crown rot complex, and bacterial wilt caused some losses to alfalfa.

A severe outbreak of leaf anthracnose on white oak and sycamore was the prominent disease of shade trees. Various root stress factors resulted in a decline of many common landscape trees. A frequent disorder of yew (Taxus) was root rot, due to poorly-drained planting sites and/or heavy, clay-type soil. The prevalence of fire blight on apple and pear increased over the previous two years. Numerous late spring freezes caused severe damage to both tree fruit and small fruit.

Severe losses from insect transmitted diseases such as bacterial wilt of cucurbits and virus diseases of muskmelon, greenbeans, and sweet corn were reported. Soil borne diseases included Fusarium wilt of eggplant, muskmelon, okra, spinach, tomato, and watermelon, charcoal rot and scurf of sweet potato, southern blight of tomato, and black dot root rot of potato. Prevalent tomato foliar and fruit diseases included anthracnose, bacterial leaf spot, early blight, late blight, and Septoria leaf spot. Common foliar diseases of cucurbits included anthracnose, Alternaria leaf spot, downy mildew, and powdery mildew.

Introduction

Plant diseases and disorders are diagnosed at the Purdue Plant Disease Diagnostic Clinic and throughout Indiana as a service to county extension agents, growers, homeowners, and others. This service provides a quick, accurate diagnosis along with suggestions for effective control methods and serves a vital role in a productive agricultural system. This paper is a record of plant diseases and disorders diagnosed in Indiana from September 1, 1975 to August 31, 1976. When this report is compared with others (1, 3, 4) it is possible to determine general trends in the increase, decrease, or stability of Indiana plant diseases and disorders. With this information, agricultural research, extension, grower, and consultant personnel can direct research activities, plan control programs, and choose plant varieties best suitable to resist prevalent diseases. Previously, plant diseases and disorders diagnosed in the Purdue Plant Disease Diagnostic Clinic appeared in the form of a compilation (1, 3, 4). A compilation will not be included with this paper, but is available from the authors upon request.

Methods

Plant specimens were submitted to the Plant Disease Diagnostic Clinic by county agents, homeowners, growers, and others, or were collected from Indiana fields by the authors. Diagnosis of each speci-

men was made on the basis of signs and symptoms or by isolation of the pathogen. Appropriate control measures were suggested upon completion of diagnostic studies.

Results

Agronomic Crops

Corn

Diseases: Fusarium ear rot was prevalent throughout the state while Gibberella ear rot was most prevalent in the northern half during the 1975 harvest. Gibberella ear rot was responsible for swine refusal of corn or feed made from corn grown in localized areas of northern Indiana. Howard and Cass counties had the most reported cases of swine refusal.

Most corn was planted early in 1976 and in relatively dry, cold soils. Consequently, seedling blights were common and more severe than in recent years. A relatively small percentage of early planted fields were re-planted due to poor stands which resulted from a combination of unfavorable environmental conditions and seedling blight. Anthracnose leaf blight was widespread in the southwestern, northwestern, and northeastern counties of the state in May and early June. The disease was severe in individual fields, especially where corn followed corn and reduced tillage practices were used. One seed production field of the inbred C-123 in Benton county was severely damaged by anthracnose leaf blight and suffered a total loss for seed production. Dry weather in July and August prevented the development of the stalk rot phase of anthracnose. Had sufficient rainfall occurred during this time, similar to that of 1975, this disease possibly would have been severe. Maize dwarf mosaic and/or maize chlorotic dwarf symptoms were prevalent on corn in the river bottom areas of southern Indiana; however, losses were minimal except in those fields planted to susceptible varieties. Common rust was epiphytotic throughout the state. Severe disease development did not occur until August, thus yield losses were negligible, except in a few seed production fields planted to highly susceptible inbreds. Stewart's disease was prevalent in southern Indiana but disease severity was light in spite of a mild 1975-76 winter and high flea beetle populations. Gibberella and Fusarium stalk rots were widespread during the fall 1976. Good harvest weather prevented severe lodging.

Disorders: Eratic germination, uneven early growth, and purple discoloration were common disorders directly related to cold, dry soils at and shortly after planting.

Soybeans

Diseases: Brown spot and bacterial blight were common early season diseases, but yield losses were negligible. Downy mildew was widespread in Indiana fields. The incidence of downy mildew and bacterial blight was 23 and 4 percent, respectively, higher in 1976 than 1975 (2). Phytophthora root rot was widespread, especially in northern Indiana, but damage was less severe in 1976 than in 1975 due to lack

of adequate moisture during the growing season. Rhizoctonia root rot was a common early season disease, but losses appeared to be minimal. Soybean mosaic and/or yellow mosaic virus symptoms were observed on individual scattered plants in many fields throughout the state. While these virus diseases were common, disease severity was low and no significant yield losses were reported. Sclerotinia stem rot was found in three widely separated fields in Wabash county. This is the first report of this disease in Indiana for several years. Brown stem rot and stem canker were two additional diseases observed in several fields scattered over the state, but neither disease caused apparent significant yield losses. Due to the dry late summer and early fall, pod and stem blight was light, and soybean seed quality was very good.

Disorders: Early season chemical damage was widespread in 1976, but not as severe as in 1975.

Small Grains

Diseases: Barley yellow dwarf virus was widespread and damaging to barley, oats, and wheat throughout the state. Take-all of wheat was observed throughout the state and was severe in many individual fields, with yield losses being 30% or more. Patches of blackened heads, varying in size from several feet in diameter to nearly entire fields, were visible in over half of all Indiana wheat fields at harvest time. The blackened heads resulted from saprophytic fungi, *Alternaria* spp., *Cladosporium* spp., and *Epicoccum* spp., attacking the glumes of plants prematurely killed by take-all, barley yellow dwarf virus and/or frost. Epicoccum was the most common fungus associated with the discolored heads.

Loose smut, powdery mildew, and leaf rust diseases were found scattered, but light, throughout the state. The most important aspect of these diseases is that new races of each pathogen have developed, and all Arthur types of wheat are susceptible to the new races. Arthur types represent 93 percent of all wheat acreage in Indiana and over 70 percent of all soft red winter wheat acreage in the U.S.

Alfalfa

Diseases: Phytophthora root rot, Fusarium root rot, crown rot complex and bacterial wilt continued to cause problems in isolated fields throughout the state, but damage from these diseases was not nearly as severe as in 1975.

Shade and Ornamental Trees

Diseases: Leaf anthracnose was the most frequently recorded disease of landscape trees. Sudden cool, wet weather in early May caused a severe outbreak of anthracnose on white oak and sycamore; maple and ash were affected to a lesser degree. The incidence and severity of anthracnose was greatest in northern Indiana with only slight injury occurring in the middle and southern areas of the state. An increase in recorded and observed occurrence of Diplodia tip blight of pine was noted as compared to 1974 and 1975 (1, 3). Disease occurrence was most prevalent on well established plantings of Austrian

and Scotch pine. An apparent increase in Dutch elm disease was seen in several northern counties during early summer. Stem canker diseases were most prevalent on Russian olive, willow, and oak. Unusually dry spring weather resulted in an overall decrease in the incidence and severity of many common leaf and stem diseases as compared with the past two years (1, 3).

Disorders: An early spring followed by numerous late spring freezes caused extensive injury to young expanding foliage and/or buds of many ornamentals. Maple, tulip tree, spruce, and pine were hardest hit judging by the number of recorded samples. Decline was the most frequently diagnosed disorder affecting landscape trees; as in past years, maple decline was most prevalent (1, 3). White pine, ash, oak, birch, dogwood, and mountain ash were other tree species frequently suffering from decline. Various urban stress factors along with spring and/or summer drought periods over the past few years appear to be responsible for much of the decline. Summer leaf scorch was severe during July and August; maple, dogwood, and mountain ash were most severely affected. Iron chlorosis was common on oak, especially pin oak, and sweet gum.

Ornamentals

Diseases: Dry weather during spring and summer resulted in fewer ornamental diseases than in past years. Most noticeable of the early spring diseases was rust on juniper. Cedar-apple, cedar-hawthorn and cedar-quince rust all were prevalent. Other diseases commonly diagnosed were Phomopsis tip blight of juniper, powdery mildew on Euonymous and lilac, bacterial blight of geranium, Fusarium basal dry-rot of Gladiolus, and Pyracantha scab.

Disorders: The most frequently received ornamental was Taxus. In most cases, plants showed yellow foliage and poor growth as the result of root rot. The cause of Taxus root rot was most frequently related to poorly drained planting sites and/or heavy, clay-type soil. This proclivity for root rot to occur on Taxus strongly indicates the need to plant this particular plant species in only well drained, light-textured soils. An early spring dieback of rose was prevalent in most areas of Indiana. The excessive amount of dieback was largely related to a long spell of warm growing weather in autumn which did not allow plants to become sufficiently hardened. Unusually warm periods in February followed by freezing weather in March also contributed to the dieback. Winter desiccation was prominent on holly, juniper, and arbor-vita.

Fruit Trees

Diseases: Numerous late spring freezes resulted in a reduced fruit crop throughout the state and consequently less noticeable disease problems. The most prevalent disease of apple and pear was fire blight. Black knot was the most common disease of plum. Occurrence of both fire blight and black knot showed an increase over the previous two years. Apple scab, cherry leaf spot, and peach leaf curl were other

diseases of frequent record, however, field occurrence was light. No fruit rot of any consequence was noted as of September 15, 1976.

Disorders: All fruit disorders of importance were weather related. Frost rings, russetting, and fruit malformations, especially on apple, were common due to the many late freezes in spring. Hail damage was frequently diagnosed as causing moderate damage in various orchards throughout the state. There were a few isolated cases of herbicide injury on apple and peach caused by improper application of material.

Small Fruits

Diseases: Black root rot of strawberry was the most frequently recorded small fruit disease. Disease occurrence was usually associated with older strawberry plantings (3 to 5 years) in heavy soil; however, exact cause of the disease is not yet known. Black rot of grape was moderate to severe in various vineyards in southern Indiana. Raspberry anthracnose was lighter than that reported in the previous two years (1, 3). In general, there were no small fruit diseases of major importance during the 1976 growing season.

Vegetables

Diseases: Several insect transmitted diseases were common on vegetable crops throughout the state. In some cases, these diseases were responsible for severe losses. The unusually high frequency of insect borne diseases appeared to be related to weather conditions which favored winter survival or high seasonal populations of insect vectors. The most serious disease was bacterial wilt of muskmelon and cucumber caused by *Erwinia tracheiphila* and transmitted by the striped and spotted cucumber beetles. Plant losses of 10-20% in commercial muskmelon fields were not uncommon. Troublesome aphid borne diseases included cucumber mosaic virus on muskmelon, bean yellow mosaic virus on pole and bush green beans, and maize dwarf mosaic virus on sweet corn.

Soil borne diseases included Fusarium crown rot of asparagus, clubroot and yellows of cabbage, Fusarium wilt of eggplant, muskmelon, okra, spinach, tomato, and watermelon, charcoal rot and scurf of sweet potato, southern blight of tomato, and black dot root rot of potato. The latter disease caused by *Colletotrichum coccodes* has now been identified in all major potato production areas of Indiana and constitutes a major threat to the continued cultivation of susceptible potato cultivars. Fusarium wilt of muskmelon and watermelon was observed most frequently in southwest Indiana where hot dry weather accentuated symptom development.

Prevalent tomato foliar and fruit diseases included anthracnose, bacterial leaf spot, early blight, late blight, and Septoria leaf spot. An early season outbreak of tomato bacterial spot was favored by high winds and wind blown rain. Overall losses to tomato diseases were considered much less severe during the 1976 growing season than during the preceding year. Common foliar diseases of cucurbits in-

cluded anthracnose, Alternaria leaf spot, downy mildew, and powdery mildew.

Disorders: Chemical injury, the most common disorder identified on several vegetable crops, was generally related to herbicide drift or improper pesticide application. The total number of vegetable specimens with chemical injury symptoms in many cases represented a reduction from the previous year.

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