

Plant Disease Records at Zamorano, Honduras

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BY

ALBERT S. MULLER¹ and D. A. ROBERTS¹

A report of the first plant disease survey in the Zamorano Valley, Honduras, appeared in 1952, in *Ceiba* (4), official journal of the Escuela Agrícola Panamericana. A second study seemed desirable at this time because crop acreages have increased in recent years. This has been especially true for vegetables and field crops. Moreover, crops new to the region have been added.

The survey reported in this article was made during the last two weeks of August. For several weeks previous to and during the survey, rains occurred almost every day. Certain crops usually grown during the dry season of the year were not present in the fields at this time, and their diseases were not observed during the present survey.

Most of the diseases in this report have been found in other Central American countries (1, 2, 3, 5, 6), but some of them are new to this region.

DISEASES OF VEGETABLES

Allium spp.—Onion, leek, and garlic were severely blighted by *Alternaria porri* (Ell.) Saw.

Apium graveolens.—Celery foliage was badly damaged by *Cercospora apii* Fres., and the crop was rendered less productive because of the root knot nematode, *Meloidogyne* sp.

Asparagus officinalis.—A leaf blight of minor importance due to *Cercospora asparagi* Sacc., was found on mature foliage of asparagus.

Beta vulgaris.—*Cercospora beticola* Sacc. caused a moderately severe leaf spot of beet.

Brassica capitata.—Only slight damage was found on cabbage attacked by *Alternaria brassicicola* (Schw.) Wilt.

Capsicum spp.—A mosaic virus disease was extensive in plantings of both sweet and hot pepper. Bacterial spot and bacterial wilt, caused by *Xanthomonas vesicatoria* (Doidge) Dows. and *Pseudomonas solanacearum* E. F. Sm., respectively, were also widespread. The defoliating disease, caused by *Cercospora capsici* Heald & Wolf, was common in mature plantings. Rotted fruits of sweet pepper were found covered with black mold of an *Alternaria* sp., apparently a wound parasite.

1. Plant Pathology Department, University of Florida, Gainesville.

Cucumis sativus.—Both downy mildew and powdery mildew, serious diseases of cucumbers, caused, respectively, by *Pseudoperonospora cubensis* (Berk. & Curt.) Rostow. and *Erysiphe cichoracearum* DC, were widespread. A few plants showed symptoms of the vascular wilt due to *Erwinia tracheiphila* (E. F. Sm.) Holland.

Cucurbita spp.—The mildews reported above were also found on squash, but were less severe than on cucumber. Soil rot of stems due to *Rhizoctonia solani* Kühn damaged some plants.

Daucus carota. — Foliage blight, caused by *Alternaria dauci* (Kühn) Groves & Skolko, caused very severe damage in carrots. The root knot nematode (*Meloidogyne* sp.) was widespread and had caused a moderate amount of damage. Rots caused by *Erwinia carotovora* (L. R. Jones) Holland and by *Sclerotium rolfsii* Sacc., reported previously (4), were not observed.

Hibiscus esculentum.—Leaf spot of okra caused by *Cercospora hibicina* Ell. & Ev. and blossom blight caused by *Choanephora cucurbitarum* (Berk. & Rav.) Thaxt. were of minor importance. *Meloidogyne* root knot was found on many plants.

Lactuca sativa.—External foliage of lettuce was severely damaged by *Cercospora longissima* (Trav.) Sacc., which causes a leaf spot. Entire heads of many plants were rotted by *Sclerotinia sclerotiorum* (Lib.) DBy. Soft rot, caused by *Erwinia carotovora* and reported previously (4), was not found, nor was leaf spot, caused by *Septoria lactucae* Pass.

Lycopersicon esculentum. — Entire plantings of tomato were blighted by *Phytophthora infestans* (Mont.) DBy. Early blight, due to *Alternaria solani* (Ell. & Mart.) L. R. Jones & Grout, was found on the lower leaves. *Stemphylium solani* G. F. Weber, hitherto unreported from this region, caused many small spots per affected leaf, severely damaging the foliage of a variety with small pearshaped fruits. About one-fourth of the fruits of this variety showed blossom-end rot lesions that were covered by an *Alternaria* mold and by a *Fusarium* sp. *Cladosporium fulvum* Cke., a dry-season pathogen in this area (4), was not found. Mosaic infection was moderate. The root knot nematode (*Meloidogyne* sp.) was moderately severe, as was *Pseudomonas solanacearum*, the cause of bacterial wilt.

Phaseolus vulgaris.—The diseases of garden varieties of bean are common to field beans, and are reported in the section Diseases of Field Crops.

Raphanus sativus.—Plantings of radish were affected by *Alternaria* leaf blight. White rust, caused by *Albugo candida* (Pers. ex Chev.) Kuntze, was reported earlier (4), but was not observed at this time.

Solanum melongenum.—Soil rot, caused by *Rhizoctonia solani*, and wilt, caused by *Pseudomonas solanacearum* were moderately severe in plantings of eggplant. A few plants showed symptoms of mosaic.

Solanum tuberosum.—Potato plants in one garden plot had lost about three-fourths of their leaves as a result of an epiphytotic of late blight, caused by *Phytophthora infestans*. Early blight, a serious dry-season disease caused by *Alternaria solani*, was reported previously (4).

Zea mays.—The most important disease of sweet corn was virus stunt, found in approximately 25 per cent of a Cuban variety. Another disease, thought to be caused by the corn streak virus, was observed in a few plants. Of the two rusts observed, *Puccinia polysora* Underw. was more prevalent than *P. sorghi* Schw., but neither seriously affected crop production in this variety. The variety was moderately susceptible to *Helminthosporium turcicum* Pass., the cause of a leaf spot characterized by long, broad necrotic lesions. The tropical tar spot, caused by *Phyllachora maydis* Maubl., was also present on plants of this variety.

DISEASES OF FIELD CROPS

Arachis hypogaea. — Moderately severe infections of peanut foliage were caused by the leaf-spotting pathogen, *Cercospora personata* (Berk. & Curt.) Ell. & Ev. Rust, *Puccinia arachidis* Speg., usually severe in the dry season, was not seen, but has been reported earlier (4).

Ipomea batatas.—No serious diseases were found on sweet potato at this time, but storage rot due to *Rhizopus nigricans* Ehren., was listed previously (4), along with white rust, caused by *Albugo ipomeae-panduranae* (Schw.) Sw.

Manihot utilisima.—Leaf spotting of yuca, caused by *Cercospora henningsii* Allesch., was observed, but was of minor importance.

Oryza sativa.—The white stripe virus disease (hoja blanca) of rice was observed. This disease has been a serious threat to rice production, and to obtain control it was necessary to spray several times with an insecticide to reduce the population of the insect vector. An important control measure is plowing under crop residues and the volunteer seedlings that come up after harvest. The common leaf spot caused by *Helminthosporium oryzae* Breda de Haan, was observed, but no estimate of its severity in the seedling stage could be made. Another leaf spotting disease of minor importance, caused by *Cercospora oryzae* Miyake, was reported previously (4).

Phaseolus vulgaris.—Diseases of field beans, which are usually planted in the autumn at Zamorano, were observed only in an early planting and on volunteer plants from a previous crop. Two virus diseases, one a severe rugose mosaic and the other probably caused by bean yellow mosaic virus, were observed in a few plants. Soil rot, caused by *Rhizoctonia solani*, the leaf spots due to *Chaetoseptoria wellmanii* Stw. and *Cercospora cruenta* Sacc. and rust, *Uromyces phaseoli typica* Arth. were observed. Anthracnose, caused by *Colletotrichum lindemuthianum* (Sacc. & Magn.) Briosi & Cav., was previously reported (4) as a serious disease, and a stem blight, caused by *Sclerotium rolfsii* Sacc., was also reported (4).

Ricinus communis.—The castor bean plant was moderately affected by leaf spots caused by *Cercospora ricinella* Sacc. & Berl. and by *Alternaria* sp. A blight of lower leaves was caused by *Rhizoctonia solani*; this is believed to be a disease that is most common during the rainy season.

Saccharum officinarum. Sugarcane was not seriously affected by disease, but mosaic was observed in the POJ 2725 variety.

Vigna sinensis.—The most common disease observed on cowpea was leaf spot, caused by *Cercospora cruenta* Sacc., which results in premature defoliation. Other leaf spots present were those due to *Chaetoseptoria wellmanii* and to *Aristastoma oeconomicum* (Tracy & Earle) Tehon.

Zea mays.—The most important disease of field corn was leaf blight, caused by *Helminthosporium turcicum*, which was much more severe on the variety H-501 than on other hybrid varieties planted. As in sweet corn, *Puccinia polysora* was more common than *P. sorghi*; neither caused extensive damage in the field corn observed. *Physoderma maydis* Miyake was present, but was of minor importance. A species of *Fusarium* was associated with a moderately severe spotting of the basal parts of leaves. Corn stunt and corn mosaic virus diseases were observed, but only in a small percentage of the plants.

DISEASES OF PASTURE CROPS

Holcus sorghum.—The principal disease observed on sorghum was bacterial spot, caused by *Pseudomonas syringae* v. Hall, which severely affected the leaves of the lower halves of plants. Rust, *Puccinia purpurea* Cke., was of minor importance on the variety now under cultivation. Head smut, *Sphacelotheca reiliana* (Kühn) Clint., and common smut, *Sphacelotheca sorghi* (Lk.) Clint. previously reported as being serious on other varieties (4), were not encountered in this survey. Two fungus leaf spots previously reported as severe in this valley (4), those caused by *Helminthosporium turcicum* and *Cercospora sorghi* Ell. & Ev., were not found on the variety inspected.

Tripsacum latifolium.—*Puccinia polysora* was found on leaves of mature Guatemala grass.

Cajanus indicus.—Pigeon pea leafspot due to *Cercospora cajani* P. Henn. was of minor importance. Rust, *Uromyces dolicholi* Arth., was unimportant on the crop observed in this survey, but has been reported to cause severe defoliation and reduction of seed yield (4).

Medicago sativa.—Alfalfa rust, *Uromyces striatus* Schroet, was found to be of minor importance, but it is considered to be a serious problem during the dry season. *Cercospora zebrina* Pass. caused a leafspot of minor importance.

FORAGE AND COVER CROPS IN TEST PLOTS

Axonopus micay.—A serious virus stunt disease was found on imported micay grass.

Cynodon dactylon.—A strain of giant bermuda grass was severely attacked by *Helminthosporium cynodontis* Marig.

Holcus halepensis.—Rust, *Puccinia purpurea*, on Johnson grass was so severe that it makes this grass unsuitable for forage in the Zamorano valley.

Panicum maximum.—Some of the strains of this grass in the plots inspected were badly affected by the anthracnose fungus, *Colletotrichum graminicolum* (Ces.) G. W. Wilson.

Pennisetum purpureum.—*Helminthosporium sacchari* (Breda de Haan) Butler caused a moderately severe leaf spot of one of the va-

rieties, but did not occur on the other varieties of Napier or elephant grass.

Phaseolus spp.—Several species of beans were found to be susceptible to attack by *Chaetoseptoria wellmanii*.

DISEASES OF FRUITS CROPS

Carica papaya. — That virus diseases can become a threat to papayas in Central America was evidenced by the occurrence of bunchy top and mosaic diseases in small plantings. Two common leaf diseases were found, those caused by the powdery mildew fungus *Oidium caricae* Noack and by *Pucciniopsis caricae* (Speg.) Earle. *Colletotrichum papayae* P. Henn. caused an anthracnose type of rot of ripe fruit.

Citrus spp.—Old citrus trees in heavy soils were attacked by the foot rot pathogen, *Phytophthora parasitica* Dast. Greasy spot, caused by *Cercospora* sp., was prevalent in all citrus examined. Anthracnose, caused by *Colletotrichum gloeosporioides* Penz., occurred on leaves of weakened trees, and the scab organism, *Sphaceloma fawcettii* Jenkins, was observed in some plantings. Powdery mildew, *Oidium* sp., was found in one planting.

Cydonia oblonga.—Thread blight, caused by *Pellicularia koleroga* Cke., was of minor importance on quince.

Ficus carica.—Mature foliage of fig was moderately attacked by rust, *Physopella fici* (Cast.) Arth.

Fragaria chiloensis.—A leaf spot disease of minor importance on strawberry was caused by *Ramularia tulasnei* Sacc. Some plants were affected by a mosaic virus. It was reported earlier (4) that much fruit was lost from rot due to *Botrytis cinerea* Pers.

Malus Spp.—The thread blight fungus, *Pellicularia koleroga*, occurred on apple.

Mangifera indica.—A disease of minor importance on mango foliage was caused by *Cercospora mangiferae* Koork. New foliage was susceptible to anthracnose, caused by *Colletotrichum gloeosporioides* and to powdery mildew, *Oidium mangiferae* Berth. Anthracnose was reported to be serious (4) at the young-fruit and ripe-fruit stages.

Musa sapientum.—Moderate infection of banana by *Cercospora musae* Zimm. was recorded from one planting.

Persea americana.—*Phytophthora cinnamoni* Rands continues to be the cause of loss of avocado orchards that were planted on heavy soils. A few trees were found to be affected by scab, anthracnose, thread blight, and tar spot, caused by *Sphaceloma perseae* Jenkins, *Colletotrichum gloeosporioides*, *Pellicularia koleroga*, and *Phyllachora gratissima* Rehm., respectively.

Prunus spp.—Rust, *Tranzschelia pruni-spinosae* (Pers.) Dietl., was common on peaches and plums, which were also affected by thread blight, *Pellicularia koleroga*. Leaf curl, incited by *Taphrina deformans* (Fckl.) Tul., scab, caused by *Cladosporium carpophyllum* Thüm., and fruit rot due to *Sclerotinia cinerea* Schrot. were reported on peaches previously (4).

Pyrus communis.—*Pellicularia koleroga* caused a thread blight of pear.

DISEASES OF ORNAMENTAL PLANTS

Canna sp..—Severe canna rust, *Puccinia cannea* P. Henn., was found. A mosaic disease was also observed.

Jasminum officinale.—Leaf spot, caused by *Cercospora jasminicola* Chupp & Muller, was common on jasmine.

Petunia sp..—*Cercospora petuniae* Chupp & Muller caused a leaf spot of petunia.

Rosa spp..—The most serious disease of rose was blackspot, due to *Actinonema rosae* (Lib.) Fr., which caused severe defoliation. *Oidium leucoconium* Desm., powdery mildew, was also important. Leaf spot caused by *Cercospora rosicola* Pass. was common, particularly on rootstock plants. Symptoms of rose yellow mosaic virus occurred in all plants of the varieties Mirandy and Editor MacFarland.

Zinnia elegans.—*Zinnia* foliage was severely attacked by the leaf spotting fungus *Cercospora zinniae* Ell. & Mart. and by powdery mildew, *Oidium sp.*

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