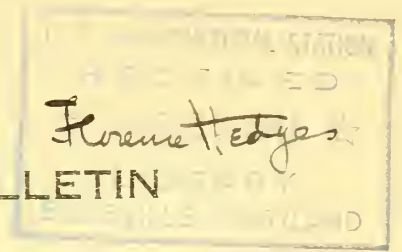


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THE PLANT DISEASE BULLETIN

Issued By

THE PLANT DISEASE SURVEY

Supplement 23

Diseases of Forest and Shade Trees, Ornamental and Miscellaneous Plants

in the United States in 1921

August 15, 1922

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

PLANT DISEASE SURVEY

1922

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It should be understood that many other collaborators and pathologists have assisted in gathering data within the States but the following list includes those who actually furnished state reports to the Washington office.

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DISEASIS OF FOREST AND SHADE TREES, ORNAMENTAL AND MISCELLANEOUS PLANTS
IN THE UNITED STATES IN 1921

Prepared by
G. Hamilton Martin, Jr.

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Foreword

The summary of the diseases of forest and shade trees, ornamental and miscellaneous plants has been prepared by utilizing the following sources of information: (1) collaborators (2) specialists in the offices of Forest Pathology and Blister Rust Control (3) articles in botanical journals and (4) special reporters. In the case of the last two groups initials have been used in place of the full name of the reporter. A list of collaborators is given on the opposite page. The names of the special reporters are as follows:

JA = Jacob Albrecht	EBM (2) = E. B. Mains (Unusual rusts on <i>Myssa</i> and <i>Urticastrum</i> . <i>Am. Jour. Bot.</i> 7: 442-451. Nov. 1921.
EE = Ellsworth Bethel	
FWE = F. W. Besley	
JSE = J. S. Boyce	
STD = S. T. Dana	GEM = G. H. Martin
D = J. J. Davis (Provisional list of parasitic fungi and their hosts of Wisconsin)	JM = J. Matz
WSF = W. S. Fields	EMc = Bright McConnell
BF = Bruce Fink (Notes on powdery mildews of Ohio. <i>Ohio Jour. Sci.</i> 21: 211-216. April 1921)	IBM = I. L. Melhus (Mosaic studies. <i>Phytopath.</i> 12: 42. Jan. 1922)
GHG = G. H. Godfrey	WM = Woodbridge Metcalf
GFG = G. F. Gravatt	DGM = D. G. Milbrath
RJH = R. J. Haskell	LOC = L. C. Overholtz
LOK = L. O. Kunkel (A possible causative agent for the mosaic disease of corn. <i>Bul. Exp. Sta. Hawaiian Sugar Plant. Assoc.</i> 3 (1) July 9)	OVP = O. V. Piper
	OMS = C. M. Scherer
	S&D = Shear, C. L. and Dodge, E. O. (<i>Mycologia</i> 13: 135-170. May 1921)
PAL = P. A. Lehenbauer	JLS = John L. Sheldon
AM = Alexander MacElwee	JAS = John A. Stevenson
EBM = E. B. Mains (<i>Cereal Courier</i> 13: 9. April 30, 1921)	HET = H. E. Turley
	CAW = C. A. Weigel
	FW = Freeman Weiss
	SMZ = S. M. Zeller

A general summation of the distribution and prevalence in the United States of the diseases of the hosts mentioned in this summary has been made impossible due to the lack of the necessary data. Therefore it is necessary to issue the information in list form with here and there a few scattered general notes. Data have been taken from reports of past years in the case of the Coniferae and certain of the ornamental hosts.

No doubt a great many of the diseases listed in the following pages are nation-wide in their distribution, but owing to lack of attention by pathologists in general to the diseases of these plant groups, definite data are not available for summarizing.

This past season an effort has been made to gather more detailed information on certain important conifers. A few reporters responded most helpfully. Later it is hoped to do the same with certain important hardwoods used either for economic or ornamental purposes.

With the growing realization of the value of our trees and ornamental plants may there also be impressed upon the mind the necessity of protecting these groups of hosts from disease havoc. During 1921 the climatological phenomena were unusual with regard to rainfall and temperature. The weather for 1921 and the temperature by months has been summarized in Plant Disease Bulletin Supplement 20. Since the growing realization of meteorological effects upon trees and ornamental plants is increasing, it is hoped that more attention will be paid to this phase of pathology.

Soil conditions play an important role also in shade tree and ornamental plant health, as it so often happens that transplantings are made to situations that are wholly unfavorable for growth.

An effort has been made to present a more complete list of references pertaining to the diseases of plants given in this summary.

The authority for the scientific names of the forest trees of the United States has been George B. Sudworth's "Check List of the Forest Trees of the United States." Scientific names of all other trees have been taken from Bailey's "Standard Cyclopedia of Horticulture."

The following report on meteorological effects in the Pacific Northwest has been prepared by J. S. Boyce, Office of Forest Pathology:

Winter Injury: The winter of 1919-1920 in the region west of the summit of the Cascade Mountains was characterized by a long period of drouth and unprecedented low temperatures. The results were apparent in the spring and summer of 1920 when the injury became apparent on trees and shrubs. Large ornamental chestnut trees (Castanea dentata) were killed outright, especially in the neighborhood of Oregon City. Even the native species did not escape. Dogwood (Cornus nuttallii) was frequently top killed.

Snow and Ice Damage: During the latter part of November and early December 1921 a snow and ice storm of unusual severity swept through the gorge of the Columbia River. Considerable damage was caused to the hardwoods by branches and tops breaking under the heavy load of snow and ice, and to second growth conifers by breaking of the tops. Douglas fir suffered considerably. However, the area of damage is not extensive.

Wind Damage: On January 29, 1921 a wind storm swept the west coast of Washington and extended inward for about 100 miles. At Grays Harbor the wind reached a recorded velocity of over 140 miles per hour before the instrument was wrecked. It has been estimated that more than six billion feet board measure of merchantable timber was blown down by this storm, most of which cannot be salvaged and becomes a total loss.

A cruise of a portion of the area this past summer by the U. S. Forest

Service shows a total loss of 14.4% and the relative damage by species.

Species	Per cent
Douglas fir (<u>Pseudotsuga taxifolia</u>).....	6.1
Western hemlock (<u>Tsuga heterophylla</u>).....	18.9
Silver fir (<u>Abies amabilis</u>).....	16.7
Western red cedar (<u>Thuja plicata</u>).....	6.2
Sitka spruce (<u>Picea sitchensis</u>).....	9.8

Naturally the shallow rooted hemlock and silver fir, and to a lesser degree spruce, suffered most severely. Sound trees were uprooted by the force of the wind. The excessive winter rainfall previous to the storm favored this by softening the soil. Trees with butt rot caused by the velvet top fungus (Polyporus schweinitzii) were usually broken off from the ground level to a height of 15 feet.

Dr. J.,H. Faull has ably presented some forest problems he finds existent in Ontario which can well be applied to our forests also. Therefore, herewith is copied some of his remarks from "Some problems of forest pathology in Ontario." Jour. Forestry 20: 67-70. Jan. 1922.

"Buttrots constitute the outstanding destructive agencies at work in our Ontario forests. No forest is exempt, and every mature stand becomes more and more susceptible with increasing age. The time inevitably comes when they bring about an accelerated loss of stumpage values through deterioration. They are also responsible for most windfalls and consequently for the vast amounts of debris that litter the floors of our forests, affording a limitless supply of highly combustible wasted materials. And finally butt rots are dominant influences in relation to the succession of cover types in unregulated forests. Fortunately they are almost altogether restricted to mature or suppressed timber; young trees are practically immune. This fact greatly simplifies the problem of control. Plainly butt rot problems will be very largely solved in the administration of any good policy of forest management.

"One of the unexpected drawbacks encountered in investigating butt rots has been the lack of information on even the identity of the causal organisms. This applies especially to the larger number of butt rots of conifers. Balsam rots may be cited as an extreme case; though several types occur in living balsam trees, nobody as yet, so far as the literature shows, has definitely established a connection with a specific causal factor in any single case. To help meet this situation investigations were begun two years ago, and are now being carried on with fruitful results. The methods employed are those so successfully used in cultural diagnostic studies of bacteria.

"But there are other fundamental problems of even greater importance calling for solution, such for example as the rate of progress of butt rot infestations, the relation of butt diseases to the age of the host species, to the specific resistance of the host and to environmental factors. And here we would include such topics as soil characters, crowding, mixed stands, and climate, all of which have a direct bearing on the relation of butt diseases to yield and hence to the question of the right time of harvesting. The solution of these problems will demand time,

patience, and a force of trained investigators, but the results attained will be of the greatest value in the administration of our forests of today and tomorrow."

DISEASES OF CONIFERS

ARBORVITAE (*Thuja occidentalis*)

Diplodia sp.

Alabama (JFC)

Keithia thujina Durand

Virginia, Wisconsin

Leptosphaeria sp.

Pennsylvania

Macrosporium sp.

Indiana (JFC)

Mycosphaerella sp.

Pennsylvania, Alabama

Pestalozzia conigena Lev.

Minnesota

Pestalozzia funerea Desm.

Virginia, North Carolina, Mississippi

Pestalozzia sp.

Alabama (JFC)

Phoma thujana Thüm.

New Jersey (JFC), Michigan (JFC)

Recurvaria thujaella Kearf.

New York (JFC)

Septobasidium sp.

North Carolina (JFC)

Root rot caused by unfavorable
cultural conditions

New York

Leafscorch

New York, Nebraska

Winter injury

Maine, Ohio, Minnesota, Iowa (JFC)

Dieback caused by lack of soil
moisture

Pennsylvania

Tip-dying, cause undetermined

New Jersey

ARBORVITAE, CHINESE (*Thuja orientalis*)

Nursery blight caused by Phoma sp.

Pennsylvania, Illinois, Iowa, Nebraska, and Kansas

Chlorosite, cause undetermined

Kansas

Winter injury

Kansas

CEDAR, INCENSE (*Libocedrus decurrens*)

Heartwood rot caused by Polyporus amarus Hedge.

Oregon - Jackson (JSB)

Widespread throughout range of host and causing losses up to 50% or more in overmature stands. (JSB)

Incense cedar rust caused by Gymnosporangium blasdaleanum (D. & H.) Kern
Oregon

This disease is characterized by the formation of conspicuous, compact witches' brooms. Individual sprays may be killed outright. Swellings on the limbs or the bole sometimes result from infection. The disease is widespread throughout the range of the incense cedar and where severe greatly retards the growth of the host. (JSB)

Stigmatea sequoiae (Cke. & Hk.) Sacc. is found on living leaves of incense cedar in California and southern Oregon rather frequently. Weakly, if at all parasitic and causing no apparent injury to the host. (JSB)

CEDAR, RED (Thuja plicata)

Stringy butt rot caused by Poria weirii Murr.

Washington - occasional; causes small amount of cull, decay only in heartwood and confined to stump butt log. (JSB)

Buttrot of heartwood, cause undetermined

Washington (JSB)

The decay closely resembles that caused in other species by Polyporus schweinitzii. Common in Washington and probably also in Oregon; causes a small amount of cull. (JSB)

Leaf blight caused by Hendersonia thyoides Cke. & Ell.

Oregon (JSB) - Rare, of no economic importance.

Cedar leaf-blight caused by Keithia thujina Durand

Washington, Oregon - (JSB)

Common throughout range of the host, principally attacks small trees and when severely attacked the trees from a distance look as though they had been scorched by fire, the disease also retards the growth of infected trees, but exact figures on loss increment are not yet available. (JSB)

FIR, SILVER (Abies amabilis)

Needle cast caused by Lophodermium nervisequum Hart.

Oregon - causes premature shedding of older needles. (JSB)

Fir-fireweed rust caused by Pucciniastrum pustulatum (Pers.) Diet.

Washington - occasional, on needles of the season. (JSB)

Fir-blueberry rust caused by Calyptospora columnaris (Alb. & Schw.) Kühn

Washington (JSB)

Mistletoe caused by Razoumofskyia occidentalis abietina (Engelm.) Coville

Oregon

FIR, BALSAM (Abies balsamea)

Fir-blueberry rust caused by Calyptospora columnaris (Alb. & Schw.) Kühn

Pennsylvania - very local in central part of state, infected leaves die and fall off. (LOO)

Fir-chickweed rust caused by Melampsorella elatina (Alb. & Schw.) Arth. = M. cerastii (H. Mart.) Schroet.

Wisconsin

420
Fir-fern rust caused by Uredinopsis mirabilis (Pk.) Magn.
Wisconsin

Fir Phoma (Phoma sp.)
New York

Twig blight, cause unknown
Michigan

Witches broom, cause unknown
Michigan

FIR, WHITE (*Abies concolor*)

Stringy brown rot caused by Echinodontium tinctorium Ell. & Ev.

Idaho - general and common throughout state, severe.

Oregon - Baker (Whitney, Oct. 28, 1920), Grant (Bates, Oct. 14, 1920) Klamath (Bly, Nov. 13; Odessa, Sept. 14; Recreation, Sept. 13) and Wasco (Dufur, Oct. 8; Friend, Sept. 21) Counties. Stringy brown rot of the heartwood caused by the Indian paint fungus results in enormous loss in merchantable timber. The decay is widespread throughout the range of the host, but the stands in the Klamath Lake region and in eastern Oregon are severely affected. A cruising rule in the Blue Mountains of the eastern part of the state is to consider all trees over 18 inches in diameter at breast height as worthless and cull all smaller trees 25%. An investigation was conducted on the Crater National Forest on the stringy brown rot during which it was found that 44% of all the infections entered through fire scars. (JSB)

Needle cast caused by Lophodermium nervisequum Hart.

Oregon - Baker (Whitney, Oct. 28, 1920), Grant (Bates, Oct. 14, 1920) Klamath. Very common attacking the older needles and varying greatly in severity, not only in different localities, but on individuals in the same locality, mostly on saplings and small poles. This disease causes a premature death and shedding of the older needles. The increment of infected trees is reduced more or less, depending on severity and continuity of attack. (JSB)

Fir needle cast caused by Phacidium infestans Karst.

Oregon - rare, not important. (JSB)

Fir-blueberry rust caused by Calyptospora columnaris. (Alb. & Schw.) Kühn

The two observations reported are Peridermium ornamentale Arth. considered by some to be the aecia of C. columnaris. (JSB)

Oregon - on needles of the season. (JSB)

Witches broom caused by Razoumofskya occidentalis abietina Englm. Coville

Oregon - reduces increment of infected trees. (JSB)

FIR, LOWLAND WHITE (*Abies grandis*)

Stringy brown rot caused by Echinodontium tinctorium Ell. & Ev.

Washington, Oregon - (JSB)

Probably occurs throughout the range of the host, causes considerable loss in mature timber. (JSB)

Rot caused by *Fomes officinalis* Fr.

Oregon - not uncommon in the Coast Range of the western part of state.

Red-brown sapwood rot caused by *Fomes pinicola* (Fr.) Oke.

Washington (JSB)

Oregon - very common on fallen logs in western Oregon.

Found occasionally on living trees; of little economic importance. (JSB)

White root rot caused by *Polyporus dryadeus* Fr.

Washington - found on a living tree, rare, not economically important. (JSB)

Oregon - one specimen collected; the tree was apparently living.

Fir-willow rust caused by *Melampsora arctica* Rostr.

Oregon - rare, of no importance. (JSB)

Witches broom caused by *Razoumofskya occidentalis abietina* (Engelm.) Coville

Washington (JSB)

Yellow witches broom caused by *Melampsorella elatina* (Alb. & Schw.) Arth.

Oregon - rare; of no importance; a caëoma which seems to belong here has been found on needles of the season. (JSB)

Matting caused by *Herpotrichia nigra* Hart.

Idaho.

This disease has been reported as doing great damage in Europe by killing and matting the leaves of Abies.

Yellow root rot caused by *Sparassis radicata* Weir

Oregon - observed once.

Sooty mold caused by *Dimerosporium* sp.

Washington (JSB)

Occasional throughout range of host, of no economic importance, apparently little or not at all injurious to the host, on older needles. (JSB)

Cladosporium sp.

Idaho - 1915; perhaps saprophytic only. (JFC)

Needle cast caused by *Lophodermium nervisequum* Hart.

Oregon (JSB)

Common throughout the range of the host, causes premature shedding of older needles. (JSB)

Fir-Fireweed rust caused by *Pucciniastrum pustulatum*. (Pers.) Diet.

Idaho

Washington - widespread in western part of state, of little economic importance, kills needles of the season. (JSB)

Fir-Athyrium rust caused by *Uredinopsis copelandi* Syd.

Washington - rare. (JSB)

Fir-fern rust caused by Uredinopsis mirabilis (Pk.) Magn.

Washington. (JSB)

Oregon. (JSB)

Common throughout the range of the host, on needles of the previous season which are killed, injury to host is slight. (JSB)

FIR, ALPINE (*Abies lasiocarpa*)

Matting caused by Herpotrichia sp.

Idaho

Yellow witches broom caused by Melampsorella elatina (Alb. & Schw.) Arth.

Utah

FIR, RED (*Abies magnifica*)

Witches broom caused by Razoumofskya occidentalis abietina (Engelm.) Coville

Oregon

California - in the Mt. Shasta region of northern California this mistletoe causes the witches broom of red fir; infected branches are commonly killed by the parasite; impossible to estimate aggregate damage, but on the whole not serious. (JSB)

FIR, NOBLE (*Abies nobilis*)

Witches broom caused by Razoumofskya occidentalis abietina (Engelm.) Coville

Oregon

FIR, SHASTA (*Abies shastensis*)

Stringy brown heartwood rot caused by Echinodontium tinctorium Ell. & Ev.

Oregon

California - most prevalent in Mt. Shasta region of the northern part of state. (JSB)

Occasional throughout range of the host, small amount of loss caused. (JSB)

FIR (*Abies* spp.)

Witches broom, cause unknown.

Washington

Cladosporium sp.

Rhode Island (JFC)

Cytospora pinastri Fr.

Wisconsin (JFC)

Fusicoccum abietinum (Hart.) Prill. & Del. = (Phoma abietina Hart.)

New Hampshire (JFC)

Macrosporium sp. or Alternaria sp.

Indiana (JFC)

Pestalozzia sp.

District of Columbia (JFC)

Brown root and butt rot caused by Fomes annosus Fr.

Oregon - infrequent in western part of state on fallen logs and upturned roots of fallen trees.

Rot caused by Trametes carnea Wettst.

Oregon - the most common wood-destroying forms on fallen *Abies* spp. in western Oregon.

Rot caused by Polyporus fissus Berk.

One of the common wood destroying forms found on down logs in western Washington and Oregon. (SMZ)

Red-brown root and butt rot caused by Polyporus schweinitzii Fr.

Common in western Washington and Oregon, but no special survey has been made. (SMZ)

DOUGLAS FIR (*Pseudotsuga taxifolia*)

The loss through decay in stands of Douglas fir in the Pacific Northwest is very large according to Dr. J. S. Boyce, Forest Pathologist, Office of Forest Pathology. He states that in certain cases the cull figure may reach 50% or more and that a loss of 20% in overmature stands is the rule rather than the exception. It is only in young stands of second growth that Douglas fir is relatively sound.

Dr. Boyce also states: "Four species of wood destroying fungi are responsible for all but an infinitesimal portion of the decay found in Douglas fir and these fungi are very widespread. They are the ring scale fungus (Trametes pini (Thore) Fr.) causing decay known as conk rot which extends throughout the tree, the velvet top fungus (Polyporus schweinitzii Fr.) causing red-brown butt rot usually confined to the stump and butt log, the quinine fungus (Fomes laricis (Jacq.) Murr.) causing brown trunk rot which extends throughout the tree, and the rose colored Fomes (Fomes roseus) (Alb. & Schw.) Cke.) causing yellow-brown top rot commonly found in the upper portion of the bole or in the top. Of these, conk rot causes by far the greatest loss. Measurements of 170 mature, merchantable trees showed a total loss from decay of 45 per cent distributed as follows: conk rot, 39 per cent; red-brown butt rot, 2.5 per cent; brown trunk rot, 2 per cent and yellow-brown top rot, 1.5 per cent. In western Washington and Oregon fungi cause losses of from 20 to 50% or more of the merchantable timber in over mature stands."

Conk rot caused by Trametes pini (Brot.) Fr.

Washington (JSB)

Oregon (JSB)

The most common fungus destructive to merchantable timber in western Oregon.

Red-brown butt-rot caused by Polyporus schweinitzii Fr.

Washington (JSB)

Oregon (JSB)

Commonly found but not such a serious factor as Trametes pini. (SMZ)

Brown trunk rot caused by Fomes officinalis Fr.

Washington. (JSB)

Oregon (JSB)

Occasionally found.

Yellow-brown top rot caused by Fomes roseus (Alb. and Schw.) Cke.

Dr. S. M. Zeller says that the European form is seldom found but that a thin form which he is calling Trametes carnea is the most common fungus found on fallen logs in western Oregon.

Oregon (JSB)

Needle blight caused by Phacidium sp.

Oregon - occasional, retards growth of young trees. Ref. Jour. Agr. Res.: 10, No. 2, p. 99. (JSB)

Witches broom caused by Razoumofskya douglasii (Engelm.) Kuntze

Oregon (JSB)

Dr. Boyce reports that false mistletoe is serious but that fortunately it does not occur in the typical rain forests west of the Cascade Mountains and north of the Umpqua-Rogue River divide, and he continues, "but it is very frequent in southern and eastern Oregon and eastern Washington. Infected trees develop enormous brooms, in many cases the entire crown of large trees becomes a huge witches broom. Mature trees may be killed and the rate of growth of infected trees is much reduced."

Rust caused by Melampsora albertensis Arth.

Oregon - eastern part of state, occasional occurrence. (JSB)

California - northern section of state, occasional occurrence. (JSB)

Needles of the season are attacked but the resulting injury to the host is very slight, normally found on small saplings. (JSB)

Phomopsis disease caused by Phomopsis pseudotsugae Wilson

Reported as occurring in England and Scotland where the disease attacks stems and branches, causing swelling above affected area, cracking of bark or around edge of canker, girdling branch and causing death. In some cases the effect is very similar to Botrytis attack. Mention of this disease is made at this time in hopes that all interested in diseases of conifers will keep an open eye for any indication of this disease in the United States. Following are two references:

Acock, N. L. A Phomopsis disease of Douglas fir. Gardiner's Chronicle III, 59: 45, Jan. 22, 1921, No. 1778.

Wilson, Malcolm. The diseases of the Douglas fir. Trans. Royal Scot. Arboricult. Soc., 35: 77-78. Sept. 1921.

Sap rot caused by Fomes pinicola (Fr.) Cke.

Washington.

Polyporus volvatus Pk.

Idaho - severe.

"Although this is not usually regarded as a tree disease in any of the general texts, states Dr. Henry Schmitz of the Forestry College, University of Idaho, "it is my opinion that it is one of the most

important. Field observations tend to indicate that the fungus comes in after trees have been injured by fire. The fungus seems to be parasitic, killing the bark, cambium and sapwood. I have observed fruiting bodies of this fungus in trees having a green healthy foliage and on trees which have evidently been killed by the fungus. This fungus would bear further investigation."

Sparassis radicata Weir

Montana, Idaho, Washington, and Oregon.

Needle blight caused by an undetermined fungus of the Stictidaceae
Montana and Idaho.

Meruliosa caused by ^{MERULIUS} ~~Meruliosse~~ americanus Burt and M. brassicaefolius Schw.
Oregon - rather common in western part of state.

These two fungi evidently do considerable damage in dimension timbers, both in the natural stands and in structures. (SMZ)

Damping off (cause unknown)

California - often rather serious in seed beds, acid treatment seems to give good protection. (WM)

Meteorological effects

California - cold winds or quick climatic changes in spring often cause death of new growth twigs and leaders. (WM)

Smoke poisoning

California - This host is quite sensitive to coal smoke in cities; in San Francisco and vicinity many trees have died from this. (WM)

HEMLOCK (Tsuga canadensis)

Twig blight caused by Cenangium balsameum var. abietis Pk.

Pennsylvania - On recently killed suppressed hemlocks, not known certainly to be a parasite. (LCO)

Leaf cone and twig rust caused by Melampsora abietis canadensis (Farl.) Ludwig

Pennsylvania - Almost entirely absent on trees where it was rather abundant in 1920. (LCO)

Wisconsin

Leaf rust caused by Pucciniastrum myrtilli (Schum.) Arth. = (Peridermium Peckii Thum.)

Pennsylvania - central part of state; on an occasional leaf only as first observed June 23 when aecia were just bursting in two parallel rows on the lower surface. Vaccinium abundant in the locality where rust was found on needles. (LCO)

Ganoderma tsugae Murr. = (Fomes tsugae (Murr.) Sacc.)

Massachusetts (JFC)

Peridermium sp.

North Carolina, Wisconsin.

HEMLOCK, WESTERN (*Tsuga heterophylla*)

Stringy brown rot caused by Echinodontium tinctorium Ell. & Ev.

Washington (JSB)

Oregon - a resupinate form occasionally found

This rot of the heartwood appeared to be the most destructive decay of hemlock in the Pacific Northwest and is probably widespread throughout the range of the host. (JSB)

Heart rot caused by Trametes pini (Brot.) Fr.

Washington - not uncommon. (JSB)

Oregon - infrequently observed.

Sulphur heart rot caused by Polyporus sulphureus (Bull.) Fr.

Washington (JSB)

Root and butt rot caused by Fomes annosus (Fr.) Cke.

Washington - occasional, apparently causes little loss. (JSB)

S. M. Zeller notes its occurrence in the Pacific Coast Range as infrequent.

Red-brown sapwood rot caused by Fomes pinicola Fr.

Washington - occasional, resulting loss minor. (JSB)

This fungus commonly occurs on dead trees but is sometimes found causing decay of living trees. (JSB)

Not uncommon on standing hemlock and a real factor in decay of fallen logs. (SMZ)

Rust caused by Caeoma dubium Ludwig

Washington (JSB)

Sooty mold caused by Dimerisporium sp.

Washington - occasional throughout range of host, apparently causes no injury, or if it does it is very slight. (JSB)

Witches broom caused by Razoumofskya tsugensis Rosend.

Washington, Oregon. (JSB)

The false mistletoe causes pronounced witches brooms which reduces the increment of the host. Not severe in western Washington and Oregon. (JSB)

HEMLOCK, MOUNTAIN (*Tsuga mertensiana*)

Black felt-blight caused by Herpotrichia nigra Hart.

Oregon (JSB)

HEMLOCK (*Tsuga* spp.)

Pestalozzia sp.

New Jersey

Stysanus sp.

West Virginia (JFC)

Scorch caused by weather conditions

Connecticut

JUNIPER, SOUTHERN RED (*Juniperus barbadensis*)Nursery blight caused by Phoma sp.

Reported found in Pennsylvania, Illinois, Iowa, Nebraska, and Kansas.

JUNIPER, DWARF (*Juniperus communis*)Juniper needle cast caused by Lophodermium juniperinum (Fr.) de Not.

Washington, Oregon. (JSB)

In the instances of these findings the fungus was only weakly if at all parasitic. (JSB)

Rust caused by Gymnosporangium sp.

New Hampshire (JFC)

JUNIPER (*Juniperus communis depressa*)Rust caused by Gymnosporangium clavipes Oke. & Pk.

Wisconsin

Rust caused by Gymnosporangium davisii Kern

Wisconsin

Rust caused by Gymnosporangium clavariaceforme (Jacq.) DC.

Wisconsin

JUNIPER (*Juniperus communis sibirica*)Nursery blight caused by Phoma sp.

Pennsylvania, Illinois, Iowa, Nebraska, and Kansas.

JUNIPER, WESTERN (*Juniperus occidentalis*)Heart rot caused by Fomes juniperinus Schrenk

Oregon (JSB)

Probably occurs throughout the range of the host. This fungus causes a great deal of decay which causes considerable loss when the trees are worked up for posts or pencil stocks. (JSB)

Sooty mold caused by Torula sp.

Oregon (JSB)

Probably occurs throughout the range of the host. Although this fungus was found growing on the resin from the glandular pits of the scale-like leaves it apparently was causing no injury. (JSB)

Leafless true mistletoe - Phoradendron ligatum Trelease

Oregon - occasionally found. (JSB)

Witches brooms caused by Gymnosporangium kernianum Bethel

Oregon (JSB)

Sometimes found. Causes a broom formation which is dense, compact and often globose in shape. (JSB)

JUNIPER (*Juniperus pachyphloea*)

Rust caused by Gymnosporangium gracilens (Pk.) Kern & Bethel
New Mexico

Nursery blight caused by Phoma sp.

Found in Pennsylvania, Illinois, Iowa, Nebraska and Kansas

JUNIPER (*Juniperus prostrata*)

Nursery blight caused by Phoma sp.

Found in Pennsylvania, Illinois, Iowa, Nebraska, and Kansas.

JUNIPER, ROCKY MOUNTAIN (*Juniperus scopulorum*)

Rust caused by Gymnosporangium juvenescens Kern
Utah.

Rust caused by Gymnosporangium nelsoni Arth.
Utah

Nursery blight caused by Phoma sp.
Kansas

JUNIPER (*Juniperus sibirica*)

Rust caused by Gymnosporangium juniperinum (L.) Mart.
Utah

JUNIPER (*Juniperus utahensis*)

Rust caused by Gymnosporangium inconspicuum Kern
Utah

Rust caused by Gymnosporangium nelsoni Arth.
Utah

JUNIPER (*Juniperus virginiana*)

Dothidea sphaeroidea Cke.
Louisiana

Rust caused by Gymnosporangium germinale (Schw.) Kern = (Gymnosporangium clavipes Cke. & Pk.)

Found in New York, Pennsylvania, and Iowa.

Rust caused by Gymnosporangium globosum Farl.

Reported in Massachusetts, Pennsylvania, West Virginia, Wisconsin, Minnesota, Iowa, Kansas, and North Dakota.

Rust caused by Gymnosporangium juniperi-virginianae Schw. = (Gymnosporangium macropus Ik.)

Reported from Pennsylvania, New Jersey, Virginia, West Virginia, Georgia, Alabama, Wisconsin, Minnesota, Iowa, Nebraska, South Dakota, and Montana.

Rust caused by Gymnosporangium juvenescens Kern
Wisconsin

Rust caused by Gymnosporangium spp.

Massachusetts (JFC), New Jersey (JFC), Maryland, West Virginia, North Carolina, Iowa, North Dakota, South Dakota, and Montana (JFC).

Nursery blight caused by Phoma sp.

Pennsylvania, Illinois, Minnesota, Iowa, Nebraska, and Kansas.

Root rot caused by Polyporus purpureus Fr.

Iowa

Sphaeropsis juniperi Pk.

New York (JFC)

Macrosporium sp.

Kansas (JFC)

Fomes annosus Fr.

District of Columbia (JFC)

Cytospora sp.

Massachusetts (JFC)

Diplodia sp.

Pennsylvania

Chlorosis - non parasitic

Kansas

Winter injury

Kansas

Nursery blight - undetermined

Nebraska and Kansas

Heart rot - undetermined

Maryland

Root rot - undetermined

Alabama (JFC)

JUNIPER (*Juniperus* spp.)

Rusts caused by Gymnosporangium botryosites (Schw.) Kern

Massachusetts, Rhode Island, Connecticut, New Jersey, Pennsylvania and Alabama

Gymnosporangium clavariaeforme (Jacq.) DC.

Vermont and Michigan

Gymnosporangium germinale (Schw.) Kern = (Gymnosporangium clavipes Oke. & Pk.)

Connecticut (JES)

Pennsylvania (GHS)

South Carolina - caused some damage to ornamental cedars near headquarters, Camp Jackson.

Reported in previous years from New York, New Jersey, Pennsylvania and Iowa.

LARCH (*Larix laricina*)

Larch willow rust caused by Melampsora bigelowii Thüm.
Wisconsin (JJD)

Larch-birch rust caused by Melamosporidium betulinum (Pers.) Kleb.
Wisconsin (JJD)

Heartwood rot caused by Trametes pini (Brot.) Fr.
Minnesota

LARCH, WESTERN (*Larix occidentalis*)

Brown trunk rot caused by Fomes officinalis Fr.
Oregon (JSB)

Probably distributed over range of host and causing considerable loss. (JSB)

Red brown heartwood butt rot caused by Polyporus schweinitzii Fr.
Oregon (JSB)

Probably distributed throughout range of the host. (JSB)

Heartwood rot caused by Trametes pini (Brot.) Fr.
Oregon (JSB)

Probably found throughout range of the host. (JSB)

Needle cast caused by Hypodermella laricis Tub.
Oregon (JSB)

Small trees are sometimes almost defoliated.

Larch mistletoe caused by Razoumofskya laricis Piper

Idaho - moderately important, very common on larch in certain sections of the Payette Lake region.

Oregon (JSB)

The mistletoe is widespread. It causes large witches' brooms which may ultimately result in the death of the tree. The rate of growth is greatly reduced and many trees are deformed by this disease. (JSB)

Needle blight caused by Lophodermium laricinum Duby

Idaho

Washington

Yellow root rot caused by Sparassis radicata Weir

Occurs in Montana, Idaho, Washington, and Oregon.

LARCH (*Larix* spp.)

Canker caused by Dasyscypha willkommii Hart.
Michigan

Parchment pore fungus rot caused by Polystictus pergamenus Fr.
Minnesota

Valsa abietis Fr.
Ohio

Phomopsis pseudotsura

Wilson, Malcolm. A new recorded disease on Japanese larch. Trans. R. Scott. Arbor. Soc. 35: 73-74. September 1921.

Neria lariois Vuill.

Hiley, W. E. The larch needle-cast fungus. Quart. Journ. For. 15: 57-62. illus. pl. Jan. 1921. No. 1. Literature cited: p. 62.

Gymnosporangium globosum Farl.

Connecticut (JLS)

Minnesota

Reported previously from Connecticut, New York, Virginia, West Virginia, Mississippi, Texas, Oklahoma, and Kansas.

Gymnosporangium juniperi-virginianae Schw. = (Gymnosporangium macropus Lk.)

Connecticut (JLS), Pennsylvania, Maryland (JFC), Virginia (JFC), Ohio - considerable in some localities, the disease is recognized to be confined to southern Ohio (ROT), and Minnesota.

Reports to Plant Disease Survey in previous years from Massachusetts, Connecticut, New Jersey, New York, Pennsylvania, Delaware, West Virginia, South Carolina, Alabama, Oklahoma, Ohio, Illinois, Minnesota, Iowa, Nebraska, and Kansas.

Gymnosporangium nelsonii Arth.

Utah

Gymnosporangium nidus-avis Thaxt.

Found in Massachusetts, New York, and Nebraska.

Gymnosporangium spp.

Massachusetts, Colorado.

Blight caused by Pestalozzia funerea Desm.

Illinois

Blight caused by Pestalozzia sp.

Michigan

Nursery blight caused by Phoma sp.

Rhode Island, Pennsylvania, (JFC)

Indiana - local, moderate amount of damage. (HET)

PINE (Pinus attenuata)

Lodgepole pine mistletoe caused by Razoufifskyia americana (Nutt.) Kuntze

Reported from Oregon

PINE, AUSTRIAN (Pinus austriaca)

Rust caused by Cronartium sp.

Ohio, Nebraska

Canker caused by Nectria cucurbitula Sacc.

Pennsylvania - local, severe; a number of trees on an estate badly

damaged. (CMS)

Twig blight caused by Physalospora cydoniae Arnaud
Connecticut

Dieback caused by Diplodia sp.
New Jersey

Winter injury and killing
Connecticut, Kansas

Blight - cause unknown

Pennsylvania - Fernhill Park, Germantown, Philadelphia, June 6, about one third of a planting of young Austrian pine were affected, the young leaves had a burnt appearance. (AM)

Macrosporium sp.
New Jersey (JFC)

Mycosphaerella tulasnei Jacz.
New Jersey (JFC)

Thelephora laciniata Pers.
Rhode Island (JFC)

PINE, LODGEPOLE (*Pinus contorta*)

Brown trunk rot of the heart wood caused by Fomes officinalis Fr. = Fomes laricis (Jacq.) Murr.

Oregon (JSB)

Probably found throughout range of host, aggregate loss small. (JSB)

Red brown butt rot of the heartwood caused by Polyporus schweinitzii Fr.
Oregon (JSB)

Probably found throughout range of host. Infected trees are often broken off near the ground level by wind, aggregate loss small. (JSB)

Rust caused by Cronartium cerebrum (Pk.) Hedge. & Long
Idaho

Western pine gall rust caused by Cronartium harknessii (Moore) Meinecke
Washington - San Juan Island (SMZ)

Oregon - both galls and small witches brooms are formed as the result of infection between Emigrant Camp and Summit. (JSB)

Fusiform galls caused by Cronartium filamentosum (Pk.) Hedge. & Long
Oregon - occasional (JSB)

Probably occurs throughout range of host but not as destructive as C. harknessii (JSB)

Rust caused by Cronartium pyriforme (Pk.) Hedge. & Long
Montana

Rust caused by Cronartium comptoniae Arth.
New Hampshire

Needle cast caused by Lophodermium pinastri (Schrad.) Chev.

Oregon (JSB)

Causes premature shedding of infected needles and reduces increment of heavily infested trees. Very widespread. (JSB)

Needle blight caused by Hypoderma sp.

Oregon - infected needles die. (JSB)

Blight caused by Neopeckia coulteri (Pk.) Sacc.

Oregon (JSB)

Found only at high elevations. Twigs and small branches near ground die, due to death of needles. (JSB)

Lodgepole pine mistletoe caused by Razoumofskya americana (Nutt.) Kuntze

Washington - quite common on Mount Constitution, Orcas Island, as well as on eastern slopes of the Olympic Mountains. (SMZ)

Oregon (JSB)

Throughout range of host, widespread and does considerable damage, causing the formation of huge witches brooms on trees attacked and greatly reduces their rate of growth. (JSB)

PINE, JACK (*Pinus divaricata*)

Rust caused by Cronartium cerebrum (Pk.) Hedgc. & Long

Minnesota

Cronartium comptoniae Arth.

Minnesota

Cronartium pyriforme (Pk.) Hedgc. & Long

Minnesota

Peridermium sp.

Wisconsin

Parchment pore fungus rot caused by Polystictus pergamenus Fr.

Minnesota

Needle cast caused by Lophodermium sp.

Minnesota, Wisconsin

Root gall caused by Fusarium ? (sp.)

Nebraska

Blight, cause undetermined

Nebraska

Rusts caused by Cronartium cerebrum (Pk.) Hedgc. & Long

Mississippi

Caeoma strobilina Arth.

Mississippi

Coleosporium ipomoeae (Schw.) Burr.

Georgia

Rusts caused by Coleosporium solidaginis (Schw.) Thüm.

Delaware - common; Mississippi.

Coleosporium terebinthinaceae (Schw.) Arth.

Alabama

PINE, SPRUCE (*Pinus glabra*)

Rust caused by Peridermium minutum Hedgc. & Hunt

Florida

PINE, SUGAR (*Pinus lambertiana*)

Needle cast caused by Lophodermium pinastri (Schrad.) Chev.

Oregon (JSB)

Common on needles found on the ground and occasionally is weakly parasitic.
(JSB)

Merulius brassicaefolius Schw.

Oregon

Damping off probably caused by Pythium debaryanum Hesse

California - very bad in nurseries. (Wm)

PINE, SWISS (*Pinus montana* var. *mughus*)

Rust caused by Cronartium comptoniae Arth.

New Hampshire

PINE, WESTERN WHITE (*Pinus monticola*)

White pine blister rust caused by Cronartium ribicola Fischer

This disease was found in the Pacific Northwest in the fall of 1921. This is the first time the disease has been found in the West. It has been found at several points in the Puget Sound Region of Washington confined to the cultivated black currant (Ribes nigrum), and two infected eastern white pines (Pinus strobus) were located in a nursery at Mt. Vernon, Washington. This is the first serious epidemic forest tree disease that has appeared on the Pacific Coast. Unless this rust can be eradicated or properly controlled, the future of the commercially valuable western white pine and sugar pine becomes very uncertain. (JSB)

More detailed information on this disease is given under Pinus strobus.

Blue stain caused by Ceratostomella pilifera (Fr.) Wint.

Western white pine is extremely susceptible to blue stain of the sapwood when dried even under the best conditions, provided climatic conditions are suitable for development of the fungus; warm days with high humidity promote staining. Can be prevented by immediate kiln drying.
(JSB)

Reported also from Idaho.

Sparassis radicata Weir

Reported in Montana, Idaho, Washington, and Oregon.

PINE, BISHOP (*Pinus muricata*)

Gall fungus, - probably Peridermium harknessii Moore Am. Auct.

California - in native stands and plantations along coast. (WM)

PINE, MARITIME (*Pinus pinaster*)

A plantation of this species at Chico, California has been dying from one end for several years. This may be due to climatic influences but it looks more like a root disease such as affects "Les Landes" district in France. No evidence of disease is apparent above ground, but all the trees in one half of the plantation have died. The trees are 25 to 30 years old. (WM)

PINE, LONGLEAF (*Pinus palustris*)

Rust caused by Coleosporium laciniariae Arth.

Florida

PINE, BULL PINE (*Pinus ponderosa*)

This species is relatively sound and free from decay. It is rarely that the loss in a stand will amount to more than two percent from all species of wood destroying fungi. (JSB)

Heart rot caused by Fomes officinalis Fr.

Oregon - this rot may extend throughout the heartwood. (JSB)

Distributed throughout range of host. (JSB)

Red rot caused by Trametes pini (Brot.) Fr.

Oregon (JSB)

Distributed throughout range of host, also known as ring scale rot. (JSB)

Red brown butt rot caused by Polyporus schweinitzii Fr.

Oregon (JSB)

Distributed throughout range of host. (JSB)

Western pine gall rust caused by Cronartium harknessii (Moore) Meinecke

Washington, Oregon (JSB)

Causes galls and small witches brooms on infected trees. Occasional throughout range of host, kills infected trees or branches thereof and retards growth. (JSB)

Pine-Comandra rust caused by Cronartium pyriforme (Pk.) Hedge. & Long

Montana, Oregon (JSB), California

Kills young trees. This rust is locally destructive but, due to the fact that the alternate host Comandra is not widespread, the total damage is small.

Pine rust caused by Cronartium comptoniae Arth.

New Hampshire, Michigan, Minnesota.

Pine rust caused by Cronartium cerebrum (Pk.) Hedge. & Long

Pennsylvania - Greenwood Furnace, Huntingdon County, a large gall 6 inches in diameter, found near the base of a western yellow pine in a pine plantation. (LCC)

Needle cast and witches brooms caused by Hypoderma deformans Weir
Oregon (JSB)

Needle cast caused by Lophodermium pinastri (Schrad.) Chev.
Oregon (JSB)

Distributed throughout range of host. May vary from a weak to quite strong parasitic fungus. The variation depends on climatic conditions and also on the individual susceptibility of infected trees. Causes premature shedding of infected needles, attacks older needles. Increment of infected trees reduced. (JSB)

Pacific Slope yellow pine mistletoe - Razoumofskya campylopoda (Engelm.) Piper
Oregon (JSB)

This mistletoe is widespread. It is a serious parasite. Huge witches brooms and distorted trunks commonly result in large trees while many seedlings and saplings are badly deformed or killed outright. The growth of infected trees is reduced in varying degrees, depending on the severity of infection. (JSB)

Canker caused by Cenangium piniphilum Weir

Montana - western part

Idaho - Lake region of northern part of state, of considerable importance on trees 5-25 years or older, thrives best in moist, dense stands, where reproduction is overcrowded.

Washington - eastern section of state.

Weir, James R. Cenangium piniphilum n. sp. an undescribed canker forming fungus on Pinus ponderosa and P. contorta. Phytopath. 11: 294-296. July 1921.

Seedling blight caused by Cladosporium herbarum Lk.
Nebraska

Damping off caused by Fusarium sp.

New Jersey

District of Columbia

Peridermium sp.

Ohio

Discosia sp.

Nebraska

Polyporus volvatus Pk.

Idaho - severe

Winter killing

New Mexico (JFC)

PINE, YELLOW (Pinus ponderosa scopulorum)

Rust caused by Cronartium cerebrum (Pk.) Hedgc. & Long

Nebraska

PINE, TABLE MOUNTAIN (*Pinus pungens*)

Rust caused by Cronartium pyriforme (Pk.) Hedge. & Long = (C. Comandrae Pk.)
 Pennsylvania - Charteroak, Huntingdon County, May 30, 1921, found once on
 a branch of a 15 or 20 year old tree; was fruiting on day found. (LCO)

PINE, MONTEREY (*Pinus radiata*)

Rust probably caused by Cronartium harknessii (Moore) Meinecke
 California - seriously affected with a gall fungus in native stands and
 plantations along the California coast. (WM)

PINE, RED (*Pinus resinosa*)

Leaf cast caused by Lophodermium pinastri (Schrad.) Chev.
 Minnesota

Red-brown sapwood rot caused by Fomes pinicola (Fr.) Oke.
 Minnesota

Pecky wood rot caused by Trametes pini (Brot.) Fr.
 Minnesota

Damping-off caused by Pythium debaryanum Hesse
 Minnesota

Seedling blight caused by Rhizoctonia sp.
 Minnesota

Pitch pine blister rust caused by Coleosporium delicatulum (Arth. & Kern)
 Hedge. & Long
 Vermont

Needle rust caused by Coleosporium solidaginis (Schw.) Thüm.
 Vermont

Blister rust caused by Cronartium comptoniae Arth.
 New Hampshire

PINE, PITCH (*Pinus rigida*)

Rusts caused by Coleosporium laciniariae Arth.
 New Jersey

Coleosporium solidaginis (Schw.) Thüm.
 Connecticut

Cronartium cerebrum (Pk.) Hedge. & Long
 Pennsylvania

Cronartium comptoniae (Pk.) Hedge. & Long
 Occurs in New Hampshire, Vermont, Massachusetts, New York, and New Jersey.
 (JFC)

Leaf cast caused by Hypoderma sp.
 New Hampshire (JFC)

Leaf cast caused by Lophodermium pinastri (Schrad.) Chev.

Rhode Island

Pennsylvania - Charteroak, Huntingdon County, Jan. 30, locally severe, caused yellowing and casting of leaves, also appeared to cause injury and death to entire spur branches before leaves reached maturity, so that affected leaves were much stunted. Leptostroma stage collected on January 30 and perfect stage, May 1909. (LOO)

Rust caused by Peridermium sp.

Ohio

Pestalozzia funerea Desm.

Massachusetts

PINE, SCOTCH (Pinus sylvestria)

Rust caused by Cronartium comptoniae (Arth)

New York, Ohio

Colletotrichum sp.

Ohio - severe in seed beds, kills the growing point of seedling, limited to Lawrence County.

Sphaeropsis sp.

Rhode Island (JFC)

Peridermium sp.

Minnesota

PINE, ICELOLLY (Pinus taeda)

Rusts caused by Coleosporium laciniariae Arth.

Florida

Coleosporium solidaginis (Schw.) Thüm.

New Jersey

Cronartium cerebrum (Pk.) Hedgc. & Long

Louisiana

Cronartium comptoniae Arth.

New Jersey, Georgia

PINE, SCRUB (Pinus virginiana)

Blister rusts caused by Cronartium comptoniae Arth.

Pennsylvania - Stone Valley. A survey of a small area ranging in age up to 30 years, showed 22-1/2% infection. (LOO)

Coleosporium helianthi (Schw.) Arth.

South Carolina

Peridermium sp.

Delaware - most common in Sussex County, very abundant, injures trunk and branch.

PINE, WHITE (*Pinus strobus*)

White pine blister rust caused by *Cronartium ribicola* Fischer

STATUS OF WHITE PINE BLISTER RUST CONTROL IN 1921-22
(Prepared by S. B. Detwiler, Office of Blister Rust Control)

Eastern United States

Severe and wide-spread blister rust infection took place in 1919 on white pine in the New England States and New York. Since it requires three years, as a rule, for blister rust cankers to develop, the extent of this damage first became apparent during the early summer of 1921. Sample plot studies indicate approximately 200 percent increase in canker production occurred in 1919. Infection in 1920 was very light. As a result of increasing damage, much interest has been aroused in the protection of pine woodlots from further ravages of the disease. Positive evidence is now at hand that systematic work in destroying wild and cultivated currant and gooseberry bushes is effective in checking the spread of the rust in areas thus treated. Control areas cleared of the secondary hosts of the blister rust in 1916 and 1918 now furnish convincing evidence of the success of local control measures.

The distance to which currants and gooseberries must be removed to safeguard pine stands does not exceed 900 feet under average conditions. Under favorable conditions, no commercial damage to the pines will result if currants are destroyed within 600 feet, while in other cases, notably cultivated black currants, the bushes must be removed to a greater distance than 900 feet. The sporidia of the blister rust remain alive only for a few minutes after they are blown from currant or gooseberry leaves. This, together with the fact that currant and gooseberry plants are less difficult to exterminate than most weeds, are the chief factors contributing to the success of local control of the blister rust. Cultivated black currants are the most heavily infected of all *Ribes*. They grow tall, usually are located in open spaces exposed to the wind, they have a large leaf surface and retain their foliage very late in the season. In one instance 150 black currant bushes on an exposed hill top infected pines to a distance of 1.7 miles, while 12 infected black currants in a valley, exceptionally well screened, caused very limited infection of pine and for only a few hundred feet.

In 1916, blister rust infection was found generally distributed on *Ribes* on a line from Cape Cod to Lake George and northward to the Canadian border. From 1917 to 1921, the New England States, New York, Wisconsin, and Minnesota cooperated with the Bureau of Plant Industry in developing practical local control measures. Cooperation between these states and the Federal government is continuing for the purpose of securing the widespread application of control measures. The Bureau of Plant Industry has assigned a number of blister rust agents to work in cooperation with the State Forestry Departments and the State Agricultural Extension Divisions. By this means, pine owners are instructed in the methods of work and the cooperating State agency assists the pine owners to do the work effectively.

BLISTER RUST CONTROL DATA, 1921, IN INFECTED EASTERN TERRITORY

State	No. wild and cultivated currants and gooseberry bushes destroyed.	No. acres cleared of wild currant & gooseberry bushes.	Average cost per acre
Connecticut	41,476	8,000	\$0.33
Maine	57,012	156,221	.022
Massachusetts	637,249	32,933	.313
New Hampshire	1,664,156	137,827	.159
Rhode Island	16,574	26,971	.142
Vermont	60,368	6,319	.548
New York	730,587	8,474	2.65
Minnesota	39,773	589	.675
Wisconsin	457,093	8,887	.444
TOTAL	3,704,588	386,221	.187

The low cost of control work in Maine is due to the fact that in the section worked wild currant and goose berry bushes were very few and localized. Consequently large areas were eliminated by advance scouting, as containing no Ribes. The scouts pulled the scattered bushes and marked the Ribes areas for crew work. A total of 152,413 acres were eliminated by the scouts and 3,808 acres worked by the crews. The per acre cost for scouting was only 1.2 cents while the crew work cost forty cents per acre. The average cost for the whole area worked was 2.2 cents per acre.

White pine will continue to be a profitable crop in spite of the ravages of blister rust, because its value is so generally recognized that pine owners seldom fail to act when informed on the situation. In most cases, all that is necessary is to take the pine owner into his woodlot, show him blister rust infection already present, teach him to identify the wild currant and gooseberry bushes, and to systematize the work of uprooting them. The high returns from the white pine growth are sufficient incentive to quick action when the owner realizes the rust is on his pine or nearby, especially when he can be shown pines 7 to 15 inches in diameter that are dead or dying from the disease, as is now the case in a number of localities.

In 1921 the blister rust was found in Pennsylvania on currants and on native pine for the first time in this State. The disease evidently has spread from adjacent infected areas in New York. During the summer of 1922, pine infection has also been found in four localities in Michigan.

Western United States.

The most important development of the year was the discovery of the white pine blister rust in the Pacific Northwest. The original discovery of the rust in the West was made in the Fall of 1921 by Professor J. W. Eastham, Provincial Plant Pathologist of British Columbia. This was on cultivated black currants at Vancouver, B. C. Later, the blister rust was found on cultivated black currants at fifteen or more points on Vancouver Island and the mainland. Professor Eastham found diseased cultivated red currants and cultivated gooseberries at three points in British Columbia but these bushes were infected very lightly and were grown in rows immediately adjacent to heavily infected black currants. An importation of about one thousand white pine seedlings from France to Vancouver, B. C. in 1910 is thought to be the original source of infection. This importation was of course made some years before the establishment of the blister rust quarantine in Canada and the United States. In November, 1921, Dr. Bethel and Mr. Putnam, of the Bureau of Plant Industry, found cultivated black currants infected with white pine

blister rust at Sumas City, Mt. Vernon, Everett, and Port Townsend, Washington. Later, Mr. L. N. Goodding of the Office of Blister Rust Control also found two five-needle pines at Mt. Vernon, Washington, which had blister rust cankers on 1917 wood. Infection apparently took place from adjacent cultivated black currants.

Previous to the above discoveries this disease was not known to occur in any place in North America west of the State of Minnesota. Extensive field surveys during the season of 1922 have shown the following facts:

- (1) The white pine blister rust is widespread throughout the coast pine belt of British Columbia on both pines and Ribes.
- (2) It occurs on both pines and Ribes at Revelstoke and Beaton east of the dry belt in British Columbia, but has not been found on any host plant nearer than a hundred miles north of the international boundary in this region.
- (3) During the summer of 1922 it was found on Ribes in the following counties of western Washington: San Juan, Island, Whatcom, Skagit, King, Pierce, Clallam, Jefferson, Kitsap, Mason, Grays Harbor, and Pacific. The number of localities and number of plants per species is as follows:

<u>Places</u>	<u>Species</u>	<u>No. plants</u>
1	G. divaricata	1
44	R. bracteosum	94
6	Cultivated red	15
106	R. nigrum	709

The disease thus far has not been found on pines in this region except a single canker of 1917 origin at Blaine near the international line in Whatcom County.

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Root, G. A. White pine blister rust work in Oregon. Rept. Bd. Hort. Oregon 16 (1919-20): 176-181. illus. 1921.

Spaulding, Perley. Notes on Cronartium ribicola. (Abstract) Phytopath. 12: 46. Jan. 1922.

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PINE, WHITE (*Pinus strobus*)

Blister rust caused by Peridermium sp.

North Carolina - more prevalent than in previous years.

Leaf cast caused by Hypoderma strobicola Tub.

Pennsylvania - Stone Creek, Huntingdon County - present in a small white pine seeding, apparently only old needles that were about to be shed are attacked, as it was found only on the needles of the previous year's growth; a single needle may be affected and all the cluster may be dead; spores matured in July. (LOO)

Needle cast caused by Lophodermium lineare Pk.

Rhode Island (JFC)

Pennsylvania - Greenwood Furnace, Huntingdon County - found on a few young white pines 12-15 years old, all needles prior to 1920 growth have been shed. Disease noted only on previous year's needles on which the appearance was that the fungus is decidedly parasitic and somewhat destructive; at a distance of a few feet the needles of the previous year have a wilted appearance and are more or less twisted; this fungus is easily distinguished from the other needle cast fungi in that the black apothecia are more or less continuous in lines along the leaf. (LOO)

Needle cast caused by Lophodermium pinastri (Schrad.) Chev.

Pennsylvania - Greenwood Furnace, Huntingdon County - found on five year seedlings at the state nursery, rather severe. (LOO)

Wisconsin

Needle blight - non-parasitic

Maine - There was a rather general turning brown of the white pine trees in the southern part of Maine this year. The injury is characterized by the turning brown of the tips of this year's needles in all parts of the tree. In unusually severe cases, the entire needle, both in this and previous years' growth is affected and the tree dies. Ordinarily, however, recovery without any appearance of permanent injury seems more common. The trouble is very similar to that which caused a good deal of alarm in 1907 and 1908 and was referred to at that time as the 'white pine blight.' There is no sign of disease or insects and the present trouble is apparently entirely physiological. (STD)

"Needle blight" of Pinus strobus has been reported by the Forest Service and by lumbermen many times from 1905 onward. Investigations were begun in 1918. The disease manifests itself as a reddening of the new needles and has been so abundant that certain pine areas have assumed an autumnal coloration in midsummer. The trouble has been variously ascribed to winter injury, late frosts, insects, fungi, etc., and has been confused with winter browning and sulfur fumes injury. It has been discovered that it begins with a killing of the roots, apparently due to a combination of soil peculiarities and drought conditions, hence the root system is not able to supply the sudden demand for water made by the new foliage. Repeated blighting results in the death of affected trees. Hundreds of trees were examined in 1918 and tagged with serially numbered metal disks. Out of 275 healthy trees 2 have since developed blight and under exactly known conditions. Out of 147 trees 6 inches in diameter or less 7 percent have died. Out of all trees over 6 inches in diameter 23.7 percent have died. The results so far show that young stands for the most part recover, but that mature stands are seriously injured. (JHF)

Faull, J. H. Records for four years on the needle blight of Pinus strobus (Abstract) *Phytopath.* 12: 58. January 1922.

Some problems of forest pathology in Ontario. Needle blight of white pine. *Jour. For.* 20: 67-70. Jan. 1922.

Chemical injury

"During the summer of 1921 two non-parasitic troubles of the white pine came under observation. In one case in Massachusetts a lot of 25 to 30 acres of white pines, which appeared from a distance to be totally dead, were found to be still alive, but only the basal portions of the needles were living. Gases from the chimney of a brick kiln about 1/4 mile north were suspected as the cause of the damage. A checking of the weather records, with the dates of burning of the kiln, substantiated the suspicions that such gases (probably SO₂) caused the trouble. Another case of the death of pine trees was along the roadside in New Hampshire. It was found that barrels of calcium chloride for application to the road had been stored under these trees and the salt which seeped into the soil had killed the pines and partially defoliated the elms and birches nearby." (Snell, Walter H. and N. O. Howard. Chemical injuries to white pines. (Abstract) *Phytopath.* 12: 59. Jan. 1922

Armillaria mellea (Vahl.) Quel.

New Hampshire (JFC)

Caliciopsis pinea Pk.

Maine (JFC)

Caenodinium pini B. & C.

Connecticut (JFC)

Caenodinium sp.

New York (JFC)

Cenangium ferruginosum Fr.

Ohio

Coccomyces sp.

Maine (JFC)

Corticium vagum B. & C.

Minnesota

Fusicoccum sp.

New Hampshire (JFC)

Fusoma parasiticum Tub.

Minnesota

Nectria cucurbitula (Tode) Fr.

Vermont

Nectria sp.

Wisconsin (JFC)

Phacidium crustaceum B. & C.

Rhode Island (JFC)

Phoma sp.

New Hampshire (JFC), Connecticut, Wisconsin (JFC)

Physalospora sp.

Pennsylvania - apparently the fungus described by Clinton as a Phoma; produces basal canker on planted white pine, such trees are easily detected by the yellowish cast of the foliage as stated by Clinton, works slowly but eventually results in the death of the tree. (LOO)

Rhizoctonia sp.

Massachusetts

Connecticut

Minnesota

Winter killing

Maine, Massachusetts, Connecticut, Pennsylvania

Leaf scorch

Massachusetts, Connecticut, Michigan

Ectotrophic mycorrhiza

Pennsylvania - slow death of trees showing much stunted needles and perhaps attributed to ectotrophic mycorrhiza, very common, considerable loss. (LOO)

Ohio

PINES (Pinus spp.)

Cenangium ferruginosum Fr.

Ohio

Cladosporium sp.

New York, West Virginia, Indiana, (JFC)

Coleosporium solidaginis (Schw.) Thüm.

New York, New Jersey, Georgia, and Minnesota.

Cronartium cerebrum (Pk.) Hedgc. & Long

Maryland and Georgia

Cronartium comptoniae Arth.

New Jersey and Pennsylvania

Cronartium filamentosum (Pk.) Hedgc. & Long

Washington

Cronartium pyriforme (Pk.) Hedgc. & Long

Connecticut, New Jersey, and Pennsylvania

Diplodia pinea Kickx.

New Jersey (JFC)

Fusarium spp.

Vermont, New York (JFC), Pennsylvania, Illinois, Missouri and Nebraska.

Gallowaya pini (Galloway) Arth.

New Jersey and North Carolina

Hendersonia foliicola Fckl.

District of Columbia

Lophodermium brachysporium Rostr.

New Jersey

Lophodermium pinastri (Schr.) Chev.

Pennsylvania - Huntingdon County - seems most severe on Pinus rigida in vicinity of Charteroak, causing yellowing and casting of leaves, also appears to cause injury and death to entire spur branches before leaves reach maturity. Leptostroma stage collected Jan. 30. Perfect stage May 29. (100)

Washington

Lophodermium sp.

Pennsylvania

Mycosphaerella tulasnei Jacz.

New Hampshire (JFC)

Naemacyclus niveus (Pers.) Fckl.

Colorado - just present

Peridermium sp.

Washington

Pestalozzia sp.

New York (JFC), Pennsylvania

Polyporus osseus Klch.
Massachusetts (JFC)

Septoria parasitica Hart.
Pennsylvania

Razoumofskya americana (Nutt.) Kuntze
Found in Idaho, Oregon, and California

Winter injury
Maine, New York (JFC), New
Jersey, Pennsylvania & Ohio

Razoumofskya campylopoda (Engelm.) Piper
Oregon

Drought
Massachusetts (JFC)

Razoumofskya sp.
Washington

Sun scorch
Massachusetts, New York

Rhizoctonia sp.
Maine, Idaho

Leaf blight - physiological
North Carolina

Scorias spongiosa (Schw.) Fr.
Massachusetts

Undetermined Diseases

Root rot (Ohio), blight (Maine, Vermont, and Rhode Island), seedling blight (Nebraska), Damping off (Iowa), and heart rot (Massachusetts (1916 JFC)).

SEQUOIA (*Sequoia washingtoniana*)

New disease - cause undetermined

California - a planted stand of these trees at Chico, which had grown splendidly up to 25 years old, has been dying for the past five years, the first evidence of the disease is a brownish appearance of the lower crown which gradually ascends until the whole crown is dead, the process takes from six months to a year. So far about one third of the trees have died at irregular intervals throughout the plantation. The trees average 75-100 feet high and 12 to 20 inches, diameter breast high. (WM)

Seedling rot caused by Botrytis douglasii Tub.
Ohio

Cercospora sequoiae Ell. & Ev.
District of Columbia (JFC)

SPRUCE, ENGELMANN (*Picea engelmannii*)

Stringy brown rot caused by Echinodontium tinctorium Ell. & Ev.
Oregon (JSB)

Causes a heartrot in living trees, aggregate damage small. (JSB)

Spruce needle cast caused by Lophodermium sp.

Oregon - causes premature shedding of infected needles, attacks older needles. (JSB)

Blight caused by Herpotrichia nigra Hart.

Oregon - found occasionally at high elevations, kills twigs and branches near ground. (JSB)

Leaf rust caused by Chrysomyxa weirii Jack.

Idaho - importance slight, found only on Engelmann spruce from 2 to 3 inches in diameter.

Oregon

Yellow root rot caused by Sparassis radicata Weir

Occurs in Montana, Idaho, Washington, and Oregon.

SPRUCE, NORWAY (*Picea excelsa*)

Spruce phoma caused by Phoma chonophila Sacc.

Ohio

SPRUCE, BLACK (*Picea mariana*)

Witches' broom caused by Razoumofskyia pusilla Pk. = (Arceuthobium pusillum)

Massachusetts

Rust caused by Melampsoropsis abietina (Alb. & Schw.) Arth. = (Peridermium abietinum)

Michigan

Heartwood rot caused by Trametes pini (Brot.) Fr.

Minnesota

SPRUCE, BLUE (*Picea parryana*)

Rust caused by Peridermium sp.

Utah

SPRUCE, SITKA (*Picea sitchensis*)

Spruce needle cast caused by Lophodermium sp.

Washington (JSB)

Attacks older needles and causes premature shedding. (JSB)

Heartwood rot caused by Trametes pini (Brot.) Fr.

Washington (JSB)

This fungus causes the most extensive decay of all wood destroying fungi in spruce stands. Probably found throughout range of the host. (JSB)

Red-brown butt rot of heartwood caused by Polyporus schweinitzii Fr.

Washington (JSB)

The work of this fungus was particularly noticeable in the wind thrown timber in the Olympic storm zone, sound trees had been uprooted while those with butt rot had been broken off near the ground. (JSB)

SPRUCE (*Picea* spp.)

Rusts caused by Chrysomyxa rhododendroni (DC.) De Bary

Massachusetts

Coleosporium solidaginis (Schw.) Thüm.
Minnesota

Melampsoropsis ledicola (Pk.) Arth.
Washington

Spruce needle-cast caused by Lophodermium sp.
New Hampshire (JFC)

Phoma sp.
Pennsylvania, Virginia (JFC)

Witches broom - cause unknown
Washington

Leaf scorch
New York, Kansas

Drought
New York - probably common

YEW, WESTERN (*Taxus brevifolia*)

Needle blight caused by Mycosphaerella taxi Cke.
Washington, Oregon. (JSB)
Kills infected needles. (JSB)

DISEASES OF HARDWOODS

ALDER, MOUNTAIN (*Alnus tenuifolia*)

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.
Oregon - caused little or no damage. (JSB)

ALDER, RED (*Alnus oregona*)

Catkin deformation caused by Exoascus tosquinetii Sacc.
Oregon (JSB)

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.
Oregon - on leaves, little or no damage. (JSB)

Leaf spot caused by Septoria alni Sacc.
Oregon - little or no damage. (JSB)

ALDER (*Alnus* spp.)

Leaf spot caused by Cylindrosporium vermiforme Davis
Pennsylvania - Bear Meadows - first collection of this unique species. (LOO)

Leaf spot caused by Leptothyrium alneum (Lev.) Sacc.
Pennsylvania - on Alnus rugosa, Bear Meadows; caused a moderate amount of damage, formed discolored areas instead of definite spots. (LOO)

Catkin deformation caused by Exoascus tosquinetii Sacc. = (Exoascus amentorum Sadeb.)

Idaho - common on the catkins of alders growing around Payette Lake.

Lycorrhiza

Washington

Winter injury

Washington

Root galls, cause undetermined

Washington - in western part of state, probably crown gall, large galls similar to those on other plants.

ASH, MOUNTAIN (*Pyrus sitchensis*)

Rust caused by Gymnosporangium nootkatensis (Trel.) Arth.

Washington - the telia occur on the leaves of Alaska Cedar (Chamaecyparis nootkatensis), causes slight injury to the leaves. (JSB)

ASH, AMERICAN MOUNTAIN (*Pyrus americana*)

Fruit rot and canker caused by Glomerella sp.

Indiana - local, causing slight damage, produces a rot of the berry and a canker on the branches. (HET)

Canker caused by Physalospora cydoniae Arnaud

Indiana - canker on main stem of tree which was girdled, death resulted. (CMS)

ASH, OREGON (*Fraxinus oregona*)

Leaf blight caused by Cylindrosporium californicum Earle

Oregon - when severe it causes a premature browning of the leaves. (JSB)

Leaf blotch caused by Phyllosticta viridis E. & K.

Oregon (JSB)

ASH (*Fraxinus* spp.)

Leaf spot caused by Cercospora fraxinites Ell. & Ev.

Texas - trace, unimportant.

Only report to this office to date of the occurrence of this disease in the United States.

Rust caused by Puccinia peridermiospora (Ell. & Tracy) Arth. = (P. fraxinata (Lk.) Arth. and Aecidium fraxini)

New Hampshire - first report to Plant Disease Survey from this state.

Minnesota - on leaf and twig, unimportant, -in former years has been reported from Massachusetts, Connecticut, New York, Delaware, Maryland,

Virginia, Ohio, Wisconsin, Minnesota, Iowa, North Dakota, and Nebraska.

Leafspot caused by Septoria fraxini Desm.

Minnesota - local in state, unimportant.

Has also been found in Michigan.

ASPLEN (*Populus tremuloides*)

White heartwood rot caused by Fomes igniarius (L.) Fr.

Maine (STD)

BEECH (*Fagus atropunicea*)

White heartwood rot caused by
Fomes igniarius (L.) Fr.
Maine (STD)

BIRCH (*Betula* spp.)

Canker caused by Melanconium betulinum
Schm. & Kze.
Ohio - first appearance in state.
(RCT)

White streaked sapwood rot caused
by Pleurotus ostreatus Jacq.
Maine (STD)

White heartwood rot caused by Fomes igniarius (L.) Fr.
Idaho - quite common on L. occidentalis)

Wood rot caused by Pycnoporus cinnabarinus Karst. = (Folystictus cinnabarinus)
(Jacq.) Fr.)
Washington

Witches broom - cause unknown
Washington

Drought injury caused by extremely dry hot weather.

New York - a few trees were injured or killed, especially where the birches were planted in filled-in lawns.

BUCKEYE (*Aesculus glabra*)

Leaf blotch caused by Guignardia aesculi (Pk.) Stewart = (Phyllosticta paviae
Desm., P. sphaeropsidea Ell. & Ev.)

Ohio - period of greatest injury was during July and August when the host was in full leaf, of considerable importance and becoming more prevalent, all species of *Aesculus* are apparently susceptible.

Iowa - average amount of prevalence, trace of loss.

BUCKTHORN (*Rhamnus* spp.)

Rust caused by Puccinia coronata Oda.
Connecticut (JIS)

New York - much more prevalent than in previous years.

Illinois - especially prevalent in northern part of state.



Fig. 85. Geographical distribution of ash rust in the U. S. as reported to the Plant Disease Survey.

BUCKTHORN (*Rhamnus* spp.)

Rust caused by Puccinia coronata Oda.
Connecticut (JIS)

New York - much more prevalent than in previous years.

Illinois - especially prevalent in northern part of state.

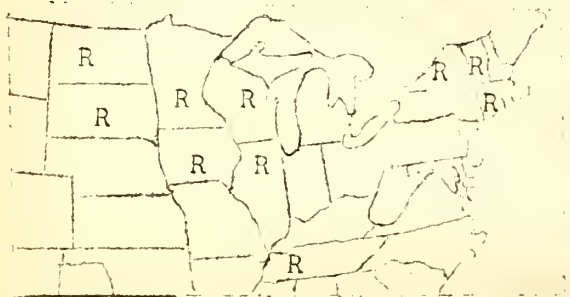


Fig. 86. Distribution of crown rust of buckthorn in the U. S. as reported to the Plant Disease Survey

BUTTERNUT (*Juglans cinerea*)

Anthracose caused by *Gnomonia leptostyla* (Fr.) Ces. & De Not. = (*Marssonia juglandis* (Lib.) Sacc.) (*Gloeosporium juglandis* (Lib.) Mont.)

New York - probably found wherever butternut grows in state, was severe on many trees.

Pennsylvania - leaves yellowing and dying, fungus fruiting nicely. (LOO)

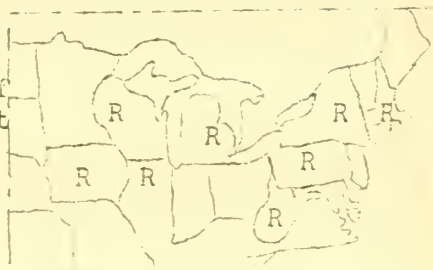
Illinois - prevalence same as preceding years.

Iowa - unimportant during 1921.

Leaf spot caused by *Microstroma juglandis* (Ber.) Sacc.

Pennsylvania - rather common but not severe. (LOO)

Fig. 87. Distribution of anthracnose of butternut in the U. S. as reported to the Plant Disease Survey.



CAMPHOR (*Cinnamomum camphora*)

Anthracose caused by *Gloeosporium camphorae* Sacc.

Texas - not important, trace.

CATALPA (*Catalpa* spp.)

Leaf spot caused by *Phyllosticta catalpae* E. & M.

Connecticut - two reports of occurrence during year.

Indiana - not common.

Fig. 88. Distribution of *Phyllosticta* leaf spot of the catalpa in the U. S. as reported to the Plant Disease Survey



Leaf spot caused by *Phyllosticta catalpae* E. & M.

New York - not important during present year.

Ohio - a moderate amount was general in distribution, causing defoliation, first reported appearance July 18, greatest amount of injury occurred during July when the host was in full leaf, weather favorable to the disease.

Control measures suggested by Dr. Freda Detmers, Ohio Agricultural Experiment Station as follows: "First, the sanitary one of burning fallen infected leaves and second, spraying with Bordeaux mixture (4-6-50

strength), after the leaves have unfolded and again if the spots appear. It may be necessary to repeat the application two or three weeks later." Plant Diseases in Ohio for 1921. Ohio Agr. Exp. Sta.-Ohio State University, page 45.

Powdery mildew caused by Microsphaeraalni vaccinii
(Schw.) Salm.
Ohio - local

Heartwood rot caused by Polystictus versicolor (L.) Fr.
Ohio - undoubtedly very much more common than reported and causes serious damage to the tree by rotting out the heartwood.

BIGNONIA

CATCLAW (Bigonia unguis - cati)

Rust caused by Ravenelia versatilis (Pk.) Diet.
Arizona.

CHERRY, WESTERN CHOKE (Prunus demissa)

Leaf blister caused by Taphrina cerasi (Fckl.) Sade.
Washington - rare. (JSE)

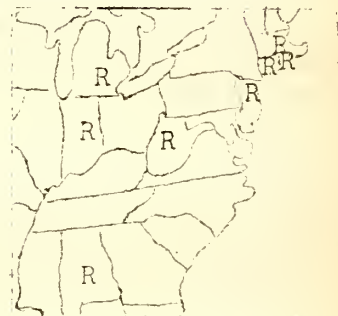


Fig. 89. Distribution of the Macrosporium leaf spot of the Catalpa in the U. S. as reported to Plant Disease Survey.

CHESTNUT (Castanea dentata)

Blight caused by Endothia parasitica (Murr.) And. (Prepared by G. F. Gravatt, Office of Forest Pathology)

"During 1921 the chestnut blight continued its steady spread. In North Carolina the disease was found in five new counties - Rockingham, Forsyth, Iredell, Burke, and McDowell, making a total of thirteen infested counties in that state. In Virginia it was reported from one new county - Craig - and in West Virginia from one new county - Upshur. In all infested areas examined the percent of infected and dead trees increased during 1921. Newspaper reports of the chestnut blight becoming less virulent and of the chestnut stand coming back have so far as investigated proved to be without foundation.

"Two reports of chestnut blight in Indiana sent in by the Department of Conservation, Indianapolis, to the Plant Disease Survey are interesting as a warning to uninfested states with chestnut interests. In one case the blight was found on a nursery tree from Michigan, a state supposed to be free from the disease. On tracing back the source of this infected tree, it was found to have been grown in an old infested nursery in Ohio and had simply been reshipped by the Michigan nursery. In the other case the blight was found in an Indiana chestnut orchard. Chestnut orchards located outside of the native range of the chestnut are liable to become infected from chestnut trees as grown in nurseries within the blight area."

Anthracoze caused by Gloeosporium sp.
Connecticut

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.
Indiana - moderately severe.

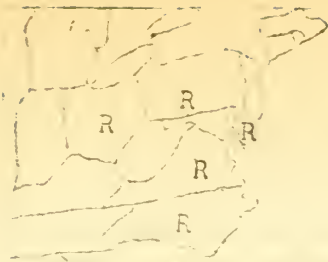


Fig. 90. Geographical distribution of powdery mildew of chestnut in the U. S. as reported to the Plant Disease Survey.

Leaf spot caused by Marssonia ochroleuca D. & C.

Although no reports were received of its occurrence during 1921, it might well have occurred in Maine, Massachusetts, New York, New Jersey, Delaware, West Virginia, North Carolina, and Ohio, as it has been reported from the above states in previous years.

Fig. 91. Geographical distribution of leaf spot of chestnut caused by Marssonia ochroleuca D. & C., in the U. S. as reported to the Plant Disease Survey.



CHINQUAPIN, WESTERN (Castanopsis chrysophylla)

Leaf spot caused by Scirrhia sp.

Oregon - quite common in western Oregon. (JSE)

Probably occurs in Washington. (JSE)

CRAB APPLE, WILD (Pyrus diversifolia)

Rust caused by Cyrenosporanaium nootkatensis (Trel.) Arth.

Washington - the tolia occur on the leaves of Alaska cedar (Chamaecyparis nootkatensis). (JSE)

DOGWOOD (Cornus canadensis)

Leaf rust caused by Fuccinia porphyrogenita Curt.

Washington (JSE)

DOGWOOD (Cornus nuttallii)

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.

Oregon - on leaves is locally quite abundant but causes little apparent injury to the host. (JSE)

DOGWOOD (Cornus sp.)

Leaf spot caused by Cryptomyces maximus (Fr.) Rehm.

Indiana - local, caused very little damage. (NET)

ELDER (Sambucus canadensis)

Powdery mildew caused by Microsphaera grossulariae (Wallr.) Lev.

Ohio

ELM (*Ulmus* spp.)

Anthracose caused by Gnomonia ulmea (Schw.) Thun.

New Hampshire

Connecticut - more prevalent than during average year.

South Carolina

Texas - trace, unimportant.

Ohio - greatest damage during midsummer when host is in full foliage moisture and temperature favorable to disease during season.

Indiana - found over state, moderate amount of damage noticed in a nursery. (HET)

Illinois - throughout state, not important during 1921.

Kansas - moderately severe.

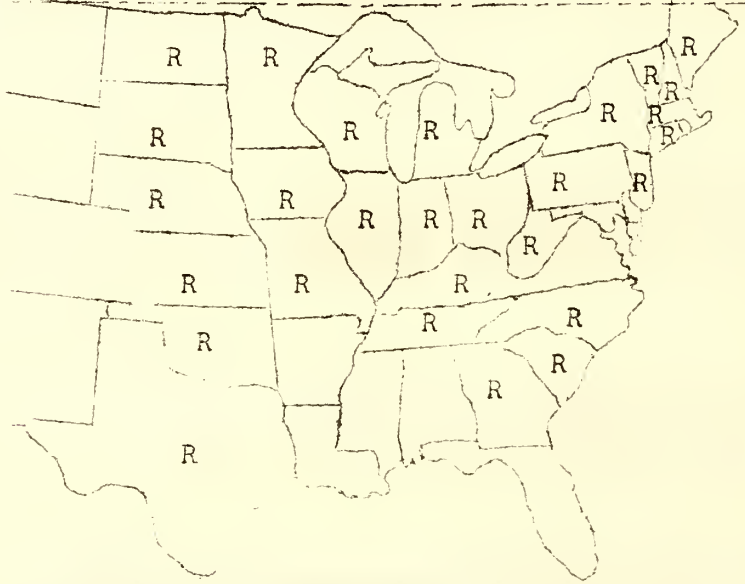


Fig. 92. Geographical distribution of anthracnose of the elm in the U. S. as reported to the Plant Disease Survey.

New York - found in state wherever elms are grown, earliest report in July, only certain trees are badly affected, the branches may intertwine with other elm trees that are wholly free from disease.

Kilian, Charles. Le developpement du Dothidella ulmea (Duv.) Winter. Rev Gen. Bot. 32: 534-551. Pl. 16-19. Dec. 1920. No. 384 Index bibliographique: p. 551.

Powdery mildew caused by Uncinula macrospora Pk.

Ohio - usually found on elms throughout state. (BF)

Root rot caused by Ozonium omnivorum Shear

Texas - prevalent, causes about 1% reduction in the state.

Twig blight caused by Poronidulus conchifer (Schw.) Murr.

Ohio - greatest injury during growing season, produces a defoliation and a death of the twigs, more prevalent than during past years and becoming more important.

Slime flux caused by bacteria, yeasts, etc.

Connecticut, New York.

Canker caused by Sphaeropsis ulmicola Lll. & Ev.

Wisconsin - throughout the southeastern part of state, prevalence increasing, becoming an important disease of the shade tree, may affect the tree at any time or age, starts in nurseries, may be stimulated by injuries.

GUM, COTTON (*Nyssa aquatica*)

Rust caused by Aplopsora nyssae (Ell. & Tr.) Mains = (Uredo nyssae Ell. & Tr.)
Kentucky (EBM), Mississippi (EBM)

HACKBERRY (*Celtis occidentalis*)

Powdery mildew caused by Sphaerotheca phytoptophila Kell. and Swing.

Ohio - on witches broom. (BF)

Also reported found in Indiana, Illinois, Missouri, Iowa, and Kansas.
(Salmon: Monograph of the Erysiphaceae)

Powdery mildew caused by Uncinula parvula Oke. & Pk.

Ohio (BF)

Also reported from Maine, Vermont, Massachusetts, New York, Pennsylvania, South Carolina, Alabama, Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, and Missouri. (Salmon: Monograph of the Erysiphaceae)

Smothering disease caused by Thelephora retiformis

Texas - trace

HAWTHORN (*Crataegus douglasii*)

Rust caused by Gymnosporangium blasdaleanum (D. & H.) Kern

Oregon - cluster-cups are sometimes found on the leaves. (JSE)

HAWTHORN (*Crataegus* spp.)

Canker caused by Phyalospora cydoniae Arnaud

Indiana - local occurrence, trace of damage. (HET)

Fire blight caused by Bacillus amylovorus (Burr.) DeT.

Washington

Cockayne, A. H. Fire blight and its control. The hawthorn question.

New Zealand Journal of Agriculture 23: 30-36, July 1921. No. 1.

Powdery mildew caused by Phyllactinia sp.

Washington

Rust caused by Gymnosporangium globosum Farl.

New Hampshire

Rust caused by Gymnosporangium germinale (Schw.) Kern = (Roestelia aurantiaca Fl.)

Connecticut

Rust caused by Gymnosporangium sp.

Missouri - very common locally.

HAZELNUT (*Corylus californica*)

Leafspot caused by Gnomoniella coryli (Patsch.) Sacc.

Washington (JSB), Oregon (JSB)

Little injury to host. Probably present occasionally wherever hazelnut occurs in the above two states. (JSB)

Leafspot caused by Septoria corylina Pk.

Washington (JSB), Oregon (JSB)

Probably found in western Washington and Oregon throughout range of host.

Where the disease is severe, infected leaves become very much wrinkled and shriveled. (JSB)

HICKORY (*Hicoria* sp.)

Anthracnose caused by Gnomonia caryae Wolf = (Gloeosporium caryae E. & D.)

Illinois - moderately severe

Leafspot caused by Microstroma juglandis (Per.) Sacc.

Pennsylvania - Seven Mountains, June 23; observed at the same time on

Juglans cinerea but it seemed to be much more severe on the hickory, causing dead areas, the leaves were more or less curled or twisted.

(LOO)

HOP TREE (*Ptelea trifoliata*)

Rust caused by Puccinia windsoriae Schw.

Illinois - general on native trees of this host around Hillview, Pike County.

HORNBEEAM (*Ostrya virginiana*)

Leafspot caused by Gloeosporium rofergiae var. dendriticum Davis

Pennsylvania - produces a moderate amount of damage. (LOO)

HORSE CHESTNUT (*Aesculus hippocastanum*)

Leaf blotch caused by Guignardia aesculi (Pk.) Stewart = (Phyllosticta paviae Desm.) (Phyllosticta sphaeropsidea Ell. & Ev.)

Connecticut (Aug. 15) - average amount.

New York - very common and severe wherever horse chestnuts are grown.

New Jersey - abundant, though less prevalent than in 1920.

Virginia - general over state.

Ohio (July 19) - general over state, serious and becoming more prevalent, period of greatest injury was in August when in full leaf.

Illinois - becoming worse; most destructive disease of host in state, general in range throughout state.

Utah - reported from two districts in the state; this appears to be the first appearance of this disease in Utah.

Powdery mildew caused by Uncinula flexuosa Pk.

Ohio - confined to species of *Aesculus* and little known in state. (PF)

Leaf spot caused by Monochaetia desmazierii Sacc.

Indiana - infestation local and slight. (HET)

MAPLE, BROAD LEAF (*Acer macrophyllum*)

Black specked leaf spot caused by Rhytisma punctatum (Pers.) Fr.

Washington, Oregon. (JSB)

This disease is relatively common and widespread over the range of the host in the Washington-Oregon district, but of no importance. (JSB)

Rot caused by Hydnum sp.

Oregon (JSB)

MAPLE, DWARF (*Acer glabrum*)

Leaf spot caused by Septoria acerina Pk.

Oregon (JSB)

MAPLE, VINE (*Acer circinatum*)

Leaf spot caused by Septoria circinata Ell. & Ev.

Washington (JSB), Oregon (JSB)

This disease is apparently widespread in western Washington and Oregon.

Does not injure leaves severely. (JSB)

MAPLE (*Acer* spp.)

Tar leaf spot caused by Rhytisma acerinum Fr.

Connecticut - not bad.

Pennsylvania - central part of state, first noticed June 23 when small spots appeared on seedling of Acer rubrum, some spots bearing the first beginnings of the black stroma; easily distinguished at this stage from the Phyllosticta spot which is brown and not yellow from the first, while tar spot is a rich cream color until the formation of the stroma. (LOO)

South Carolina - on nursery stock.

Ohio

Illinois - general throughout state.

Minnesota - throughout state wherever maple is found, unimportant.

Black specked leaf spot caused by Rhytisma punctatum Fr.

Indiana - generally prevalent but causing very slight damage. (HET)

Orange County: on forest saplings. (WWIG)

Illinois, Idaho

Tar spot caused by Rhytisma sp.

Washington - common on maples in woods of western Washington.

Phyllosticta leaf spot caused by Phyllosticta minima (B. & C.) Ell. & Ev.

Pennsylvania - on A. pennsylvanica, Seven Mountains, moderate amount of damage; on A. negundo, State College, Center County, June 28.

Ohio

Leaf spot caused by Gloeosporium apocryptum Ell. & Ev.

New Hampshire

Ohio - prevalent throughout eastern and northern portion of state.

Wilt caused by *Verticillium* sp.

(Prepared by G. F. Gravatt, Office of Forest Pathology)

"Found in Maryland, District of Columbia, West Virginia, Virginia, North Carolina, Tennessee, and Indiana. This fungus seems to cause a serious disease of the ornamental maples and further work is under way. The disease is probably distributed over the eastern United States as it was found in each locality where a careful search was made."

Virginia - quite generally distributed in state, especially on Norway and Silver maples, also noted by C. M. Scherer and G. F. Gravatt in May.
Indiana (HET)

Powdery mildew caused by *Uncinula circinata* Cke. & Pk.

Ohio (EF)

White butt rot caused by *Fomes applanatus* (Pers.) Wallr.

Maine (STD)

Leaf spot caused by *Cladosporium humile* Davis

Pennsylvania - noted only on a few trees and only late in summer, severe.

Canker caused by *Schizophyllum commune* Fr.

Oklahoma - growing on pruned trees in a dying condition.

Fumago vagans

Connecticut - no damage except unsightliness, following in honey dew of insects.

Erinose

Washington - local.

Sun or leaf scorch

Connecticut - less than in the average year.

New York - severe on many shade trees on lawns and street, more prevalent than in 1920, weather conditions which prevailed were a dry mid-summer and a high temperature.

Indiana - local and slight. (HET)

"During the spring and early summer a great many sugar maples suffered from leaf scorch. Some of these trees were so badly injured that they have since died; a great many others have been severely weakened. The writer does not remember ever seeing so much leaf scorch before. Of the twenty-five hundred sugar maples along our highways about one-third of them suffered from leaf scorch. A few Norway maples also were affected.

"During the summer the writer took several trips through different parts of Westchester County and found the conditions the same as in Mount Vernon.

"The leaf scorch was noticed about the first week in June and by the middle of July was very severe." (Adam G. Henn, City Forester, Mount Vernon)

Oregon - a leaf scorch similar to that described in the Plant Disease Bulletin, Supplement 11, p. 292, appeared to some extent on

maples in Portland, during the late spring and summer of 1921. The cause was not determined. (JSB)

Frost injury - a May frost in 1921 caused slight injury to the tender leaves of various maples around Portland, Oregon. Those species leafing out last naturally suffered most. No serious damage resulted. (JSB)

Winter injury
Washington

Chlorosis caused by excess of lime in soil.
Texas - prevalent in limestone soils, reduction in growth about 10%.

OAK, CHESTNUT (*Quercus prinus*)

Twig blight caused by Physalospora cydoniae Arnaud or Diplodia longispora C. & Ell.

"Twig blight was much less prevalent in Virginia in 1921 than in the two preceding years. It was also noted in 1921 in North Carolina, Tennessee, West Virginia, Maryland, and District of Columbia." (G.F. Gravatt)

OAK, OREGON (*Quercus garryana*)

Piped rot of the heartwood caused by Polyporus rheades Fr. = (Polyporus dryophilus Berk.)

Oregon (JSB)

Powdery mildew caused by Oidium sp.
Oregon - on coppice sprouts, rare. (JSB)

Mistletoe, Phoradendron villosum Nutt.
Oregon - commonly causes large globose swellings on the trunk and branches of infected trees, widely distributed over range of host. (JSB)

OAK (*Quercus* spp.)

Anthraxnose caused by Gnomonia veneta (Sacc. & Speg.) Kleb. (Gloeosporium nervisequum (Fckl.) Sacc.)

Delaware - general throughout northern part of state, spraying with Bordeaux when leaves were about half grown seemed to reduce injury and infection. (CMS)

Wisconsin - generally prevalent around Milwaukee, slight amount of damage. (CMS)

Iowa - common, trace of loss.

Leaf blister caused by Taphrina coerulescens (D. & M.) Tul.
Pennsylvania - on Quercus coccinea, trees 50-70 feet high were heavily infected, practically all leaves showed many diseased spots. (LOO)
South Carolina - unimportant
Ohio

Powdery mildew caused by Microsphaera alni (Wallr.) Salm.
Georgia - infestation slight and local. (BMC)
Indiana - on Q. pedunculata

Strumella canker caused by Strumella coryneoides Sacc. & Wint.

Illinois - common on oak in this locality, first observed in 1919.

Oregon - found at one point only, on dead twigs (sporodochial stage), further search for the canker was fruitless and so it is not considered prevalent.

Leaf spot caused by Marssonina sp.

Pennsylvania - State College, Center County, July 17; observed in good fruiting condition on a species of scrub oak on which it was a serious disease during the current year, most of the leaf area was dead. (LOO)

Canker caused by Schizophyllum commune Fr.

Ohio - it is questioned by authorities as to whether Schizophyllum is parasitic, but many times evidence seems to point that way, this occurrence being one of those instances. (CMS)

Bulgaria polymorpha (Oed.) Wett.

Connecticut

Drouth breakdown

Ohio

PEPPER TREE (Schinus molle)

Timber rot caused by Trametes schini Brown

Arizona - southern part of state; of general prevalence and causing severe damage, infection follows after breaking of branches by storms, careless pruning, etc.

Rot caused by Armillaria mellea (Vahl.) Quel.

California - trees so afflicted begin to die from the top downward and when finally dead the roots stink abominably when dug out, so much so that it takes considerable courage and staying power to stay on the job until it is finished. (JA)

According to L. P. Meinecke these trees were killed by Armillaria and the offensive odor was caused by secondary invasion by bacteria.

PLUM (Diospyros virginiana)

Leaf spot caused by Cercospora fuliginosa Ell. & Kell.

Indiana - local and slight. (MET)

PLUM, INDIAN (Osmaronia cerasiformis)

Leaf spot caused by Septoalgeum nuttallii Harkn.

Washington (JSB), Oregon (JSB)

Causes premature death of severely infected leaves. Widely distributed in western Washington and Oregon. (JSB)

POPLAR, BLACK (Populus trichocarpa)

Rust caused by Melampsora occidentalis Jackson

Washington (JSB), Oregon (JSB)

Little injury as a rule to infected leaves. (JSB)

Yellow leaf blister caused by Taphrina aurea (Pers.) Fr.

Washington, Oregon (JSB).

This disease is widespread. Infected leaves sometimes badly deformed.
(JSB)POPLAR, LOMBARDY (Populus nigra var. italica)Yellow leaf blister caused by Taphrina aurea (Pers.) Fr.

Oregon - infected leaves sometimes very misshapen. (JSB)

POPLAR, WHITE (Populus alba)Rust caused by Melampsora abietis-canadensis (Farl.) Ludw.

Oregon - little injury to infected leaves. (JSB)

POPLAR (Populus spp.)Canker caused by Cytospora chrysosperma (Pers.) Fr.

Ohio - severe locally, period of greatest injury in midsummer during growing season, favorable weather conditions throughout season; Norway poplar especially susceptible.

Indiana - local prevalence. (HET)

Colorado - (Ann. Rpt. State Entom., Colo., Circ. 28)

Arizona

Utah - poplars in various parts of Utah are being rapidly destroyed by this disease, in many cases whole rows of P. alba bolleana will be destroyed, disease also appears severely on P. nigra and P. carolina; severe on P. tremuloides in the mountains, and in some aspen groves 10 to 25% of the trees will be found dead as a result of this disease.Idaho - reported in various parts of the state but not of much importance. Concerning the distribution of the fungus, (Jour. Agr. Res. 13: 331-345) Long says "Cytospora chrysosperma is rather widely distributed in certain sections of the United States, especially in the southwestern states. It ranges from Texas and Kansas northward to Montana and westward to California. It has been found in nine states: Arizona, Colorado, Kansas, Montana, Nevada, New Mexico, North Dakota, South Dakota, and Texas." Hubert (Phytopath. 10: 442-447. 1920) adds Idaho, Washington, and Wyoming, and Povah (Phytopath. 11: 157-165. 1921) adds New York and lists a new host, P. grandidentata for this pathogen. He also reports that "In the diseased area over 68% of the poplars were infected and over 30% killed."Hubert, Ernest E. Observations on Cytospora chrysosperma in the Northwest. Phytopath. 10: 442-447. 1920.

Leach, J. G. Poplar canker. Ann. Rept. State Entom., Colorado 11 (Circ. 28): 46 Col. Pl. Agr. 1920.

Long, W. H. An undescribed canker of poplars and willows caused by Cytospora chrysosperma. Jour. Agr. Res. 13: 331-345. Pl. 27-28. 1918.Povah, A. H. W. Canker disease of poplars in South Africa thought to be identical with Cytospora chrysosperma in America. Jour. Dept. Agr. So. Afr. 2: 310. Apr. 1921.An attack of poplar canker following fire injury.
Phytopath. 11: 157-165. Fig. 1-3. April 1921.

Leaf spot caused by Sclerotium bifrons Ell. & Ev.
Colorado.

Powdery mildew caused by Uncinula salicis (DC.) Wint.
Ohio (BF)

White butt rot caused by Fomes applanatus (Pers.) Wallr.
Connecticut - on roots of a living tree in a yard following injury by crown gall.

White heartwood rot caused by Fomes igniarius (L.) Fr.
Idaho - found generally on Aspen throughout range of host in state.

Heart rot caused by Pleurotus ostreatus (Jacq.) Fr.
Idaho - damage is caused by breaking of trees easily due to wind, after the fungus has attacked the trees.

Canker cause undetermined.
Wisconsin - bad on Lombardy poplar in northwest section of the state.

SERVICE BERRY, WESTERN (Amelanchier alnifolia)

Leaf spot caused by Dimerosporium collinsii (Schw.) Thüm.
Oregon - common in southern part of state, the infected leaves are killed. This fungus also causes the formation of witches brooms on the host. (JSB)

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.
Oregon - causes slight injury. (JSB)

Rust caused by Gymnosporangium blasdaleanum (D. & H.) Kern
Oregon - cluster cups were most abundant on the fruits and stems, causing hypertrophy and were found sparingly on the leaves. (JSB)

Rust caused by Gymnosporangium harknessianum (Ell. & Ev.) Kern
Oregon - this rust caused hypertrophy of the stems and fruit of the host, probably common in southern part of state. (JSB)

SERVICE BERRY (Amelanchier cusickii)

Leaf and fruit blight caused by Sclerotinia gregaria Dana
Washington

SYCAMORE (Platanus occidentalis)

Anthraxnose caused by Gnomonia veneta (Sacc. & Speg.) Klebahn = (Gloeosporium nervisequum (Pckl.) Sacc.

Connecticut - more prevalent than in previous years.

New Jersey

Maryland - trees near Baltimore badly affected. (FWB)

Ohio - severe, causing defoliation and death of shoots, period of greatest injury during June and July.

Iowa - much less than in the past five years.

Indiana - worse than in previous years, bad on ornamental sycamores.

Utah - The American varieties of sycamore throughout the state were entirely defoliated during the spring. With the advent of dry weather, however, the trees recovered and nothing but the dead and cankered twigs at present show the effects. The European varieties appeared to be highly resistant showing very little trouble even when surrounded by diseased individuals of the American type.

Powdery mildew caused by Microsphaera alni (Wallr.) Salm.
Delaware - serious injury to young growth.

Winter injury
Ohio

Blight or leaf curl, caused undetermined
Pennsylvania - the native Plane tree (Platanus occidentalis) throughout the rural district surrounding Philadelphia is afflicted with a blight or leaf curl similar to that of the American Beech. The leaves burn at the edges, curl up and die. Not all of the trees are so affected, but large specimens here and there are very conspicuous as one motors along the country roads. Possibly the frost of March 29 had something to do with it. (AM)

TULIP TREE (Liriodendron tulipifera)

Anthracose caused by Colletotrichum sp.

Pennsylvania - occupying a few dead areas on leaves bearing also Discosia artocreas (Tode) Fr. (LOO)

Leaf spot caused by Discosia artocreas (Tode) Fr.

Pennsylvania - occupying definite dead spots, circular in outline. (LOO)

UMBRELLA TREE (Melia sp.)

Texas root rot caused by Ozonium omnivorum Shear

Texas - prevalent, 2% loss.

Arizona

WALNUT (Juglans spp.)

Leaf spot caused by Gnomonia leptostyla (Fr.) Cv. & De Not. = (Narssonia juglandis (Lib.) Sacc.)

New York - limbs dying and the leaves on the tree noticed were badly spotted.

Illinois

Iowa - rare

Powdery mildew caused by Phyllactinia corylea (Pers.) Karst.

Ohio - on Juglans nigra (BF)

Crown gall caused presumably by Bacterium tumefaciens EFS & Town.

Arizona - on Juglans rubestris in southern part of state, May, local, causing a moderate amount of damage.

Frost injury

Maryland - on Juglans cordiformis, branches were killed.

WILLOW (Salix spp.)

Rust caused by Melampsora bigelowii Thüm.

Pennsylvania (LOO)

Minnesota - not important.

Washington (JSB)

Oregon - widespread throughout range of host, causing premature yellowing of infected leaves which may drop from the tree. (JSB)

Rust caused by Melampsora confluens (Pers.) Cast.

Oregon - occasional occurrence throughout range of the host, little injury to the leaves. (JSB)

Rust caused by Melampsora sp.

Pennsylvania - appeared more abundantly than in 1920 on stems of basket willow. (LOO)

Iowa - common

Idaho - common in northern part of state.

Washington

Powdery mildew caused by Uncinula salicis (DC.) Wint.

Washington - common, trace of injury.

Oregon - causes little injury to host. (JSB)

Rot caused by Fomes applanatus (Pers.) Wallr.

Oregon (JSB)

This fungus is a wound parasite on living trees. Occurrence rare. (JSB)

White heartwood rot caused by Fomes igniarius (L.) Gill.

Oregon (JSB)

Tar spot caused by Rhytisma salicinum Fr.

Washington, Oregon.

Probably widespread throughout range of host in western Washington and

Oregon, causes little injury to host. (JSB)

Crown gall caused by Bacterium tumefaciens EPS. & Town.

Connecticut - slight injury, a new host to state.

Texas - trace, mostly aerial galls.

Leaf blight caused by Cylindrosporium sp.

Washington

Twig spot caused by Marssonina sp.

Washington

WITCH HAZEL (Hamamelis virginica)

Leaf spot caused by Phyllosticta hamamelidis Cke.

Pennsylvania - When found on June 9 some spots were 3 cm. in diameter, involving considerable leaf area. Later in the season the spots may be even larger and the characteristic dark red brown areas

resemble injury by sunscald. Observations on the above data show as conclusively as can be shown with controlled inoculations that this fungus is primarily responsible. Small dead areas circumscribed by a very narrow dark line are the earlier evidence of infection. Spots 6 mm. in diameter are found producing pycnidia. Later in the season a coremium forming imperfect fungus also appears but is undoubtedly entirely saprophytic. There is a distinct tendency for the pycnidia to be formed in lines along the veins of the leaf. (LCO)

DISEASES OF ORNAMENTAL PLANTS

AMPELOPSIS SPP.

Leaf spot caused by Guignardia bidwellii (E.) V. & R. = (Phyllosticta ampelopsidis)

Illinois - common on host everywhere, worse than in 1920.
Indiana

Downy mildew caused by Plasmopora viticola (B. & C.) Berl. and De Ton.
Pennsylvania - on A. quinquefolia

Powdery mildew caused by Uncinula necator (Schw.) E. & E. = (U. ampelopsidis Pk.)
Delaware - on A. quinquefolia

Canker caused by Nectria cinnabarina Fr.

Idaho - very slight, found on vines which seemed to have suffered winter injury.

Leaf spot caused by Septoria hederæ West.

Indiana - local and slight. (HET)

ANEMONE (Anemone sp.)

Leaf spot caused by Alternaria sp.

Ohio - first report of this disease from this state, negligible in importance.

ASTER, CHINA (Callistephus chinensis)

Wilt caused by Fusarium conglutinans callistephi Beach

New York - severe, in Genesee County 25,000 plants were affected.

Virginia - caused very severe damage in a greenhouse at Richmond.

Ohio - general distribution serious and of much greater prevalence than in 1920, 25% loss the maximum in any one field, earliest reported appearance 1921 was in June, the peak of greatest injury occurred in late June and early July at the time of transplanting, both moisture and temperature conditions were favorable to the disease.

Indiana - has become a limiting factor in aster growing within the state, bad in greenhouses and garden plots.

Illinois - probably distributed over entire state, disease very pronounced in 1921, greater amount than average year, very important locally

from 50 to 75% of plantings in the state infested, 10% of plants infested caused a reduction of about 10%, attacks worst in July and August at the time of flowering and before, low moisture and high temperature prevailed during growing season, practically all varieties were attacked, no remedies known.

Michigan - common everywhere, - depending on nature of planting stock.

North Dakota - less prevalent than in 1920.

Idaho

Oregon - first report

Yellows, cause unknown

New York

Pennsylvania - severe locally.

Illinois - probably found throughout state, a more pronounced prevalence in 1921, period of greatest injury July and August before flowering; all varieties seem susceptible; weather relations during year consisted of a low moisture and a high temperature. (PAL)

Rust caused by Coleosporium solidaginis (Schw.) Thüm.

New York

Pennsylvania

Leaf spot caused by Septoria callistephi Gloyer

Illinois - serious on young plants growing in the University greenhouse.

First report in Illinois.

This is the first definite report to the Plant Disease Survey of the occurrence of this disease from states west of New York. In 1920 Michigan reported a leaf trouble caused by Septoria sp.

BACHELORS BUTTON (*Centaurea* sp.)

Rhizoctonia rot caused by Rhizoctonia sp.

Indiana - local, infection slight, caused a rotting of the stems.

BARBERRY (*Berberis* spp.)

Rust caused by Puccinia fendleri (T. & E.) Jackson

Washington - on Berberis aquifolium

Rust caused by Puccinia mirabilissima Pk.

Washington - on Berberis aquifolium

Rust caused by Puccinia graminis Pers.

(See wheat stem rust, Pl. Dis. Bul. Suppl. 21: 166-176. 1922)

Angular leaf spot caused by ~~Bacteria~~ ^{bacteria} sp.

Illinois - in northern portion of state, causes spotting of leaves.

Idaho

BEGONIA (*Begonia* sp.)

Leaf blight caused by Botrytis sp.

Indiana - general and slight, appears to be spread in greenhouses by mites and ants. (HET)

CALENDULA OFFICINALIS

Rust caused by Puccinia recedens Syd.

Illinois, Nebraska

Has not been previously reported in the United States.

CANNA (Canna sp.)

Rust caused by Puccinia cannae (Wint.) P. Henn.

Florida (JAS)

Canal Zone - Panama City, March 17; collected by A. Zetek and I. Molino.

Mosaic cause unknown

Hawaii - frequently observed on C. indica (OLK)

Bacterial bud rot

Nebraska - important locally, considerable damage around Lincoln shown by the numerous reports received.

CARNATION (Dianthus caryophyllus)

Rust caused by Uromyces caryophyllus (Schw.) Wint.

New Jersey - common but not serious.

Ohio - appears chiefly as a greenhouse disease but occurs infrequently also as a disease of garden carnations, attacks the host in its vegetative period, injuring the plant by distorting and killing the leaves.

Indiana - noted in greenhouse, not important during year.

Colorado - unimportant.

Root and stem rot caused by Rhizoctonia sp.

New Jersey - common but not serious

Pennsylvania - undoubtedly general, but little data is available, only report from College greenhouse.

Illinois - found over entire state, more prevalent from center of state, south. Earliest appearance in June. Does greatest amount of damage in August and September, attacks host at first flowering period. All varieties are susceptible, no treatment known.

Washington

Root knot caused by Heterodera radiculicola (Greef.) Müller

Texas - unimportant

Washington

Bud rot caused by Sporotrichum poae Ph.

Pennsylvania - in State College greenhouses.

Indiana - loss was slight on some varieties, one grower was forced to stop growing Matchless variety due to its susceptibility to bud rot. (HET)

Leaf mold caused by Heterosporium echinulatum (Berk.) Oke

Oregon - caused a \$500 loss in a greenhouse where 75% of the plants were reported attacked. Nature of injury was in way of leaf spot, stunting and killing of plants. The dark prolonged winter weather which reduced photosynthesis and promoted dampness

assisted considerably in producing the large amount of the disease. Varietal susceptibility was noticeable as the Matchless was most severely attacked and proved nearly worthless while the Aviator was not bothered so much and the crop not reduced. The Enchantress Supreme was the least susceptible.

CHRYSANTHEMUM (*Chrysanthemum hortorum*)

Leaf spot caused by Septoria chrysanthemi Cav.

Texas - trace, unimportant.

Sooty mold caused by Fumago sp.

Texas - trace, unimportant.

Leaf spot caused by Phyllosticta chrysanthemi E. & D.

Virginia - caused severe damage in a greenhouse.

Powdery mildew caused by Erysiphe cichoracearum DC. = (Oidium chrysanthemi)

Ohio

Rust caused by Puccinia chrysanthemi Roze.

Ohio

DAFFODIL (*Narcissus pseudo-narcissus*)

Nematode caused by Tylenchus dipsaci (Kuhn) Bastian)

Illinois - found in a bulb garden, attacking the leaves.

DAHLIA (*Dahlia* sp.)

Powdery mildew caused by Erysiphe cichoracearum DC.

Ohio

Drought injury

Connecticut - considerable injury in midsummer apparently due to drought.

EVONYMUS (*Evonymus* sp.)

Powdery mildew caused by Microsphaeraalni (Wallr.) Salm.

Ohio

Leaf spot caused by Exosporium concentricum Heald & Wolf.

Texas - very prevalent.

Anthracnose caused by Colletotrichum griseum Heald & Wolf

Texas - prevalent.

DIANELLA ODORATA

Mosaic, cause undetermined

Hawaii - a disease closely resembling the yellow stripe disease of sugar cane. (LOK)

DIANTHUS PLUMARIUS

Southern blight caused by Sclerotium rolfsii Sacc.

South Carolina - not important.

FREESIA (*Freesia* sp.)

Nematode, *Heterodera radicum* (Greef) Müller

California - a considerable number of plants yellowing were found in many fields near Santa Cruz. The plants were growing on sandy soil which was well drained. (WSF)

GERANIUM (*Pelargonium* sp.)

Gray mold caused by *Botrytis* sp. producing leaf spot and blossom blight.

Ohio

Kansas - was quite serious.

Dropsy, cause physiological

Ohio - general throughout state, importance slight in 1921, nature of injury is an excess number of blisters on the leaves, a physiological condition which is caused by excessive moisture, more frequent in greenhouses, seldom seen out doors.

Rhizoctonia rot caused by *Rhizoctonia* sp.

Indiana - local and moderately severe. (HET)

GLADIOLUS (*Gladiolus* sp.)

Fusarium rot probably caused by *Fusarium oxysporum* Schlecht. var.

Massey, L. H. *Fusarium* rot of gladiolus (Abstract) *Phytopath.* 12: 53. Jan. 1922.

GOLDEN GLOW (*Rudbeckia laciniata*)

Powdery mildew caused by *Erysiphe cichoracearum* DC.

Connecticut

HEPATIC (Hepatica sp.)

Smut caused by *Urocystis anemones* (Pers.) Wint.

Ohio - leaves were attacked.

HIBISCUS SABDARIFFA L.

Foot rot caused by *Phytophthora terrestris* Sherb.

Porto Rico (JM)

HIPPEASTRUM SP.

Mosaic, cause undetermined

Hawaii - frequently observed. (LOK)

HOLLYHOCK (*Althea rosea*)

Rust caused by *Puccinia malvacearum* Mont.

Connecticut - average amount.

New York - found in state wherever hollyhocks are grown.

Virginia - general throughout state.

Ohio - general over state April 24, greatest damage is done in midsummer

by impairing the vigor of the leaves.

Colorado

Washington - general throughout state.

Oregon - general throughout western part of state, worst disease of the hollyhock.

California - not as abundant as in 1920. (WSF)

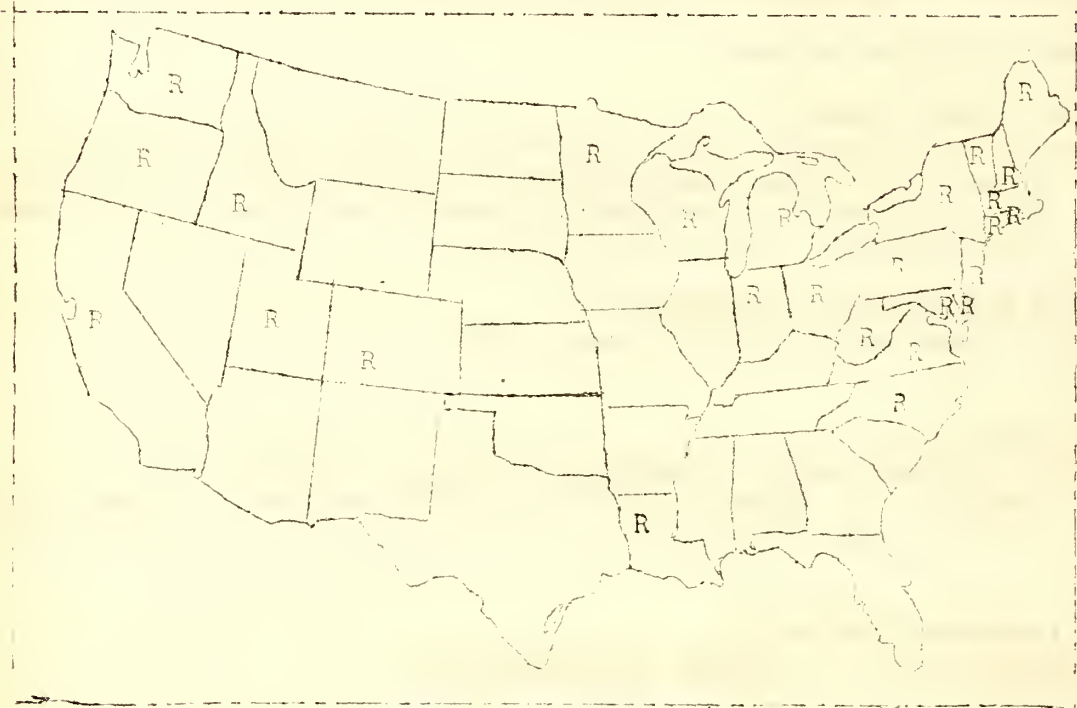


Fig. 95. Geographical distribution of Puccinia malvacearum on Althea rosea in the U. S., as reported to the Plant Disease Survey.

Leaf spot caused by Cercospora althaeina Sacc.

Delaware, Minnesota.

Anthracnose caused by Colletotrichum malvarum (B. & C.) South.

Delaware - stem and leaf infection.

Root rot caused by Ozonium omnivorum Shear

Texas - important, reduces the crop about 10%.

HYDRANGEA (Hydrangea hortensia)

Leaf spot caused by Phyllosticta hydrangeae Ell. & Ev.

New York

Frost injury

Ohio

IRIS (Iris spp.)

Sclerotium caused by Sclerotium rolfsii Sacc.

California - to all appearances was secondary following insect injury.

(WSF)

Rhizome rot caused by bacteria

Indiana - local, on imported rhizomes in a garden.

JASMINE, CAPE (*Gardenia jasminoides*)Leaf spot caused by Macrosporium sp.

Ohio.

LARKSPUR (*Delphinium* sp.)Blight caused by Bacterium delphinii EFS

Connecticut

Wilt caused by Fusarium sp.

Ohio - this is the first report of this disease in the state, probably a soil infection as a considerable amount of *Fusarium* was found in the soil.

Wm. Small published in the Bull. Mis. Inform. Kew, on page 321-328, 1920, on a wilt of the carnation in England.

Rhizoctonia stem rot caused by Rhizoctonia sp.

Indiana (HET)

LILAC (*Syringa* spp.)Powdery mildew caused by Microsphaeraalni (Wallr.) Salm.

Connecticut

Ohio - average amount as in previous years.

Illinois - generally distributed throughout state, worse than preceding year or years, about 70% of the plants in the state were affected, caused a withering of the leaves.

Iowa - more prevalent, affected practically all the plants in the state, actual loss slight.

Dodder (*Cuscuta* sp.)

Missouri

Winter injury

Washington

LILY, EASTER (*Lilium candidum*)Leaf spot caused by Sclerotinia libertiana Fekl.

Connecticut - a new trouble, rather bad at Madison, New Haven County.

MATRIMONY VINE (*Lycium* sp.)Powdery mildew caused by Microsphaera sp.

Ohio

MORNING GLORY (*Ipomoea purpurea*)White rust caused by Albugo sp.

Missouri - very common locally.

NASTURTIUM (*Tropaeolum* sp.)

Dodder caused by Cuscuta sp.
Missouri

OLEANDER (*Nerium oleander*)

Gall caused by Bacterium savastanoi var.

Arizona - southern part of state, disease affects stems, leaves and even flower clusters, appears to be increasing.

OLEASTER (*Elaeagnus angustifolia*)

Root galls caused by Mycodomatia
Washington

PANSY (*Viola tricolor*)

Rust caused by Puccinia violae (Schum.) DC.
South Carolina - not important.

Rust cause undetermined

Connecticut - aecia were found on plants purchased from a dealer. (JLS)

Anthraco caused by Colletotrichum violae tricoloris R. G. Sm.
New York

Root rot caused by Rhizoctonia sp.

Delaware - severe injury to plants in cold frame, same soil had been used for ten years.

Chlorosis caused by lime
Washington

PEONY (*Paeonia officinalis*)

Bud rot and leaf spot caused by Botrytis sp.
Pennsylvania

Ohio - rather severe, of general distribution over the state.

Indiana - general over state, caused some damage. (HET)

Washington

Leaf blotch caused by Cladosporium paeoniae Pass.

Pennsylvania - apparently a new disease, general over state.

Indiana - caused a great deal of damage at Bridgeport where plants had not been cut back, moderately severe. (HET)

Fusarium leaf and stem blight caused by Fusarium sp.

Indiana - produced a slight amount of damage, caused a blackening of the stem and leaves. (HET)

Root rot caused by Armillaria mellea (Vahl.) Quel.

Michigan - found in a bed where forest litter had been used.

Crown gall caused by Bacterium tumefaciens EFS & Town.
Michigan

PETUNIA (*Petunia* sp.)

Mosaic, cause undetermined
Pennsylvania (F), Iowa

Rhizoctonia caused by Rhizoctonia sp.
Pennsylvania (F)

PHLOX (*Phlox* sp.)

Powdery mildew caused by Erysiphe oichoracearum DC.
Connecticut - average prevalence.
New York - moderately severe
Maryland - local heavy infestation (GHM)
Ohio
Indiana - moderately severe. (HET)
Washington

Leaf spot caused by Cercospora sp.
New York

PRIMROSE (*Primula* sp.)

Root knot caused by Heterodera radicum (Greef) Müller
Connecticut - bad on roots of host in greenhouse at station, but does not seem to hurt them much.

PRIVET (*Ligustrum vulgare*)

Powdery mildew caused by Microsphaera alni (Wallr.) Salm.
Indiana - worse than in previous years, causes objectional appearance to hedges.
Illinois - general throughout state, worse than in previous years, very serious on hedge plants, not found on Regal privet.

Root rot caused by Ozonium omnivorum Shear
Texas - prevalent, reduction in yield about 2%.

Anthracose caused by Glomerella cingulata (Atk.) S. & S. = (Gloeosporium cingulatum Atk.)

Ohio
Texas - prevalent, about 1% reduction.

Leaf spot caused by Exosporium concentricum Heald Wolf
Texas

Frost injury
Texas - unimportant

Winter and drought injury
Ohio

RHODODENDRON (*Rhododendron californicum*)

Leaf spot caused by Cryptostictis sp.
Oregon (JSB)

Rust caused by McLampsoropsis pipuriana Arth.

Oregon (JSB)

Bud rot caused by Sporocybe azaleae (Pk.) Sacc.

Oregon (JSB)

Witches broom, cause unknown

Oregon - appearance of the broom suggests an Exobasidium not uncommon. (JSB)

ROSE (*Rosa* spp.)

Powdery mildew caused by Sphaerotheca spp.

Reported from New Hampshire, Connecticut, New York, Delaware, North Carolina, South Carolina, Texas, Arkansas, Ohio, Indiana, Kansas, Arizona, Idaho, Washington, Oregon, and California.

This disease was more prevalent and serious than in 1920 in all of the states reporting its occurrence with the exception of Idaho. In Oregon it is the worst rose trouble; in Texas it was epidemic. Leaves, twigs and young shoots were affected. Kansas reports that it is more or less prevalent each year regardless of the climatic conditions. That the ramblers are the worst and most commonly affected is shown by reference to their susceptibility from Connecticut, Delaware, Arkansas, Indiana, Oregon, and California. In California the following varieties were also susceptible Madam Abel Chatenay, Madam Cochet, Ulrich Brunner, Pink Rambler, Marie Henrietta, Bride, Bridesmaid, Radiance. The Killarney and Bride varieties were affected most in Indiana. Sulphur spray was suggested as a means of treatment from Oregon.

Dates of first appearance:

May 20, Indiana	June 1, Kansas	June 8, Delaware
May 25, Ohio	June 1, California	June 24, New Hampshire
June, New York	June 7, Oregon	August 19, Arizona
	June 8, Connecticut	

Bruce Fink in his notes on powdery mildews of Ohio (Ohio Journ. Sci. 21: 211-216, April 1921) says that this species seems to be the one which causes the injury to the roses generally in Ohio and throughout other parts of the United States, also that Salmon says that S. pannosa (Wallr.) Lev. which is the common powdery mildew of the rose in Europe is according to his opinion replaced by other species of Sphaerotheca in America. This is one of the diseases that might warrant further study in the United States.

The following map shows the distribution of the species of Sphaerotheca which have been reported at various times to the Plant Disease Survey.

Leaf blotch caused by Actinopenema rosae (Lib.) Fr. = (Diplocarpon rosae Wolf)

Connecticut, Delaware, Texas, Ohio, Indiana, Michigan, Arkansas (all over state), Missouri, Washington, Oregon (western portion of state), and California.

It is of interest to note that its occurrence in the Pacific Coast States is most always in the more humid districts. In Washington the greatest prevalence was around the Puget Sound Region, in Oregon it occurred in considerable amount in the coast counties, and in California the same was true especially around the San Francisco Bay Region. In Delaware, Texas, Washington, Oregon, and California it was very prevalent, and epidemic in Texas. Varietal differences

Varietal differences were noted, being very common on the Jack Rose in Indiana, in Oregon varietal differences in susceptibility were strongly apparent. Found both on field and greenhouse plants in



Fig. 96. Geographical distribution of Powdery Mildew of the rose caused by Sphaerotheca spp. in the U. S. as reported to the Plant Disease Survey.

Indiana. Gardner of Indiana, reports that C. L. Burkholder held the disease in check with Bordeaux mixture 2-4-50 (Fyrox) until August 1, at which time spraying was discontinued. In Michigan "Grape Dust" a sulphur-tobacco mixture was used, but without effect.

Dates of earliest appearance:

May 17, Oregon

June 28, Connecticut

June 27, Ohio

August 20, Delaware.

Rust caused by Phragmidium rosae-californicae Diet.

Washington, Oregon. (JSB)

Rust caused by Phragmidium spp.

Illinois - somewhat general in distribution in state.

Washington - common throughout state.

Oregon - western counties.

California - throughout state

Varietal susceptibility was noticed in Indiana where the disease was serious on wild rose (Rosa setigera) which is commonly grown in lawns throughout state. In California it was severe on certain varieties (Madam Abel Chatenay, American Beauty, Paul Meyron, General McArthur, Killarney, Marie Henrietta, and Sainsborough Fink. In Oregon no varietal susceptibility was noticed, does not appear to be increasing greatly there.

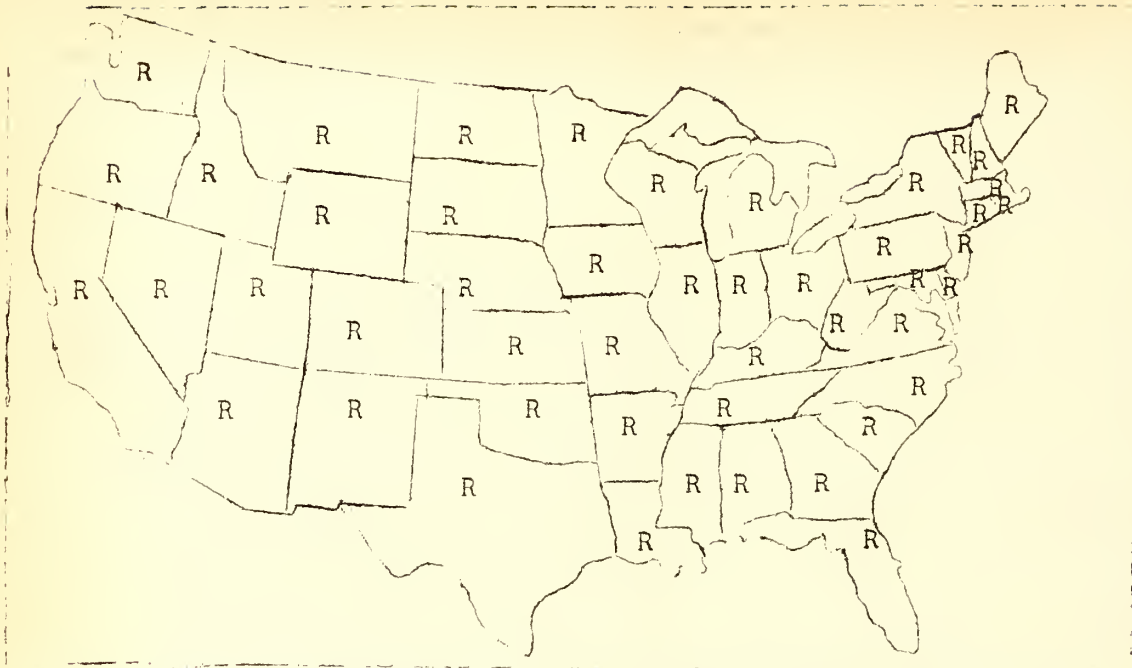


Fig. 97. Geographical distribution of leaf blotch of rose in U. S. as reported to the Plant Disease Survey.

Dates of earliest appearance of Phragmidium spp. of the rose:

May 27, Illinois June 2, Oregon August 11, California.

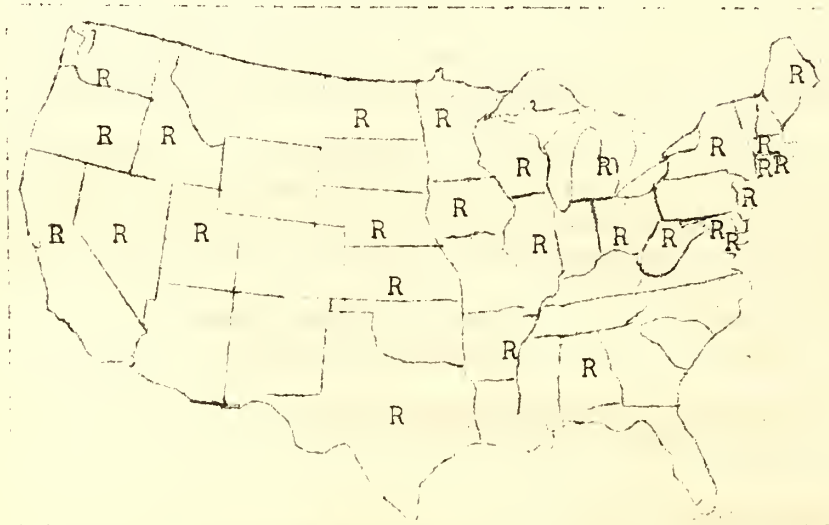


Fig. 98. Geographical distribution of rose rust in the U. S. as reported to the Plant Disease Survey.

Crown gall caused by Bacterium tumefaciens EFS & Town.

Indiana - general prevalence, causing severe damage and about 75% reduction in yield, affects the Ophelia rose and is apparently being distributed on the roots of diseased stock by the nurseries. (HET)

An important disease especially in the nurseries. (Tabor)

Texas root rot caused by Ozonium omnivorum Shear

Texas - general in central eastern section of state, prevalent, about 2% reduction in plants found in the state in the black lands.

Canker or cane blight caused by Leptosphaeria coniothyrium (Fckl.) Sacc. =
(Coniothyrium sp.)

North Carolina - very common, important.

Texas - trace only.

Indiana - general and doing a moderate amount of damage. (HET)

An interesting note by H. T. Güssow in the Bull. Soc. Path. Veg. France 8:
30. Jan.-Mar. 1921, states that he now considers that rose canker
is caused by Bacterium tumefaciens and not by Coniothyrium sp.

Canker caused by Diaporthe umbrina Jenk.

Delaware (Newark, New Castle County, April) - not previously reported;
Prof. Houghton has observed this disease the past two years on
Jack Rose and Rosa sp.

This is the first report to the Plant Disease Survey from any state.

Canker caused by Cylindrocladium scoparium Morg.

Pennsylvania - very severe cases found in vicinity of Philadelphia in
several wholesale rose establishments. In one place 10,000 Russel
plants were lost, in another 3,000 Premier plants died, and in a
third place 1,200 Killarney and Columbia plants had to be replaced.
(CNY)

First report to Plant Disease Survey from Pennsylvania.

Canker, cause undetermined.

Idaho

Botrytis rot caused by Botrytis sp.

Texas, - trace, unimportant.

Anthraxnose caused by Gloeosporium rosae Hals.

Texas - trace.

Ohio - period of greatest injury was during June and July upon the
vegetative part of the host in affecting the stem, more prevalent
than past year but of moderate amount, weather was favorable for
disease.

Chlorosis caused by excess of lime in the soil.

Texas - prevalent in limestone soil.

Winter injury

Washington

Fertilizer injury caused by too much fertilizer.

Indiana - caused a yellowing and dropping of leaves. (HET)

SEDUM SPECTABILIS

Leaf spot caused by Septoria sedi West.

Illinois - serious on this ornamental Sedum in the late fall.

SNAPDRAGON (Antirrhinum spp.)

Anthraxnose caused by Colletotrichum sp.

Indiana (HET)

Rust caused by Puccinia antirrhini Diet. & Holw.

This disease was reported to the Plant Disease Survey for the first time from South Carolina, Kansas, North Dakota, and Arizona. Previously reports have been received from Maine, New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, South Carolina, Ohio, Indiana, Michigan, Iowa, Missouri, North Dakota, Nebraska, Kansas, Utah, Arizona, Washington, Oregon, and California. Snapdragon rust was severe in South Carolina (locally), North Dakota, Kansas, Arizona, and Oregon. In Oregon it was given as the worst disease they had. The dates of first appearance are scattered throughout the year as some of the reports were of greenhouse infestations.

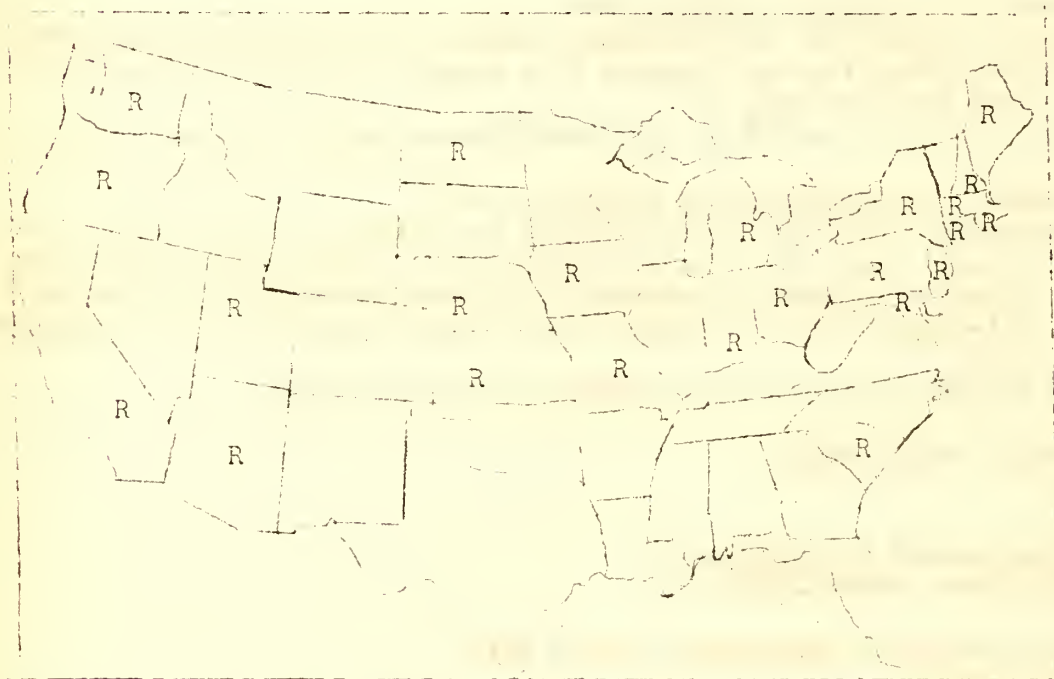


Fig. 99. Geographical distribution of snapdragon rust in the U. S. as reported to the Plant Disease Survey.

The following extract may be of assistance to those who grow snapdragons both commercially and privately.

"During 1919 the effect of temperature on the germination of snapdragon spores was studied as well as the effect of temperature on the duration of the incubation period. In field experiments on the control of the disease the following fungicides were used: cuprammonium sulphate, cupric acetate, sulphur, and sulphur containing 12% bisulphite of soda. The weather during the greater part of the growing season was cold, and the copper fungicides afforded the best protection. In 1920 field experiments were made on the control of snapdragon rust by means of calcium polysulphide, sulphur, and sulphur plus varying percentages of soot. The results obtained indicate that sulphur affords better protection than calcium polysulphide, but that contrary to the opinion generally current, the addition of soot to sulphur did not

increase its efficiency." (Butler, O. R. Rept. of the New Hampshire Agr. Exp. Sta. for biennium ending June 30, 1920. New Hampshire Agr. Exp. Sta. Bul. 198. May 1921)

A bacterial leaf spot caused by Pseudomonas antirrhini Takimoto, has been reported from Japan, (Takimoto, Seito. Bacterial leaf-spot of Antirrhinum majus L. Bot. Mag. Tokyo 34: 253-257. Oct. 1920.) but this office has no record of its ever having been collected in the United States.

Septoria leaf spot caused by Septoria antirrhini Desm. has recently been referred to from France. (Ducomet, Vital. Sur le Septoria antirrhini Desm. Bull. Soc. Path. Veg. 8: 33. Jan.-Mar. 1921.) This disease has not yet been reported to the Plant Disease Survey as being found in the United States.

SNOWBERRY (Symphoricarpos spp.)

Rust caused by Puccinia symphoricarpi Hark.

Washington, Oregon (JSB)

California - on S. racemosus.

An aecial stage was found on same host in exactly same locality in the spring. (WSP)

Fowdery mildew caused by Microsphaera diffusa Cke. & Pk.

Ohio - on Symphoricarpos vulgaris (BF)

Washington - on Symphoricarpos sp.

Leaf spot caused by Septoria symphoricarpi Ell. & Ev.

Washington

SPIRAEA (Spiraea douglasii)

Cylindrosporium sp.

Oregon (JSB)

SWEET PEA (Lathyrus odoratus)

Powdery mildew caused by Sphaerotheca pannosa (Wallr.) Lev.

Washington

Powdery mildew caused by Erysiphe polygoni DC.

Indiana - destructive in the greenhouses by killing the old leaves, worse than in previous years.

Powdery mildew, cause undetermined

Ohio - first report.

Root rot and wilt caused by Fusarium sp.

New York - root rot appearing June 29, and the wilt on July 26.
North Dakota.

Black root rot caused by Thielavia basicola (B. & Br.) Zopf.

Connecticut - Found October 7 on greenhouse stock.

Damping off caused by Pythium debaryanum Hesse
Connecticut - June 10, local.

Mosaic cause undetermined

Washington

California - quite general in southern California. (DGM)

Rhizoctonia caused by Rhizoctonia sp.

Washington

SYRINGA (Philadelphus sp.)

Rust caused by Gymnosporangium gracilens Kern & Bethel.

"About six years ago I sent Dr. Jaczewski culture of the telia of Gymnosporangium gracilens Kern & Bethel; and he succeeded in growing it on Philadelphus. This result is noteworthy in two respects: first, it is an unusually long period for a gelatinous rust to retain its viability, being three weeks in transit. Second, it establishes the fact that this rust is the same as that found on Philadelphus in Asia Minor. Hitherto, it was supposed to be an endemic of the desert regions of the southwestern United States." (EB)

TULIP

Mold caused by Sclerotinia parasitica Masee = (Botrytis tulipae (Libert)

Hopkins

Washington.

VACCINIUM SPP.

Stem blister caused by Calyptospora columnaris (alb. & Schw.) Kuhn.

Washington, Oregon. (JSE)

Leaf spot caused by Exobasidium vaccinii (Fockl.) Wor.

Washington (JSE)

Rust caused by Eucciniastrum myrtilli (Schum.) Arth.

Oregon (JSE)

VIOLET (Viola spp.)

Black root rot caused by Thielavia basicola (B. & Br.) Zopf.

Connecticut - reported by a greenhouse grower as troublesome.

Root rot caused by Pythium debaryanum Hesse.

Connecticut - reported from a greenhouse.

Southern blight caused by Sclerotium rolfsii Sacc.

South Carolina

DISEASES OF MISCELLANEOUS PLANTS

- Althaea ficifolia* Cav.
Puccinia malvacearum Bertero
 Oregon (JSB)
 Antwerp hollyhock
 Rust
- Amaranthus graecizans*
Albugo candida (Pers.) Kuntz.
 Maryland (Detmold, Allegany County) - Sept. 16 (GHM)
 Tumbleweed
 White rust
- Artemisia tridentata* Nutt.
Puccinia absinthii (Hedw. f.) DC.
 Washington
 Oregon - probably widespread throughout district,
 does little injury to host. (JSB)
 Sagebrush
 Rust
- Asclepias syriaca* L.
 Mosaic
 Wisconsin
 Milkweed
 Mosaic
- Ceanothus velutinus* Dougl.
Cylindrosporium ceanothi Ell. & Ev.
 Oregon (JSB)
 Buckbrush
 Leaf spot
- Cerastium* sp.
Rhizoctonia solani Kühn.
 General - throughout eastern United States (Piper)
 Mouse-ear chickweed
 Brown patch
- Circaea pacifica* Asch. & Magn.
Puccinia circaeae Pers.
 Washington (JSB)
 Enchanters nightshade
 Rust
- Elymus* sp.
Puccinia clematidis (DC.) Lag.
 Oregon
 Wild rye grass
 Rust
- Epilobium angustifolium* L.
Pucciniastrum pustulatum (Pers.) Diet.
 Washington, Oregon. (JSB)
 Fireweed
 Rust
- Euphorbia corollata* L.
Microsphaera euphorbiae (Pk.) Burk. & Curt.
 Ohio (BF)
 Spurge
 Powdery mildew
- Euphorbia* sp.
Melampsora monticola Mains
 Oregon (JSB)
 Spurge
 Rust
- Gaultheria shallon* Pursh
Mycosphaerella gaultheriae Cke. & Ell.
 Washington (JSB)
 Oregon - widespread throughout range of host,
 injury to leaves slight. (JSB)
 Aromatic wintergreen
 Leaf spot

Gaylussacia baccata (Waug.) C. Koch Metecrological Connecticut - reports and observations include portions of the townships of Plainsfield, Sterling, Canterbury and Brooklyn. Most of the blossoms were killed, only a few berries were found in sheltered places. (JLS)	Black huckleberry Freezing
Geranium texanum (Trelease) Heller Plasmopora geranii Berl. & De Toni Louisiana	Geranium Downy mildew
Lapsana communis L. Puccinia lapsanae (Schul.) Fckl. Washington (JSB)	Nipple-wort Rust
Lathyrus nuttallii S. Wats. Erysiphe polygoni DC. Oregon (JSB) Uromyces fabae (Pers.) De Bary Oregon (JSB)	Vetch Powdery mildew Rust
Malva rotundifolia L. Puccinia malvacearum Bertero Washington, Oregon. (JSB)	Mallow Rust
Malva sp. Puccinia malvacearum Mont. California - widespread, can undoubtedly be found anywhere mallow grows. (WSF)	Mallow Rust
Madia sp. Coleosporium madiae Cke. Oregon (JSB)	Tarweed Rust
Mentha sp. Puccinia menthae Pers. Washington (JSB)	Mint Rust
Menziessia ferruginea Sm. Rhytisma sp. Washington - causes little injury to host. (JSB)	Fools huckleberry Tarspot
Micromeria chamissonis (Benth.) Greene Puccinia micromeriae D.T.T. Oregon (JSB)	Tea vine Rust
Oxalis stricta L. Microsphaera russellii Clinton Ohio (BF)	Wood sorrel Powdery mildew
Physalis longifolia Nutt. Mosaic Iowa (ILM)	Ground cherry

Physalis spp.	Ground cherry
Mosaic	
Indiana	
Unknown leaf spot	
West Virginia (RJH)	
pubescens	
Pteridium aquilinum pubescens Underw.	Brake
Uredinopsis mirabilis (Pk.) Magn.	Rust
Washington, Oregon. (JSB)	
Rhus diversiloba Torr. & Gr.	Poison oak
Cylindrosporium toxicodendri (Curt.) Dearness	Leaf spot
Oregon	
Solanum carolinense L.	Horse nettle
Mosaic	
Indiana	
Thalictrum sp.	Meadow-rue
Puccinia triticina Eriks. & Henn.	Rust
Indiana (EBM)	
Vaccinium	
Vaccinium spp.	Huckleberry
Calyptospora columnaris (Alb. & Schw.) Kühn	Stem blister
Washington, Oregon. (JSB)	
Widespread throughout range of host and in the above	
districts. (JSB)	
Exobasidium vaccinii (Pckl.) Wor.	Leaf spot
Washington (JSB)	
Meteorological	Freezing
Connecticut - on <u>V. vacillans</u> & <u>V. corymbosum</u>	
Microsphaera alni vaccinii (Schw.) Salm.	Powdery mildew
Ohio	
Pucciniastrum myrtilli (Schum.) Arth.	Rust
Oregon (JSB)	
Veronica serpyllifolia L.	Thyme leaved speedwell
Rhizoctonia solani Kühn	Brownpatch
General - throughout eastern United States. (CVP)	
Taraxacum officinale Weber	Dandelion
Sphaerotheca humuli var. fuliginea (Schlecht.) Salm.	Powdery mildew
Washington - common throughout the Fuyallup Valley.	

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