Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

JAN 25 1950

LIBRARY
RECEIVED

★ JAN 9 - 1950 ★
U. S. DEPARTMENT OF AGRICULTURE
BELTSVILLE BRANCH

THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

AGRICULTURAL RESEARCH ADMINISTRATION

UNITED STATES DEPARTMENT OF AGRICULTURE

SUPPLEMENT 188

THE PLANT DISEASE WARNING SERVICE IN 1949

Supplement 188

December 15, 1949

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

Issued by

THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station

Beltsville, Maryland

THE PLANT DISEASE WARNING SERVICE IN 1949

Paul R. Miller and Muriel O'Brien

Plant Disease Reporter
Supplement 188

December 15, 1949

One of the interesting characteristics of plant diseases in general is their great degree of fluctuation from year to year in their occurrence, prevalence, and destructiveness. The diseases that we have under consideration in the Crop Plant Disease Forecasting Project seem to be no exception. These diseases, late blight of potato and tomato (Phytophthora infestans), blue mold of tobacco (Peronospora tabacina), and downy mildew of cucurbits (Pseudoperonospora cubensis), were as widely distributed in 1949 as in the past three years but generally not as destructive. Figures 1 through 4 plot this year's distribution of these diseases and our short text will attempt to tell the highlights of the second year's observations under the Warning Service.

Phytophthora infestans on Potato:

Infection on potatoes with P. infestans, although reported from the numerous places shown in Figure 1, was of little economic importance this year. Sources of infection included cull piles, seed potatoes, the overwintering refuse resulting in infected volunteer plants, diseased seed, infected tubers, and airborne spores which produced scatter infection. Attack usually took place at from early maturity to full maturity, with infection local to general in occurrence and slight to moderate in effect. At the time of first appearance in the field estimated percentages of infection ranged from 5 to 100. At time of continued spread estimated percentage of infection ranged from a trace to 100, with losses ranging from a trace through slight to a high of 25 to 50 percent.

Weather reports from the various States show that, for the most part, rainfall was light, dews present, and temperature near normal to above normal prior to appearance of the disease, although several States reported heavy rainfall before attack, with temperatures ranging from much below to near normal. The warm wet and warm dry conditions prevailing this summer over the eastern to northeastern portion of the United States

(Fig. 5), probably because of the higher temperatures, prevented the production and dissemination of spores of the fungus.

Fungicides used as sprays included Dithane, Parzate, tribasic coppers, Bordeaux, fixed coppers (Basicop, Perenox), and Dithane and Parzate plus zinc sulfate. All fungicides gave good control when applied properly with adequate coverage. Five States, eastern Ontario, and Quebec reported that Bordeaux was used successfully by from 10 to 50 percent of the growers with good to excellent results. Dusts employed on potato were neutral copper, commercial dusts containing Dithane Z-78 and Parzate, Copper A, and zinc carbamate, with good results obtained. One report listed poor results from the use of yellow copper oxide and copper lime. A schedule of Fungicide Results is given in Tables 1 and 2.

Phytophthora infestans on Tomato:

Tomato late blight likewise was unimportant nationally this year, although reported as severe by growers in several areas. Sources of inoculum were southern plants, carry-over on potatoes, infected potatoes in nearby fields, and scattered infections which suggested airborne spores. Plants were attacked when at young transplant stage, one-half maturity size, at maturity, and at late fruit set. Infection for the most part was reported as general or local, with a few reports of scattered infection. Severe damage was reported at Leesburg, Florida in May. In the Virginia mountain area, also, damage was severe at the time of continued spread of the disease, when there were some large fruits on the plants. Infection in Mississippi was general during the three stages (first appearance, continued spread, and reappearance), with severe damage at first cluster open, and severe to moderate damage on green mature fruit.

Estimated percentage of infection in fields ranged from a trace to 20 at time of first appearance, with higher ranges of 50 to 100 reported in areas more heavily affected. At time of continued spread the range was as wide, i. e., from a trace to 100 percent, the most notable circumstance being the low infection in sprayed fields, which sometimes amounted to only 5 to 10 percent as against 90 to 100 percent in unsprayed fields. Similarly, reduction in yield followed the same pattern, with slight reductions in sprayed fields and as high as 50 percent in unsprayed fields. One State reported up to 100 percent reduction in yield, but no evidence was given as to whether the fields had been sprayed. In Mississippi, although area planted to tomatoes this year was estimated to be 1500 acres more than in 1948, the yield was less by 200 carloads. Part of this reduction was due to stem-end cracking of the fruit brought about by excess rainfall prior to picking, part to buckeye rot (*Phytophthora parasitica* Dast.), while late blight fruit rot was said to be responsible for 30 percent of the total reduction.

Fig. 1-DISTRIBUTION of TOMATO LATE BLIGHT in 1949

Fig. 2-DISTRIBUTION of POTATO LATE BLIGHT in 1949

Fig. 3 DISTRIBUTION of TOBACCO BLUE MOLD in 1949

Fig. 4 DISTRIBUTION of CUCURBIT DOWNY MILDEW in 1949

Rainfall, as affecting tomato late blight this year, was reported rather consistently as being light to moderate, although heavy rainfall was reported in Virginia, Arkansas, Mississippi, Illinois, Pennsylvania, Michigan, and Ontario, Canada, at the time of appearance and spread. In Maryland rainfall was heavy at the time of appearance. Temperatures reported were near normal to above normal. Dews were reported present in the greater majority of cases.

Reports indicated that the increased use of fungicides for control of late blight on tomato, together with the dry summer, probably contributed to the low incidence of the disease. The materials used and their effectiveness in controlling tomato late blight will be found in Tables 1 and 2.

Peronospora tabacina on Tobacco:

The distribution of tobacco blue mold in 1949 is shown in Figure 3. The types of tobacco affected were flue-cured, burley, cigar-wrapper, Havana seed, broadleaf, and shade types. Sources of inoculum were either unknown or reported as old bed-sites. Infection was reported as scattered to local, with general infection noted over the eastern half of North Carolina. Damage was slight except for the Carolinas and Virginia, which experienced a severe blue mold year.

Rainfall was reported for the most part as moderate, above normal in a few cases, with temperatures near normal to above in all reported cases. Estimated percentage of infection ranged from 1 to 100. Reduction in plants in beds was slight, with an estimated high of 10 percent. However, in several cases 100 percent reduction was reported in plant-bed-yields, particularly in unsprayed beds.

Where control measures were employed soon enough excellent results were obtained. In South Carolina stunting of plants was induced when the grower used Fermate dusts with Kaolin diluent. No stunting was experienced with Fermate-Pyrophyllite mixtures and no injury was noted to plants.

Psuedoperonospora cubensis on Cucurbits:

Downy mildew of cucurbits is shown in Figure 4 as being, for the most part, present over the eastern coastline States. Acreages involved averaged about 1000 for Pennsylvania and Louisiana, and ranged from 1000 to 5000 in Delaware and Maryland. Sources of inoculum were either unknown, or reported as older plants, spring crop and garden plants, and for northern regions spread from plantings of cucurbits in more southerly regions. In Florida the organism is endemic and wild cucurbits might possibly constitute an additional source of inoculum. Infection occurred from first fruit-set to maturity, with marked activity at time of harvest; it was reported as local in Connecticut, local to general in New York,

and general in Pennsylvania, Florida, Virginia, Louisiana, South Carolina, Maryland, and Delaware. Damage at start was slight. During the time of continued spread it was generally described as moderate, but severe damage was reported in Connecticut, Virginia, Louisiana, South Carolina, Arkansas, and Maryland. Estimated percentage of infection ranged from a trace to 1 at time of first appearance, to 100 at time of continued spread and at harvest. Reduction in yield was reported as trace or none to 75 percent.

Weather conditions accompanying infection were consistently reported as light rainfall prior to appearance of the disease, with moderate rainfall during period of greatest attack and spread. Dews were universally reported. Heavy rainfall occurred at time of greatest attack in South Carolina and Louisiana, and in Ontario, Canada. Temperature in most cases reported was near normal to above normal, with below normal reported from South Carolina, Arkansas, and Ontario.

The most notable event connected with occurrence of downy mildew of cucurbits this year was the loss of the cantaloup crop in South Carolina. Acreage is extensive in this State, while dusting and spraying for control have not been accepted by the vast majority. All of the loss in reduced financial returns and reduced yield in this crop this year can be attributed to downy mildew, which was reported in the worst epidemic form in this State since 1938. Downy mildew was severe on cucumbers also in South Carolina, killing almost 100 percent of the vines in ten days to two weeks after its first appearance.

Phytophthora phaseoli on Lima Beans:

A few reports were received on the incidence of downy mildew of lima bean (Phytophthora phaseoli Thaxt.) Areas of infection included southern New Jersey, south-central and southeast Pennsylvania, Long Island, New York, and Sussex and Kent Counties in Delaware. Source of inoculum is unknown. Infection was local in Pennsylvania and New York, and local to general in Delaware and New Jersey. Estimated percentage of infection in fields ranged from 5 through 55, with as high as 80 percent infection noted on pods on individual plants in localized areas of some fields. Weather conditions at time of infection and spread were indicated as moderate rainfall with temperatures above normal. Serious losses were reported in New Jersey; reduction in yield in other areas was estimated at none to 40 percent. Copper sprays, either Bordeaux or fixed coppers, and copper dust were used. No control results were given.

Conclusions:

Although it is impossible to measure accurately the disease potential from year to year, it would appear from the reports this year that the coordinated efforts on the part of warning service participants are paying good dividends in disease control. Indications are that control

Fig. 5 MONTHLY WEATHER CONDITIONS April through September 1949

unshaded	Temperature and precipitation below normal	Cd
Temperature and precipitation above normal	Ww
Temperature above, precipitation below normal	Wd
Temperature normal, precipitation above normal	Nw
Temperature below, precipitation above normal	Cw
X	Temperature normal, precipitation below normal	Nd

measures were more effectively practiced this year, particularly for tomato late blight and cucurbit downy mildew. The use of blue mold control measures still appears to be governed by the gambling chance that the attack will be light, will come at a time inopportune for fungus growth, or will not appear at all. Tables 1 and 2 summarize all control information received this year.

WORK PERFORMED COOPERATIVELY BY THE CROP PLANT DISEASE FORECASTING PROJECT
AND THE PLANT DISEASE SURVEY UNDER THE PROVISIONS OF THE RESEARCH AND
MARKETING ACT OF 1946

Table 1. Materials used as sprays and their effectiveness in 1949.

Fungicide or Material	: State area or Prov- : incc. ^a	:	:	:	:	Formula or Dosage	:	: Percent: : using	: Applied by : Air- : Machine:	Results and Remarks
<u>CONTROL OF LATE BLIGHT</u> <u>ON POTATO</u>										
Bordeaux	5	1	1	2		8-8-100 (2) ^b 10-5-100 8-16-16 4-2-40 4-4-40 100-125 gal./ acre - 10 day intervals 4-4-50 8-4-100 Fixed copper- 4 lbs. of 50%	48,10 25 10 25-30 50	All (2) " 100 100 100 All	Excellent Good Excellent Good Excellent ?	
Fixed Coppers	1	1	1	2		COC-S			All	Poor
Basicop							Approx. 2 10	All		Good Good One State-no result listed
Perenox							Approx. 2 5	All All		Good Good
Neutral Coppers	2		1			2 lbs./100 gal.(1) 4 lbs./100 gal.(1)	15 20	All " "		Excellent Good Good

For explanation of a and b and abbreviations, see footnote at end of Table II, page 314.

Table 1. Spray materials (continued)

Fungicide or Material	: State area or Prov- : ince. a		Formula or Dosage	: Percent : Applied by		Results and Remarks
	: N.E.:	: S. : M.W.:		: using	: Air-:	
POTATO (continued)						
Copper Zinc Chromate	1	2	1	All	?	
Dithane Liq.	1	2	1	100	Good	Good
			2-3 qt./100 gal. (1)	45	Good	Good
			100-125 gal./acre-10 day intervals	All	?	?
Dithane Dry	1		1 1/2 /100	4	Good	Good
Dithane D-14+ Zn SO ₄	1	2	2 qt.- 1 lb./100 gal. (1)	95	Excellent	Excellent
			2 qt./100 gal. (1)	20	Good	Good
Dithane				2	Good	Good
Biscarbamates Dithane + Parzate	1		2 qts. + 1 lb. Zinc Sulphate	23	100	Fairly good
Biscarbamates early + copper late in season	1			25	100	Good
Parzate Liq.	1		2-3 qts./100	45	All	Good
Parzate Dry	1	2	1 1/2 lbs./100 gals. (2)	(1) 4	100	Good
			100-125 gals./acre-10 day intervals	100	Good	Good
				All	?	?

Table 1. Spray materials (continued)

Fungicide or Material	: State area or Prov- : ince. ^a	: : N.E.: S. :M.W.:Prov-: : : : :ince :	Formula or Dosage	: : Percent: : using :Ground :Air-: : : :Machine:plane:	Results and Remarks
POTATO (continued)					
Parzate + Zn SO ₄	1		2 qt. 3/4 lb./100	.5 100	Excellent
Parzate	(some results given under Biscarbamates: See above)				
<u>CONTROL OF LATE BLIGHT</u> <u>ON TOMATO:</u>					
Bordeaux	1				
(included in other sprays: See under <u>Fixed Copper, Zerlate.</u>)					
Eordeaux	1	1	4-4-100/8-8-100 8-8-100	15 ALL	Good Used after in- fection started. Control good ex- cept where fruit was badly cracked.
	1	1	8-6-100	10 100	Good
			5-5-50	50 100	Good
			3-4-50	5	Excellent
Compound A	1	1	2/100 gal. 4/100 gal.	3 100 ? ALL	Good Clear-cut results obsured because of dry spell three-fourths of May
Fixed Coppers	1				
(included in other sprays; see under Zerlate)					

Table 1. Spray materials (continued)

Fungicide or Material	: State area or Prov- : ince. ^a :		Formula or Dosage	: Percent: : using :		: Applied by : Air- : Machine: plane:		Results and Remarks
	: N.E.:	: S.:	: M.W.:	: Prov-:	: ince:	: :	: :	
TOMATO (continued)								
Fixed Copper	3	1	tank mix - 2 lbs. of 50% Fixed Copper + 1 lb. Zerlate in all or most sprays		3	100		Good
			4 lbs. 50% Cu./ acre or Bordo 3-6-100		9	100		Good
			2 lb. actual/100 gal. 1% Cu		75	99.5		Excellent
					10			Good
Copper		1	2/100 gal.		10	100		When spray started on time and re- peated once each week and after each rain very good results ob- tained
Neutral Coppers	1				20	All		Good
Tribasic Copper Sulphate	1	1	2 lbs./100 gal. 4 lbs./100 gal.		15	100		Excellent Clear-cut results obsured because of dry spell in May
Dithane or Parzate	1				1	1		Fairly good
Dithane Z-78	1		2-100		Trace	All		Excellent
Dithane D-14 + Zn SO ₄	1	1	2 qt. + 1 lb./ 100		95	100		Fairly good to ex- cellent depending on application

Table 1. Spray materials (continued)

Fungicide or Material	: State area or Prov- : ince. : : : : N.E.: S. : M.W.: Prov- :<
-----------------------------	---

Table 1. Spray materials (continued)

Fungicide or Material	State area or Prov- : ince. : N.E.: S. : M.W.: Prov- : : : : ince :	Formula or Dosage	: : Percent: : using :Ground :Air- : : Machine:plane:	Results and Remarks
TOMATO, (continued)				
Zerlate alternating with copper	1		50 All	Control good where last two sprays were copper, poor where last spray was Zerlate
Zinc dimethyl Dithiocarbamate	1	2/100	75 99.5	Excellent
CONTROL OF CUCURBIT DOWNY MILDEW				
Bordeaux	1 1	cuc. ?-4-100 (1) melons 4-2-100 4-4-50 (1)	35 95 50 100	(No results given) Good. In cer- tain fields anthracnose caused very severe damage where materials gave poor con- trol
Fixed Copper	2	4 lbs. 50%	40 95	(No results given)

Table 1. Spray materials (continued)

Fungicide or Material	State area or Prov- : ince. ^a :	Formula or Dosage	Percent: : using :	Percent : Applied by :	Results and Remarks
	: N.E.: S. : M.V.: Prov- : : : : ince :			: Machine: plane:	
CUCURBITS (continued)					
		4-100			Good. When used in time, held the disease in check
Tribasic	1	3-100 (melons)	10	100	Excellent
Dithane D-14 + Zn SO ₄	1	2 qts., 1/2 lb.	All	All	Generally good
Dithane Z-78	2	2-100 (2)			Good. When used in time, held the dis- ease in check Excellent
		no formula - (melons)	5-7	100	Excellent
Zerlate	1	2-100 (melons)	5-7	100	Excellent
CONTROL OF BLUE MOLD OF TOBACCO					
Copper or Bordeaux	1	4 lbs. fixed Cu.	24	100	Fairly good
Fermate	3	3 lbs./100 (2)	50	100	About 25% re- ceived excel- lent results, 50% good and

Table 1. Spray materials (continued)

Fungicide or Material	: State area or Prov- :		Formula or Dosage	: Percent: Applied by :		Results and Remarks
	: incc. a :	: N.E.: S. :M.V.: Prov-:		: using :	: Ground : Air- :	
	: :					

Table 2. Materials used as dusts and their effectiveness in 1949.

Fungicide or Material	: State area or Prov- :		Formula or Dosage	: Percent :		Results and Remarks
	: incc. a :	: N.E.: S. M.W.: Prov-:		: using :	: Applied by :	
	:	: : : incc. :		:	: Machine: plane:	
<u>CONTROL OF LATE BLIGHT</u>						
<u>ON POTATO:</u>						
Basicop		1	?		100	Good
Copper A.		1	"	2	100	Good
COC-S		1	"			
COC-S		1	6% Met. Cu.	1	100	Fairly good
				90	10	Good
Copper-lime dust	1		20% Cu-80% lime	5	100	Fair
Fixed Copper	2	1	7%	48	All	Good to poor
			7%	2	70	Fair
			6%	10	none	Good
Misc. Copper dusts	1			2	100	Good
Neutral Copper	2			90	100	Good
			7%	5	All	Good
Tribasic Copper Sulphate	1	1	7% Met.-Cu. in all cases	90	10	Good
				75	90	Good
				20	100	Good
Yellow Copper oxide	1		6% Met.-Cu.	5	100	Poor
Dithane Z-78	2		3.9% active ingredient (1)	10	100	Poor to good

Table 2. Dust materials (continued)

Fungicide or Material	: State area or Prov- : :ince a	: : N.E.: S. : M.W.: Prov- : : : :ince :	Formula or Dosage	: : Percent: : using :Ground :Air- : : :Machine: plane:	: : Percent : Applied by	Results and Remarks
POTATO (continued)						
Dithane		1	Mfg. (1) 6%	5 90	10	Good Good
Parzate Z-78	1		1C%	1	All	Good
Parzate		1	6-8%	90	10	Good-excellent
CONTROL OF LATE BLIGHT ON TOMATO						
Copper	2		7% 6%	4 40	2 All	Fairly good Good
Copper A		1	12%	?		Clear-cut results obscured because of dry spell three- fourths of May
Fixed Copper	1	1	20-80 5-7 6% Cu.	25 5 5	100 All All	Good Good Poor
Copper Lime	1		20% Cu-80% Lime	5	100	Poor
Tribasic Copper Sulphate	1		7% Met. Cu.	20	100	Good

Table 2. Dust materials (continued)

Fungicide or Material	: State area or Prov- : : incc. :	: : : : : N.E.: S. : M.W.: Prov-:	: :<
-----------------------------	--------------------------------------	---	---

a Explanation of abbreviations:

N.E. = Northeastern States:

Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, and Ohio.

S. = Southern States :

Virginia, Kentucky, North Carolina, South Carolina, Tennessee, Arkansas, Oklahoma, Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida.

M.W. = Mid-western States :

Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, and North Dakota.

Prov-
incc = Canadian Provinces :

Prince Edward Island, Nova Scotia, New Brunswick, Quebec, and Ontario.

b () Numbers in parentheses refer to number of States or Provinces using same formula; and, likewise, number of States or Provinces with same percentage of growers using where (.) appears in "percent using" column.