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THE PLANT DISEASE REPORTER

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Division of Mycology and Disease Survey

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THE PLANT DISEASE WARNING SERVICE IN 1952

Supplement 217

December 15, 1952

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.

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THE PLANT DISEASE SURVEY DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station

Beltsville, Maryland

✧ THE PLANT DISEASE WARNING SERVICE IN 1952 ✧

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Introduction

Insofar as disease occurrence is concerned, the 1952 summary of the Warning Service is mostly negative. Nevertheless, absence or insignificance of a disease is as much a part of the record as are severe outbreaks, and proper evaluation of factors connected with occurrence and importance must take both high and low extremes as well as normals into account.

Weather is discussed in this report only in very general terms. The usual weather charts, as well as the disease distribution maps for the growing season, are omitted. A more detailed progressive analysis would be necessary to bring out specific correlations between weather and disease incidence this season.

There is no question but that in 1952 the downy mildew diseases under consideration by the Crop Plant Disease Forecasting Program, namely, late blight of potato and tomato (Phytophthora infestans (Mont.) D By.), blue mold of tobacco (Peronospora tabacina Adam), and cucurbit downy mildew (Pseudoperonospora cubensis (Berk. & Curt.) Rostow.), were less widely distributed and caused less damage than in any year since the initiation of the Warning Service in 1946. The 1952 season was characterized by either the absence of these diseases or by light or moderate incidence or sporadic development. Interest in spraying and dusting was consistent and sustained. Control measures were used on perhaps a larger scale than heretofore, and good results were obtained with correct timing and application. Rainfall over most of the eastern part of the country during a large part of the growing season was light to moderate, with drought conditions prevailing in some regions. This hot dry weather inhibited disease development and spread. An exception was in the Great Lakes States area and in the northern Middle West tier of States, where heavy rainfall occurred during July and August and where late blight was prevalent.

Late blight of potato and tomato was sparsely present over the eastern portion of the country but occurred in the north central States to about the same extent as during the past several years. In the country as a whole, late blight was less widely distributed and caused less damage than during any of the preceding six years.

Blue mold of tobacco appeared later than usual except in North Carolina, where one of the earliest appearances for the State was recorded. Field development of blue mold was observed in Tennessee. A large percentage of the growers used control treatments and this factor, plus timeliness and proper application, did much to control the disease.

Downy mildew of cucurbits was not a problem this year, mainly because of dry weather, the effective use of control measures, and the planting of resistant varieties.

There follows a digest of local disease conditions this year, listed alphabetically by State or Province. The individual reports are based upon brief summaries submitted by the collaborators and also upon items abstracted from the warning letters issued throughout the year.

Late Blight of Potato:

Arkansas: Late blight was observed on potatoes at Monte Ne.

Canada:

Manitoba: Late blight appeared moderately early in 1952 and in each case reported it had already done considerable damage so that it appeared it would soon become widespread and severe. However, subnormal rainfall in autumn apparently prevented this and the potato

crop was, for the most part, in very good condition at harvest.

As in previous years, the provincial authorities were kept informed of the blight situation. They in turn notified potato-grower cooperatives, the members of which took appropriate action. In most cases none but insecticidal dusts were used. Dusting the crop is still preferred to spraying and Bordeaux mixture dust appeared to be the most popular fungicidal dust.

New Brunswick: Late blight was most difficult to find in the potato crop this year owing to the extremely dry weather from the latter part of June until the end of September.

Nova Scotia: Favorable weather for blight development occurred this season in Nova Scotia. Blight was reported in Kings County but was more severe in Colchester and Pictou Counties.

Ontario (Eastern): Late blight was first reported on Green Mountain potatoes in a spray experiment plot at Ottawa. The first report in a commercial field was on Canus potatoes at Metcalfe, Carleton County, on August 11. After this date it gradually spread and increased until it became general, infection being slight to moderate in well-sprayed or dusted fields, and severe (killing the plants) in poorly or unsprayed or undusted fields.

The weather during all of the growing season was moist, one or two sunny days alternating with one or two rainy days. The early part of the season was hot, the high temperatures limiting the development of late blight. The week of July 27 was wet and cool and favorable for the development and spread of the fungus. Thereafter, the weather continued to be more or less favorable for the spread of late blight, the nights being cool with heavy dews when it did not rain.

All potato fields were sprayed two or three times for the control of insect pests and fungus diseases. Only about 25 percent of fields received four or more applications. The fungicides used were Bordeaux mixture, Dithane D-14, Dithane Z-78, and fixed coppers (in decreasing order). Tuber rot was general in all potato crops, varying from a trace to 30 percent, averaging around 3 to 4 percent.

Ontario (Western): There were no outbreaks of potato blight of any consequence in southwestern Ontario.

Quebec: Late blight of potato was reported in Quebec in the following counties: Chateauguay, Papineau, Labelle, Joliette, Berthier, Champlain, Nicolet, Chicoutimi, Temiscouata, Portneuf, Quebec, and Bonaventure.

Prince Edward Island: The potato crop in all varieties was relatively free from blight, especially in Kings County, owing to the low rainfall in certain areas. In Queens and Prince Counties the unsprayed and poorly sprayed fields of the older commercial varieties were severely affected. On farms where the spray schedule was properly conducted little or no disease occurred. Some new varieties developed for late blight resistance were heavily attacked.

Fungicides used in 1952 were Bordeaux mixture, Dithane D-14, Parzate, copper oxychloride sulfate, and tribasic copper sulfate. In our screening test for new fungicides, Manzate gave outstanding results both in disease control and yield.

The Advisory Service, inaugurated in 1947 to assist potato growers in Nova Scotia and Prince Edward Island to protect their crops against diseases and insects, was expanded in 1952 at the request of the industry to cover not only the disease and insect season but also the planting and harvesting seasons. Material for the weekly bulletins was contributed by pathologists, entomologists, inspectors, field men, and others. The bulletins were prepared and edited at the Charlottetown Laboratory. These bulletins were sent to all contributors, agricultural officials, nine newspapers, six privately owned radio stations, and the Canadian Broadcasting Corporation Network.

Colorado: Late blight was found in several locations in the San Luis Valley near La Jara and Monte Vista. The variety planted in the infected fields was Red McClure. This constitutes the first report of late blight in this area since 1947.

Potato blight was also reported in the Julesburg area, where it made a sudden appearance. Growers attempted to get coverage of copper by air.

Connecticut: Although late blight was found in Connecticut on both potatoes and tomatoes

this year, there was only sparse general infection. An occasional field of potatoes or tomatoes was badly affected late in the season. Most of these cases of severe late blight infection occurred in fields that had been sprayed carelessly or not at all.

Delaware: Incidence of blight on potatoes was light. No spread to other fields occurred because of unfavorable weather conditions. The disease was not found in late-planted potatoes.

All commercial growers spray or dust. About 70 percent use copper and the rest zineb. The preference for sprays or dusts was about equally divided.

Florida: Late blight of potato was found in fields scattered throughout the Hastings area but did not spread very much.

Illinois: Late blight ranged from ten to 100 percent in potato fields examined. Infection and rot in tubers was not present in more than trace amounts.

Spraying was done with conventional high-pressure, high gallonage ground equipment. Materials used included: fixed coppers (4/100) and Bordeaux mixture (after late blight had appeared). In general the fungicides held blight in check.

Iowa: Late blight was serious this year in the peat fields that were not regularly sprayed.

Louisiana: Late blight was reported on potato in two locations in Louisiana this year. Where it occurred, the disease was kept in fairly good check by persistent spray applications of Dithane D-14, although rainfall was rather heavy during certain periods between the outbreak and harvest time. Losses were experienced from tuber infections in a few small areas but were probably not over 1 percent.

Maine: Late blight was observed fruiting on potato cull piles on June 2, the earliest date recorded in Maine.

Michigan: Late blight was present on potatoes in the Upper Peninsula and the northern portion of the Lower Peninsula.

Minnesota: Late blight was first observed in the peatland area near Hollandale in Freeborn County. It became widespread in this area, with 100 percent of the plants infected in some fields. In general, however, adequate spraying prevented significant loss. Blight was also heavy in another peat bog in Isanti County, northeast of Princeton. It was probably severe enough here to reduce yields somewhat. In both locations the new variety Cherokee was heavily infected. Kennebec was infected but less heavily.

In the vicinity of Minneapolis and St. Paul blight was general, but losses were small, probably because of adequate spraying.

Potato fields are small and widely scattered in north central Minnesota. Only a few fields were examined here and in most of these no blight was found. Tubers were infected at harvest time at the Grand Rapids Experiment Station.

In a fairly extensive survey about mid-August in the Red River Valley from Clay County to Kittson County it was impossible to find blight in most fields. Only occasional traces were observed. There were two exceptions to this rule. At Oklee, in eastern Red Lake County, the varieties Pontiac, Cobbler, and White Rose were grown side by side in a rather small field. A trace of blight was observed on Pontiac, but Cobbler was about 40 percent and White Rose 100 percent infected. The same reaction was evident in a variety trial plot near Fisher, where White Cloud was completely killed and Pontiac only lightly infected. This plot had not been sprayed or dusted.

It appears that weather in the Red River Valley favored blight, but that the area escaped heavy infection during the summer probably because of the combined effect of the relative resistance of the variety Pontiac, which is widely grown, and extensive use of fungicides.

The harvest season was dry in most areas in the State and there have been very few reports of tuber infection. Blight probably caused very little loss in the State this year.

Practically all commercial growers use fungicides. In the Hollandale area sprayers are used exclusively, but in the Red River Valley dusters are largely used because of the relative scarcity of water. A considerable amount of airplane dusting is done in the Red River Valley.

Mississippi: No late blight was found on potatoes or tomatoes in the truck crop area this

year. There was no late blight, identified as such by a pathologist, elsewhere in the State. In general, the season has been unusually dry and, therefore, not favorable for development and spread of the fungus.

Nebraska: Late blight appeared about the middle of August in the western potato-producing area. After that the weather was not conducive to late blight development in the North Platte Valley and, consequently, tubers were not affected. In the Mirage Flats area, however, timely rains occurred and the disease reached epidemic proportions.

New Hampshire: Potato and tomato late blight were of minor importance in New Hampshire in 1952. Potato late blight was observed in Coos County in mid-summer but did not cause appreciable damage owing to the hot, dry weather. During September both potato and tomato late blight were observed in Strafford, Rockingham, and Hillsborough Counties. Most outbreaks were in home gardens that were not protected by fungicides. In a few instances potato tubers became inoculated during harvest operations, and appreciable losses resulted in storage.

In general, it is believed fungicides were used on a larger scale than was necessary considering the weather conditions, especially on such varieties as Kennebec. Neutral copper sprays and dusts were most popular in the State this past year. Many growers followed a regular program of spraying and dusting with DDT and copper at intervals of seven to ten days throughout the season.

New York: Late blight of potato was reported in the Orient section of Suffolk County, at Cutchogue on the Island, and in Herkimer County.

North Carolina: Blight first appeared in early June in the coastal area. Hot, dry weather followed the initial outbreak and the disease caused no appreciable loss in this area. No control measures were used, as the weather became unfavorable for spread.

In the mountain area blight appeared around mid-July but was held in check by hot, dry weather and did not cause serious loss. Most of the commercial acreage was treated. Bordeaux mixture and copper lime dust were the most widely used of the fungicides.

North Dakota: There was a deficiency of rainfall in the Red River Valley until July and then some areas received above-normal precipitation. The area around Grand Forks had an abundance of rain during July and August, and late blight was present here the latter part of August. Foliage infection was light in all but one field observed. A warning was given to the growers and most farmers killed the vines to prevent further damage. Very little tuber late blight has been reported. Early blight (*Alternaria solani*) was of little importance.

Since potato support prices have been discontinued, there has been a decided reduction in the use of potato fungicides. Most growers also realize it is useless to use fungicides when early and late blights seldom cause an appreciable loss.

Pennsylvania: Late blight of potato was observed in September and October in five counties and appeared early enough to cause widespread tuber infection despite the prevention of an outbreak of late blight by hot summer weather. The average loss for the State is estimated at about 0.5 percent.

Nearly 100 percent of the commercial potato acreage is sprayed. Parzate and Dithane are the most commonly used fungicides. Many growers change to 8-4-100 Bordeaux in late July or early August since they report less storage rot where this plan is followed.

South Carolina: Late blight was not observed on the 1952 potato crop. The variety Sebago, which is partially resistant to late blight, was used almost exclusively in 1952.

Virginia: Late blight was not observed or reported on potatoes this year.

Wisconsin: Late blight of potato was found near Hancock, in the muck area near Delavan, and in the Antigo area.

Late Blight of Tomato:

Alabama: No late blight was observed in the field in southeastern, central or northern Alabama. The only late blight observed in 1952 was on tomato transplants from Florida.

Tomato plants in southeastern and central Alabama were free of foliar diseases. However, early blight (Alternaria solani) was prevalent on the late crop of tomatoes in northern Alabama.

Arkansas: Late blight on tomatoes was observed at Monte Ne, Arkansas.

Canada:

New Brunswick: There was only one report of late blight of tomato and this was confined to a small field. The tomato plants were not sprayed in the tomato-growing area, but blight failed to become established on vines or fruit.

Ontario (Eastern): Late blight from natural infections on tomato foliage and fruits was first observed at Ottawa, Carleton County, about September 1. Thereafter it continued to spread and increase and by the end of September it was present in every garden and commercial field, varying from a trace to about 25 percent fruit infection, averaging about 5 percent. Most tomato fields were unsprayed.

Ontario (Western): In southwestern Ontario this year there have been no outbreaks of tomato late blight.

Colorado: On September 12 a severe outbreak of late blight on tomatoes was noticed near Fort Lupton. The disease was well disseminated about the 40-acre field and had killed the foliage rapidly. The sudden exposure to sunlight caused high losses to the fruit, due to sunscald. Very little loss to the fruit caused by Phytophthora infestans was observed.

Connecticut: Please see section on Late Blight of Potato.

Delaware: Late blight was not found on the commercial canning crop or in home gardens.

Practically 90 percent of the commercial growers spray with zineb (1 1/2 lbs. active ingredient to 100 gallons of water) and apply at least six applications, averaging 150 to 175 gallons per acre. This schedule has been effective in controlling all tomato diseases, including Stemphylium.

Florida: (East coast of Florida north of Dade County): Late blight was continuously present in the spring crop of 6,500 acres, but it did not become serious during the season except in isolated locations. As late as the middle of May, 1952, one 130-acre field showed an estimated 90 percent of the plants infected. The grower had been spraying regularly but was using an excess of lime on a nabam plus zinc sulfate twice-a-week schedule. He was advised to omit the lime, and upon doing so checked the spread of the disease so thoroughly that he lost only the crown hand of fruit.

From 12 to 20 applications of fungicides are regularly used on tomatoes in this area. Nabam plus zinc sulfate-sprayed tomatoes usually begin to show yellowish mottled leaves with an overall stunting about half way through the season. Zineb does not produce these symptoms so soon nor so severely. Phygon XL at 3/4 lb. has hitherto been used as an alternate material to avoid this injury but last spring many of the growers started alternating with nabam plus manganese sulfate. Many farmers now use nabam plus manganese sulfate continuously or alternated with nabam plus zinc sulfate, zineb, or Phygon. One pound of manganese sulfate and 2 quarts of nabam are mixed in the concentrated form for 100 gallons of spray. This fall Manzate has been available to a limited extent and growers are well pleased with the results. Manzate is used at the rate of 1 1/2 to 2 lbs. per 100 gallons but most prefer the latter figure.

Georgia: Although approximately three and one-half million plants were confiscated and destroyed by the Georgia Department of Entomology, some fields set in late February and March with Florida-grown plants were a total loss due to the stem canker stage of late blight.

The amount of blight that appeared in the green-wrap regions of Georgia varied from a trace to 40 percent. Fortunately, owing to unfavorable weather for blight development and spread during this growing period, the disease was not observed in the tomato plant fields.

Illinois: No late blight on tomatoes was reported.

Indiana: Late blight was found on green-wrap tomatoes received from Florida.

Iowa: Late blight of tomatoes was unreported in either home gardens or commercial fields. An extensive spray program was undertaken by a large canning company in southeastern Iowa. Unfortunately, the disease level was too low to assess its merits adequately in 1952.

Kentucky: Late blight of tomatoes was found in Davies County in a field set with Florida-grown plants.

Louisiana: No late blight was observed or reported on tomatoes in Louisiana.

Maryland: Late blight of tomato was found in Washington County in a field set with Florida-grown plants. In the latter part of the season there were two reports of tomato blight on locally-grown tomatoes.

Michigan: There was no tomato blight anywhere in Michigan in 1952. The early part of the season was hot and dry but weather was favorable to late blight in September. It appears that most of the growers have adopted a successful control program.

Mississippi: Please see section on Late Blight of Potato.

New Hampshire: Please see section on Late Blight of Potato.

New Jersey: Late blight of tomatoes was found in early June on one farm at Indian Mills, Burlington County.

North Carolina: Late blight on tomatoes was not a problem in the Piedmont or the eastern Coastal Plain and was much less severe in the mountain areas than usual. The disease did not occur until mid-August and caused damage only on late garden plantings. The long drought and abnormally high temperatures were primarily responsible for the late occurrence and slight damage during this season. Fixed copper sprays (2-100) and dust (7% Cu) were extensively used throughout the mountain area.

Ohio: Late blight of tomatoes was not observed in Ohio in 1952 except for one occurrence in two unsprayed rows in a field located on the Indiana line near Celina, Ohio, which is near the southern edge of Ohio's tomato-producing section. Its non-appearance was probably due to weather conditions, which were definitely not favorable for the occurrence of blight. It was extremely dry and warm in June with few nights cool enough to favor infection. There was slightly more rain in July and August but temperatures remained high.

Pennsylvania: Late blight of tomato appeared late in the season and the average loss was below 0.25 percent. Maximum infection in one field was 75 percent. The disease occurred in Lancaster, Lehigh, Bucks, Philadelphia, and Pike Counties.

More than 90 percent of the commercial tomato fields are being sprayed. Fixed copper 50% (4 lbs. -100) or Bordeaux (6-3-100), are the sprays used by most growers to prevent late blight. A few growers are using Manzate or Parzate or Dithane.

South Carolina: Late blight was brought into Charleston County (Mt. Pleasant community) on tomato plants from Florida in early April. Owing to the dry, hot weather that followed the original introduction, almost no secondary spread occurred and the disease was never found except in the two fields set from this lot of plants. Growers used fixed copper almost entirely; only a few used zineb or nabam. There was no opportunity to observe the relative effectiveness of the various control programs.

Virginia:

Blacksburg: Tomato late blight did not appear until quite late in southwestern Virginia. During most of the summer the weather was very dry and the summer tomato crop came through with practically no late blight until about mid-September. Home gardeners who used zineb or copper were able to control late blight very well.

Norfolk: Late blight was observed only once on tomatoes this year. This was near Cheriton, Virginia, where plants from one small shipment from Florida developed the stem

canker stage of this disease. Plants from other shipments set in this and other fields in the same locality did not show late blight. Destruction of all plants from the infected shipment was recommended. The grower reset the field but depended upon the transplanter to destroy the original plants. The destruction was incomplete and some secondary spread occurred to later-set plants in close proximity to diseased plants surviving from the first shipment. However, dry weather this year prevented blight from becoming a problem in eastern Virginia.

Late Blight Forecasting

Late blight forecasts were made again this year from Ames, Iowa for the north-central region, and proved successful with a high degree of accuracy in predictions. In this region blight was a threat to potatoes in northern Iowa, parts of North Dakota, Minnesota, and Wisconsin. It was accurately predicted that no destructive outbreak would occur in Indiana and that the blight would continue to develop in northern Iowa, especially in the Crystal Lake peat beds where potato foliage and weeds were rank. Since this region had the most rainfall during this past season, forecasts were of value to all growers.

Because of the high daily temperatures tomato growers had little to fear from blight in the north central States.

Blue Mold of Tobacco:

Connecticut: Blue mold was reported in the seed beds in Hartford County. Most growers sprayed with ferbam.

Canada:

Ontario: Tobacco blue mold occurred in the majority of hotbeds in the Blenheim burley tobacco district towards the end of the planting season, and was found in a few greenhouses in the Delhi flue-cured tobacco district after planting was completed.

Florida: Blue mold in cigar-wrapper tobacco plant beds in the vicinity of Quincy caused less damage in 1952 than usual. Most of the bed acreage was dusted with 6.5% zineb or 15% ferbam. Zinebdust was slightly the more effective, probably because of superior dusting quality.

Blue mold occurred sporadically in shades set rather early, especially during ten days of cool weather following rain on April 24. Zineb dust, 6.5%, applied twice a week at dosages averaging 11 pounds per acre at each application, gave excellent control. A considerable acreage of commercial shade was dusted twice a week, once with fungicide and insecticide combination and once with fungicide alone.

Georgia: Blue mold was first observed in Georgia in Cook County on January 22 and by the end of February had become widely scattered throughout the flue-cured area. This early outbreak, coupled with severe early damage in many beds, resulted in more growers using blue mold fungicides than ever before. A more thorough job was done and treatments were kept up. Most growers used the regular 15% Fermate dust, applied in the neighborhood of 30 lbs. of dust to 100 square yards.

Kentucky: Blue mold was late in appearing in Kentucky and was found in very few beds. There should be very little carry-over for next year.

Maryland: Blue mold was found in Charles, St. Marys, and Prince Georges Counties. Apparently damage was not extensive. Protective fungicides were used.

North Carolina: Blue mold was first observed on February 20, one of the earliest appearances of the disease in the State. The disease spread very slowly until March 20 when conditions became favorable for development and spread. It became established throughout the tobacco area and caused severe damage in some localized untreated beds. Including the whole tobacco area, blue mold incidence for the 1952 season would be considered as light to moderate.

It is estimated that 75 percent of the growers used control measures, of which 45 percent was spray and 55 percent dust. Approximately 80 percent of the growers treating used ferbam, and 20 percent, zineb. Treatments when timely and properly applied gave satisfactory control of the disease.

Ohio: Blue mold was not very serious during this past season. It was present in some beds in most of the tobacco-raising areas of the State but occurred only where the growers did nothing to control it until late in the season. Ferbam was the material most widely used for control in Ohio.

Pennsylvania: Blue mold was found in Lancaster County.

South Carolina: An early outbreak of blue mold was first reported in Georgia on January 22. One month later it appeared in early-seeded beds in Columbus County, North Carolina, and Florence County, South Carolina. The outbreak in South Carolina was quickly brought under control with ferbam dust with little or no secondary spread.

Surveys made in early March when plants were two-leaf to size of a half-dollar revealed primary infections in four locations with no secondary spread in 37 stops in five counties. Three infections were noted in Horrey County and one in Florence County. Relatively few growers had started treatment.

Surveys made at the end of March in Florence and Williamsburg Counties revealed four infections in 13 stops. Twelve of the 14 locations were being treated with ferbam. In a survey made of Horry, Florence, and Marion Counties in early April blue mold was found in 11 out of 16 sites. At half of these locations plants were of transplanting size, the remainder being one-fourth to one-half transplanting size. There was evidence of effective dusting with ferbam. Severely infected beds were found where growers had stopped treating in order to check the growth of the plants. The intention was to have plants ready for the second week in April. The severity of the disease indicated that the plants would not be ready until the third or fourth week in April.

Atypical symptoms were observed late in the season at the time of general transplanting. Severe necrotic leaf spotting occurred on beds showing nitrogen deficiency where the grower had stopped treating too early. Evidently the beds were hit with a shower of spores just before the weather warmed up enough to kill out the fungus in the infected leaves. Spots were brown, irregular in outline, and varied from flecks to one-fourth inch in diameter.

A second set of atypical symptoms occurred about the same time on a bed that had shown only a trace of leaf spotting earlier. This was in an area that had had an initial outbreak which had been brought under control. Plants in the bed were thick, stems were 4 to 8 inches long and pencil-thick or less in diameter. Midway up the stem and progressing downward the cortex showed a watersoaked brown discoloration encircling the plant. The mycelium of a phycomycete was observed in crushed mounts. Isolations on water agar failed to yield any phycomycete. The farmer reported that the trouble had occurred for several years. The plants showing symptoms do not survive after transplanting.

Spread of blue mold was probably held in check for two reasons. Although there was sufficient volume of precipitation, these rains usually came in heavy showers and were followed by drying winds, thus reducing the humidity and the length of the humid period. With over 90 percent of the farmers treating, the amount of inoculum in the air was probably greatly reduced.

Severity in infection at the end of the season was due to a change into cool rainy weather. Severe infections occurred only on beds where farmers had not treated or had stopped treating in order to allow blue mold to burn back the beds because the plants were ready before the weather had warmed up sufficiently for good transplanting. Farmers are obviously seeding too early. This is brought on by the unpredictable dry weather that sometimes occurs during the middle of the planting season. Often one week delay makes a great difference in obtaining a stand.

The number of farmers treating has increased in the past year. Over 90 percent of the farmers are using the program. Only about 1 percent use a sprayer. The balance use a dust. Most of the dust is ferbam, 11.4%. A few farmers used the Dithane form of zineb dust, 6.5%. Farmers using Dithane report difficulty in getting a smooth flow of the dust through the dust gun during humid or rainy weather. Using the same diluent, this trouble was not observed in the Parzate form of the zineb dust.

Virginia: Blue mold appeared later than usual although it was generally distributed throughout the flue-cured area. About 90 percent of the tobacco growers in the flue-cured area applied control measures, chiefly ferbam, although a few used zineb. These materials were used at the rate of 3 to 4 lbs. ferbam and 2 to 2 1/2 lbs. of zineb to 100 gallons of water. Both of these materials were very effective when used according to recommendations and farmers are

highly pleased with the results, whether they used sprays or dusts.

Note

It might be of interest to note that blue mold was found this year in Georgia on two additional hosts, namely, on pepper plants and on tomato seedlings.

Downy Mildew of Cucurbits:

Alabama: No downy mildew was observed in cucumber fields in southeastern Alabama.

Arkansas: A mild sprinkling of downy mildew was observed August 25 in one cucumber planting at Van Buren. This planting had been irrigated. Adjacent cucumbers not irrigated had none of the disease. Appearance of downy mildew in the one isolated case is of interest, since this region suffered from high temperatures and a severe drought this year. The source of inoculum presents an interesting but unanswered question.

Delaware: Downy mildew was not found until the commercial season was over and no damage was done to commercial crops. The acreage has decreased considerably in Delaware. Of the growers left about 60 percent dust and 20 percent spray. Zineb (1 1/2 lbs. active ingredient to 100 gallons of water, or as a 6% to 8% dust) is the preferred material. Usually five to six applications are made, 150 gallons of spray per acre, or 4 lbs. of dust. These schedules are effective in control of the usual diseases.

Florida: (Ft. Pierce). Downy mildew was very serious in the month prior to October 22 on cucumbers and squash. Some fields were abandoned because of the disease, despite a regular spray or dust program. This is attributed to the generally heavy rains in the area this season. Zineb or nabam plus zinc sulfate with a sticker at the rates recommended for late blight of tomato is used. Nabam plus manganese sulfate has also been used with satisfactory results by a few farmers.

Georgia: In early June downy mildew was found on cucumbers in several fields in Cook County about 20 miles south of Tifton. In late September it was found in a 45-acre field of cucumbers in Toombs County about 100 miles northeast of Tifton. In another field 20 miles south of Tifton in Cook County it was also found on the variety Palmetto.

Kentucky: No cucurbit downy mildew was reported or seen in Kentucky this season.

North Carolina: The disease was first observed on June 25 on cucumbers and spread very slowly owing to unfavorable weather conditions. Finally the disease became generally distributed throughout the State wherever cucurbits are grown but caused no appreciable damage except on late cucumbers in the mountain area and on a few scattered plantings of fall cucumbers in the eastern part of the State. It is estimated that only one percent of the acreage was treated. The treatments consisted primarily of tribasic copper dust (5% Cu) and zineb dust (6%).

Pennsylvania: The hot dry weather of late summer almost completely prevented the appearance of cucurbit downy mildew.

South Carolina: Cucurbit downy mildew appeared late in the spring cucumber crop. It became widespread over the area but did not cause any appreciable loss since the normal harvest season ended by the time the disease became established. Most growers used zineb, nabam, or fixed copper for control. Mildew never did become serious in the fall crop. It seems likely that the pathogen failed to survive the extremely hot, dry summer to an extent adequate to get started in the fall, since volunteer plants in the spring crop fields remained almost entirely free of mildew throughout the summer and fall.

Anthrachnose (*Colletotrichum lagenarium*) was serious in some fields, causing more damage than it has in any season since fall cucumbers have been grown extensively in this State. Almost all fall crop growers used either zineb or nabam and achieved adequate anthracnose control where a proper dust or spray schedule was followed.

Texas: Downy mildew was observed on cantaloupes in a field near Yoakum about mid-June.

Virginia:

Blacksburg: Downy mildew of cucurbits was not a problem this year because of the dry weather. A small amount of zineb was used.

Norfolk: Normally, if downy mildew does much damage in this area, it appears on cucumbers during the first part of July and on cantaloupes by the middle of July. This year this disease did not appear on cucumbers until the middle of August, and even later on cantaloupes. By that time the spring crop of both had been harvested.

A sizeable acreage of cucumbers was planted this fall on the Eastern Shore of Virginia, and a large part of the acreage was planted to a downy mildew-susceptible variety. The disease became prevalent during the latter half of September and most of the growers used fungicides, either as sprays or dusts. The degree of control varied from none to good, depending on the time and thoroughness of applications. No correlation was noted between the fungicides used and degree of control.

Downy Mildew of Lima Beans (*Phytophthora phaseoli* Thaxt.):

Delaware: Downy mildew of lima beans was found in late August and by September 10 it was present in all parts of the State. As weather conditions thereafter never did become very favorable for any extended period, the disease did not become epidemic. However, it did cause losses in some fields, low-lying or in pockets in the woods. Total loss to the crop is estimated at less than 2 percent.

Growers are loath to spray or dust even when downy mildew is present. Less than 5 percent of the growers use a fungicide. Preferred material is fixed copper dust, 5% to 7% actual Cu at 40 to 50 lbs. per acre.

Pennsylvania: Downy mildew of lima beans appeared about middle of July in Lancaster County and became general over southeastern Pennsylvania. In some fields it was destructive. Many growers sprayed with fixed copper or Bordeaux. The average loss was less than 1 percent.

MYCOLOGY AND DISEASE SURVEY