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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

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BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

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UNITED STATES DEPARTMENT OF AGRICULTURE

SOME NEW AND IMPORTANT PLANT DISEASE OCCURRENCES
AND DEVELOPMENTS IN THE UNITED STATES IN 1952

Supplement 220

August 15, 1953

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

SOME NEW AND IMPORTANT PLANT DISEASE OCCURRENCES
AND DEVELOPMENTS IN THE UNITED STATES IN 1952

Compiled by Nellie W. Nance

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Some 1951 reports of plant diseases are included in this summary which were not published when the 1951 summary was completed. Otherwise this summary includes important diseases of 1952 compiled for the most part from reports to the Plant Disease Survey and articles in Phytopathology. Reports listed in the tables are for the most part not noted again in the text.

Noteworthy Observations. Oak wilt was not found in any additional States during the 1952 surveys, but it was found to be spreading in affected areas. The best control that could be recommended was to destroy the oak wilt-infected trees.

In 1952, for the country as a whole, late blight of potato and tomato was less widely distributed and caused less damage than during any of the preceding six years. Drought and record-breaking heat in the South and East during June and July and adequate control measures to a large extent inhibited disease development and spread.

Heavier than normal precipitation in Arizona in the early part of the year may have been a factor in the unusual development of rusts on pine and pear, as reported below.

The identity and distribution of virus diseases of the small grains received much attention. One significant discovery is the constant presence of a seed-borne virus in plants of a low-yielding strain of a barley variety. An outbreak of a soil-borne wheat mosaic developed in some of the Plains States. In Arkansas, the oat virus diseases yellow dwarf and red spot mosaic caused considerable damage, especially on winter oats. Aphids on cereal crops were probably more abundant in this State than at any time during the past 30-odd years.

Gladiolus corms received by Florida growers from southern Oregon were infected with the western aster yellows virus. There was no evidence of spread in Florida; nevertheless the introduction of western aster yellows into the eastern United States constitutes a menace to celery and zinnia in areas where only the eastern strain of the virus is known to occur.

Presence of the insect *Bemisia tabaci* in Florida, determined in connection with studies on the spread of Abutilon mosaic on *Sida*, may be a matter for concern, since this species is the vector for several other virus diseases not yet known to occur in this country.

General Summary of Weather Conditions -- 1952. Severe drought over large areas of the Country during the summer and fall was the outstanding weather feature of 1952. The simultaneous occurrence of drought and record-breaking heat in the South and East during June and July greatly reduced crop yields, particularly in New England, the Carolinas, Georgia and Tennessee where losses were estimated at many millions of dollars. The fall drought was almost Nation-wide and was particularly severe from the middle of September through the first decade of November. The weather during this period was ideal for harvesting but was unfavorable for pastures and seeding and growth of winter grains. Low humidity and the absence of rain created an extreme fire hazard and widespread fires east of the Rocky Mountains burned over vast areas of grass and brush as well as large tracts of valuable timber. Smoke from these fires at times reduced visibility to less than a mile and on one or two mornings in New Orleans, Louisiana, thick smog resulting from the smoke disrupted traffic.

Another major weather feature of the year was an early season heat wave during late March and early April in the north-central interior that rapidly melted a heavy snowcover over a frozen surface, resulting in damaging floods in the Minnesota and upper Mississippi Rivers and the most destructive flood in history along the Missouri River.

Other important features included the heavy winter snowfall in the western mountains, which assured abundant irrigation water, and adequate rainfall and favorable temperatures in the Main Corn Belt during the summer months, which contributed materially to the production of bumper crops of corn, soybeans, and hay. In Iowa, the yields of corn and soybeans per acre were the

TEMPERATURE AND PRECIPITATION

WINTER OF (DECEMBER-FEBRUARY) 1951-52

SPRING (MARCH-MAY) 1952

SUMMER OF 1952 (JUNE-AUGUST)

FALL OF 1952 (SEPTEMBER-NOVEMBER)

(From Weekly Weather and Crop Bulletin National Summary, Volume 39, 1952.)

greatest of record.

PRECIPITATION. The Nation-wide precipitation average for 1952 was the lowest since 1934. Central and northern Mississippi, some sections in the Pacific Northwest, and the major portion of the Great Plains received less than 75% of normal, and a few stations in western Texas and along the Canadian Border in the northern Great Plains reported less than 50%.

In the Pacific Northwest precipitation was normal or above only in June and December. Fortunately, rainfall came at timely intervals during the growing season and the yields of most crops were average or above. In the fall and early winter, however, the moisture deficiency delayed seeding, reduced the acreage of winter wheat, and resulted in insufficient stream flow for electric power.

In large areas of the lower Great Plains the year was one of prolonged drought. In Oklahoma the crop season was the driest on record, and at Hardesty an annual total of 8.10 inches of moisture was the lowest ever recorded for a calendar year in the State. In Texas the year's drought was reflected in the lowering of the major reservoirs, which declined from near one-half full in January to less than one quarter full in December. In the remainder of the Great Plains above-normal moisture in January or February, timely showers in late June and early July, and favorable temperatures during the growing season, produced good crops. In southern and eastern regions east of the Great Plains drought-breaking rains occurred in Louisiana and extreme southern Mississippi about the middle of July and in most of the remaining eastern States during August.

Above-normal precipitation for 1952 was largely limited to California, Nevada, and Arizona, most of the middle and north Atlantic States, and scattered sections in the upper Mississippi Valley and Great Lakes Region.

SNOWFALL. Heavy snows fell in the western mountains from January through March, particularly in the Sierra Nevadas where January depths at many stations were the greatest of record. In the Sierra Nevadas heavy snowfall and strong winds damaged power and communication lines, blocked roads and isolated some communities, and snowslides and avalanches in some localities demolished homes and other buildings killing several people. Rapid snowmelt caused damaging floods along the Milk River in Montana in late March and in Utah and Nevada in April and May.

East of the Rocky Mountains the year's snowfall was generally about average in the more northern districts, but generally below normal in middle sections where the ground was free of snow much of the time.

TEMPERATURE. East of the Continental Divide temperatures for the year averaged 3° to 4° above normal along the Canadian Border and north Atlantic Coast and 1° to 2° elsewhere, but west of the Divide yearly averages were near normal at all reporting stations. Nation-wide monthly averages were below normal only for March, October and November.

The winter of 1951-1952 was unusually mild over the eastern two-thirds of the Country, and freeze damage in the deep South was relatively light. In the northern Rocky Mountains and far West, however, the winter was colder than usual.

The spring was somewhat cooler than normal in the central and south-central interior, and generally above normal elsewhere.

The summer was characterized by abnormally warm weather, particularly in central and southern areas east of the Continental Divide.

In the far West the autumn was warmer than normal during September and October, but was unusually cold during November. East of the Divide temperatures averaged below normal for this season, except in the Northeast.

DESTRUCTIVE STORMS. During 1952 damage caused by high winds, tornadoes, and hail was above the average of previous years. Of these three types of storms, high winds were the most destructive, causing damage of about \$75,000,000. More than one-half of this total occurred on September 1 when winds, which registered 90 m.p.h. before the anemometer was smashed, damaged buildings, installations, and 35 large planes at Carswell Air Base in Tarrant County, Texas.

Hail damage totaled nearly \$50,000,000, about four-fifths of which occurred between the Rocky Mountains and the Mississippi River. Oklahoma reported the greatest damage, over \$7,000,000, followed by North Dakota with over \$6,000,000 and Nebraska and Kansas with over \$5,000,000 each. Probably the most destructive single hailstorm of the year occurred on June 24 in Huron, South Dakota and surrounding localities where damage was estimated at \$3,500,000.

Tornadoes killed 230 persons and caused over \$35,000,000 damage. The greatest tornado

disaster of the year occurred on March 21 and 22 when a series of these storms swept through parts of Arkansas, Tennessee, Missouri, Kentucky, Alabama, and Mississippi, leaving over 200 persons dead and 1,200 injured, and destroying property estimated at nearly \$15,000,000.

The year's only important hurricane damage occurred in South Carolina on August 30 and 31 and was estimated at slightly over two million dollars. Severe glaze in southeastern Missouri and adjacent sections of Arkansas, Kentucky, and Illinois during the first three days of January resulted in losses estimated to be in excess of \$1,500,000. (Summary furnished by Weather Bureau, Department of Commerce, July 10, 1953.)

Maps on page 73 show the temperature and precipitation for the winter of 1951-52, spring, summer, and fall of 1952.

Table 1. Diseases reported in States where they had not been found or reported on a particular host until 1952¹.

Host Disease (Cause)	Where found	Remarks
CORN		
Meadow nematode (<u>Pratylenchus zeae</u>)	Texas	Found causing considerable damage to localized spots in a corn field. (PDR 36: 491)
OATS		
Downy mildew (<u>Sclerospora macrospora</u>)	Florida	Found on Southland oats collected near Greenville late in May 1952. (PDR 36: 338)
	Alabama	Found during the late spring of 1952
	Tennessee	in these two States. (PDR 36: 347)
WHEAT		
Take-all (<u>Ophiobolus graminis</u>)	Georgia	Occurrence in Georgia represents a significant southward extension in the known range of take-all. (PDR 36: 391)
	Illinois	Mature perithecia of this fungus were found on Royal wheat in late June 1952. (PDR 37: 148)
Soil-borne mosaic viruses	Oklahoma	Found for the first time in Okla. during the season of 1952. Serious losses in some fields. (PDR 37: 27)
SOYBEAN		
Target spot (<u>Corynespora cassiicola</u>)	Virginia	Found on soybeans at the Va. Truck Exp. Station, Norfolk, Oct. 8, 1952. Spotting prevalent on leaves of the vars. Dortchsoy 31 and Roanoke. (PDR 36: 491)
Yellow bean mosaic (Phaseolus virus 2)	Mississippi	Observed for first time in 1952. Virus diseases not a factor in soybean production in Miss. (PDR 37: 154)
APPLE		
Flyspeck (<u>Microthyriella rubi</u>)	California	Found on vars. Double Red Delicious and Newton Pippin. (PDR 37: 166)

¹Thomas E. Summers and Donald H. Bowman. The cereal rusts and other diseases of small grains in Mississippi. PDR 37:142. They state that eleven diseases were found for the first time in Mississippi. For some new species of Ustilaginales from North America see Research Studies of the State College of Washington Vol. 20 (1): 3-10. 1952.

Table 1. (Continued)

Host Disease (Cause)	Where found	Remarks
GERANIUM MACULATUM		
Rhizome rot (<u>Seaverinia geranii</u>)	Ohio	The <u>Botrytis</u> conidial stage was also found on the rhizomes. Seaver recorded the disease from New York and Wisconsin. (PDR 37: 374)
GLADIOLUS		
<u>Curvularia</u> sp.	Oregon	Found on few corms but has not been found on gladiolus foliage or flowers. (PDR 36: 474)
<u>Meloidogyne hapla</u> (northern root-knot nematode)	Florida	Previously had not been reported farther south than North Carolina (PDR 36: 335)
Topple (? calcium deficiency)	North Carolina	High percentages of cut spikes of four varieties of gladiolus in Western N. C. were affected in the 1952 season. (PDR 37: 285)
HYDRANGEA OPULOIDES		
Stem nematode (<u>Ditylenchus</u> sp.)	Alabama	Found on greenhouse hydrangeas in 1949, 1951 and 1952, apparently the first record for this country. (PDR 37: 340)
ORNAMENTAL ARBORVITAE (<u>THUJA ORIENTALIS</u> var. <u>CONSPICUA</u>)		
Blight (<u>Cercospora thujina</u>)	Tennessee	Over 30,000 plants were affected in the nursery that submitted specimens. (PDR 37: 258)
SNAPDRAGON		
Downy mildew (<u>Peronospora antirrhini</u>)	Maryland	Caused serious damage in a commercial greenhouse. (PDR 36: 211)
VIOLA spp.		
Violet scab (<u>Sphaceloma violae</u>)	Kansas	(PDR 36: 331)
PEANUT		
<u>Meloidogyne hapla</u> (northern root-knot nematode)	Alabama	Found in three fields. In one field most of the plants were severely stunted during June 1952. (PDR 36: 335)
PLANTAGO spp.		
Plantain scab (<u>Sphaceloma plantaginis</u>)	Iowa Kansas Missouri	(PDR 36: 331)

Table 1. (Continued)

Host Disease (Cause)	Where found	Remarks
SUGARCANE "Sclerospora disease" (<u>Sclerospora</u> sp.)	Louisiana	: First record of positive identifica- : tion, other than in Australia, where : it has been for 10 years, and in : Peru where it was recently identi- : fied. (The Sugar Bull. 30: 390. : Sept. 1952)
SPINACH White rust (<u>Albugo occidentalis</u>)	Louisiana	: White rust was widespread and : severe in a planting of several : acres of spinach near Natchitoches : on April 4, 1952. (PDR 36: 211)
SWEETPOTATO Internal cork (Virus)	Florida	: Found in Palm Beach and Martin : Counties. Combined plantings : totaled about 1500 acres, disease : varied from 30 to 70% in the sale- : able field-run roots. (PDR 36: : 337)
TOMATO <u>Meloidogyne hapla</u> (northern root- knot nematode)	Florida	: Previously had not been reported : farther south than North Carolina. : (PDR 36: 335)

Table 2. Diseases found or reported in this country for the first time in 1952=*; diseases found on new hosts=**.

Host Disease (Cause)	Where found	Remarks
CORN Maize leaf fleck virus (<u>Corium zeae</u> n. sp.)	California	: The virus is not mechanically trans- : missible nor is it carried in the : seed produced by infected plants. : Transmission of the virus did not : occur through the soil. Three : aphid species were demonstrated : vectors of the virus. (Warren N. : Stoner. Phytopath. 42: 683)
RYE Dwarf bunt**		: Affected rye plants found in a field

Table 2. (Continued)

Host Disease (Cause)	Where found	Remarks
(Rye continued) <u>Tilletia caries</u> = <u>T. brevifaciens</u>	Utah	of the dwarf-bunt-resistant wheat var. Wasatch on a farm in Sanpete County, Utah. (PDR 36: 434)
ALFALFA Yellow mosaic (<u>Marmor medicaginis</u> var. <u>flavo-</u> <u>varians</u> n. var.)	Idaho	A new strain of alfalfa mosaic virus producing both necrotic local lesions and systemic necrosis and mottling on beans was isolated from natural- ly infected alfalfa in Idaho. (W. J. Zaumeyer. Phytopath. 43: 38)
CRABGRASS (<u>DIGITARIA SANGUINALIS</u>) WITCHGRASS (<u>PANICUM CAPILLARE</u>) Crazy dwarf**	Indiana	Found growing near affected corn plants. (Phytopath. 42: 675)
JOHNSON GRASS (<u>HOLCUS HALEPEN-</u> <u>SIS</u>) Downy mildew (<u>Sclerospora</u> sp.)**	Mississippi	Perhaps <u>S. macrospora</u> , associated with diseased oats (PDR 37: 143)
OAT GRASS, TUALATIN var. (<u>ARRHENATHERUM ELATIUS</u> var. <u>BULBOSUM</u>) Dwarf smut* (<u>Tilletia brevifaciens</u>)	Oregon	Found in five fields varying from a trace to 50% dwarfed culms. (PDR 36: 343)
STRAWBERRY Western aster yellows** (Virus)	California	Found during 1952 in scattered area of Central California, mostly on plantings of the Lassen variety. Identity of virus determined by cross-inoculations. (PDR 37: 272)
DWARFMISTLETOE (<u>ARCEUTHOBIMUM</u> <u>AMERICANUM</u>) Anthracnose** (<u>Septogloeum gillii</u>)	Montana	In October 1948 this mistletoe suf- fered heavy mortality at several lo- cations in the Lewis and Clark Nat. Forest. (PDR 36: 300)
FITTONIA <u>VERSCHAFFELTII</u> var. <u>ARGYRONEURA</u> Blight** (<u>Rhizoctonia solani</u>)	Ohio	Found in 1952 in greenhouses. (PDR 37: 373)

Table 2. (Continued)

Host Disease (Cause)	Where found	Remarks
FORSYTHIA INTERMEDIA F. F. SUSPensa Cane blight** (<u>Botryosphaeria ribis</u>)	Maryland	Although this is believed to be the first report on forsythia it is not the first observation. Identified on nursery specimens from near Rockville, Maryland in 1945. (PDR 36: 440)
GERANIUM VISCOSSISSIMUM Leaf spot (<u>Cercospora geranii</u> n. sp.)	Washington	Whitman County (Wm. B. Cooke and C. G. Shaw. Lloydia 15: 126)
HOLLY (ILEX CRENATA var. ROTUNDIFOLIA) <u>Physalospora ilicicola</u> **	Georgia	Collected during the early part of September 1951, from dying plants near Atlanta. (PDR 36: 355)
AMARANTHUS RETROFLEXUS CAPSELLA BURSA-PASTORIS SOLANUM SARACHOIDES Broomrape** (<u>Orobanche ramosa</u>)	California	Observed in 1952 (PDR 37: 136)
CALIFORNIA LAUREL (UMBELLULARIA CALIFORNICA) Bacterial leaf spot (<u>Pseudomonas lauracearum</u> n. sp.)	California	Diseased leaves were collected from a California laurel tree, located on the west slope of the Berkeley hills, east of the Univ. of Calif. campus. (John M. Harvey. Madroño 11: 195)
JUNIPER MISTLETOE (<u>PHORADENDRON JUNIPERINUM</u>) Rust** (<u>Uredo Phoradendri</u>)	Arizona	Found in June 1952. (PDR 37: 258)
MAGNOLIA GRANDIFLORA. Leaf scab (<u>Sphaceloma magnoliae</u> n. sp.)	Florida Georgia Louisiana Mississippi	The disease was severe in Ga. from 1941-1943, but has since been less harmful. (Anna E. Jenkins and J. H. Miller. Jour. Wash. Acad Sci. 42: 323)
VIOLA PATRINII Violet scab** (<u>Sphaceloma violae</u>)	Kansas	Found in garden on Kansas State College campus. Plants in only a small area affected. (PDR 36: 331)

Table 2. (Continued)

Host	:	:
Disease	:	:
(Cause)	Where found	Remarks
BEAN	:	:
Yellow bean mosaic strain	:	:
(virus)	Washington	A new local-necrotic-lesion-pro-
	:	ducing virus isolated from infected
	:	bean pods collected in eastern
	:	Wash. is described, identified,
	:	and compared with other bean vir-
	:	uses. Believed to be a new strain
	:	of yellow bean mosaic. (Zaumeyer
	:	and Fisher. Phytopath. 43:45)
PEPPER, BELL	:	:
Cladosporium leaf spot	:	:
(<u>Cladosporium capsici</u>)	Georgia	First collected in Sept. in a two-
	:	acre field in Union County. The
	:	entire field was seriously affected.
	:	Unable to find out where the seed
	:	came from. (PDR 36: 440)
BRUSSELS SPROUTS	:	:
Brassica-root nematode*	:	:
<u>Heterodera cruciferae</u>	California	First record of this nematode in the
	:	U. S. Evidence indicates that it
	:	has been present in Calif. for many
	:	years. Heavy populations of the
	:	nematode in most fields. (PDR 36:
	:	438)

DISEASES OF CEREAL CROPS

J. E. Machacek reported results of the 1952 cooperative seed-treatment trials in Canada and the United States for the control of wheat bunt (Tilletia spp.), oat smut (Ustilago spp.), barley smut (Ustilago spp.), wheat seedling blight (Helminthosporium sativum), and flax seed rot. (PDR 37: 59).

E. D. Hansing reported results of Kansas experiments conducted in the field nursery in 1950, 1951, and 1952, comparing new fungicides with older ones to determine their relative value as seed treatments for the control of bunt (Tilletia foetida) or stinking smut (T. caries) of wheat, loose and covered smuts (Ustilago avenae and U. kolleri) of oats, covered kernel smut (Sphacelotheca sorghi) of sorghum and Victoria blight (Helminthosporium victoriae) of oats. Experiments were conducted also in the nursery to determine the comparative effect of these fungicides on emergence of these crops. (PDR 37: 49).

According to G. W. Bruehl temporary soil sterilization did not provide a basis for estimating losses from root and crown rots of wheat and barley. (PDR 36: 234).

AVENA SATIVA. OATS: H. H. McKinney and others reported investigations on the effects of light, temperatures, mineral nutrition, soil reaction, aphid infestation, and acid burning on chlorophyll degeneration and the development of anthocyanin pigments in oats and other grasses. They found that nutrition is a major factor in chlorophyll degeneration. (PDR 36: 445).

Erysiphe graminis var. avenae, powdery mildew. John F. Schafer and others reported the reaction of oats varieties and selections to powdery mildew at Lafayette, Indiana. This disease developed in severe proportions in the greenhouse at Lafayette, in 1950-51 and 1951-52. (PDR 37: 306).

Helminthosporium spp., blight. Beginning in early December leaf blotch (H. avenae) was observed in all fields surveyed and was especially severe where oats followed oats, according to Julian H. Miller and others, reporting notes on small grain diseases in Georgia for 1951-1952. The other blight (H. victoriae) has all but disappeared since the epiphytotic of 1946-47. (PDR 36: 287).

Leptosphaeria avenaria, Septoria black stem, in epidemic proportions was noted by T. R. Stanton in many of the important oat-growing sections of Iowa, the Dakotas, Minnesota, and Wisconsin during an automobile trip from June 29 to July 16, 1952. (PDR 36: 349). In Iowa, Septoria black stem and kernel blight did not appear to be seed-transmitted. There was no evidence of seedling infection at any of the temperatures, according to experimental results reported by Simons and Murphy. The infected seed was not toxic to chickens and mice under conditions of the experiment. (PDR 36: 448).

Puccinia graminis var. avenae, stem rust. P. Rothman and K. J. Frey reported that in experiments at East Lansing, Michigan, in 1951 and 1952 an epiphytotic of stem rust of oats caused a 25 percent reduction in yield, an 8 percent reduction in test weight, and a two-day delay in heading of susceptible oat strains as compared with their resistant counterparts from the same cross. (PDR 37: 302).

Puccinia coronata var. avenae, crown rust, was again the most damaging disease of cereals, according to R. W. Earhart reporting on small grain diseases of the Southeastern Coastal Plain. (PDR 36: 420).

Sclerospora macrospora, downy mildew, was reported by Thomas E. Summers as much more important in some southern areas than had been realized. He gave the known susceptible varieties, field distribution of diseased plants, sources of infection and control, and distribution as determined by a survey in 1952. (PDR 36: 347). According to Summers and Bowman in their report on cereal rust and other diseases of small grains in Mississippi, downy mildew was the most important disease of oats in the State in 1952. (PDR 37: 142).

Smog. According to Ruth Ann Bobrov, smog in the Los Angeles, California area causes serious damage to the oat crop. Ultimate browning and death of the entire blade may result. The extent of injury is in proportion to the concentration of smog in the air. (Phytopath. 42: 558).

Virus diseases

Marmor terrestre var. typicum and M. terrestre var. oculatum, soil borne viruses, have been observed in North Carolina, South Carolina, Georgia, and Alabama. The actual loss from these diseases has never been determined but in recent years has been little. J. G. Moseman and others reported the reaction of winter oat varieties and selections to soil-borne viruses in the southeastern United States. The two varieties Letoria and Stanton, developed in the Carolinas, were not recommended in those States in 1952, but were said to be good farther north in

States where mosaic had not been observed. (PDR 37: 226).

Red leaf. According to results of experiments reported by Wilson and Murphy this disease of oats as observed in Iowa is a systemic virus disease. It is readily soil and aphid transmitted, but is not seed transmissible. Low temperature and direct sunlight favored symptom expression of the disease. Differential varietal reaction to the disease was observed. (PDR 37: 21). In Mississippi very little was observed in 1952 although it had been destructive during 1950 and 1951. (PDR 37: 142).

Virus diseases of small grains in Arkansas in 1951-52 including yellow dwarf and red spot mosaic were described and reported by R. H. Rosen. While the diseases caused considerable damage in Arkansas in 1952, especially on winter oats, it was also true that aphids were probably more abundant on these crops in this State than at any time during the past 30-odd years. (PDR 36: 315).

HORDEUM VULGARE. BARLEY: Erysiphe graminis, powdery mildew. V. F. Tapke reported that the development of resistance to powdery mildew in the adult stage of susceptible barleys is a variable character which may be greatly affected by the environmental conditions under which the plants are grown in the pre-adult stage. (Phytopath. 43: 162).

Helminthosporium sativum, spot blotch. Results of comparative studies on the pathogenicity of H. sativum to brome grass, tall fescue grass, and barley were reported by E. S. Luttrell. Susceptibility of smooth brome and rescue grass to leaf infection with H. sativum approached that of barley while tall fescue grass was highly resistant. (PDR 37: 150).

Ustilago nuda, loose smut, was the most important barley disease observed in Georgia, appearing in 10 to 15 percent of the plants in all fields inspected, according to Miller and others. (PDR 36: 287).

Stripe mosaic (virus)

R. F. Eslick determined the effect on yield of barley stripe mosaic (false stripe), a seed-borne virus disease heretofore not considered serious, over the five-year period 1947 to 1951 in the variety Glacier. The average reduction in yield was 31 percent. The presence of the disease in the seed of Montana's recommended varieties is a serious threat to the State's 18-million bushel barley crop. (PDR 37: 290).

According to H. H. McKinney, reporting new evidence on virus diseases in barley, the "running out" of certain barley varieties, as claimed by many farmers, is explained by the fact that about 90 percent of the plants grown from seed from a low yielding plot of Glacier barley were infected with seed-borne virus, although most of the infected plants showed few or no virus disease symptoms. There is some evidence that strains of the barley stripe mosaic virus exist. What appear to be mild or semi-mild strains were isolated from barley collections in South Dakota and Nebraska. Also, there seems to be an oat strain that is seed-transmitted to some extent. Brome grass mosaic virus or a strain of it was isolated from barley leaves collected in Nebraska. The brome grass mosaic virus, so far as known, is not seed-transmitted.

ORYZA SATIVA. RICE: Since white tip disease of rice has been found to be caused by a seed-borne nematode, Aphelenchoides oryzae, E. H. Todd pointed out that it was of interest to determine the longevity of the organism within the rice seed. Periodic examinations of seed from panicles of severely affected rice plants collected in 1949 have shown that the nematode is capable of surviving in seed for at least 24 months. It was also concluded that the nematode is an external parasite. (Proc. So. Agri. Workers. p. 141. 1952).

For lowland rice culture as a possible means of controlling Sclerotinia sclerotiorum and rootknot in vegetable crops in the Florida Everglades, see the Vegetable Crop section.

SECALE CEREALE. RYE: Puccinia rubigo-vera var. secalis, leaf rust, was the only damaging disease attacking rye, according to R. W. Earhart reporting on small grain diseases of the Southeastern Coastal Plain. (PDR 36: 421).

SORGHUM VULGARE. SORGHUM: Sorghum seed treatment tests in South Dakota from 1948 through 1952 were summarized by R. H. Converse and C. M. Nagel. (PDR 37: 401).

SORGHUM VULGARE var. CAFFRORUM. SHARON KAFIR: Sphacelotheca sorghi, covered kernel smut. Leukel and Webster gave experimental results of seed treatment tests in 1952. Eleven treatments eliminated covered smut at both Beltsville, Maryland and Lincoln,

Nebraska. (PDR 36: 426).

TRITICUM AESTIVUM. WHEAT: Puccinia graminis var. tritici, stem rust. C. M. Nagel reported that race 15B of stem rust was generally prevalent throughout eastern South Dakota in late June. (PDR 36: 338).

Reaction of various wheat and Agropyron hybrid selections to stem rust (Puccinia graminis var. tritici) and leaf rust (P. rubigo-vera var. tritici) and a soil-borne virus was reported by W. J. Sando. (PDR 37: 296).

Reactions at Beltsville, Maryland, of segregates from hybrids of wheat x Agropyron elongatum x wheat to eight races of P. graminis var. tritici were reported by W. J. Sando and C. V. Lowther. (PDR 37: 300).

Puccinia rubigo-vera var. tritici, leaf rust. Julian H. Miller et al. stated that leaf rust was unusually late appearing in the Georgia Piedmont area in the 1951-52 season and predicted a loss much less than usual, about 5 to 10 percent. The late appearance was explained by the previous summer's drought during which very little volunteer wheat survived. (PDR 36: 287). On the other hand, leaf rust was by far the most serious disease attacking wheat during the past season in the Southeastern Coastal Plain of Georgia and Florida, according to R. W. Earhart. Susceptible varieties were seriously damaged in some locations. (PDR 36: 421). H. C. Young and others reported that after the leaf rust forecast in Oklahoma for the 1952 crop season was made leaf rust development proceeded according to prediction until about May 1, 1952. Then, for the first time since the Oklahoma forecasts have been made, rust development was almost completely retarded by a period of hot dry winds. Subsequent development caused an estimated loss of about 5 percent of the crop, instead of 7 to 10 percent originally predicted. The summer and fall of 1952 in Oklahoma were the driest on record. (PDR 37: 311). Nagel reported leaf rust rapidly killing the lower leaves of wheat during late June in eastern South Dakota. (PDR 36: 338). Johnston and Levine reported the distribution and prevalence of physiologic races of the leaf rust of wheat in the United States in 1951. The physiologic race content of 316 field collections made in 27 States was determined in Kansas and Minnesota. Although 30 races were isolated, only 5 could be considered as abundant and widely distributed. Race 5, representing 27.0 percent of all isolates, was by far the most abundant. Race 126 was second in importance. One of the features worthy of special note was the increasing abundance and distribution of race 15 and the related race 2. (PDR 36: 345). Johnston and Levine reported that although wheat leaf rust was less severe than usual in many parts of the United States in 1952, uredial collections from 28 States were received for physiologic race determinations. They listed the races isolated. (PDR 37: 438).

Tilletia caries, dwarf bunt. Holton and Jackson reported results of soil treatment of infested soil for control of this bunt, which has become an important problem in the winter wheat areas of the Pacific Northwest. Dwarf bunt can persist in the soil for more than one year, even in the absence of a wheat crop. Seed treatment has proven ineffective. (PDR 36: 423). 1952 seed-treatment tests for bunt control in winter and spring wheats in Washington were reported by Holton and Woo. (PDR 36: 424). A heavy infection of dwarf bunt in Rex wheat and lesser amounts in Elmar wheat, near Genesee, Idaho, in the summer of 1952 is evidence that more than one pathogenic race of the fungus causes dwarf bunt of winter wheat in the Pacific Northwest. These varieties possess the Martin factor for bunt resistance and, along with other varieties with this factor, have hitherto been highly resistant to dwarf bunt throughout the Pacific Northwest. (PDR 36: 434).

Siang and Holton reported that the effectiveness of hexachlorobenzene against dwarf bunt (T. caries) as well as common bunt (T. foetida) of wheat seemed to be due primarily to the inhibitory action of the vapor on spore germination. In field practice, the efficiency of control was dependent on the concentration of vapor given off by the HCB in the soil. (PDR 37: 63).

Ustilago spp. R. W. Leukel reported the results of cooperative tests with fungicides for smut control in wheat and oats in 1952. (PDR 36: 428).

Virus diseases

Soil-borne mosaic viruses. The 1952 epiphytotic of a soil-borne wheat mosaic in Kansas was reported by H. Fellows and others. The disease is not new in the State but had previously been sporadic or local in occurrence and this was the first known widespread outbreak of significance. It was observed in 36 eastern counties but probably was present in others. Losses on the whole were light, but yields from affected areas as compared with healthy areas in the same field were lower by 8 to 13 percent. (PDR 37: 287). An outbreak of a similar disease in north central Oklahoma was reported by D. F. Wadsworth and H. C. Young,

Jr. (PDR 37: 27). Mosaic with symptoms indicating the soil-borne mosaic-rosette or wheat virus 1 as the causal agent was widespread in the Piedmont and Tidewater areas of Virginia in 1952, according to Fenne and Roane. This outbreak seemed to be coupled with the introduction in 1950 of the mosaic-susceptible Atlas 50 and Atlas 66 wheats. Previously only mosaic-resistant sorts were widely grown. (PDR 36:212). H. H. McKinney reported results of tests of soils from mosaic wheat fields for the presence of soil-borne wheat mosaic viruses in the Western Prairies and the Great Plains. Soil collections were made from 1949 to 1952 in northcentral and northwestern Missouri, throughout Kansas, in western Iowa and in north-central Oklahoma. Occurrence of soil-borne mosaic virus was demonstrated in all these States. The farthest west that such viruses were collected was near the 100th meridian in Kansas. Except for those from Hodgeman and Pratt Counties, active soil samples collected in Kansas were from the eastern half, and most from the eastern fourth, of the State. The affected area in Oklahoma roughly connects with that in southern Kansas. The identity of the virus or viruses involved is not yet determined. (PDR 37: 24).

Yellow streak-mosaic virus. H. Fellows and others reported studies on the relative abundance of wheat yellow streak-mosaic virus in leaves, crowns, and roots of the wheat plant. Very low virus concentrations were found in the roots and high concentrations in tissue of both dormant leaves and leaves starting active spring growth. The findings should be helpful in the search for a vector. (PDR 36: 319). H. Fellows and John W. Schmidt reported that wide variation in reaction of Agropyron-Triticum hybrids to the wheat yellow-streak mosaic virus suggested the possibility of selecting resistant wheat-like strains. (PDR 37: 349). Sill and Fellows reported experimental investigation on the effect of temperature on symptom expression by the yellow strain of the wheat streak-mosaic virus. Results explain and confirm previous field observations that mosaic symptoms appear in the spring and become increasingly severe with rising temperatures. (PDR 37:30).

ZEA MAYS. CORN: Diplodia zeae, Fusarium moniliforme, Gibberella zeae, Nigrospora oryzae, ear rots. Benjamin Koehler reported ratings of some yellow corn inbreds for ear rot resistance. (PDR 37: 440).

Helminthosporium turcicum, northern leaf blight. Paul E. Hoppe reported that the disease has occurred in some areas of Wisconsin during recent years, but had never before been so severe nor so widely distributed as in 1952. (PDR 37: 94). C. C. Wernham outlined a method for mass production of corn resistant to H. turcicum. (PDR 37: 138). According to James G. Dickson a general spore shower of Puccinia sorghi and H. turcicum was indicated by the extensive appearance of rust and leaf blight in southern Wisconsin about July 25. General spread on commercial hybrids in the area was not evident until August 7. (PDR 36: 350).

DISEASES OF FORAGE AND COVER CROPS

Information obtained from a survey to determine the occurrence and relative importance of diseases on forage crops, including legumes and grasses, in New York was summarized by Daniel A. Roberts and others. (PDR 36: 416).

GRASSES

Ustilago bullata, head smut. Meiners and Fischer reported that further studies on host specialization in head smut of grasses have resulted in the differentiation of 4 additional races, and in the reduction of the number of differential grass species from 14 to 11. (Phytopath. 43: 200).

AGROSTIS spp. BENTGRASS: Anguina agrostis, bentgrass nematode, has become a serious pest during recent years in bentgrass grown for seed production in the Pacific Northwest according to Courtney and Howell, who reported results of extensive investigations on life history, host range, and control. The nematode was probably introduced in poorly cleaned and graded seed shipments. Damage is largely from reduction of seed yield. (PDR 36: 75).

Curvularia lunata, "fading-out". Howard and Davies reported that since 1949, the velvet bent plots at the Rhode Island Agricultural Experiment Station at times developed a yellow and green dappled color pattern from which C. lunata was consistently isolated. "Fading-out" made at least three epiphytotic appearances in 1952 in Rhode Island. The disease was also found in Massachusetts, Connecticut, New York, New Jersey and Missouri. (Phytopath. 43: 109).

BROMUS INERMIS. MOUNTAIN BROME: Ustilago bullata, head smut. Seed treatment tests

to control this fungus on mountain brome were conducted at Pullman, Washington, in 1952. Jack P. Meiners stated that of the seven fungicides tested, only Ceresan M and Panogen gave adequate control of head smut without reducing stands. (PDR 37: 152).

DACTYLIS GLOMERATA. ORCHARD GRASS: Stagonospora maculata, purple leafspot, is a major disease of the above-ground parts of orchard grass in the Northeast, according to J. H. Graham. Studies showed that the fungus overwinters as pycnidia and mycelium in leaves and stems of orchard grass. Preliminary data indicated that high resistance may be obtained by selection. (Phytopath. 42: 653).

HOLCUS HALEPENSIS. JOHNSON GRASS: Two recently discovered diseases of Johnson grass are reported apparently for the first time from Mississippi. Downy mildew (Sclerospora sp.) was found in the fall of 1952, often along the edges of fields in which oats had been affected by S. macrospora during the spring. A virus disease was widespread over the State in 1950 and 1951, but was observed more locally in 1952. The English grain aphid Macrosiphum graminarium was found to be a vector, and in controlled experiments the virus mildly affected oats to which it had been transmitted by this insect. (PDR 37: 142).

LEGUMES

In seed disinfection tests carried out in Oklahoma, Texas, Alabama, Georgia, Tennessee, and North Carolina in co-operation with the representatives of the Du Pont Company, nine types of forage crops were treated with Arasan, the cost of treated seed being only about 1 percent per lb. of seed more than the price of unprotected seed of the same quality. Striking results were obtained for all crops. Average stand increases ranged from 17 to 130 (Lespedeza sericea) and 227 percent (Ladino clover). In one experiment with Lespedeza 164 percent more plants developed as a result of seed treatment. (Seed World 71: 40, 1952).

ARACHIS HYPOGAEA. PEANUT: See under Special Crops.

GLYCINE MAX. SOYBEAN: The effect of seed treatment on yield and nodulation of soybeans in Minnesota is reported by M. F. Kernkamp and others. If soybeans are planted in ground that has never produced the crop, it appears that the best practice is to use the inoculant and dispense with seed treatments. (PDR 37: 224).

Kilpatrick and Johnson reported fungi isolated from different parts of soybean plants in 1951 and 1952. The studies showed that a variety of fungi occurred on soybeans in the Mississippi Delta. Several caused serious diseases, while others were secondary and of little or no economic importance. (PDR 37: 98). In a further report on soybean diseases in Mississippi in 1951 and 1952 Johnson and Kilpatrick stated that the bacterial foliar diseases were the most prevalent of all soybean diseases each year. Evidence indicated occurrence of two races of the downy mildew fungus, Peronospora manshurica, in the area. Among other diseases reported were several diseases not listed in the host index of Mississippi plant diseases; they include leaf spot (Phyllosticta sp.), target spot (Corynespora cassiicola), leaf spot (Alternaria sp.), anthracnose (Colletotrichum spp.), purple seed stain (Cercospora kikuchii), and yellow bean mosaic (Phaseolus virus 2).

J. H. Graham summarized the results of North Carolina studies on the overwintering of three pathogens (bacterial pustule, (Xanthomonas phaseoli var. sojensis), bacterial blight (Pseudomonas glycinea), and wildfire, (Pseudomonas tabaci)), in association with seed, soil, and debris. These pathogens were found to be seed-borne. (Phytopath. 43: 189). Graham also reported the cultural and epiphytotic relationships of these three bacteria. (Phytopath. 43: 193).

Cephalosporium gregatum, brown stem rot, is recognized as one of the most important diseases of the soybean in Illinois and several neighboring States, as well as in Canada in southwestern Ontario. The observations on its spread in the soil recorded by A. A. Hildebrand in Ontario have value from the standpoint of practical control of the disease. They warn specifically against the danger of spreading the disease from one location to another by transfer of infested soil. The necessity of crop rotation is also pointed out. (PDR 36: 106).

Sherwin and Kreitlow reported conspicuous discolorations designated as "gray," "brown," or "papillate" found in seed of soybeans from Illinois, Louisiana, Maryland, Mississippi, and Virginia. The discolorations were caused by the frogeye fungus Cercospora sojae. Seeds discolored by this fungus failed to germinate as well as clean seeds in greenhouse and field tests. In addition, many seedlings originating from discolored seeds bore lesions on cotyledons and developed earlier infection on leaves in the field. In the field there was a tendency toward

progressive increase in seed discoloration when plants were left standing after they matured. (Phytopath. 42: 568).

LESPEDEZA spp. BUSH CLOVER: Meloidogyne spp., root-knot nematodes. J. C. Wells and others reported that the superiority of Rowan lespedeza in tests on root-knot nematode soils at four widely separated locations in North Carolina suggested that M. incognita was the predominant species found at these locations. In view of its resistance to this species, Rowan appeared promising as a variety and as a source of resistance in a breeding program. (PDR 37: 97).

LUPINUS spp. LUPINE: Pythium ultimum, root and stem rot. J. L. Weimer described this disease on blue (L. angustifolius) and white (L. albus) lupines in Georgia. The disease did not reach epiphytotic proportions, but a considerable number of plants were killed. (PDR 36: 279).

MEDICAGO SATIVA. ALFALFA: Corynebacterium insidiosum, bacterial wilt. During the summer of 1951 Hodgson and Coe found alfalfa plants in the Matanuska Valley, Alaska affected by lucerne bacterial wilt. This appears to be the most northerly record of the disease so far. (PDR 36: 116).

Witch's broom (virus). In Washington J. D. Menzies reported alfalfa witch's broom as especially serious in areas where small fields and permanent plantings had been the custom. The disease had spread more rapidly in small thin stands than in larger, dense plantings. Its range of spread was not great and benefits from isolating new plantings were reported. Experience in the Methow Valley of Washington indicated that area-wide removal of old, diseased fields followed by reseeding and the maintenance, through good cultural practices, of dense, productive stands is an effective means of preventing spread into new plantings. (Phytopath. 42: 649).

TRIFOLIUM REPENS. WHITE CLOVER: Heterodera trifolii, clover root nematode, according to Raski and Hart, was found in white clover in a lawn in Camarillo, California in August 1951. Soil from the infested lawn was used in testing the host range of this species. So far this species is known from this one locality in California and has not been collected in any commercial plantings of clover. (PDR 37: 197).

TRIFOLIUM REPENS var. LADINO. LADINO CLOVER: A severe and widespread occurrence of a virus disease in Ladino clover in Virginia was reported by S. B. Fenne. The virus apparently spreads from other crops that carry it but are not damaged by it. (PDR 36: 491).

TRIFOLIUM PRATENSE. RED CLOVER: Pythium sp., damping-off. In an experiment reported by J. W. Gerdemann red clover proved more susceptible to pre-emergence damping-off in warm soil than in cold soil. There was an indication that Arasan partially controlled pre-emergence damping-off in the warm soil. (PDR 36: 419).

Stemphylium sarcinaeforme, leaf spot (target spot). Reaction of red clover strains to Stemphylium leaf spot was reported by J. H. Graham. The relatively resistant strains came from areas where the disease was most severe. Although no strain was highly resistant differences in reaction among plants of locally adapted varieties suggested the possibility of isolating more resistant clones. (PDR 37: 95).

VIGNA SINENSIS. COWPEA: Warid and Plakidas reported exceptional heat tolerance for some viruses occurring naturally on cowpea in Oklahoma and Louisiana. (PDR 36: 380).

DISEASES OF FRUIT CROPS

CITRUS spp. CITRUS: Fomes applanatus, concentric canker and wood rot. Wood rot of citrus trees has been recognized in Florida for many years, but the form designated as concentric canker which is commonly associated with it and which, according to James F. L. Childs, is a phase of the same disease, appears not to have been recognized previously. The disease is not a limiting factor to the citrus industry but is unquestionably of considerable importance in the general deterioration of citrus orchards under Florida conditions. Control is largely a matter of prevention. (Phytopath. 43: 99).

Gummosis (an actinomycete associated). In Florida gum pockets were said to be a char-

acteristic feature of grapefruit trees affected with gummosis. An actinomycete has been found regularly in the gum pockets. Growth was extremely slow on all media tried. On inoculation into trunks and branches of mature grapefruit trees typical symptoms of gummosis were obtained. These results support Godfrey's implication of an actinomycete as the cause of gummosis. (James F. L. Childs, *Phytopath.* 43: 101).

Grant and Schneider reported initial evidence of the presence of tristeza, or quick decline virus disease, of Citrus in Florida. (*Phytopath.* 42: 51).

CITRUS LIMON. LEMON: Phytophthora citrophthora, brown rot. E. C. Calavan and others reported control of brown rot of lemon fruits in California by means of various fungicides. (*Phytopath.* 42: 512).

CITRUS SINENSIS. ORANGE: Phytophthora citrophthora, foot rot. Navel orange cuttings suffer more damage from Phytophthora root rot than do Valencia cuttings, according to observations in California by Halma and Opitz. (PDR 36: 413).

CYDONIA OBLONGA. QUINCE: See pear.

FICUS CARICA. FIG: Phomopsis cinerescens, canker, has been recognized in California for some time but in recent years it has become especially destructive, according to Harley English. The disease has been found on all important commercial varieties. Three strains of the causal fungus that differ in cultural characteristics and in pathogenicity have been isolated. (*Phytopath.* 42: 513).

FRAGARIA spp. STRAWBERRY: Botrytis cinerea, Botrytis rot. In Louisiana, Norman L. Horn reported that Orthocide 406 was the best fungicide used in a field screening test. Not only was the amount of fruit rot reduced, but plants treated with this material seemed more vigorous than the controls. (PDR 36: 309).

Gnomonia fragariae, stem-end rot. From their studies on the fungus associated with stem-end rot of strawberries in Michigan, Alexopoulos and Cation concluded that G. fragariae, though frequently associated with Dendrophoma obscurans and previously regarded as the perfect stage, is actually distinct. The only records outside of United States appear to be in Belgium, Germany, France, and Ontario, Canada. (*Mycologia* 44: 221).

Phytophthora fragariae, red stele. Sources of red stele root disease resistance in breeding strawberries in Oregon were listed and discussed by George F. Waldo. (PDR 37: 236).

Crown and root rot tentatively attributed to an unidentified fungus reported by Sherbakoff in 1924, has again been observed in Tennessee during the past five years. (*Phytopath.* 42: 283).

Virus diseases

P. W. Miller, reporting on preliminary tests of wild strawberries, F. ovalis and F. vesca, stated that limited data indicated that virus infection in the native strawberry species in eastern Oregon may be less than west of the Cascades. (PDR 36: 352). Wild plants of F. vesca and F. chiloensis from the California coast mostly far removed from cultivated strawberries showed little infection. (PDR 37: 20). According to C. P. Marcus, Jr. it was evident from a survey in Eastern United States that virus-infected wild strawberry plants constitute a source of infection for virus free commercial strawberry plantings. (PDR 36: 353).

C. P. Marcus, Jr., and P. W. Miller reported progress in the search for virus-free plants of cultivated strawberry varieties. Virus free plants have been found in varieties that comprise about 96 percent of the strawberry acreage in the United States. Virus-free plants of 29 varieties were obtained before 1952 and 5 more in 1952, in the Beltsville work. In Oregon virus-free plants of 6 other varieties were obtained, making a total of 40 virus-free varieties. (PDR 37: 90).

R. H. Fulton reported that the strawberry type 2 virus in the Robinson variety was not destroyed by heat treatments that could be endured by the plants tested. (PDR 36: 466).

Tobacco necrosis virus. J. P. Fulton reported a tobacco necrosis virus associated with strawberry plants. The virus apparently came in with plants of Fragaria vesca (East Malling clone). It was readily transmitted mechanically from strawberry tissue and did not produce symptoms in F. vesca. (PDR 36: 313).

Yellows. P. W. Miller reported results of various studies in Oregon concerned with insect transmission of the yellows virus complex. Cool temperatures seemed to lengthen persistence of the components of the strawberry yellows virus complex in the body of the vector

(*Capitophorus fragaefolii*). It is not definitely known why the viruses should live longer at cooler temperatures. It is thought, however, that the increased persistence is probably associated with a slowing up of biological reactions, enzymic and otherwise, in both the viruses and aphids. (PDR 36: 311). Studies on the percentage of strawberry plants infected with yellows virus complex by single strawberry aphids indicate that this insect is a less efficient vector than some other aphid vectors of viruses. The aphid *Myzus solani* was found colonizing on both wild and cultivated strawberries in the field but tests showed that it did not transmit the strawberry yellows virus complex. (PDR 37: 89).

Stunt. Skiles and King reported the presence of the relatively uncommon strawberry stunt virus of Zeller and Weaver in the Robinson variety in Minnesota. Symptoms induced in *Fragaria vesca* by this virus from Robinson could readily be distinguished from those due to yellows virus (type 1 virus Demaree and Marcus) from Marshall, and type 2 virus Demaree and Marcus from Wisconsin 537 variety, either in developmental or final stages. The stunt disease seems to be distinct from other virus diseases of strawberry. (PDR 36: 406).

MALUS SYLVESTRIS. APPLE: *Cytospora leucostoma*, canker. A survey in March 1952 in San Juan County, New Mexico, showed that a canker-forming fungus was causing severe damage in many apple orchards, the extent of damage in any one orchard depending on the percentage of Rome Beauty present. In one four-year-old orchard the disease killed 85 percent of the Rome Beauty trees and injured the remainder. Infection appeared to follow winter injury and sun scald. Isolates from active cankers proved to be *C. leucostoma*. In some orchards active cankers were removed by cutting away the infected bark, the wounds were treated with Bordeaux paste. Other growers checked enlargement by spraying the infected parts with 4-4-50 Bordeaux mixture at very high pressures. The force of the spray stream actually removed the infected bark and deposited a protective film of fungicide. (Leyendecker, P. L., PDR 36: 276).

Physalospora obtusa, black rot. A severe outbreak of black rot on fruit in Georgia followed a spring epidemic of fire blight. In cases with severe fire blight the source of inoculum was so great that the usual spray schedule was ineffective (Jack Taylor, PDR 36: 412). A similar relationship between fire blight and black rot leaf spot was reported from Delaware (see below under control). (PDR 36: 410, 37: 81).

Sclerotium rolfsii, southern blight. J. R. Shay reported a serious outbreak in 1952 on one-year apple nursery stock in a commercial nursery near Indianapolis. Southern blight had not previously been observed in this nursery. The organism is only rarely reported in Indiana. (PDR 37: 121).

Advances in Disease Control. Chandler and Thurston reported that tests of fungicides in Pennsylvania in 1951 and 1952 continued to show that several newer organic fungicides give control of apple scab (*Venturia inaequalis*) equal to or better than that obtained with sulfur schedules. The newer materials reduced injury to both foliage and fruit. The authors used a glossmeter for measuring specular reflection from apples. In three successive seasons it was found that the glossiest apples were those sprayed with Crag Fruit Fungicide 341, with Orthocide 406, or with combinations of these and mercury. (Phytopath. 43: 108). R. W. Harriess quoted examples from his experience which showed that the most important factor in the control of apple scab was good soil drainage, followed by free air circulation, largely through pruning, and then keeping the soil in a state of balance to ensure hard, healthy wood. (Fruit Grower, 1952, 2951, pp. 865-866, 1952). Results of 1952 tests with fungicide mixtures for control of apple scab and rusts (*Gymnosporangium juniperi-virginianae*, *G. clavipes*) in the Hudson Valley of New York were reported by Palmiter and Emerson. In general the results of previous tests were confirmed. (PDR 37: 11).

Fire blight has been one of the principal limiting factors in the production of apples and pears in Colorado, according to W. D. Thomas, Jr. and W. J. Henderson. It causes an estimated annual loss of about 10 percent of the entire apple and pear crops in the State. In spray tests on apples and pears at several locations from 1947 to 1950 an application of Dithane Z-78 at 10 percent bloom and a subsequent application in the full-bloom stage reduced the incidence of current-season blossom and twig infection approximately 75 percent. In Colorado this spray method, together with sanitary pruning and treatment of hold-over cankers, has become a standard recommendation for fire-blight control. (PDR 36: 273).

Fire blight and frog-eye leaf spot (black rot) have been increasing in severity on susceptible varieties in Delaware for several years, according to Heuberger and Poulos, who state that control measures must be found or many orchards will be abandoned. In view of the known correlation between incidence of fire blight and black rot, control of the former should also

aid in control of the latter. In tests under epiphytotic conditions in 1952 two zineb fungicides (Dithane Z-78, Parzate) one manganese ethylene bis dithiocarbamate (Manzate), and one antibiotic (thiolutin), at specified concentrations, gave significant control of both diseases. Other materials were ineffective against one or both diseases. (PDR 36: 410, 37: 81).

Recently several apple diseases hitherto considered of minor importance have caused severe fruit losses in southern Indiana. They include blackpox (Helminthosporium papulosum), black rot (Physalospora obtusa), fly speck (Leptothyrium pomi), sooty blotch (Gloeodes pomi-gena), and Botryosphaeria rot (Botryosphaeria ribis). The financial loss caused by the last-named can be very large, and in general increase in incidence of all of these "summer diseases" has necessitated investigation of fungicides for their control. A difficulty is the injurious effect of many materials on the finish of some varieties such as Golden Delicious. In 1952, according to Lewis and Shay, fair success was obtained for the first time in controlling these troubles in the orchard and after harvest on this variety without finish injury. Captan gave best results. (PDR 37: 84). E. C. Sharville reported that captan not only did not injure but actually improved the finish of russet-sensitive varieties such as Golden Delicious and Grimes Golden.

PRUNUS spp. CHERRY: Yarwood and Harvey reported that California tests proved the claim of a grower that washing cherries with plain water improved the keeping quality. (PDR 36: 389).

PRUNUS spp. WILD PLUM: Phony peach (virus). Bruer and Shepard stated that the survey for phony disease in wild plum started in 1950 was still in progress. 1,8000 tests on material from 600 location in 83 counties of 11 States had been made by the acid technique. The disease was found in Alabama, Arkansas, Georgia, Louisiana, Mississippi, North and South Carolina, Tennessee, and Texas. Prunus injucunda, P. munsoniana, and P. umbellata were added to the infected species. The distribution and intensity of infection in wild plum and in peach were roughly coincident and spread from the former to the latter was frequent in zones of general disease occurrence. As a step in control of phony disease in peach orchards, wild plum should be eliminated from orchard environs. (Phytopath. 42: 282).

PRUNUS PERSICA. PEACH: Clitocybe tabescens, root rot, is a disease of economic importance in Georgia peach orchards, according to E. F. Savage and others. A survey showed this root rot to be generally prevalent in peach orchards throughout both the major and minor peach growing sections of Georgia and to occur in both the Piedmont and Sandhill sections of South Carolina. In Georgia the disease is found mainly on land planted to peaches for periods ranging from 30 to 50 years. (PDR 37: 269).

A fungus tentatively identified as Diplodina is the cause of a fruit rot of peaches and may be potentially if not already important in the north Louisiana peach growing area, according to Norman L. Horn. The rot is a "brown rot" and symptoms are similar in some respects to those of the ordinary Monilinia brown rot. Possibly the disease has been present for some time and been confused with Monilinia. (PDR 36: 351).

Fusicoccum persicae, canker, has for several years caused havoc in two southeastern Massachusetts peach orchards according to E. F. Guba. Only the current season's terminal growth is susceptible to spore infections. The cankers are perennial and the branches die as they become completely girdled. In 1952 a protectant schedule of Ferbam followed by Thiuram or Orthocide almost completely prevented infections of new growth. Protection with the fungicides was supplemented with eradication of cankers and sanitation. (Phytopath. 43: 109).

Glomerella cingulata, anthracnose. Peterson and Dunegan reported that peach anthracnose, after an increase in severity each year from 1947 to 1950, virtually disappeared from central Georgia following the destruction of commercial blue lupin plantings by low temperatures in 1951. The apparent correlation between occurrence on lupin and on peach is based solely on circumstantial evidence. (Phytopath. 42: 343).

Xanthomonas pruni, bacterial leaf spot. It was demonstrated in York County, Pennsylvania, that mercury sprays gave indication of reducing bacterial leaf spot on peach foliage. (PDR 36:68). Experimental confirmation of presence of the bacterium in infected peach twigs was reported by Goldsworthy and Wilson, who suggest the name "black tip" to describe the early season symptoms most prevalent under Atlantic seaboard conditions. (PDR 36: 408). H. W. Anderson, however, still believes that "black tip" is less suitable than the not wholly satisfactory "spring canker" as a descriptive name for the combined symptoms of the overwintering phase of this bacterium on peach, at least as observed in Illinois. (PDR 37: 16).

Phony peach (virus). See above under plum.

Yellow leaf roll (virus). Jensen and others reported that this serious disease in northern California was transmitted by the widespread geminate leafhopper, Colladonus geminatus, in 31 greenhouse tests at the University of California, in 1950-1951. (Journ. Econ. Ent. 45: 335).

Winter injury. John H. Weinberger reported that the need for a nematode-resistant stock led to the limited commercial use of seedlings of peaches introduced from Yunnan Province, China. Susceptibility to some strains of nematodes and the extra cost of such stock have delayed the general adoption of this Yunnan stock in the Southeast. In tests in the springs of 1951 and 1952 at Fort Valley, Georgia it was found that 91 percent of the trees of all varieties on Yunnan stock were winter killed, compared with 7 percent of the trees on Lovell stock. It appears that in the Central Georgia region, at least, Yunnan rootstocks increase the susceptibility of varieties to winter injury. (PDR 36: 307).

PYRUS COMMUNIS. PEAR: Erwinia amylovora, blight. H. W. Anderson described a method for maintenance of virulent cultures of E. amylovora and suggested overwinter survival in mummied fruit. (PDR 36: 301). John C. Dunegan and others described a rapid method for mass inoculation of pear trees with the blight organism. The method should give a more precise test of susceptibility of a large number of trees than was hitherto possible with the time-consuming hand-inoculation procedure. (PDR 37: 14). For control in Colorado see above under apple.

Gymnosporangium sp. Paul D. Keener reported severe outbreaks of an unidentified species on quince, pear, and English hawthorn at higher elevations in Arizona. Several species of Juniperus were found in all the areas, and it was believed that some of these served as alternate hosts. Both winter and summer moisture were favorable during 1951 and 1952. (PDR 37: 235).

RUBUS OCCIDENTALIS. BLACK RASPBERRY: Mosaic (virus). Growing of black raspberries was a thriving industry in western Washington in former years. In the middle thirties there was a sharp decline in production and commercial blackberry growing was practically abandoned. Surveys showed that a virus disease was the cause of this sharp decline in production. In most of the areas where blackberries were grown the disease was widely distributed. Experiments showed that the chronic symptoms of "flecking", referred to as mild mosaic of red raspberries, were expressions of the black raspberry mosaic virus, and that the large green aphid, Amphorophora rubi, was the natural vector of the virus in the field. The virus was also recovered from the wild black raspberry, Rubus leucodermis. (Huber and Johnson, PDR 36: 239).

VACCINIUM spp. BLUEBERRY: Botrytis sp., twig tip blight of cultivated blueberries, has become of economic importance in western Washington, according to Eglitis, Johnson and Crowley. Inoculations were made into wounds in 1-year old twigs of the Jersey variety. Several strains of the fungus have been isolated from blueberries. (Phytopath. 42: 513).

VITIS spp. GRAPE: Guignardia bidwellii, black rot. In Illinois, Herbert C. Barrett described a large-scale method of inoculating grapes with the black rot organism. (PDR 37: 159).

Pierce's disease (virus). J. H. Freitag and others reported that six additional leafhopper vectors of the Pierce's disease virus were demonstrated, by transmission of the virus from infected grape and alfalfa plants to previously healthy grape and alfalfa test plants. Their work brings to a total of 20 the list of species of leafhoppers that have been shown to be vectors of Pierce's disease and includes the common species of the subfamily in all parts of California. Since these leafhoppers have not been commonly observed, they are not considered to be important in the dissemination of the virus to its economic host plants. However, they may be involved in the spread of virus to wild host plants which constitute a natural virus reservoir. (Phytopath. 42: 533).

DISEASES OF NUT CROPS

P. W. Miller reported on nut diseases in Oregon in 1952. (PDR 37: 18).

Xanthomonas juglandis and X. corylina, walnut bacteriosis and filbert bacteriosis. T. R. Aspitarte et al. report reaction of these bacteria in plate tests with some of the newer antibi-

otics and certain bactericides. The two organisms, which are practically identical culturally, showed some differences in their reaction to some materials. Development of resistant types of both organisms or else of loss of potency in the antibiotics was indicated by delayed (10 to 20 days) appearance of bacterial colonies in the originally completely cleared zones around discs holding certain antibiotics. (PDR 37: 263).

DISEASES OF ORNAMENTALS AND MISCELLANEOUS PLANTS

CHRYSANTHEMUM spp. CHRYSANTHEMUM: Chrysanthemum stunt (virus). Philip Brierley reported that the stunt virus showed exceptional heat tolerance, not only withstanding boiling but remaining as infective after this treatment as unboiled samples of the same virus preparation. The virus was still infective in dried leaves of the Mistletoe variety after eight weeks, the longest period tested. Alcohol preparations were as infective as distilled water ones. Therefore, it was suggested that flaming rather than alcohol should be used for sterilizing tools used in propagating plants. (PDR 36: 243). Reaction of various experimental hosts, including 76 species and varieties, largely members of the Compositae, to the chrysanthemum stunt virus was described by Brierley. Thirty-nine of these proved to be susceptible. Only seven of the susceptible kinds developed recognizable symptoms, including five species or varieties of Chrysanthemum and two species of Senecio. No test plant was found to equal the two chrysanthemum varieties Mistletoe and Blazing Gold. No evidence of seed transmission was found. (PDR 37: 343).

GLADIOLUS spp. GLADIOLUS: J. G. Bald reported California studies on control of gladiolus diseases by heat curing and dipping of corms. (Phytopath. 43: 141, 146, 151). Investigations on neck rot caused by Botrytis gladiolorum, also reported by Bald, showed that lesions develop mainly from inoculum carried on corms or from air-borne spores. A field study of neck rot in a crop relatively free from the leaf spot phase of Botrytis indicated that continued high humidity and temperature around 55°-65° F. favor the development of the disease. These are the same conditions that favor the leaf spot phase, but they exist at soil level and below rather than above. The effectiveness of certain protective reactions seemed to be related to temperature. (Phytopath. 43: 167).

J. G. Bald and R. N. Jefferson described injury to gladiolus corms associated with the root mite, Rhizoglyphus rhizophagus. Indications are that this root mite is a serious pest of gladiolus in southern California, partly because of its association with rotting organisms, or even with pathogens such as the organisms causing Fusarium basal rot and yellows, and bacterial scab. (PDR 36: 435).

Western aster yellows virus. R. O. Magie and others reported this virus in Oregon-grown gladiolus corms planted in Florida. They pointed out that the chief importance of the introduction of this virus into eastern United States lies in the menace to celery and zinnia in areas where only the eastern strain of the virus is known to occur. (PDR 36: 468).

HYDRANGEA sp. HYDRANGEA: Ringspot (virus). According to Brierley and Smith, a ringspot virus of unknown identity was isolated from hydrangea plants affected with a newly observed disease termed rugose mosaic. (PDR 36: 382).

IRIS spp. IRIS: Black rot (organism not yet identified). Gould and McLean reported that an unusual rot of certain ornamental bulbs has been under observation in western Washington since 1946. In early spring it appeared on bulbous iris in the form of wilting or a yellowing of one or more plants. In general the effect on hyacinths and tulips was similar to that on iris. (Phytopath. 42: 514).

IRIS FILIFOLIA. DUTCH IRIS: Sclerotium rolfsii, crown and stem rot. Frank A. Haasis reported experiments for the control of this pathogen on Dutch iris in North Carolina. Soil fumigation with chlorobromopropene reduced the amount of S. rolfsii in the soil but on the other hand thorough fumigation also permitted other inadvertently introduced pathogens to increase, apparently by destroying inhibitors. (PDR 36: 474).

MYRICA CAROLINENSIS. BAYBERRY: Bayberry-yellows virus. A yellows-type disease was observed in bayberry plants growing in Pemberton, New Jersey. The virus was transmitted by cleft-grafting and also by the agency of dodder (Cuscuta campestris and C. subinclusa) but not by juice inoculation. Ten species of leafhoppers were tested but failed to transmit the

virus, nor could it be transmitted through seeds of bayberry, periwinkle, or dodder. This virus was not identical with any of the known yellows viruses. (S. P. Raychaudhuri, *Phytopath.* 43: 15).

NARCISSUS sp. NARCISSUS: Observations on occurrence and control of the root-lesion nematode disease of narcissus in the Pacific Northwest was reported by Harold J. Jensen. This disease was especially important in Oregon where it was widespread. (PDR 37: 39).

ORCHIDACEAE: Virus diseases. A number of rare diseases believed to be of virus origin are described from California and reported by D. D. Jensen. (*Calif. Agric.* 6: 7, 15-16).

RHODENDRON spp. (AZALEA): Ovulinia azaleae, azalea petal blight, has done little damage in Maryland according to W. F. Jeffers. The relatively cold winter temperatures may be responsible for what appeared to be slow development of this disease in the State. (PDR 36: 301).

ROSA spp. ROSE: Peronospora sparsa, downy mildew. Kenneth F. Baker summarized the history and distribution of rose downy mildew and evaluated the factors involved in recent epidemics in California and Indiana. (PDR 37: 331).

Rosette (virus). This disease, according to Thomas and Scott, was found on Rosa rubrifolia grown as an ornamental in a Wyoming school planting and a native rose nearby. What seemed to be the same disease was found on a native rose, possibly R. pisocarpa, at about the same time in a mountainous area of Trinity County, California. Inoculations show that it is capable of causing severe damage to several of the species and varieties of roses commonly grown but thus far is only a potential threat to rose culture in California. (*Phytopath.* 43: 218).

SIDA spp.: Abutilon mosaic (virus). Evidence given by Costa and Bennett seemed sufficiently strong to justify the tentative assumption that infectious chlorosis of Malvaceae, or Abutilon mosaic, is widely distributed in Florida on species of *Sida* and that it is being spread there under natural conditions by the known insect vector, Bemisia tabaci. This insect was previously not known to be present in this country. It is the vector of a number of other viruses, none of which are known to occur in the United States. (PDR 37: 92).

ZANTEDESCHIA spp. CALLAS: Erwinia aroideae and E. carotovora, bacterial chalk rot. It appeared from certain studies as reported by Ark, Starr, and Sutton that the organism responsible for chalk rot, a destructive disease of Z. elliotiana and Z. rehmanni, which are cultivated on a commercial scale in Santa Cruz County, California, was identical with E. carotovora. E. aroideae apparently is merely a strain of E. carotovora. The disease was most severe under conditions of high temperature and soil moisture. Chemical treatments of the corms failed to control the disease, but soil amendments with cow manure at the rate of 8 tons per acre reduced the incidence of infection from 55 to 5 percent. (*Phytopath.* 42: 320).

DISEASES OF SPECIAL CROPS

AGARICUS CAMPESTRIS. COMMON MUSHROOM: According to E. B. Lambert and T. T. Ayers the new "two-phase pasteurizing" system of mushroom culture gave better control of diseases and insects. This system has been followed in four successive crops in their experimental growing rooms. (PDR 36: 261).

ARACHIS HYPOGAEA. PEANUT: In central east Georgia, J. H. Machmer reported that severe chlorosis of peanut was noted in September 1950, and again in September 1951. After many collections of samples it was concluded that Criconemoides sp., a ring nematode, showed a major association with the so-called "peanut yellows" although other factors may have been involved. (PDR 37: 156).

Meloidogyne hapla, root knot. Control by soil fumigation and by crop rotation in North Carolina, where the disease is widespread in the peanut growing area, was reported by W. E. Cooper. (*Proc. of So. Agri. Workers*, p. 136. 1952).

BETA VULGARIS. SUGAR BEET: Lightning injury, as observed in Idaho, is described by Watson and Gessel to aid in the identification of this type of injury on sugar beets. (PDR 36: 487).

CARTHAMUS TINCTORIUS. SAFFLOWER: *Phytophthora drechsleri*, root rot. C. A. Thomas described a greenhouse method of evaluating resistance in safflower to *Phytophthora* root rot. (Phytopath. 42: 219).

Puccinia carthami, rust, appeared in an experimental planting at the Salt River Valley Farm of the Experiment Station, Mesa, Arizona. The severely affected plants were grown from seed of Nebraska variety No. 852 obtained from California and described as giving heavier yields. Earlier supplies of commercial seed were not affected. (PDR 36: 325).

Yellows (virus). G. H. Coons presented evidence to show that virus yellows, a serious disease of sugar and forage beets in Europe, is widespread on beets in the United States. (PDR 36: 356).

GOSSYPIUM spp. COTTON: P. B. Marsh described the alkali-centrifuge test, a useful measuring technique in the study of problems concerning cotton fiber deterioration. (PDR 37: 71).

S. G. Lehman reported the results of dusting tests for control of fungus damage to seed cotton in North Carolina in 1951. (PDR 36: 414).

Losses from cotton diseases in 1952 were compiled by the Cotton Disease Council's Committee on Disease Losses. (PDR 37: 175).

Meloidogyne incognita var. *acrita*, root-knot nematode, annually causes damage to a considerable acreage of cotton in some areas of the San Joaquin Valley. Results obtained from treatment with nematocides applied in the row indicated that this method gives promise of reducing the expense of soil treatment and still result in good control. (D. J. Raski and M. W. Allen. PDR 37: 193).

Rhizoctonia solani, damping off. Isolates of *R. solani* from cotton in Louisiana varied considerably in tolerance to high temperatures, according to Jack C. Schwegmann. (PDR 37: 178). In Alabama, *Rhizoctonia* blight was more destructive than observed for the past several years. (PDR 37: 179).

Thielaviopsis basicola, black root rot, was reported by Leyendecker on Pima 32 cotton in 1951, in two fields near Canutillo, Texas. This is the second record of the disease in the southwestern United States. (PDR 36: 53). P. J. Leyendecker, Jr. and others reported that the circumstances of the occurrence of black root rot on cotton in the Rio Grande Valley of Texas and New Mexico indicated that the organism is indigenous to the area. The increased acreage of American Egyptian cotton and the awareness of presence of the disease in the area possibly accounted for the expanded range of the black root rot. (PDR 37: 130).

Cold injury. Seedling losses were sufficiently serious to require replanting about 20 percent of the crop in several counties of the Sand Mountain area of northeastern Alabama. Damage was attributed mainly to a freak period of unfavorable low soil and air temperature, strong wind, sunshine, and excessive water loss from seedlings. (A. L. Smith et al. PDR 37: 179).

HIBISCUS CANNABINUS. KENAF: *Colletotrichum hibisci*, tip blight. In October 1951 this disease was observed in damaging proportions on commercial plantings in Florida, according to John R. Presley. A brief history of the disease was given. (PDR 36: 333).

Leveillula taurica f. *hibisci*, powdery mildew. The powdery mildew on kenaf in Florida was determined as this species by Wm. W. Diehl. (PDR 36: 52). Field and greenhouse observations indicated that the disease can easily and economically be controlled in south Florida by timely applications of elemental dusting sulfur in amounts sufficient to cover the plants. (Warren N. Stoner, PDR 36: 302).

LINUM USITATISSIMUM. FLAX: The response of flax varieties to seed treatment was reported by R. E. Atkins and C. S. Reddy. Results were obtained from several Iowa locations during the three year period 1950-1952. Plots treated with Ceresan M yielded somewhat more than Panogen treated plots in 1950 and 1952, while both had identical average yields in 1951. Average percentage increase of treated versus non-treated plots was of similar magnitude for the three seasons. (PDR 37: 330).

MENTHA spp. MINT: *Puccinia menthae*, rust. Under conditions favorable for its development, mint rust frequently causes serious damage in commercial fields. In 1950 it was serious

in Indiana and Michigan on spearmint, *Mentha spicata*, and Scotch mint, *M. cardiaca*. In 1949 and 1950 it attained epiphytotic proportions in Oregon and Washington on peppermint, *M. piperita*. The absence of rust on peppermint in Indiana and Michigan suggested possible existence of physiological races in this area, according to Baxter and Cummins. It was found that *P. menthae* is composed of at least 15 physiologic races in North America. The P-13 strain of spearmint proved to be immune from all 15 races. Deep fall plowing, elimination of exposed plant debris, and destruction of nearby wild or escaped hosts were suggested as possible measures in the control of the rust. (Phytopath. 43: 178).

Root and rhizome rot. C. E. Horner reported that during the winter and early spring of 1950-51 and 1951-52, peppermint in Western Oregon was affected by a root and rhizome rot, caused by a complex of several fungi. *Rhizoctonia solani*, *Fusarium roseum*, *Fusarium* sp., and *Pythium* sp. were consistently isolated and their pathogenicity established. (Phytopath. 42: 514).

NICOTIANA spp. TOBACCO: *Fusarium oxysporum* f. *nicotianae*, *Fusarium* wilt, was discovered August 14, 1952 in a single field of flue-cured tobacco in Pittsylvania County, Virginia. In this field, wilt was accompanied by severe root knot (*Meloidogyne* sp.) infestation. Wilt has been previously reported from Lee County, Virginia in Burley tobacco, but this is the first time it has been noted in flue-cured tobacco in Virginia. (W. A. Jenkins, PDR 36: 391).

Heterodera rostochiensis, golden nematode. Discovery in Connecticut of a tobacco-cyst nematode indistinguishable morphologically from the potato golden nematode made it advisable to reinvestigate the susceptibility of tobacco to the potato nematode. It was found that the potato golden nematode larvae readily enter tobacco roots but do not develop further. Evidence indicates dying and decomposition of the larvae in tobacco roots. (Feldmesser and Fassuliotis, PDR 36: 483; Mai, PDR 36: 485).

Macrophomina phaseoli, charcoal rot, was extremely prevalent in Virginia and was consistently associated with basal (shank) rotting of plants injured by the application of mineral oils for sucker control. (W. A. Jenkins, PDR 36: 368).

Peronospora tabacina, blue mold. P. J. Anderson described symptoms of blue mold, life history of the causal organism, and the influence of weather on the severity of attack. For control, the use of ferbam and zineb were recommended on both seedlings and plants in the field and satisfactory methods of application were indicated. (Circ. Conn. Agric. Exp. Stat. 181. 1952). On flue-cured tobacco in southside Virginia and portions of the old belt in North Carolina, according to Wilbert A. Jenkins, blue mold was rarely seen in "active" form during the entire plant bed season. "Dry weather" mold, characterized by scanty sporulation and chlorotic foliar spots dotted with necrotic lesions varying in size and number, was common, however. Climatic conditions apparently constituted the greatest factor this season in blue mold control. (PDR 36: 278). In an experiment to obtain more information on wind dissemination of sporangia of this fungus, R. A. Hyre reported that it appears safe to assume that inoculum for blue mold infection at Newark, Delaware had been wind-borne for at least 20 miles. (PDR 36: 335). In the final summary of the plant disease warning service (PDR Suppl. 217: 203) Miller and O'Brien stated that blue mold of tobacco appeared later than usual except in North Carolina, where one of the earliest appearances for the State was recorded. Blue mold developed in the field in Tennessee. Control treatments plus timeliness and proper application did much to reduce the disease.

Phytophthora parasitica var. *nicotianae*, black shank. Powers and Lucas reported variation within this fungus, which is generally considered to be a relatively stable organism. (PDR 36: 335).

Tobacco mosaic (virus). Schlegel, Gold, and Rawlins made the following summary: "Radiophosphorus (P^{32}) in young mosaic tobacco leaves inhibited virus formation and mosaic symptom expression. P^{32} activity of around 100 counts per second per mg. fresh weight of leaf tissue decreased virus formation to approximately half that in control leaves; 200 counts per second decreased it to around 1/4 that in controls. Levels of P^{32} of 200 or more counts visibly inhibited the terminal growth of stems and roots, but the enlargement of formed leaves was less susceptible to inhibition by P^{32} ." (Phytopath. 43: 206).

PARTHENIUM ARGENTATUM. GUAYULE: *Sclerotium bataticola*, charcoal rot, is a common soil-borne fungus which infects many wild and cultivated plants in Texas during hot, dry weather. Conditions associated with attack on guayule in southwest Texas in 1951-52 are discussed by Don C. Norton and F. A. Frank. (PDR 37: 41).

SACCHARUM OFFICINARUM. SUGARCANE: Pratylenchus sp., nematode, has been found associated with root deterioration of sugarcane in the Louisiana field affected with the recently reported Sclerospora disease (sp. undet.) according to Wray Birchfield. The relation, if any, of the nematodes to the Sclerospora disease had not been determined. (PDR 37: 38).

SESAMUM ORIENTALE. SESAME: Fusarium wilt of sesame has been reported only recently in the United States. In 1948 it was found on a plantation in south Georgia where it was thought that the disease had been present for at least 15 years. On the basis of cross inoculation experiments, Joanne K. Armstrong and G. M. Armstrong concluded that the Fusarium causing wilt of sesame may be restricted in its pathogenicity to the one host. (PDR 37: 77).

DISEASES OF TREES AND SHRUBS

Winter injury to trees and shrubs was observed extensively in Illinois in 1952. The injury was attributed mainly to a sudden severe freeze which occurred in early November 1951. This was the coldest November in Illinois since the origination of state-wide records in 1890. (PDR 36: 389).

Results of fungicide tests for control of leaf diseases of shade trees in Illinois in 1951 and 1952 were summarized by J. C. Carter and P. F. Hoffman. (PDR 37: 114).

CASTANEA spp. CHESTNUT: Hans Nienstaedt reported tannin as a factor in the resistance of chestnut to the chestnut blight fungus, Endothia parasitica. (Phytopath. 43: 32).

CASTANEA DENTATA. CHESTNUT: Endoconidiophora fagacearum, oak wilt. Ernst and Bretz reported the American chestnut susceptible to the oak wilt fungus when artificially inoculated under greenhouse conditions. (PDR 37: 162).

CHAMAECYPARIS THYOIDES. ATLANTIC WHITE CEDAR: Fomes annosus, root rot. An examination of a small Atlantic white cedar plantation near Asheville, North Carolina, showed that two-thirds of the original 50 trees were dead or dying as a result of this fungus. (Toole and Boyce, PDR 36: 330).

CORNUS FLORIDA. DOGWOOD: Elsinoë corni, spot anthracnose. Because of the increasing demand for information on this disease and its control, several notes bearing on the disease were published by various authors. The States involved in the 1952 distribution were Florida, Georgia, North and South Carolina, and Maryland. (PDR 36: 292).

CRATAEGUS OXYACANTHA. ENGLISH HAWTHORN: Gymnosporangium sp. in Arizona; see pear in Fruit section.

LARIX spp. LARCH: Dasyscypha willkommii, European larch canker. In the resurvey for this canker in 1952 in Massachusetts, Fowler and Aldrich reported only three newly infected trees were found among thousands inspected. (PDR 37: 160).

PINUS spp. PINE: Cucurbitaria pithyophila, an entomogenous fungus, associated with pine, actually develops on a scale insect infesting pines, according to J. S. Boyce from Yale University, Connecticut. The actual relationship between the insect and the fungus is unknown. The fungus has been reported on Pinus flexilis from Colorado and Idaho, on P. monticola from British Columbia and Washington, and on P. strobus in several places in the east from New York to Georgia. It has not been recorded on P. lambertiana or on P. albicaulis. (PDR 36: 62).

Berch W. Henry described a root rot of southern pine nursery seedlings in a nursery near Brooklyn, Mississippi and its control by soil fumigation. It caused mortality in the seed bed, decreased production of plantable seedlings, and lowered survival of seedlings after transplanting to the forest. (Phytopath. 43: 81).

PINUS PONDEROSA var. SCOPULORUM. PONDEROSA PINE: Cronartium filamentosum, rust. Frank G. Hawksworth reported the pycnial stage of C. filamentosum on ponderosa pine at several locations in Arizona. Pycnia had not been observed in nature previously. Just why this stage was prominent in 1952 and why it was not found in previous years is an interesting question. Local weather conditions may be a determining factor. At the Grand Canyon pre-

cipitation during March and April was more than twice the normal amount; otherwise the first half of 1952 was nearly normal. (PDR 37: 246).

PINUS RESINOSA. RED PINE: Fomes annosus, root and butt rot, caused dying of red pines in plantations in New York State, according to D. S. Welch and E. L. Stone. This disease has long been recognized as a serious problem in Europe, and perhaps may become similarly important in this country as plantations become older. (PDR 37: 247).

PINUS RIGIDA. PITCH PINE: Fomes annosus, root rot. Elmer R. Roth reported extensive rotting of the roots of two uprooted pitch pine trees located on the flood plain of the Swannanoa River near Asheville, North Carolina. The only living healthy roots were some small secondary roots that had formed near the ground level. (PDR 36: 330).

Hypoderma lethale, needle browning. C. L. Morris reported that of the fungicides tested under field conditions, two, Puratized Agricultural Spray and a fixed copper spray, gave practically complete control of this needle cast fungus on pitch pine in Pennsylvania. (PDR 37: 368).

PLATANUS OCCIDENTALIS. SYCAMORE: Gnomonia veneta, anthracnose. In Illinois, P. F. Hoffman reported results of fungicide tests for control of this disease in 1952. In contrast with the three preceding years when there was very little sycamore anthracnose the disease was prevalent throughout the State in 1952. Two organic mercury compounds, Puratized Agricultural Spray and Tag 331, were most effective. (PDR 37: 112).

POPULUS spp. ASPEN: Hypoxylon pruinaum, canker. R. L. Anderson reported factors influencing the incidence of Hypoxylon canker on aspen in the Lake States region. (Phytopath. 42: 463).

POPULUS TREMULOIDES var. AUREA. ASPEN: Fomes igniarius, wood rot. According to Paul D. Keener sporophores of wood-rotting fungi are of infrequent occurrence in Arizona. However, recently from one to numerous conks of this fungus were observed near the ground-level as well as high up on the common aspen. (PDR 37: 164).

PSEUDOTSUGA TAXIFOLIA. DOUGLAS FIR: Rhabdocline pseudotsugae, needle cast, was first discovered in Pennsylvania by Stambaugh and Bramble in January 1952 while conducting studies of Christmas tree plantings in Susquehanna County. The affected area was again examined on June 2, 1952 at which time the new season's needles were almost fully matured. The infected trees varied from 4 to 18 feet in height and were confined to a 50-foot wide strip planting 0.7 acres in extent. From a total of 592 trees in the planting, 225 or 40 percent were infected. Heavy infections were noted on 68 percent of the infected trees or 25 percent of the total stand. The infection seemed to be at least two years old. Approximately one-half million, uninfected young fir trees were situated in a field adjacent to the infected planting. A spray schedule was started on June 2 to control the spread of the disease to the adjacent field of young Douglas fir. (PDR 36: 292).

PYRACANTHA COCCINEA LALANDI. LALAND FIRETHORN: Fusicladium pirinum var. pyracanthae, scab. Puratized Agricultural Spray and Bordeaux mixture gave the best control of scab on Pyracantha in the three years of tests in Delaware, according to R. S. Cox. Timing appeared to be more important than the total number of applications. (PDR 37: 7).

QUERCUS spp. OAK: Endoconidiophora fagacearum (Chalara quercina), oak wilt. Numerous investigations on the development of the fungus, production of the perithecial stage, and possible means of long-distance spread were reported. According to Curl, Stessel, and Zuckerman visible growth of the fungus was found in Illinois as large subcortical mycelial mats on 22 wilt-killed oak trees during the autumn and winter of 1951 and the spring of 1952. Species of insects belonging to the families Scolytidae, Cerambycidae and Buprestidae were found beneath the bark of all trees having mycelial mats. (Phytopath. 43: 61). Stessel and Zuckerman report the first known observation of perithecia in nature, on a wilt-killed red oak in Illinois in October 1951. The perithecia were abundant on the mycelial mats beneath open cracks in the bark, which exposed the viable ascospores and endoconidia to the air. In spring of 1952 perithecia were found on additional trees. Association of various insects with the fertile mats suggests that some insect may act as dissemination agents. Observations indicate that viable asco-

spores are continuously available for distribution from October to May, and that mats and perithecia may remain viable over the winter. (Phytopath. 43: 65). Natural occurrence of perithecia was reported in 1952 from West Virginia. (Barnett et al., Phytopath. 42: 531; Staley and True, Phytopath. 42: 691) and Pennsylvania (Morris and Fergus, Phytopath. 42: 681). Distribution of affected trees in West Virginia indicates that vectors must be the principal means of spread there, and the perfect stage apparently has an important role in spread.

J. G. Leach, R. P. True, and C. K. Dorsey, West Virginia University, report that growth pressure of the fungus cushion resulting in bark cracks provides a mechanism for liberation of spores from beneath the bark and that insects can act as spermatizing agents. (Phytopath. 42: 537).

During investigation of the compatibility of the oak wilt fungus isolates in Pennsylvania, it was found that inter-fertile strains existed in the State, according to Fergus and others. (PDR 36: 327).

In Illinois Eugene B. Himelick and others reported rodent feeding on mycelial pads of the oak wilt fungus. Mats exposed to rodent damage were producing perithecia and an abundance of conidia. They pointed out that it seems possible that rodents feeding on mats could become contaminated with the fungus and transfer it when feeding to healthy oaks. (PDR 37: 101). Development of mycelial mats during dry weather in Minnesota was reported by Robert N. Campbell and David W. French. Apparently these mats developed after the end of the growing season and during a prolonged drouth, indicating enough moisture under the bark of standing dead trees to permit fungus development in very dry weather, also a reservoir of inoculum. They also report evidence of rodent feeding on the mats. (PDR 37: 243).

Results of the effect of time and temperature on isolation of the oak wilt fungus from infected twig samples were reported by Bretz and Morison. (PDR 37: 162).

The progress of oak wilt investigations in Ohio in 1952 was reported by H. C. Young and others. Host range, longevity of the fungus, and effect of associated fungi were among the subjects studied. (PDR 37: 244).

Marvin Fowler summarized the 1952 surveys for oak wilt. (PDR 37: 104). The disease was not found in any additional States, but had spread within affected States.

Polyporus dryadeus, root rot. During a wind storm at Athens, Georgia, two large oaks were windthrown. Both trees had had fruiting bodies of this fungus at the base for several years. Because of the weakened root system, windthrow hazard is great in shade trees extensively rotted by P. dryadeus, according to W. A. Campbell and J. H. Miller. (PDR 36: 490).

QUERCUS ALBA. WHITE OAK: Gnomonia veneta, anthracnose. Charles L. Fergus stated that the relation of weather to the severity of white oak anthracnose in State College, Pennsylvania, and vicinity was studied during 1950, 1951, and 1952. The factor most closely related to severity was the number of days and hours of rain during late April and May, when buds were opening and leaves expanding. Severity was greater in 1952 in a park area where leaves and twigs were raked and removed, than under natural forest conditions. (Phytopath. 43: 103).

ULMUS spp. ELM: Ceratostomella ulmi, Dutch elm disease. In Massachusetts David H. Marsden presented evidence for the value of intelligent, sustained programs in local control of Dutch elm disease. (PDR 37:3). Richard J. Campana reported further spread of this disease in Illinois in 1952. During the year, 24 infected trees were found in seven counties. (PDR 37: 110).

Gloeosporium ulmicolum has been observed on the fruit of rock elm (U. thomasi) and variegated English elm (U. procera argenteo-variegata) for several seasons in the vicinity of Champaign-Urbana, Illinois. Although quite common on elm leaves, apparently it has not been reported on elm seed heretofore. (Ralph W. Ames, PDR 36: 301).

Phloem necrosis (virus). In Illinois various chemical tests were tried by Ralph W. Ames in the hope of finding a quick and certain method of detection of phloem necrosis in an elm tree before the tree reaches the stage when symptoms are evident. (PDR 36: 288).

WASHINGTONIA FILIFERA. PALM: An undetermined fungus disease that rots the trunks is threatening this only native palm of California. More than 20 trees have succumbed to the trunk-rotting disease. The causal fungus apparently enters the palm trunks through wounds or cracks. The disease seems to be associated with heavy watering. The fungus is similar to that which causes the brown rot gummosis disease in citrus trees. (Science New Letter 62: 29, July 12, 1952).

DISEASES OF VEGETABLE CROPS

Evaluation and use of disease resistance by vegetable breeders is discussed by C. F. Andrus. (PDR 37: 206).

Tests reported by Wallen and Skolko showed that emergence from vegetable seed of low germination can be improved by treatment with suitable materials. (PDR 37: 66).

Sclerotinia sclerotiorum, rot. Lowland rice farming is a possible cultural control for S. sclerotiorum in the Everglades according to Warren N. Stoner and W. D. Moore. The quick thorough destruction of the sclerotia by flooding which is a part of lowland rice culture indicated that this economical method of control for sclerotiniase may be fitted into a satisfactory rotational program in the area, since rice may be grown on infested high-value vegetable land in summer. (PDR 37: 181). Stoner and Walter H. Thomas, Jr. reported a preliminary trial of lowland culture rice in rotation with vegetable crops as a means of reducing root knot (Meloidogyne incognita) nematode infestations in the Everglades. (PDR 37: 187).

Systox, an organic phosphate insecticide, controlled root-knot nematodes (Meloidogyne spp.) when used as a soil drench in certain concentrations in experiments reported by J. N. Sasser, but the possibility of toxic residues makes further investigation necessary before the chemical can be recommended for this purpose. Cucumbers and tomatoes were used as experimental plants. (PDR 36: 228).

APIUM GRAVEOLENS. CELERY: Paratylenchus hamatus. Lownsbery and others reported that P. hamatus has produced the same stunting and chlorosis of celery commonly associated with the nematode in the field. Disease severity was proportional to the P. hamatus population. Since populations have been found at pathogenic levels throughout the year, it was concluded that the nematode could survive New England winters. (Phytopath. 42: 651).

Septoria apii, late blight, is abundant in the soil of all major celery-growing sections of western Oregon, according to Edward K. Vaughan. It is present every year and frequently causes severe losses, particularly in celery grown for harvesting after the start of the fall rains. Spray and dust trials over the past four years have shown that the losses can be almost entirely prevented by timely application of fungicides. Ziram and tribasic copper sulphate have given the best control without evidence of phytotoxicity. (Phytopath. 42: 519).

Adaxial crack stem (boron deficiency), a serious disease of Utah type celery, has been observed in coastal California since 1945. The disease was reported particularly severe on Utah 10B, especially when grown under extremely high nitrogen fertilization. The disease may be controlled by applying water sprays of borax to celery foliage. (John T. Middleton and others. Phytopath. 42: 603).

ARMORACIA RUSTICANA. HORSERADISH: Albugo candida, white rust. The production of oospores of this fungus on leaves of horseradish has been obtained under greenhouse conditions in Illinois, according to R. M. Takeshita and others. This suggests a mode of overwintering of the pathogen in addition to persistence of systemic mycelia in the crown area. (PDR 36: 253).

BETA VULGARIS. BEET: Yellow-net (virus). D. M. McLean reported the occurrence of the yellow-net virus disease in table beet seed plants in northwestern Washington. The disease is caused apparently by the same virus that causes yellow-net of sugar beets in California. Only plants in the genus Beta have been experimentally infected with yellow-net virus. (PDR 36: 241).

Yellows (virus). A study of the occurrence, symptoms, and the insect relations of the virus causing virus yellows in table beet seed crops in the Pacific Northwest was reported by D. M. McLean. (PDR 37: 276).

BRASSICA OLERACEA var. CAPITATA. CABBAGE: Fusarium oxysporum f. conglutinans, yellows. Two new outbreaks occurred in Florida during the 1951-1952 growing season. Records show that over 1,000 acres of land in the Hastings area became heavily infested with yellows during the three-year period 1948 to 1951. During the last two years losses have been reduced, as growers have shifted from yellows-susceptible to yellows-resistant varieties for planting in infested land. (A. H. Eddins, PDR 36: 337).

Xanthomonas campestris, black rot. Studies on the transmission of black rot and survival of the causal organism in the soil were made at Hastings, Florida, from 1947 to 1951. Results reported by Eddins indicated that the organism mostly originated from infected seed. (PDR 37:

216). In Wisconsin, Cook, Larson, and Walker reported relation of the black rot pathogen to cabbage seed. Certain data were interpreted as confirmatory of field observations that epiphytotics in the crop often arise from a very few initially infected seedlings in the seed-bed in environments favorable for secondary spread. (Phytopath. 42: 316).

BRASSICA RAPA. TURNIP: Cercospora albomaculans, leaf spot. J. O. Andes, of the Agricultural Experiment Station, at Knoxville, Tennessee reported fungicides for turnip-green leaf spot control. This disease is serious in some seasons, especially after the first cutting owing to build up of inoculum. (Proc. of So. Agri. Workers, Feb. 1952, pp. 129-130).

CAPSICUM FRUTESCENS var. GROSSUM. BELL PEPPER: Cladosporium herbarum, a transit and storage rot of California peppers was described by G. B. Ramsey and Barbara C. Heiberg. The rot has been found following injuries in peppers and also associated with other diseases such as Botrytis rot and Alternaria rot, but in most instances lesions appeared where there were no visible wounds and no other organism was present. (PDR 36: 481).

Cladosporium capsici, leaf spot, found in Georgia, has apparently not been reported before from this country. The disease appeared late, and therefore did not affect the fruits very badly. See also Table 2. (Miller and Taylor, PDR 36: 440).

Curly top (virus) was the only apparent cause of the killing or spoiling of about 80 percent of the bell pepper plants in a three-acre field near Lovington, New Mexico. Larger pepper plants in a large field near Littlefield, Texas showed about 1 percent of the plants with typical symptoms of curly top. (P. A. Young, PDR 36: 390).

CUCURBITS: CUCUMBER, MELON, SQUASH: Cladosporium cucumerinum, scab. In Wisconsin, Walker, Pierson, and Wiles reported two new scab-resistant cucumber varieties. (Phytopath. 43: 215).

Colletotrichum lagenarium, anthracnose. In Louisiana, J. G. Atkins and N. L. Horn reported a simple greenhouse method for evaluating fungicides for control of anthracnose on cucumber. Results were in agreement with those from field tests. (PDR 36: 270). Barnes and Epps reported evidence indicating two distinct types of resistance to anthracnose infection in cucumbers have been located, differing not only in the degree of resistance exhibited but also in mode of inheritance. (PDR 36: 479).

Erysiphe cichoracearum, powdery mildew. G. H. Godfrey in Texas reported effective control of cantaloupe powdery mildew with dinitro capryl phenyl crotonate. (Phytopath. 42: 335).

Pseudoperonospora cubensis, downy mildew, has two distinct biological forms, according to Hughes and Van Haltern. This is in keeping with the field observations of both Ellis, and Epps and Barnes who suggested this possibility. (PDR 36: 365). In the summary of the plant disease warning service for 1952, Miller and O'Brien stated that cucurbit downy mildew caused less damage than in any year since the initiation of the Warning Service in 1946. (PDR Suppl. 217: 203).

Cucurbit viruses. C. W. Anderson reported observations that may help to explain the distribution of cucurbit viruses in central Florida; the viruses concerned are watermelon and cucumber mosaic viruses, a mosaic virus from the wild plant Melothria, and another from cantaloupe resembling the South Carolina cantaloupe mosaic virus. (PDR 36: 377).

IPOMOEA BATATAS. SWEETPOTATO: Endoconidiophora fimbriata, black rot, is one of the most destructive and widely distributed diseases of sweetpotato in the United States. Pen Ching Cheo discussed varietal differences in susceptibility. (Phytopath. 43: 78).

Norman D. Dobie and others reported a new method for application of chloropicrin in warehouse fumigation in Oregon. Fusarium roseum was used to test the effectiveness of storage house disinfestation with chloropicrin applied in steam. (Phytopath. 42: 693).

Streptomyces ipomoea, soil rot, has gradually become more important during the past 30 years. At present it is the major disease of the crop in southeastern Iowa. Many fields have been abandoned for further sweetpotato culture because of the disease. Sulfur as a soil treatment was effective in controlling the disease. Total yields and plant vigor were often increased following sulfur treatment and the appearance of the fleshy roots was appreciably improved. (Hooker, W. J. and Lewis E. Peterson. Phytopath. 42: 583).

Internal cork (virus). According to L. W. Nielsen sweetpotato roots infected with the internal cork virus were grown in soils artificially heated from mid-September until early November, and more necrotic lesions developed in them than in similar roots grown in non-heated

soils. Storage temperature markedly influenced lesion development in diseased roots. Additional infected roots developed lesions and the lesions became larger and more numerous at storage temperatures of 70°, 85° and 94° F. In contrast, no additional lesions developed in roots stored at 55° F.; however, there was evidence that the lesions present enlarged slowly over a 7-month period. (Phytopath. 42: 625). The relation of temperature to internal cork development in stored sweetpotato roots was discussed by Robert Aycock and others. (Phytopath. 43: 50).

LACTUCA SATIVA. LETTUCE: Erysiphe cichoracearum, powdery mildew, caused reduction in yield and quality of lettuce in the Salinas Valley of California where it reappeared in the fall of 1951 exactly ten years after the same area had experienced the only other known field occurrence in the State, according to W. C. Snyder and others. (PDR 36: 321). Recurrence of this disease in California in 1952 and appearance of the perithecial stage of the fungus in the field suggested the origin of a race pathogenic to cultivated lettuce, according to Josue A. Deslandes and others. (PDR 37: 135).

Pseudomonas marginalis, soft rot. According to B. A. Friedman, bacteria considered to be identical with P. marginalis were isolated from leaves of plants of Arizona-grown head lettuce and Florida-grown escarole (Cichorium endivia) found affected with a slimy soft rot upon examination at the New York market. (Phytopath. 42: 112).

Mosaic (virus). Grogan, Welch and Bardin point out that it has been known for many years that common lettuce mosaic virus is seed-borne and several workers have suggested the use of disease-free seed as a control. However, this method of control had not been tested experimentally. Lettuce seed free of mosaic was used to plant experimental plots in commercial fields. Results of field trials showed that the spread of common mosaic under California conditions was mainly a local phenomenon and that the use of mosaic-free seed is an effective means of controlling the disease in large scale field plantings. (Phytopath. 42: 573).

LYCOPERSICON ESCULENTUM. TOMATO: The progress report of the National Screening Committee for Disease Resistance in the Tomato was prepared by L. J. Alexander and M. M. Hoover. The 1952 results demonstrated that a great deal of previously unrecognized valuable germ plasm exists, especially for resistance to diseases. (PDR 37: 317).

Manzate (manganese ethylene bis dithiocarbamate), according to J. D. Wilson, gave promise of being the nearest approach yet found to a fungicide that can be used singly to check those diseases for which the tomato is sprayed. Plots treated with Manzate produced fewer cull fruits and gave a higher yield of usable tomatoes than those treated with ziram or zineb. Manzate gave better control of anthracnose (Colletotrichum phomoides) than either ziram or zineb. In one experiment in which late blight destroyed 87 percent of the fruits in the untreated check plots, the loss was reduced to 10 percent by Manzate, to 12 percent by Parzate, and to 56 percent by Zerlate. (Ohio Farm and Home Research 37 (276): 41).

Fusarium oxysporum f. lycopersici, wilt. A new tomato variety, Homestead, developed by the U. S. Department of Agriculture, from crosses involving Victor, Pan American, Rutgers, and Dobbie's Champion was reported to be available for autumn and winter plantings. In tests over three years at the Homestead, Fort Pierce, and Gainesville Stations, Florida, and in other southern States this variety was resistant to wilt and highly productive. (Seed World, 71 (8): 44). Waggoner and Dimond reported that a continuing interest in the therapy of plant diseases led to attempts to cure a plant disease by ionizing radiation. In addition to evaluating plant radiotherapy, their studies provided unique information concerning the nature of disease. Because Fusarium is considerably more resistant to ionizing radiation than the host, it was predicted that therapy of Fusarium wilt could not be affected with a source of radiation external to the host. This prediction was verified by using gamma radiation from Co⁶⁰. Therapy of Fusarium wilt by internal sources of radiation seemed unlikely. Stems which had become necrotic from the effects of Fusarium no longer translocated appreciable amounts of phosphate to leaves and growing point. However, stems which were discolored translocated about as much phosphate to growing point and terminal leaves as healthy tomato stems. (Phytopath. 42: 599). The physiology of Fusarium wilt was discussed by R. P. Scheffer and J. C. Walker. (Phytopath. 43: 116).

Phytophthora infestans, late blight. According to Walter and Conover, two accessions of small-fruited tomato types used as ornamentals were observed to show a high degree of resistance to late blight in southern Florida. Performance of hybrid populations resulting from crossing these accessions with large-fruited susceptible breeding stocks has shown that the resistance is hereditary. (Phytopath. 42: 197). In the final summary (PDR Suppl. 217: 203)

of the plant disease warning service in 1952, Miller and O'Brien stated that 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. 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 proved unfavorable for disease development and spread.

Purdy and Bardin reported infection of tomato plants by ascospores of Sclerotinia sclerotiorum through old flower parts. (PDR 37: 361).

J. W. Lesley and others reported that the Simi tomato, bred at Riverside, California, is resistant to Verticillium albo-atrum and Fusarium oxysporum f. lycopersici and has yielded well on infested soil in the coastal plain of southern California and in the Simi Valley. It originated from a cross between Riverside and N. D. 216-2-3 and is recommended particularly for processing on account of its fleshiness and deep red color. (Hilgardia 21: 289).

Curly top (virus). In fields in west Texas and New Mexico, abnormal tomato plants showed typical symptoms of the curly-top disease, which apparently killed or damaged 15 to 85 percent of the plants. (P. A. Young, PDR 36: 390). In California, H. M. Armitage reported the control of curly top virus in tomato and other agricultural crops by reducing populations of overwintering beet leafhoppers. (J. Econ. Ent. 45: 432).

Internal browning (? virus). High moisture content of the air which results possibly in water congestion of the tissue of the tomato fruit may be an important factor in the internal breakdown of the tomato tissue, according to greenhouse experiments reported by S. P. Raychaudhuri. (PDR 37: 220).

Hormone injury to tomato, pepper and Rudbeckia adjacent to a railroad right-of-way sprayed by a commercial organization for weed control was reported by P. A. Young. The particular compound used could not be determined. (PDR 37: 36).

P. A. Young described several disorders of tomato fruits in Texas, which were apparently favored by weather conditions and were unusually abundant, including catfaces on the sides of the fruits (PDR 37: 373); stem-end stripes, and vertebrae-crack lines. (PDR 37: 325).

PHASEOLUS LIMENSIS. LIMA BEAN: DeZeeuw and Andersen reported results of lima bean seed treatment trials in Michigan, 1951 to 1952. A noteworthy observation was made regarding Phygon XL as a seed protectant for lima beans. It caused blackening of the cotyledons and prevented the seed coat from splitting so that the cotyledons were restrained abnormally. (PDR 37: 69).

Phytophthora phaseoli, downy mildew was found in Delaware 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. The total loss to the lima bean crop was estimated at less than 2 percent. Downy mildew appeared about the middle of July in Lancaster County, Pennsylvania and became general over the southeastern part of the State. The average loss was less than 1 percent. (PDR Suppl. 217: 212).

PHASEOLUS VULGARIS. BEAN: It was concluded from greenhouse and field studies that the fungi chiefly responsible for blights of snap bean in Georgia were Macrophomina phaseoli, Rhizoctonia solani, and Sclerotium rolfsii. Seed treatment failed to give practical control of these diseases in field trials. Field observations indicated that they may be avoided by early planting. (E. S. Luttrell and K. H. Garren. Phytopath. 42: 607).

Translocation of streptomycin in bean plants and its effect on bacterial blights (Pseudomonas medicaginis var. phaseolicola and Xanthomonas phaseoli) was reported by Mitchell, Zaumeyer and Andersen. (Science 115: 114).

Bean virus 2 (yellow). Afanasiev and Morris reported that bean plants of the Great Northern variety, which is resistant to bean virus 1, were infected in Montana by a virus causing drooping of leaflets, chlorotic spotting, and later general mottling, distortion, and crinkling of leaves; they gradually became dwarfed and spindly, grew slowly, bloomed later, and gave poor yields. The virus was not transmissible through the seed. The host differentiation, physical properties, and association of the virosis with white and yellow sweet clovers indicated that this disease is caused by bean virus 2 (yellow bean mosaic). (Phytopath. 42: 101).

Tobacco ringspot (virus). Cheo and Zaumeyer described a new severe strain of tobacco ringspot virus isolated from mottled bean pods collected in Virginia and Delaware. It infected all bean varieties tested and produced more severe necrotic symptoms than the McKinney strain of tobacco ringspot virus. (PDR 36: 459).

SOLANUM TUBEROSUM. POTATO: Fusarium sp., dry rot. Observations indicated that dry rot was more prevalent in stored potatoes treated with a sprout inhibitor than in untreated tubers stored under the same conditions. A histological study of tubers treated with certain sprout inhibitors showed that the normal healing of cut surfaces of potato tubers was delayed without interfering in any way with growth of Fusarium. The active agent contained in sprout inhibitors was found to be responsible for delay in the healing of wounds. (H. S. Cunningham, Phytopath. 43: 95).

Heterodera rostochiensis, golden nematode (see also under tobacco in Special Crops section). Bert Lear and W. F. Mai reported the use of methyl bromide for disinfesting burlap bags and machinery to help prevent spread of the golden nematode. (Phytopath. 42: 489).

Macrophomina phaseoli, charcoal rot, resulted in 33 to 50 percent loss of Irish Cobbler and Kennebec potato tubers in home gardens in the Knoxville, Tennessee area at the time of digging in early July. The potatoes had been left in the very hot, dry soil for two weeks or more after the vines had died. According to E. L. Felix tubers should not be left in the ground under very high temperature conditions. (PDR 36: 369).

Phytophthora infestans, late blight, see under Tomato.

Spongospora subterranea, powdery scab. Schultz reported that in Maine during the 1951 epiphytotic of late blight (Phytophthora infestans), blight-immune Kennebec potato tubers contracted late blight in the soil infested with S. subterranea. Experience has shown that the late blight fungus invades blight-immune tubers through injuries or wounds on the tubers. (Phytopath. 42: 343).

Bernard A. Friedman and Donald Folsom reported on storage behavior of Kennebec potatoes infected by Verticillium albo-atrum. (Phytopath. 43: 108).

Curly top (virus, Ruga verrucosans). N. J. Giddings reported curly top as quite prevalent in two fields of potatoes being grown for certified seed stock in California. Estimated infection was 8 to 10 percent. Estimated reduction in value for the two fields was \$15,000, since they could not be sold for certified seed. (PDR 37: 167).

SPINACIA OLERACEA. SPINACH: Puccinia aristidae, orange rust, was a serious market disease of Colorado spinach in 1952, causing much loss in truck shipments to Chicago. Once infection occurs fields of spinach become worthless within a few days. Under the usual methods of handling spinach in Colorado, this rust can increase rapidly in transit. (Ramsey, Smith and Wright, PDR 36: 323).

DIVISION OF MYCOLOGY AND DISEASE SURVEY