New or Noteworthy Diseases

Owing to the cool, wet spring, the crop season in the Prairie Provinces was considerably retarded and the appearance of the cereal rusts was correspondingly delayed. The most significant development was the widespread occurrence of race 15B of wheat stem rust (Puccinia graminis var. tritici). With the appearance of this race, durums were severely rusted in southern Man., although the damage was not great. However, important wheat growing areas along the Red River in North Dakota and Minnesota were severely damaged. (cf. W.E. Brentzel. U.S.D.A. Pl. Dis. Reporter 34(11):340-341. 15 Nov. 1950). The varieties Carleton and Stewart, hitherto resistant to stem rust, were rusted as heavily as other commercial durum wheats. The rust resistant common wheats Thatcher, Regent, and Redman carried much lighter infections and damage to these varieties, if any, was slight. Elsewhere in Canada, heavy or even moderate infections of wheat stem rust appeared to be confined to a few localities in Ont.

When the previous, known distribution of race 15 is reviewed, it is clear that it has had sufficient distribution on cereals and grasses in the Great Plains to permit its rise to predominance under favourable circumstances. Possibly one of these circumstances is the incorporation of emmer "blood" into common and durum wheats. Emmer wheats, such as Yaroslav and Vernal, are more or less susceptible to race 15 and particularly so to its biotype 15B. The existence of this biotype coincident with the growing of great acreages of Carleton and Stewart (derived from Vernal) and of many Hope and H44 derivatives (derived from Yaroslav) appears to have been one of the primary causes of the rust epidemic of 1950.

Other cereal rusts, particularly wheat leaf rust (P. triticina) and oat stem rust (P. graminis var. avenae) were also of some importance. Race surveys demonstrated that race 7, of oat stem rust, which was rarely collected in previous years, is now widely distributed and three races, viz. races 34, 45, and 57, of oat crown rust (P. coronata var. avenae) have increased rapidly to become the predominent races this year. These race changes serve to emphasize the difficulty in breeding varieties that remain resistant for any length of time to these two rusts, which do cause severe losses in localized areas, wherever the alternate hosts, the barberry and buckthorn, have escaped. For this reason, the action of the Ontario Department of Agriculture to encourage local municipalities in the eradication of these pests within their confines deserves the fullest support, for much benefit will accrue if a good job of eradication is done.

The smut situation changed little in the past year. The winter wheat variety, Wasatch, has been tested in Interior British Columbia for the past three years and proved resistant to the strains of dwarf bunt (Tilletia caries form) present; it is now recommended for the area. Tests made by a new technique indicate that on account of favourable conditions for infection during the flowering period last summer in Sask. the amount of loose smut (Ustilago nuda) will be high in barley crops grown from untreated seed next year.

Browning root rot (Pythium spp.), one of the main root-rot diseases in the 1920's and 1930's in certain districts chiefly in Sask., has been of little or no economic importance in recent years. This decline seems to be connected

with the increased use of the combine whereby more straw is returned to the soil, increased use of phosphate fertilizers, and the growing of large acreages of Thatcher, one of the most resistant varieties of the common wheats to this root rot.

Bacterial wilt (Corynebacterium insidiosum) of alfalfa was found for the first time in Que. in 1950; as pointed out last year this disease is likely to be found wherever alfalfa is grown in Canada. An important new pest in Canada, the stem nematode (Ditylenchus dipsaci) of alfalfa, was found in small amounts at and about Lethbridge, Alta. An unusual phenomenon this year was the occurrence of heavy infections of rust (Puccinia sorghi) on fodder and sweet corn in Ont. Stalk rot, previously attributed to Gibberella zeae but apparently caused by a complex of organisms, was very destructive to corn in Ont. Rust (Melampsora lini) was the currently important disease of flax in Man. Races capable of attacking the variety Dakota increased rapidly in 1949 and caused heavy infection on this variety in 1950; however, no rust was found on Rocket or Cheyenne. From studies made at Harrow it appears that not only is pod and stem blight (Diaporthe phaseolorum var. sojae) present on soybeans in southwestern Ont. but also stem canker (D. phaseolorum var. batatis). The latter pathogen can attack the plants in mid-season, causing wilting and early death.

Bacterial ring rot (Corynebacterium sepedonicum) continues to be an important disease of potatoes in Canada although it was less prevalent in 1950 than in the previous year. No cases were observed in the current crop in P.E.I. and only a few fields were infected in B.C. Efforts to reduce its spread in several of the other provinces are only partially successful.

Black leg (Erwinia phytophthora) was more prevalent from northern Ont. eastward this year than usual on account of cool, usually moist conditions, particularly in spring. The cool season also favoured the development of rhizoctonia (Pellicularia filamentosa) on the potato plant.

Late blight (Phytophthora infestans) was relatively prevalent everywhere from Ont. eastward, causing fairly heavy losses from tuber rot in southwestern Ont., about Montreal and the Eastern Townships in Que., and on the south shore of N.S., with lighter losses elsewhere in N.S. and in N.B. and P.E.I. The newly developed blight-resistant varieties Canso and Keswick appear promising. Late blight was also fairly destructive to tomato in the same areas where it was severe on potatoes. One case of apparent overwintering in the greenhouse was observed near Kingsville, Ont.

Further search has revealed that wart (Synchytrium endobioticum) is much more prevalent in Nfld., especially on the East Coast, than was formerly realized. As a result of one year's tests for resistant varieties, the new late-blight resistant variety Keswick was found to be immune to the particularly virulent strain of wart in Nfld., while Katahdin, a mauve-flowered strain of Sebago, and Canso were highly resistant.

Recent studies at Fredericton have demonstrated that late leaf roll, bunch or purple top, and haywire are symptom phases of the same virus disease, best known by the names Bunch Top or Purple Top. The virus according to D.J. MacLeod is either an aberrant strain of Callistephus virus 1 or an entirely different virus (Solanum virus 17). The same worker presents field evidence of the presence of the western strain of aster yellows virus on celery and zinnia in N.B.

Three more cases of whiptail of cauliflower were reported this year and the benefit of an application of ammonium molybdate is recorded for one. Late blight (Septoria apii-graveolentis) of celery was unusually severe in Ont. and Que. unless the plants were well protected by a fungicide. Heavy infections of downy mildew (Peronospora pisi) were reported for the first time in Ont. Tobacco virus diseases have been epidemic since 1947 in the Old Tobacco Belt in Ont. Studies at Harrow in 1950 have shown that tobacco etch, although not previously reported in Canada, is the most prevalent of these diseases. Etch also severely affected pepper in the same area. Anthracnose (Colletotrichum phomoides) of tomato continues to be one of the most important diseases of canning crops because of the rapid deterioration of the fruit just before or after picking. Another outbreak of bacterial canker (Corynebacterium michiganense) of tomato occurred in Que.

The following records of diseases of fruit crops may be noted: Rust (Gymnosporangium clavipes) was heavier on apple in N.S. than ever in 26 years' observations. Canker (Tympanis conspersa) caused some damage in a neglected orchard in N.S. Scab (Venturia inaequalis) was heavy in parts of the Kootenays, B.C. The weather favoured scab in s.w. Que. and many sprays were needed to control it. Little leaf and rosette (zinc deficiency) have been seen on apple and other tree fruits in B.C. for several years. Fire blight (Erwinia amylovora) of pear was again serious in Creston Valley, B.C. Stony pit (virus) was seen for the first time in N.S. Blossom blight and brown rot (Sclerotinia fructicola) caused considerable loss to cherry, peach and plum in B.C., Ont. and N.S.
Spur blight (Didymella applanata) of raspberry was destructive in parts of Ont. Decline of strawberry and stunting of raspberry both apparently caused by viruses, are causing concern in parts of B.C.

Among tree diseases mention may be made of mistletoe (Arceuthobium americanum), which has long been serious on Pinus banksiana in Sask. In 1950 Wallrothiella arceuthobii was abundant on the Arceuthobium in one area. Scouting for Dutch elm disease (Ceratostomella ulmi) showed more infected trees in Que. than in 1949, and considerable southward spread. A few infected trees were scattered in e. Ont. and a well-established outbreak was found near Windsor.

The following reports of diseases of ornamental plants are worthy of note: Grey mould (Botrytis cinerea) was serious on Antirrhinum and Chrysanthemum, and was reported on other hosts at various points in eastern Canada; its prevalence was partly due to wet weather. Bunch top (Solanum virus 17) occurred naturally in N.B. on Antirrhinum and Petunia. Mosaic (Cucumis virus 1) was heavy on Antirrhinum majus in a greenhouse in Ont. on plants that were started outdoors near infected watermelon. Yellows (Callistephus virus 1) continues to be serious, especially in the Maritime Provinces, on Callistephus and several other genera.

Fasciation (Corynebacterium fascians) was found on gladiolus in Sask., the first positive record of this organism in Canada. Bacterial soft rot (Erwinia carotovora) was reported on gladiolus in Ont. in 1949. Yellows (Fusarium orthoceros var. gladioli) was serious on this plant in P.E.I., and core rot (Sclerotinia draytoni) was common in Ont., N.S., and P.E.I. Evidence was obtained that several viruses may be involved in the gladiolus mosaic complex. Leaf spot (Didymellina macrospora) was heavy on iris in parts of Ont. and Que. Decline (virus) continues to be the most serious disease of narcissus in B.C.