New or Noteworthy Diseases

Stem rust (Puccinia graminis) caused almost no damage to wheat in Canada in 1942. It developed very late in the season and only traces were found on susceptible varieties at maturity in Man. Somewhat heavier infections were present in Sask. and Alta.

Leaf rust (Puccinia triticina) was fairly prevalent on Red Bobs, a variety susceptible to leaf and stem rusts, and on the stem-rust resistant Thatcher and Apex, while Regent and Renown, which are also resistant to leaf rust, bore only light infections. Crown rust (Puccinia coronata) of oats and leaf rust (P. anomala) of barley were more prevalent than usual in the Prairie Provinces. The increase of barley leaf rust in Man. was ascribed in part to the increased acreage of Plush, a variety very susceptible to leaf rust. Additional evidence was obtained in N.B. that local epidemics of crown rust and stem rust on oats are due to plantings of the alternate hosts.

The oat nematode (Heterodera avenae) was first observed in Simcoe Co., Ont. in 1933 and was definitely identified in 1934 in Simcoe and Ontario Counties as the result of studies by Dr. D.F. Putnam (P.D.S. 14: 12-13). Its presence in Waterloo Co. was substantiated by him in 1936 (P.D.S. 16: 9-10). In 1937, it was reported to be rather widely distributed in Ont. by M.J. Laughland, but the nematodes were not positively identified (P.D.S. 17: 10-11). Studies conducted by Dr. A.D. Baker in the past two years indicate that although more infested fields have been found in the areas originally indicated by Putnam, there is no evidence of the nematode being diffused over widely scattered counties in the province. The occurrence of the meadow nematode (Pratylenchus pratensis) on oats is reported to the Survey for the first time.

Although browning root rot (Pythium spp.) caused very severe lesioning of the roots of cereals, growing conditions were so favourable that recovery was general and yields moderate. However, severe root necrosis did delay ripening and increased the possibilities of frost damage. Isolations from field material indicate that both fox-tail millet (Setaria italica) and broomcorn millet (Panicum miliaceum)may suffer considerable damage from browning root rot.

That leaf blotch (Helminthosporium avenae) may at times be an important seedling blight in Canada is indicated by the high incidence of the organism in the seed, the relatively severe leaf infections observed in the field when heavily infected seed is sown, and by the presence of seedling blight under cool greenhouse conditions. Primary infection in net blotch (H. teres) and spot blotch (H. sativum) may also be largely from infected seed.

Covered smut (U. Hordei)and black (loose) smut (U. medians or U. nigra) were prevalent in Plush barley in Man. destroying 40-50% of the heads in some fields. Tapke has reported recently that half the samples of loose smut collected in the United States and studied by him were affected by U. nigra rather than U. nuda. The same situation may also hold in Canada.

Bacterial wilt (Corynebacterium insidiosum) continues to be destructive to alfalfa in the irrigated districts of southern Alta. It was present in all stands three years old or older and in an occasional two-year-old

stand. Crown rot, due to a low-temperature basidiomycete, caused early-spring killing of alfalfa in the principal alfalfa-growing areas in Alta. particularly in the seed-growing districts of northern and central Alta. The disease along with true winter-killing did considerable damage in the seed-growing areas of northeastern Sask. Witches' broom (virus) was reported shortening the life of alfalfa stands in the Nicola and Cariboo Valleys, B.C.; this is the first definite indication of its economic importance in Canada.

Diseases of flax attracted much attention in Canada due to their unusual prevalence and their greater importance as the result of the increased acreage. Rust (Melampsora Lini)was general and reached epidemic proportions in some fields in the Prairies. It was most severe on Bison, probably the most commonly grown variety. Redwing is fairly susceptible, but is favoured in northerly sections on account of its earliness. Royal appears to be quite resistant. Field observations indicate that rust was worse when a field was located close to those in flax the previous year or where bits of rusted straw were present in the seed with which it was sown. Other flax diseases to which attention may be directed are browning and stem break (Polyspora Lini) and anthracnose (Colletotrichum Lini).

Kok-saghyz, or Russian dandelion, was grown for the first time in Canada in 1942. A bacterial leaf spot caused by a possibly new species of Xanthomonas was found in Man. A rust (Puccinia Carthami) was found on the little-cultivated safflower at Morden, Man. and Saskatoon, Sask.

Pod and stem blight (Diaporthe Phaseolorum var. Sojae)is the most important disease affecting soybeans in Essex Co., Ont., according to Drs. Koch and Hildebrand, because of its widespread occurrence and destructiveness. Both the blight and anthracnose (Colletotrichum Glycines) are diseases new to Canada. Of the sugar-beet diseases in southwestern Ont. mention may be made of seed-head injury (Phoma Betae), Rhizoctonia rot (R. Solani), Rhizopus rot (R. arrhizus), black root or damping off (cause undetermined), and the sugar beet nematode (Heterodera schachtii)

Among the vegetable diseases, bacterial blight (Xanthomonas phaseoli) and halo blight (Pseudomonas medicaginis var. phaseolicola), especially the latter, were prevalent on beans in Canada and were particularly destructive in southern Alta. Yellows (aster yellows virus) continues to be destructive in carrots in the Maritime Provinces. A yellows, believed to be due to beet curly-top virus, was reported on carrot from the Okanagan Valley, B.C. Mosaic (virus) is a disease of great economic importance in both field and greenhouse crops of cucumbers in Ont. Two diseases new to the Okanagan Valley, B.C. were downy mildew (Peronospora Schleideniana), which destroyed about half the onion crop and anthracnose (Marssonina Panattoniana) on lettuce. A bacterial stalk rot (?Phytomonas dissolvens) was quite prevalent on some hybrid lines of corn at Vineland Station, Ont. The leaf spots (Phoma Betae and Ramularia Betae) were found for the first time on swiss chard in Canada. A serious outbreak of Phytophthora stem rot (P. parasitica) was found on tomato at Ottawa. Both early blight (Alternaria Solani) and Septoria leaf spot (S. Lycopersici) were destructive to field tomatoes in the Niagara Peninsula, Ont. While potato X virus has been identified as one of the components causing streak in tomatoes in mixed virus infections, this virus was found alone for the first time in Ont. in tomatoes, in which it caused an indistinct vein-banding.

Bacterial ring rot (Corynebacterium sepedonicum) of potato affected approximately half the commercial acreage in southern Alta. in 1942. Previously it was almost wholly confined to the large irrigated district centering on Lethbridge, but this year it was found at Brooks and Rosemary in the Eastern Irrigation District. Ring rot was observed for the first time in B.C. and was also present in certified stock in the other provinces except N.S. For the second year only a single case has been found in P.E.I. The disease apparently is being brought under control in certified seed in N.B., but continues to be prevalent in Que. due to a disregard of sanitary measures. The amount in certified seed in the other provinces is negligible. To curtail still further the possible contamination of healthy stocks of certified seed, the table stock of each grower is inspected as well and if bacterial ring rot is found in any field on his farm no seed stocks are certified from that farm. The amount of ring rot in table stock is not precisely known, but affected stock is believed to be a source of great danger in provinces where the disease is not established. For example, bacterial ring rot was found this year at Vancouver, B.C. in carload shipments from Alta., Sask., and Man.

Late blight (Phytophthora infestans) caused a noticeable reduction of yield in B.C. and N.B. due to an early-season attack, while it caused severe losses as a tuber rot in Man., in the Rainy River District and the eastern counties of Ont., with a somewhat lighter toll in western Que. and P.E.I.

No additional cases of wart (Synchytrium endobioticum) were found in N.S., although a careful survey of plantings of "English" potatoes was made. Leaf roll (virus) caused the rejection of more fields entered for certification than mosaic in most provinces. While it was less prevalent in N.B. than in 1941, there was a big increase in P.E.I. It was also destructive in Que., particularly in Nicolet Co.

Purple top (?virus) of potato was unusually prevalent in the Maritime Provinces in 1942, where it has been observed more or less frequently since 1939. D.J. MacLeod (P.D.S. 19:74) has given a description of the trouble as it occurs in N.B. Observers are emphatic that more and more plants become affected as the season advances. This condition seems to be especially common in Katahdin, on which it was first noted, while few plants of Green Mountain are affected. The possibility that purple top of potato may be due to the aster yellows virus, particularly the strain on carrots, is reviewed. (p. 61)

The Wisconsin leaf spot (Pseudomonas mellea) of tobacco was recognized for the first time in Canada when it occurred in epidemic form in Que. Mosaic of tobacco in Ont. and Que. is apparently due, in part, to the tobacco mosaic virus and, in part, to the cucumber mosaic virus. The latter appears to be more prevalent than the former in Que., where pipe and cigar-leaf tobacco is grown in comparatively small plots. Cucumber mosaic is spread by insects from overwintering perennial hosts. Rhizopus Oryzae caused some loss in flue-cured tobacco in Ont.

Fire blight (Erwinia amylovora) is quickly becoming established on apple in Alta., where it was reported for the first time in 1941.

Although perennial canker (Neofabraea perennans) is prevalent in the Okanagan valley, B.C., losses have been greatly reduced since the introduction of the woolly aphid parasite, Aphelinus mali. Scab (Venturia inaequalis) caused heavy losses in the interior of B.C., where it is usually of little importance and can be controlled by a relatively limited spray schedule. The disease was also unusually severe in southern Ont. due to continued rain. Elsewhere scab control presented no special difficulty. Bitter pit (non-parasitic) was general this year in N.B. and N.S. and affected up to 50% of the fruit on individual trees.

Isolations made by W. Jones indicate that most of the blossom and twig blight in cherry and plum in the coastal region of B.C. is due to Sclerotinia laxa, although S. fructicola occurs. A similar study is needed on fruit affected by brown rot. Brown rot caused considerable loss to the peach crop in southern Ont. as a result of the moist season. Bacterial blight (Xanthomonas pruni) was of considerable importance in peach orchards in Lincoln Co., Ont., particularly in those adjacent to Lake Ontario. Western X disease (virus) of peach has increased in the southern Okanagan, B.C., since the orchards were first surveyed in 1940. Affected trees are often difficult to detect. Although X disease (virus) was only found in the Niagara Peninsula, Ont. in 1941, the disease was probably present there several years earlier. Evidence has been collected that the chokecherry is not essential to the spread of X disease, but that it may spread directly from peach to peach over considerable distances. X disease has also been found severely affecting chokecherries near Brighton and Port Hope, many miles east of Toronto.

Shot hole (Cercospora circumcissa) was severe on plums and Sioux sandcherry at Brandon, Man.; although this fungus has not previously been reported in the Survey, it is represented in the Herbarium by specimens on P. virginiana from Gaspe, Que., and on P. serotina and P. virginiana from Ont.

Among the tree diseases mention may be made of: Labrella leaf spot (L. Coryli) on Corylus rostrata in B.C.; brown mould (Gonatorrhodiella Highlei) associated with Nectria canker on beech in N.B. and N.S.; canker and die back (Fusarium lateritium var. Mori) on mulberry from B.C.; leaf blight (Rhabdogloeum Pseudotsugae) associated with Rhabdocline on Douglas fir in B.C.

Interesting new records of diseases of ornamentals are: bacterial blight (Xanthomonas incanae) on stocks in greenhouses at Dundas and Toronto, Ont.; anthracnose (Sphaceloma Rosarum) on rose in B.C. and Man., previously listed on phanerogamic specimens from Que. and N.B. by Dr. Anna E. Jenkins; stem rot (Sclerotinia sclerotiorum) on tulip in B.C.; and rust (Endophyllum Sempervivi) on Sempervivum spp. near Grimsby, Ont., but reported previously from B.C.