New or Noteworthy Diseases

Stem rust (Puccinia graminis) reached the Prairie Provinces too late in the season to cause damage in 1951. However, race 15B of wheat stem rust was the predominant race in Man. and the escape from damage was not due to any resistance of the varieties to this race but merely to the arrival of the rust too late to cause any really heavy infection. The rusts overwintered poorly in the southern United States on account of severe winter weather. Their subsequent spread northward was delayed by an early-summer drought in the Dakotas, Minnesota and southern Man. Some stem rust developed in southern Alta., but this rust was caused by race 56, a common race in former years throughout the spring wheat area. Rye stem rust was fairly heavy on barley at Fredericton, N.B. and occurred on this cereal at several places in Eastern Canada. Although stem rust appears rarely to overwinter in Canada, an authenticated case of overwintering of rye stem rust on Agropyron repens was observed in the spring of 1951 at Winnipeg. Leaf rust (Puccinia triticina) became heavy on wheat late in the season in northwestern Man. and adjacent eastern Sask.; it was probably heavy in Eastern Canada. Of the other cereal rusts only oat stem rust was heavy in some localities in Eastern Canada.

There was little change in the smut situation in Canada in the last year. Examination of cereal seed samples in Western Canada clearly shows that smut is all too common especially in barley and oats, although most of the smuts could be controlled by careful seed treatment. Interest has been revived in the use of chemicals in the control of barley loose smut since it has been found that a long soak in a 0.2% solution of Spergon will frequently result in a clean crop.

The poor filling of the heads was the major disorder that affected and caused great damage to the wheat crop in a great area centering in Sask., but extending into both Alta. and Man. High temperatures accompanied in some areas by drought caught the crop at a critical stage of development, virtually killing the plants. The injury was frequently aggravated by common root rot and in some instances by injury from 2,4-D. Humid weather reduced the quality of the threshed grain. Because of inclement weather much of the crop was still uncut or unthreshed at the close of the season.

Evidence was secured at Winnipeg that false stripe of barley, which has been known at least since 1924 in Man. and has been recorded in several other Canadian provinces, is caused by a virus.

The possible occurrence of grey speck (manganese deficiency) of oats was recorded in Alta. for the first time. Other new records were: root necrosis (Gloeosporium bolleyi Sprague) on oats in the plots at Ottawa and leaf spot (Selenophoma donacis (Pass.) Sprague & Johnson var. stomaticola (Baeuml.) Sprague & Johnson) on Avena fatua in Sask.

Black stem (Ascochyta imperfecta) was unusually heavy on alfalfa in the Prairie Provinces, especially in seed-growing areas. Stem nematode (Ditylenchus dipsaci) was found in additional fields in southern Alta., but the infestation does not appear to be spreading in the fields and plots where it was found in 1950.

Crown bud rot, which was first recognised as a distinct disease in 1950 in southern Alta., was found to be quite prevalent; its etiology is still to be worked out. Anthracnose (Colletotrichum viciae Dearn. & Overh.) on hairy vetch at Kentville, N.S., was a new Canadian record.

The exceptionally wet season that prevailed over most of Canada except in B.C. was favourable for the development and spread of many fungous diseases. Notable was the occurrence of the rot of heads and necks of sunflower and safflower by Sclerotinia sclerotiorum. As the heads of sunflower are several feet above the ground it hardly seems possible that the heads could become regularly infected other than through the development of the apothecia from the sclerotia and the discharge of ascospores. The latter have been shown to play an important part in initiating infection by S. trifoliorum in England, but they generally appear to be unimportant in S. sclerotiorum.

Rust (Puccinia helianthi) was again very destructive to sunflowers in Man. Downy mildew (Plasmopara halstedii) is as yet a minor disease of sunflower in Man., but if the observations at Ste. Anne de la Pocatière, Que., are any criterion it could become very troublesome because of its long persistance in the soil. Of the diseases of soybean, in southwestern Ont., stem canker (Diaporthe phaseolorum var. batatis) is well established, brown stem (Cephalosporium gragatum) is widely distributed, and Pythium ultimum has been found causing a stem and root rot of soybean not previously observed. Rust (Melampsora lini) continues to be the important disease of flax in Man. and it was fairly abundant in Sask. Extremes of weather were unfavourable for the flax crop. Helminthosporium leaf spot (H. turcicum) was epidemic for the first time on corn in southwestern Ont. and was probably a part of the larger epidemic that developed in Indiana and other corn producing States south of the border.

A new pathogen of corn roots, first found on corn in southwestern Ont. in 1950 has recently been described by Cain as Phialophora radicicola. Other new records were: Bunt (Tilletia pallida G.W. Fischer) balls were found in a seed sample of Agrostis canina from P.E.I. The pathogen is quite distinct from T. decipiens, which is known in Canada on A. tenuis in N.S. A snow mould apparently caused by a species of Sclerotinia, at least unknown in Canada, was very destructive to many grass hosts at Prince George, B.C.

The status quo has been maintained in combatting bacterial ring rot (Corynebacterium sepedonicum) of potato. Vigilance and prompt eradication have been successful in B.C. and P.E.I. in keeping the number of ring rot cases to a few scattered fields. The provincial campaign in potato growing areas in Alta. has kept the infection at a level where losses are virtually nil and the introduction of disease-free seed of good quality has improved the industry. Least successful in the fight against ring rot is Que. where 22% of the fields entered for certification were rejected for ring rot.

Weather conditions were especially favourable for the development of late blight in most parts of Canada except B.C., and losses were heavy in the Maritime Provinces and some districts of Que. with lesser damage occurring in Ont., Man.,

and into northeastern Sask. Its absence from northern Alta. must have been due to the lack of initial inoculum. Late blight struck early and losses were almost entirely the result of reduced yields. In the Montreal district unsprayed fields were a total loss. In spite of the devastating epidemic, however, late blight could be controlled and an excellent crop harvested if the crops were kept protected. Equally significant is the fact that the average marketable yield of the plots sprayed with Bordeaux has been 40% greater than that of the unsprayed plots in the last seven years at Charlottetown, P. E. I.

A year like 1951 emphasizes the importance of the present program of breeding varieties of potato resistant to late blight and other diseases. However, it will be noticed that small amounts of late blight have been seen on the foliage of the blight-resistant varieties Canso, Keswick and Kennebec and it caused rot in the tubers at several places in Quebec and the Maritimes. Recently it has been demonstrated experimentally that there exists a race of Phytophthora infestans that is able to attack not only Green Mountain but also Canso and Keswick, previously immune to late blight infection. Late blight was also heavy on tomato at points in Eastern Canada. Moreover the organism on tomato appears to be a distinct race to which potato varieties such as Green Mountain are equally susceptible; however, the tomato is not fully susceptible to the potato races. Showing a similar distribution pattern to late blight, onion mildew (Peronospora destructor) was epidemic in e. Ont. and the Montreal district while it was almost absent in the B. C. Interior.

Further varietal trials in soils infested by wart (Synchytrium endobioticum) have shown that the mauve-blossom strain of Sebago is the only highly resistant variety so far being tested in Nfld. Other varieties that proved promising last year were only moderately resistant in the 1951 trials.

A survey of crops for Verticillium wilt carried out during the last two years in the B. C. Interior has revealed that the disease is widely distributed in the Okanagan, Thompson, and Upper Fraser Valleys. The disease was most prevalent in tomato and pepper, but was affecting potato, eggplant, cantaloupe, cucumber, squash, watermelon, and apricot. Severe damage, particularly to tomatoes, was correlated with continuous cropping. Wilt was also prevalent for the first time on strawberries in Ont.

New records of vegetable diseases were: Rust (Uromyces appendiculatus) on lima bean at Wainfleet, Ont.; leaf spot (Cercospora fabae Fautrey) on broad bean on Tancock Island, N. S.; brown spot (Cephalosporium apii Smith & Ramsay) on green pascal celery near Burlington, Ont.; white rot (Sclerotium cepivorum Berk.) on garlic at Steveston, B. C.; Aphanomyces cladogamus Drechsler as one of the fungi causing damping-off of pepper in a greenhouse at Harrow, Ont. Root rot of tomato caused by Colletotrichum atramentarium, long known as a weak parasite of potato in Canada, was found in a greenhouse near Leamington, Ont. Yellows (Fusarium oxysporum f. conglutinans) was severe on cabbage in the Montreal district although not previously observed in that area.

Fire blight (Erwinia amylovora) appeared to be more widespread on apple and pear in 1951 than in recent years. The disease has been kept at a low level in the B. C. Interior by winter pruning through regulations enforced by the provincial authorities. Nevertheless in the Creston Valley, pear production has declined despite increased planting, the decline being attributed to fire blight. Apple scab was moderately heavy to severe in parts of B. C. and from Ont. eastwards, but if the trees were carefully sprayed a clean crop was usually harvested. Leaf blotch (magnesium deficiency) was satisfactorily controlled for the first time in B. C. Little leaf and rosette (zinc deficiency), already known on apple, was diagnosed for the first time on pear, prune, peach and cherry in the Okanagan Valley, B. C. Much of the winter killing of apricot and peach in the Kootenays appears to be confined to trees weakened by Coryneum blight (Clasterosporium carpophilum). Sweet cherry is generally resistant to crown rot (Phytophthora cactorum), an important disease of apple, but a tree of the new variety Van was found infected at Summerland, B. C., a finding anticipated from previous inoculation trials. This new variety, which is just now coming into production in B. C., shows great promise because its fruit appear normal when the tree is affected by the little cherry virus. Careful surveys conducted during the past five years in cherry orchards in the Niagara Peninsula, Ont., reveal that a high percentage of the trees are affected with one or more of the virus diseases. Yellow rust (Phragmidium rubi-idaei), formerly rarely found in commercial plantings of raspberry, except in B. C., may now occasionally be seen causing damage in Ont.

Shoot rust (Chrysomyxa woronini) was found to be not uncommon at St. Anthony, Nfld., on both Picea glauca and P. mariana always in association with the telial witches' brooms on Ledum groenlandicum. Finding the rust on the latter host suggests that it may yet be found further south, especially in humid forest regions, than previous observations suggested. Anthracnose (Gnomonia veneta) was exceedingly prevalent this year on Platanus at Victoria, B. C., and along the Niagara River in Ont. The finding of rust (Puccinia coronata) on Rhamnus utilis at Morden, Man., added a new host for North America. Infection of willows by scab (Fusicladium saliciperdum) and blight (Physalospora miyabeana) and of poplar by leaf and twig blight (Fusicladium radiosum) was favoured by the wet season in the Maritimes. Dutch elm disease (Ceratostomella ulmi) continues to spread slowly in Ont., the worst infection to date being in Essex Co. New Canadian records were leaf spot (Cercoseptoria crataegi (Ell. & Ev.) Davis) on Crataegus and leaf spot (Gloeosporium serotinum Ell. & Ev.) on Prunus serotina, both in N. S.

Rust (Puccinia malvacearum) of hollyhock was exceptionally heavy in parts of eastern Canada. Grey mould (Botrytis cinerea) was heavy on several ornamentals in Que. as a result of the wet season. Powdery mildew (?Erysiphe cichoracearum) of begonia seems to be increasing in Ont. and Que. Bacterial Blight (Pseudomonas syringae) was severe on forsythia, mock orange and lilac in N. S. Leaf spot (Alternaria fasciculata Cke. & Ell.) of gladiolus was newly described from Ont. The field symptoms of gladiolus core rot (Sclerotinia draytoni) were conspicuous in Que., an unusual condition presumably associated with the wet season. It is increasingly evident that many gladiolus stocks are heavily infected with viruses. Decline (virus) continues to be the most serious disease of narcissus in B. C. Angular leaf spot (Septoria azaleae Vogl. ex Sacc. & Syd.) developed in a greenhouse in Ont. on azaleas imported a few months previously from Europe. Fire (Botrytis tulipae) was severe on tulips in several provinces. The use of sawdust mulch, for weed control, appeared to reduce its incidence markedly in B. C., but has several disadvantages.