New or Noteworthy Diseases

Stem rust (Puccinia graminis) was of almost no economic importance on wheat in the Prairie Provinces in 1943. The disease was rarely found in Man. and Sask. in the former "rust area", where virtually no wheat susceptible to stem rust is now grown. In Eastern Canada, stem rust appears to have been quite severe in some sections. The stem rust situation in oats was strinkingly different. The rust was more prevalent than usual throughout the Prairie Provinces, and it was fairly abundant in the East. In Man. not only fields of susceptible oat varieties became quite heavily infected, but heavily rusted spots appeared in fields of the now rust-resistant varieties. It was experimentally shown that these rusted areas were due to races heretofore of rare occurrence.

A notable observation among the leaf rusts, was the heavy aecial infection of crown rust (Puccinia coronata) on Rhamnus cathartica in Man. Fortunately the few bushes that do occur are located in towns and cities and are usually distant from oat fields. Although crown rust became fairly heavy on oats, the buckthorn bushes are so few that their presence probably had little bearing on rust development on the oats.

The prevalence of common root rot in Sask. in the years 1941 to 1943 is compared by calculating the mean disease rating for each season. The rating was low in 1942, when an excellent wheat crop was realized, moisture was abundant and soil temperature low. In the other two years, an average crop was harvested, drought conditions were present in large areas and soil temperatures were, at times, high. These values, unfortunately, are not directly comparable with those obtained in Man. (P.D.S. 21:2), where the prevalence of common root rot is expressed as a percentage reduction in yield for 1939, 1940 and 1941, but they do demonstrate the same seasonal variation.

Browning root rot (Pythium spp.) was recorded from all three Prairie Provinces. For the first time in many years, the disease was severe on wheat in the heavier soils of the Regina plains and of the Rosetown area in Sask. A severe outbreak was also recorded in one or two areas in Man.

The oat nematode (Heterodera avenae) caused little apparent damage in the infested areas in Ont., but, as Dr. A.D. Baker points out, conditions were, nevertheless, unusually favourable for the increase of the nematode, and severe injury may be expected in 1944 if the season, particularly the spring, is dry.

Black smut (Ustilago nigra) of barley was reported again from Man. and was found in Que. for the first time. Nearly 40% of the samples of loose smut obtained from widely separated parts of Que., when germinated by Dr. R.O. Lachance, proved to be U. nigra. While Lachance emphasizes that the finding is based on only one year's collections, it does confirm Tapke's observations and suggests that a considerable portion of the loose smut in Canada could be controlled by chemical seed treatment.

Two pathogens not previously reported on barley in Canada were Selenophoma Donacis var. stomaticola from Dodsland, Sask., and Septoria nodorum from Sperling, Man. A special survey of the diseases present on material from 26 uniform rust nurseries containing varieties of wheat, oats, and barley, scattered across Canada, was carried out at Winnipeg and the results are shown in tabular form. (c.f. p. 15)

Bacterial wilt (Corynebacterium insidiosum) has become a well-established and destructive disease on alfalfa in several parts of the dry interior of B.C. and in the irrigated areas of southern Alta. It was also found on unirrigated land in Alta in the Clover Bar district, east of Edmonton. Damage from winter-killing and crown rot was so severe in northern and north-central Alta. that 40% of the fields were destroyed or rendered worthless. In the northern sections, true winter-killing was chiefly responsible due to a light snow cover, while farther south, where the snowfall was higher, crown rot caused by a low-temperature basidiomycete was very active. Another low-temperature organism, which was recognized as a distinct pathogen in the root-rot complex of alfalfa and sweet clover in Alta. over 10 years ago has been described as a new species of Sclerotinia, S. sativa Drayton & Groves. It has also been encountered on tulips and narcissus.

Diseases of flax were in general not as destructive in 1943 as in the previous year. Browning (Polyspora Lini) infections were plentiful in Sask. in June, a condition that was not unexpected as the 1942 seed was known to be heavily infected. Little of the stem break stage appeared, due to the drier season, but there was some development of the browning stage just before harvest. The variety Royal appears to be as susceptible as Bison, but as yet, seed stocks of the former are not as heavily infected. Flax rust (Melampsora Lini) was again fairly severe in Sask. and Man., and in an occasional field of the rust resistant Royal a moderate infection occurred. Contrary to the general disease situation, seedling blight (Rhizoctonia Solani) was definitely more prevalent and caused considerable thinning of flax stands in Sask. and Man.

Special attention has been given to the diseases of several plants, the cultivation of which may yet be undertaken on a considerable scale. Worthy of mention are the discovery of Coleosporium dolicatulum on Euthamia in the goldenrod plots at Ottawa, Ont., the occurrence of Puccinia Hieracii across Canada and of yellows (Callistephus virus 1) in the Maritimes on Kok-saghyz, and the presence of Cercospora clavata, Uromyces Asclepiadis and a virus disease, tentatively referred to yellows (Callistephus virus 1), on milkweed in Ont. It has also been demonstrated experimentally that Puccinia Carthami, which causes a rust on safflower, is a brachy-form; the presence of pycnia were confirmed by observations at Winnipeg. Evidence was obtained that teliospores on the seed do cause infection on the young crop.

Of the diseases of soybean in southwestern Ont., first place was given to Fusarium blight (F. oxysporum f. tracheiphilum) followed by pod and stem blight (Diaporthe Phaseolorum var. Sojae), downy mildew (Peronospora manshurica), etc. Diseases now to Canada were the leaf spots (Phyllosticta

sojaecola, Cercospora sojina and Septoria Glycines). Blotch (Helminthosporium turcicum) on Sudan grass is another new record. While disease contributed to the reduction in yield and quality of sugar beets in southwestern Ont., this was the first season that Cercospora leaf spot (C. beticola) was not destructive. An interesting case of boron deficiency in sunflowers was recorded at Ottawa; down mildew (Plasmopara Halstedii) was unusually prevalent on the crop.

Among the vegetable diseases, a few observations have been chosen for comment. "Calapproved" bean seed from California gave crops free from bacterial blight (Xanthomonas phaseoli) and halo blight (Pseudomonas medicaginis var. phaseolicola) if the plantings were sufficiently isolated from diseased crops. Bacterial blight of carrot (Xanthomonas carotae) is now widespread in Canada, apparently through the use of seed carrying the pathogen. Yellows (Callistephus virus 1) is now reported in carrots from every province in Canada except Ont. It is suggested, however, that it may soon be found in the latter province, as purple top of potato was reported there for the first time this past season. Ansatospora macrospora (Osterw.) Newh. is reported as the cause of a serious storage crown rot of celery, under observation in New York State and Ont. for several years. Other diseases new to Canada are blight (Phoma Anethi) on dill in Ont., white rust (Cystopus candidus) on horseradish in Que., blight (Heterosporium Allii) on leek in B.C., and a leaf spot of spinach caused by an undescribed Cercospora in Que. The suggestion is made that Ramularia Pastinacae and Cercosporella Pastinacae are phases of the same fungus causing leaf spot on parsnip.

Bacterial ring rot (Corynebacterium sepedonicum) of potato continues to be prevalent in table stock in several Canadian provinces. Its apparent increase is in part due to the greater effort being made to discover its presence, but in the meantime its spread has not been altogether halted. An extended survey revealed the disease on more farms in southern Alta. than before, but the average number of diseased plants in the affected fields was less, probably as a result of regulations governing the source of seed. A survey in Man. showed that ring rot is an important factor in the poor quality of Manitoba-grown potatoes. In Ont., the survey was largely concentrated in the main areas and should effectively prevent its further spread among the principal growers. The situation in Que. and N.B. is not known with certainty. There was a slight decline in the number of fields entered for certification that showed ring rot.

Late blight (Phytophthora infestans) was unusually destructive in eastern Canada in 1943, and losses from tuber rot were considerable, except where unusual efforts were made to control the disease. It was epidemic for the third successive year in Man. and was found in Alta. for the first time, but it has not yet been reported from Sask. Late blight was also destructive to the late green tomato crop.

Leaf roll (virus) was also very prevalent, and, while the losses are less spectacular, its presence is one of the main difficulties in the production of certified potato seed.

Fire blight (Erwinia amylovora) caused considerable damage on apple in Alta., Man., Ont. and Que. and in young pear orchards in the Niagara Peninsula, Ont. Apple scab (Venturia inaequalis) was unusually severe throughout eastern Canada. Western X disease (virus) of peach again increased in prevalence in the southern Okanagan Valley, B.C., while X disease (virus) increased only slightly in Ont. What appears to be the European plum pocket (Taphrina Pruni) was found in B.C.; this may be the first authentic material of this fungus in Canada, most early records being referable to T. communis. A promising achievement of the Division of Horticulture, Central Experimental Farm, Ottawa, is the development of a black currant resistant to white pine blister rust (Cronartium ribicola) with fruit of good quality and high ascorbic acid content. An authentic record of yellow rust (Phragmidium Rubi-idaei) on cultivated raspberry was obtained from Ont. Late yellow rust (Pucciniastrum americanum) was serious on Viking raspberry in N.B., up to 30% of the fruit being unsaleable in some plantings. Canker (Godronia Cassandrae) caused serious killing of blueberry bushes in B.C.; previously reported from Que.

Leaf spots of maple, due to Cylindrosporium pennsylvanicum, Phyllosticta minima, P. minutissima, and Phleospora Aceris, were common in eastern Canada; the last is a new report for Canada, and P. minutissima is new to eastern Canada. Several interesting reports were made on Viburnum: Phyllosticta ? punctata in Man., Plasmopara Viburni in Ont., Puccinia Linkii on V. trilobum in N.S. (previously known only on V. pauciflorum) and Ramularia Viburni in Ont. Attention is drawn to the evident identity of Labrella Coryli, reported from B.C. (P.D.S. 22:vi, 92), with Gloeosporium Coryli known from eastern Canada.

Among the diseases of ornamentals may be mentioned: Downy mildew (Basidiophora entospora) heavy on Aster at Ottawa, Ont.; aster yellows (virus) severe on Callistephus and other hosts in eastern Canada; rust (Coleosporium Campanulae) destructive at Ottawa on Campanula rapunculoides; leaf spot and stem blight (Ascochyta ?clematidina) on Clematis spp. in Man. and Ont.; leaf spot (Phyllosticta Digitalis) on Digitalis spp. at Ottawa, Ont., a new record; rust (Pucciniastrum sp. on Epilobium and Clarkia at Ottawa, Ont.; smut (Entyloma Compositarum on Gaillardia at Ottawa, Ont., first record for eastern Canada; leaf spot (Pseudomonas gardeniae) on Gardenia in Ont., new record; spotted wilt (virus) severe on Lachenalia, etc. at Montreal, Que.; anthracnose (Glomerella cingulata) severe on sweet pea, London, Ont.; downy mildew (Plasmopara viticola heavy on Parthenocissus (not previously reported in Canada) and Vitis in Ont. and Que.; blister rust (Cronartium ribicola) on Ribes, found for the first time in Man.; leaf spot (Ramularia lactea) on pansy in B.C., new record. In last year's report (P.D.S. 22:vi, 86, 90), Cercospora circumcissa was reported on Prunus spp. including P. virginiana and P. serotina. Dr. Chupp (in litt.) has pointed out that the Cercospora on Prunus serotina is Cercospora graphioides Ell., which is distinct from C. circumscissa on the other species of Prunus.