New or Noteworthy Diseases

Stem rust of wheat was destructive, not only in Manitoba and eastern Saskatchewan, but also in the Maritime provinces and Quebec. It appeared in southern Saskatchewan on June 21, two weeks earlier than normal, and in Manitoba on June 22, a week before the usual date. As the result of frequent heavy spore showers and favourable weather conditions, a severe epidemic developed in Manitoba. While susceptible wheat varieties were materially reduced in both yield and grade by rust, fortunately only about 14% of the wheat acreage in that province was sown to susceptible varieties. Rust development was limited to slight traces on the rust resistant varieties, Renown and Thatcher. Stem rust spread throughout Saskatchewan and far into Alberta, but severe rust damage was confined to eastern Saskatchewan. It caused moderate damage to a few late fields in western Saskatchewan, and eastern Alberta. Severity of infection ranged from 30-100% at the time of examination in over half the fields in Nova Scotia, Prince Edward Island, and New Brunswick, and it is estimated that in most fields it eventually caused moderate to severe damage. However, the rust-resistant varieties now being extensively tested in these provinces were clean or showed only traces of rust. Rust damage was apparently severe in Quebec and slight to moderate in Ontario, but this conclusion is based on a strictly limited number of observations.

Leaf rust of wheat was unusually prevalent in western Canada in 1938. It was epidemic in most sections of Manitoba and of eastern Saskatchewan. Of all the commercial wheat varieties, Thatcher was the most severely attacked. Renown was also rusted, but less severely, while the old standard varieties, Marquis, Reward, and Ceres, bore infections intermediate between those of Thatcher and Renown. Yields of all varieties were considerably reduced by this rust. Controlled experiments at the Dominion Laboratory of Plant Pathology, Winnipeg, demonstrated that yields and grades of Thatcher and Renown were reduced by leaf rust and in the case of Thatcher the reduction in yield was quite pronounced. It is conservatively estimated that leaf rust, in some localities, reduced the yield of early-sown Thatcher by about 25% and in late-sown fields the reduction in yield amounted to 35% or more. Leaf rust was prevalent from Quebec eastward on Huron and other varieties commonly grown in these provinces.

Stem rust of oats was mildly epidemic in Manitoba and eastern Saskatchewan this year. In addition, stem rust would appear to have been locally destructive in Ontario and Quebec, but no information is available to indicate whether these outbreaks

centre about plantings of barberry, or are due to wind-borne inoculum from a distance. In the Maritime provinces stem rust seldom exceeded a trace. At a few points, badly rusted spots were seen, but the infection was even less than last year. Barberries are definitely known to occur in some of these centres.

Crown rust was prevalent in eastern Saskatchewan and Manitoba. It was also prevalent through most of Eastern Canada, although it was not as destructive as in 1937. Further evidence was obtained that buckthorn plantings are responsible for severe outbreaks of crown rust. Moreover, crown rust apparently possesses greater powers of spreading than stem rust, so that a few bushes strategically located may be responsible for an epidemic over a relatively large area.

The prevalence of wheat bunt (Tilletia caries and T. laevis) in Western Canada remains unchanged at about 3 smutty cars per 1,000. However, out of 309 cars of winter wheat from Alberta, 69 cars or 22.3% graded smutty. Bunt was also reported to be heavy in winter wheat from Armstrong, B.C. The oat smuts (Ustilago Avenae and U. Kolleri) continue to be prevalent across Canada. In the Maritime provinces this year 25% of the fields examined showed 5% or more of smut.

Head blight of cereals is evidently a minor disease in Canada. However some of the fungi isolated from disease heads are worthy of mention. Botrytis cinerea was isolated from blighted heads of oats from Nova Scotia, and New Brunswick. As far as we are aware this is the first report of a Botrytis on oats. Fusarium graminearum was isolated from head blight samples of wheat collected in the Maritimes. While this species is reported as common in some countries, it has been rarely encountered in Canada. The common head blight pathogens in this country are F. Poae, F. avenaceum and F. culmorum. Head blight in barley is usually caused by Fusarium spp. (usually the three just mentioned) and Helminthosporium sativum.

Ergot (Claviceps purpurea) was suddenly a problem in wild rice (Zizania aquatica) in northern Manitoba, where the crop was of considerable commercial value this year, due to a crop failure in Minnesota. The sclerotia have been collected previously in Ontario, New Brunswick, and Nova Scotia.

Our present knowledge of certain leaf spots and stem blights of alfalfa, common clover, and sweet clover in Canada is briefly summarized. Stemphylium leaf spot (Stemphylium sarcinaeforme) was

found on red clover at Macdonald College, Que. This is the first record for Canada, although it is reported as common in the State of New York.

Late blight (Phytophthora infestans) was epidemic over most of Eastern Canada. In New Brunswick a loss of 50% of the crop from rot was not uncommon, while in Prince Edward Island, early killing of the tops in a crop, which was planted late due to wet weather in the spring, resulted in a marked reduction in the yield of marketable tubers. Bacterial wilt and rot (Phytomonas sepedonica (Spieckerm. & Kotth.) Magrou) was destructive in Quebec and was found in a larger number of fields in New Brunswick. In addition it was observed for the first time in Alta., Sask., Man., Ont., and P.E.I., where it was detected in one or a few fields. The smear method has proved extremely useful in detecting the organism in tubers suspected of harbouring the disease, and it is anticipated that its use will accelerate the elimination of diseased stocks.

Phyllid Yellows was epidemic in Alta. and Sask., although the damage was not great except near psyllid-infested greenhouses about Calgary and other urban centres, where it has been known since 1932. The epidemic was severe in several of the States to the south.

Purple Top is another somewhat similar disease occurring in the Prairie provinces. While it is widely distributed, the damage has seldom exceeded a trace in Canada. The recent work of Leach at Minnesota, suggests that it may be Aster Yellows, but the trouble has not been transmitted through the tubers. Further studies are necessary to determine whether or not the disease can be induced only by viruliferous leafhoppers.

Vegetable diseases worthy of mention are: Leaf blight (Macrosporium Carotae) of carrot was found in Nova Scotia for the first time. Bacterial blight (Phytomonas Carotae Kendr.) previously unreported in Canada, has been observed at Brandon, Man., in 1935 and again this year at Brandon and near Winnipeg. Bacterial blight (Phytomonas Phaseoli)was estimated to have caused a loss of $50,000 in the bean crop grown in the irrigated areas of southern Alberta. Blight (Phomopsis vexans) was destructive to egg-plant in the Niagara peninsula, Ont. Black root (Aphanomyces Raphani Kendr.) is a new Canadian disease of redish found at Macdonald College, Que. Downy mildew (Peronospora Spinaciae) was unusually destructive this year at Vancouver, B.C., and in the Niagara peninsula, Ont. Anthracnose (Colletotrichum phomoides) a not uncommon disease of imported tomatoes, was epidemic and greatly reduced the quantity of marketable fruit in Essex and Kent counties, Ont.

Downy mildew or blue mould (Peronospora tabanica Adam) was reported in Canada for the first time, when it was found in eight seed beds and four fields in the Old Tobacco Belt in Essex and Kent counties, Ont.

The fruit disease situation has changed but little in the past year. While fire blight has been locally destructive in most parts of the Dominion, it has never been reported from Alberta or in the famous commercial orchards of the Annapolis valley, N.S. This year what appears to be this disease caused some damage to nursery stock in the latter province. Drought spot or corky core (boron deficiency) is no longer a problem in orchards receiving soil treatments with boric acid in B.C. Moreover, applications made in 1936 are still 100% effective in 1938. A survey of the cherry orchards in the Okanagan valley, B.C., revealed a small amount of crinkle, which is apparently a genetic abnormality. Coryneum blight (C. Beijerinckii) was reported on peach in Leamington district, Ont., which is the first report of its occurrence in eastern Canada.

The needle rust (Chrysomyxa Weirii) reported on Picea rubra at St. Martins, N.B., appears to be a new tree rust for eastern Canada.

Several new diseases of ornamentals or important extensions of range or host were recorded in 1938, as follows: Bacterial leaf spot (Phytomonas Woodsi (E.F. Sm.) Bergey et al.) was fairly destructive to greenhouse carnations in Ont.; a new record. Yellows (Fusarium spp., Elegans section) is an important disease of gladiolus, which has been known in P.E.I. since 1933; it was reported in Manitoba and Saskatchewan in 1937 and in Ontario this year. Fusarium corm rot (F. oxysporum var. Gladioli Massey), a disease of gladiolus new to Canada, was found at Winnipeg, Man., in 1938. Botrytis rhizome rot (Sclerotinia convoluta) was observed at Summerland, B.C.; a previous record was from Ottawa, Ont., in 1927. Powdery mildew (Microsphaera Alni) was found on privet in Ontario and Prince Edward Island; a new host. Bacterial blight (Phytomonas papavericola Bryan & McWhort.) was recorded at Salmon Arm, B.C., on Mecanopsis Baileyi; if the determination is correct this is a new host for the organism and a new disease for Canada. Phytopthora cactorum caused a blossom blight of tulip at Belleville, Ont., and dark berry of Cotoneaster horizontalis on Vancouver island, B.C.; its occurrence on pears at Kentville, N.S., was recorded in 1919 (H.T. Güssow. Agric. Gaz. Can. 6:951-952. 1919). Crown rot (Phytomonas Delphinii) was reported on a new host, Aconitum, at Brandon, Man. Hollyhock rust (Puccinia Malvacearum) on Althaea

rosea at Edmonton, Alta.; the rust is now known from every province in Canada, except Saskatchewan. A root rot caused by Diplodia radicicola Tassi was reported on Aristolachia Sipho from Ontario. Rust (Puccinia Cyani) on Centaurea Cyanus is now known from British Columbia and Nova Scotia as well as Ontario. Foliar nematode (Aphelenchoides ritzema-bosi Schwarz) was found on chrysanthemums in a greenhouse at London, Ont.; it is apparently a new record for Canada.

The Weather and Its Influence on Plant Disease

Crops suffered little winter injury due to the mild winter in British Columbia. Spring work was completed early and the moisture supply was adequate. Prolonged dry weather during the summer hastened the maturity of the crops.

Small fruits matured so rapidly during the hot dry weather in July that it was difficult to handle them on the market. The shipment of over-ripe strawberries from Coastal points resulted in heavy losses due to breakdown, upon arrival at their Prairie destination.

Diseases such as rust and downy mildew were quite prevalent, but the damage was less than in 1937. On the whole diseases did not seriously reduce the yield during the present growing season. (W. Jones)

In most parts of Alberta the crop went into the ground under more favorable conditions than in 1937, although seeding was somewhat delayed in the south by wet weather and in the north by lack of soil moisture, with consequent soil drifting in some areas. This reversal of the normal moisture relations continued during June and there was a general deterioration of the crops in the central and northern sections. Early in July heavy rains fell over most of the province from Edmonton south, but almost entirely missed the northern districts. Only light showers were received throughout the season in the Athabasca and Peace River districts, with the result that crops were very light and in many cases not worth harvesting. All the cultivated sections of the south received abundant rainfall, which was excessive at some points, including Pincher Creek and Cardston. Harvesting of the generally heavy, late maturing crop was completed under ideal conditions, since severe killing frosts did not come until early October. Heavy hail damage occurred in many sections of the province. Stem rust was usually abundant, but its spread was delayed by cool weather in early August and most of the crop escaped damage. Foliage diseases were