New or Noteworthy Diseases

Stem rust of wheat was of little importance in Canada in 1939. For the first time in at least a decade it caused only minor losses in Manitoba. One of the factors contributing to reduced rust infection was the limited amount of inoculum available to infect susceptible varieties. In Manitoba, 77% of the wheat acreage was sown to the new rust-resistant varieties, Thatcher and Renown; about 18% to durum wheats, chiefly Mindum; and the remaining 5% to Marquis, Ceres, Reward, and other susceptible varieties. Large acreages of varieties resistant to stem rust were also sown in the spring wheat region of the United States and eastern Saskatchewan. Moreover stem rust was much less prevalent than normal in the winter wheat areas in the United States and thus there was little primary inoculum reaching the spring wheat areas. Further, weather conditions during July and August retarded rust development. Rust infection was likewise limited in Eastern Canada. The growing of Coronation, and other rust-resistant varieties is increasing and while the weather was more favourable for rust development particularly in the Maritime Provinces, the prevailing drought throughout the States along the border greatly reduced the initial inoculum in Canada.

Stem rust of oats was generally very light throughout Canada. Some rust damage occurred in a few late fields of susceptible varieties in the West. In general, stem rust was light in the East, except in the Eastern Townships of Quebec, where considerable rust was recorded at harvest time. Elsewhere, severe outbreaks were limited and most of them were definitely connected with plantings of barberries in close proximity to the infected fields.

Crown rust of oats was also light throughout Canada, due to unfavourable weather conditions for its development. Nevertheless, considerable crown rust developed in certain areas, and while every case has not been investigated, outbreaks have been found repeatedly centering about plantings of buckthorns.

There was no appreciable change in the amount of wheat bunt (Tilletia caries and T. laevis) in Western Canada, the percentage of cars grading smutty being 0.26%. The oat smuts (Ustilago Avenae and U. Kolleri) were again present in considerable amounts across Canada. The average percentage was: Alberta and Saskatchewan, less than 1%; Manitoba, 4.4%; Ontario, 1.3%; Quebec, 2.7%; New Brunswick, 3.1%; Nova Scotia, 2.3%; and Prince Edward Island, 7.5%. The figure for the latter province was higher than usual. In general, covered smut is more common in oats than loose smut. Loose smut of barley and wheat occurred only in small amounts. However, certain of the newer barley varieties showed regularly rather high percentages.

Damage from common root rot (Helminthosporium sativum and Fusarium spp.) was the subject of special study in Manitoba. Fields selected at random in each of the major agricultural soil zones was systematically sampled. The plants from each field were divided into 4 classes, viz.: (1) healthy; (2) slightly root-rotted; (3) moderately root-rotted; and (4) severely root-rotted. The ... plants in each class was counted, each class was threshed separately ... obtained. It was found that on the average 21.9% of

the plants were diseased with an average loss in yield of 7.5%. The loss in yield was particularly striking in the plants classified as slightly affected.

Browning root rot (Pythium spp.) was prevalent in a number of districts in Alberta. This fact suggests that the disease is on the increase in that province. Browning root rot was of considerable importance in Saskatchewan, but it was only observed in a few fields in Manitoba.

Head blight was observed in slight amounts in wheat and barley in Quebec and the Maritime Provinces, while its occurrence was also reported in oats in Quebec. The disease may in reality be much more important than these records indicate, for these field surveys have to be carried out before the greater part of the crop is approaching maturity. Nevertheless, isolations from diseased material collected on such surveys do indicate what pathogens are operating. In wheat, species of Fusarium, particularly F. graminearum, the imperfect stage of Gibberella Saubinetii, were most frequently isolated from diseased spikelets. In barley, Fusarium Poae was the leading fungus, but Helminthosporium sativum was also important. In oats, Fusarium avenaceum was most frequently isolated from affected spikelets; in fact, it was recorded from all collections.

Head discoloration is often conspicuous in wheat varieties in many parts of Canada. While Alternaria, Cladosporium, and other more or less saprophytic fungi are frequently isolated, Septoria nodorum, the cause of glume blotch, was most common in material from Quebec and the Maritime Provinces.

Kernel smudge is a common defect of durum wheat in some seasons in Western Canada. In 1938, 25.4% of the cars of Amber Durum had kernel smudge marked against them, while in 1939 only 0.3% were so affected. The trouble was largely confined to the Red River Valley, Manitoba.

Yellow leaf blotch (Pyrenophora Tritici-repentis (Helminthosporium Tritici-repentis) appeared in epidemic proportions over most of the wheat-growing area in Manitoba. It was also recorded from Saskatchewan and Quebec. A rather complete account of our present knowledge of the disease appears on pp. 12-14 of the report.

Speckled leaf blotch (Leptosphaeria avenaria (Septoria Avenae) and leaf blotch (Helminthosporium Avenae) are both well recognized diseases of oats in Canada, but in the summer of 1939 both were found occurring simultaneously in many fields in Quebec. Leaf blotch is characterized by narrow stripes usually much narrower than long with parallel sides. Soon after the spots become necrotic the conidiophores of the fungus can be found. In speckled leaf blotch, the individual spots are broadly ellipsoid, on which the darker pycnidia may often be seen. As soon as these symptoms were clearly recognized, the two diseases could be assessed without difficulty in the field. They occurred in widely varying proportions. Field observations were supplemented by examination of a representative series of collections in the laboratory, from which it was learned that speckled leaf blotch also occurred in eastern Ontario and the Maritime Provinces.

Prairie Provinces, being particularly prevalent in Manitoba and northern Saskatchewan. Dr. Hagborg reported that only a portion of the fields in Manitoba showed a distinct chlorotic halo about the lesion, but all collections yielded typical P. coronafaciens. Its distribution in the East is not known.

Bacterial wilt (Phytomonas insidiosa) of alfalfa was found to be a destructive disease in the irrigated districts of southern Alberta. The disease appears to have been introduced rather recently and it is feared it may become a serious problem. Grimm, almost the only variety grown in Alberta, is also one of the most susceptible. The disease has already been reported from British Columbia. A new root rot of sweet clover caused by Phytophthora Cactorum was also discovered in Alberta.

A trouble of mangel, which has been known for several years in N.B., was shown to be of virus nature and was tentatively identified as curly top. A second condition in N.B., provisionally called fern leaf was thought to be of virus nature, but it was not successfully transmitted by sap inoculation.

Crested wheat grass was found affected by smut for the first time in Canada, when it was detected in a sample of seed from Spruce Home, Sask. The smut was identified as Ustilago Hordei.

Among the diseases of vegetables, the bacterial blights of beans, particularly halo blight (Phytomonas medicaginis var. phaseolicola), have caused great concern. Bacterial blight was reported from Alberta eastward, while halo blight was abundant in British Columbia and was reported from Alberta and Manitoba. According to Mr. D. Simpson, it was present in a sample of 1938 seed from Kitchener, Ont. The seed is often badly affected. Aster yellows in carrots appears to be definitely on the increase; some severe infections were reported this year in New Brunswick and Nova Scotia. Anthracnose (Marssonina Panattoniana), a new disease of lettuce for Manitoba, was severe at Brandon and about Winnipeg.

Late blight (Phytophthora infestans) of potato was less important than usual over large sections of the country, which fact is in marked contrast to the severe epidemic of 1938.

Bacterial ring rot (Phytomonas sepedonica) continues to be a very serious disease of potato. It was located in 12 townships in the irrigated districts of Alberta, and it was found for the first time in Eastern Ontario, although the number of cases in Ontario was small. The situation in Quebec remained unchanged, but the disease was located in over double the number of fields in N.B. than last year. Several new cases were found in P.E.I. and it was reported for the first time in N.S., where one field was found affected. Bacterial ring rot has not yet been discovered in B.C.

Psyllid yellows and a possibly associated net necrosis were rather severe at some points in southern Alberta this year, but they were far less general than last. Severe losses, however, were occasioned this year by planting seed lots affected by net necrosis. It was shown experimentally that

a seed lot might give poor germination even where only a few tubers were visibly affected. Curly top (virus) was believed to have affected scattered potato plants in the Okanagan valley, B.C. The disease has been known on tomatoes and some other plants for a long time, but it has not been previously recorded on potato. In a separate section of the report are recorded the viruses that have been isolated by Mr. D.J. MacLeod from various potato varieties being grown in Canada.

Tobacco streak, which was found for the first time in 1938, was observed this year in both Ontario and Quebec. Downy mildew or blue mould appeared for the second consecutive year and apparently overwintered for it appeared first on seedbeds where it was present in 1938. Phytophthora Rot (P. Cactorum) occurred on the fruit of tomato in several greenhouses in Ontario; it was also observed in 1935, but not reported to the Survey. Phoma rot (P. destructiva) was reported for the first time as a destructive rot in a field in Ontario. A Typhula rot, which has been known for several years in pit-stored turnips in B.C., has been ascribed to a new species, T. umbrina.

Possibly the most significant development in the fruit disease situation is the discovery of several new diseases of cherries and plums. Some of these are of a virus nature, others appear to be physiological, and several remain to be investigated. Some interesting evidence is presented on the fluctuation of peach yellows and little peach with the rise and fall of the vector population.

No new diseases of particular interest were reported on trees or ornamentals.

The Weather and Its Influence on Plant Disease

In the Coastal regions of British Columbia, winter damage to fruit trees, strawberry plants, and berry canes was negligible. In May, however, late frosts did considerable damage to the strawberry blossoms in the Fraser Valley areas and to the current season canes of loganberries and blackberries in some plantings on Vancouver Island. The months of March and April were comparatively dry but precipitation for May, June, and July was well above the average.

Seeding was completed in good time and the yield of fodder crops, grains, and vegetables was better in most districts than in 1938. The strawberry crop was damaged by rain in June, reducing both quality and yield. This was the only major crop adversely affected to a marked degree by the weather.

Fungus diseases on the foliage of field and fruit crops were more general than in 1938, but damage was not unusually great. The season was favourable for the spread of the downy mildew of the hops in summer, but this disease was checked during the dry weather later in the season and excellent crops were harvested. Late blight of potatoes was general in the crops of the Fraser Valley towards the end of the season where no spraying was done although precipitation was considerably less than in 1938.