Notes on Cereal and Grass Viruses in 1959

J.T. Slykhuis

Barley yellow dwarf virus (BYDV) was transmitted by aphids from overwintered winter wheat, winter rye, timothy, brome grass, perennial ryegrass, red fescue, Kentucky bluegrass and intermediate wheatgrass at Ottawa, thereby demonstrating that winter reservoirs of the virus are common in the area.

The bird cherry oat aphid (Rhopalosiphum padi L.), an efficient vector of common strains of the virus, passed the winter in the egg stage on cherry trees. By late April it appeared that this aphid species could become abundant and important in spreading BYDV from perennial grasses to young spring grains, but coccinelid beetles become abundant on the cherry trees and the aphids disappeared in early May before spring grains emerged. They were not found again until mid-June and were scarce until August and thus did not appear important in the spread of BYDV, The English grain aphid, (Macrosiphum avenae (Fab.)) was observed in spring oats as early as May 14, before it was found in perennial grasses. The first BYDV infections in spring grains were associated with this aphid and were scattered in patches over the entire field rather than occurring at the edges. It appears that the vector had settled on the fields after prolonged flight and did not come from local sources,

BYDV spread to a limited extent in the Ottawa area during June and July. By mid-July 1 to 5 per cent of the plants in most fields showed yellow dwarf symptoms, but the diseased plants occurred principally in small patches. In these patches the yields were reduced as much as 42 per cent below the yields of the surrounding healthy areas.

BYDV was also isolated from barley leaves sent to Ottawa by Dr, H. A.H. Wallace from Winnipeg. It is also believed to be the cause of a high incidence of chlorotic leaf symptoms on barley and oats, samples of which were sent to Ottawa from Fort William. There was a high incidence of the disease on some oat crops near Montreal, and it was identified on oats at Fredericton, New Brunswick.

Agropyron mosaic virus (AMV), which occurs on Agropyron repens in most areas in southeastern Ontario, spread slowly to immature wheat in experimental plots during the summer of 1959, By early September all plants in a 1/4-acre plot of Cornell winter wheat, sown in late May, were infected with the virus. Although the spread of the virus appears to be associated with eriophyid mites, none of the 3 species of mites usually present with the virus has been proved to be a vector.

Symptoms like wheat striate mosaic were found on a timothy plant collected in October, 1958, The painted leafhopper (Endria inimica Say), which is a vector of the wheat striate mosaic virus, is common in the Ottawa area each summer, and transmission tests were made with this insect. In one such test, Kent wheat plants on which E. inimica fed after feeding for one week on the diseased timothy, developed symptoms resembling mild striate mosaic. Similar

symptoms were also observed in August, 1959 on spring-sown Cornell winter wheat that remained vegetative all summer and fall. Further experiments are needed to verify the presence of wheat striate mosaic in southeastern Ontario,

Virus-like symptoms, including severe rolling and stiffening of leaves, chlorotic streaks and blotches, and stunting developed on young Kent wheat plants that were infested with Brachycolus frequens, an aphid that often occurs on Agropyron in southeastern Ontario. After affected plants were sprayed repeatedly with Malathion to kill the aphids, they appeared to recover completely and grow normally, but the non-sprayed plants eventually died. It appears that the symptoms associated with these aphids are not caused by a virus but by toxic effects of aphid feeding.

Cereal Smuts in Western Canada - 1959

W. Popp

Loose smut of wheat was relatively scarce in Manitoba in 1959 (Table 3). Infection consisted of a maximum of 2 per cent in Lee wheat, less than 1 per cent in durum varieties, and none in Selkirk. Selkirk occupied over 83 per cent of the crop acreage.

Eighty-three per cent of the barley fields examined in Manitoba were found to be smut infected, There was an average of 1.5 per cent in the crop as a whole. As compared to 1958, there was a decline of loose smut and an increase of covered smut, This coincides with a change in the relative prevalence of Montcalm and Parkland barley. Montcalm is affected mainly by loose smut whereas Parkland is prone to infection by covered smut.

Practically no smut, either loose or covered, was found in oats.

All major classes of wheat inspected in 1959 by the Western Inspections Branch of the Board of Grain Commissioners were relatively free from bunt (Table 4). This is rather unusual for Alberta Red Winter wheat. The amount of bunt found in the 1958 crop is shown in Table 5.