PYTHIUM ROOT ROT OF WHEAT IN SASKATCHEWAN[1]

T. C, Vanterpool[2]

Browning root rot of wheat (Pythium spp.), after a virtual absence of about 20 years, has again appeared in Saskatchewan and was a cause of some concern in June, 1962, on the crop following summerfallow (4). The trouble was most generally present and conspicuous in the south of the province, particularly on the heavy soils.

The disease shows up as large brown areas in the fields because of the yellowing and browning of the outer two to four leaves, brought about by root-infecting fungi, Affected roots are brown at their tips. With the onset of warm weather and good growing conditions the crop often shows striking recovery, In 1962, shortly following the onset of browning root-rot systems, many fields became heavily infected with Drechslera tritici-repentis (Died,) Shoem,, the yellow leaf spot fungus, which appeared to be favoured by the slightly moribund condition of the yellowed outer leaves,

Browning root-rot was one of the major root diseases of wheat in the twenties and early thirities. It was shown (1, 2) to be caused primarily by several species of Pythium in soil low in available phosphorus and low in organic matter. Its virtual disappearance (4) was attributed to the general use of mineral phosphatic fertilizers and the incorporation of the wheat straw in the soil following the advent of the combine method of harvesting and the practice of trash fallow in place of bare fallow. In addition, the wheat varieties now commonly grown are slightly more resistant to the disease than was Marquis. Grain yields are reduced by one to several bushels per acre arid maturity is slightly delayed.

The last outbreak of browning root rot of any consequence was during the last World War when there was a shortage of fertilizer distributor attachments and a consequent reduction in the use of phosphatic fertilizers (4). Its reappearance in moderate amounts in 1962 is attributed to a decrease in the use of fertilizer during the last few years by many farmers who considered the further outlay of money to be a luxury or, at least, not a necessity when they could not dispose of their wheat stocks because of reduced sales and the quota system. However, with the prospect of increased wheat sales to foreign countries there was an increase in the acreage sown to wheat in 1962, An increased demand for phosphate fertilizer followed and a shortage of this product resulted. In addition, the exceptionally dry summer of 1061 kept the mineralization of organic matter, including phosphorus, at a level below the minimum requirements for the crop, There is also evidence that a dry period in May, such as prevailed in 1962, followed by good June rains favored the onset of the disease, At this time also, a lawn

[1]Financial assistance for survey for this work was given by the Saskatchewan Agricultural Research Foundation.

[2]Professor of Biology, University of Saskatchewan, Saskatoon, Saskatchewan.

of Merion bluegrass (Poa pratensis L.) at Saskatoon was found to be severely damaged by Pythiurn arrhenomanes Drechsl,, one of the most virulent species of Pythium attacking wheat, The return to the normal use of phosphatic fertilizers on wheat should again reduce browning root rot to negligible proportions,

Literature Cited

1. VANTERPOOL, T.C. and J.H.L. TRUSCOTT. 1932, Studies on browning root rot of cereals, II. Some parasitic species of Pythium and their relation to the disease. Canad, J. Res, 6: 68-93,
2. VANTERPOOL, T.C. 1935, Studies on browning root rot of cereals. III. Phosphorus-nitrogen relations of infected fields. IV, Effects of fertilizer amendments, V. Preliminary plant analyses. Canad, J, Res., C. 13: 220-250,
3. VANTERPOOL, T.C. 1940, Present knowledge of browning root rot of wheat with special reference to its control. Sci. Agric. 20: 735-749.
4. VANTERPOOL, T.C. 1952, The phenomenal decline in browning root rot (Pythium spp.) on the Canadian Prairies, Sci. Agric. 32: 443-452,

BIOLOGY DEPARTMENT,
UNIVERSITY OF SASKATCHEWAN,
SASKATOON, SASK,