WHEAT STREAK MOSAIC VIRUS IN CORN IN ONTARIO

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During a survey in southwestern Ontario in August 1965, mosaic symptoms were observed on several corn (Zea mays L.) plants in each of several fields in Essex and Kent counties. At one location in Essex County, the incidence of plants with mosaic symptoms in two fields varied from 5% to more than 10%. Although some plants had only mild mosaic symptoms and were not stunted, others had pronounced yellowish streaks or chlorotic dots and dashes interspersed with oval to elliptical chlorotic rings on the leaves (Fig. 1) and were moderately stunted.

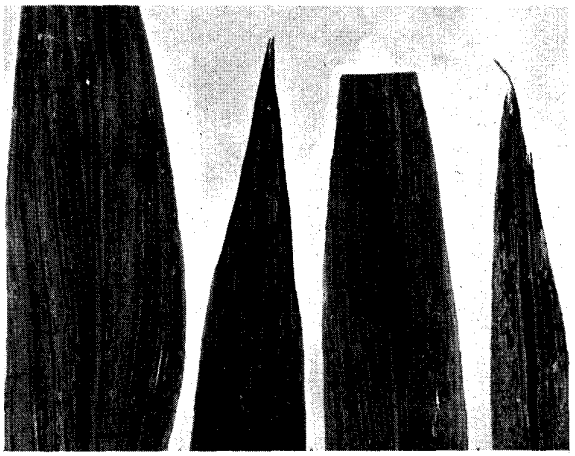

Figure 1. Symptoms caused by wheat streak mosaic virus on corn from Essex County, Ontario.

A virus was transmitted manually from mosaic-diseased corn plants to corn (inbred HY, Single Cross CH159 x CH3, and 'North Star' sweet corn) as well as to 'Kent' wheat. In tube precipitin and precipitin ring tests, the virus reacted positively with an antiserum prepared against wheat streak mosaic virus (WSMV) from Alberta. It was also transmitted by Aceria tulipae (K.) the vector of WSMV. The same virus was isolated from Setaria viridis (L.) Beauv. and Echinochloa crus-galli L. from the same corn fields. Although several species of perennial grasses in and around these corn fields were also tested, the virus was not detected in any. According to the farmer, the corn fields concerned had been planted near winter wheat. Probably the wheat harbored WSMV over the winter and served as the source of infection in the corn planted nearby.

Since red striping of pericarp of corn was widespread in southwestern Ontario in 1964 (1, 5) observations and tests were made to determine if the presence of WSMV was correlated with the presence of this condition. WSMV was isolated from immature kernels with red striped pericarp as well as from leaves of plants with mosaic symptoms. However, WSMV was also isolated from immature kernels without red striped pericarp from plants with mosaic symptoms on leaves. Red striped pericarp occurred in corn in many locations where WSMV was not found and on plants from which WSMV could not be isolated. Therefore, there was no indication that WSMV was a cause of the red striped pericarp.

WSMV, which is common on wheat in Alberta, was not detected on wheat in Ontario until 1964 (4), but was again found on several plants in Middlesex County in 1965. Although WSMV has been found in corn in Idaho (2) and Nebraska (3) and probably also in Ohio (6), this is the first record of its occurrence in corn in the field in Canada.

Agropyron mosaic virus (AMV) was suspected to be a cause of mild mosaic symptoms on corn and wild annual grasses closely associated with diseased Agropyron repens L. Although AMV was isolated from the A. repens and from Setaria glauca (L.) Beauv., a mild strain of WSMV but no AMV was isolated from the corn.

Wheat spot mosaic virus (WSpMV), which occurs associated with WSMV in Alberta and is transmitted by A. tulipae, the vector of WSMV, was readily transmitted to a number of inbred lines of corn. Although WSpMV has not been recognized in southwestern Ontario, it should not be ignored as a possible cause of leaf spotting of corn in areas where WSMV occurs.

Literature cited

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