INCIDENCE OF WHEAT SPINDLE STREAK MOSAIC IN ESSEX, KENT, AND LAMBTON COUNTIES, ONTARIO. 1969-72

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Abstract

The annual incidence of wheat spindle streak mosaic virus in winter wheat in 1969–72 averaged usually between 30% and 51% infected shoots in Essex and Kent counties and between 22% and 37% in Lambton County. Overall annual yield losses were 3–5% in Essex and Kent and 2–4% in Lambton, based on previous disease incidence - yield loss data. Disease incidence was often higher around field entrances and near roadsides and farm paths, suggesting that slow spread of the disease is occurring.

Wheat spindle streak mosaic of winter wheat is caused by a soil-borne virus. In the spring, spindle-shaped dashes and short streaks develop on new leaves as plant growth resumes. The streaks change from light green to bright yellow and develop necrotic centers as the leaf matures. The disease occurs in all areas of southern Ontario where winter wheat is grown frequently (3); in 1967–68 it attracted particular attention in Essex and Kent counties because the streaks and necrosis ceused an overall brownish discoloration in many fields. The averaqc percentage of shoots with symptoms in Essex and Kent counties in those two seasons was 49.6%, and this was estimated to cause an overall loss in grain yield of 5% in each season (1). In surveys in southern Ontario in 1969, Slykhuis and Polak (4) estimated the mean percentage of diseased plants as 38%, and James (2) as 33%. The results of annual surveys in Essex, Kent, and Lambton counties in 1969–72 are presented here.

Table 1. Incidence of wheat spindle streak mosaic in Essex, Kent and Lambton Counties in 1969–1972

County	Year	Number of fields examined	Number of fields with: NO disease	Trace of disease (none in counts)[a]	Up to 50% diseased plants	51–99% diseased plants	All plants infected	Average infection for all fields (%)
Essex	1969	40	7	4	10	5	14	50.7
	1970	30	5	9	11	3	2	22.7
	1971	57	3	7	31	10	6	30.1
	1972	60	5	12	15	17	11	43.4
Kent	1969	22	3	2	8	7	2	42.5
	1970	19	3	3	9	1	3	23.2
	1971	40	4	7	14	7	8	38.5
	1972	52	12	6	15	14	5	35.2
Lambton	1969	22	6	3	7	6	0	21.9
	1970	22	16	1	5	0	0	1.3
	1971	22	4	4	8	6	0	24.9
	1972	25	3	4	8	9	1	37.2

[a] Disease observed in field, butnotoccurring within random sample lengths.

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Disease surveys

Fields were selected at random, usually by examining every 5th–8th wheat field encountered. In each field, counts were made

on enough 1-yard (91 cm) or 1-foot (30 cm) lengths of row to arrive at a consistent estimate of the proportion of infected shoots.

In 1969, 1971, and 1972 disease incidence averaged between 30% and 51% infected shoots in Essex and Kent counties, and between 22% and 37% in Lambton County (Table 1). Estimates of the disease were lower in 1970, especially in Lambton County. In each season, symptoms were brightest in April and early May, fading when temperatures rose in late May and early June, as described by Slykhuis (3). In 1970 especially, rapid growth occurred in May, and symptoms were mainly confined to the lower parts of the plants. This may have been responsible in part for the lower counts, especially in Lambton County. Except in fields close to Lake Erie, only occasional fields showed the overall discoloration that occurred so widely in 1967 and 1968.

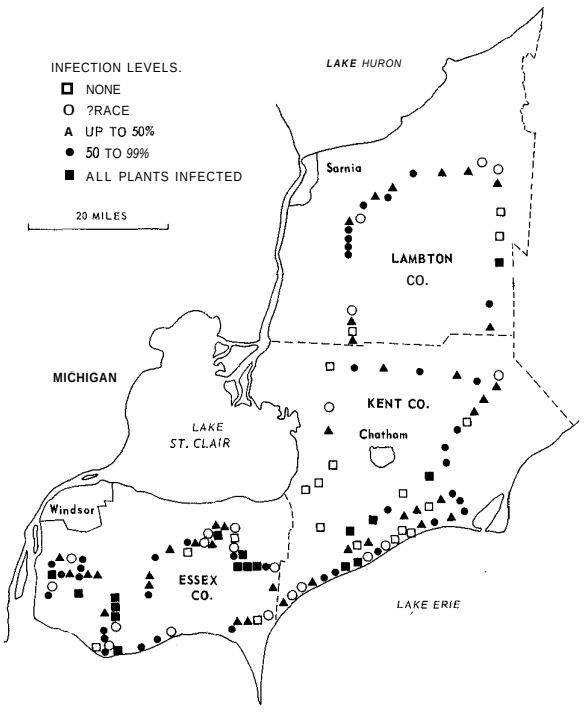

Figure 1. Wheat spindle streak mosaic survey, 1972.

In 1967 and 1968, infection of all plants in a field was estimated to cause a yield loss of 10% (1). The general levels of infection in 1969-72 indicate overall yield losses in each year of 3-5% in Essex and Kent counties and 2-4% in Lambton County. Because disease symptoms were less persistent in 1969-72 than in 1967 and 1968, these figures may be on the high side. A 4% loss would represent about 2 bushels per acre (135 kg/ha) on 130,000 acres (52,650 ha) in each year.

Disease estimates for 1967-72 reveal no tendency for the disease to increase, and fields with no disease or only a trace of infection occur in all areas together with heavily infected fields (Fig. 1). Yet the disease incidence was often noted to be higher around field entrances and near roadsides and farm paths, suggesting that slow spread is occurring, possibly either by traffic and farm machinery, or along water drainage channels.

Literature Cited

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4. Slylchuis, J. T., and Z. Polak, 1969. Verification of wheat spindle streak mosaic virus as a cause of mosaic of wheat in Ontario. Can. Plant Dis. Surv. 49:108-111.