SURVEY FOR SOUTHERN LEAF BLIGHT OF CORN IN QUEBEC IN 1971

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Abstract

Helminthosporium maydis was identified for the first time in Quebec on August 5, 1971, in Iberville County. By harvest time southern leaf blight was widespread throughout the corn growing area of Quebec, but the distribution pattern was uneven, and severe leaf symptoms developed in only a few fields in September and early October. Cob infection was not found and little or no reduction in yield was expected.

Introduction

Southern leaf blight of corn attributed to race T of Helminthosporium maydis Nisikado was reported in Ontario in 1970, with significant infections in fields in the Ottawa Valley in mid-September to mid-October (Gates et al. 1971). A one-day survey from Macdonald College to the Deschambault Experimental Station in mid-September, 1970, revealed miscellaneous lesions (including frost damage) on corn leaves in the limited part of Quebec traversed, but H. maydis was not found (unpublished).

In 1971 a systematic survey was made of the main corn area of Quebec. With the advice of Dr. R. I. Brawn, formerly of the Department of Agronomy, and with the help of Agronomes of the Quebec Department of Agriculture and Colonization, staff at CDA Research Stations, seed merchants, and coopexating farmers, locations were chosen where fields were sown with hybrids with Texas male-sterile (T) cytoplasm. Some of the fields were sown with mixtures containing approximately 50% normal (N) cytoplasm seed.

Methods

Twenty-four "stations" were located by August 12 (although station 22 was first visited September 16). The stations, consisting of farms on which one or more fields of corn were grown, were revisited at approximately 2-week intervals. In addition to the regular stations, 33 other farms were visited, most of them only once, to check on patterns of southern leaf blight in other areas. Surveys were terminated October 17.

Samples were collected wherever leaf lesions were found and were incubated in moist chambers. Disease intensity and distribution were estimated and recorded in the field, but all diagnoses were based on the results of microscopic examination of incubated tissues. only a few samples were surface-sterilized and plated. It is quite probable that some lesions were not identified because of the failure of the pathogen to sporulate on them.

Observations and discussion

The first positive identification of H. maydis in Quebec was from a single lesion on one leaf of 'Dekalb 007' collected August 5 at station 5 in Iberville county. There were several hybrids and a corn variety test plot on this farm. On August 11, H. maydis was identified on leaves collected in Deux Montagnes Co., from a variety purchased at a premium price as N cytoplasm seed.

When station 5 was revisited August 16, about 2% of the plants had one lesion on the bottom leaf. At a second station in Iberville Co. on the same date about 5% of the plants had 10 to 12 spots per leaf on all five leaves below the cob, and 1 or 2 spots on the first leaf above the cob on scattered plants. No lesions were found on the first visit there August 5.

Traces to 2% of the plants had up to 5 spots on one or two lower leaves on the second visit to fields in Iberville, Napierville, and Chateauguay counties August 17 to 26, although no lesions were found earlier. The first lesions in the Plant Pathology plots at Macdonald College (Jacques Cartier Co.) were collected August 20.

On August 27, two field in Deux Montagnes Co. had scattered lesions on the leaves below the cob, and 1 or 2 lesions on the cob leaf on 5% to 20% of the plants. In one field 75% of the plants had about 20 lesions on the bottom leaf, and from 1 to 3 lesions on all leaves above the cob. The kernels were in the "blister" stage.

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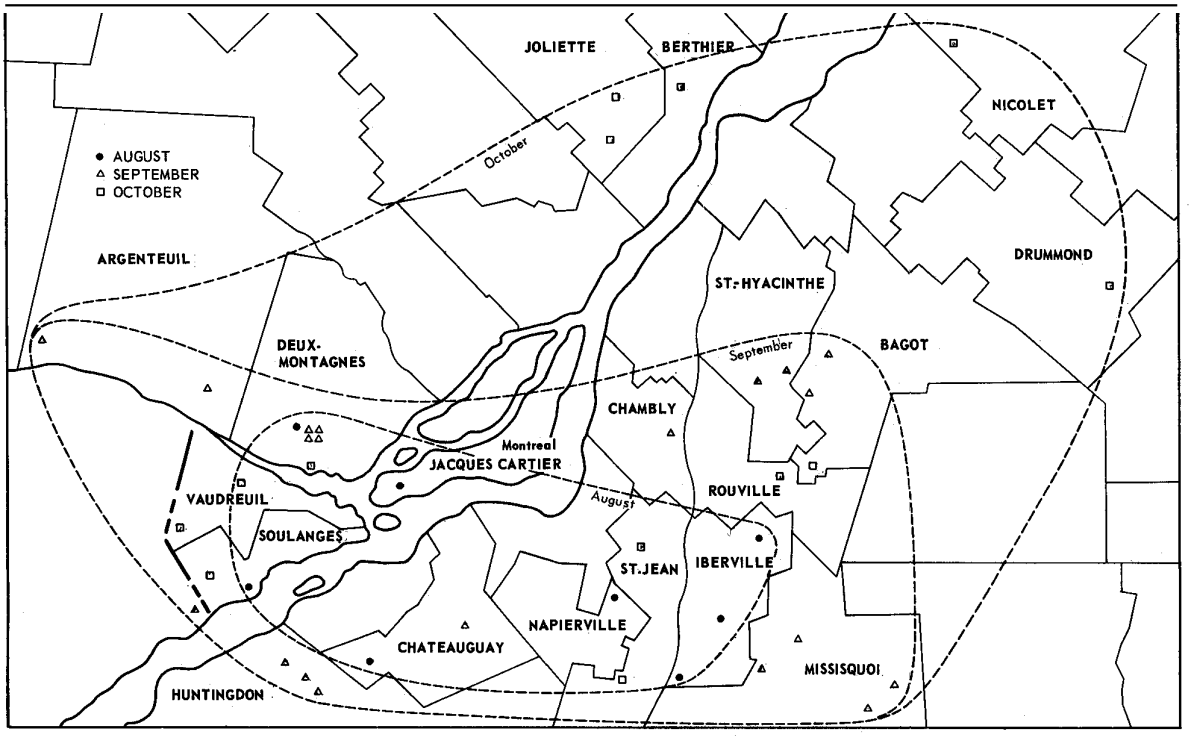

Figure 1. Distribution of southern leaf blight of corn in Quebec, August 1 – October 15, 1971. Blight was also detected in Pontiac Country (not shown) September 4.

In Vandreuil Co. at station 10, where corn had been grown for 6 or 7 years in varidus fields, about 3%of the plants had one or two lesions on lower leaves, August 31.

On September 11, a few lesions were found on about 5% of the plants in a field in Huntingdon Co. In a nearby field there were many lesions on the lower leaves and 3 to 10 lesions on the cob leaves of 75% of the plants. The kernels were in the dent stage. On the same date a few plants in a field in Bagot Co. had up to 10 spots per bottom leaf; and about 65% of the plants in a field in Mississquoi Co. had lesions on the lower leaves. A few spots were found in a field in Pontiac Co., September 4. About 50% of the plants had numerous spots on the cob leaf in a field in Argenteuil Co., September 16.

Light infections of southern leaf blight were found just before harvest (October 14-16) in fields in Berthier, Joliette, Nicolet, and Drummond counties.

The disease was widespread in the entire corn area by harvest time. However the distribution pattern was erratic. Some fields of T cytoplasm corn remained relatively or entirely free of southern leaf blight throughout the season, although infection appeared early and developed rapidly in other fields in the same area. For example, blight appeared August 20 and developed rapidly on plants in one experiment in the Plant Pathology plots at Macdonald College, but it was not identified in a nearby plot or in differential varieties until October 20. In the College farm fields the disease was not seem until early October.

Although the disease developed rapidly, damage is believed to have been negligible, at worst. At Station 2, Iberville Co., blight severity increased from 4 to 5 spots per bottom leaf on 1% of the plants, August 17, to 10 spots on the cob leaf on 75% of the plants, September 9. However infection reached this severity in only a few fields even by early October. Plants were in mid to late silk August 17, and kernels were beginning to dent by September 9.

In four fields in late September and early October, lesions were observed on the husks, but not on the cobs themselves.

The most significant finding of the survey is that southern leaf blight was present and widespread in Quebec by the end of the season. Presumably there will be some overwintering of the fungus, to provide inoculum early in the season in 1972. Development of the disease in 1972 will depend largely on weather conditions. If they are favorable to the pathogen (high temperatures and high humidity), the disease could start earlier and develop faster than in 1971 and might induce some loss of yield in susceptible T cytoplasm corn. Seed of N cytoplasm corn should be in fairly good

supply in 1972, and growers who can obtain it at reasonable prices might be well advised to do so. All growers are advised to cultivate their fields thoroughly to cover any diseased corn debris as well as possible before the new crop emerges.

Acknowledgments

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Literature cited

Gates, L. F., C. D. McKeen, C. G. Mortimore, J. C. Sutton, and A. T. Bolton 1971. Southern leaf blight of corn in Ontario in 1970. Can. Plant Dis. Surv. 51:32-37.