

# Cercospora leaf spot and powdery mildew of fenugreek, a potential new crop in Canada

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Two diseases, *Cercospora* leaf spot and powdery mildew, were observed on the foliage of research plots of fenugreek (*Trigonella foenum-graecum*) in 1983. The leaf spot, caused by the fungus *Cercospora traversiana*, resulted in serious defoliation and also affected the stems and pods. It appears that *Cercospora* leaf spot possesses the potential to be a serious constraint to the production of fenugreek in Canada. Powdery mildew was not serious.

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Deux maladies, la rayure nervale et le blanc, ont été observées sur le feuillage du fenugrec (*Trigonella foenum-graecum*) croissant sur des parcelles de recherche en 1983. La rayure nervale, causée par le champignon *Cercospora traversiana*, provoque une défoliation importante et affecte aussi la tige et les gousses. Il semble que la rayure nervale puisse gêner sérieusement la production du fenugrec au Canada. Le blanc, quant à lui, ne fait pas de dommage sérieux.

## Introduction

Fenugreek (*Trigonella foenum-graecum* L.) is a crop that is used in several ways. Some of its uses are as a spice, a tea, a vegetable, a forage, in the making of dyes and as a starter material in the production of steroidal hormones, such as cortisone.

Within the Research Branch of Agriculture Canada the evaluation of new crops for their agronomic potential in Canada is centered at the Research Station, Morden, Manitoba. Fenugreek has been evaluated at this station and other locations in the prairie provinces during the past five years. The primary objective has been to determine if the crop is able to mature and produce an acceptable yield of seed. Part of this evaluation has involved the identification of potentially serious diseases.

In late August, 1983, a foliar disease was observed which within two weeks had caused severe defoliation, plus stem and pod infection. A second disease of lesser importance also was observed on the foliage. In this paper a description and illustration of disease symptoms and causal organisms are reported.

## Cercospora Leaf Spot

**Symptoms** — The disease was uniformly distributed throughout a plot grown for seed increase. On individual plants only the upper few leaves remained, giving the appearance of tufts of green scattered throughout the plot (Fig. 1). On older leaves lesion size had increased significantly and sporulation was evident, sometimes giving the lesion a whitish cast. The necrotic areas were sharply defined and most lesions were surrounded by a yellowish halo (Fig. 2). Stem and pod infection also were severe (Fig. 3). Infected areas of the pod were discolored and severely infected areas were shrunken or twisted

(Fig. 4). Infection of some plants was so severe that even the youngest leaves wilted and died.

**Conidial Measurements** — Measurements of 40 conidia, collected from leaf lesions, were made in distilled water to which a small amount of lactophenol containing cotton blue was added. The conidia varied in length from 48.1  $\mu\text{m}$  — 162.8  $\mu\text{m}$  with a mean of 95.4  $\mu\text{m}$ . Conidial morphology is illustrated in Fig. 5. The conidia appear similar to the description by Chupp (1) for *Cercospora traversiana* Sacc. (Syns. = *Cercospora trigonellae* Maublanc, and *Cercospora traversiana* var. *trigonellae coeruleae* Savul. & Sandu-Ville), on fenugreek. They were acicular to almost cylindrical, straight to curved, indistinctly multiseptate, base truncate, tip subacute to subobtuse.

**Pathogenicity** — Fenugreek seedlings in the 4-5 leaf stage were inoculated with a distilled water suspension of *C. traversiana* conidia. The conidial inoculum was obtained from pure cultures of fungus grown on V-8 juice agar. The inoculated plants were covered with polybags for 48 hr, after which the bags were removed and the plants were returned to the greenhouse. Lesions appeared approximately 12 days after inoculation. This pathogen possesses such a high degree of virulence that a single lesion is sufficient to kill a leaflet (Fig. 6). Conidia resembling those used to inoculate the seedlings were isolated from lesions on the inoculated plants.

**Discussion of Cercospora Leaf Spot** — In 1959, Leppik (2) reported that *C. traversiana*, causing leaf spot of fenugreek had reached several Eastern European countries and South America from the Near East and India. The disease was reported to affect the leaves, stems, young pods and seedlings, damaging the plants before they ripen. In 1972, Voros and Nagy (4), reported on a new destructive pathogen of fenugreek, *Cercospora traversiana*. If fenugreek is to become a viable crop in Canada knowledge about the destructiveness and control of this disease is required. Yield in 1983 was estimated to be only 20 percent that of the previous year.

## Powdery Mildew

A second disease, powdery mildew, was observed on fenugreek leaves, but was present only at an inconspicuous level

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(Fig. 7). The low severity of this disease may have been due to its late occurrence in the growing season.

Results of examination of the conidia from leaf lesions suggest that the pathogen was *Erysiphe polygoni* (Fig. 8). Prior to 1961 (3) *E. polygoni* was not reported on fenugreek. Since 1968 there have been three reports of *E. polygoni* on fenugreek. Based on this year's observations powdery mildew would not seem to be a serious problem.

#### Literature cited

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