Occurrence of soybean foliage diseases in eastern Ontario, 1979

P.K. Basu

Four foliage diseases of soybean *(Glycine rnax)*, namely bacterial blight *(Pseudomonas ylycinea)*, brown spot *(Septoria glycines)*, downy mildew (*Peronospora rnanshurica)*, and powdery mildew (*Microsphaera diffusa*) were noted in field plots at Ottawa and growers' fields (76 ha) near Winchester, Ontario. Implications of the potential importance of these diseases are discussed.

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On a constaté la presence de quatre maladies foliaires du soja *(Glycine max)*, soit la brûlure bacterienne *(Pseudomonas glycinea)* la tache brune (*Septoria glycines)*, le mildiou *(Peronospora manshurica)* et le blanc *(Microsphaera diffusa*) dans certaines parcelles d'essai a Ottawa et champs de producteurs (76 ha) pres de Winchester (Ontario). Les implications de l'importance de ces maladies sont discutees

Introduction

At the Ottawa Research Station a breeding program is underway to develop soybean *[Glycine max* L. (Merril)] cultivars adapted to short-season areas such as eastern Ontario where the crop is gradually expanding. Since knowledge about diseases of soybeans in this area is meagre (4), a survey of the breeding plots at Ottawa and of several growers' fields in the Winchester, Ontario area was carried out in 1979. The results are reported here.

Methods

Each experimental plot consisted of four 5 m rows, 25 cm apart. Five plants, equally spaced from each other, were selected from the two middle rows. Growers' fields were sampled by following a W-pattern or a diagonal path (2). A sample of 50 plants was obtained from each field by collecting five plants from each of 10 sites on the sampling path. Plants in each sample were examined for foliage disease symptoms (1, 6, 7) and for presence of pathogens by using appropriate culture methods (3). The percentage of plants affected by each disease was determined and an estimate of disease severity on individual plants was made using a soybean leaf diagram indicating percent necrotic area (unpublished).

Results and discussion

In the regional soybean trial at Ottawa, plots containing 20 cultivars and lines were affected by two diseases, bacterial blight *(Pseudomonas glycinea* Coerper) and powdery mildew *(Microsphaera diffusa* Cke. Pk.). Bacterial blight was present at a low level (avg. <0.1%) necrotic area on leaves) in all plots throughout the growing season (May to September) while powdery mildew developed on only a few plants late in the season (August 31).

In the Winchester area, surveyed in early September, three foliage diseases: bacterial blight, brown spot *(Septoria glycines* Hemmi, Trans. Sapporo) and downy mildew *[Peronospora manshurica* (Naoum) Syd. ex Gaum] were found in seven soybean fields (76 ha). In two 20-ha fields of cv. Maple Arrow, 44% and 14% of the plants were affected by bacterial blight and downy mildew, respectively, (with an avg. 0.1% necrotic area on leaves). In two 10-ha fields of cv. Evans brown spot was present on all plants; and about 2% to 5% of the leaf area per plant was necrotic. A few bacterial blight lesions were detected also on some of these plants, but the predominance of brown spot made it too difficult to rate for bacterial blight. It was noted that none of the fields of Maple Arrow was as severely affected by brown spot as those of cv. Evans. The cause for such a difference in disease incidence remains to be determined since cultivar reactions to different diseases are not fully known

The results of this survey suggest that diseases like bacterial blight and brown spot could become epiphytotic and be a potential threat to soybean production in eastern Ontario, if favorable conditions, such as cool, wet weather with frequent rain storms occur during the growing season, as reported in other studies (5, 6, 7). The sporadic occurrence of downy and powdery mildews does not appear to be a serious problem at the present time; however, reactions of more than one or two diseases on soybean cultivars warrant further investigation in order to develop suitable resistant lines or other control measures.

[1] *Ottawa Research Station, Research Branch, Agriculture Canada, Ottawa, Ontario K1A 0C6*

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