BACTERIAL BLIGHT IN REGISTERED FIELD BEAN CROPS IN SOUTHWESTERN ONTARIO, 1963

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During the summer of 1963 twenty fields of registered beans were inspected. Each field was inspected three times during the first week of July, August and September respectively. All the fields examined were located in southwestern Ontario, the principal bean-growing region of Canada. The purpose of the three inspections was to observe and compare the incidence and development of bacterial blight in bean fields grown from seed from three foundation seed sources. Of the 20 fields, 7 fields were grown from foundation seed imported from Michigan 8 fields were grown from foundation seed produced at the Ridgetown Agricultural School, Ontario; and 5 fields were seeded with the growers' own 1962 foundation seed. The number of fields inspected of each of the varieties was: Michelite '62, 2; Michelite, 3; Sanilac, 10; Seaway, 4 and Saginaw 1.

The first inspection was made to determine the prevalence of seed-borne infection in the bean crop at the seedling stage and to distinguish, if possible, the symptoms of halo blight (Pseudomonas phaseolicola) from both common blight (Xanthomonas phaseoli) and fuscous blight (Xanthomonas phaseoli var fuscans). At this time, the bean plants either were just emerging or at a very early stage of development. No recognizable symptoms of the bacterial blights were observed.

During the second inspection the 7 fields grown from Michigan seed showed no visible symptoms of infection by any of the bacterial-blight pathogens. These fields included 2 each of Michelite '62, Sanilac and Seaway and 1 of Saginaw. Of eight fields seeded with Ridgetown seed, 1 of 3 fields of Michelite and 3 of 5 fields of Sanilac showed a trace of blight infection. In 5 fields sown with the growers' own 1962 foundation seed, a trace of blight was found in 2 of 3 fields of Sanilac while no infection was observed in 2 fields of Seaway. The seed-borne nature of the blight infections was apparent by the production of discrete loci of infection in scattered areas of the fields. On the basis of symptomatology all the infections were considered to be caused by the fuscous and common blight pathogens. Laboratory examination of infected leaves from many fields revealed the presence of X. phaseoli var fuscans but not X. phaseoli. No halo blight symptoms were observed.

The third inspection was made in September to the spread of infection in the fields before the crop had fully matured. In this survey pod infection was the criterion for disease diagnosis. Only those fields in which infection had previously been noted were found to have a trace of pod infection.

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In marked contrast to the extensive spread of blights observed in this area in 1961 and 1962 the incidence of blights in the fields inspected was notably slight.

Rainfall during June, July and August in the area was but 50 to 60 per cent of that for the same three months of 1961 and 1962. This fact undoubtably affected the development and spread of the blight pathogens which require conditions of high humidity for multiplication and rainfall for their distribution through the field. Temperatures for the region in 1963 were normal, as they were in 1961 and 1962 when bacterial blight was epidemic in the area. Although 1963 was a poor year for the comparison of blight development, field examination indicated that imported Michigan seed produced blight-free crops. As mentioned above, some fields produced from other sources were infected. Laboratory examination of samples of the growers' own foundation seed indicated that 2 samples of Sanilac and 1 sample of Seaway were infected with the fuscous blight pathogen. Under conditions of low rainfall and normal temperatures only 1 field of Sanilac grown from seed known to be infected showed visible symptoms of infection. Breeder seed from Michigan is produced under rigid inspection in the blight-free arid areas of Idaho. This seed is then grown 1 year in northern Michigan and inspected at regular intervals by a plant pathologist. Only seed from disease-free fields is marketed as foundation seed. Ridgetown breeder's seed and the growers' own foundation seed is produced in the blight-infected area of southwestern Ontario. As a consequence, a trace of blight in either breeder or foundation seed can increase in subsequent generations of registered seed to a serious level unless the number of generations from foundation seed is limited.

While examining the 20 fields other diseases were noted. Six fields showed a trace of bean rust, Uromyces phaseoli var typica; 3 fields of Sanilac, 2 fields of Seaway and 1 field of Saginaw. The field of Saginaw was also severely attacked by Sclerotinia wilt. The habit of growth of this variety, particularly in shaded areas where high humidity prevails, tends to promote infection by Sclerotinia sclerotiorum. Two fields of Michelite were moderately infected with the soil-borne root rot pathogen Fusarium solani f. phaseoli.

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