IDENTITY, TAXONOMY AND SEED-BORNE ASPECTS OF THE GRAY LEAF SPOT ORGANISM ON BLUE LUPIN

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C O N T E N T S

F I G U R E S

P L A T E S

TABLES

A C K N O W L E D G E M E N T S

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I N T R O D U C T I O N

While conducting studies in the Manawatu on the brown spot disease of blue lupins[1/] caused by *Pleiochaeta setosa* (Kirchn.) Hughes, Milne (1964) frequently encountered a *Stemphylium* disease characterised by necrotic lesions on leaves, stems and pods. A disease caused by a species of this genus had not previously been reported on blue lupins in New Zealand, but in the United States of America Wells, Forbes, Webb and Edwardson (1956) described two previously unrecognised diseases on this host, namely "little leaf spot" caused by *Stemphylium botryosum* Wallroth and "gray leaf spot" caused by *S. solani* Weber. Milne considered his isolates to be *S. botryosum* but was confused by the symptoms being typical of those recorded for *S. solani* (gray leaf spot). He did not pursue the matter further and at the completion of his studies on *P. setosa* there remained the unresolved question of the identity of the *Stemphylium* species present on blue lupin in the Manawatu.

The anomally revealed by Milne (1964) was explained in a later publication by Wells, Forbes and Edwardson (1961a) in which they reported the discovery of a virulent strain of the little leaf spot organism (*S. botryosum*) that caused gray leaf spot symptoms identical to those induced by *S. solani*. It seemed probable therefore that

1/ *Lupinus angustifolius* L.

Milne had in fact isolated virulent strains of S. botryosum from diseased blue lupins. In the present study the identity of the species causing gray leaf spot is established and consideration given to field identification of the disease.

The second part of this work concerns taxonomy of the genus Stemphylium. Until recently the accepted concept of Stemphylium was based on a compromise proposal put forward by Wiltshire in 1938. This was necessary, if not strictly correct, due to the original concept of Stemphylium being misinterpreted soon after the genus was erected in 1833 and a different group of fungi thereafter being commonly attributed to Stemphylium. However in a recent paper Simmons (1967) restored the original concept by proposing that the other group be transferred to another genus, namely Ulocladium Preuss. This makes it possible for the first time in over 100 years to consider the genus Stemphylium strictly within the limits of the original concept laid down by Wallroth.

The final part of the study is concerned with the seed-borne nature of the gray leaf spot disease of blue lupins in New Zealand. The presence of necrotic lesions on developing pods and seeds, together with a report that the pathogen is seed-borne (Milne 1964) suggested that both seed yield and seed performance may be affected. Further, if viable inoculum of the pathogen is associated with harvested seed from blue lupin crops, this could be of significance in the establishment of primary infection foci when such seed is used for further cropping.

These three areas of study can be summarised as follows:

I the pathogen - its identity, and field identification of the disease it causes;

II taxonomy of Stemphylium - the tenability of present species, and an evaluation of species delimitation in this genus;

III significance of the pathogen in blue lupin seed crops - its effect on seed yields and seed performance, its presence in seed lines and the significance of this in the establishment of primary infection foci.