EPIDEMIOLOGICAL STUDIES OF CERCOSPORA LEAF SPOT IN FABA BEANS

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INTRODUCTION

Cercospora leaf spot (Cercospora zonata) is a common fungal disease of faba beans in southern Australia. In recent years the disease has increased in prevalence and severity in commercial crops, raising concern within industry. We have reported preliminary studies of resistance in the host (1) but the epidemiology of this disease is not well understood. Field trials were conducted in 2005 and 2006 to examine a) pathogen survival and distribution in soil and b) the influence of climatic factors on lesion expansion and spatial and temporal development of the disease.

MATERIALS AND METHODS

Field trials conducted in 2005 and 2006 were incorporated into a dedicated disease nursery site at Turretfield Research Centre, SA, as part of the Australian Faba Bean Breeding Program.

Each trial consisted of 54 plots, separated by buffer plots, according to the design in Figure 1. Each plot consisted of a hedgerow of 18 plants. Four bays were planted on soil with a 3-year faba bean rotation (positive zone) and four bays were planted on adjacent soil with no history of faba beans (negative zone). One bay was planted on the boundary straddling these two zones. Two genotypes were evaluated; cv. Farah (susceptible - S) and breeding line 1322/2 (resistant - R).

RESULTS

Spatial and temporal development of disease was similar in both years. Disease developed at different rates in the positive and negative soil zones, and at different rates on the susceptible and resistant genotypes.

Disease development in positive zone From 7 to 10 WAS disease incidence on cv. Farah increased from 3 to 100%. In contrast, the incidence on genotype 1322/2 was less than 35% over the same period and 90% at 14 WAS (Fig. 2). At 17 WAS cv. Farah showed 35% defoliation, due to severe lesions, and 17% LAD on mid-canopy leaves. At the same time, the resistant genotype 1322/2 exhibited 4% defoliation and 3% LAD on mid-canopy leaves.

Disease development in negative zone Disease spread more slowly on both genotypes (Fig. 2). Additionally, only 5% defoliation and 5% LAD on mid-canopy leaves were evident on cv. Farah at 17 WAS. Defoliation of plants or lesions on mid-canopy leaves were not observed on genotype 1322/2.

DISCUSSION

The incidence and severity of cercospora leaf spot appeared to be strongly linked to faba bean rotation, suggesting the presence of soil borne inoculum that survives in a 3-year rotation of faba bean. Data analysis and correlation with weather factors are ongoing.

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REFERENCES