Benchmarking Models, Aerial Spore Sampling, Irrigation and Nutrients for downy mildew of lettuce and white blister on brassicas

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Aim of HAL Project VG07070 *(3 years)*

Determine economics of managing downy and powdery mildew and white blister using aerial spore sampling, disease predictive models, irrigation and nutrients.

Aerial spore sampling detection kit:

- Develop an aerial spore sampling kit for white blister spores in collaboration with UK growers, Australian and UK researchers.
- Available in 3 yrs. The spore trap costs $A1,500 and weekly tests $A14-28.

Fig 1 Spore trap

Disease predictive models:

- Models avoid weekly sprays by timing sprays to when the fungus is active in the field.
- Weather data is collected by a weather station (Fig 2) and put into the model.

Fig 2

White Blister disease predictive model:

- Validate the new white blister model on brassicas (Fig. 3 No bars = no risk; Green bars = low risk; Yellow bars = moderate risk; Red bars = high risk).
- ***An earlier model saved up to 10 sprays per crop***.

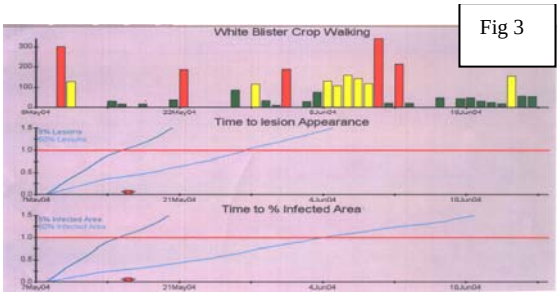

Fig 3

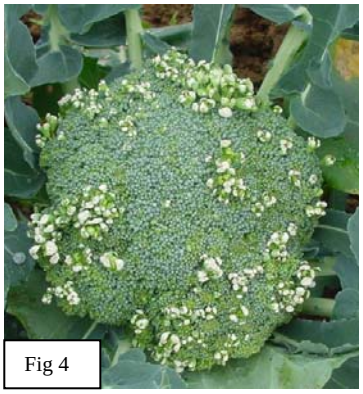

Fig 4

Downy mildew disease predictive model:

Build a model for lettuce downy mildew based on overseas work and our laboratory trials.

- Spores are formed from midnight to 4 am.
- Spore release starts after dawn, peaks at 10 am and declines after midday.
- Infection coincides with spore release (Fig 6).
- ***Avoid leaf wetness late in the morning.***

Fig 5

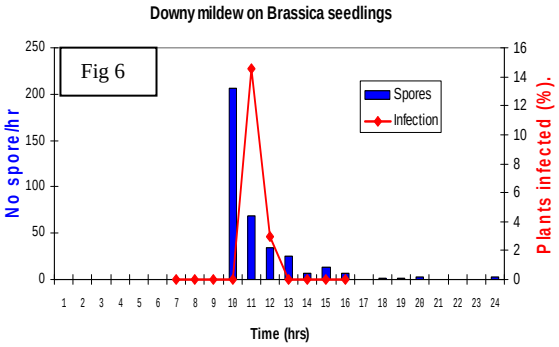

Fig 6

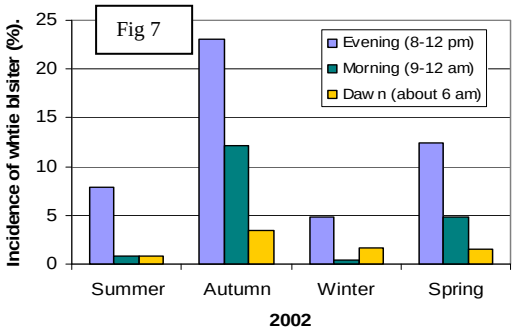

Fig 7

Effect of Irrigation Time on Disease

- Surveys of white blister on radish and downy mildew on spring onions showed ***lower levels of disease with dawn irrigation and higher levels of disease with evening irrigation*** (Fig 7).
- Confirm survey data with a field trial on broccoli at Werribee.

Effect of Nitrogen (N) on Disease

- Determine if higher rates or types of N increases disease.