

## White Blister (*Albugo candida*)

### Main control points

- Watering – short, heavy, pre-dawn / morning
- Ventilation – dry leaves quickly
- Fertiliser- P&K may improve disease tolerance
- Hygiene – remove weeds and crop trash
- Plant varieties that are more tolerant to *Albugo*
- Fungicides – none registered ... yet
- Spores can infect plant as it emerges from seed
- White blister can occur with Downy Mildew



Broccoli



Gall

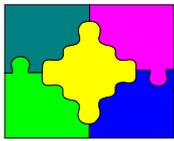


### Background

- White blister (*Albugo candida*) is a fungal disease that affects plants of the crucifer family.
- The disease was first reported in 1870 and became commercially important early in 2002 when vegetable growers near Melbourne found the disease on broccoli and cauliflower crops. Both seedlings and mature crops were affected and substantial and extensive losses were incurred.
- Despite quarantine restrictions on the interstate movement of broccoli and cauliflower plant material, the disease is now widespread throughout southern Australia.

### Symptoms

- White blisters on leaves and flowers, possibly gall swellings on stems of seedlings
- Yellow to brown spots on the upper leaf surface and white, round to oval blisters on the corresponding under leaf surface.
- The blisters consist of masses of white dust-like spores.
- Badly infected leaves may be misshapen.



## Control Strategies

You can control white blister with a combination of management practices and a fungicide spray program.

### Controlled watering

Spores germinate on wet leaf surfaces to infect plants. Prolonged leaf wetness encourages white blister. Irrigate pre-dawn or early morning.

### Ventilation

Maintain good air-movement in the environment to dry leaves off quickly to reduce the chance of infection. This may mean increasing plant spacing.

### Nutrition

Maintain a balanced nutrition program. Applications of phosphorous and potassium fertilisers may reduce the disease on radish.

### Hygiene

Remove sources of spores, such as volunteer radish, crucifer weeds and crop debris.

### Fungicides

No fungicides are currently registered for control of white blister on brassica crops. Growers have been able to control the disease using systemic fungicides. Please contact your local chemical supplier for information on safe application of these fungicides without breaching MRL's, (refer to Veg-MOF #3, "Minimising Chemical Residues"). Crop Protection Approvals (CPA) are currently undertaking residue work on this issue.

## More about White Blister

### How is it Spread ?

- Wind, rain or insects disperse aerial spores
- Rain splash of spores from soil.

### Where can the disease come from ?

- Diseased plants or crops
- Volunteer crucifers and crucifer weeds
- Crop debris
- Seed
- Soil borne spores survive for 3-17 years

### What crops are at risk ?

- Confined to crucifers and crucifer weeds.
- 10 known races of white blister, some races can infect multiple crucifer hosts

### What weather conditions favour infection ?

- The disease develops at temperatures ranging from 10°C - 25°C
- Spores germinate over the range of 1°C - 20°C with an optimum of 10°C - 14°C
- Blisters form 6-10 days after infection
- White blister needs free water (dews, fog or rain) on leaves
- Spores are released at any time
- Infection can occur on wet leaves within 3 hours at 20°C, at any time of the day or night

For more information please contact your local Veg Cheque facilitator.

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### HAL Project :

### 'Disease Management Strategies for Bunching Vegetable Growers'



This project has identified management practices on radish which reduce white blister and these may be applicable to other crucifer crops such as broccoli.

### Systemic fungicides control White Blister on Radish

Chemical trials on radish found that systemic fungicides gave better control of white blister than did contact fungicides.

### Irrigation timing reduces White Blister

Prolonged leaf wetness encourages white blister. Avoid irrigating radish crops in the evening (8pm-midnight) in all seasons. The best times to irrigate are pre-dawn or early morning.

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