

Vegetable ~~Matters of~~ Facts

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Vegetables

Integrated Control of Sclerotinia Diseases

Main control points

Control of Sclerotinia lettuce drop can be improved by:

- Better application and timing of registered fungicides with the right volume of water
- Research trials have identified that a new fungicide, Boscalid is effective in controlling Sclerotinia on beans and lettuce.
- Using green manure (biofumigant) Brassica crops in crop rotations to reduce inoculum carryover or suppress Sclerotinia development in the soil.
- Selecting crops more tolerant to Sclerotinia infection for rotation with lettuce in high disease-pressure sites.



Lettuce drop caused by root/basal infection



Lettuce drop caused by airborne spores

Background

Sclerotinia diseases are a major cause of crop loss in a range of crops such as carrots, beans, brassicas and lettuce.

- Intensive cropping and the use of susceptible crops in rotations has led to build up of the fungus in the soil.
- There are limited chemical controls and under conditions of high disease-pressure these do not always provide effective control.
- Reduction of the number of sclerotia (pathogen resting bodies in soil) is essential for more effective control.
- Crop losses can range from 10 to 45%.

What was done?

This project evaluated for disease control:

- The effectiveness of commercially prepared biological control agents.
- The usefulness of green manure (biofumigant) Brassica crops.
- Cultural strategies such as the use of Sclerotinia tolerant crops and soil amendments.
- Strategic application of a number of fungicides.

Green manure Brassica crops

Some Brassica crops (e.g. mustard) release volatile compounds (biofumigants), which are toxic to some soil pathogens. As green manure crops they also provide large bulk and deep tap roots which can help reduce soil crusting and compaction, improve water infiltration and organic matter content.



Cultural and Soil Amendment Strategies

Research has shown that infection by *S. minor* is closely correlated to plant architecture. Crops that have foliage that is in contact with the soil are easy to infect. Seedlings of crops that have upright foliage such as beets, broccoli and spinach are much less susceptible to infection.

Soil amendments including "mustard meal" and "neem cake" which have reported biofumigant properties and nitrogenous amendments which release high levels of ammonia into the soil can kill sclerotia of *S. minor* and reduce disease pressure.

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Slobodan Vujovic, Private Bag 15, Ferntree Gully Delivery Centre 3156; Fax (03) 9800 3521.

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For more information please contact your local VegCheque officer.

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Biological Control Agents

These are fungi or bacteria which have the ability to destroy *Sclerotinia* in the soil and/or suppress the development of the disease in the root zone of the plants. These may reduce the viability of sclerotia in the soil and are incorporated into the soil prior to planting or act by protecting the plant/roots from infection by *Sclerotinia* fungus. These can be incorporated into seedling mixes or directly to the soil prior to transplanting.

Three main biocontrol agents were evaluated *Coniothyrium minitans* (Contans™) which is a specialised mycoparasite of *S. Minor* sclerotia, and *C. minitans* (A69) and *Trichoderma hamatum* (6sr4) which both provide good competition for nutrients and protection in the root zone.

Key Results

- Better application and timing of fungicide sprays with the right volume of water improved disease control.
- Boscalid has been issued with an APVMA permit (PER8141) for other states for control of *Sclerotinia* on lettuce. A permit is not required in Victoria for legal off-label use of this chemical but note that there are no Maximum Residue Limits (MRL) for this under the code for Food Standards Australia and New Zealand and there is a zero tolerance.
- BQ-Mulch™ (*Brassica juncea*) used as a green manure rotation crop provided good early season control of disease and improved soil quality.
- Seedlings of rotation crops, which have an upright growth pattern are more tolerant to *Sclerotinia* infection particularly in high *Sclerotinia* disease pressure sites.
- Biocontrol agents were not as effective as fungicides because they did not grow at levels desirable for effective biocontrol. More work is required to improve their growth.

Want to know more?

HAL Project VG00048

Contact: Oscar Villalta or Dr Ian Porter DPI-Knoxfield, 92109222

Brochure "Development of Biological Controls for *Sclerotinia* Diseases", available from Industry Development Officers

Check us out and view other fact sheets at:

<http://www.dpi.vic.gov.au/agvic/ihd/projects/vchq.htm>

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□ The State of Victoria, Department of Primary Industries, 2005.

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