

Foliar Diseases in Greenhouse Vegetables

Issue 2

December 2008

This newsletter is an update on the research project aimed at improving the sustainability of foliar disease management in greenhouse vegetables. The project commenced in June 2006 and is funded by the Vegetable Levy and the Commonwealth Government through Horticulture Australia Limited.

Issue 1 was sent out in March 2007 and outlined the aims of this project and the outcomes of the grower survey conducted in the initial stages of the project. Copies of Issue 1 are available on request.

The main outcomes of the research so far are:

- Powdery mildew occurs all year and is not managed effectively by humidity control
- *Botrytis grey mould*, *Sclerotinia rot* and downy mildew all require high humidity, occur more in winter and spring, and can be reduced by effective humidity control
- Venting is an effective way of managing humidity and can minimise some diseases
- Fungicide trials on cucumber powdery mildew show that early control is best, which minimises build up of the fungus. Once the mildew infection is severe, fungicides are ineffective.

Foliar Diseases

Some foliar diseases are a problem all year round. Other diseases are only a problem at certain times of the year because they rely on specific climatic conditions such as high humidity to infect plants and grow. Correct disease identification is crucial to ensure that you are choosing the right management strategies for a disease. For example some growers still confuse powdery mildew with downy mildew, which could lead to choosing an inappropriate management strategy such as an ineffective fungicide.

The symptoms of the main foliar diseases seen in this project and the conditions that favour them can be found in the 'Greenhouse Vegetable Foliar Disease Identification' factsheet sent out with this issue.

Greenhouse Climate and Disease

Temperature, relative humidity and the incidence and severity of foliar diseases has been recorded at 4 commercial greenhouse properties over the last 2 years. This data is being collected so we can look at how the greenhouse climate affects different diseases. This could help growers manipulate their greenhouse climate to help minimise the risk of disease.

- Powdery mildew does not need high humidity → can infect plants and grow at 0-100% relative humidity
- Reducing the humidity in the greenhouse is unlikely to be effective for minimising powdery mildew infection
- *Botrytis*, downy mildew and *Sclerotinia* need high humidity (>90%) → mainly found in winter and spring
- Reducing the humidity in the greenhouse will help to minimise infection → could mean don't have to spray



Greenhouse venting – end doors only (left), ends up and roof vents (centre), sides up (right)

Reducing Greenhouse Humidity

The easiest way to reduce humidity in the greenhouse is by venting. The type and number of vents in a greenhouse will affect the amount that humidity can actually be reduced. Some greenhouses only have very limited venting.

- In some greenhouses even when all vents are open humidity still very high (>90%)
- In other greenhouses ventilation more effective → humidity does not stay above 90% for prolonged periods
- For some growers may be worth investigating more effective ventilation

Alternative Fungicides & Spray Programs

Eighteen products have been assessed in greenhouse screening trials against cucumber powdery mildew. The trials included fungicides from 5 different resistance management groups as well as 'soft' products like oils and plant health products.

- Several products very effective against powdery mildew but relevant chemical company unwilling to support an application for a permit for greenhouse use
- Some products effective against powdery mildew but caused phytotoxicity → not suitable for use
- All results showed powdery mildew must be controlled early otherwise you cannot restrict the disease
- Soft options may have to be sprayed more often than fungicides to be effective
- Results from screening trials used by reviewers at SARDI when advising on APVMA permit applications for S.A.
- Spray programs being developed using fungicides only, 'soft' products only or fungicide and 'soft' in combination
- Spray programs will be trialled in commercial greenhouses in coming months

One of the reasons that some chemical companies are reluctant to support permits or registration for their products to be used on greenhouse crops is that the greenhouse industry has a reputation for use and abuse of pesticides. Your spray program needs to incorporate fungicides from different activity groups to reduce the risk of fungicide resistance. YOU CANNOT RELY ON ONE FUNGICIDE ONLY!

Integrated Disease Management

There is much more you can do to manage foliar diseases than just relying on fungicide sprays. Integrated disease management combines different strategies into a program to manage diseases in a sustainable way.

- Where possible change the climate in the greenhouse to make the environment less favourable for diseases
- Use spray programs that rotate fungicides from different activity groups
- Plant varieties that are less susceptible to disease
- Keep greenhouse free of plant debris that can harbour disease
- Maintain a zone around greenhouses free of weeds and rubbish

In the next issue

- Results from spray program trials
- Results from variety trials

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