



The Nursery Papers

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Controlling *Botrytis* (grey mould) in nurseries

The growing environment in nurseries holds the key to the incidence of the fungal disease *Botrytis*, according to NSW Agriculture plant pathologist Gordon Stovold. *Botrytis* in nurseries can't be controlled effectively using fungicides alone. The problem of resistance to fungicides is so acute that using benomyl can, in fact, make the disease situation worse than if no chemical at all was used.

Climate control

Botrytis thrives in still humid conditions, so nursery operators should control atmospheric conditions by:

- A. reducing humidity,
- B. increasing airflow and
- C. using sub-irrigation instead of overhead sprinklers.

The bad news

Botrytis samples from plant tissue collected from 80 nurseries were tested in the laboratory for resistance to benzimidazoles and dicarboximides, and to other fungicides. Results showed that resistance to the benzimidazoles (Benlate, Spin Bavistin) is almost universal. Resistance to dicarboximides (trade names Rovral, Sumisclex, Ronilan) occurred in two-thirds of the isolates.

Of the other fungicides tested, thiram showed good efficacy and chlorothalonil (Bravo), prochloraz (Octave), dichloran (Allisan) and dichlofluanid (Euparen) all had some activity against *Botrytis*, as

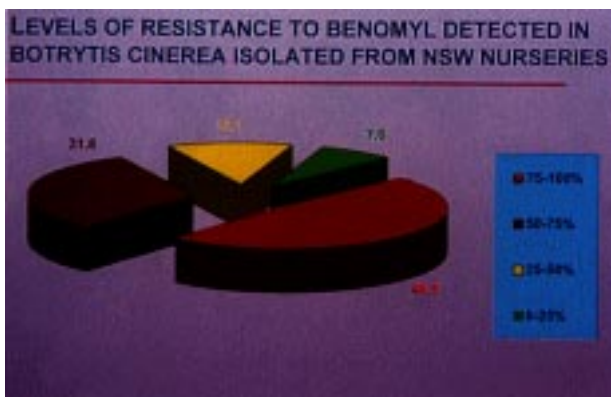
did two new experimental chemicals, fluazinam and pyrimethanil.

Other fungicides such as copper compounds and mancozeb showed no efficacy.

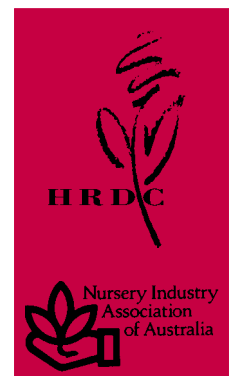
Promising preventive treatments

In another test, they took the apparently effective fungicides listed above, plus a number of biocontrol materials and sprayed them on *Lisianthus* leaves in a glasshouse. Leaves were sampled and detached at two, seven and 16 days after spraying and inoculated separately with resistant and sensitive isolates of *Botrytis*. The treated leaves were then incubated in moist chambers to encourage development of the infection. Leaf lesions caused by *Botrytis* were measured.

Results were favourable for the two experimental chemicals - fluazinam and pyrimethanil. Dichlofluanid and the biocontrol Amnite also provided effective control of the fungicide resistant strains of *Botrytis*. Using benomyl or iprodione on the resistant strains actually made the disease worse than if no chemical was used.

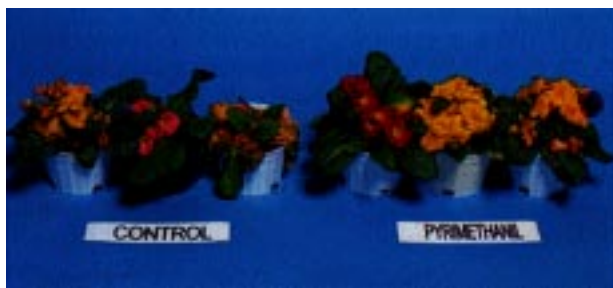


Levels of resistance to benomyl in *Botrytis* isolated from NSW nurseries.



Treating infected plants

In a further trial, Polyanthus plants already infected with *Botrytis* were treated with the chemicals effective in the preventative study above. Only the two experimental fungicides - fluazinam and pyrimethanil - succeeded in eradicating the disease.



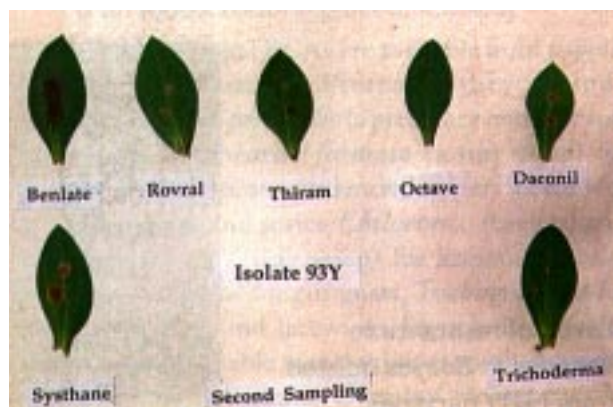
In Stovold's trial, Polyanthus were infected with *Botrytis* and then treated with fungicides. Note the success of the dichlofluanid, Pyrimethanil (not registered), against the control that went untreated.

Chemical control recommendations

Stovold concludes that the use of benzimidazoles for the control of *Botrytis* in the nursery is no longer appropriate. Benomyl resistance persists and when it is used on resistant isolates, it gives the resistant strain a competitive advantage. Hence the use of benomyl will make the situation worse.

Regarding dicarboximides (eg iprodione - trade names Rovral, Sumisclax, Ronilan), as resistant strains die out over 12 months, these fungicides can be used with caution. Stovold recommends their use three or four times per year during peak periods of infection.

Botrytis can be controlled by fungicides that are not currently registered for use on ornamentals (June 1997) and by experimental chemicals from overseas, yet to be registered for any crop in Australia. As a result of this project some new fungicides are likely to become available for use in nurseries. When they become available they must be used in rotation or resistance may develop.



The Bottom Line

Effective control of *Botrytis* in nurseries cannot be achieved by fungicides alone. Assume benomyl resistance and also resistance to iprodione, if it has been used continuously for a long period. It may still be possible to use iprodione (trade names Rovral, Sumisclax, Ronilan) strategically, during peak infection periods. Fungicides should always be used in rotation to minimise the risk of resistant strains developing. Controlling the growing environment is the key way of minimising *Botrytis*.

Acknowledgment

Gordon Stovold and two technical officers, Karleen Villagran and Alex Newfield, conducted the research project into *Botrytis* on ornamentals. The project was funded by the Horticultural Research and Development Corporation (HRDC) and the NSW Horticultural Stock and Nursery Act (HSNA). This Nursery Paper has been adapted from an article by Helen Moody, horticultural writer, Sydney, that appeared in the January 1997 issue of *Australian Horticulture* magazine.

The incidence of lesions shows variation in the effectiveness of different fungicides as preventatives against *Botrytis* infection.

