



Botector®

**EFFECTIVE
PROTECTION
AGAINST
BOTRYTIS
ON GRAPES.**

THE ALTERNATIVE IN
GRAPE PROTECTION



Grow a better tomorrow.



PROTECT YOUR GRAPES FROM BOTRYTIS WITH BOTECTOR.

Botrytis can cause costly damage to the quality of wine and table grapes. Now you can protect your most valuable asset with Botector, the innovative new biological fungicide from Nufarm.

With a unique mode of action, Botector can be effectively used throughout the growing season to protect your crop from infection.

Importantly, there is no negative influence on ripening, no phytotoxic reaction, no withholding periods and no known resistance issues. Botector offers growers, including organic growers, the opportunity to safeguard their crop from botrytis with newfound confidence. Botector is approved for use by Australian Certified Organic.

Botector®

- ✓ *Contains two strains of Aureobasidium pullulans*
- ✓ *Unique mode of action, important tool for resistance management*
- ✓ *Low resistance risk*
- ✓ *No pre-harvest interval*
- ✓ *Free from negative impact on wine fermentation or wine quality*
- ✓ *Packed as water dispersible granules (WG) in 1.2 kg packs*
- ✓ *Leaves no chemical residue*
- ✓ *Highly reliable and efficacious in field*
- ✓ *No negative influence on ripening*
- ✓ *No phytotoxic reaction*
- ✓ *Approved for use in Organic Production by Australian Certified Organic*



BOTRYTIS EXPLAINED

Botrytis cinerea, also known as Botrytis bunch rot, is a weather-driven disease that can cause significant loss of grape yield and quality. Depending on the grape variety and on the season, botrytis can result in a yield loss of more than 50%.

Generally, cool and wet weather is favourable for the development of botrytis.

Botrytis infection can occur by:

- Infecting young shoots early in the season
- Bunch infection at flowering
- Berry infection through microscratches

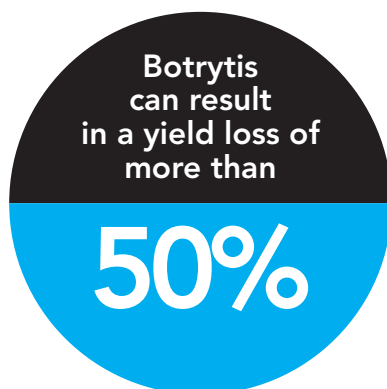
Botrytis can cause problems at vinification:

- Increased oxidation susceptibility
- Higher pH of wine
- Increased sulphur requirements
- Sedimentation issues

BOTRYTIS INFECTION CONDITIONS

Choosing to use Botector should be based on growing conditions and the target disease.

- Optimal germination temperature for Botrytis occurs at 18°C
- Free water in the correct temperature range enhances germination
- Relative humidity above 90% can also significantly increase conidia germination
- Infection can occur at flowering under the right conditions and sit as latent infection, expressing post veraison
- From veraison infection can occur through wounds in the epidermis
- Entry can also occur through micro scratches, powdery mildew russet points and hail or bird damage





BOTRYTIS CONTROL

BOTRYTIS MANAGEMENT MEASURES

Botrytis is best managed with preventative methods. The main strategy for limiting occurrence of botrytis is to increase the resilience of the grape vine to prevent infection of the pathogen.

The following techniques are essential for good management practice:

- Plant spacing
- Balanced nutrition
- Needs based irrigation
- Moderate yield load
- Preservation of highly productive canopy
- Bunch zone formation to allow sufficient ventilation, rapid dry-off after rain and dew, sun exposure & reliable crop protection coverage

DIRECT CONTROL MEASURES

The application of fungicides for botrytis control work more effectively with preventative applications. Due to the risk for development of resistant strains of the pathogen, over use of a specific fungicide on established infections can lead to the development of resistant strains. Good management resistance strategies involve the use of many different products. Botector adds another product and a unique mode of action to Botrytis management and fungicide resistance.

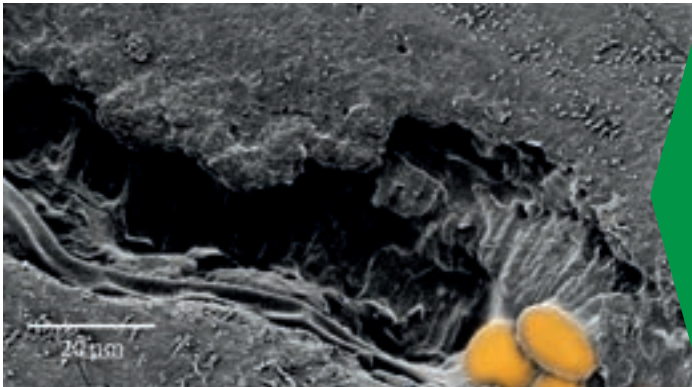
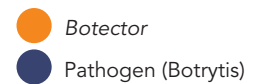
WHAT IS BOTECTOR & HOW DOES IT WORK

Botector is a biological fungicide that contains a naturally occurring fungus, *Aureobasidium pullulans*, that is commonly found in the environment.

Botector works through competitive exclusion. It creates a physical barrier at potential infection sites, such as microscratches, excluding Botrytis from access to space and nutrients, where it could create an infection and start to impact on grape health and development

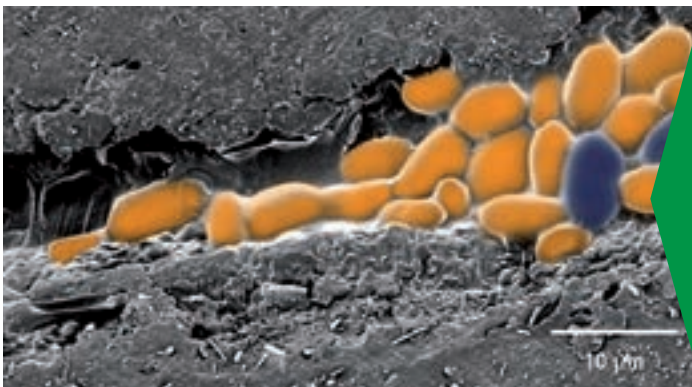
Competitive exclusion is extremely low resistance risk, so Botector can be used with confidence in your Botrytis program. However, as always good practice is to rotate fungicide modes of action to avoid potential issues.

COMPETITIVE EXCLUSION - COMPETITION FOR SPACE AND NUTRIENTS



1

Microscratches on the fruit surface represent natural entrances for the pathogen. The scratches are colonised by *Botector* immediately after application.



2

Due to the competitive nature of Botector the pathogen cannot infect the plant.



3

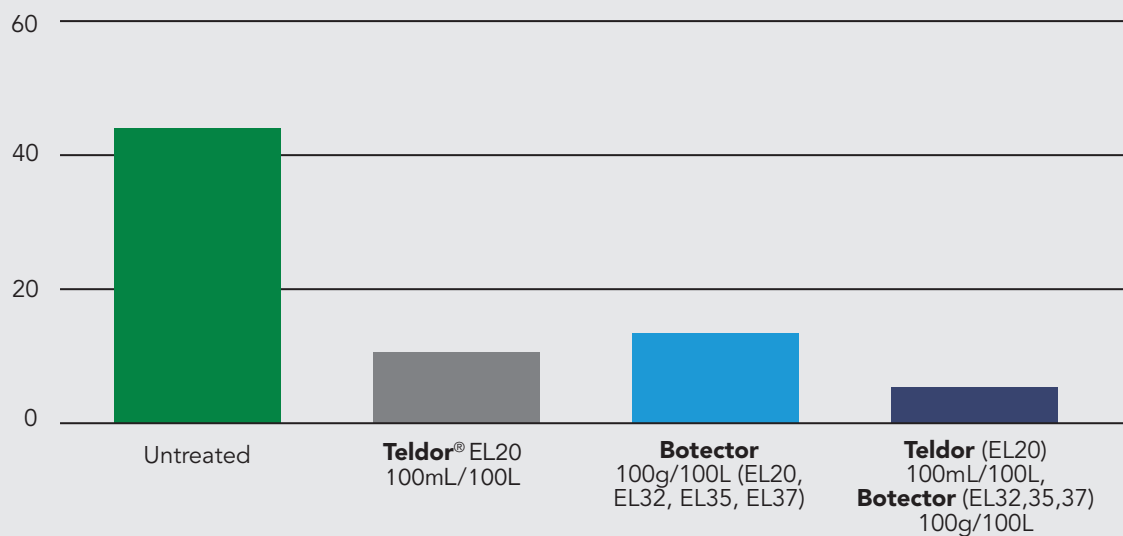
The microscratch is completely colonised with *Botector*. Botector acts as a natural shield which protects fruit from infection.

(pictures: Mendgen)

<https://www.youtube.com/watch?v=0mVxrMtgml&feature=youtu.be>

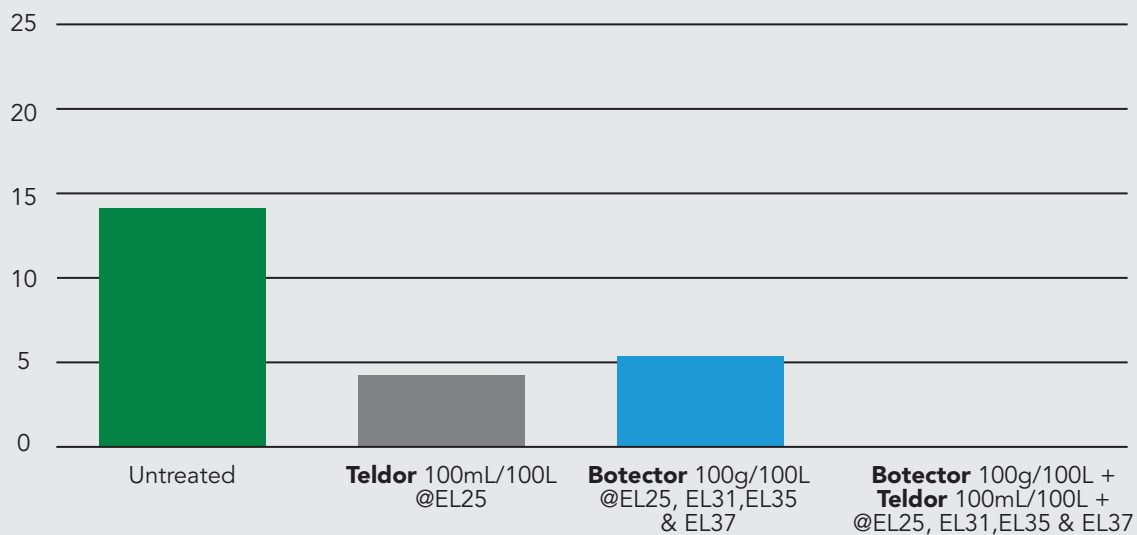
% Botrytis Severity Pinot Noir

Lenswood, SA. 2014/15



Botrytis % Bunch Incidence Sauvignon Blanc

Ross Glen, WA 2014/15



APPLICATION INSTRUCTIONS

APPLICATION TIMING

Best performance from Botector is achieved from preventive treatments between end flowering (EL 25) and ripening (EL 37), however application is not restricted to these timings if further applications are required:



EL 25: 80% CAPFALL

Against latent infection and infection of flower residues, depending on weather conditions.



EL 32: BEGINNING OF BUNCH CLOSURE

Last opportunity to achieve coverage within the bunch.



EL 34-37: DURING RIPENING

Against berry infection (depending on weather conditions).



EL 37: BERRIES NOT QUITE RIPE

Against berry-infection (susceptible grapes).

(Lorenz et al., 1994)

COMPATIBILITY

Botector contains a living biological organism which can be negatively influenced by some mixing partners. The active ingredients and/or surfactant systems of some products can reduce spore survival and colonisation rates. The table below summarises biological compatibility with some commonly used fungicides and surfactants.

Please note that different formulations of the same active may have different compatibilities, for example coppers, so do not mix any products not specifically listed as compatible with Botector.

Product	Compatible	Not Compatible
Captan®		X
Champ® 500WG	✓	
Custodia®		X
Dragon®		X
Flute®	✓	
Microthiol®	✓	
Neoram®	✓	
Protector®	✓	
TriBase Blue®	✓	
Vitiwet™	✓	

Caution should be taken when mixing more than one product with Botector and is generally not recommended unless specifically noted as compatible.

For further details or products not listed please contact your local Nufarm Territory Manager.

FURTHER INFORMATION ON APPLICATION

- For the application of Botector use standard spraying equipment
- Clean the tank before using
- Keep the water temperature below 25°C
- Use the tank suspension within 8 hours
- Apply preferably in the evening or when temperatures are below 25°C
- The suspension should be agitated during application
- Treat the whole bunch zone carefully when applying the product
- To achieve thorough coverage remove leaves in the bunch zone moderately
- Do not leave leftovers in the tank. The microorganisms in the product can multiply and thus block the jets

STORAGE STABILITY

As Botector contains living microorganisms do not store the product above 20°C.

From date of manufacture the product is stable:

- At room temperature ($\leq 20^{\circ}\text{C}$) for 10 months
- At cold storage ($\leq 8^{\circ}\text{C}$) for a minimum of 24 months
- DO NOT FREEZE

DIRECTIONS FOR USE

RESTRAINTS:

DO NOT apply during the hottest part of the day when temperatures exceed 25°C.

DO NOT apply if it is likely to rain before the spray is dry.

CROP	PEST	RATE	WHP	CRITICAL COMMENTS
Grapes	Botrytis Bunch Rot / Grey Mold (Botrytis cinerea)	100 g / 100 L (minimum rate: 400 g/ha, maximum rate: 1 kg/ha)	0 days before harvest	<p>Botector should be applied as a preventative treatment within the recommended growth stages.</p> <p>Apply as part of a botrytis bunch rot program, using up to 4 applications, particularly when weather conditions favour disease infection.</p> <p>Application should ensure penetration of canopy and thorough even coverage of flowers/bunches, from growth stages EL 25-37.</p>

NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.

WITHHOLDING PERIOD: NOT REQUIRED WHEN USED AS DIRECTED.

GENERAL INSTRUCTIONS

Botector should be applied preventatively within the recommended growth stages.

The product competes for space and nutrients with the pathogen.

This publication is a guide only and no substitute for professional or expert advice. The product label should be consulted before use of any of the products referred to in this publication.



nufarm.com.au

103-105 Pipe Road, Laverton North, Victoria 3026

Tel: 61 3 9282 1000

Fax: 61 3 9282 1001



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