Flexible, biological and effective mould and rot control

Using Botector keeps botrytis under control, reducing pressure on selective conventional chemistry, without compromising on disease control.

Protect

Unique mode of action
• Soft on beneficials, complementary to IPM strategies, with no residue or known resistance

Complements most spray programs
• Suitable for the organic market while fitting in with your conventional chemistry spray program

Superior granule formulation
• Easy measurement, handling and mixing

No withholding period or impact on ripening
• Allows for flexible harvest
Exceptional fruit rot control with Botector

With a new registration for use in all berry crops, Botector is the only biological fungicide that can protect all berries and it does more than just botrytis, providing useful suppression of other key rots — rhizopus, anthracnose and phomopsis.

Fungal rots in berries

Botrytis, commonly known as grey mould (Botrytis cinerea), is a significant disease of all berry crops including strawberries, blueberries and raspberries. Botrytis has a major impact on berry crops through reducing yields and through reducing marketable fruit and downgrading quality.

During the growing season botrytis spores are always present but do not start to impact crops until cool and wet conditions occur. In cool, wet conditions, spores can germinate and infect flowers or developing fruit.

Infection to flowers can cause flowers to rot and abort, reducing yield potential or lead to a latent infection, with infection lying dormant in flower tissues, transferring to developing berry tissue and expressing as berries ripen and sugar levels rise. This leads to a typical browning of the fruit, commencing from around the calyx.

Both ripe and unripe berries are susceptible to infection from active botrytis spores. Spores colonise small wounds and microscratches leading to superficial or surface infections with typical grey mould appearance.

Both types of infection lead to rotten fruit and reduced yields, with the potential to reduce shelf life if the disease expresses post-harvest. Moving stock in and out of cool stores often creates the perfect moist and cool conditions for disease expression.
How can Botector help to protect your berry crops?

Botector is not like your usual fungicides. It doesn’t affect a metabolic pathway of the fungus, as such does not apply selective pressure on the fungal population. Botector contains a living, non-pathogenic organism *Aureobasidium pullulans*, which actively and aggressively competes for colonisation spaces that *Botrytis* would otherwise occupy. We call this **competitive exclusion**.

Competitive exclusion creates a physical barrier against infection. It is complementary to all fungicide programs, adding another mode of action to spray programs, reducing selection pressure on other modes of action, helping to decrease the risk of fungicide resistance developing.

Botector seals entry points for botrytis infection on both flowers and fruits, making it the backbone to any successful management program and ultimately will help growers to reduce spore load and total disease pressure. Botector also provides suppression of rhizopus, phomopsis and anthracnose fruit rots too.

Application of Botector to open flowers can prevent latent infection. Application to ripe and unripe berries will stop or limit superficial or surface infection. It may even reduce the expression of latent infection.

Fruit rots can affect berries right up to harvest and beyond, so it is important to maintain protection programs. Botector has a nil withholding period so you can use it right up until harvest. Even better, applications just before pick can lead to a better shelf life, with rots being suppressed even after the berries are picked.

Botector is certified for use in both conventional and organic production systems, so it can be used by all growers. Best of all, its performance as a fungicide is no different to conventional chemistry.
Botector stands up in all situations

Even under high disease pressure, Botector effectively manages disease.

![Graph showing percent incidence of Botector and untreated control over years.](image)

**Figure 1:** Botector - botrytis population management in strawberries. Percent incidence botrytis on fruit following 3 - 5 applications.

Using Botector doesn’t mean compromising on control

Botector is as good or better than standard commercial treatments.

![Graph showing percent control across different sites with Botector and commercial standards.](image)

**Figure 2:** Percent control of botrytis in small berry crops compared to programs of single or multiple commercial standards.
The best application technique for the best results

For the best results with Botector, getting your application technique right is imperative. Botector is non-systemic and only colonises where it is applied, so ensuring that you get a consistent and even spread must be a focus.

When using a boomspray, use a minimum of 400L spray volume per hectare and Botector at 700-1000g/ha. Calibration of spray equipment should be checked regularly to ensure that whatever water volume achieves full canopy and fruit coverage.

When using a sprayer designed to spray dilute volumes, ensure application is made with sufficient volume to achieve required coverage (to the point of run-off).

In most cases this will be 700L/ha and above, depending on canopy density, Botector rate should be 70-100g/100L spray volume, sufficient to apply a minimum of 700g/ha.

Botector can be used successfully using concentrate spraying as well. However it is recommended not to exceed a 2x concentration. Nufarm recommends the use of Du-Wett if undertaking a concentrate spray to ensure the best coverage.

Flexible application

Botector performs whether you use a dilute or concentrate spray. Remember to use Du-Wett for the best results in concentrate sprays.

Figure 3: Percentage incidence botrytis infection comparing dilute vs concentrate spraying. Stanthorpe, Queensland, 2017.
Case study 1: Conventional blueberry grower from Brooklet in northern New South Wales

- High pressure disease situation, 250mm rainfall during trial period
- Compared Botector program to conventional fungicide program
- Net outcome was 27% less infected and unsaleable berries
  - Extra 4978 punnets/ha @ $3.00/punnet = $14933 extra revenue/ha

Botector Program
12 Days Post Harvest
Room Temp (6˚C - 23˚C)

- 70% Disease Free
- 5% Botrytis
- 25% Other rots

Grower Program
12 Days Post Harvest
Room Temp (6˚C - 23˚C)

- 42% Disease Free
- 27% Botrytis
- 31% Other rots
Case study 2:
Organic blueberry grower from Adele in northern New South Wales

54% Reduction in incidence of infected berries

- Medium disease pressure, 70mm rainfall during trial period
- Compared standard organic program to Botector program
- Net outcome was 54% reduction in incidence of infected and unsaleable berries
  - Extra 1875 punnets/ha @ $4.80/punnet = $7875 extra revenue/ha

Key points for using Botector in Berries

- Registered for use in all berry crops, including strawberries, blueberries, raspberries & blackberries
- Can be used up to 6 times per crop
- Use strategically to protect crops and keep disease levels low. Botector has no curative or eradicant properties, it is a protectant only
- Coverage and timing are critical to getting the best results
- Rates can be adjusted from 700-1000g/hectare
- Adjust rates for reliability under higher pressure or where coverage may be compromised
Botector in berries at a glance

- The only biological fungicide registered for use in all berry crops
- Highly effective protection from botrytis infection
- Also suppresses rhizopus, anthracnose and phomopsis fruit rots
- Nil WHP, use right up to harvest
- Flexible application – apply with boom spray or horticultural high volume sprayer with either dilute or concentrate volume
- Reduce pressure on conventional chemistry
- Suitable for use in IPM programs
- Suitable for use in organic programs

For more information on Botector®, contact your local Nufarm Territory Manager.

nufarm.com.au