

# TripleX | Technical Sheet

## Grapes

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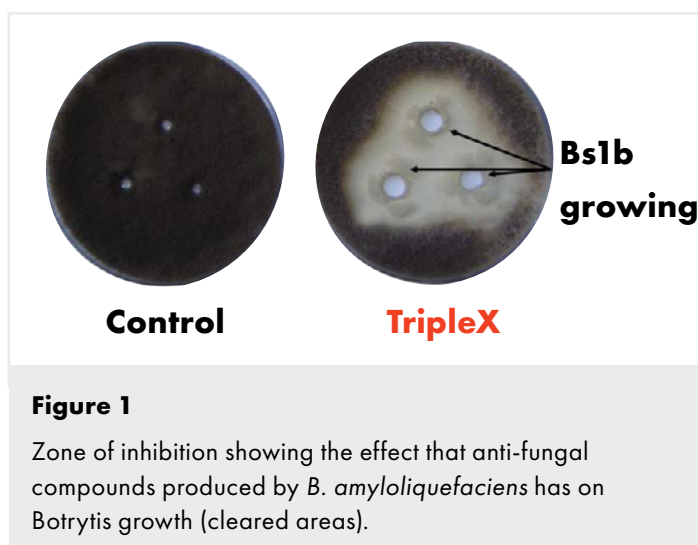
### What is TripleX and how does it work?

TripleX is an ACVM Registered (P8137) biofungicide used as a Botrytis biocontrol agent in grapes and other crops. TripleX is Certified Organic and can be used in conventional and organic vineyards.

### TripleX consists of two key components that have complementary actions:

1. The active ingredient is *Bacillus amyloliquefaciens* Bs1b – a spore forming bacteria from the Bacillus family. The *B. amyloliquefaciens* active ingredient has two life forms: a spore (the life form in TripleX) and the bacterium (the bioactive version of this bacteria).

When the spore lands on the plant surface (leaf or fruit) it germinates into the bacterial form and colonises these areas. It is the bacterial form that produces a range of antifungal compounds which kills Botrytis mycelium and inhibits Botrytis spore germination (see **Figure 1**). The anti-fungal compounds produced by *B. amyloliquefaciens* are also active against other fungi such as Cladosporium species that cause sooty mould.



**Figure 1**

Zone of inhibition showing the effect that anti-fungal compounds produced by *B. amyloliquefaciens* has on Botrytis growth (cleared areas).

2. The other part of TripleX is a base of non-viable extracts from the fermentation of beneficial bacteria. The TripleX base components has ingredients that helps *B. amyloliquefaciens* establish on the plant surface including an anti-microbial activity that “clears a space for the bacteria” as well as nutrients to assist in its growth.

### Using TripleX most effectively

As a biocontrol agent, TripleX works best when used as a preventative rather than a curative. This means you need to establish populations of *B. amyloliquefaciens* on the plant prior to key infection periods occurring. Re-applying the product later to ensures coverage of plant surface areas.

The ideal application timings for TripleX are at flowering, pre-bunch closure and late season (post veraison). Applying TripleX at pre-bunch closure means *B. amyloliquefaciens* is present inside the bunch to combat Botrytis when it starts its infection cycle.

## TripleX Compatibility List

Disease	TripleX Compatible	Not TripleX compatible
<b>Botrytis</b>	Scala/Pyrus Switch Fluazinam (Gem/Nando) Teldor Nexus	Captan
<b>Powdery Mildew</b>	Kumulus Luna Sensation Flute Impulse Pristine Protector Quintec Talendo Topas 200 EW Karbyon HML32 HML32 Eradicant Use HML32 Protectant Use Excel Oil Excel Organic Oil JMS Stylet Oil	Lime sulphur
<b>Downy Mildew</b>	Fluazinam (Gem/Nando) Nordox 75 Kocide Opti Liquicop	Mancozeb/Dithane

### Important Compatibility Notes

1. Growers should check products are on their industry approved list of products, i.e. New Zealand Wine Growers Spray Schedule prior to application.
2. If the product that you want to co-apply with TripleX is not listed here, then call Biostart on **0800 116 229**. Meanwhile presume it is not compatible.
3. The product actives were tested at the active level listed on the label. Higher application rates, different formulations, or other factors may result in incompatibility.
4. Different brand names with the same active constituents may have the same compatibility, however, the varying solvents or carriers may result in incompatibility.
5. **Integrated disease management:** Integrate TripleX into an overall disease management strategy whenever fungicide use is necessary. Follow practices known to reduce disease development which may include rotating and/or tank-mixing with other products with different modes of action.

## TripleX Directions for Use – For Botrytis Control in Grapes

Timing	Application rate: 1.5 L TripleX/ha as 300–500 mL/100 L of water
<b>Flowering between 5% and 80% capfall</b> (E–L 20–25)	Spray the bunch line to target Botrytis infection in flowers
<b>Pre-bunch closure</b> (E–L 30–35)	Spray the bunch line to establish <i>B. amyloliquefaciens</i> in the bunch prior to closure
<b>Late season until harvest</b> (E–L 35–38)	Spray the bunch line at 14 - 21 day intervals depending on weather events and disease pressure to ensure coverage to ensure coverage of the plants surface areas



### Application Notes

- Apply 1.5 L TripleX/ha as 300–500 mL/100 L of water
- Apply in late afternoon or on overcast days as UV light adversely affects the bacteria
- The bacteria in TripleX re-activates once it is diluted in the spray tank
- Apply in clean water at a neutral pH (pH 6–7)
- Can be applied with high pressure sprayers
- Apply TripleX with a super-wetter, spreader for best all-over fruit coverage. Examples for conventional growers are Du-Wett or Hywet, whereas examples for certified organic growers are BioSpread or EcoSpread.
- If rainfall is imminent consider using rain-fast spreader sticker, e.g. Du-Wett Weathermax or Hi-Wett SprayTite)
- Nil Pre-Harvest Interval (PHI) for New Zealand and a 1 day Pre-Harvest Interval internationally
- Will not affect the wild yeasts needed for fermentation
- Recycle drums through AgRecovery