

8 September 2022

Botrytis spores are always present in the environment and can infect an orchard whenever humidity is high for an extended period (rule of thumb above 90% humidity for 15 hours). Botrytis cannot be fully eliminated but a good preventative spray programme can help reduce its incidence and severity. If spray equipment access still allows it is advisable to maintain a good Botrytis spray programme leading up to and during harvest, targeting climatic conditions that favour infection.

Product options

Product choice is limited to those with a very low or no Pre-Harvest Interval (PHI). Typically, these include various biological options (1 day PHI), ‘softer’ chemical options such as HML 32 (1 day PHI) or Esteem (1-day PHI), and Captan (3-day PHI). Choosing the best product option/s will depend on the severity of Botrytis and humidity leading up to and during harvest. The following are some points to consider with these following products:

Biological options. Biologicals are generally preventative protectants best used in low Botrytis pressure situations. Their mode of action is to colonise leaf, flower, and fruit surfaces to protect against the development of Botrytis spores. Once applied, the population of these microbes will generally decrease, and so regular applications are required. Some suppliers recommend alternating biological options with chemical products. Below is a summary of various biological options on the market.

Trade Name	Active Ingredient	Label Rate ¹
Nufarm Botector	<i>Aureobasidium pullulans</i>	100g/100L
Biostart TripleX	<i>Bacillus amyloliquefaciens</i>	500ml/100L
Bayer Serenade Optimum	<i>Bacillus subtilis (amyloliquefaciens)</i>	125-200g/100L
Grochem Clarity	<i>Bacillus subtilis (amyloliquefaciens)</i>	265-530g/ha
UPL Bacstar	<i>Bacillus subtilis var. amyloliquefaciens</i>	120-200g/100L
Agrimm Sentinel	<i>Trichoderma atroviride</i>	50g/100L
Botry-Zen ²	<i>Ulocladium oudemansii</i>	800g/100L

¹ Not all these products have a label claim for blueberries, but all are MRL exempt.

² Botry-Zen can cause speckling on fruit, so once the first fruit are starting to colour, Armour-Zen (at 1L/100L) should then used as an alternative to Botry-Zen.

Generally, all biological products require the addition of a non-ionic surfactant to enhance coverage and are best applied in the evening as they are UV sensitive. Check individual labels for additional information and mixing compatibility. Several of the above products are being used in the SFFF Botrytis trial that BerryCo is leading, so we will have more data on these in time to come.

HML 32 is a combination of fatty acids (potassium salts) and potassium bicarbonate and has a label claim for Botrytis prevention in grapes. The supplier recommends adding HML Silco (Potassium Silicate) in combination with HML 32. No spreader is required when using HML 32. An important note on the label is that HML 32 is an alkaline material and should not be added to other pesticides or materials unless they have been identified as being compatible via a small premix (jar test). If using Silco, it is also advisable to thoroughly wash any glass components on tractors or spray equipment as Silco can etch these.

Esteem is a Polyoxin D zinc salt formulation and is both a Botrytis protectant and suppressant. An application rate of 100 mls per 100L water is suitable where water application rates are around 500L/ha (aim for approx. 500ml Esteem per ha in total). Esteem can be applied up to 4 times through a growing season and has a 1-day PHI. The Australian label states that pre-harvest applications can assist with reducing disease expression during post-harvest storage. Regarding potential pesticide resistance:

- Apply Esteem preventatively or as early as possible in the disease cycle.
- Avoid applying more than two consecutive applications and where possible alternate with pesticides that have other functional modes of action.

Recent research from the University of Tasmania has shown that Polyoxin D zinc salt also has some efficacy against rust in blueberries.

For more information see [Arxada Esteem](#) or speak to Alan or David.

Captan is the only 'broad spectrum' type chemical that has a low PHI (3-day). It will likely be more effective than biological options but could also be alternated with some of them (see individual labels). Depending on the approach you want to take, Captan could be left as the last protectant option if Botrytis conditions are high. If using Captan, pay special attention to the spray solution pH as this can significantly affect its efficacy. For example, the half-life of Captan (when half of the active ingredient degrades) is 32 hours at pH 5, eight hours at pH 7, and only **10 minutes at pH 8**. A suitable product to lower spray solution pH if required is [Grochem Lokit](#).