

Integrating Alternative Products for Botrytis Control

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Integrating alternative products into Botrytis management programs allows growers to reduce the number of fungicide applications. Alternative products include biological control agents (BCAs), systemic acquired resistance (SAR) inducers, calcium (Ca), and products managing ethylene.



Untreated



Calcium Spray

Calcium

- Ca strengthens and stabilizes the cell wall making the penetration of *Botrytis cinerea* more difficult, thus delaying the infection and symptom development.
- Fertigation is an effective method for delivering Ca to transpiring tissues such as leaves. However, sprays and dips are necessary to get high levels of Ca into flower petal tissue.

BCAs

- Howler® *Pseudomonas chlororaphis*
- Cease™, Serenade® *Bacillus subtilis*
- Revitalize®, Double Nickel *Bacillus amyloliquefaciens*
- RootShield® *Trichoderma harzianum*
- Guard® *Trichoderma viridae*
- Botector® *Aureobasidium pullulans*
- BotryStop™ *Ulocladium oudemansii*
- Regalia™ *Reynoutria sachalinensis*

SAR Inducers

- Actigard® Acibenzolar-S-methyl
- Aliette® Fosetyl-aluminum
- Alude™, BioPhos® Phosphorus acid

BCAs and SAR Inducers

- BCAs are microorganisms with anti-fungal activity and SAR inducers enhance plant defense responses.

Ethylene Management

- Ethylene sensitivity and Botrytis sensitivity can be interrelated; therefore, ethylene management techniques can reduce Botrytis infection.
- Applying postharvest ethylene treatments, such as EthylBloc or STS, can reduce Botrytis symptoms in susceptible varieties.

Botrytis Management Decision Making

- Apply tank mixes of single- and multi-site fungicides during periods of high disease risk.
- During periods of low disease risk, use a multi-site fungicide, a single-site fungicide, or a BCA.
- Some biological control agents may require multiple applications to become established.
- Spray Ca during production and use Ca showers or dips in postharvest applications.
- Consider postharvest ethylene treatments (EthylBloc, STS) for ethylene-sensitive varieties and species.
- SAR inducers should be applied in regular intervals regardless of risk.
- Off-peak season and low disease risk conditions provide an opportunity to rely on alternative measures.

Disease risk	Season	Single-site fungicide	Multi-site fungicide	BCA	SAR inducer	Others (Ca, Ethylene)
High	Peak	x Tank mix	x		x	x
High	Off-peak	x Tank mix	x		x	x
Low	Peak	x	or x	x	x	x
Low	Off-peak			x	x	x