Bee Vectoring Technology™

Nature's Solution for Healthy Crops

Bee Vectoring of Biologicals is a highly effective and efficient Crop Protection Tool

TSXV:BEE

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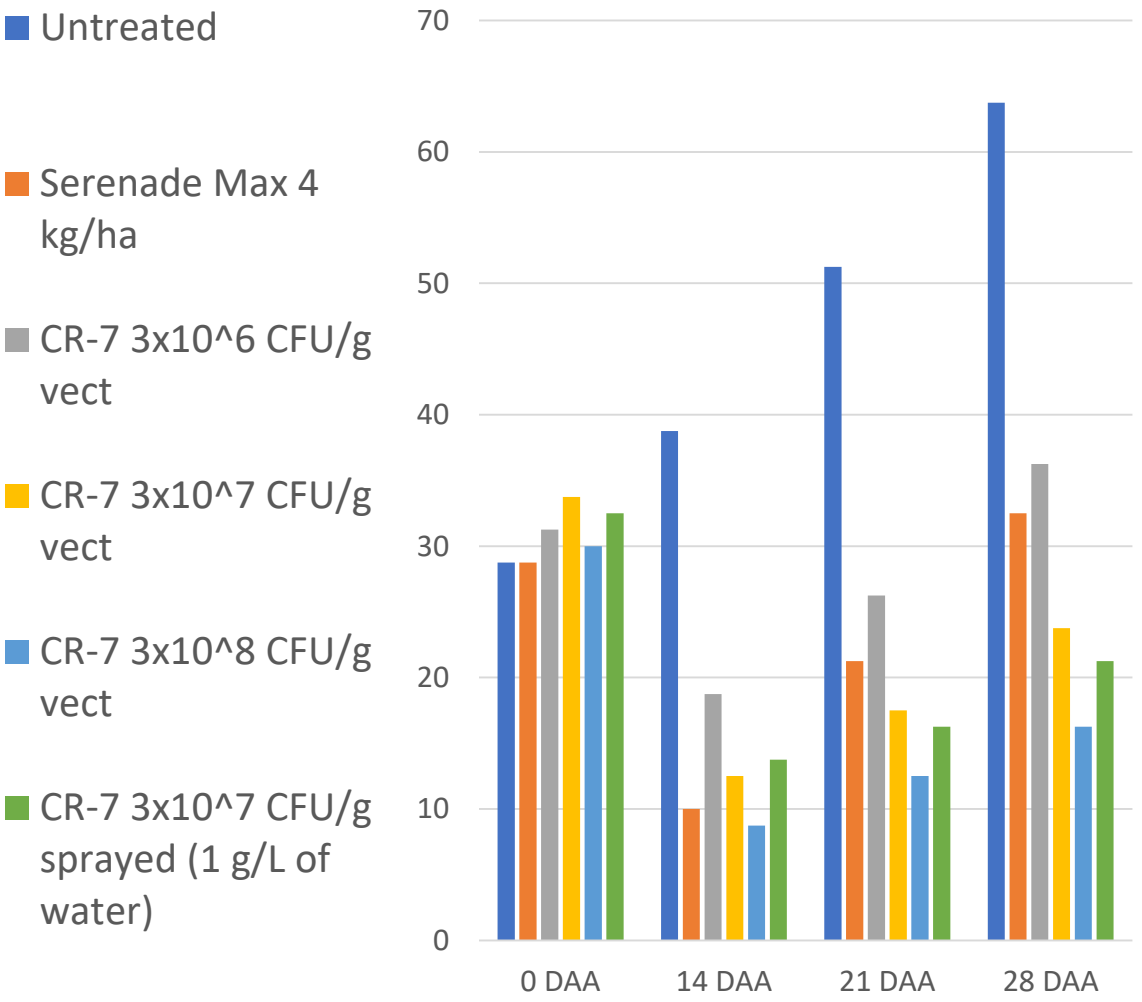
Christoph Lehnen

ABIM

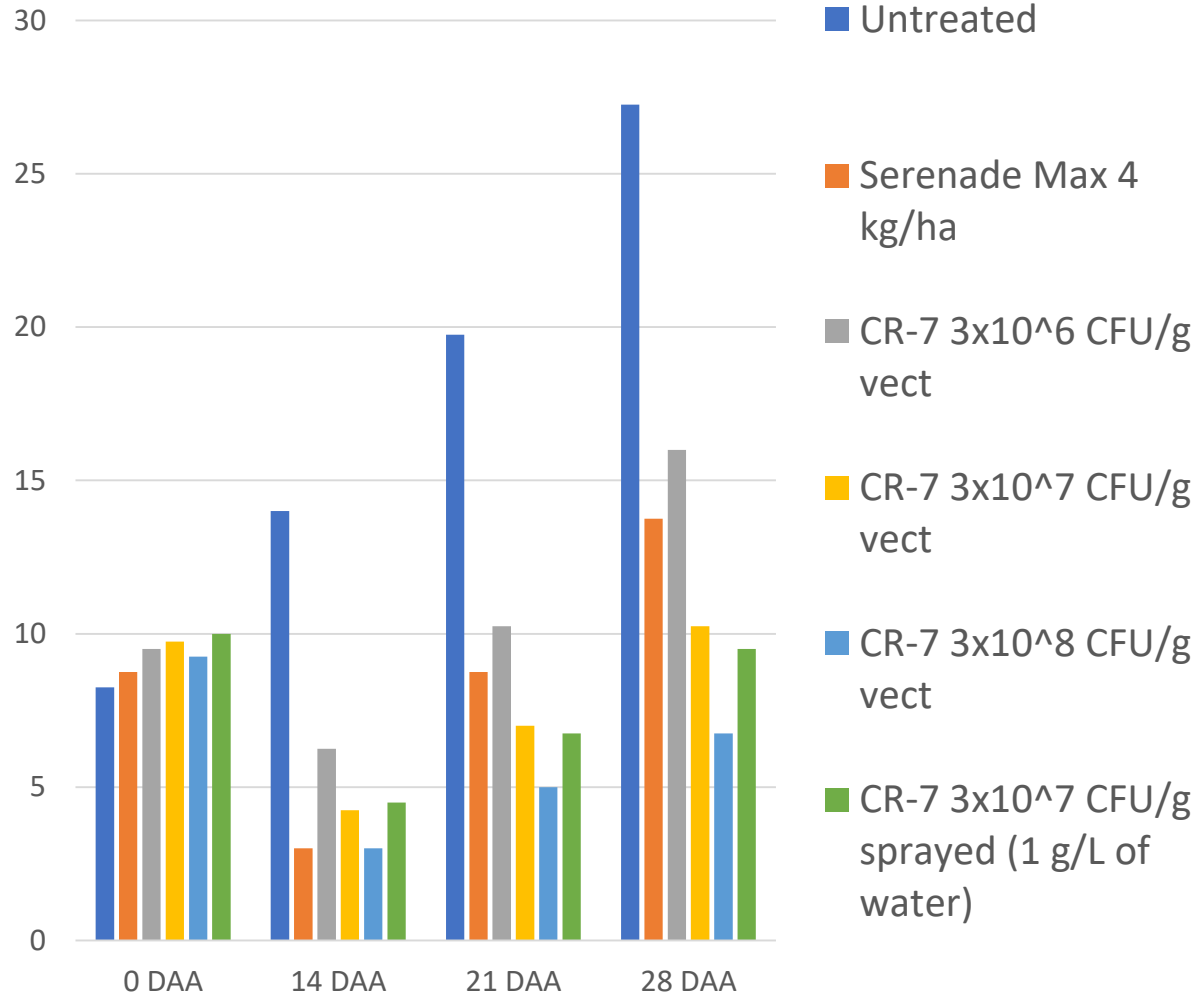
October, 2019

Tomato trial Mexico 2019

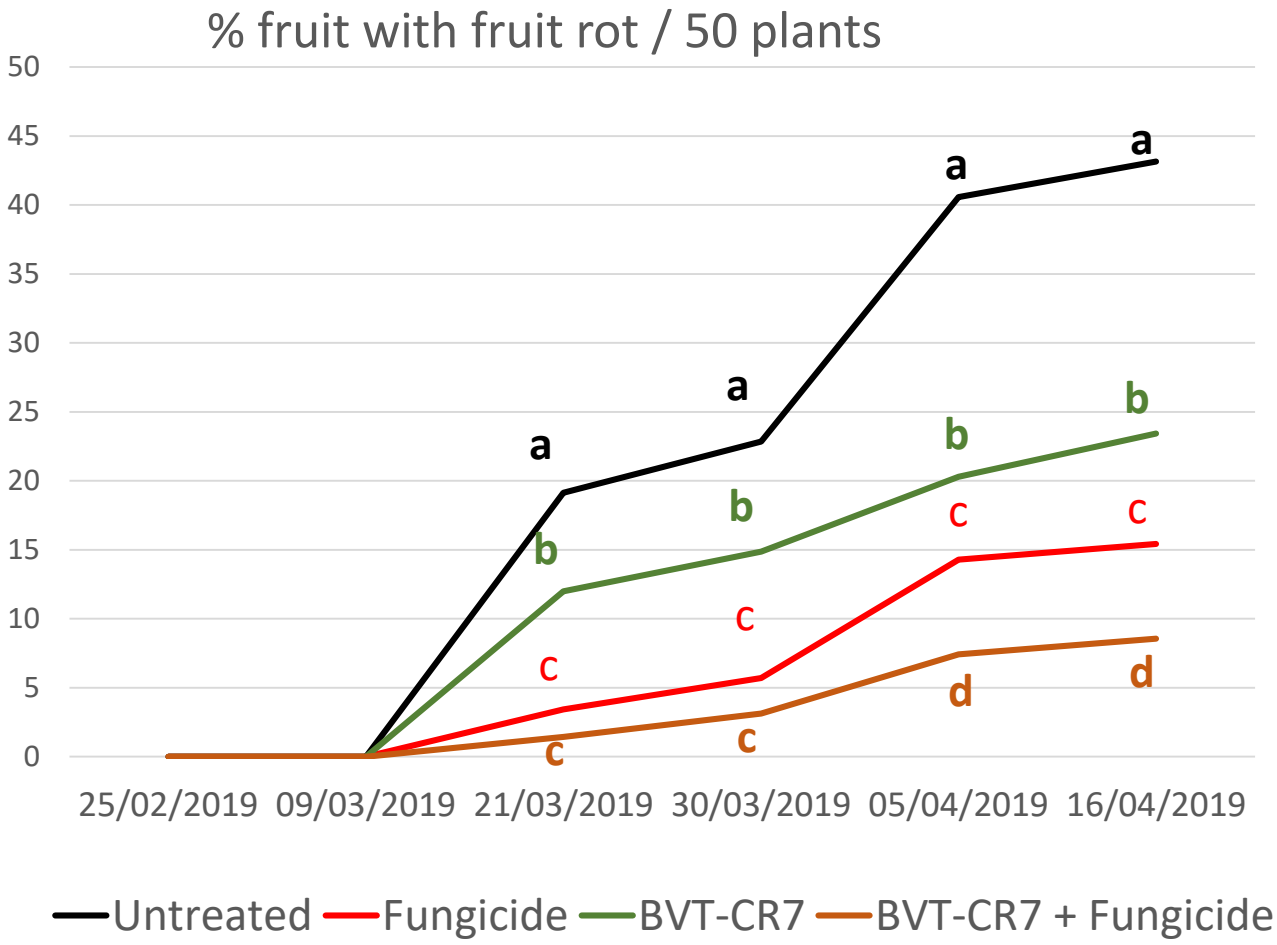
PESINC % 80 Flowers / plot

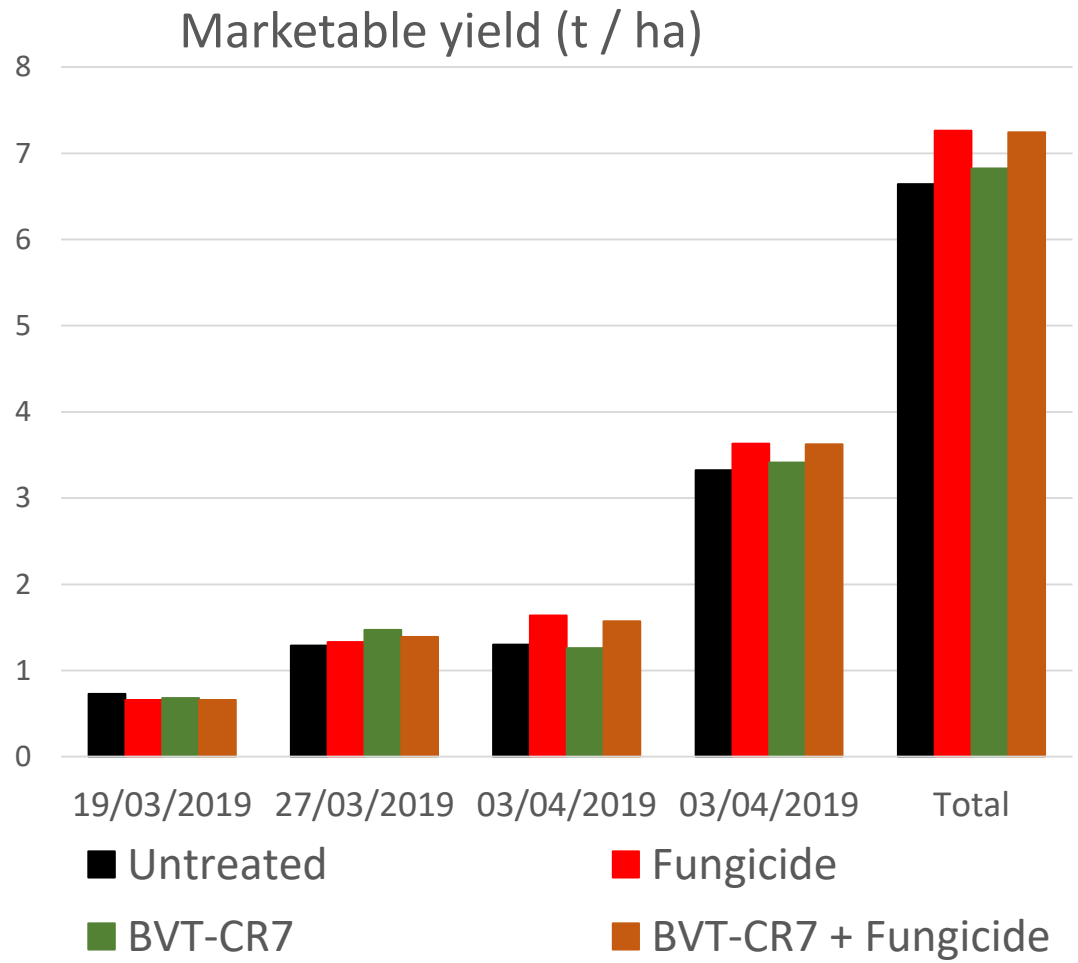


PESSEV % 80 Flowers / plot



BVT-CR-7 vectored by bees (tomato trial Italy 2019): good control of Botrytis = useful instrument for IPM

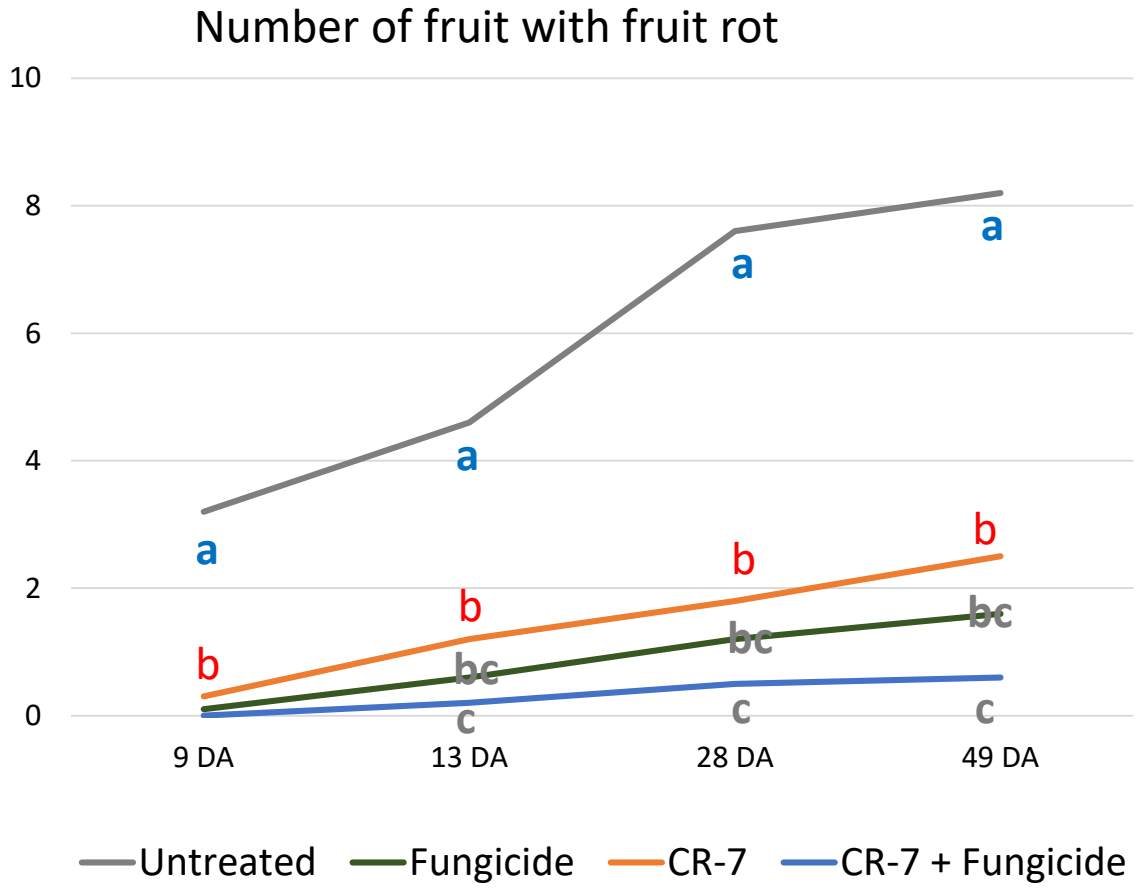


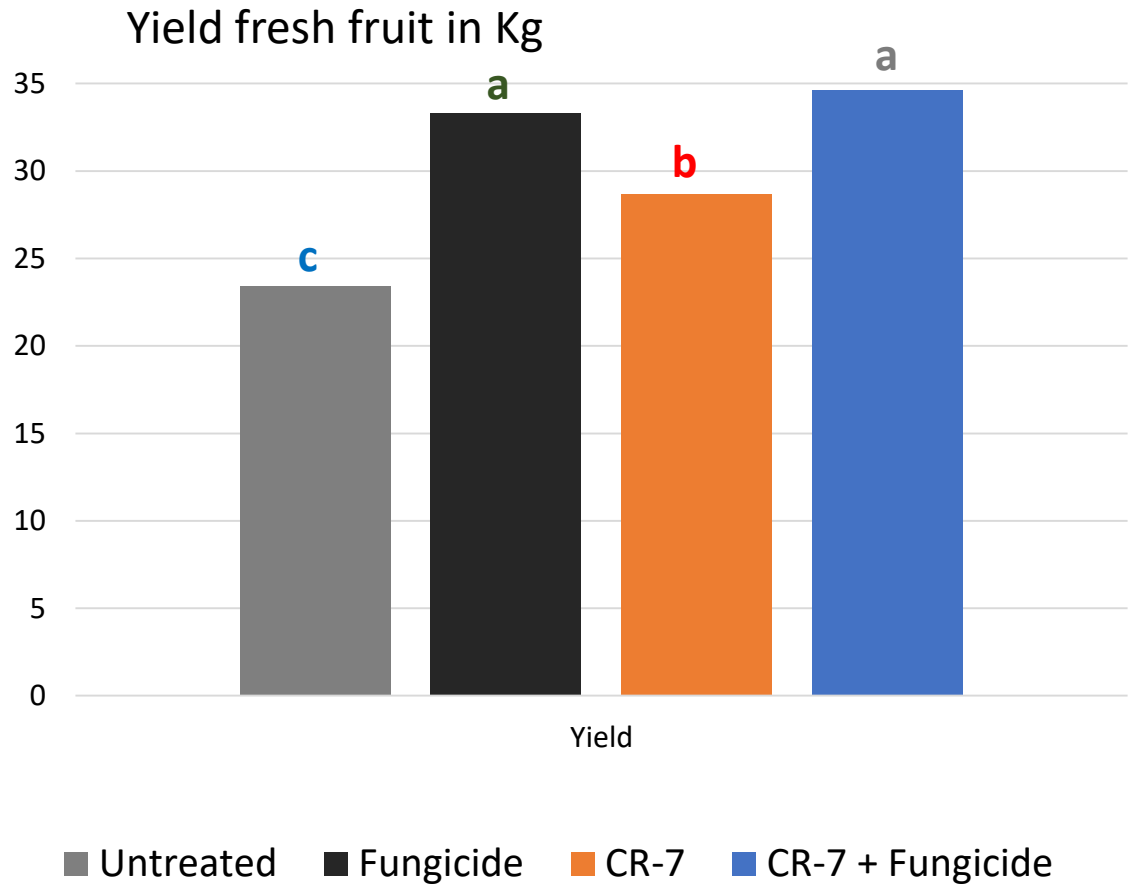


Different letters (a,b,c) = significant difference

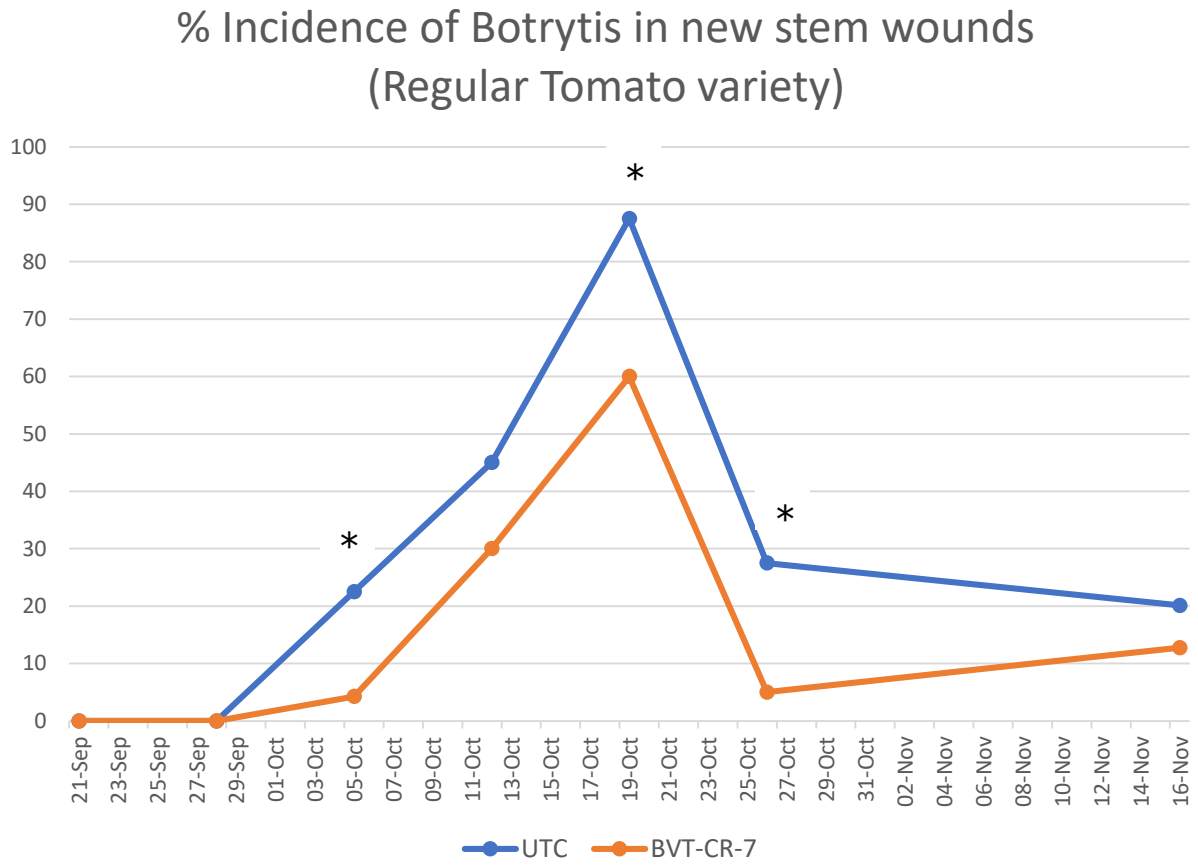
Performance of BVT System: excellent reduction of Botrytis on fruit and enhancement of yield

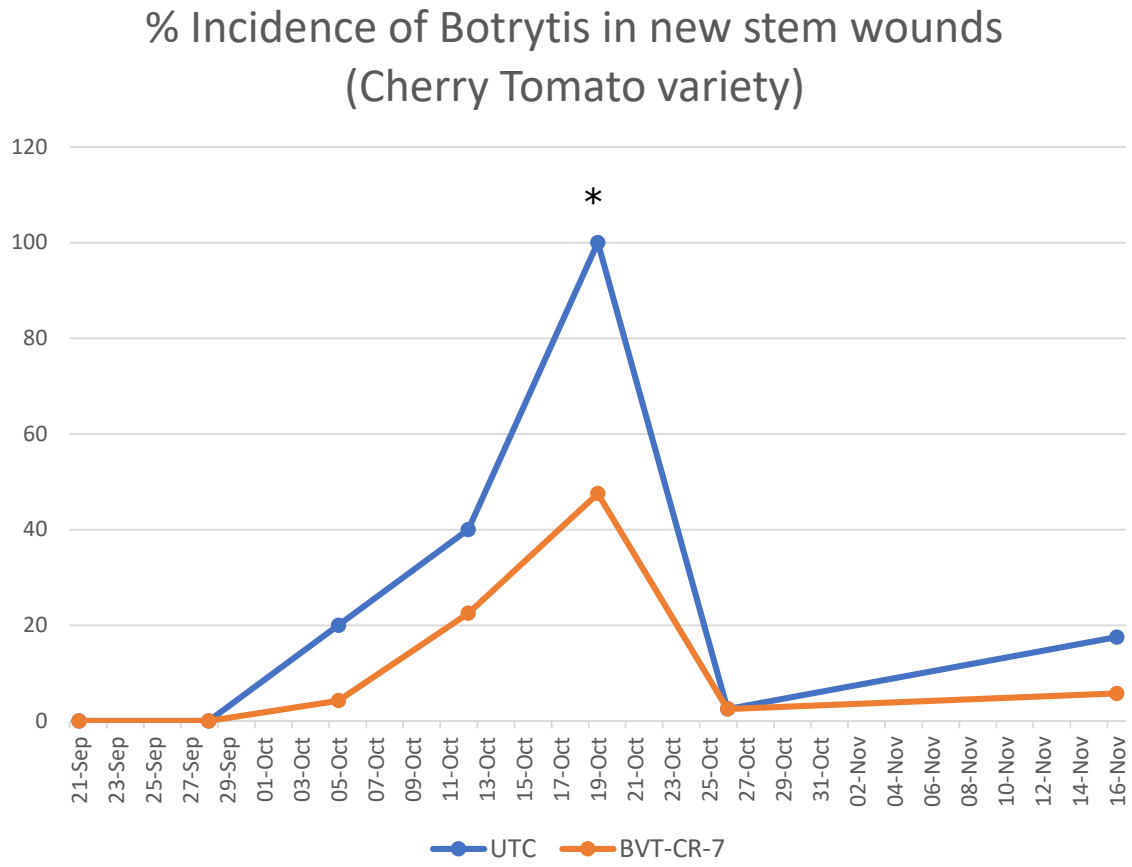
Tomato trial Italy 2017





Tomato trial 2018 (Greenhouse – Switzerland)
Bumble bee vectoring

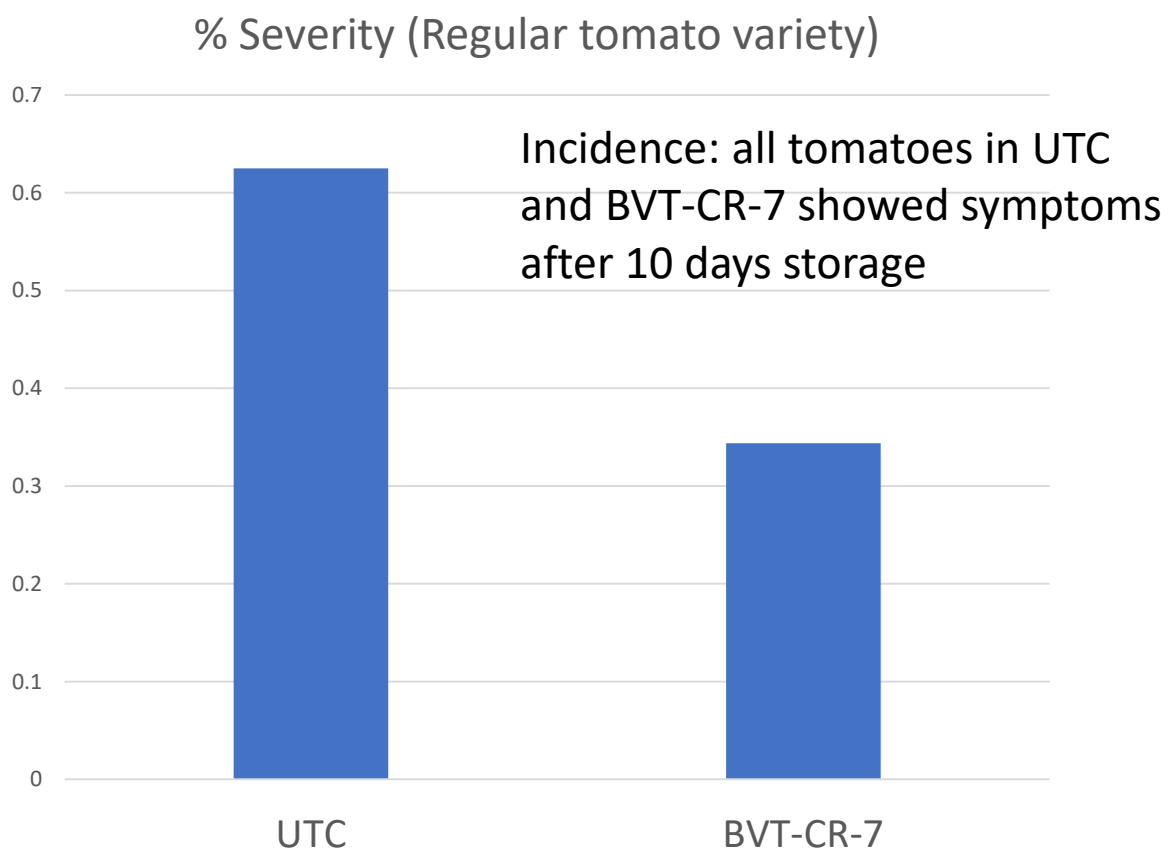




* = significantly different

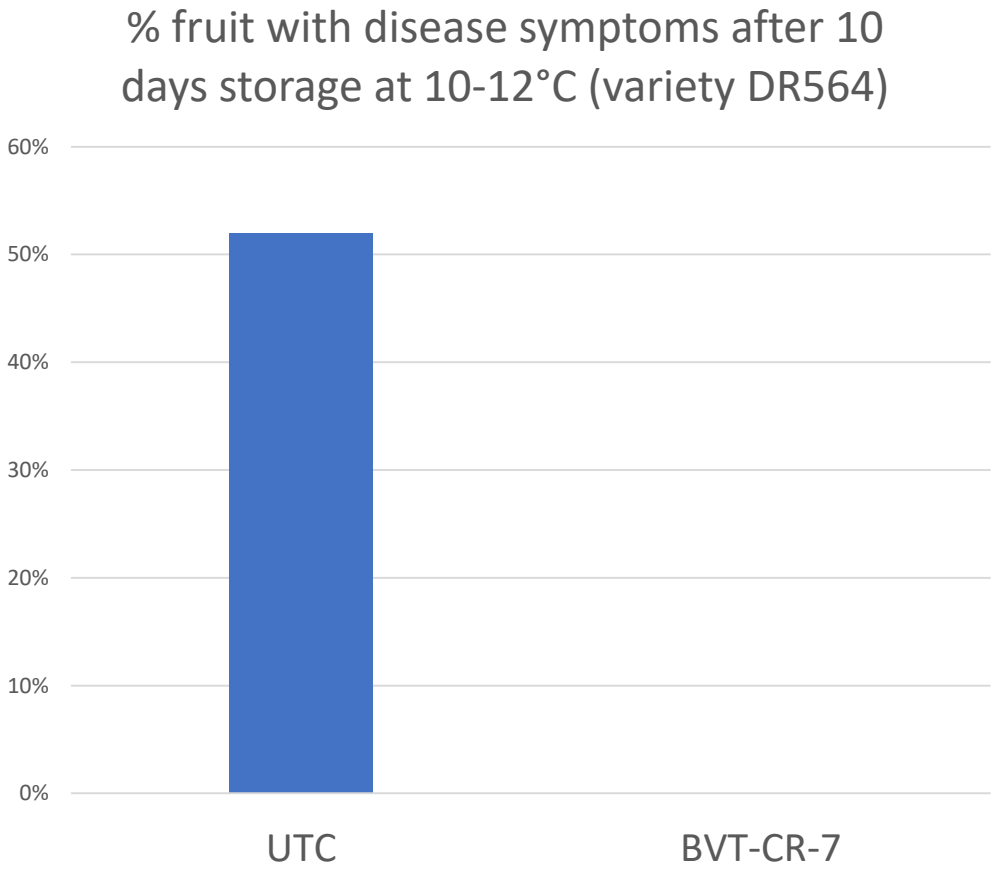
Tomato trial 2018 (Greenhouse – Switzerland)
Bumble bee vectoring

Regular Tomato – Post harvest

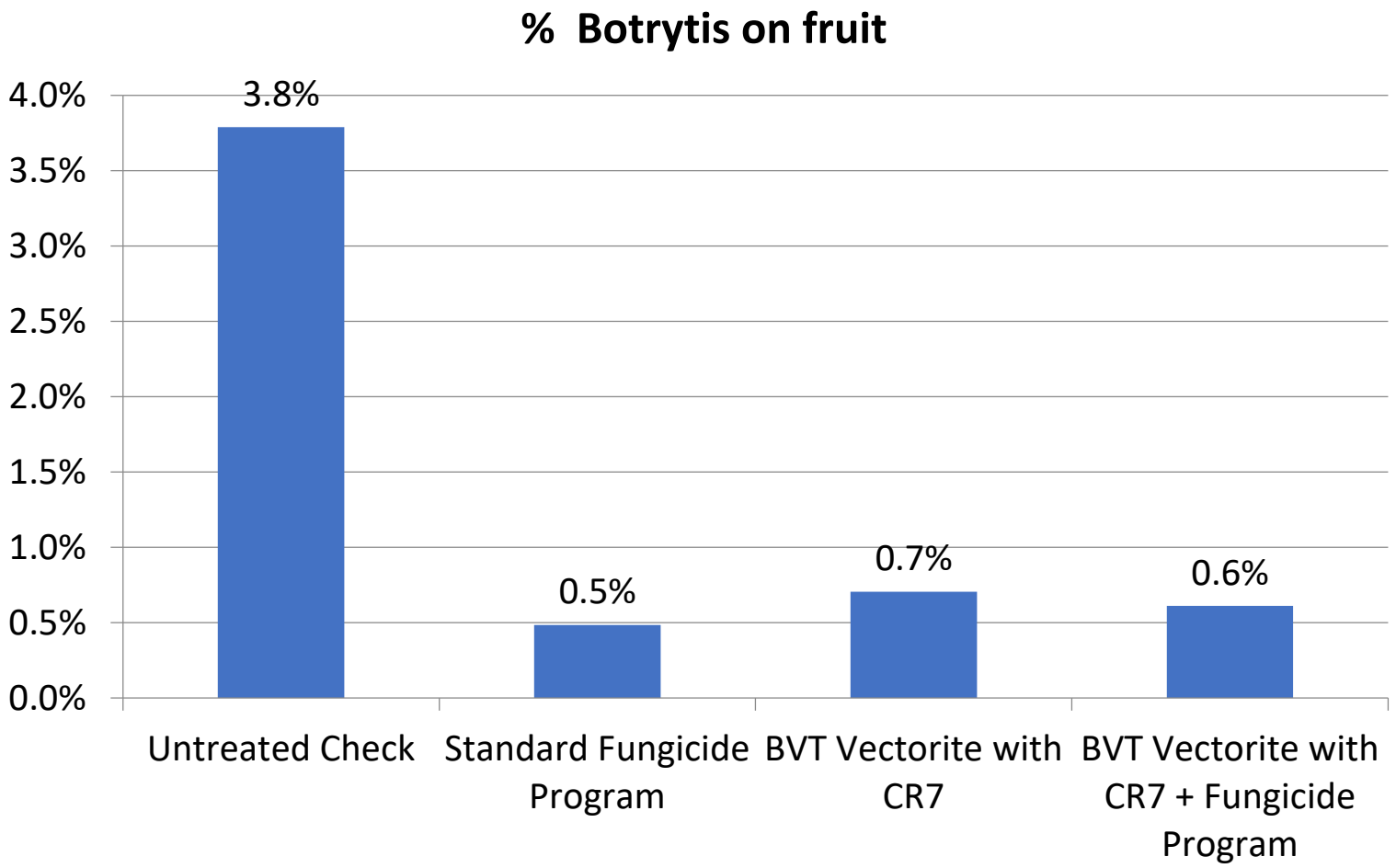


Incidence: all tomatoes in UTC and BVT-CR-7 showed symptoms after 10 days storage

Cherry Tomato – Post harvest

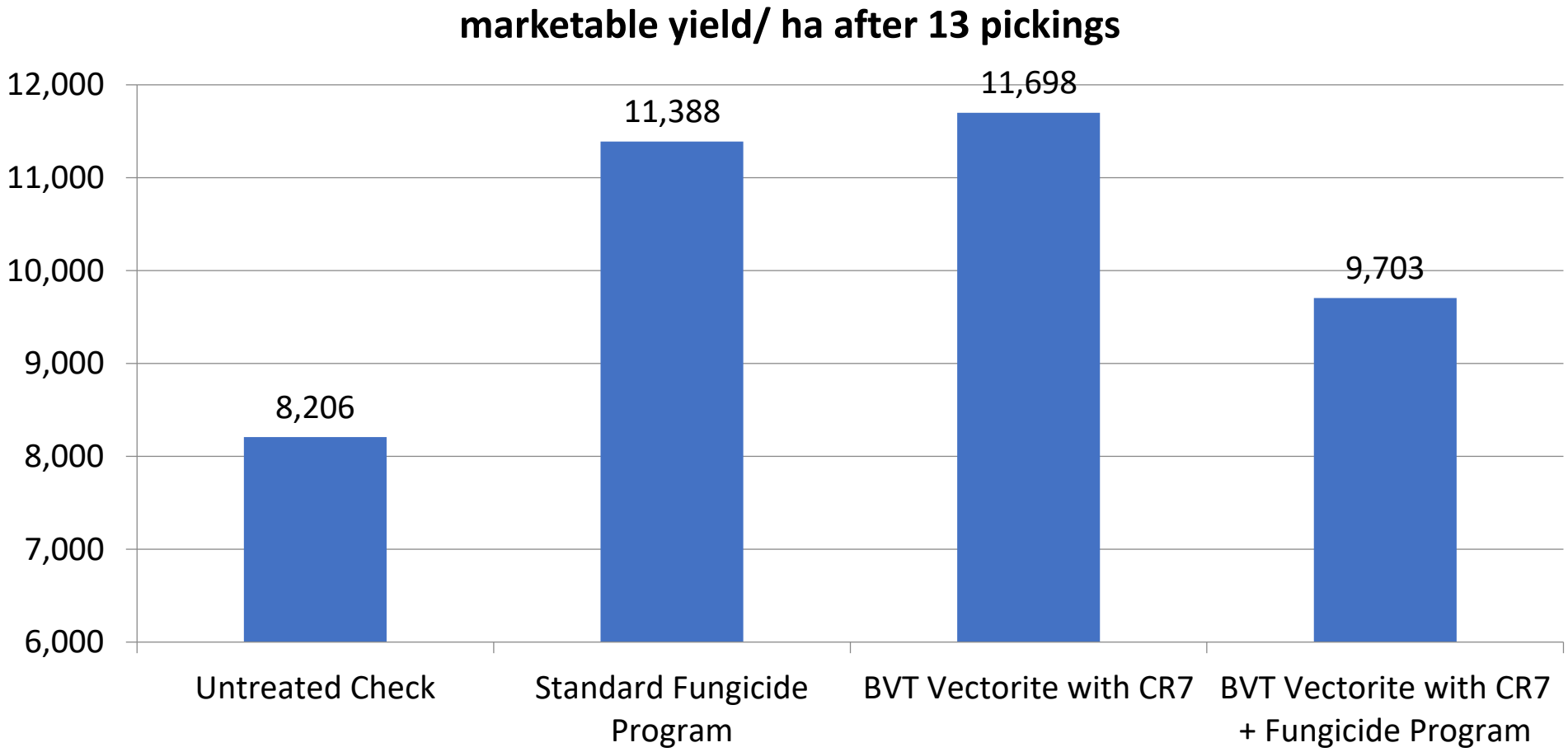


BVT-CR-7 vectored by bumble bees: equivalent control of Botrytis on strawberries



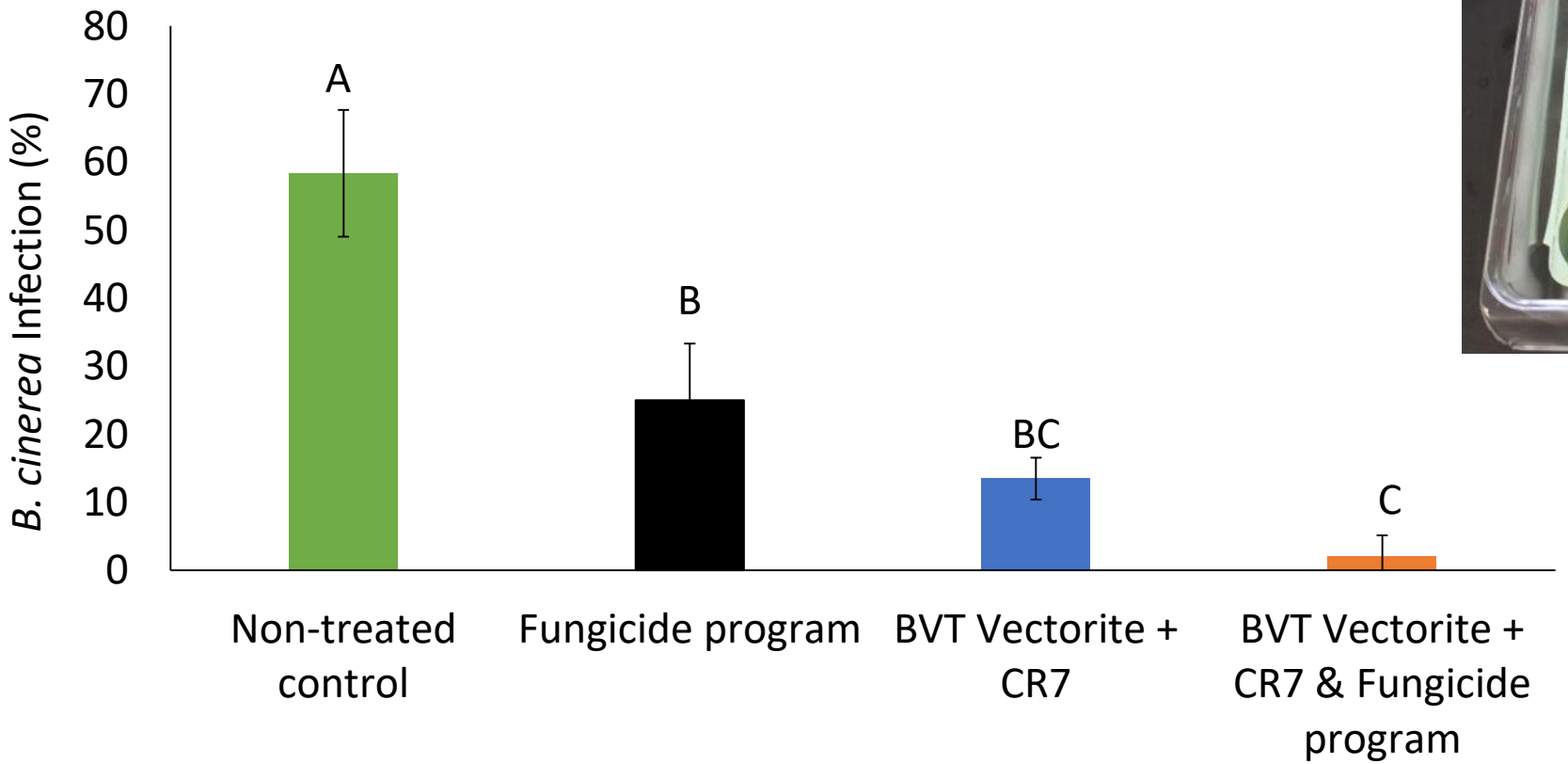
Average visual assessment of Botrytis incidence over 13 harvests

BVT-CR-7 vectored by bees: enhancing yield in strawberries



Strawberry- Storage (rating during 4 consecutive days) enhancing shelf life

State University of Florida



Uses of *Clonostachys rosea*

C.rosea is effective against the following diseases:

- *Botrytis* – Gray Mold
- *Sclerotinia*- white mold
- *Monilinia*- brown rot
- *Rhizopus*- red leak
- *Alternaria*- early blight
- *Phomopsis*
- *Anthracnose*

And more…

- **Bee Vectoring** – Delivery to crops via managed pollinator colonies for targeted control of necrotrophic diseases
  - *Botrytis, Sclerotinia, Monilinia*

Focus of BVT

- **Foliar spray** – Formulations for conventional application methods for broad bio-fungicidal use
  - MRL exempt (residue-free), resistance management, 0-day pre-harvest interval, no re-entry interval
  - Endophyte
- **Seed treatment and root disease control** – Formulation for seed coatings for plant growth promotion and root disease control
  - Endophyte
  - Early emergence; plant vigor

Exploited via Third Parties

BVT Bee Vectoring Technology™

2 delivery Systems To Meet Unique Grower and Crop Needs

Bumble bees, with current channel of distribution -mostly indoors

Bumblebee hive lid designed to incorporate dispenser tray

Removable tray with Vectorite™ powder and plant treatment agent

Bees walk across the tray, pick up plant treatment, exit hive, and deliver it to the plant

- Larger insects with greater carrying capacity
- Generally better fliers in cold/damp weather
- Existing market structure (commercial bumble bee production)
- Simpler “passive” mechanical system

Honeybees, all outdoors larger crops

- Much larger hives (20,000 vs 300)
- Greater coverage (acres) per hive
- Electro-mechanical system; could include hive health monitoring
- 4.2 million hives in USA alone

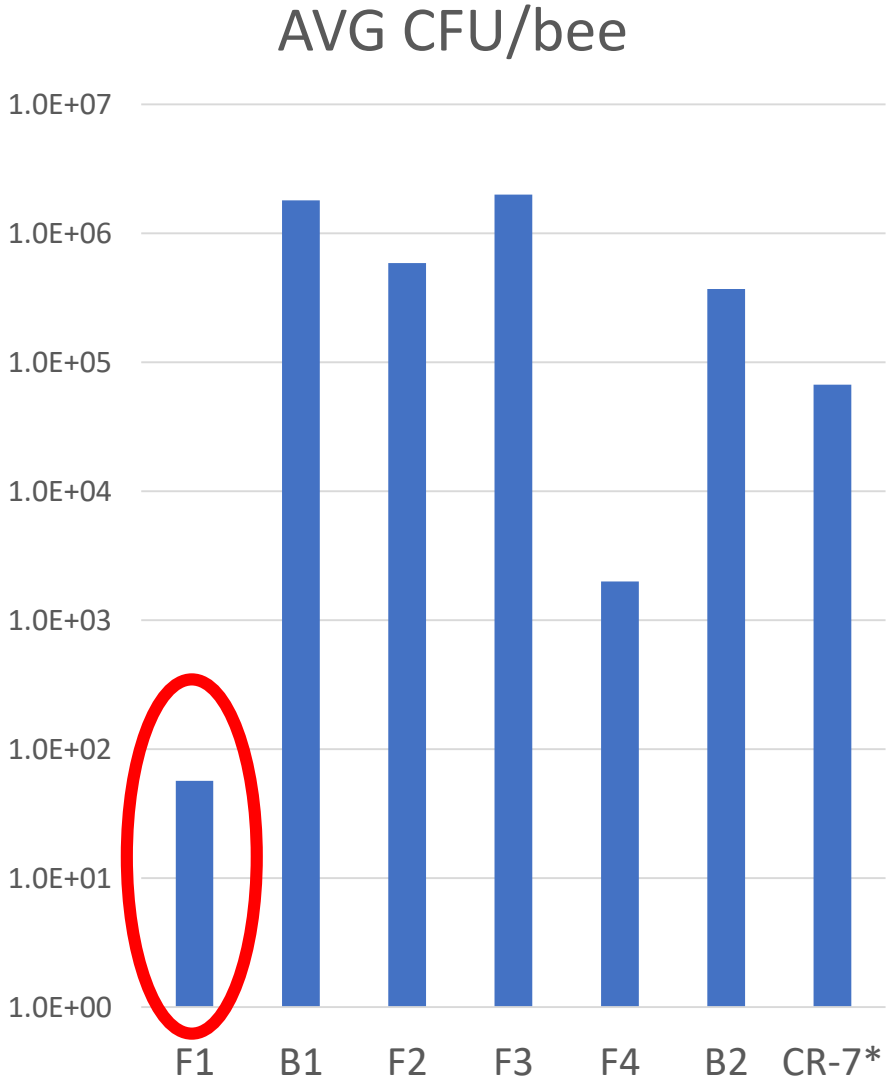
BVT Bee Vectoring Technology™

Where from here: extending to biologicals and bioagents for other targets

CR-7 Compatibility

F = Fungus; B = Bacteria

Product	CR-7 Recoverability (%)	Compatibility level
Water Control	0	
BVT CR-7 Spray	83	
F1	17	low
B1	33	moderate
F2	50	moderate
F3	100	high
F4a	83	high
F4b	67	high
B2	50	moderate



Ag-Biologicals: A major opportunity to reduce Chemicals

Market Drivers Favor Ag-Biologicals

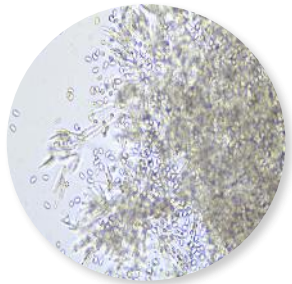
On Farm

- ✓ Growers need higher yields
- ✓ New sustainable tools
- ✓ Reductions in chemicals

Beyond Farm

- ✓ Increasing regulatory hurdles (new chemical pesticide can cost $500million to develop)
- ✓ Consumer demand for “Safe” food with no residues
- ✓ Food Chain / Retailers need transparency

Benefits of Ag-Biologicals



- ✓ **No chemical residues**
  - Meets global trade needs and secondary standards of retailers
- ✓ **Enhance yield and quality**
  - Improved plant vigor; help manage biotic and abiotic stresses
- ✓ **Resistance management**
  - New modes of action minimize development of resistance
- ✓ **Inherently less toxic than conventional pesticides**
  - Short re-entry and post harvest intervals gives flexibility

$50BN Chemical Pesticide Industry Being Eroded and Replaced by Ag-Biologicals

BVT: A Novel Disruptive Crop Production Tool

BVT System

Biologicals

An Alternative to Chemicals

+

Bee Vectoring

An Alternative to Spraying

Better Crops

Higher yields

Better quality

Longer shelf-life

+

Less chemicals

Less water

Less machinery

Reduced Impact

Savings:

- Water: 2500 – 5000 liters + per hectare
- Diesel: 10 – 20 liters or more per hectare

All-Natural System: Pollination + Crop Protection + Crop Enhancement

Bee Vectoring: A great Alternative to Spraying

Bee Vectoring: **Use of commercial bees to deliver natural control agents to flowering crops to manage key crop diseases and pests and enhance quality and yields of crops**

115 crops worldwide; 85 require pollination

Bees contribute to 1/3 of food in human diet

80+ million honey beehives globally; 5 million bumblebee hives grown every year

Rationale for Vectoring:

- Same principles as natural pollination
- The flower is the primary portal of entry for many diseases & insects
- Flowers are the best place for the active ingredient to inoculate the plant

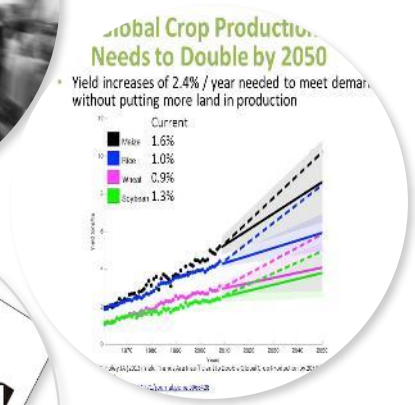
Benefits of Vectoring:

- Substantially minimizes waste of control agent; no water
- Continual delivery throughout the bloom period (spraying can miss blooms)
- Additional yield, residue & quality benefits from improved pollination

BVT Bee Vectoring Technology™

Confluence of Pressures to *Sustainably* Feed the World

Growers are using Ag-Biologicals* at a growing rate at expense of current $50 Billion pesticide industry



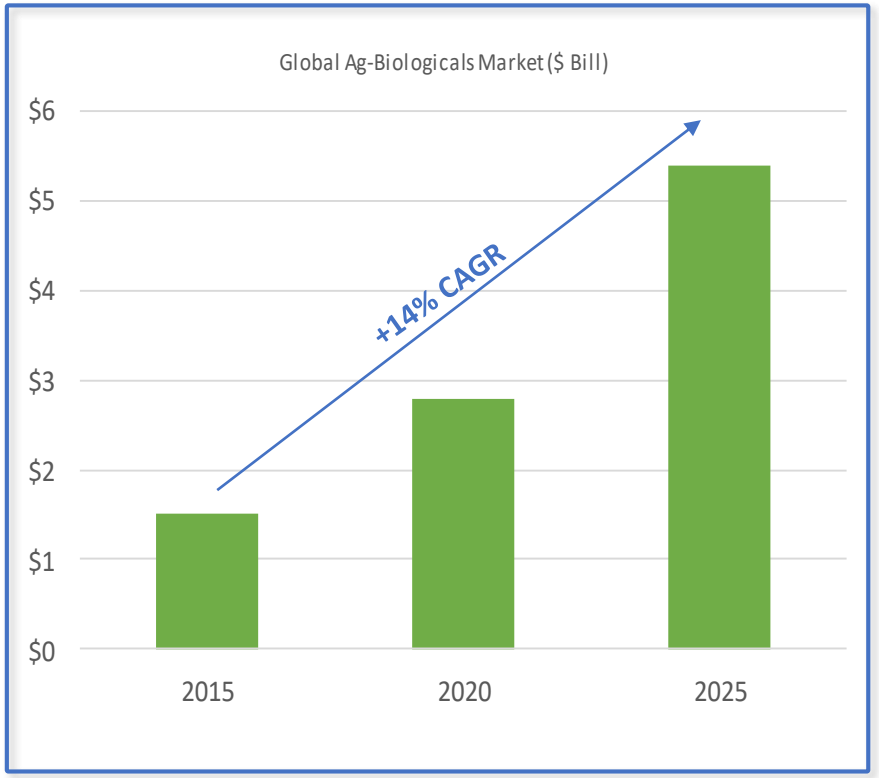
World population ~10bill by 2050

Crop productivity needs to Double

Use of chemicals being limited or banned

Consumers are looking for safe, healthy food with less chemicals

Growth in Use of Ag-Biologicals*



** Products derived from natural sources used to increased crop productivity*

Bee Vectoring Technologies

Mission: **To integrate innovative technologies to produce healthy food with environmentally-responsible practices that improve grower profits, benefit human consumption, and safeguard the Earth by protecting crops in the most efficient and targeted way.**

Founded in 2012 to pioneer disruptive sustainable crop production tools

- Use commercial bees to deliver plant treatment agents to crops
- System developed and optimized over 20+ years
- 60+ patent applications worldwide (40+ granted, 20+ pending, in 37 key countries) in 5 technology areas

Superior Value Proposition

- Biopesticide controls key diseases, therefore less chemicals, sustainable crops, more profits for farmers
- Field trials and grower demos consistently showing higher yields, beating chemicals
- 100% natural (no synthetic or genetic changes) beneficial system that reduces impact on environment

BVT Today

- In rapid commercialization phase: regulatory process completed; year over year demos & trials with exceptional results completed; customers seeking BVT out
- Building partnerships with global agri-businesses
- Proven exceptional technology production facility can support > $20+Mill annual sales; easy to expand

BVT Bee Vectoring Technology™

Thanks / Contact Details

- ✓ Bumble and honeybees effectively deliver bioagents to the flowers in crops
- ✓ The BVT System is a sustainable and disruptive crop production tool
  - ✓ Proven to manage Botrytis and improve shelf life; increase yields; enhance crops
  - ✓ Highly suitable for IPM
- ✓ Proprietary system – simple and effective
  - ✓ Platform that is scalable

Contact Info

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