



## BioCeres® WP AzaGuard®

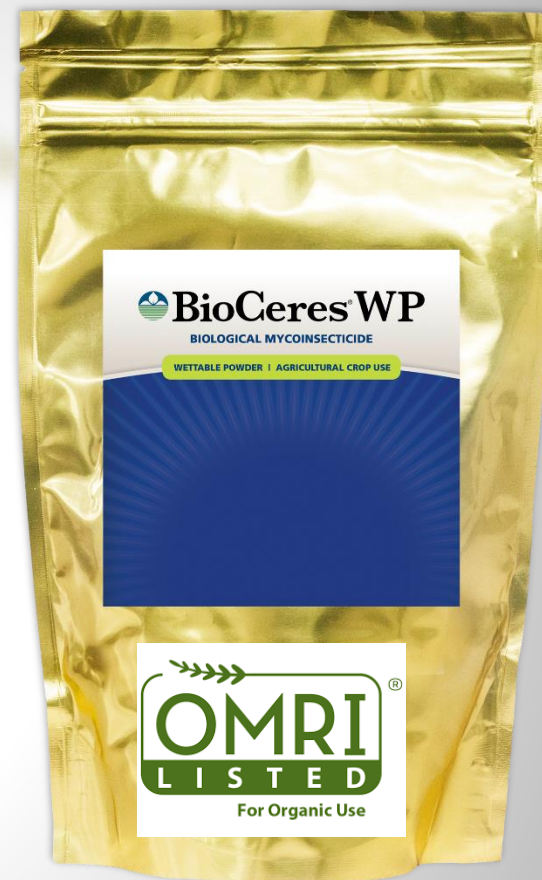
IR-4 Bio-Pesticide Workshop, 2016

**Presented by: Manuel Campos**

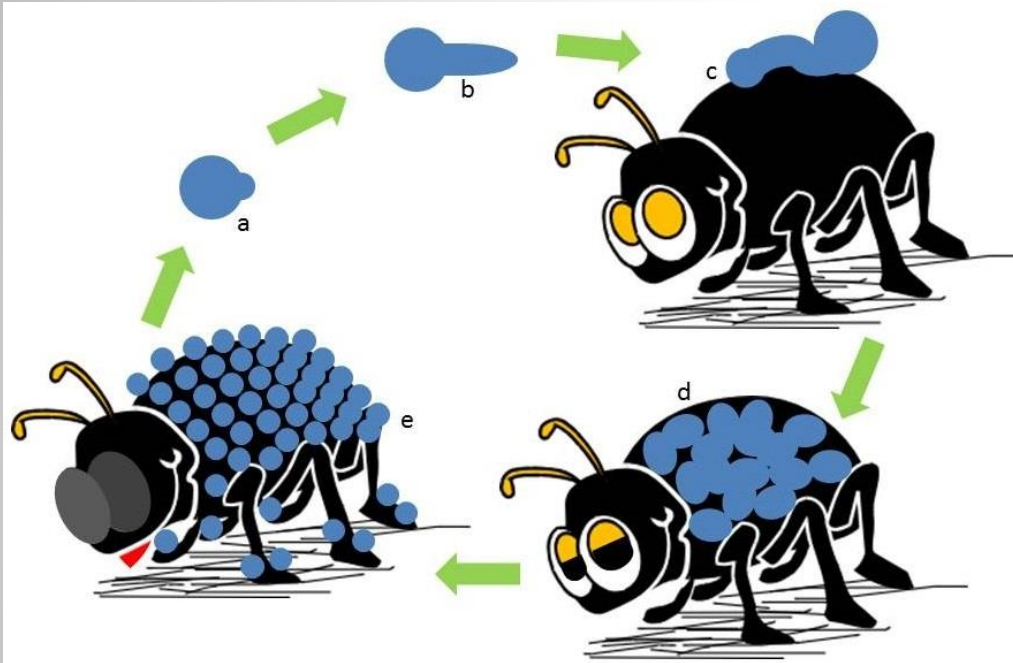


## BioCeres WP

- **Active Ingredient:** *Beauveria bassiana* strain-ANT-03-20.0% w/w
- Shelf Life: 6 months
- Environmental Hazards: Do not apply while **bees** or **pollinating insects** are actively foraging.
- 1.0–3.0 lbs./acre for most crops ground apps: At least 50 Gallons of solution/A. Ensure thorough coverage of plant foliage but not to run off.
- Spray Interval: 5-7 days as needed
- Pre-Harvest Interval (PHI): 0 (Zero) Days
- Can be applied by air.



# Mode of Action (MoA) or Infection



**Mode of infection of entomopathogenic fungi.** Conidial spore (a) in the formulation or discharged from an infected cadaver germinates and produces a germ tube (b). It produces an appressorium (c) on insect cuticle when it finds an ideal penetration site. Upon successful entry into the host body, it divides and produces hyphal bodies and invades the host tissues (d). Fungus emerges from the dead host and produces more conidial spores (e).

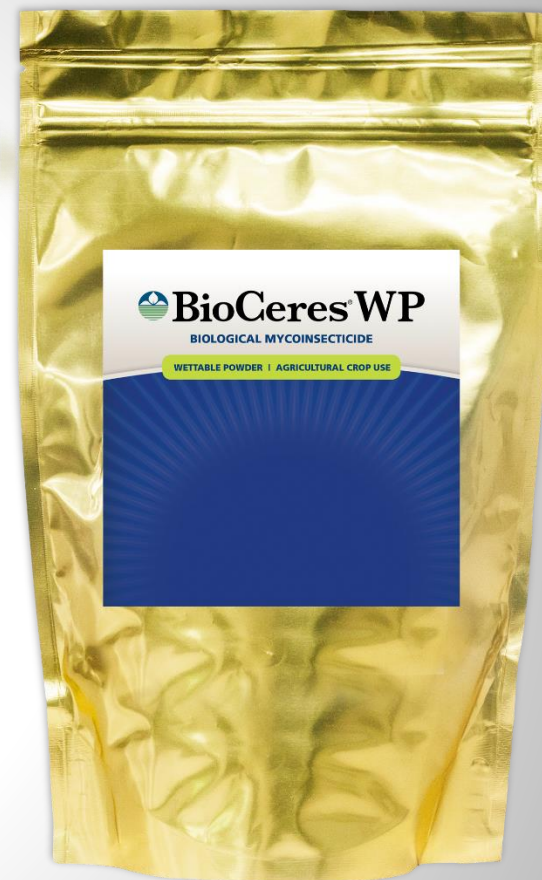
(Picture Courtesy: Surendra Dara, UCCE)



**Western tarnished plant bug infected by  
*Beauveria bassiana*  
(Picture Courtesy: Surendra Dara, UCCE)**

## Efficacy Studies

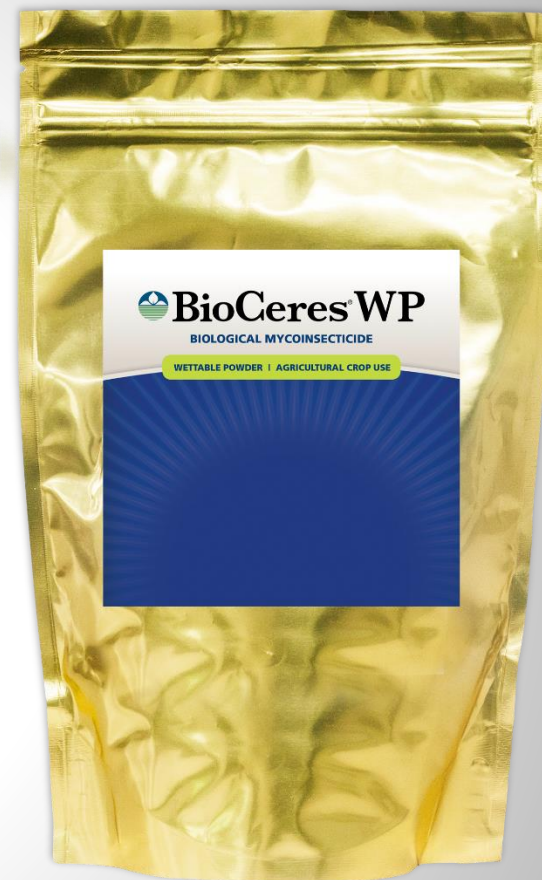
CROP	PEST	INSECT STAGE	Efficacy (%)
Field lettuce in cages	Tarnished Plant Bug	adult	98.4-99.5
GH cucumber	Stripped cucumber beetle	adult	56.7-64.3
GH cucumber	Tarnished Plant Bug	adult	71.0-82.3
GH tomato	White fly	adult, nymph	67.0-88.9
GH tomato	White fly	adult, nymph	82.8-93.7
GH tomato	White fly	adult, nymph	78.9-82.1
GH cucumber	Thrips	adult, nymph	62.6-95.7
GH cucumber	Thrips	adult, nymph	59.7-81.7
GH cucumber	Thrips	adult, nymph	64.9-72.0





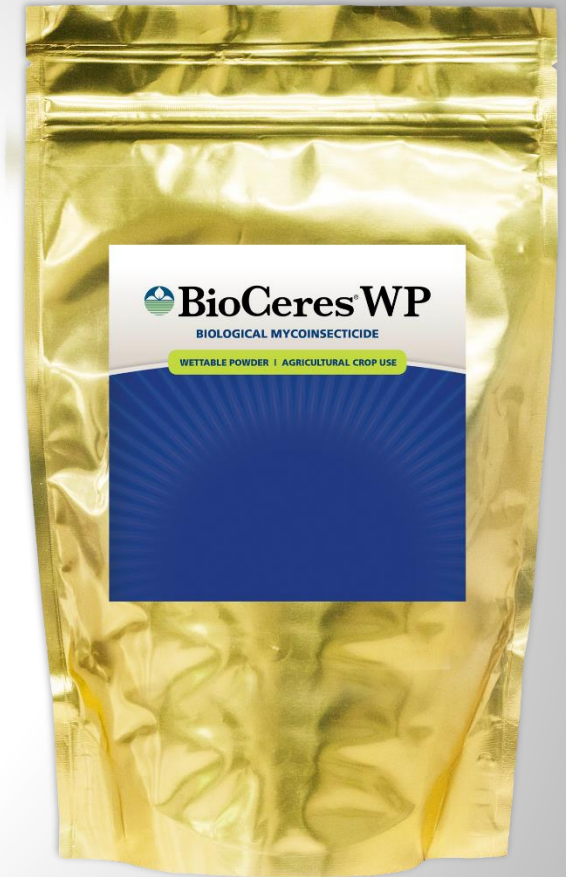
# Efficacy Studies

CROP	PEST	INSECT STAGE	Efficacy (%)
GH Ornamentals: Dahlia	Aphids	adult/nymph	82.9
GH Ornamentals: Dahlia	White fly	adult/nymph	76.5
GH Ornamentals: Dahlia	Thrips	adult/nymph	81.7
GH Ornamentals: Lysinachia	Aphids	adult/nymph	100.0
GH Ornamentals: Lysinachia	White fly	adult/nymph	100.0
GH Ornamentals: Lysinachia	Thrips	adult/nymph	90.0
GH Ornamentals: Lysinachia	Spider mites	adult/nymph	90.9
GH Ornamentals: Fuschia	Mealy bugs	adult/nymph	100
Turfgrass	Chinch bug	adult/nymph	84.2
Strawberry (in tunnels)	Tarnished Plant Bug	adult	62-92
Strawberry (in tunnels)	Tarnished Plant Bug	nymph	73-100



# Efficacy Studies

CROP	PEST	INSECT STAGE	Efficacy (%)
Turfgrass	Chinch bug	adult/nymph	82.2
Turfgrass	White grubs	larvae	75.6
Turfgrass	White grubs	larvae	78.5
Turfgrass	White grubs	larvae	85.4
Turfgrass Colonized seeds	White grubs	larvae	81.9
Lab tests	Plum curculio weevil	adult	60-80
Lab tests	M. sanguinipes grasshopper	adult	83-100
Field Bok-choy	Cabbage maggot	larvae	42.9 more than Coragen



## *Insects and Crops on Current Label*

✓ **Aphids**

✓ **Bud Weevil**

✓ **European Corn Borer**

✓ **Plant Bugs**

✓ **Thrips**

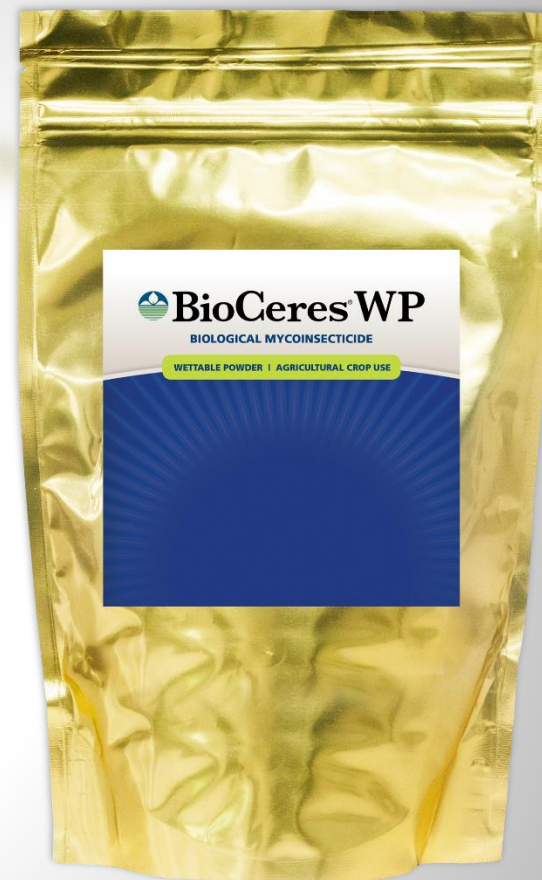
✓ **Whiteflies**

✓ **Spotted Wing Drosophila**

✓ **Striped Cucumber Beetle**

Efficacy studies (>75%)

- Forage Crops, Berries
- Leafy and Bulb Vegetables
- Cereal Grains, Citrus
- Cucurbits, Grapes
- **Fruiting Vegetables**
- **Greenhouse Vegetables and Ornamentals**
- Shade and Ornamental Trees
- Herbs and Spices
- Root and Tuber Vegetables
- Legumes, **Strawberry**
- Pome Fruit (Apples, Pears etc.)
- Stone Fruits
- Tree Nuts and Pistachios
- Tropical and Sub-Tropical Fruit



Effective on Variety of Insect Pests	
Physical	Dark brown liquid with pungent odor
Active Ingredient	3.0% EC Azadirachtin "Strain A"
Other Constituents	Azadirachtins B-K, Salanin, Nimbin, Nimbidin, Meliantriol
pH	3.0
Specific Gravity	1.04
Mode of Action	Insect growth regulator, anti-feedant and oviposition (egg-laying) inhibitor

**Environmental Safe**





# Insect Pests and Nematodes

Insect Pests		
Aphids	Beetles	Worm (Bud, Cut, Army)
Fungus Gnats	Leaf Hoppers	Leaf Miners
Lepidopterans	Loopers	Mushroom Flies
Saw Flies	Thrips	Whiteflies
Nematodes		
Root-Knot	Dagger	Golden

Applications
Indoor / Outdoor Food Crops
Ornamental Greenhouse/Nursery
Turfgrass
Trees and Ornamentals
Packing houses



# Efficacy Studies

Insect Pest	Host/Category
Silverleaf Whitefly	Cabbage
Diamondback Moth	Broccoli
Leafminer, Fungal Gnats	Greenhouse
Thrips, Aphids	Greenhouse
Gypsy Moth	Nursery/Forest
Mushroom Fly	Mushrooms
Army Worms, Thrips, Mealybugs	Field Crops
Colorado Potato Beetle	Potatoes
Caterpillars, Clover Mite, Cucumber Beetle	Vegetables



# IR-4 Bio-Pesticide Research Requests

CROP	PEST	PR#
All Crops	Brown Marmorated Stink Bug	B00029 B00028
Avocado	Asian Ambrosia Beetle	B00035 B00034
Citrus	Asian Citrus Psyllid	B00086
Coffee	Coffee Borer	B00159
Potato	Colorado Potato Beetle	B00093
All Crops	Chili Thrips	B00023
All Crops	Whitefly Q	B00022
Potato	Potato Leafhopper	B00105
All crops	Spotted wing drosophila	B00026
Apple	Insects	B00091



And more...

 **BioSafe Systems**  
Simply Sustainable. Always Effective.

## *Interest for IR4 trials*

- **BioCeres and AzaGuard are different from other formulations since they are formulated with different strains.**
- **We look for suitable combinations for better insect control.**





*Thank You!*



**We want to thank to IR4 Manager Dr. Michael Braverman for the invitation to participate in this Biopesticide Workshop.**

**Also, to Dr. Vijay Choppakatla for providing info for this presentation**



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