Bacillus mycoides isolate J (BmJ)

Biological Plant Activator

Brett Highland, PhD.
Field Development Manager Eastern US, Certis USA, Savannah, GA

2017 Agrow Award for Best New Biological Product

2017 2nd place Blum Award, ABIM, Basil Switzerland.
• **Worlds first** Biological Plant Activator who’s active ingredient is microbial in origin. (*Bacillus mycoides* isolate J)

• Mode of action-Systemic acquired resistance mechanism, similar to Actigard

• No direct adverse affect on pathogens.
• Stability similar to Bt WDG’s *(2 – 3 years if kept dry).*
• **Compatible** with fungicides, insecticides, **fertilizers**.
• **Most coppers** are OK for tank mixing.
• “Normal” commercial use rate vegetables, **1-2 oz./acre, range 1-4.5 oz./acre**.
• Apply **before infection** occurs.
• **NOP and OMRI approved, 0 PHI, 4 hr. REI**
• **No phytotoxicity** or yield reduction detected.
• Takes about **3 hrs.** for plants to become induced.
• New unique **FRAC group- P6**
<table>
<thead>
<tr>
<th>CROPS</th>
<th>DISEASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almonds</td>
<td><em>Alternaria</em> leaf spot</td>
</tr>
<tr>
<td><strong>Carrots</strong></td>
<td><em>Alternaria</em> leaf blight <em>(Early blight)</em></td>
</tr>
<tr>
<td>Citrus</td>
<td>Citrus canker</td>
</tr>
<tr>
<td>Cole crops</td>
<td>Downy mildew</td>
</tr>
<tr>
<td>Cucurbits</td>
<td>Anthracnose, Powdery mildew, Downy mildew, Gummy stem blight</td>
</tr>
<tr>
<td>Fruiting veg</td>
<td>Bacterial spot &amp; speck, Early blight, Gray mold, Late blight</td>
</tr>
<tr>
<td>Grapes</td>
<td>Downy mildew</td>
</tr>
<tr>
<td><strong>Lettuce</strong></td>
<td>Downy mildew, Powdery mildew, <em>Cladosporium and Stemphylium</em> leaf spots</td>
</tr>
<tr>
<td>Legumes</td>
<td>White Mold</td>
</tr>
<tr>
<td>Pecans</td>
<td>Pecan scab</td>
</tr>
<tr>
<td>Pome fruit</td>
<td>Fire blight</td>
</tr>
<tr>
<td>Potatoes</td>
<td>Early blight, late blight, White mold, <em>Potato virus Y</em> (seed potatoes)</td>
</tr>
<tr>
<td>Spinach</td>
<td>Downy mildew, Leaf spots <em>(Cladosporium, Stemphylium)</em></td>
</tr>
<tr>
<td>Sugar beets, Garden (table) beets</td>
<td><em>Cercospora</em> leaf spot</td>
</tr>
<tr>
<td><strong>Tobacco</strong></td>
<td>Blue mold</td>
</tr>
</tbody>
</table>
• **Beauvaria bassiana** Strain GHA
  (Currently also available as BotiniGard®ES from Bioworks Inc.)
• MOA, direct parasite of insects and mites
• Conidia, contains $2 \times 10^{13}$ spores per quart
• 11.3% ES formulation
• Storage between 40 - 85°F, do not freeze
• 4hr REI and 0 day PHI.

Mycosis in whitefly nymphs after treatment with **Beauveria bassiana** strain.
Now sold by Certis USA for outdoor agriculture, Registered Q1 2018.
Labeled Pests Include: Whitefly, aphids, thrips, psyllids, mealybugs,
leaf/planthoppers, stem boring Leps., leaf-feeding beetles, Scarab beetles, plant bugs,
Orthoptera, spider mites.
Registration on: Vegetables, fruits & berries, tree nuts, agronomic crops, herbs &
spices.
NOP and OMRI approved.

Use Rates and Application
• Application rates of ¼ to 1 quart per acre.
• Ground (5-100 gpa), chemigation and aerial applications
• No spreading agents needed.

Tank mix compatibility
• Can be tank mixed with most insecticides and surfactants.
• Cannot be tank mixed with most fungicides

Mycosis in twospotted spider mite six days after treatment with Beauveria bassiana strain.
AgriPhage - Tomato Spot and Speck

- *Xanthomonas campestris vesicatoria* (XCV)
- *Pseudomonas syringae* tomato (PST)
- Manufactured by Omnilytics, Inc.
- It is an 8 phage mixture, and also with the phage of *Xanthomonas gardneri* added in 2018
- Effective phage titers persist on the leaf surface for 3-5 days.
- In the presence of active lesions, phage will persist for 10 days+
- No phytotoxicity
• Field Rate: 1-2 pints per acre, usual timing 1-2 applications per week
• Apply as a preventive to tomatoes or peppers.
• Apply in the field with conventional ground spray equipment or via aerial application.
• In the greenhouse, apply as a foliar spray or by fogging.
• Water pH: best if 6.5-9
• Storage, do not exceed 90 deg. F, store if possible in cool conditions.
• Can be mixed with most insecticides, fungicides, fertilizers. Cannot be mixed with copper fungicides (consult compatibility lists, CertisUSA)
• Residue exempt, 4 HRI, 0 PHI, NOP approved
• AgriPhage Tomato Canker
  • *Clavibacter michiganensis michiganensis* (CMM)
    • Systemic, internal disease. Phages cross root barrier for systemic control.
    • Common pest in *greenhouses* in the U.S. and Canada.
    • Primary disease in shade grown *field* tomatoes in Mexico.
    • Can be an important pest in field grown tomatoes in the US.
New Phage Products Soon to be Introduced

- AgriPhage for fire blight, pome fruit, *Erwinia amylovora*
- AgriPhage for citrus canker, *Xanthomonas axonopodis citri*
- Both expected to be labelled by 1st Q 2019
• **Polyoxin D zinc salt** (5% Suspension Concentrate)

• Naturally derived from *Streptomyces* sp.

• Broad spectrum chitin synthase inhibitor, prevents fungal cell wall formation.

• Best when used preventatively, usually on a 7-14 day schedule.

• Application rates: **6.5 - 13 fluid ounces/acre**

• 4 hr. REI, 0 days to harvest (exempt from residue tolerance)

• Minimum PPE requirement:
  - Long-sleeved shirt, long pants, socks, shoes, chemical-resistant gloves.

• Broad tank mix compatibility.
Important Crops registered:
- Fruits: Berries, Pome, Stone, Citrus
- Vegetables: Fruiting, Cucurbit, Leafy, Bulb, Brassica, Legume
- Herbs & Spices

Key Target diseases/pathogens:
- Monilinia
- Powdery mildew, downy mildew, white rust (spinach)*
- Botrytis
- Anthracnose
- Mummy berry
- Pome fruit summer diseases and fruit rots*

**Organic use:**
- Favorable NOSB recommendation; NOP approval anticipated Jan. 2019
- WSDA application submitted; approval anticipated 1Q-2019

(* not labeled at this time)
Homeplate (Ho6) Non-Selective Herbicide

- 80% Fatty acid (combo of caprylic and capric fatty acids). Highest concentration in the market.
- EPA label approved August, 2018.
- OMRI, NOP & Residue Exempt.
- Full crop label.
- Pre-plant, in season and desiccant label language.
• Kocide 3000 – O was registered February of 2017.
• NOP approved for organic production.
• Registered for use on vegetables, tree and small fruit crops, vine crops, and others, for a variety of fungal and bacterial diseases.
• Formulation delivers a maximum amount of biologically active copper at low rates.
• Same label as Kocide 3000.
• Certis still selling:
Questions or Comments. Thank you!

H. Brett Highland, PhD.
Certis USA, Field Development Manager,
Southern US
bhighland@certisusa.com
912.335.1835 Off.
941.492.1243 Cell

Or Visit www.certisusa.com