Biopesticides for Managing Diseases in US Vegetable Crops

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Vegetable Diseases - Biopesticides - Current Usage

Products in Greatest Use:
Phosphorous acid fungicides
Oxidate (new - Rendition)
Contans
Regalia
Trilogy + other botanical oils
Actinovate
SoilGard
DoubleNickel
Serenade Optimum
Serenade Soil
### Vegetable Diseases - Biopesticides - Current Usage

<table>
<thead>
<tr>
<th>Products in Greatest Use</th>
<th>Other Products</th>
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<tbody>
<tr>
<td>Phosphorous acid fungicides</td>
<td>BacStop</td>
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<tr>
<td>Oxidate (new - Rendition)</td>
<td>EF400</td>
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<tr>
<td>Contans</td>
<td>Bio-Tam (aka Tenet)</td>
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<tr>
<td>Regalia</td>
<td>Companion</td>
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<tr>
<td>Trilogy + other botanical oils</td>
<td>MilStop and Kaligreen</td>
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<td>Actinovate</td>
<td>Mildew Cure</td>
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<td>SoilGard</td>
<td>MeloCon</td>
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<td>DoubleNickel</td>
<td>Mycostop</td>
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<td>Serenade Optimum</td>
<td>Organocide</td>
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<td>Serenade Soil</td>
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<td>RootShield</td>
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<td>Sonata</td>
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<td>Zonix</td>
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Marketing – Challenges + Successes

Efficacy data: adequate to convince growers?
Breadth of potential use: Sales potential
Product shelf-life
Company: large and established?
Sales pitch and incentives
Ingredient costs increase to prohibitive level
Biopesticide Labeling Issues

- Insufficient instructions for proper use
- Breadth of diseases listed unrealistic
- Marketing focus on garden use (no ag label)
Vegetable Diseases – Biopesticides
Needs + Opportunities

Diseases not effectively managed with conventional fungicides

Bacteria (black rot of crucifers, tomato bacterial speck + spot)

Soil-borne pathogens (*Phytophthora capsici*, *Verticillium*)

Nematodes

Products broadly labeled

Organic production, especially diseases that cannot be ignored and occur commonly:

Late blight, black rot of crucifers, tomato bacterial speck + spot, cucurbit mildews,

Basil downy mildew

High tunnel tomatoes: Botrytis, leaf mold, powdery mildew