What are Biologicals:
Biologicals are microorganisms and naturally occurring substances that control pests. Growers use biologicals as a fundamental part of crop protection programs for a variety of reasons such as:
- Chemical management
- New resistance strategies
- Prolonged flexibility and performance reliability

Biological crop protection offers highly targeted solutions and advanced resistant management strategies. New innovation has driven market development, and increased fungal protection on a larger scale.

BASF’s Serifel biofungicide has a unique component known as *Bacillus amyloliquefaciens MBI600* which covers a broad spectrum of disease control by setting the standard of purity and performance reliability.

What is *Bacillus amyloliquefaciens*:
*Bacillus amyloliquefaciens* is a bacterium containing active ingredients used to suppress diseases caused by fungi. The active ingredient is a spore-forming bacterium that colonizes the surface of the plants. *Bacillus amyloliquefaciens* reduces foliar fungal pathogens by reducing disease development. Serifel biofungicide manages disease organisms such as:
- Alternaria
- Botrytis
- Fusarium
- Rhizoctonia
- Powdery Mildew

*Not for sale in California.*
Serifel® Biofungicide

Serifel biofungicide is a biological fungicide that exhibits broad spectrum disease control and a novel mode of action.

- When integrated with a disease management system Serifel biofungicide provides unique solutions to address challenges in the food production value chain
- Serifel biofungicide is based on the Bacillus amyloliquefaciens (MBI600) strain covering a broad spectrum of disease control that sets the standard for quality purity and performance reliability
- The positive toxicological and environmental profile making it a flexible option for disease control
- Suppresses foliar diseases
- Protects leaf canopy

Serifel Biofungicide Foliar Applications in Grapes  | Powdery Mildew Control

<table>
<thead>
<tr>
<th>Foliar Application</th>
<th>Average Percent Severity of Powdery Mildew on Leaves 34 Days After Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vivando® fungicide 10 oz (14 day interval)</td>
<td>0.3</td>
</tr>
<tr>
<td>Elevate® 16 oz + Serifel 0.45 lb (14 day interval)</td>
<td>1.4</td>
</tr>
<tr>
<td>Serifel 0.23 lb (7–10 day interval)</td>
<td>2.7</td>
</tr>
<tr>
<td>Elevate 16 oz (14 day interval)</td>
<td>4.7</td>
</tr>
<tr>
<td>Serenade® Optimum 14 oz (7–10 day interval)</td>
<td>6.2</td>
</tr>
<tr>
<td>Untreated Check</td>
<td>20.3</td>
</tr>
</tbody>
</table>

2014, BASF Trial – Hughson, CA. 34 days after application. All treatments applied with 0.0625% induce.

Anticipated Label Use Recommendations

- Primary Use Rate: 4 oz/A. Flexibility to increase rate up to 16 oz/A.
- Maximum Rate / Season: No Maximum
- PHI: 0 Day Preharvest Interval
- REI: 4 hours
- Active Ingredient: Bacillus amyloliquefaciens

Target Crops
- Fruiting Vegetables
- Grapes
- Cucurbits
- Strawberries

Target Diseases
- Alternaria
- Fusarium
- Botrytis
- Powdery Mildew
- Rhizoctonia

Serifel Biofungicide and Merivon® Fungicide for Strawberry Botrytis Control

<table>
<thead>
<tr>
<th>Foliar Application</th>
<th>Season Average Botrytis Fruit Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luna® Tranquility 20 oz alt Serifel 0.5 lb alt Captan 80WDG 1.9 lbs</td>
<td>10.5</td>
</tr>
<tr>
<td>Merivon fungicide 8 oz alt Captan 80WDG 1.9 lbs</td>
<td>12.9</td>
</tr>
<tr>
<td>Merivon fungicide 8 oz alt Serifel 0.5 lb alt Captan 80WDG 1.9 lbs</td>
<td>13.9</td>
</tr>
<tr>
<td>Untreated Check</td>
<td>26.1</td>
</tr>
</tbody>
</table>

2014–15 Dr. Merley & Peres, U of FL. Variety = “Radiance.” Applications made weekly from Nov. 21 to Feb. 20 (14 applications). Backpack CO2 sprayer 100 GPA @ 60 psi. Biological products inserted as sprays 4, 8, 11 and 14 and Captan was 1, 5, 10 and 12. Fruit harvested Dec. 9 to Feb. 27 (23 harvests). For the Merivon fungicide alternation with Captan, Captan was used for sprays 1, 4, 5, 8, 10, 11, 12 and 14.