

## Supplemental Labeling

# Serifel®

## Biofungicide

**Serifel is an agricultural biofungicide/bactericide product for suppression of select foliar plant diseases in certain agricultural field crops.**

This supplemental labeling expires November 10<sup>th</sup>, 2018, and must not be used or distributed after this date.

### Active Ingredient:

*Bacillus amyloliquefaciens* strain MBI 600\*† ..... 9.9%

**Other Ingredients:** ..... 90.1%

**Total:** ..... 100.0%

\*Serifel contains a minimum of  $5.5 \times 10^{10}$  viable spores per gram

†Formerly named *Bacillus subtilis* strain MBI 600

### EPA Reg. No. 71840-18

#### CAUTION/PRECAUCION

#### Directions For Use

- It is a violation of federal law to use this product in a manner inconsistent with its labeling.
- The supplemental labeling and the entire **Serifel** container label, EPA Reg. No. 71840-18, must be in possession of the user at the time of application.
- Read the label affixed to the container for **Serifel** before applying.
- Use of **Serifel** according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for **Serifel**.

#### Product Information

This package contains **Serifel**, a wettable powder (WP). The active ingredient in **Serifel** is *Bacillus amyloliquefaciens* strain MBI 600, a beneficial microbe providing suppression of listed foliar plant diseases in certain agricultural field crops. Apply **Serifel** preventively in low to medium disease pressure situations. **Serifel** can be applied as a foliar spray or a directed or banded spray. **Serifel** can be applied alone or in a tank mix with other registered pesticide products, unless otherwise noted in the **Crop-Specific Directions**. Apply **Serifel** in a regularly scheduled protective spray program and use in a rotation program with other registered pest control products. Under higher disease pressure situations, **Serifel** can be tank-mixed with other registered pesticide

products.

#### Application Instructions

Apply rates of **Serifel** as instructed by the **Crop-Specific Directions**. Apply **Serifel** with ground equipment, aerial equipment or through sprinkler irrigation equipment. Equipment must be checked frequently for calibration. If heavy rainfall or irrigation occurs shortly after application, reapplication of **Serifel** may be necessary.

Under low-level disease conditions, the minimum application rates can be used while maximum application rates and shortened spray schedules are to be used for severe or threatening disease conditions. Tank mixing **Serifel** with other registered pesticide products can also improve performance.

#### Restrictions and Limitations

- **Crop Rotation Restriction** - None
- **Preharvest Interval (PHI)** – 0 Day
- **Re-entry Interval (REI)** – 4 hours
- **Not for use** in greenhouse or transplant production
- **Not for use** in California on crops marked with an asterisk (\*) in **Crop-Specific Directions**

BASF Corporation

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## Crop-Specific Directions

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<p><b>Berries and small fruits subgroups</b></p> <p><b>Bushberry subgroup</b>  Blueberry (highbush and lowbush)  Currant  Elderberry  Gooseberry  Huckleberry</p> <p><b>Caneberry subgroup</b>  Blackberry (all varieties)  Loganberry  Raspberry (black and red)  Wild raspberry</p> <p><b>Low growing berry subgroup (except strawberry)</b>  Bearberry  Bilberry  Cloudberry  Cranberry  Lingonberry  Muntries  Partridgeberry</p> <p><b>Small fruit vine climbing subgroup (except fuzzy kiwifruit and grape)</b>  Amur river grape  Gooseberry  Kiwifruit, hardy  Maypop  Schisandra berry</p>	<p><b>Foliar diseases</b></p> <p>Bacterial canker*  (<i>Pseudomonas</i> spp.)</p> <p>Powdery mildew*  (<i>Microsphaera</i> spp.)</p>	<p>4 – 16 oz/A  (0.25 – 1.0 lb/A)</p>	<p><b>For Powdery mildew</b>, begin applications prior to infection and continue on 2 - 10 day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high.</p> <p>For <b>Bacterial canker</b>, apply before fall rains and again during dormancy prior to spring growth. Apply prior to disease development and continue on 2 – 10 day intervals as needed throughout the growing season.</p> <p><b>For Cranberries</b>, make application only to non-flooded fields.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<p><b>Brassica (cole) leafy vegetables group*</b></p> <p><b>Head and stem</b>  Broccoli  Broccoli, Chinese  Brussel sprouts  Cabbage  Cabbage, Chinese  Cabbage, Chinese mustard  Cauliflower  Cavalo broccolo  Kohlrabi</p> <p><b>Leafy greens</b>  Broccoli raab  Chinese cabbage (bok choy)  Collards  Kale  Mizuna  Mustard greens  Mustard spinach  Rape greens</p>	<p><b>Foliar diseases</b></p> <p>Pin rot  (<i>Alternaria</i> spp./<i>Xanthomonas</i> spp. complex)</p>	<p>4 – 16 oz/A  (0.25 – 1.0 lb/A)</p>	<p>Begin foliar applications prior to infection and continue on 3-10 day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Crop-Specific Directions (continued)

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<b>Citrus fruit group</b> Calamondin Citrus citron Citrus hybrids Grapefruit Kumquat Lemon Lime Mandarin Orange (sour and sweet) Pummelo Satsuma Tangelo Tangerine Tangor	<b>Foliar diseases</b> Citrus canker* <i>(Xanthomonas campestris pv. citri)</i> Scab* <i>(Elsinoe fawcetti)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Citrus canker</b>, apply when environmental conditions are conducive to disease development and continue on a 7 – 14 day interval if needed.</p> <p><b>For Scab</b>, apply at the first new flush of foliage and repeat at petal fall and when fruit are ½ inch in diameter.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<b>Fruiting vegetables group</b> Eggplant Groundcherry Pepino Pepper (all varieties) Tomatillo Tomato	<b>Foliar diseases</b> Bacterial speck* <i>(Pseudomonas spp.)</i> Bacterial spot* <i>(Xanthomonas spp.)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Bacterial spot and Bacterial speck</b>, begin applications shortly after emergence or transplanting and continue on a 2 – 7 day application interval if conditions are conducive to disease development. For improved suppression of bacterial spot and speck, tank mix or rotate with labeled copper based bactericides.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<b>Grape</b>	<b>Foliar diseases</b> Botryosphaeria dieback, including Black dead arm, Botryosphaeria canker and Diplodia cane dieback* <i>(Botryosphaeria spp., Diplodia spp., Lasiodiplodia spp., Neofusicoccum spp., Dothiorella spp., and Sphaeropsis spp.)</i> Esca, Black measles* <i>(Phaeoacremonium spp., Phaeomoniella spp.)</i> Macrophoma rot* <i>(Botryosphaeria dothidea)</i> Phomopsis cane and leaf spot* <i>(Phomopsis viticola)</i> Phomopsis dieback* <i>(Phomopsis viticola)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Botryosphaeria dieback, Phomopsis dieback, and Esca</b>, apply to pruning wounds. Sanitation of pruning tools is critical.</p> <p><b>For Macrophoma rot</b>, apply to pruning wounds. Sanitation of pruning tools is critical. For foliar symptom suppression during the growing season, apply just after bloom and continue on 7 – 10 day intervals until harvest when environmental conditions are conducive for disease development.</p> <p><b>For Phomopsis cane and leaf spot</b>, begin applications between bud break and 1 inch shoots and repeat when shoots are 6-8 inches long.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Crop-Specific Directions (continued)

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<b>Leafy vegetables (except <i>Brassica</i> vegetables) group*</b> Amaranth Arugula Cardoon Celery Celery, Chinese Celtuce Chervil Chrysanthemum (edible-leaved and garland) Corn salad Cress (garden and upland) Dandelion Dock Endive Fennel, Florence Lettuce (head and leaf) Orach Parsley Purslane (garden and winter) Radicchio (red chicory) Rhubarb Spinach Spinach (New Zealand and vine) Swiss chard	<b>Foliar diseases</b> Bacterial leaf spot ( <i>Xanthomonas</i> and <i>Pseudomonas</i> spp.)	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Bacterial leaf spot</b>, begin applications prior to disease onset and continue on 2 – 10 day application intervals if conditions are conducive to disease development.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Crop-Specific Directions (continued)

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<p><b>Legume vegetables (succulent and dried beans and peas, except soybean) group*</b></p> <p>Broad bean Chickpea Guar Lablab bean Lentil Pigeon pea</p> <p><b><i>Lupinus</i> spp.</b> Grain lupin Sweet lupin White lupin</p> <p><b><i>Phaseolus</i> spp.</b> Field bean Kidney bean Lima bean Navy bean Pinto bean Tepary bean</p> <p><b><i>Pisum</i> spp.</b> English pea Field pea Garden pea Green pea</p> <p><b><i>Vigna</i> spp.</b> Adzuki bean Blackeyed pea Catjang Cowpea Crowder pea Moth bean Mung bean Rice bean Southern pea Urd bean</p>	<p><b>Foliar diseases</b></p> <p>Powdery mildew (<i>Microsphaera diffusa</i>)</p>	<p>4 – 16 oz/A (0.25 – 1.0 lb/A)</p>	<p><b>For Powdery mildew</b>, begin foliar applications prior to onset of disease and continue on 5 – 10 day intervals as needed.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Crop-Specific Directions (continued)

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<b>Pome fruit group</b>  Apple Crabapple Loquat Mayhaw Oriental pear Pear Quince	<b>Foliar diseases</b>  Alternaria blotch* ( <i>Alternaria mali</i> )  Blue mold* ( <i>Penicillium</i> spp.)  Bot rot* ( <i>Botryosphaeria dothidea</i> )  Brooks spot* ( <i>Mycosphaerella pomi</i> )  Bull's eye rot* ( <i>Neofabraea</i> spp.)  Cedar apple rust* ( <i>Gymnosporangium juniper-virginianae</i> )  Fire blight* ( <i>Erwinia amylovora</i> )  Flyspeck* ( <i>Schizothyrium pomi</i> )	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Bot rot, Brooks spot, Bull's eye rot, Cedar apple rust, and Flyspeck</b>, begin applications at pre-bloom when conditions are favorable for disease development. Repeat applications on 7-14 day intervals or as needed.</p> <p><b>For Fire blight</b>, begin applications at 1-5% bloom and repeat as needed to protect new blossoms when conditions are favorable for disease development. During rapid bloom development, apply at 2-7 day intervals when conditions are favorable for disease development. Continue application at 7-day intervals after petal fall when conditions are favorable for disease development. For improved performance, use <b>Serifel</b> in a rotational program with a registered antibiotic product.</p> <p><b>For Alternaria blotch and Blue mold</b>, begin applications prior to disease development and continue on 7-10 day intervals as needed.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<b>Stone fruit group</b>  Apricot Cherry (sweet and tart) Nectarine Peach Plum (all varieties) Plumcot Prune	<b>Foliar diseases</b>  Alternaria spot* ( <i>Alternaria alternata</i> )  Anthracnose* ( <i>Colletotrichum</i> spp.)  Bacterial canker* ( <i>Pseudomonas</i> spp.)  Bacterial spot* ( <i>Xanthomonas arboricola</i> )  Blossom blight* ( <i>Monilinia</i> spp.)  Botrytis gray mold* ( <i>Botrytis</i> spp.)  Ripe fruit rot* ( <i>Monilinia</i> spp., <i>Botrytis</i> spp., <i>Rhizopus</i> spp.)  Shot hole* ( <i>Wilsonomyces carpophilus</i> )	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Anthracnose</b>, begin applications prior to disease development when conditions are favorable for disease development and continue on 7-10 day intervals as needed.</p> <p><b>For Bacterial canker</b>, apply after harvest prior to fall rain events. Re-apply in the early spring during dormancy.</p> <p><b>For Bacterial spot</b>, begin applications at bud break and continue at 7-14 day intervals as needed until harvest. For improved performance, use <b>Serifel</b> in a rotational program with registered antibiotic and copper products. Use higher rates and shorter intervals when disease pressure is high.</p> <p><b>For Blossom blight</b>, begin applications at early bloom and continue through petal fall at 7-day intervals as needed.</p> <p><b>For all other listed diseases</b>, begin foliar applications prior to infection and continue on 7-10 day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Crop-Specific Directions (continued)

Crop	Target Diseases	Product Use Rate per Application (oz or lb of Serifel®/Acre)	Application Directions
<b>Strawberry</b>	<b>Foliar diseases</b> Angular leaf spot* <i>(Xanthomonas fragariae)</i> Leaf scorch* <i>(Diplocarpon earliana)</i> Leaf spot* <i>(Mycosphaerella fragariae)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Angular leaf spot, Leaf scorch, and Leaf spot,</b> begin foliar applications prior to infection and continue on 7-10 day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<b>Root and tuber vegetables (except sugar beet) group*</b> Potato Arracacha Arrowroot Carrot Cassava (bitter and sweet) Chayote Chinese artichoke Chufa Dasheen (taro) Edible canna Ginger Jerusalem artichoke Leren Sweet potato Tanier True yam Turmeric Yam bean	<b>Foliar diseases</b> Aerial stem rot <i>(Erwinia carotovora)</i> Bacterial leaf spot <i>(Xanthomonas campestris pv. carotae)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Bacterial leaf spot,</b> begin foliar applications shortly after emergence or transplanting and continue on 7-10 day intervals if conditions are favorable for disease development. Use the higher rate and shorter interval when disease pressure is high.</p> <p><b>For Aerial stem rot,</b> begin applications prior to disease development and continue at 7-10 day intervals as needed.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>
<b>Tree nuts group*</b> Almond Beech nut Brazil nut Butternut Cashew Chestnut Chiquapin Coconut Filbert Hickory nut Pecan Pistachio Walnut (black and English)	<b>Foliar diseases</b> Bacterial canker <i>(Pseudomonas syringae)</i> Walnut blight <i>(Xanthomonas campestris)</i>	4 – 16 oz/A (0.25 – 1.0 lb/A)	<p><b>For Bacterial canker,</b> begin applications prior to disease development and repeat at 7-10 day intervals as needed. Use the higher rate and shorter interval when disease pressure is high.</p> <p><b>For Walnut blight,</b> begin applications no later than pistillate bloom and repeat at 3-10 day intervals as needed. For improved performance, use <b>Serifel</b> in a rotational program or tank-mixed with other crop protection products labeled for use on Walnut blight. Use higher rates and shorter intervals when disease pressure is high.</p> <p>Mix and apply <b>Serifel</b> in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.</p>

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## Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above.

**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.**

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**TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BASF AND THE SELLER DISCLAIM ANY LIABILITY FOR CONSEQUENTIAL, EXEMPLARY, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.**

BASF and the Seller offer this product, and the Buyer and User accept it, subject to the foregoing **Conditions of Sale and Warranty** that may be varied only by agreement in writing signed by a duly authorized representative of BASF.

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We create chemistry