BASF
We create chemistry

Bacillus amyloliquefaciens strain MBI 600	Group	44	Fungicide

Serifel®

Biofungicide

Serifel is an agricultural biofungicide/bactericide product for suppression of plant diseases in listed crops.

OMRI LISTED
For Organic Use

Active Ingredient:

Bacillus amyloliquefaciens strain MBI 600*†	11.0%
Other Ingredients:	89.0%
Total:	100.0%

* **Serifel** contains a minimum of 5.5 x 10^{10} colony forming units per gram.
† Formerly named *Bacillus subtilis* strain MBI 600

EPA Reg. No. 71840-18 **EPA Est. No.**

KEEP OUT OF REACH OF CHILDREN

CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **First Aid**, **Precautionary Statements**, **Directions For Use**, **Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Batch Code: (Printed on Bottle)

Net Weight:

BASF Agricultural Solutions US LLC
2 TW Alexander Drive
Research Triangle Park, NC 27713

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Agricultural Solutions US LLC (hereafter "BASF") for emergency medical treatment information at 1-800-832-HELP (4357).

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION. Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Protective eyewear
- A NIOSH-approved particulate respirator with any R or P filter with NIOSH approval number prefix TC-84A; or a NIOSH-approved powered air purifying respirator with an HE filter with NIOSH approval number prefix TC-21C. (Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.)

Follow the manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

For terrestrial uses, **DO NOT** apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment washwater or rinsate.

Directions For Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling. **DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval (REI). The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **12 hours**.

EXCEPTION: If the product is soil injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas (that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water) is:

- Coveralls
- Chemical-resistant gloves (made of any waterproof material)
- Shoes plus socks
- Protective eyewear

STORAGE AND DISPOSAL

DO NOT contaminate water, food, or feed by storage or disposal.

Pesticide Storage

Store in a cool, dry place until used. **DO NOT** store this product near food, feed, seed, fertilizers, or other pesticides.

Pesticide Disposal

To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

Container Handling

Nonrefillable Container. DO NOT reuse or refill this container. Clean container promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. **DO NOT** burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

In Case of Emergency

In case of large-scale spill of this product, call:

- CHEMTREC 1-800-424-9300
- BASF 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF 1-800-832-HELP (4357)

Product Information

This package contains **Serifel® biofungicide**, a wettable powder (WP). The active ingredient in **Serifel** is *Bacillus amyloliquefaciens* strain MBI 600, a beneficial microbe providing suppression of listed foliar and soilborne plant diseases. Apply **Serifel** preventively in low to medium disease pressure situations. **Serifel** can be applied as a foliar spray, a directed or banded spray, a soil or plant drench, as an in-furrow application, or through chemigation. **Serifel** can be applied alone or in a tank mix with other registered pest control products, unless otherwise noted in **Table 2. Crop-specific Directions**. Apply **Serifel** in a regularly scheduled protective spray program and use in a rotation program with other registered pesticide products. Under higher disease pressure situations, **Serifel** can be tank mixed with other registered pesticide products.

Label statement required by the State of Oregon

Information regarding the contents and levels of metals in this product is available on the Internet at http://www.aapfco.org/metals.html

Integrated Pest Management (IPM)

Serifel can be integrated into an overall disease and pest management program. Follow cultural practices known to reduce disease development. Consult your local extension specialist, certified crop advisor and/or BASF representative for additional IPM strategies established for your area. **Serifel** may be used in agricultural extension advisory (disease forecasting) programs, which recommend application timing based on environmental factors favorable for disease development.

Application Instructions

Apply rates of **Serifel** as instructed by **Table 2. Crop-specific Directions**. Apply **Serifel** with ground 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.

Cleaning Spray Equipment

Spraying equipment must be cleaned thoroughly before and after applying this product, particularly if a product with potential to injure crops was used prior to **Serifel**.

Consult BASF Representatives for additional information regarding agitation and recirculation.

Foliar Ground Applications

Apply **Serifel** in sufficient water to ensure thorough coverage of foliage, bloom, and fruit. Thorough coverage is required. Complete coverage of the stem, all the way down to the soil, is required for suppression of soilborne diseases of the stem.

Maintain agitation of product during the application process. Apply the product mixture shortly after mixing. **DO NOT** store mixed slurries of **Serifel** overnight.

In-furrow, Shanked-in, Injected or Soil Drench Applications

Apply **Serifel** as a water-based suspension alone or with other registered pest control products and fertilizers labeled for in-furrow or soil drench via standard agricultural application machinery. Prior to mixing, determine physical compatibility by mixing proportional quantities of the products in water as described in the **Compatibility Test for Tank Mix Components** section of this label. Maintain agitation of product during the application process. Apply

the product mixture shortly after mixing. **DO NOT** store mixed slurries of **Serifel® biofungicide** overnight.

For in-furrow, shanked-in, injected, or soil drench applications, mix 4 to 16 ounces by weight of **Serifel** with a water volume appropriate for the crop and application type. Use higher rates and consider mixing with other registered pesticide products when conditions favor heavy disease development.

For soil drench applications at planting for seeding or transplants, apply a spray mixture of **Serifel** with adequate water volume to thoroughly drench through the root zone.

For shanked-in and injected applications, the use of **Serifel** can be prior to planting, at planting or after planting of seed or transplants.

For in-furrow applications, apply **Serifel** as an in-furrow spray using the appropriate amount of water for the specific crop. Making a pre-slurry suspension of **Serifel** may help disperse **Serifel** and improve equipment compatibility at lower application volumes.

Table 1. Instructions for In-furrow, Shanked-in, Injected or Soil Drench Applications of Serifel

Rate Per 1000 row feet	**Serifel Rate** (ozs/A)									
(ozs product)	**12-inch rows**	**15-inch rows**	**20-inch rows**	**22-inch rows**	**30-inch rows**	**32-inch rows**	**34-inch rows**	**36-inch rows**	**38-inch rows**	**40-inch rows**
0.3	13.1	10.4	7.8	7.1	5.2	4.9	4.6	4.4	4.1	4.0
0.4	see footnote[1]	13.9	10.4	9.5	7.0	6.5	6.1	5.8	5.5	5.2
0.5	see footnote[1]	see footnote[1]	13.1	11.9	8.7	8.2	7.7	7.3	6.9	6.6
0.6	see footnote[1]	see footnote[1]	15.7	14.2	10.4	9.8	9.2	8.7	8.2	7.9
0.7	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	12.2	11.4	10.7	10.2	9.6	9.2
0.8	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	13.9	13.0	12.3	11.6	11.0	10.5
0.9	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	15.7	14.7	13.8	13.1	12.3	11.8
1.0	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	15.4	14.5	13.7	13.1
1.1	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	16.0	15.1	14.4
1.2	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	see footnote[1]	15.7

Application Directions. Use 0.3 to 1.2 ozs of **Serifel** per 1000 feet of row. Refer to this chart to determine the rate per acre. Apply at planting as an in-furrow application by directing the spray into the furrow before seed is covered.

DO NOT apply more than 16 ozs (1 lb) per acre of **Serifel**.

[1] For 40-inch rows, use a maximum of 1.2 ozs of **Serifel** per 1000 row feet.
For 36- to 38-inch rows, use a maximum of 1.1 ozs of **Serifel** per 1000 row feet.
For 34-inch rows, use a maximum of 1.0 oz of **Serifel** per 1000 row feet.
For 30- to 32-inch rows, use a maximum of 0.9 oz of **Serifel** per 1000 row feet.
For 20- to 22-inch rows, use a maximum of 0.6 oz of **Serifel** per 1000 row feet.
For 15-inch rows, use a maximum of 0.4 oz of **Serifel** per 1000 row feet.
For 12-inch rows, use a maximum of 0.3 oz of **Serifel** per 1000 row feet.

Instructions for Directed or Banded Sprays Related to Ground Applications

The application rates shown in **Table 2. Crop-specific Directions** on this label reflect the amount of product to be applied uniformly over an acre of ground on a broadcast basis. In some crops, **Serifel® biofungicide** may be used as a directed or banded spray over the rows or plant beds with the alleys or row middles left unsprayed. For such uses, reduce the labeled **Serifel** rates in proportion to the area actually sprayed. This adjustment is necessary to avoid applying the product at use rates higher than permitted according to label directions. The following formula may be used to determine the broadcast equivalent rate for doing directed or banded sprays:

$$\text{sprayed bed width} + \text{unsprayed row middles width} = \text{total row width}$$

$$\frac{\text{sprayed bed width in inches}}{\text{total row width in inches}} \times \frac{\text{broadcast rate}}{\text{treated acre}} = \frac{\text{band rate}}{\text{field acre}}$$

Example: A directed spray application will be made to 45-inch plant beds that are separated by 15-inch unsprayed row middles.

$$\text{45 inches sprayed bed width} + \text{15 inches unsprayed row middles} = \text{60 inches total row width}$$

The calculation to determine the appropriate equivalent rate of product to use for this situation based on a label broadcast rate of 4 ozs/acre follows:

$$\frac{\text{45 inches sprayed bed width}}{\text{60 inches total row width}} \times \frac{\text{4 ozs } \textbf{Serifel}}{\text{treated acre}} = \frac{\text{3 ozs } \textbf{Serifel}}{\text{field acre}}$$

Directions for Use through Sprinkler Chemigation Systems

Sprayer Preparation

Clean chemical tank and injector system thoroughly. Flush system with clean water.

Application Instructions

Apply **Serifel** at rates and timings as described in this label.

Use Precautions for Sprinkler Irrigation Applications

- Apply this product only through sprinkler (including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move) irrigation systems. **DO NOT** apply this product through any other type of irrigation system.
- Add **Serifel** to the pesticide supply tank under agitation containing sufficient water to maintain a continuous flow by the injection equipment. In continuous moving systems, inject this product-water mixture continuously, applying the labeled rate per acre for that crop.
- **DO NOT** exceed 1/2 inch (13,577 gallons) per acre. In stationary or noncontinuous moving systems, inject the product-water mixture in the last 15 to 30 minutes of each set allowing sufficient time for all of the required pesticide to be applied by all the sprinkler heads and applying the labeled rate per acre for that crop.
- **DO NOT** apply when wind speed favors drift beyond the area intended for treatment.
- Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. Thorough coverage of foliage is required for good suppression. Maintain good agitation during the entire application period.
- If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.
- The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch, which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- Allow sufficient time for pesticide to be flushed through all lines and all nozzles before turning off irrigation water.
- **DO NOT** connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
- A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of

the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Specific Instructions for Public Water Systems

1. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
2. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the flow outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
4. The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
5. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. The pesticide supply tank must be under agitation containing sufficient water to maintain a continuous flow by the injection equipment. In continuous moving systems, inject this product-water mixture continuously, applying the labeled rate per acre for that crop.
8. **DO NOT** apply when wind speed favors drift beyond the area intended for treatment.

Additives and Tank Mixing Information

Serifel® biofungicide can be tank mixed with most recommended registered pest control products, liquid fertilizers, biological control products, adjuvants, and additives as specified in **Table 2. Crop-specific Directions**. Before using any tank mix (bactericides, fungicides, insecticides, herbicides, liquid fertilizers, biological control products, adjuvants, and additives), test the combination on a small portion of the crop to be treated to ensure that a phytotoxic response will not occur as a result of application.

Consult a BASF representative or local agricultural authorities for more information concerning additives.

If tank mixes are used, observe the most restrictive of labeling limitations and precautions of all products used in mixtures.

Compatibility Test for Tank Mix Components

Using a suitable container, add proportional amounts of product to water following the tank mixing order below.

Tank Mix Components

1. **Water.** For 100 gallons per acre spray volume, use 16 cups (1 gallon) of water. For other spray volumes, adjust rates accordingly. Use only water from the intended source at the source temperature.
2. **Water-dispersible products** (dry flowables, wettable powders, suspension concentrates, or suspoemulsions). Cap the jar and invert 10 cycles.
3. **Water-soluble products.** Cap the jar and invert 10 cycles.
4. **Emulsifiable concentrates** (oil concentrate or methylated seed oil when applicable). Cap the jar and invert 10 cycles.
5. **Water-soluble additives.** Cap the jar and invert 10 cycles.
6. Let the solution stand for 5 minutes.

Evaluate the solution for uniformity and stability. The spray solution should not have free oil on the surface, nor fine particles that precipitate to the bottom, nor thick (clabbered) texture. Simulate tank agitation by inverting the jar for another 10 cycles to ensure that the mixture resuspends. If the tank mix combination does not settle or can be resuspended by agitation, it is considered physically compatible. **DO NOT** use any spray solution that could clog spray nozzles.

Mixing Order

1. **Water** - Begin by agitating a thoroughly clean sprayer tank 3/4 full of clean water. The pH of the spray solution must be between 4 and 9. The product mixture must be applied shortly after mixing. **DO NOT** store mixed slurries of **Serifel** overnight.
2. **Agitation** - Maintain constant agitation throughout mixing and application.
3. **Inductor** - If an inductor is used, rinse it thoroughly after each component has been added.
4. **Products in polyvinyl alcohol (PVA) bags** - Place any product contained in water-soluble PVA bags into the mixing tank. Wait until all water-soluble PVA bags have fully dissolved and the product is evenly mixed in the spray tank before continuing.

5. **Water-dispersible products** (such as **Serifel® biofungicide**, dry flowables, wettable powders, suspension concentrates, or suspoemulsions).
6. **Water-soluble products**
7. **Emulsifiable concentrates** (such as oil concentrates when applicable).
8. **Water-soluble additives** (such as ammonium sulfate (AMS) or urea ammonium nitrate (UAN) when applicable).
9. **Remaining quantity of water**

Make sure that each component is thoroughly mixed and suspended before adding tank mix partners. Maintain constant agitation during application. See **Table 2. Crop-specific Directions** for more details.

Restrictions and Limitations

- **Crop Rotation Restriction** - None
- **Preharvest Interval (PHI)** - 0 Day
- **Re-entry Interval (REI)** - 12 hours
- **Not for use** in California on crops and diseases marked with an asterisk (*) in **Table 2. Crop-specific Directions**

Table 2. Crop-specific Directions

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Alfalfa and Clover Includes alfalfa and clover mixed with forage grasses	**Foliar Diseases** White mold *(Sclerotinia sclerotiorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For White mold,** begin application shortly after emergence or transplanting and repeat on 7- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Artichoke	**Foliar Diseases** Alternaria leaf spot *(Alternaria* spp.*)* Anthracnose *(Colletotrichum* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Powdery mildew *(Leveillula taurica)* Ramularia leaf spot* *(Ramularia cynarae)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications before infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia crown rot *(Rhizoctonia solani)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Asparagus	**Foliar Diseases** Alternaria leaf spot *(Alternaria* spp.*)* Anthracnose *(Colletotrichum* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Phytophthora spear and crown rot *(Phytophthora* spp.*)* Watery soft rot *(Sclerotinia* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Berries and small fruits subgroups **Bushberry subgroup** Blueberry (highbush and lowbush) Currant Elderberry Gooseberry Huckleberry **Caneberry subgroup** Blackberry (all varieties) Loganberry Raspberry (black and red) Wild raspberry **Low growing berry subgroup (except strawberry)** Bearberry Bilberry Cloudberry Cranberry Lingonberry Muntries Partridgeberry **Small fruit vine climbing subgroup (except fuzzy kiwifruit and grape)** Amur river grape Gooseberry Kiwifruit, hardy Maypop Schisandra berry	**Foliar Diseases** Alternaria fruit rot *(Alternaria* spp.*)* Anthracnose *(Colletotrichum* spp.*)* Bacterial canker *(Pseudomonas* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Mummy berry *(Monilinia* spp.*)* Powdery mildew *(Microsphaera* spp., *Podosphaera* spp., *Sphaerotheca* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Mummy berry,** begin applications at bud break and continue on 7- to 10-day intervals as needed. **For Alternaria fruit rot, Anthracnose, Botrytis gray mold, and Powdery mildew,** begin applications prior to infection and continue on 2- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. **For Bacterial canker,** apply before fall rains and again during dormancy prior to spring growth. Apply prior to disease development and continue on 2- to 10-day intervals as needed throughout the growing season. **For Cranberries,** make application only to non-flooded fields. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
***Brassica* (cole) leafy vegetables group** **Head and stem** Broccoli Broccoli, Chinese Brussels sprouts Cabbage Cabbage, Chinese (napa) Cabbage, Chinese mustard Cauliflower Cavalo broccolo Kohlrabi **Leafy greens** Broccoli raab Cabbage, Chinese (bok choy) Collards Kale Mizuna Mustard greens Mustard spinach Rape greens	**Foliar Diseases** Alternaria leaf spot *(Alternaria* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Downy mildew *(Peronospora* spp.*)* Pin rot *(Alternaria* spp./ *Xanthomonas* spp. complex*)* Powdery mildew *(Erysiphe polygoni)* Rust *(Puccinia porri)* White rust* *(Albugo candida)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 3- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Bulb vegetables group Chive, fresh leaves Chive, Chinese, fresh leaves Daylily, bulb Elegans hosta Fritillaria, bulb Fritillaria, leaves Garlic, bulb Garlic, great-headed, bulb Garlic, serpent, bulb Kurrat Lady's leek Leek Leek, wild Lily, bulb Onion, Beltsville bunching Onion, bulb Onion, Chinese, bulb Onion, fresh Onion, green Onion, macrostem Onion, pearl Onion, potato, bulb Onion, tree, tops Onion, Welsh, tops Shallot, bulb Shallot, fresh leaves	**Foliar Diseases** Botrytis leaf blight and neck rot *(Botrytis* spp.*)* Downy mildew *(Peronospora* spp.*)* Powdery mildew *(Erysiphe* spp.*)* Purple blotch *(Alternaria porri)* Stemphylium leaf blight and stalk rot* *(Stemphylium vesicarium)* White rot *(Sclerotium cepivorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Pink root* *(Phoma* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Citrus fruit group Calamondin Citron Citrus hybrids Grapefruit Kumquat Lemon Lime Mediterranean mandarin Orange (sour and sweet) Pummelo Satsuma mandarin Tangelo Tangerine Tangor	**Foliar Diseases** Alternaria leaf spot *(Alternaria* spp.*)* Citrus canker *(Xanthomonas campestris* pv. *citri)* Greasy spot *(Mycosphaerella citri)* Melanose *(Diaporthe citri)* Post bloom fruit drop *(Colletotrichum* spp.*)* Scab *(Elsinoe fawcettii)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Greasy spot,** begin applications at the start of each new flush of foliage and repeat for each new flush. Tank mix **Serifel** with labeled spray oil or copper-based fungicide products. **For Post bloom fruit drop,** begin applications at early bloom when conditions are favorable for disease development. Continue on 7- to 10-day intervals as needed. **For Alternaria leaf spot,** begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. **For Melanose,** begin applications at petal fall and continue on 14- to 21-day intervals as needed. **For Citrus canker,** apply when environmental conditions are conducive to disease development and continue on 7- to 14-day intervals if needed. **For Scab,** apply at the first new flush of foliage and repeat at petal fall and when fruit are 1/2 inch in diameter. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Cucurbit vegetables group Chayote Chinese waxgourd Citron melon Cucumber Gherkin Pumpkin Watermelon **Edible gourd** Chinese okra Cucuzza Hyotan ***Momordica* spp.** Balsam apple Balsam pear Bitter melon Chinese cucumber **Muskmelon** Cantaloupe Casaba Crenshaw melon Golden pershaw melon Honey balls Honeydew melon Mango melon Persian melon Pineapple melon Santa Claus melon Snake melon **Summer squash** Crookneck squash Scallop squash Straightneck squash Vegetable marrow Zucchini **Winter squash** Acorn squash Butternut squash Calabaza Hubbard squash Spaghetti squash	**Foliar Diseases** Alternaria leaf spot *(Alternaria* spp.*)* Anthracnose *(Colletotrichum* spp.*)* Downy mildew *(Pseudoperonospora* spp.*)* Gummy stem blight *(Didymella bryoniae)* Powdery mildew *(Erysiphe* spp., *Sphaerotheca* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Charcoal rot* *(Macrophomina phaseolina)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Verticillium wilt *(Verticillium* spp.*)* Vine decline* *(Monosporascus cannonballus)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Corn Field corn Popcorn Seed production Silage corn Sweet corn	**Foliar Diseases** Common rust *(Puccinia sorghi)* Southern leaf blight *(Bipolaris maydis)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix **Serifel** with a labeled corn fungicide. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Charcoal rot *(Macrophomina phaseolina)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Fruiting vegetables group Eggplant Groundcherry Pepino Pepper (all varieties) Tomatillo Tomato	**Foliar Diseases** Anthracnose *(Colletotrichum* spp.*)* Bacterial speck *(Pseudomonas* spp.*)* Bacterial spot *(Xanthomonas* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Buckeye rot *(Phytophthora parasitica)* Early blight *(Alternaria* spp.*)* Late blight *(Phytophthora infestans)* Powdery mildew *(Erysiphe* spp., *Leveillula* spp., *Oidiopsis* spp., *Sphaerotheca* spp.*)* Target spot* *(Corynespora cassiicola)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Bacterial spot, Bacterial speck and Target spot,** begin applications shortly after emergence or transplanting and continue on 2- to 7-day intervals if conditions are conducive to disease development. For improved suppression of bacterial spot and speck, tank mix or rotate with labeled copper-based bactericides. **For Anthracnose, Botrytis gray mold, Buckeye rot and Powdery mildew,** begin application shortly after emergence or transplanting and continue on 7- to 10-day intervals as needed. **For Early blight and Late blight,** apply when plants are 4 to 6 inches tall and continue on 5- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Sclerotinia stem rot* *(Sclerotinia sclerotiorum)* Southern blight *(Sclerotium rolfsii)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone. Complete coverage of the stem, all the way down to the soil, is required for suppression of soilborne diseases of the stem.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Fuzzy Kiwi	**Foliar Diseases** Botrytis Fruit Rot *(Botrytis cinerea)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Botrytis,** begin applications prior to disease development. Use higher rates and shorter intervals when disease pressure is high.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Grape	**Foliar Diseases** Botryosphaeria dieback, including Black dead arm, Botryosphaeria canker and Diplodia cane dieback* *(Botryosphaeria* spp., *Diplodia* spp., *Dothiorella* spp., *Lasiodiplodia* spp., *Neofusicoccum* spp., *Sphaeropsis* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Downy mildew *(Plasmopara viticola)* Esca, Black measles* *(Phaeoacremonium* spp., *Phaeomoniella* spp.*)* Eutypa *(Eutypa lata)* Macrophoma rot* *(Botryosphaeria dothidea)* Phomopsis *(Phomopsis viticola)* Phomopsis cane and leaf spot *(Phomopsis viticola)* Phomopsis dieback *(Phomopsis viticola)* Powdery mildew *(Erysiphe* spp., *Uncinula* spp.*)* Summer bunch rot *(Alternaria* spp., *Aspergillus* spp.*, *Botrytis* spp., *Cladosporium* spp., *Penicillium* spp.*, *Rhizopus* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Powdery mildew and Phomopsis,** begin foliar applications at bud break or prior to onset of disease. Repeat applications on 5- to 10-day intervals as needed. **For Downy mildew,** begin applications before pre-bloom and continue on 7- to 10-day intervals as needed. **For Botrytis gray mold and Summer bunch rot,** begin applications prior to disease development when conditions favor the development of Botrytis and summer bunch rot such as during early bloom, bunch preclosure and veraison. Use the higher rate and shorter interval when disease pressure is high. **For Botryosphaeria dieback, Phomopsis dieback, Esca and Eutypa,** apply to pruning wounds. Sanitation of pruning tools is critical. **For Macrophoma rot,** 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- to 10-day intervals until harvest when environmental conditions are conducive for disease development. **For Phomopsis cane and leaf spot,** begin applications between bud break and 1-inch shoots and repeat when shoots are 6 to 8 inches long. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Hops	**Foliar Diseases** Powdery mildew *(Sphaerotheca macularis)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Powdery mildew,** begin foliar applications prior to onset of disease and continue on 5- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Leafy vegetables (except *Brassica* vegetables) group 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	**Foliar Diseases** Bacterial leaf spot *(Pseudomonas* spp., *Xanthomonas)* Botrytis gray mold *(Botrytis* spp.*)* Cercospora leaf spot *(Cercospora* spp.*)* Downy mildew *(Bremia lactucae, Peronospora* spp.*)* Head and leaf drop *(Sclerotinia* spp.*)* Pink rot *(Sclerotinia sclerotiorum)* Powdery mildew *(Erysiphe* spp.*)* White mold, Lettuce drop *(Sclerotinia sclerotiorum)* White rust* *(Albugo* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Head and leaf drop, White mold, and Lettuce drop,** apply before emergence as a directed or banded spray 4 to 6 inches wide. Apply again at thinning or cultivation and continue on 10- to 14-day intervals if conditions remain conducive for disease development. **For Pink rot,** apply before emergence as a directed or banded spray 4 to 6 inches wide. Apply again at thinning or cultivation and continue on 10- to 14-day intervals if conditions remain conducive for disease development. **For Botrytis gray mold, Cercospora leaf spot, Downy mildew, White rust and Powdery mildew,** apply prior to infection and continue on 7- to 10-day intervals as needed. Use the higher rate and shorter interval when disease pressure is high. **For Bacterial leaf spot,** begin applications prior to disease onset and continue on 2- to 10-day intervals if conditions are conducive to disease development. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Bottom rot *(Rhizoctonia solani)* Fusarium wilt *(Fusarium* spp.*)* Head and leaf drop *(Sclerotinia* spp.*)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Legume vegetables (succulent and dried beans and peas, except soybean) group Broad bean Chickpea Guar Lablab bean Lentil Pigeon pea ***Lupinus* spp.** Grain lupin Sweet lupin White lupin ***Phaseolus* spp.** Field bean Kidney bean Lima bean Navy bean Pinto bean Tepary bean ***Pisum* spp.** English pea Field pea Garden pea Green pea ***Vigna* spp.** Adzuki bean Blackeyed pea Catjang Cowpea Crowder pea Moth bean Mung bean Rice bean Southern pea Urd bean	**Foliar Diseases** Botrytis gray mold *(Botrytis* spp.*)* Powdery mildew *(Microsphaera diffusa)* White mold *(Sclerotinia sclerotiorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For White mold and Botrytis gray mold**, apply shortly after emergence or transplanting when conditions favor disease development. Repeat on 7- to 10-day intervals as needed. When disease pressure is high, use **Serifel** in a rotation program with other registered fungicides. **For Powdery mildew,** begin foliar applications prior to onset of disease and continue on 5- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Oilseed group Castor oil plant Cottonseed Flaxseed Rapeseed Rapeseed, canola varieties Safflower Sesame Sunflower	**Foliar Diseases** White mold *(Sclerotinia sclerotiorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For White mold,** apply shortly after emergence when conditions favor disease development. Repeat on 7- to 10-day intervals as needed. When disease pressure is high, use the higher rate and shorter interval. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Cylindrocladium black rot* *(Cylindrocladium* spp.*)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Southern blight *(Sclerotium rolfsii)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

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Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Peanut*	**Foliar Diseases** Early leaf spot *(Cercospora arachidicola)* Late leaf spot *(Cercospora personatum)* Pepper spot *(Leptospherulina crassiasca)* Rust *(Puccinia arachidis)* Web blotch *(Phoma arachidicola)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Foliar diseases,** apply prior to disease development. Repeat on 5- to 14-day intervals as needed. When disease pressure is high, use higher rates and shorter intervals. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Cylindrocladium black rot *(Cylindrocladium* spp.*)* Rhizoctonia limb rot, Peg rot and Pod rot *(Rhizoctonia solani)* Sclerotinia blight *(Sclerotinia minor)* Sclerotioum rot, Southern stem rot, Southern blight and White mold *(Sclerotium rolfsii)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Pome fruit group Apple Crabapple Loquat Mayhaw Pear Pear, Oriental Quince	**Foliar Diseases** Alternaria blotch *(Alternaria mali)* Bitter rot *(Colletotrichum* spp.*)* Blue mold* *(Penicillium* spp.*)* Bot rot* *(Botryosphaeria dothidea)* Botrytis gray mold *(Botrytis* spp.*)* Brooks spot *(Mycosphaerella pomi)* Bull's eye rot* *(Neofabraea* spp.*)* Cedar apple rust* *(Gymnosporangium juniperi-virginianae)* Fire blight *(Erwinia amylovora)* Flyspeck* *(Schizothyrium pomi)* Powdery mildew *(Podosphaera* spp.*)* Scab *(Venturia* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Bitter rot, Bot rot, Brooks spot, Bull's eye rot, Cedar apple rust, and Flyspeck,** begin applications at pre-bloom when conditions are favorable for disease development. Repeat applications on 7- to 14-day intervals as needed. **For Powdery mildew,** begin applications at tight cluster or earlier if conditions are favorable for disease development. Repeat application on 7- to 10-day intervals through the second cover spray. **For Fire blight,** begin applications at 1% to 5% bloom and repeat as needed to protect new blossoms when conditions are favorable for disease development. During rapid bloom development, apply at 2- to 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 **Serifel** in a rotational program with a registered antibiotic product. **For Scab,** begin applications at green tip or when conditions are favorable for disease development. Continue applications on 7- to 10-day intervals as needed. Use **Serifel** in a rotational program with fungicides registered for scab control. **For Alternaria blotch, Blue mold and Botrytis gray mold,** begin applications prior to disease development and continue on 7- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Root and tuber vegetables (except sugar beet) group Arracacha Arrowroot Artichoke, Chinese Artichoke, Jerusalem Canna, edible Carrot Cassava (bitter and sweet) Chayote (root) Chufa Dasheen (taro) Ginger Leren Potato Sweet potato Tanier Turmeric Yam bean Yam, true	**Foliar Diseases** Aerial stem rot* *(Erwinia carotovora)* Bacterial leaf spot *(Xanthomonas campestris* pv. *carotae)* Black dot *(Colletotrichum coccodes)* Black rot/Crown rot *(Alternaria* spp.*)* Brown spot and black pit *(Alternaria alternata)* Early blight *(Alternaria solani)* Botrytis gray mold *(Botrytis* spp.*)* Late blight *(Phytophthora infestans)* White mold *(Sclerotinia sclerotiorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Black rot/Crown rot, Bacterial leaf spot and Botrytis gray mold,** begin foliar applications shortly after emergence or transplanting and continue on 7- to 10-day intervals if conditions are favorable for disease development. Use the higher rate and shorter interval when disease pressure is high. **For Aerial stem rot,** begin applications prior to disease development and continue at 7- to 10-day intervals as needed. **For White mold,** begin foliar applications shortly after emergence or transplanting and continue on 7- to 10-day intervals if conditions are favorable for disease development. **For Early blight and Late blight,** begin applications shortly after emergence or transplanting and continue on 5- to 7-day intervals as needed. Use **Serifel** in a rotational program or tank mix with other registered fungicides labeled for early blight and late blight control. **For all other listed diseases,** begin application prior to disease development and continue on 7- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

* Not registered for use in California.

(continued)

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Root and tuber vegetables (except sugar beet) group Arracacha Arrowroot Artichoke, Chinese Artichoke, Jerusalem Canna, edible Carrot Cassava (bitter and sweet) Chayote (root) Chufa Dasheen (taro) Ginger Leren Potato Sweet potato Tanier Turmeric Yam bean Yam, true	**Soil Diseases** Black rot of Sweet Potato* *(Ceratocystis fimbriata)* Black scurf *(Rhizoctonia solani)* Cavity spot *(Pythium* spp.*)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia damping off *(Rhizoctonia solani)* Silver scurf* *(Helminthosporium* spp.*)* Verticillium wilt *(Verticillium* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

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Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Soybean *(Glycine max)*	**Foliar Diseases** White mold *(Sclerotinia sclerotiorum)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix **Serifel** with a labeled soybean fungicide. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Charcoal rot *(Macrophomina phaseolina)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Stone fruit group Apricot Cherry (sweet and tart) Nectarine Peach Plum (all varieties) Plumcot Prune	**Foliar Diseases** Alternaria spot *(Alternaria alternata)* Anthracnose *(Colletotrichum* spp.*)* Bacterial canker *(Pseudomonas* spp.*)* Bacterial spot *(Xanthomonas arboricola)* Blossom blight *(Monilinia* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Brown rot of fruit *(Monilinia* spp.*)* Powdery mildew *(Podosphaera* spp., *Sphaerotheca* spp.*)* Ripe fruit rot *(Botrytis* spp., *Monilinia* spp., *Rhizopus* spp.*)* Shot hole *(Wilsonomyces carpophilus)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Anthracnose and Brown rot of fruit,** begin applications prior to disease development when conditions are favorable for disease development and continue on 7- to 10-day intervals as needed. **For Bacterial canker,** apply after harvest prior to fall rain events. Reapply in the early spring during dormancy. **For Bacterial spot,** begin applications at bud break and continue at 7- to 14-day intervals as needed until harvest. For improved performance, use **Serifel** in a rotational program with registered antibiotic and copper products. Use the higher rate and shorter interval when disease pressure is high. **For Blossom blight,** begin applications at early bloom and continue through petal fall at 7-day intervals as needed. **For Powdery mildew,** begin applications at popcorn stage and continue on 7-day intervals as needed. **For all other listed diseases,** begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Strawberry	**Foliar Diseases** Angular leaf spot *(Xanthomonas fragariae)* Anthracnose *(Colletotrichum* spp.*)* Botrytis gray mold *(Botrytis* spp.*)* Leaf scorch* *(Diplocarpon earliana)* Leaf spot* *(Mycosphaerella fragariae)* Powdery mildew *(Erysiphe* spp., *Sphaerotheca* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Angular leaf spot, Anthracnose, Leaf scorch, and Leaf spot,** begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. **For Botrytis gray mold and Powdery mildew,** begin applications at or before flowering, continuing on 7- to 10-day intervals as needed. Use the higher rate and shorter interval when disease pressure is high. Use **Serifel** in a rotational program or tank mix with other registered fungicides labeled for Botrytis and powdery mildew control. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Charcoal rot *(Macrophomina phaseolina)* Fusarium wilt *(Fusarium* spp.*)* Phytophthora root rot *(Phytophthora* spp.*)* Pythium damping off *(Pythium* spp.*)* Rhizoctonia root rot *(Rhizoctonia solani)* Verticillium wilt *(Verticillium* spp.*)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply a high enough water volume to thoroughly soak soil through the root zone.

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Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Sugar beet	**Foliar Diseases** Leaf spot *(Cercospora beticola)* Powdery mildew *(Erysiphe betae)* Rhizoctonia stem canker and crown rot *(Rhizoctonia solani)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Leaf spot and Powdery mildew,** begin applications prior to infection and continue on 7- to 14-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. **For Rhizoctonia stem canker and crown rot,** begin applications at the 2-leaf stage and continue on 3- to 10-day intervals until the 8-leaf stage. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Tobacco	**Foliar Diseases** Angular leaf spot *(Pseudomonas* spp.*)* Anthracnose *(Colletotrichum destructivum, Glomerella glycines)* Barnspot/Frogeye leaf spot *(Cercospora nicotianae)* Brown spot *(Alternaria alternata)* Blue mold *(Peronospora* spp.*)* Botrytis gray mold *(Botrytis cinerea)* Collar rot *(Sclerotinia sclerotiorum)* Powdery mildew *(Erysiphe cichoracearum)* Target spot *(Rhizoctonia solani)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	Begin foliar applications prior to infection and continue on 7- to 10-day intervals if conditions are conducive for disease development. Use the higher rate and shorter interval when disease pressure is high. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.
	Soil Diseases Black root rot *(Thielaviopsis basicola)* Black shank *(Phytophthora* spp.*)* Charcoal rot *(Macrophomina phaseolina)* Southern blight *(Sclerotium rolfsii)*		See **Application Instructions** for **In-furrow, Shanked-in, Injected or Soil Drench Applications**. Apply enough water to thoroughly soak soil through the root zone.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Tree nuts group Almond Beech nut Brazil nut Butternut Cashew Chestnut Chinquapin Coconut Filbert (hazelnut) Hickory nut Pecan Pistachio Walnut (black and English)	**Foliar Diseases** Alternaria blight *(Alternaria* spp.*)* Anthracnose *(Colletotrichum* spp.*)* Bacterial canker *(Pseudomonas syringae)* Botryosphaeria panicle and shoot blight* *(Botryosphaeria* spp.*)* Brown rot/Blossom blight *(Monilinia* spp.*)* Hull Rot *(Monilinia* spp., *Rhizopus* spp.*)* Rust* *(Tranzschelia discolor)* Scab *(Cladosporium* spp.*)* Shot hole *(Wilsonomyces carpophilus)* Walnut blight *(Xanthomonas campestris)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Anthracnose, Shot hole and Brown rot/Blossom blight,** begin applications prior to disease development when conditions are favorable for disease development and continue on 7- to 10-day intervals as needed. **For Bacterial canker,** begin applications prior to disease development and repeat at 7- to 10-day intervals as needed. Use the higher rate and shorter interval when disease pressure is high. **For Walnut blight,** begin applications no later than pistillate bloom and repeat at 3- to 10-day intervals as needed. For improved performance, use **Serifel** in a rotational program or tank mixed with other crop protection products labeled for use on walnut blight. Use the higher rate and shorter interval when disease pressure is high. **For Hull Rot, Serifel** can be applied to the foliage or to the soil. For foliar applications, apply **Serifel** 3 to 4 weeks prior to hull split (early June) for hull rot caused by *Monilinia* spp. Make an application of **Serifel** at hull split for hull rot caused by *Rhizopus* spp. **Serifel** can also be applied to orchard floor to reduce the inoculum of fungi causing hull rot. For orchard floor applications, make 1 to 2 applications of **Serifel** to the orchard floor 1 to 3 weeks prior to hull split. Apply **Serifel** in a mix of 50 gallons of water per acre across the entire width of the row up to 6 to 12 inches from the trunks. 30 minutes after application, turn on water sprinklers for 5 hours to water **Serifel** into the soil. **For all other listed diseases,** begin application prior to disease development and continue on 7- to 10-day intervals as needed. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

* Not registered for use in California.

Table 2. Crop-specific Directions *(continued)*

Crop	Target Diseases	Product Use Rate per Application (ozs or lb of **Serifel® biofungicide**/Acre)	Application Directions
Wheat and Barley*	**Foliar Diseases** Head scab *(Fusarium* spp.*)*	4 to 16 ozs/A (0.25 to 1.0 lb/A)	**For Head scab,** apply **Serifel** at any time from one week prior to flowering to one week after flowering. Tank mix **Serifel** with a fungicide labeled for head scab. Mix and apply **Serifel** in sufficient water volume to ensure uniform dispersion in spray tank and thorough coverage of foliage and shoot tissue.

* Not registered for use in California.

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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 Agricultural Solutions US LLC ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

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071840-00018.20240920.**NVA 2024-04-0492-0229**
Based on: NVA 2019-04-492-0054
Supersedes: NVA 2022-04-0492-0197

BASF Agricultural Solutions US LLC
2 TW Alexander Drive
Research Triangle Park, NC 27713

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