



U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Pesticide Programs  
Biopesticides and Pollution Prevention Division (7511P)  
1200 Pennsylvania Ave., N.W.  
Washington, D.C. 20460

EPA Reg. Number:

71840-18

Date of Issuance:

12/19/2014

NOTICE OF PESTICIDE:

Registration  
 Reregistration  
(under FIFRA, as amended)

Term of Issuance:

Unconditional

Name of Pesticide Product: Serifel

Name and Address of Registrant (include ZIP Code):

BASF Corporation  
26 Davis Drive  
Research Triangle Park, NC 27709

**Note:** Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Biopesticides and Pollution Prevention Division prior to use of the label in commerce. In any correspondence on this product, always refer to the above EPA Registration Number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA or the Act).

Registration is in no way to be construed as an endorsement or recommendation of this product by the U.S. Environmental Protection Agency (EPA). In order to protect health and the environment, the Administrator, on his or her motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is unconditionally registered in accordance with FIFRA section 3(c)(5) provided that you:

1. Submit and/or cite all data required for registration/reregistration/registration review of your product when the EPA requires all registrants of similar products to submit such data.
2. The data requirements for storage stability and corrosion characteristics (Guidelines 830.6317 and 830.6320) are not satisfied. A one-year study is required to satisfy these data requirements. You have 18 months from the date of registration to provide these data.

Signature of Approving Official:

Kimberly Nesci, Branch Chief  
Microbial Pesticides Branch  
Biopesticides and Pollution Prevention Division (7511P)

Date:

12/19/2014

3. Make the following label change before you release the product for shipment:
  - Revise the EPA Registration Number to read, "EPA Reg. No. 71840-18."
4. Submit one copy of the revised final printed label for the record before you release the product for shipment.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the EPA. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) lists examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the EPA find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA-approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance Assurance.

If these terms are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6. Your release for shipment of the product constitutes acceptance of these terms. A stamped copy of the label is enclosed for your records. Please also note that the record for this product currently contains the following confidential statement of formula (CSF):

- Basic CSF dated 12/08/2014

If you have any questions, please contact Dr. Kenneth Haymes at (703) 347-0398 or [haymes.kenneth@epa.gov](mailto:haymes.kenneth@epa.gov).

Sincerely,



Kimberly Nesci, Chief  
Microbial Pesticides Branch  
Biopesticides and Pollution  
Prevention Division (7511P)

Enclosure



The Chemical Company

Group 44 Fungicide

# Serifel®

## Biofungicide

**ACCEPTED**

12/19/2014

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 71840-18

Serifel is an agricultural biofungicide product for suppression of plant diseases in certain crops.

OMRI place holder

**Active Ingredients:**

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

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

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

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

†Formerly named *Bacillus subtilis* strain MBI 600

EPA Reg. No. 71840-XX

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:**

**Net Weight: 5 pound plastic bottles, 4 per box**

BASF Corporation  
26 Davis Drive, Research Triangle Park, NC 27709

## FIRST AID

|                   |   |
|-------------------|---|
| <b>If in eyes</b> | <ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul> |
|-------------------|---|

## 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 Corporation for emergency medical treatment information: 1-800-832-HELP (4357).

## Precautionary Statements

### Hazards to Humans and Domestic Animals

**CAUTION.** Causes moderate eye irritation. Avoid contact with eyes or clothing. Wear protective eyewear. 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

Mixers/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95 or R-95. 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:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- 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 wash water or rinsate.

## In Case of Emergency

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

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

## 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 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), notification to workers, and restricted-entry interval. 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 **4 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

## 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 ¼ 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. 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.

## Product Information

This package contains **Serifel® Biofungicide**, a wettable powder (WP). The active ingredient in **Serifel** is *Bacillus amyloliquefaciens* strain MBI600, a biological agent 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 the **Crop-Specific Directions**. Apply **Serifel** in a regularly scheduled protective spray program and use in a rotation program with other fungicides. Under higher disease pressure situations, tank mix **Serifel** with registered fungicide 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.htm>.

## Integrated Pest Management

**Serifel** must be integrated into an overall disease and pest management program. Cultural practices known to reduce disease development should be followed. 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 the **Crop-Specific Directions**. Apply **Serifel** with ground equipment, aerial equipment or through sprinkler irrigation equipment. Equipment should 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 fungicides 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 for disease control. 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® Biofungicide** as a water-based suspension alone or with other labeled in-furrow or soil drench products (fungicides, insecticides, nematicides, fertilizers, etc.) 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** overnight.

**For in-furrow, shanked-in, injected, or soil drench applications**, mix 4-16 ounces by weight of **Serifel** with a water volume appropriate for the crop and application type. Use higher rates and consider mixing with another fungicide 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.

| Instructions for In-Furrow, Shanked-In, Injected or Soil Drench Applications of Serifel |                              |                              |                              |                              |                              |                              |                              |                              |                              |                     |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|---------------------|
| Rate Per<br>1000 row<br>feet  | Serifel Rate<br>(oz/A)       |                              |                              |                              |                              |                              |                              |                              |                              |                     |
| (oz<br>product)   | 12-inch<br>rows              | 15-inch<br>rows              | 20-inch<br>rows              | 22-inch<br>rows              | 30-inch<br>rows              | 32-inch<br>rows              | 34-inch<br>rows              | 36-inch<br>rows              | 38-inch<br>rows              | 40-<br>inch<br>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<br>footnote <sup>1</sup> | 13.9                         | 10.4                         | 9.5                          | 7.0                          | 6.5                          | 6.1                          | 5.8                          | 5.5                          | 5.2                 |
| 0.5   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 13.1                         | 11.9                         | 8.7                          | 8.2                          | 7.7                          | 7.3                          | 6.9                          | 6.6                 |
| 0.6   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 15.7                         | 14.2                         | 10.4                         | 9.8                          | 9.2                          | 8.7                          | 8.2                          | 7.9                 |
| 0.7   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 12.2                         | 11.4                         | 10.7                         | 10.2                         | 9.6                          | 9.2                 |
| 0.8   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 13.9                         | 13.0                         | 12.3                         | 11.6                         | 11.0                         | 10.5                |
| 0.9   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 15.7                         | 14.7                         | 13.8                         | 13.1                         | 12.3                         | 11.8                |
| 1.0   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 15.4                         | 14.5                         | 13.7                         | 13.1                |
| 1.1   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 16.0                         | 15.1                         | 14.4                |
| 1.2   | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | See<br>footnote <sup>1</sup> | 15.7                |

**Application Directions.** Use 0.3 to 1.2 oz 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 oz (1 lb) per acre of **Serifel**.

<sup>1</sup>For 36 to 38 inch rows, use a maximum of 1.1 oz per 1000 row feet.  
 For 34 inch rows, use a maximum of 1.0 oz per 1000 row feet.  
 For 30 to 32 inch rows, use a maximum of 0.9 oz per 1000 row feet.  
 For 20 to 22 inch rows, use a maximum of 0.6 oz per 1000 row feet.  
 For 15 inch rows, use a maximum of 0.4 oz per 1000 row feet.  
 For 12 inch rows, use a maximum of 0.3 oz per 1000 row feet.

## Instructions for Directed or Banded Sprays Related to Ground Applications

The application rates shown in the **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:

sprayed bed width + unsprayed row middle width = 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.

45 inches sprayed bed width + 15 inches unsprayed row middles = 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 recommendation of 4 ounces/acre follows:

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

## 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 a 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(s).

- 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 control. 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 regular 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 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. **DO NOT** apply when wind speed favors drift beyond the area intended for treatment

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## Additives and Tank Mixing Information

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**Serifel® Biofungicide** can be tank mixed with most recommended fungicides, insecticides, herbicides, liquid fertilizers, biological control products, adjuvants, and additives as specified in **Crop-Specific Directions**. Before using any tank mix (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

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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 mixtures are used, adhere to restrictions due to rates and precautions on all labels.

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## Compatibility Test for Tank Mix Components

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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 insure 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 should be between 4 and 9. The product mixture should 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 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 AMS or 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 section **Crop-Specific Directions** for more details.

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## **Restrictions and Limitations**

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- **Crop Rotation Restriction** - None
- **Preharvest Interval (PHI)** – 0 Day
- **Re-entry Interval (REI)** – 4 hour

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- **Not for use** in greenhouse or transplant production
  - **Not for use** in California on crops marked with an asterisk (\*) in **Crop-Specific Directions**

## Crop-specific Directions

| Crop   | Target Disease  | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions  |
|--|---|---|---|
| <p><b>Alfalfa and Clover*</b></p> <p>Includes alfalfa and clover mixed with forage grasses</p> | <p><b>Foliar diseases</b></p> <p>White mold (<i>Sclerotinia sclerotiorum</i>)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p><b>White mold:</b> Begin application shortly after emergence or transplanting and repeat 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> |

## Crop-specific Directions *(continued)*

| Crop              | Target Diseases  | Product Use Rate per Application<br>(oz. of Serifel/Acre) | Application Directions  |
|-------------------|--|---|---|
| <b>Artichoke*</b> | <b>Foliar diseases</b><br>Anthracnose<br><i>(Colletotrichum spp.)</i><br><br>Alternaria leaf spot<br><i>(Alternaria spp.)</i><br><br>Botrytis gray mold<br><i>(Botrytis spp.)</i><br><br>Powdery mildew <i>(Leveillula taurica)</i><br><br>Ramularia leaf spot<br><i>(Ramularia cynarae)</i> | 4 - 16<br>(0.25 – 1.0 lb/A)                               | Begin foliar applications before 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.<br><br>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. |
|                   | <b>Soil diseases</b><br>Fusarium wilt <i>(Fusarium spp.)</i><br><br>Pythium damping off<br><i>(Pythium spp.)</i><br><br>Rhizoctonia crown rot<br><i>(Rhizoctonia solani)</i><br><br>Verticillium wilt<br><i>(Verticillium spp.)</i>  | 4 - 16<br>(0.25 – 1.0 lb/A)                               | See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications<br><br>Apply a high enough water volume to thoroughly soak soil through the root zone.   |

## Crop-specific Directions *(continued)*

| Crop       | Target Diseases  | Product Use Rate per Application<br>(oz. of Serifel/Acre) | Application Directions  |
|------------|--|---|---|
| Asparagus* | <b>Foliar diseases</b><br>Anthracnose<br><i>(Colletotrichum spp.)</i><br><br>Alternaria leaf spot<br><i>(Alternaria spp.)</i><br><br>Botrytis gray mold<br><i>(Botrytis spp.)</i><br><br>Phytophthora spear and crown rot<br><i>(Phytophthora spp.)</i><br><br>Watery soft rot <i>(Sclerotinia spp.)</i> | 4 - 16<br>(0.25 – 1.0 lb/A)                               | 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.<br><br>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. |
|            | <b>Soil diseases</b><br>Fusarium wilt <i>(Fusarium spp.)</i><br><br>Pythium damping off<br><i>(Pythium spp.)</i><br><br>Rhizoctonia root rot<br><i>(Rhizoctonia solani)</i>  | 4 - 16<br>(0.25 – 1.0 lb/A)                               | See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications<br><br>Apply a high enough water volume to thoroughly soak soil through the root zone.   |

## Crop-specific Directions *(continued)*

| Crop   | Target Diseases  | Product Use Rate per Application (oz. of Serifel/Acre) | Application Directions   |
|--|--|--|--|
| <p><b>Berries and small fruits subgroups*</b></p> <p><b>Bushberry subgroup</b><br/>Blueberry(highbush and lowbush)<br/>Currant<br/>Elderberry<br/>Gooseberry<br/>Huckleberry</p> <p><b>Caneberry subgroup</b><br/>Blackberry (all varieties)<br/>Loganberry<br/>Raspberry (black and red)<br/>Wild raspberry</p> <p><b>Low growing berry subgroup</b><br/>Bearberry<br/>Bilberry<br/>Cloudberry<br/>Cranberry<br/>Lingonberry<br/>Muntries<br/>Partridgeberry</p> <p><b>Small fruit vine climbing subgroup, (except fuzzy kiwifruit)</b><br/>Amur river grape<br/>Gooseberry<br/>Kiwifruit, hardy<br/>Maypop<br/>Schisandra berry</p> <p><b>Berries and small fruits subgroups</b></p> <p><b>Bushberry subgroup</b><br/>Blueberry(highbush and lowbush)<br/>Currant<br/>Elderberry<br/>Gooseberry<br/>Huckleberry</p> <p><b>Caneberry subgroup</b><br/>Blackberry (all varieties)<br/>Loganberry<br/>Raspberry (black and red)<br/>Wild raspberry</p> <p><b>Low growing berry subgroup</b><br/>Bearberry<br/>Bilberry<br/>Cloudberry<br/>Cranberry<br/>Lingonberry<br/>Muntries<br/>Partridgeberry</p> <p><b>Small fruit vine climbing subgroup, (except fuzzy kiwifruit)</b><br/>Amur river grape<br/>Gooseberry<br/>Kiwifruit, hardy<br/>Maypop<br/>Schisandra berry</p> | <p><b>Foliar diseases</b></p> <p>Alternaria fruit rot (<i>Alternaria</i> spp.)</p> <p>Anthracnose (<i>Colletotrichum</i> spp.)</p> <p>Botrytis gray mold (<i>Botrytis</i> spp.)</p> <p>Mummy berry (<i>Monilinia</i> spp.)</p> <p>Powdery mildew (<i>Sphaerotheca</i> spp., <i>Microsphaera</i> spp., <i>Podosphaera</i> spp.)</p> | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                    | <p><b>For Mummy berry</b>, begin applications at bud break and continue on a 7-10 day interval as needed.</p> <p><b>For Alternaria fruit rot, Anthracnose and Botrytis gray mold</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><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> |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases  | Product Use Rate per Application<br>(oz. of Serifel/Acre) | Application Directions   |
|---|--|---|--|
| <p><b>Brassica leafy vegetables group*</b></p> <p><b>Head and stem</b><br/>           Broccoli<br/>           Broccoli, Chinese<br/>           Brussel sprouts<br/>           Cabbage<br/>           Cabbage, Chinese<br/>           Cabbage, Chinese mustard<br/>           Califlower<br/>           Cavalo broccolo<br/>           Kohlrabi</p> <p><b>Leafy greens</b><br/>           Broccoli raab<br/>           Chinese cabbage (bock choy)<br/>           Collards<br/>           Kale<br/>           Mizuna<br/>           Mustard greens<br/>           Mustard spinach<br/>           Rape greens</p> | <p><b>Foliar diseases</b></p> <p>Alternaria leaf spot<br/>(<i>Alternaria</i> spp.)</p> <p>Botrytis gray mold (<i>Botrytis</i> spp.)</p> <p>Downy mildew (<i>Peronospora</i> spp.)</p> <p>Powdery mildew (<i>Erysiphe polygoni</i>)</p> <p>Pin rot<br/>(<i>Alternaria</i> spp.)</p> <p>Rust<br/>(<i>Puccinia porri</i>)</p> <p>White rust<br/>(<i>Albugo candida</i>)</p> | <p>4 - 16<br/>(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> |
|   | <p><b>Soil diseases</b></p> <p>Fusarium wilt (<i>Fusarium</i> spp.)</p> <p>Phytophthora root rot<br/>(<i>Phytophthora</i> spp.)</p> <p>Pythium damping off<br/>(<i>Pythium</i> spp.)</p> <p>Rhizoctonia root rot<br/>(<i>Rhizoctonia solani</i>)</p> <p>Verticillium wilt<br/>(<i>Verticillium</i> spp.)</p>   | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                       | <p>See Application Instructions for In-Furrow, Drench, Shank-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |

## Crop-specific Directions *(continued)*

| Crop   | Target Diseases   | Product Use Rate per Application<br>(oz. of Serifel/Acre) | Application Directions   |
|--|---|---|--|
| <p><b>Bulb vegetables*</b></p> <p>Chive, fresh leaves<br/>Chive, Chinese, fresh leaves<br/>Daylily, bulb<br/>Elegans hosta<br/>Fritillaria, bulb<br/>Fritillaria, leaves<br/>Garlic, bulb<br/>Garlic, great-headed, bulb<br/>Garlic, serpent, bulb<br/>Kurrat<br/>Lady's leek<br/>Leek<br/>Leek, wild<br/>Lily, bulb<br/>Onion, Beltsville bunching<br/>Onion, bulb<br/>Onion, Chinese, bulb<br/>Onion, fresh<br/>Onion, green<br/>Onion, macrostem<br/>Onion, pearl<br/>Onion, potato, bulb<br/>Onion, tree, tops<br/>Onion, Welsh, tops<br/>Shallot, bulb<br/>Shallot, fresh, leaves</p> | <p><b>Foliar diseases</b></p> <p>Botrytis leaf blight and neck rot<br/><i>(Botrytis spp.)</i></p> <p>Downy mildew <i>(Peronospora spp.)</i></p> <p>Purple blotch <i>(Alternaria porri)</i></p> <p>Powdery mildew <i>(Erysiphe spp.)</i></p> <p>Stemphylium leaf blight and stalk rot<br/><i>(Stemphylium vesicarium)</i></p> <p>White rot<br/><i>(Sclerotium cepivorum)</i></p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                       | <p>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> |
|  | <p><b>Soil diseases</b></p> <p>Fusarium wilt <i>(Fusarium spp.)</i></p> <p>Pink root<br/><i>(Phoma spp.)</i></p> <p>Pythium damping off<br/><i>(Pythium spp.)</i></p> <p>Rhizoctonia root rot<br/><i>(Rhizoctonia solani)</i></p>   | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                       | <p>See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |



## Crop-specific Directions *(continued)*

| Crop   | Target Diseases  | Product Use Rate per Application<br>(oz. of Serifel/Acre) | Application Directions  |
|--|--|---|---|
| <p><b>Citrus group*</b></p> <p>Calamondin<br/>Citrus citron<br/>Citrus hybrids<br/>Chionja<br/>Grapefruit<br/>Kumquat<br/>Lemon<br/>Lime<br/>Mandarin<br/>Orange (sour and sweet)<br/>Pummelo<br/>Satsuma<br/>Tangelo<br/>Tangerine<br/>Tangor</p> | <p><b>Foliar diseases</b></p> <p>Alternaria leaf spot (<i>Alternaria</i> spp.)</p> <p>Greasy spot (<i>Mycosphaerella citri</i>)</p> <p>Melanose (<i>Diaporthe citri</i>)</p> <p>Post bloom fruit drop (<i>Colletotrichum</i> spp.)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                       | <p><b>For Greasy spot</b>, begin applications at the start of each new flush of foliage and repeat for each new flush. Tank mix <b>Serifel</b> with labeled spray oil or copper based fungicide products.</p> <p><b>For Post bloom fruit drop</b>, begin applications at early bloom when conditions are favorable for disease development. Continue on a 7-10 day interval as needed.</p> <p><b>For Alternaria leaf spot</b>, begin foliar applications for 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><b>For Melanose</b>, begin applications at petal fall and continue on a 14-21 day interval 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> |
|  | <p><b>Soil diseases</b></p> <p>Phytophthora root rot (<i>Phytophthora</i> spp.)</p> <p>Pythium damping off (<i>Pythium</i> spp.)</p>   | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                       | <p>See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>  |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|---|---|---|--|
| <p><b>Cucurbit vegetables group*</b></p> <p>Chayote<br/>Chinese waxgourd<br/>Citron melon<br/>Cucumber<br/>Gherkin<br/>Pumpkin<br/>Watermelon</p> <p><b>Edible gourd</b><br/>Hyotan<br/>Cucuzza<br/>Chinese okra</p>  | <p><b>Foliar diseases</b></p> <p>Anthracnose<br/><i>(Colletotrichum spp.)</i></p> <p>Alternaria leaf spot <i>(Alternaria spp.)</i></p> <p>Downy mildew<br/><i>(Pseudoperonospora spp.)</i></p> <p>Gummy stem blight <i>(Didymella bryoniae)</i></p> <p>Powdery mildew <i>(Erysiphe spp., Sphaerotheca spp.)</i></p>   | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p>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> |
| <p><b>Momordica spp.</b><br/>Balsam apple<br/>Balsam pear<br/>Bitter melon<br/>Chinese cucumber</p> <p><b>Muskmelon</b><br/>Cantaloupe<br/>Casaba<br/>Crenshaw melon<br/>Golden pershaw melon<br/>Honeydew melon<br/>Honey balls<br/>Mango melon<br/>Persioan melon<br/>Pineapple melon<br/>Santaclaus melon<br/>Snake melon</p> <p><b>Summer squash</b><br/>Crookneck squash<br/>Scallop squash<br/>Straightneck squash<br/>Vegetable marrow<br/>Zucchini</p> <p><b>Winter squash</b><br/>Butternut squash<br/>Calabaza<br/>Hubbard squash<br/>Acorn squash<br/>Spaghetti squash</p> | <p><b>Soil diseases</b></p> <p>Charcoal rot<br/><i>(Macrophomina phaseolina)</i></p> <p>Fusarium wilt <i>(Fusarium spp.)</i></p> <p>Phytophthora root rot<br/><i>(Phytophthora spp.)</i></p> <p>Pythium damping off <i>(Pythium spp.)</i></p> <p>Rhizoctonia root rot<br/><i>(Rhizoctonia solani)</i></p> <p>Verticillium wilt<br/><i>(Verticillium spp.)</i></p> <p>Vine decline<br/><i>(Monosporascus cannonballus)</i></p> | <p>4 – 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p>See Application Instructions for In-Furrow, Drench, Shank-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |

## Crop-specific Directions *(continued)*

| Crop   | Target Diseases   | Product Use Rate per Application<br>(oz of Serifel/Acre) | Application Directions  |
|--|---|--|---|
| <b>Corn*</b><br>Field corn<br>Pop corn<br>Silage corn<br>Sweet corn<br>Seed production | <b>Foliar diseases</b><br>Common rust<br><i>(Puccinia sorghi)</i><br>Southern leaf blight<br><i>(Bipolaris maydis)</i>  | 4 - 16<br>(0.25 - 1.0 lb/A)                              | 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. Mix <b>Serifel</b> with a labeled corn fungicide.<br>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. |
|  | <b>Soil diseases</b><br>Charcoal rot<br><i>(Macrophomina phaseolina)</i><br>Fusarium wilt ( <i>Fusarium</i> spp.)<br>Phytophthora root rot<br><i>(Phytophthora</i> spp.)<br>Pythium damping off ( <i>Pythium</i> spp.)<br>Rhizoctonia root rot<br><i>(Rhizoctonia solani)</i> | 4 - 16<br>(0.25 - 1.0 lb/A)                              | See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications<br>Apply a high enough water volume to thoroughly soak soil through the root zone.   |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases  | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions  |
|---|--|---|---|
| <p><b>Fruiting vegetables group*</b></p> <p>Eggplant<br/>Ground cherry<br/>Pepino<br/>Pepper (all varieties)<br/>Tomatillo<br/>Tomato</p> | <p><b>Foliar diseases</b></p> <p>Anthracnose (<i>Colletotrichum</i> spp.)</p> <p>Botrytis gray mold (<i>Botrytis</i> spp.)</p> <p>Buck-eye rot (<i>Phytophthora parasitica</i>)</p> <p>Early blight (<i>Alternaria</i> spp.)</p> <p>Late blight (<i>Phytophthora infestans</i>)</p> <p>Powdery mildew (<i>Leveillula</i> spp. <i>Oidiopsis</i> spp., <i>Erysiphe</i> spp. <i>Sphaerotheca</i> spp.)</p> <p>Target spot (<i>Corynespora cassiicola</i>)</p> | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p><b>For Target spot</b>, begin application shortly after emergence or transplanting and continue on 2-7 day intervals as needed. Use <b>Serifel</b> in a rotational program or tank mix with registered copper based bactericides.</p> <p><b>For Anthracnose, Botrytis gray mold, Buckeye rot and Powdery mildew</b>, begin application shortly after emergence or transplanting and continue on 7-10 day intervals as needed.</p> <p><b>For Early blight and Late blight</b>, begin application when plants are 4-6 inches tall 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> |
|   | <p><b>Soil diseases</b></p> <p>Fusarium wilt (<i>Fusarium</i> spp.)</p> <p>Phytophthora root rot (<i>Phytophthora</i> spp.)</p> <p>Pythium damping off (<i>Pythium</i> spp.)</p> <p>Rhizoctonia root rot (<i>Rhizoctonia solani</i>)</p> <p>Sclerotinia stem rot (<i>Sclerotinia sclerotiorum</i>)</p> <p>Southern blight (<i>Sclerotium rolfsii</i>)</p> <p>Verticillium wilt (<i>Verticillium</i> spp.)</p>  | <p>4 – 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p>See Soil Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone, and/or complete coverage of the stem, all the way down to the soil, is required for suppression of soilborne diseases of the stem.</p>  |

## Crop-specific Directions *(continued)*

| Crop   | Target Diseases  | Product Use Rate per Application<br>(oz of Serifel/Acre) | Application Directions   |
|--------|--|--|--|
| Grape* | <p><b>Foliar diseases</b></p> <p>Botrytis gray mold<br/>(<i>Botrytis</i> spp.)</p> <p>Downy mildew<br/>(<i>Plasmopara viticola</i>)</p> <p>Eutypa<br/>(<i>Eutypa lata</i>)</p> <p>Phomopsis<br/>(<i>Phomopsis viticola</i>)</p> <p>Powdery mildew (<i>Uncinula</i> spp.<br/><i>Erysiphe</i> spp.)</p> <p>Summer bunch rot<br/>(<i>Aspergillus</i> spp., <i>Alternaria</i> spp.,<br/><i>Botrytis</i> spp., <i>Cladosporium</i> spp.,<br/><i>Penicillium</i> spp., <i>Rhizopus</i> spp.)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                      | <p>For <b>Powdery mildew and Phomopsis</b>, begin foliar applications at bud break or prior to onset of disease. Repeat applications on 5 -10 day intervals as needed.</p> <p>For <b>Downy mildew</b>, begin applications before pre-bloom and continue on 7-10 day intervals as needed.</p> <p>For <b>Botrytis and Summer bunch rot</b>, begin applications prior to disease development when conditions favor the development of Botrytis and sour rot such as during early bloom, bunch preclosure and veraison. Use higher rates and shorter intervals when disease pressure is high.</p> <p>For <b>Eutypa</b>, apply to pruning wounds. Sanitation of pruning tools is critical.</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> |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions  |
|---|---|---|---|
| <p><b>Leafy vegetable group*</b></p> <p>Amaranth<br/>Arugula<br/>Cardoon<br/>Celery<br/>Celery, Chinese<br/>Celtuce<br/>Chervil<br/>Chrysanthemum (edible-leaved and garland)<br/>Corn salad<br/>Cress (garden and Upland)<br/>Dandelion<br/>Dock<br/>Endive<br/>Fennel, Florence<br/>Lettuce (head and leaf)<br/>Orach<br/>Parsley<br/>Purslane (garden and winter)<br/>Radicchio (red chicory)<br/>Rhubarb<br/>Spinach<br/>Spinach (New Zealand and vine)<br/>Swiss chard</p> | <p><b>Foliar diseases</b></p> <p>Botrytis gray mold (<i>Botrytis</i> spp.)</p> <p>Cercospora leaf spot (<i>Cercospora</i> spp.)</p> <p>Downy mildew (<i>Bremia lactucae</i>, <i>Peronospora</i> spp.)</p> <p>Head and leaf drop (<i>Sclerotinia</i> spp.)</p> <p>Pink rot (<i>Sclerotinia sclerotiorum</i>)</p> <p>Powdery mildew (<i>Erysiphe</i> spp.)</p> <p>White mold, Lettuce drop (<i>Sclerotinia sclerotiorum</i>)</p> <p>White rust (<i>Albugo</i> spp.)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p><b>For Head and leaf drop</b>, apply before emergence as a directed or banded spray 4 - 6 inches wide. Apply again at thinning or cultivation and continue on a 10 - 14 day interval if conditions remain conducive for disease development.</p> <p><b>For Pink rot</b>, apply before emergence as a directed or banded spray 4 - 6 inches wide. Apply again at thinning or cultivation and continue on a 10 - 14 day interval if conditions remain conducive for disease development. Begin application approximately eight weeks before harvest and repeat on a 14 day interval.</p> <p><b>For Botrytis gray mold, Cercospora leaf spot, Downy mildew and Powdery mildew</b>, begin applications prior to infection and continue on 7-10 day intervals as needed. 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> |
|   | <p><b>Soil diseases</b></p> <p>Bottom rot (<i>Rhizoctonia solani</i>)</p> <p>Head and leaf drop (<i>Sclerotinia</i> spp.)</p> <p>Verticillium wilt (<i>Verticillium</i> spp.)</p>   | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p>See Soil Application Instructions for In-furrow, Drench, Shank-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases  | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions  |
|---|--|---|---|
| <p><b>Legume Vegetables (succulent and dried beans and peas, except soybean)*</b></p> <p>Broad bean<br/>Chickpea<br/>Guar<br/>Lablab bean<br/>Lentil<br/>Pigeon pea</p> <p><i>Lupinus spp.</i><br/>Grain lupin<br/>Sweet lupin<br/>White lupin</p>  | <p><b>Foliar diseases</b></p> <p>White mold (<i>Sclerotinia sclerotiorum</i>)</p> <p>Botrytis gray mold (<i>Botrytis spp.</i>)</p>   | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p><b>For White mold and Botrytis gray mold</b>, apply shortly after emergence or transplanting when conditions favor disease development. Repeat on 7-10 day intervals as needed. When disease pressure is high, use <b>Serifel</b> in a rotation program with other registered fungicides.</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><i>Phaseolus spp.</i><br/>Field bean<br/>Kidney bean<br/>Lima bean<br/>Navy bean<br/>Pink bean<br/>Pinto bean<br/>Tepary bean</p> <p><i>Pisum spp.</i><br/>English pea<br/>Field pea<br/>Garden pea<br/>Green pea<br/>Broad bean</p> <p><i>Vigna spp.</i><br/>Adzuki bean<br/>Blackeyed pea<br/>Catjang<br/>Cowpea<br/>Crowder pea<br/>Moth bean<br/>Mung bean<br/>Rice bean<br/>Southern pea<br/>Urd bean</p> | <p><b>Soil Diseases</b></p> <p>Fusarium wilt (<i>Fusarium spp.</i>)</p> <p>Phytophthora root rot (<i>Phytophthora spp.</i>)</p> <p>Pythium damping off (<i>Pythium spp.</i>)</p> <p>Rhizoctonia root rot (<i>Rhizoctonia solani</i>)</p> <p>Verticillium wilt (<i>Verticillium spp.</i>)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p>See Soil Application Instructions for In-furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases  | Product Use Rate per Application<br>(oz of Serifel/Acre) | Application Directions  |
|---|--|--|---|
| <b>Oil Seed group*</b><br>Canola<br>Castor<br>Coconut<br>Cotton<br>Flax<br>Oil Palm<br>Olive<br>Peanut<br>Rapeseed<br>Safflower<br>Sesame<br>Sunflower<br>Soybean and other oilseed crops including those grown for seed production | <b>Foliar disease</b><br>White mold<br><i>(Sclerotinia sclerotiorum)</i>   | 4 - 16<br>(0.25 - 1.0 lb/A)                              | <p><b>For White mold</b>, apply shortly after emergence when conditions favor disease development. Repeat on 7- 10 day intervals as needed. When disease pressure is high, use higher rates and shorter intervals.</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>Soil Diseases</b><br>Cylindrocladium black rot<br><i>(Cylindrocladium spp.)</i><br>Fusarium wilt ( <i>Fusarium spp.</i> )<br>Phytophthora root rot<br><i>(Phytophthora spp.)</i><br>Pythium damping off ( <i>Pythium spp.</i> )<br>Rhizoctonia root rot<br><i>(Rhizoctonia solani)</i><br>Southern blight<br><i>(Sclerotium rolfsii)</i><br>Verticillium wilt<br><i>(Verticillium spp.)</i> | 4 - 16<br>(0.25 - 1.0 lb/A)                              | <p>See Soil Application Instructions for In-furrow, Drench, Shank-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>   |



## Crop-specific Directions *(continued)*

| Crop   | Target Diseases   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|--|---|---|--|
| <p><b>Pome fruit group*</b></p> <p>Apple<br/>Crabapple<br/>Loquat<br/>Mayhaw<br/>Oriental pear<br/>Pear<br/>Quince</p> | <p><b>Foliar diseases</b></p> <p>Alternaria blotch<br/><i>(Alternaria mali)</i></p> <p>Bitter rot<br/><i>(Colletotrichum spp.)</i></p> <p>Blue mold<br/><i>(Penicillium spp.)</i></p> <p>Bot rot<br/><i>(Botryosphaeria dothidea)</i></p> <p>Botrytis gray mold<br/><i>(Botrytis spp.)</i></p> <p>Brooks spot<br/><i>(Mycosphaerella pomi)</i></p> <p>Bull's eye rot<br/><i>(Neofabraea spp.)</i></p> <p>Cedar apple rust<br/><i>(Gymnosporangium juniper-virginianae)</i></p> <p>Flyspeck<br/><i>(Schizothyrium pomi)</i></p> <p>Powdery mildew <i>(Podosphaera spp.)</i></p> <p>Scab<br/><i>(Venturia spp.)</i></p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p><b>For Bitter rot, 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 on 2-7 day intervals when conditions are favorable for disease development. Continue application on 7 day intervals after petal fall when conditions are favorable for disease development. Use <b>Serifel</b> in a rotational program with a registered antibiotic product.</p> <p><b>For Powdery mildew</b>, begin applications at tight cluster or earlier if conditions are favorable for disease development. Repeat application on 7-10 day intervals through the second cover spray.</p> <p><b>For Scab</b>, begin applications at green tip or when conditions are favorable for disease development. Continue applications on 7-10 day interval as needed. Use <b>Serifel</b> in a rotational program with fungicides registered for scab control.</p> <p><b>For Alternaria blotch, Blue mold and Botrytis gray 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> |

## Crop-specific Directions *(continued)*

| Crop                                    | Target Diseases   | Product Use Rate per Application<br>(oz of Serifel/Acre) | Application Directions  |
|---|---|--|---|
| <b>Soybean*</b><br><i>(Glycine max)</i> | <b>Foliar disease</b><br><br>White mold<br><i>(Sclerotinia sclerotiorum)</i>  | 4 - 16<br>(0.25 – 1.0 lb/A)                              | <p>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. Mix <b>Serifel</b> with a labeled soybean fungicide.</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>Soil diseases</b><br><br>Charcoal rot<br><i>(Macrophomina phaseolina)</i><br><br>Fusarium wilt ( <i>Fusarium</i> spp.)<br><br>Phytophthora root rot<br><i>(Phytophthora</i> spp.)<br><br>Pythium damping off ( <i>Pythium</i> spp.)<br><br>Rhizoctonia root rot<br><i>(Rhizoctonia solani)</i> | 4 – 16<br>(0.25 – 1.0 lb/A)                              | <p>See Application Instructions for In-Furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>  |

## Crop-specific Directions *(continued)*

| Crop   | Target Diseases   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|--|---|---|--|
| <p><b>Stone fruit group*</b></p> <p>Apricot<br/>Cherry (sweet and tart)<br/>Nectarine<br/>Peach<br/>Plum (all varieties)<br/>Plumcot<br/>Prune</p> | <p><b>Foliar diseases</b></p> <p>Alternaria spot (<i>Alternaria alternata</i>)</p> <p>Anthracnose (<i>Colletotrichum</i> spp.)</p> <p>Blossom blight (<i>Monilinia</i> spp.)</p> <p>Botrytis gray mold (<i>Botrytis</i> spp.)</p> <p>Brown rot of fruit (<i>Monilinia</i> spp.)</p> <p>Powdery mildew (<i>Sphaerotheca</i> spp. <i>Podosphaera</i> spp.)</p> <p>Ripe fruit rot (<i>Monilinia</i> spp., <i>Botrytis</i> spp., <i>Rhizopus</i> spp.)</p> <p>Shot hole (<i>Wilsonomyces carpophilus</i>)</p> | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p><b>For Anthracnose and Brown rot of fruit</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 Blossom blight</b>, begin applications at early bloom and continue through petal fall at 7 day intervals as needed.</p> <p><b>For Powdery mildew</b>, begin applications at popcorn stage and continue on 7 day intervals as needed.</p> <p><b>For all other 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> |

## Crop-specific Directions *(continued)*

| Crop               | Target Diseases  | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|--------------------|--|---|--|
| <b>Strawberry*</b> | <b>Foliar diseases</b><br>Anthracnose ( <i>Colletotrichum</i> spp.)<br>Botrytis gray mold ( <i>Botrytis</i> spp.)<br>Leaf scorch ( <i>Diplocarpon earliana</i> )<br>Leaf spot ( <i>Mycosphaerella fragariae</i> )<br>Powdery mildew ( <i>Erysiphe</i> spp., <i>Sphaerotheca</i> spp.)                                      | 4 - 16<br>(0.25 – 1.0 lb/A)                           | <p><b>For Angular leaf spot, Anthracnose and Leaf scorch,</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><b>For Botrytis and Powdery mildew,</b> begin applications at or before flowering continue on 7-10 days intervals as needed. Use higher rates and shorter intervals when disease pressure is high. Use <b>Serifel</b> in a rotational program or tank mix with other registered fungicides labeled for Botrytis and Powdery mildew control.</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>Soil diseases</b><br>Charcoal rot ( <i>Macrophomina phaseolina</i> )<br>Fusarium wilt ( <i>Fusarium</i> spp.)<br>Phytophthora root rot ( <i>Phytophthora</i> spp.)<br>Pythium damping off ( <i>Pythium</i> spp.)<br>Rhizoctonia root rot ( <i>Rhizoctonia solani</i> )<br>Verticillium wilt ( <i>Verticillium</i> spp.) |   | 4 – 16<br>(0.25 – 1.0 lb/A)  |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|---|---|---|--|
| <p><b>Tuberous and corm vegetables*</b><br/><b>Subgroup</b></p> <p><b>Potato</b><br/>Arracacha<br/>Arrowroot<br/><b>Carrot</b><br/>Cassava (bitter and sweet)<br/>Chayote<br/>Chinese artichoke<br/>Chufa<br/>Dasheen (taro)<br/>Edible canna<br/>Ginger<br/>Jerusalem artichoke<br/>Leren<br/>Sweet potato<br/>Tanier<br/>True yam<br/>Turmeric<br/>Yam bean</p> | <p><b>Foliar diseases</b></p> <p>Black dot<br/><i>(Colletotrichum coccodes)</i></p> <p>Black rot/Crown rot<br/><i>(Alternaria spp.)</i></p> <p>Brown spot and black pit<br/><i>(Alternaria alternata)</i></p> <p>Early blight<br/><i>(Alternaria solani)</i></p> <p>Botrytis gray mold<br/><i>(Botrytis spp.)</i></p> <p>Late blight<br/><i>(Phytophthora infestans)</i></p> <p>White mold<br/><i>(Sclerotinia sclerotiorum)</i></p>                                | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p><b>For Black rot and Botrytis gray mold</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 White mold</b>, begin foliar applications shortly after emergence or transplanting and continue on 7-10 day intervals if conditions are favorable for disease development.</p> <p><b>For Early blight and Late blight</b>, Begin applications shortly after emergence or transplanting and continue on 5-7 day intervals as needed. Use <b>Serifel</b> in a rotational program or tank mix with other registered fungicides labeled for Early blight and Late blight control.</p> <p><b>For all other diseases</b>, begin application 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> |
|   | <p><b>Soil diseases</b></p> <p>Black scurf<br/><i>(Rhizoctonia solani)</i></p> <p>Cavity spot<br/><i>(Pythium spp.)</i></p> <p>Fusarium wilt <i>(Fusarium spp.)</i></p> <p>Phytophthora root rot<br/><i>(Phytophthora spp.)</i></p> <p>Pythium damping off <i>(Pythium spp.)</i></p> <p>Rhizoctonia damping off.<br/><i>(Rhizoctonia solani)</i></p> <p>Silver scurf<br/>(<i>Helminthosporium spp.</i>)</p> <p>Verticillium wilt<br/><i>(Verticillium spp.)</i></p> | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                   | <p>See Soil Application Instructions for In-furrow, Drench, Shanked-In and Injected Applications</p> <p>Apply a high enough water volume to thoroughly soak soil through the root zone.</p>  |

## Crop-specific Directions *(continued)*

| Crop  | Target Diseases  | Product Use Rate per Application<br>(oz of Serifel/Acre) | Application Directions  |
|---|--|--|---|
| <p><b>Tree nut group*</b></p> <p>Almond<br/>Beech nut<br/>Brazil nut<br/>Butternut<br/>Cashew<br/>Chestnut<br/>Chiquapin<br/>Filbert<br/>Hickory nut<br/>Pecan<br/>Pistachio<br/>Walnut (black and English)</p> | <p><b>Foliar diseases</b></p> <p>Alternaria blight<br/><i>(Alternaria spp.)</i></p> <p>Anthracnose<br/><i>(Colletotrichum spp.)</i></p> <p>Botryosphaeria panicle and shoot blight<br/><i>(Botryosphaeria spp.)</i></p> <p>Brown rot/Blossom blight<br/><i>(Monilinia spp.)</i></p> <p>Hull Rot<br/><i>(Rhizopus spp. and Monilinia spp.)</i></p> <p>Scab<br/><i>(Cladosporium spp.)</i></p> <p>Shot hole<br/><i>(Wilsonomyces carpophilus)</i></p> <p>Rust<br/><i>(Tranzschelia discolor)</i></p> | <p>4 - 16<br/>(0.25 – 1.0 lb/A)</p>                      | <p><b>For Anthracnose, Shot hole and Brown rot,</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 all other diseases,</b> begin application 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> |

**Crop-specific Directions** (continued)

| Crop                            | Target Disease   | Product Use Rate per Application (oz of Serifel/Acre) | Application Directions   |
|---------------------------------|--|---|--|
| <p><b>Wheat and Barley*</b></p> | <p><b>Foliar disease</b></p> <p>Head scab<br/>(<i>Fusarium</i> spp.)</p> | <p>4 - 16<br/>(0.25 - 1.0 lb/A)</p>                   | <p><b>For Head scab</b>, apply <b>Serifel</b> at any time from one week prior to flowering to one week after flowering. Tank-mix <b>Serifel</b> with a fungicide labeled for head scab.</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> |

\*Not for use in California

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