

# STERLING

Liquid Fungicide and Bacteriacide

COMMERCIAL

ACTIVE INGREDIENT: Copper, present as copper sulphate pentahydrate.....1.7%  
Iodine, elemental .....0.5%

CAUTION



CORROSIVE



POISON

READ THE LABEL BEFORE USING

KEEP OUT OF REACH OF CHILDREN

Net Contents: 4 - 20 L

DO NOT APPLY TO WATERS CONTAINING FISH

Revolution 5 Agriculture  
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## **GENERAL INFORMATION:**

STERLING is a broad spectrum, preventative product for the control and suppression of many plant diseases. STERLING may be applied as a foliar spray, ground application, or in an alternating spray program with other registered crop protection products. When conditions are conducive to heavy disease pressure, use STERLING in a rotational program with other registered fungicides.

## **PRECAUTIONS**

Wear goggles, long pants, a long-sleeved shirt and shoes plus socks during mixing/loading, application, clean-up and repair. In addition, wear chemical-resistant gloves during mixing/loading, clean-up and repair.

Remove personal protective equipment immediately after handling this product. If gloves are required on the label, wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing. Remove clothing/personal protective equipment immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Discard clothing and other absorbent material that have been drenched or heavily contaminated with the product's concentrate. Do not reuse them.

For cleaning/maintaining personal protective equipment, use detergent and hot water. Keep and wash personal protective equipment separately from other laundry.

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

DO NOT enter or allow worker entry into treated areas during the restricted-entry interval of 48 hours.

## **FIRST AID**

**IF IN EYES:** 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. Call a poison control centre or doctor for treatment advice.

**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

**TOXICOLOGICAL INFORMATION:** Treat symptomatically.

## **USE RATE DETERMINATION:**

Carefully read and follow all label directions and restrictions. STERLING should be applied prior to or in the early stages of disease development. Use maximum label rates and shortened spray intervals for conditions conducive to rapid disease development. For proper application, determine the number of hectares to be treated, the recommended label use rate and select appropriate water volumes to give good canopy penetration and coverage of plant parts to be protected. Prepare only the amount of spray solution required to treat the measured acreage. Sprayer calibration is essential for good product performance.

## **DIRECTIONS FOR USE:**

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator or grower are responsible for considering all of these factors when making decisions.

**Use Restrictions:** As this product is not registered for the control of pests in aquatic systems, **DO NOT** use to control aquatic pests.

**Restricted-Entry Interval (REI):** DO NOT allow worker entry into treated areas for 4 hours or until sprays have dried unless wearing waterproof gloves, long-sleeved shirt, long pants, socks and shoes.

**Preharvest Interval:** STERLING can be used up to 7 days before harvest. PHI=7 days  
Always consult with your processor to insure you meet the required MRL before using this product.

**DO NOT** apply this product in a way that will contact workers or bystanders, either directly or through drift. Only protected handlers may be in the area during application.

**DO NOT** contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes. For use in water wholly confined to the property of the user and where there is no outflow beyond the property limits.

## **ENVIRONMENTAL PRECAUTIONS –**

**TOXIC** to aquatic organisms (copper sensitive aquatic plants, invertebrates, and fish)  
When fish are present, special application procedures must be followed. Contact distributor before treating water inhabited by fish.

## Application Rates for STERLING

When applied as directed, STERLING will control/suppress the indicated diseases. Under conditions of moderate to high disease pressures, use the higher rate and shorter application interval indicated. Apply in sufficient water carrier volume to ensure good coverage.

### Ground Application Only

Crop	Disease	Rate (mL/hectare)	Application Instructions
Asparagus	Botrytis blight ( <i>Botrytis cinerea</i> )	500-600	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Crop Group 13 Crops (Bushberries and Caneberries):  <b>Bayberry; bearberry; blackberry; highbush and lowbush blueberry; chokecherry; currant; elderberry; gooseberry; huckleberry; lingonberry; loganberry, mulberry; pincherry; raspberry; salal; Saskatoon berry; sea buckthorn; wild raspberry.</b>	Botrytis grey mould ( <i>Botrytis cinerea</i> )	500-1200	Begin applications at the first sign of disease or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
	Bacterial blight ( <i>Pseudomonas syringae</i> )	500-1200	Apply before fall rains and again during dormancy before spring.
Crop Group 13-07: Berry and Small Fruit Crop Group).  <b>Blackberry or raspberry, highbush blueberry, elderberry or mulberry, grape, strawberry, and fuzzy kiwifruit</b>	Botrytis grey mould ( <i>Botrytis cinerea</i> )	500-1200	Begin application prior to disease development and repeat on 7-10 day intervals.
Highbush blueberry, lowbush blueberry	Mummy berry ( <i>Monilinia vaccinii-corymbosi</i> )	500-1000	Begin applications at the bud break stage of development. Repeat as necessary on a 7-14 day interval.
Crop Group 5 (Cole) Crops  <b>Broccoli, Chinese broccoli, Broccoli raab, Brussels sprouts,</b>	Sclerotinia rot ( <i>Sclerotinia sclerotium</i> )	500-600	Make the first application at emergence, or immediately following transplanting. Repeat applications on 10-14 day intervals if conditions for disease development continues.
	Downy mildew ( <i>Peronospora parasitica</i> )	500-600	

<b>cabbage (all types), cauliflower, cavalo broccoli, collards, kale, kohlrabi, mizuna, mustard greens, mustard spinach, rape greens.</b>	Pin rot ( <i>Alternaria / Xanthomonas Complex</i> )		
Crop Group 6 Crops (Legume Vegetables):  <b>Bean (<i>Lupinus</i> spp., <i>Phaseolus</i> spp., and <i>Vigna</i> spp.), chickpea, lentil, and pea (all types)</b>	White mould ( <i>Sclerotinia sclerotiorum</i> )	500-600	Make the first application at planting (or immediately following planting but prior to crop emergence). Make a second application as a directed spray with multiple nozzles per seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning. Repeat applications on 7-14 day intervals if conditions for disease development persist.
	Botrytis pod rot ( <i>Botrytis cinerea</i> )	500-600	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Soybean	White mould ( <i>Sclerotinia sclerotium</i> )	500-600	Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval.
	Brown spot ( <i>Septoria glycines</i> )  Frog eye ( <i>Cercospora sojina</i> )	500-600	
Crop Group 3 Crops (Bulb Vegetables)  <b>Onions (all types), garlic (all types), leeks, shallots and chives</b>	Botrytis neck rot ( <i>Botrytis allii</i> )  Botrytis leaf blight ( <i>Botrytis squamosa</i> )	500-1000	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
	Downy mildew ( <i>Peronospora destructor</i> )	500-1000	
Peanut	Leaf spot ( <i>Cercospora arachidicola</i> , <i>Cercosporidium personatum</i> )	500-700	Begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval.

Crop Group 1: Root tuber vegetables: <b>Garden beet, sugar beet, carrot, celeriac, chervil, chicory, ginseng, horseradish, turnip-rooted parsley, parsnip, potato, radish, Oriental radish, rutabaga, salsify, sweet potato, and turnip.</b>	White mould ( <i>Sclerotinia sclerotiorum</i> )	500-800	Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval.
Potato	Early blight ( <i>Alternaria solani</i> )		
Sugar, Garden Beet	Cercospora Leaf Spot ( <i>Cercospora beticola</i> )	500-600	<p>Begin application soon after emergence and when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval.</p> <p>Serenade MAX must be applied with a non-ionic surfactant at a rate of 0.25% v/v or at labeled rates.</p> <p>Use foliar boom or overhead boom spray equipment.</p> <p>Under conditions of moderate to high disease pressures, use the higher rate and shorter application interval indicated.</p>
Crop Group 9 Crops (Cucurbits)  <b>Canteloupe, Chinese waxgourd, cucumber, gherkin, edible gourd, melon, muskmelon, pumpkin, squash, and watermelon.</b>	<p>Powdery mildew (<i>Erysiphe cichoracearum, Sphaerotheca fuliginea</i>)</p> <p>Downy mildew (<i>Pseudoperonospora cubensis</i>)</p>	500-600	<p>Begin application soon after emergence or transplant, when conditions are conducive for disease development. Repeat applications on an interval of 7-10 days.</p> <p>Begin application soon after emergence or transplant, when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval. When environmental conditions and plant stage are conducive to rapid disease development, use Serenade Max in a rotational program with other registered fungicides.</p>

Crop Group 8: Fruiting vegetables:  <b>Eggplant, ground cherry, okra, pepino, peppers (all varieties), tomatillo and tomatoes</b>	Early blight ( <i>Alternaria solani</i> )	500-700	Make the first application when plants are 6-10 cm high, or when conditions are conducive for disease development. Repeat applications on an interval of 5-7 days.
	Botrytis grey mould ( <i>Botrytis cinerea</i> )	500-600	
Tomato, Peppers	Powdery mildew ( <i>Erysiphe orontii</i> , <i>Leveillula taurica</i> )	500-600	Begin application soon after emergence or transplant, and repeat on an interval of 7-10 days.
	Bacterial spot ( <i>Xanthomonas campestris</i> )	500-600	Begin application soon after emergence or transplant, when conditions are conducive to disease development. Repeat as necessary on a 7-10 day interval. When environmental conditions and plant stage are conducive to rapid disease development, use Serenade Max in a rotational program with other registered bacteriacides.
Grapes	Powdery mildew ( <i>Uncinula necator</i> )	500-1200	Begin application when new shoots are 1-3 cm high. Make a repeat application when shoots are 6-10 cm high, and when shoots are 18-20 cm high, then at 7-10 day intervals thereafter.
	Grey mold ( <i>Botrytis cinerea</i> )  Sour rot* (a complex of various pathogens)	500-1200	Make the first application at bloom, then repeat at bunch closure, at veraison and preharvest.  *Note that sour rot disease is caused by various yeast, fungal and bacterial pathogens, and that Serenade MAX has not been tested for control of all of these agents.
Crop Group 4 Crops (Leafy vegetables):  <b>Amaranth, arugula, Chinese celery, celtuce, chervil, corn salad, cress, dandelion, dock, endive, fennel, lettuce, orach, parsley, radicchio, and swiss chard.</b>	Sclerotinia rot ( <i>Sclerotinia minor</i> , <i>Sclerotinia sclerotiorum</i> )	500-600	Make the first application at planting (or immediately following planting but prior to crop emergence). Make a second application as a directed spray with multiple nozzles per seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning. Repeat applications on 10-14 day intervals if conditions for disease development persist.

	Grey mould ( <i>Botrytis cinerea</i> )		For suppression, begin applications soon after emergence or transplant and continue as necessary on a 7 to 10 day interval. When environmental conditions are conducive to rapid disease development, use Serenade MAX in a rotational program with other registered fungicides. Thorough coverage is essential.
	Powdery mildew ( <i>Erysiphe cichoracearum</i> )	500-600	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Lettuce	Downy mildew ( <i>Bremia lactucae</i> )	500-600	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Spinach	White rust ( <i>Albugo occidentalis</i> )	500-600	Begin applications at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Celery	Pink Rot ( <i>Sclerotinia sclerotiorum</i> )	500-600	Make the first application approximately 8 weeks before harvest and repeat on a 14-day interval. Apply Serenade MAX as a directed spray in sufficient water to ensure thorough coverage of the base of the plants and the surrounding soil surface.
Crop Group 11 Crops (Pome Fruits):  Apple, Crabapple, Loquat, Mayhaw, Pear, Oriental pear, Quince, and non-bearing pome fruit trees			

Apples	Powdery Mildew ( <i>Podosphaera leucotricha</i> )	500-1200	Begin application at tight cluster, or sooner, if conditions are conducive to disease development. Repeat applications on a 7-10 day interval. Additional sprays beyond second cover may be needed on susceptible varieties or under heavy disease pressure.
Crop Group 12 Crops (Stone Fruits):  <b>Apricot, cherry, nectarine, peach, plum, plumcot, and prune</b>	Brown Rot ( <i>Monilinia spp.</i> )	500-1200	Begin application at early bloom and repeat as necessary through petal fall on a 7-day interval.
Radish, turnip and rutabaga	Downy mildew ( <i>Personospora parasitica</i> )	500-600	Downy mildew: Begin application when environmental conditions are conducive to disease development and repeat on 7-10 day intervals.
Strawberry	Botrytis gray mould ( <i>Botrytis cinerea</i> )	500-600	Begin application at the first sign of disease, or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval.
Crop Group 19: Herbs and Spices  <b>Anise, balm, basil, borage, chamomile, caraway, catnip, celery seed, chervil, chive, coriander, costmary, dill, fennel, fenugreek, horehound, juniper berry, lavender, lemongrass, lovage, marigold, mustard (seed), nasturtium, parsley, rosemary, sage, savory, sweet bay, thyme, wintergreen, woodruff, and wormwood including transplants</b>	Botrytis gray mould ( <i>Botrytis cinerea</i> ); White mould ( <i>Sclerotinia sclerotiorum</i> )	400-500	Begin application when environmental conditions are conducive to disease development. Repeat as necessary on a 7- to 10-day interval.

**Ground and Aerial Application**

Crop	Disease	Rate (kilogram/ hectare)	Application Instructions
Crop Group 20A: Oilseed crops (rapeseed subgroup)  <b>Canola, borage, crambe, cuphea, echium, flax seed, gold of pleasure, hare's ear mustard, lesquerella, lunaria, meadowfoam, milkweed, mustard seed, oil radish, poppy seed, rapeseed, sweet rocket, cultivars, varieties and/or hybrids of these</b>	Sclerotinia stem rot (Sclerotinia sclerotiorum)	400-600	Begin application at 20%- 30% bloom. A second application may be made 7-10 days later, at approximately 50% bloom and prior to significant petal fall, if conditions for disease development remain favorable. Use higher rates in fields with a history of heavy disease pressure. Spray Volume: minimum 50 L/ha

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## **ENVIRONMENTAL PRECAUTIONS – WHEN USED AS A BACTERICIDE**

**TOXIC** to birds, small wild animals, aquatic organisms and non-target terrestrial plants. Observe buffer zones under DIRECTIONS FOR USE – BACTERICIDE.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application when heavy rain is forecast.

Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

**DO NOT** apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs, and wetlands) or estuarine/marine habitats.

## **RESISTANCE MANAGEMENT RECOMMENDATIONS**

For resistance management, Sterling contains a Group M01 bactericide. Any bacterial population may contain individuals naturally resistant to Copper and other Group M01 bactericides. A gradual or total loss of pest control may occur over time if these bactericides are used repeatedly in the same fields. Other resistance mechanisms that are not linked to site of action but specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay bactericide resistance:

- Where possible, rotate the use of Sterling or other Group M01 bactericides with different groups that control the same pathogens.
- Use tank mixtures with bactericides from a different group that effective on the target pathogen when such use is permitted.
- Bactericide use should be based on an integrated disease management program that includes scouting, historical information related to pesticide use and crop rotation and considers host plant resistance, impact of environmental conditions on disease development, disease thresholds, as well as cultural, biological and other chemical control practices.
- Where possible, make use of predictive disease models to effectively time bactericide applications.
- Monitor treated bacterial populations for resistance development. Notify Revolution 5 Agriculture if reduced sensitivity of the pathogen to Sterling is suspected.
- If disease continues to progress after treatment with this product, do not increase the use rate. Discontinue use of this product, and switch to another bactericide with a different mode of action, if available.

- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or IPM recommendations for specific crops and pathogens.

**STORAGE AND HANDLING:** Store this product away from food or feed. Handling and storage equipment must be fibreglass, PVC, polypropylene, viton, aluminum or stainless steel. NEVER use nylon, copper, brass or mild steel parts or components in contact with full strength STERLING. Fabrics containing nylon or cotton will dissolve on contact with full strength STERLING. Always rinse equipment with plenty of fresh clean water. Do not allow product to freeze. Freezing will cause separation.

**DISPOSAL:** Dispose of STERLING through use. Do not pour into lakes or rivers, as this may kill fish. Neutralize spills with bicarbonate of soda or lime.

**DISPOSAL OF CONTAINER:** Triple or pressure-rinse the empty container. Add the rinsings to the treatment site (bacteriostatic algaecide) or to the spray mixture in the tank (bactericide). Follow provincial instructions for any required additional cleaning of the container prior to its disposal. Make the empty container unsuitable for further use. Dispose of the container in accordance with provincial requirements. For information on the disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

**NOTICE TO USER:** This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label.