69592-8 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY 10/18/2007 1/37

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Biopesticides and Pollution Prevention Division (7511P)
1200 Pennsylvania Avenue NW
Washington, DC 20460

EPA Reg. Number:	Date of Issuance:
69592-8	10-18-07

Term of Issuance: Unconditional

NOTICE OF PESTICIDE:

___x___ Registration ____ Re-registration
(under FIFRA, as amended)

Name of Pesticide Product:

Serenade® AS

Name and Address of Registrant (include ZIP Code):

AgraQuest, Inc.
1530 Drew Ave.
Davis CA 95616

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.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his 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 Sec. 3(c) **(5)** provided you:

1. Submit and/or cite all data required for registration/ reregistration of your product under FIFRA section 3(c)(5) and section 4 when the Agency requires all registrants of similar products to submit such data.

2. Submit two (2) copies of the revised final printed labeling before you release the product for shipment. Refer to the A-79 enclosure for a further description of final printed labeling.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA sec. 6(e). Your release for shipment of the product constitutes acceptance of these conditions. A stamped copy of the label is enclosed for your records.

Signature of Approving Official:

W. Michael Dotson

for Janet L. Andersen, Ph.D., Director
Biopesticides and Pollution
Prevention Division

Date: 10-18-07

EPA Form 8570-6

CONCURRENCES

SYMBOL ▶	7511P	7511P						
SURNAME ▶	Sherrelli	Rutt						
DATE ▶	10-18-07	10/18/07						

2/37

MASTER LABEL

Serenade® AS

[Alternate Name : Serenade Biofungicide]
An Aqueous Suspension Biofungicide

[USE INDOORS AND OUTDOORS]
[USE IN FIELD APPLICATIONS, GREENHOUSES, NURSERIES, SHADE HOUSES, LANDSCAPES, INTERIORSCAPES, SEEDLING PRODUCTION SITES, FOREST SEEDLING PRODUCTION SITES.]
[USE IN TANK MIXES OR ROTATIONAL ALTERNATING SPRAY PROGRAMS WITH OTHER CROP PROTECTION PRODUCTS]
[USE IN RESISTANT MANAGEMENT PROGRAMS]
[USE GROUND, AERIAL, CHEMIGATION AND HAND APPLIED EQUIPMENT]
[FOR USE ON ORNAMENTALS, TREES, SHRUBS, TURF, LAWNS, SOD, GOLF COURSES (GREENS, TEES, FAIRWAYS AND ROUGHS), SEEDLINGS, CONIFERS]
[USE IN PRODUCTION OF CONIFERS FOR REFORESTATION]

ACTIVE INGREDIENT

QST 713 strain of *Bacillus subtilis*	1.34%
INERT INGREDIENTS	98.66%
Total	100.00%

Contains a minimum of 1 x 10^9 CFU/g

EPA Reg. No. 69592-8

EPA Est. No.:

1	2	3	
69592-	67545-	66728-	37489-
MEX-1	AZ-1	GA-2	GA-2 CA-1

ACCEPTED
OCT 18 2007
Under FIFRA, as amended, for the pesticide registered under EPA Reg. No. 69592-8

[Superscript corresponds to last digit of lot number stamped on container]

U.S. Patent Nos. 6,060,051, 6,103,228, 6,291,426, and 6,417,163 on QST 713 strain of *Bacillus subtilis*

Net contents: [16 fluid ounces OR 20 fluid ounces OR 24 fluid ounces OR 32 fluid ounces OR 1.0 gallon, OR 2.5 gallons OR 3 gallons OR 5 gallons OR 30 gallons OR 110 gallons OR **250 gallons**]

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID –Agricultural Use

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a doctor or poison control center for further treatment advice.

Have the product label with you when calling a doctor or poison control center.

[For smaller container sizes:]
[See attached booklet for First Aid Statements.]
[Peel back tab for First Aid and Precautionary Statements and Directions for Use.]

PRECAUTIONARY STATEMENTS–Agricultural Use

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION

Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before use. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- NIOSH approved respirator with any N, R, P or HE filter

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

[**OPTIONAL STATEMENT:** When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.]

USER SAFETY RECOMMENDATIONS

Users should:
Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
Remove clothing/PPE immediately if pesticides get inside. Then wash thoroughly and put on clean clothing.
Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS – Agricultural Use

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 and rinsate. Do not apply when weather conditions favor drift or runoff from treated areas.

DIRECTIONS FOR USE – Agricultural Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your state or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

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 emergencies such as leaks or spills, call 24-hour toll-free CHEMTREC hotline at 1.800.424.9300.

AGRICULTURE 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 intervals. 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.

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,** waterproof gloves, shoes plus socks.

STORAGE AND DISPOSAL – Agricultural Use
Do not contaminate water, food, or feed by storage and disposal.

STORAGE: Store in a dry area inaccessible to children. Store in original containers only. Keep container closed when not in use.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water when disposing of equipment rinsate.
CONTAINER DISPOSAL: For 1.0-gallon, 2.5-gallon, 3-gallon, 5-gallon, or 30-gallon plastic containers –- Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. **For 110-gallon or larger returnable mini-bulk containers** – Return empty container for reuse.

GENERAL USE INFORMATION – Agricultural Use

Serenade® AS is a broad spectrum, preventative biofungicide for the control or suppression of many important plant diseases. Serenade AS is an ideal resistance management tool given its unique, multiple modes of action. It may be applied as a foliar spray alone, in alternating spray programs or in tank mixes with other registered crop protection products. For maximum effectiveness, apply Serenade AS prior to or in the early stages of disease development. When conditions are conducive to heavy disease pressure, use Serenade AS in a rotational program with other registered fungicides. Serenade AS may be applied with spray equipment commonly used for making ground or aerial applications and sprinkler/irrigation systems commonly used for chemigation.

[OPTIONAL STATEMENT: Serenade AS is most effectively used in a preventive disease management program. For improved performance use Serenade AS in a tank-mix or rotational program with other registered fungicides. When using Serenade AS alone for the first time a rate of 4 quarts per acre is recommended. Depending upon disease pressure the rate can be increased and/or spray intervals decreased. To enhance performance it is recommended that a surfactant [such as Biotune], known to be safe to the target crop, be added to the spray tank to improve penetration and coverage of above-ground portions of the plant.]

INTEGRATED PEST MANAGEMENT (IPM)

For disease resistance management, Serenade AS can be integrated into an overall disease and pest management strategy whenever fungicide use is necessary. Follow practices known to reduce disease development. Consult local agricultural authorities for specific IPM strategies developed for your crop(s) and location.

Be sure use of this product conforms to resistance management strategies, which may include rotating and/or tank-mixing with other products with different modes of action.

USE RATE DETERMINATION Agricultural Use

Carefully read and follow all label directions, use rates and restrictions. Apply Serenade AS 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 acres to be treated, the recommended label use rate and select appropriate application volume 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. Accurate spray equipment calibration is essential prior to use.

PREHARVEST INTERVAL– Agricultural Use

Serenade AS can be applied up to and including the day of harvest.

APPLICATION INSTRUCTIONS – Agricultural Use

GENERAL: 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 and the grower/treatment coordinator are responsible for considering all of these factors when making decisions. Where states have more stringent regulations, they should be observed. Note: This section is advisory in nature and does not supersede the mandatory label requirements.

GROUND: Be sure to maintain agitation during mixing and application to assure uniform product suspension. Thorough coverage of all foliage is essential for effective disease control. Serenade AS can be applied in commonly used ground equipment, hose-end, pressurized, greenhouse, and hand-held sprayers. To achieve good coverage use proper spray pressure, gallonage per acre, nozzles, nozzle spacing and ground speed. Consult spray nozzle and accessory catalogues for specific information on proper equipment calibration.

AERIAL: This product can be applied by aerial application. Refer to the Aerial Drift Reduction Advisory Information section of this label for general directions and precautions. Use the application rate indicated for the appropriate crop in sufficient water to achieve thorough coverage, or a minimum of 3 gallons of water per acre.

CHEMIGATION: This product can be applied through sprinkler or drip type irrigation systems , including a center pivot, lateral move, end tow, side wheel roll, traveler, solid set, and hand move. Refer to the Chemigation Directions for Use section of this label for general directions and precautions. Use the application rate indicated for the appropriate crop as specified in the Use Recommendations section of this label.

MIXING INSTRUCTIONS – Agricultural Use

MIXING: Serenade AS **must be diluted** with water for spray application. Partially fill the spray tank with clean water and begin agitation. Add the specified amount of Serenade AS to the tank. Finish filling the tank to the desired volume to obtain the proper spray concentration. It is critical that the spray solution be agitated during mixing and application to assure a uniform suspension. Do not allow spray mixture to stand overnight or for prolonged periods. **[Optional Statement:**
Maintain a spray solution pH between 4.5 and 8.5].

Serenade AS may be tank mixed with other registered pesticides to enhance plant disease control. Do not exceed recommended dosage rates. This product cannot be mixed with any product with prohibition against such mixing. Use of the resulting tank mix must be in accordance with the more restrictive label limitations and precautions.

COMPATIBILITY: Do not combine Serenade AS in the spray tank with pesticides, surfactants or fertilizers if there has been no previous experience or use of the combination to show it is physically compatible, effective and non-injurious under your use conditions.

Serenade AS is compatible with many commonly used pesticides, fertilizers, adjuvants and surfactants but has not been fully evaluated with all of these. To ensure compatibility of tank-mix combinations they should be evaluated prior to use, as follows: Using a suitable container add proportional amounts of product to water. Add wettable powders first, followed by water dispersible granules, then by liquid flowables and lastly, emulsifiable concentrates. Mix thoroughly and let stand for at least five minutes. If the combination stays mixed or can be remixed, it is physically compatible. 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.

[OPTIONAL STATEMENT: Do not use with penetrant-type adjuvants.]

ADDITIVES: Serenade AS is compatible with a wide range of additives. Since the product is primarily a protectant, thorough coverage of all above-ground plant parts is required for effective product performance. To improve plant surface coverage, add a non-phytotoxic adjuvant [such as Biotune™] to spray tank.

CHEMIGATION DIRECTIONS FOR USE

General Requirements:

1) Apply this product only through sprinkler or drip type irrigation systems including center pivot, lateral move, end tow, side wheel roll, traveler, solid set or hand move systems. Do not apply this product through any other type of irrigation system.
2) Crop injury or lack of effectiveness can result from non-uniform distribution of treated water.
3) Ensure that the irrigation system used is properly calibrated and if you have questions, call the State Extension Service specialists ,the equipment manufacturer or other experts.
4) 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.
5) 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 any necessary adjustments should the need arise.

Equipment Requirements:

1) Public water supply 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 25 individuals daily at least 60 days throughout the year.
2) Chemigation systems connected to the public water systems must contain a functional, reduced-pressure zone (RPZ), backflow preventer or the functional equivalent in the water supply 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 of the overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3) 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 back flow.
4) The pesticide injection pipeline must contain a functional, automatic, quick closing check valve to prevent the flow of fluid back towards the injection pump.
5) 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.
6) 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.
7) 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.
8) 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.
9) Do not apply when wind speed favors drift beyond the area intended for treatment

Application Instructions:

1) Remove scale, pesticide residues, and other foreign matter from the chemical supply tank and entire injector system. Flush with clean water. Failure to provide a clean tank, void of scale or residues may cause product to lose effectiveness or strength.
2) Do not combine Serenade AS with pesticides, surfactants or fertilizers for application through chemigation equipment unless prior experience has shown the combination physically compatible, effective and non-injurious under conditions of use. Serenade AS has not been fully evaluated for compatibility with all adjuvants or surfactants. It is advisable to conduct a spray compatibility test if mixture with adjuvants or surfactants is planned.

Center-pivot, Lateral Move, End Tow, and Traveler Irrigation Equipment (Use only with electric or oil hydraulic drive systems which provide a uniform water distribution):

- Determine size of area to be treated.
- Determine the time required to apply no more than 1/4 inch of water (6,750 gallons water per acre) over the area to be treated when the system and injection equipment are operated at normal pressures recommended by the equipment manufacturer. Run system at 80 to 95% of manufacturer's rated capacity.
- Using only water, determine the injection pump output when operated at normal line pressure.
- Determine the amount of Serenade AS fungicide required to treat area.
- Add required amount of Serenade AS fungicide and sufficient water to meet the injection time requirements of the solution tank.
- Maintain constant solution tank agitation during the injection period.
- Stop injection equipment after treatment is completed. Continue to operate the system until Serenade AS fungicide solution has cleared the sprinkler head.

Solid-set, Side (wheel) Roll, and Hand Move Irrigation Equipment:

- Determine acreage covered by sprinkler.
- Fill injector solution tank with water and adjust flow rate to use contents over a 10- to 30-minute interval.
- Determine the amount of Serenade AS fungicide required to treat area.
- Add the required amount of Serenade AS fungicide into the same quantity of water used to calibrate the injection equipment.
- Maintain constant solution tank agitation during the injection period.
- Operate system at normal pressures recommended by the manufacturer of the injection equipment and used for the time interval established during calibration.
- Inject Serenade AS fungicide at the end of the irrigation cycle or as a separate application to maximize foliar fungicide retention.

- Stop injection equipment after treatment is completed. Continue to operate the system until Serenade AS fungicide solution has cleared the last sprinkler head.

AERIAL DRIFT REDUCTION ADVISORY INFORMATION

General: 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 and the grower are responsible for considering all these factors when making decisions. Where states have more stringent regulations, they should be observed. Note: This section is advisory in nature and does not supersede the mandatory label requirements.

INFORMATION ON DROPLET SIZE: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

CONTROLLING DROPLET SIZE: Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets. Pressure -Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When high flow rates are needed, use higher flow rate nozzles instead of increasing pressure. # of Nozzles - Use the minimum number of nozzles that provide uniform coverage. Nozzle Orientation - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential. Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

BOOM WIDTH: For aerial applications, the boom width must not exceed 75% of the wingspan or 90% of the rotary blade. Use upwind swath displacement and apply only when wind speed is 3 -- 10 mph as measured by an anemometer. Use medium or coarser spray according to ASAE 572 definition for standard nozzles or VMD for spinning atomizer nozzles. If application includes a no-spray zone, do not release spray at a height greater than 10 feet above the ground or the crop canopy.

APPLICATION HEIGHT: Do not make application at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

SWATH ADJUSTMENT: When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

WIND: Drift potential is lowest between wind speeds of 2 - 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

TEMPERATURE INVERSIONS: Do not apply during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small, suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

SENSITIVE AREAS: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas). Do not allow spray to drift from the application site and contact people, structures people occupy at any time and the associated property, parks and recreation areas, non-target crops, aquatic and wetland areas, woodlands, pastures, rangelands, or animals.

CONDITIONS FOR SALE AND WARRANTY

AgraQuest warrants to those persons lawfully purchasing this product that at the time of the first sale of this product by Seller that this product conformed to its description and was reasonably fit for the purposes stated on the label when used in accordance with Seller's directions. Buyers and users of this product assume the risk of any use contrary to such directions. EXCEPT AS PROVIDED ELSEWHERE IN WRITING CONTAINING AN EXPRESS REFERENCE TO THIS WARRANTY AND LIMITATION OF DAMAGES, SELLER MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OR GUARANTY, INCLUDING ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR OF MERCHANTABILITY AND NO AGENT OF SELLER IS AUTHORIZED TO DO SO. **Except to the extent prohibited by applicable law, AgraQuest offers this product with the following conditions: 1) buyers and users of this product assume the risk of any storage, handling or use contrary to AgraQuest's label and directions and 2) AgraQuest's liability shall in no case exceed the purchase price of the applicable AgraQuest product.**

Serenade® is a registered trademark of AgraQuest.

AgraQuest, Inc.
1530 Drew Avenue
Davis, California 95618
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Recommended Application Rates for Selected Crops – Agricultural Use

Recommended Application Rates for Selected Crops- Agricultural Use

(Serenade AS has a 0-Day PreHarvest Interval for all crops contained on this label)

Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides.

Crops	Disease	Rate Qt/acre	Application Instructions
Artichoke	Powdery Mildew *Leveillula taurica, Erysiphe cichoracearum* Gray Mold *Botrytis spp.* Bacterial Crown Rot *Erwinia chrysanthemi*	1- 6	Begin application when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Serenade AS may be applied up to and including the day of harvest.
Asparagus	Rust *Puccinia asparagi* Botrytis Blight *Botrytis cinerea*	1- 6	Begin application soon after emergence and when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Serenade AS may be applied up to and including the day of harvest.
Bananas Plantains	Sigatoka *Mycosphaerella spp.*	1-6	Begin application when leaves first appear and repeat on 7 to 21 day intervals or as needed. The addition of an approved emulsifiable oil to spray solutions will improve performance.
Berries Blueberries Blackberry Raspberry Loganberry Huckleberry Cranberry Gooseberry Elderberry Currant Caneberry Bushberry and other berry crops	Mummy Berry *Monilinia vaccinii-corymbosi* Anthracnose Fruit Rot *Colletotrichum gloeosporiodes* *Colletotrichum acutatum* Botrytis Blight *Botrytis cinerea* Leaf Rust *Pucciniastrum vaccinii* Powdery Mildew *Microsphaera alni* Sooty Mold Misc. fungi Alternaria Fruit Rot *Alternaria tenuissima* Bacterial Canker *Pseudomonas* spp. Downy Mildew *Peronospora sparsa* Phomopsis *Phomopsis vaccinii*	1- 6	Mummy Berry - For suppression, begin application at the bud break stage of development and repeat on a 7 to 10 day intervals or as needed. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for mummy berry control. Bacterial Canker – Apply before fall rains and again during dormancy before spring growth. For all other diseases – Begin application prior to disease development and repeat on 7 to 10 day intervals or as needed. For improved performance of Serenade AS, add a surfactant [such as Biotune] to the spray tank to improve coverage. Cranberries – Make application to non-flooded fields only. Serenade AS may be applied to fruit up to and including the day of harvest.

Crops	Disease	Rate Qt/acre	Application Instructions
Brassica vegetables (Cole Crops) Broccoli Cabbage Cauliflower Brussels Sprouts Collards Kale Mustard Greens Kohlrabi and other brassica crops	Pin Rot Complex *Alternaria/Xanthomonas* Bacterial Leaf Spot *Pseudomonas syringae* Bacterial Soft Rot *Erwinia / Pseudomonas* Black Rot *Xanthomonas campestris* Xanthomonas Leaf Spot *Xanthomonas campestris* Alternaria Leaf Spot *Alternaria* spp. Anthracnose *Colletotrichum higginsianum* Cercospora Leaf Spot *Cercospora brassicicola* Downy Mildew *Peronospora parasitica* *Peronospora* spp. Powdery Mildew *Erysiphe polygoni* Southern Blight *Sclerotium rolfsii*	1- 6	Pin Rot - For suppression, begin application when environmental conditions are conducive to disease development and repeat on 7 to 10 day intervals or as needed. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for pin rot control. For all other diseases - Begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed.
Bulb Vegetables Onion Garlic Shallots and other bulb vegetables	Botrytis Neck Rot *Botrytis* spp. Botrytis Leaf Blight *Botrytis squamosa* Onion Purple Blotch *Alternaria porri* Onion Downy Mildew *Peronospora destructor* Downy Mildew *Peronospora* spp. Powdery Mildew *Erysiphe* spp. White Rot *Sclerotium cepivorum*	1- 6	Begin applications when environmental conditions are conducive to disease development and repeat sprays on 7 to 10 day intervals or as needed. Apply in sufficient water to provide complete coverage of plants. When conditions are conducive to rapid disease development, use Serenade AS in a rotational program with other registered fungicides for Botrytis neck rot control.
	Rust *Puccinia porri*	1- 6	For suppression, begin application when conditions are conducive to disease development and repeat on 7 to 10 day intervals or as needed. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides for rust control.

Crops	Disease	Rate Qt/acre	Application Instructions
Cereal Grains Barley Corn Millets Oat Rice Rye Sorghum Triticale Wheat Silage Crops and other cereal grain crops	Powdery Mildew *Erysiphe graminis* Rust *Puccinia* spp. Blast *Pyricularia oryzae* Sheath Spot and Blight *Rhizoctonia oryzae* *Thanatephorus kernel* Smut *Tilletia barclayana* Bacterial Blight and Streak *Xanthomonas spp* Stem Rot *Sclerotium oryzae* *Magnaporthe* spp Brown Rot, Leaf Spots and Smuts *Cercospora spp* *Entyloma spp* *Dreschlera spp* *Cochliobolus spp* *Ceratobasidium spp*	1- 6	Begin applications when environmental conditions and plant stage are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
Citrus Orange Grapefruit Lemon Tangerine Tangelo Pummelo and other citrus crops	Greasy spot *Mycosphaerella citri* Post Bloom Fruit Drop *Colletotrichum acutatum* Scab *Elsinoe fawcetti* Melanose *Diaporthe citri* Alternaria Leaf Spot *Alternaria alternata* Bacterial Blast *Pseudomonas syringae*	1- 6	Greasy spot - For suppression, begin applications at first new foliar flush, and repeat with subsequent new flushes. When conditions are conducive to rapid disease development, Serenade must be used in a tank mix program with other registered products, such as spray oil or copper- based fungicides, at labeled rates. Post bloom fruit drop – For suppression, begin applications at early bloom and when conditions are conducive to disease development. Repeat on a 7 to 10 day interval or as needed. Utilize the shorter spray interval between applications if warm, wet conditions persist. Citrus scab – For suppression, begin applications at first new foliar flush and repeat at petal fall and at ½ inch diameter fruit. Melanose – For suppression, begin applications at petal fall and repeat on a 14-21 day interval. Alternaria Leaf Spot – Begin applications when environmental conditions and plant stage are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Bacterial Blast – Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. For improved performance on post bloom fruit drop, scab and melanose, use Serenade in a tank mix or rotational program with other registered fungicides.

Crops	Disease	Rate Qt/acre	Application Instructions
Coffee	Coffee Berry Disease *Colletotrichum coffeanum* Bacterial Blight *Pseudomonas syringae*	1- 6	Begin applications when environmental conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance use Serenade AS in a tank mix or rotational program with other registered fungicides
Corn Sweet Corn Popcorn Seed Corn Silage Corn Field Corn and other corn crops	Common rust *Puccinia sorghi* Northern Corn Leaf Blight *Exserohilum turcicum* *Helminthosporium turcium* Southern Corn Leaf Blight *Bipolaris maydis* *Helminthosporium maydi* *Cochliobolus heterostrophus*	1- 6	Begin applications when environmental conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
Cucurbits Cucumber Cantaloupe Melon Muskmelon Squash Watermelon and other cucurbit crops	Powdery Mildew *Erysiphe* spp. *Sphaerotheca* spp. Gummy Stem Blight *Didymella bryoniae* *Phoma cucurbitacearum* Angular Leaf Spot *Pseudomonas syringae* Anthracnose *Colletotrichum lagenarium* Downy Mildew *Pseudoperonospora cubensis* Bacterial Fruit Blotch *Acidovorax avenae*	1- 6	Begin applications soon after emergence or transplant and continue on a 7- 10 day interval or as needed. When environmental conditions and plant stage are conducive to rapid disease development, use Serenade AS in a rotational program with other registered fungicides.
Fruiting Vegetables Pepper Tomato Eggplant Ground Cherry Tomatillo Okra and other fruiting vegetables	Bacterial Spot *Xanthomonas* spp. Target Spot *Corynespora cassiicola*	1- 6	Begin applications soon after emergence or transplant and when environmental conditions are conducive to disease development. Continue applications on a 5 to 7-day interval or as needed. When conditions are conducive to rapid disease development, for improved control, use Serenade AS in a tank mix program with copper-based bactericides registered for control of bacterial spot at labeled rates.
	Bacterial Speck *Pseudomonas syringae pv tomato*	1- 6	Begin application soon after emergence or transplant and when environmental conditions are conducive to disease development. Continue applications on a 5 to 7 day interval or as needed. Use higher rates when conditions are conducive to rapid disease development.

Crops	Disease	Rate Qt/acre	Application Instructions
Fruiting Vegetables Pepper Tomato Eggplant Ground Cherry Tomatillo Okra and other fruiting vegetables	Early Blight *Alternaria solani* Late Blight suppression *Phytophthora infestans*	1- 6	For suppression, begin applications when plants are 4- to 6-inches high. Repeat applications at 5- to 7-day intervals or as needed. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides for late blight control. Use shorter spray intervals under conditions conducive to rapid disease development.
	Powdery Mildew *Leveillula taurica* *Oidiopsis taurica* *Erysiphe* spp. *Sphaerotheca* spp. Downy Mildew *Pseudoperonospora cubensis*	1- 6	For suppression, begin application soon after emergence or transplant when environmental conditions are conducive to disease development. Repeat on a 7 to 10 day interval or as needed. Use maximum label rates under conditions conducive to rapid disease development. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides.
	Gray Mold *Botrytis cinerea*	1- 6	Begin applications soon after emergence or transplant and repeat on a 7-10 day interval or as needed. When conditions are conducive to rapid disease development, use Serenade AS in a rotational program with other registered fungicides.
	Buck-eye Rot *Phytophthora parasitica* Anthracnose *Colletotrichum candidum*	1-6	Begin application soon after emergence or transplant and continue on a 7 to 10 day interval or as needed. For improved performance of Serenade AS add a surfactant [such as Biotune] to the spray tank to improve coverage.
	Bacterial Canker *Clavibacter michiganensis*	1- 6	Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed.
Grape	Gray Mold *Botrytis cinerea* Sour Rot [a complex of pathogens *Aspergillus niger, Alternaria tenuis, Botrytis cinerea, Cladosporium herbarum, Rhizopus arrhizus, Penicillium* sp., and others]	1- 6	Begin applications at bloom, before bunch closure, at verasion and preharvest, up to day of harvest if necessary. Apply in sufficient water to provide full coverage. Serenade AS may be applied to fruit up to and including the day of harvest.
	Powdery Mildew *Uncinula necator*	1- 6	Begin application when new shoots are ½- to 1½- inches long. Repeat when shoots are 3- to 5-inches long, when shoots are 8- to 10-inches long and then at 7- to 10-day intervals until disease conditions no longer exist. Use high rates and shorter intervals when conditions are conducive to rapid disease development. Apply in sufficient water to provide thorough coverage
	Downy Mildew *Plasmopara viticola*	1- 6	For suppression, apply at 10-inch shoot, then at 7 – 10 day intervals until bunch closure (berry touch). For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for downy mildew control.
	Phomopsis *Phomopsis viticola*	1- 6	Begin applications when shoots are ½ to 1 inch long and repeat when shoots are 6-8 inches long.
	Black Rot *Guignardia bidwelli*	1- 6	Begin application when new shoots are 4 to 6 inches in length and repeat on 7 – 10 day intervals throughout the season until the berries start to change color.
	Eutypa *Eutypa lata*	2 – 5%	Apply solution to pruning wounds. Sanitation is critical. All wood from infected plants must be removed from the vineyard and destroyed (either buried or burned).

Crops	Disease	Rate Qt/acre#	Application Instructions
Herbs/ Spices	Bacterial Blight *Pseudomonas syringae* Anthracnose *Colletotrichum* spp. Alternaria Leaf Blight *Alternaria* spp. Botrytis *Botrytis spp*	1- 6	Begin application when environmental conditions are conducive to disease development. Repeat on 7 to 10 day interval or as needed.
Hop	Powdery Mildew *Sphaerotheca macularis* Downy Mildew *Peronospora* spp.	1-6 **qt./100 gal**	Use the higher rates when moderate to high disease pressure is present or expected. Begin applications when environmental conditions are conducive to rapid disease development. Continue sprays at 7 day intervals or as needed. Apply at a rate of 1-6 qt per 100 gallons of water using ground equipment. Minimum spray volume recommendations for hop growth stages are as follows: Emergence to training: Use 1-6 qt of product per 100 gallons of water. Apply using a minimum spray volume of 20 gallons per acre. Coverage will vary with the size of the vines and the type of spray equipment. Apply adequate spray volume to achieve complete spray coverage. Training to wire touch: Use 1-6 qt of product per 100 gallons of water. Apply using a minimum spray volume of 50 gallons per acre. Coverage will vary with the size of the vines and the type of spray equipment. Apply adequate spray volume to achieve complete spray coverage. Wire touch through harvest: Use 1-6 qt of product per acre. Apply in a minimum spray volume of 100 gallons per acre. Higher water volumes may be necessary to achieve thorough coverage after side arms develop. .Apply adequate spray volume to achieve complete spray coverage. Use the higher rates when moderate to high disease pressure is present or expected.

all rates in qt/acre except were noted otherwise

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Crops	Disease	Rate Qt/acre	Application Instructions
Leafy Vegetables Lettuce Celery Spinach Parsley Radicchio and other leafy vegetable crops	Downy Mildew *Bremia lactucae* *Peronospora* spp. Powdery Mildew *Erysiphe cichoracearum* Pink Rot *Sclerotinia sclerotiorum* Anthracnose suppression *Colletotrichum spp.* Bacterial Leaf Spot *Xanthomonas campestris* pv. *vitians* Bacterial Blight *Xanthomonas campestris*	1- 6	Downy mildew / powdery mildew - For suppression, begin application when conditions are conducive to disease development and repeat on 7 to 10 day intervals or as needed. Apply in sufficient water to ensure complete coverage of entire plant. For improved performance or as a preventative treatment in early crop stages use Serenade AS in a tank mix or rotational program with other registered fungicides. Pink rot – Begin application approximately 8 weeks before harvest and repeat on a 14-day day interval. Apply Serenade AS as a directed spray in sufficient water to ensure thorough coverage of the base of the plants and the surrounding soil surface. Light irrigation following application to incorporate Serenade may improve disease control. Anthracnose - suppression Begin application prior to disease development when environmental conditions and plant stage are conducive to rapid disease development and repeat on a day 7 to 10 day interval or as needed. Use higher rates and shorter application intervals under heavy disease pressure.. Bacterial Blight /Bacterial Leaf Spot- Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed.
	Sclerotinia Head and Leaf Drop *Sclerotinia* spp.	1- 6	For control of early Sclerotinia head and leaf drop: Apply at planting or immediately following planting but prior to crop emergence as a 4 to 6 inch seed line treatment. Make a second application as a directed spray with multiple nozzles per each 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 to 14 day intervals if conditions for disease development persist. Use higher rates under conditions conducive to moderate to severe disease pressure. Light irrigation after application to incorporate the product may improve disease control. OR For control of Sclerotinia head and leaf drop: Apply as a directed spray with multiple nozzles per each seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning or transplanting. Repeat applications on 10 to 14 day intervals if conditions for disease development persist. Use higher rates under conditions conducive to moderate to severe disease pressure. Light irrigation after application to incorporate the product may improve disease control.

Crops	Disease	Rate Qt/acre	Application Instructions
Legumes/ Vegetables (succulent and dried beans and peas) Bean Green beans Snap beans Shell beans Soybeans Dry Beans Garbanzo beans Lima beans Peas Chick peas Split peas Lentils and other legume/ vegetable crops	Rust *Uromyces appendiculatus*	1- 6	For suppression, begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. When conditions are conducive to disease development, for improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides.
	Rust *Puccinia* spp Bacterial Pustule *Xanthomonas spp.* Downy Mildew *Peronospora manshurica* Powdery Mildew *Erysiphe* spp	1- 6	Begin applications when environmental conditions and plant stage are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
	Asian Soybean Rust *Phakospora pachyrhizi*	1-6	Use as part of a program with other fungicides labeled for Asian Soybean Rust. Begin applications when environmental conditions are conducive to disease development. Continue at 7 to 14 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
	Aphonomyces spp	1-6	Begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat on a 7 to 10 day interval or as needed.
	White Mold (Sclerotinia Stem Rot) *Sclerotinia sclerotiorum* Gray Mold (Botrytis Blight *Botrytis spp*	1- 6	Begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. When conditions are conducive to rapid disease development use Serenade AS in a rotational program with other registered fungicides
Mint And other herb/spices	Rust *Puccinia menthae* Powdery Mildew *Erysiphe spp* Downy Mildew *Peronospora* spp.	1- 6	Begin application soon after emergence when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
Oil Seed Crops Canola Castor Coconut Cotton Flax Oil Palm Olive Peanut Rapeseed Safflower Sesame Sunflower Soybeans and other oilseed crops	Bacterial Speck *Pseudomonas syringe pv. glycinea* Brown Spot *Septoria glycines* Pod and Stem Blight *Diaporthe phaseolorum var. sojae* *Phomopsis longicola* Downy Mildew *Peronospora manshurica* Rust White Mold (Sclerotinia Stem Rot) *Sclerotinia sclerotiorum* Bacterial Pustule *Xanthomonas spp.*	1-6	Begin application soon after emergence and when conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
	Asian Soybean Rust *Phakospora pachyrhizi*	1-6	Use as part of a program with other fungicides labeled for Asian Soybean Rust. Begin applications when environmental conditions are conducive to disease development. Continue at 7 to 14 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.

Crops	Disease	Rate Qt/acre	Application Instructions
Olive	Olive Knot *Pseudomonas savastanoi* Leaf Spot *Cercospora cladosporioides*	1- 6	Apply before fall rains and again during dormancy before spring growth. For improved control, under conditions conducive to heavy disease pressure, use Serenade AS in a tank-mix or rotational program with a copper-based bactericide registered for control of olive knot. In cool, wet areas, apply preventive treatments to olive trees after harvest but before winter rains begin and again in spring if wet, rainy weather persists.
Peanuts	Early Leaf Spot *Cercospora* spp. *Cercospora arachidicola* *Late Leaf Spot* *Cercosporidium personatum* Rust *Puccinia arachidis* White Mold *Sclerotinia sclerotiorum* Web Blotch *Phoma arachidicola*	1- 6	Begin applications when environmental conditions are conducive to rapid disease development. Repeat applications at 14-day intervals or as needed. For improved control, use Serenade AS in a tank mix program with copper-based fungicides registered for control of peanut leaf spot at labeled rates. Peanut hay may be fed to livestock.

Crops	Disease	Rate Qt/acre	Application Instructions
Pome Fruit Apple Crabapple Pear Quince Mayhaw and other pome fruit	Fire Blight *Erwinia amylovora*	1- 6	For suppression begin application at 1 – 5% bloom and repeat as necessary to protect open, untreated blossoms when conditions favoring disease development are likely to occur. For maximum control, use Serenade AS prior to and as close as possible to fire blight infection events. During periods of rapid bloom development and frequent infection periods, spray intervals of 3 – 7 days may be required. After petal fall, continue applications on a 7-day interval while environmental conditions favor disease development. Apply in sufficient water to provide full coverage. For improved performance, use Serenade AS in a rotational program with antibiotics registered for fire blight control such as but not limited to oxytetracycline or streptomycin. Proper orchard cultural practices are essential to eliminate fire blight-infected tissue from the orchard to assure good performance of any crop protection product. Care must be taken to remove and destroy dead and diseased wood from the orchard prior to and during the growing season. Use of Serenade AS alone has not been shown to affect fruit finish. Use caution when selecting spray adjuvants. Select only those adjuvants which through prior experience do not affect fruit finish when combined with Serenade AS.
	Brooks Spot *Mycosphaerella pomi* Cedar Apple Rust *Gymnosporangium juniperi-virginianae* Flyspeck *Schizothyrium pomi* Sooty Blotch *Gloeodes pomigena* Bot Rot *Botryosphaeria dothidea* Bitter Rot *Colletotrichum spp.* Bull's Eye Rot *Neofabraea* spp.	1-6	For control of Brooks Spot, Cedar Apple Rust, Flyspeck, Sooty Blotch, Bot Rot Bitter Rot and Bull's Eye Rot: Begin applications pre-bloom when environmental conditions are conducive to disease development. Repeat applications at 7 to 14 day intervals or as needed. Apply in sufficient spray volume to ensure thorough coverage. Use higher application rates and shorter spray intervals when conditions are conducive to rapid disease development or heavy disease pressure. For improved performance of Serenade AS add a surfactant [such as Biotune® Adjuvant], known to be safe to the target crop, to the spray tank to improve coverage and wetting of plant surfaces. Serenade may be applied up to and including the day of harvest (0-day PHI).
	Scab *Venturia* spp.	1- 6	For suppression, begin applications at green tip or when environmental conditions become favorable for primary scab development and repeat on a 7 to 10 day interval or as needed. When environmental conditions are conducive to rapid disease development, for improved performance use Serenade AS in a tank mix or rotational program with other registered fungicides for scab control.
	Powdery Mildew *Podosphaera leucotricha*	1- 6	Begin application at tight cluster, or sooner, if conditions are conducive to disease development. Repeat applications through the second cover spray on 7 to 10 day intervals. Additional sprays beyond second cover may be needed on susceptible varieties or when environmental conditions are conducive to rapid disease development. Use high label rate and shorter spray intervals when conditions are conducive to rapid disease development.

Crops	Disease	Rate Qt/acre	Application Instructions
Root / Tuber and Corm Vegetables Carrot Potato Sweet Potato Cassava Beets Ginger Horseradish Radish Ginseng Turnip and other root/ tuber and corm crops	Black Rot/ Black Crown Rot *Alternaria* spp. Alternaria Leaf Blight *Alternaria dauci* Bacterial Leaf Spot *Xanthomonas campestris pv. carotae*	1- 6	Begin applications soon after emergence or transplant and when conditions are conducive to rapid disease development. Repeat on a 7 to 10 day interval or as needed. Use high rates and shorter intervals when conditions are conducive to rapid disease development. Apply in sufficient water to provide thorough coverage
	Bacterial Leaf Blight *Xanthomonas campestris* Downy Mildew *Peronospora* spp. Powdery Mildew *Erysiphe* spp. White Mold *Sclerotinia sclerotiorum* Gray Mold *Botrytis* spp.	1- 6	Begin application soon after emergence or transplant and when conditions are conducive to disease development. Repeat on a 7 to 10 day interval or as needed. Use high rates and shorter intervals when conditions are conducive to rapid disease development. Apply in sufficient water to provide thorough coverage.
	Early Blight *Alternaria solani* Late Blight suppression *Phytophthora infestans*	1- 6	For suppression, begin application soon after emergence when conditions are conducive to disease development. Repeat on a 5 to 7 day interval or as needed. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for late blight control.
Roses, Field	Powdery Mildew *Sphaerotheca* spp. Rust *Puccinia* spp..	1- 6	Begin applications when environmental conditions and plant stage are conducive to disease development. Continue applications on 7 to 14 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.

Crops	Disease	Rate Qt/acre	Application Instructions
Stone Fruit Apricot Cherry Nectarine Peach Plum Prune and other stone fruit crops	Anthracnose suppression *Colletotrichum* spp. Powdery Mildew *Sphaerotheca parnnosa* *Podosphaera clandestine* *Podosphaera* spp Rusty Spot *Podosphaera leucotricha* Bacterial Canker *Pseudomonas* spp. Alternaria Spot / Fruit Rot *Alternaria alternata* Scab *Cladosporium carpophilum* Brown Rot Blossom Blight *Monilinia laxa* Fruit Brown Rot suppression *Monilinia fruticola* Gray mold *Botrytis cinerea* Shot Hole suppression *Wilsonomyces carpophilus* *Xanthomonas pruni* *Bhumeriella gaapi* *Cercospora* spp. Bacterial Leaf Spot/ Bacterial Spot *Xanthomonas arboricola*	1- 6	Brown Rot Blossom Blight – Begin application at early bloom and repeat through petal fall on a 7 day interval or as needed. Scab – Begin application at petal fall and repeat on a 7 to 10 day interval or as needed. Bacterial Blight – Apply post harvest before fall rains and again during dormancy before spring growth. Powdery Mildew - For suppression, begin application at popcorn stage and repeat on a 7 day interval or as needed. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides for powdery mildew control. For all other diseases – Begin application prior to disease development when environmental conditions and plant stage are conducive to rapid disease development and repeat on a day 7 to 10 day interval or as needed. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides. Post harvest disease protection – To aid in the control of post harvest infections of *Botrytis* and *Monilinia* apply Serenade prior to harvest with sufficient water to thoroughly cover fruit. Apply on a 7-day schedule or as needed up until the time of harvest. Bacterial Leaf Spot/ Bacterial Spot- Begin applications at bud break and continue on a 7 to 14 day schedule or as needed until harvest. During periods of rapid disease development and frequent infection periods, use Serenade AS in a program with other registered antibiotics and/or copper bactericides. For the improved performance of Serenade AS, add a surfactant [such as Biotune] to the spray tank to improve coverage. Serenade AS may be applied to fruit up to and including the day of harvest.

Crops	Disease	Rate Qt/acre	Application Instructions
Strawberry	Powdery Mildew *Sphaerotheca macularis* *Erysiphe* spp. Anthracnose *Colletotrichum acutatum* Botrytis *Botrytis cinerea* Gray Mold *Botrytis* spp. Angular Leaf Spot *Xanthomonas fragariae*	1- 6	Botrytis/Powdery mildew - For suppression, begin application at or before flowering and repeat on 7 to 10 day intervals or as needed through harvest. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides for powdery mildew and botrytis control. Anthracnose – Begin application prior to disease development and repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides. Angular Leaf Spot - Begin applications when environmental conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides. Thorough coverage is essential. Serenade may be applied up to and including the day of harvest.
Sugar Beets	Powdery Mildew *Erysiphe betae* *Erysiphe polygoni* Leaf Spot *Cercospora beticola* Ramularia *Ramularia* spp Rust *Uromyces betae*	1- 6	Begin applications when environmental conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.
Tobacco	Blue Mold *Peronospora hyoscyami*	1- 6	Begin applications when conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed.

Crops	Disease	Rate Qt/acre	Application Instructions
Tree Nuts Almond Pistachio Pecan Walnut Filberts Chestnut Cashew Beechnut Butternut and other tree nut crops	Walnut Blight *Xanthomonas campestris* Alternaria Leaf Spot *Alternaria alternata* Anthracnose **suppression** *Colletotrichum acutatum* Bacterial Canker *Pseudomonas syringae* Scab *Cladosporium carpophilum* Botryosphaeria Blight *Botryosphaeria dothidea* Shot Hole **suppression** *Wilsonomyces carpophilus* *Xanthomonas pruni* *Blumeriella gaapi* *Cercospora* spp. Brown Rot **suppression** *Monilinia* spp. Pecan Scab *Cladosporium caryigenum*	1- 6	Walnut Blight – Begin application no later than pistillate bloom and repeat at 7- to 10-day intervals or as needed. Apply in advance of rain for maximum protection. When conditions are conducive to rapid disease development, for improved control, use Serenade AS in a tank mix or rotational program with a copper-based bactericide registered for control of walnut blight. For all other diseases – Begin application prior to disease development and repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides.
Tropical Fruits Avocado Bananas Plantains Mango Papaya Pineapple and other tropical fruits	Anthracnose *Colletotrichum gloeosporioides* *Colletotrichum ananas* Bacterial Canker *Xanthomonas campestris* Scab *Sphaceloma perseae*	1- 6	Avocado/Mango - Begin application at budbreak and repeat on a 14 to 21 day interval or as needed through harvest. Papaya/Pineapple - Begin application at flowering and repeat on a 14 to 21 day interval or as needed through harvest. Bacterial Canker – Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Serenade AS may be applied to fruit up to and including the day of harvest.
	Sigatoka *Mycosphaerella fijiensis.*	1- 6	Begin application when leaves first appear and repeat on a 7- to 21-day interval or as needed. Apply in sufficient water to obtain thorough coverage of foliage. For improved disease control, Serenade AS may be tank-mixed with oil or other fungicides registered for control of Sigatoka at labeled rates. When conditions are conducive to rapid disease development and/or heavy disease pressure, higher application rates and rotational spray programs with other fungicides registered for control of Sigatoka are recommended.
Kiwi	Botrytis Fruit Rot *Botrytis cinerea* Bacterial Blight *Pseudomonas viridiflava* *Pseudomonas syringae* Sclerotinia *Sclerotinia sclerotiorum*	1-6	Kiwi – Begin application at early bloom and repeat on 7-10 day intervals or as needed. Serenade AS may be applied to fruit up to and including the day of harvest.
Watercress	Cercospora leafspot *Cercospora* spp.	1- 6	Begin applications when conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed..

Crops	Disease	Rate Qt/acre	Application Instructions
Seed Production Crops blue grass rye grass fescue orchard grass and other crops grown to produce seeds	Powdery Mildew *Erysiphe spp.* Rust *Puccinia* spp.	1- 6	Begin applications when environmental conditions and plant stage are conducive to disease development. Repeat on 7 to 10 day intervals or as needed. Use higher rates and shorter application intervals under heavy disease pressure.

Recommended Application Rates for Selected Greenhouse Crops – Agricultural Use

(Serenade AS has a 0-Day PreHarvest Interval for all crops contained on this label)
Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides.

Green-house Crops	Diseases	Rate Qt/100 gallons spray mix	Application Instructions
Brassica Broccoli Cabbage Cauliflower Brussels Sprouts Collards Kale Mustard Greens Kohlrabi and other brassica crops	Pin Rot Complex *Alternaria/Xanthomonas* Bacterial Leaf Spot *Pseudomonas syringae* Bacterial Soft Rot *Erwinia / Pseudomonas* Black Rot *Xanthomonas campestris* Xanthomonas Leaf Spot *Xanthomonas campestris* Alternaria Leaf Spot *Alternaria* spp. Anthracnose *Colletotrichum higginsianum* Cercospora Leaf Spot *Cercospora brassicicola* Downy Mildew *Peronospora parasitica* *Peronospora* spp. Powdery Mildew *Erysiphe polygoni* Southern Blight *Sclerotium rolfsii*	**1- 6**	**Pin Rot** - For suppression, begin applications when environmental conditions in the greenhouse are conducive to rapid disease development and repeat on **7 – 10** day intervals **or as needed**. Thorough coverage is essential. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides. For all other diseases - Begin application soon after emergence or transplant and when conditions in the greenhouse are conducive to disease development. Repeat on a 7- to 10-day interval or as needed.
Bulb Vegetables Onion Garlic Shallots and other bulb vegetables	Botrytis neck rot *Botrytis* spp. Botrytis Leaf Blight *Botrytis squamosa* Onion Purple Blotch *Alternaria porri* Onion Downy Mildew *Peronospora destructor* Downy Mildew *Peronospora* spp. Powdery Mildew *Erysiphe* spp. **White Rot** ***Sclerotium cepivorum***	**1- 6**	Begin applications when environmental conditions in the greenhouse are conducive to rapid disease development. Continue sprays at **7 – 10** day intervals or as needed. When conditions in the greenhouse are conducive to rapid disease development, use Serenade AS in a rotational program with other registered fungicides for Botrytis neck rot control. Thorough coverage is essential.
	Rust *Puccinia porri*	**1- 6**	For suppression, begin application when conditions are conducive to disease development and repeat on a 7- to 10-day interval or as needed. . Thorough coverage is essential. For improved performance or as a part of a preventative disease control program, use Serenade AS in a tank mix or rotational program with other registered fungicides for rust control

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Green-house Crops	Diseases	Rate Qt/100 gallons spray mix	Application Instructions
Cucurbits Cucumber Cantaloupe Melon Muskmelon Squash Watermelon and other cucurbits	Powdery Mildew *Erysiphe* spp. *Sphaerotheca* spp. Gummy Stem Blight *Phoma cucurbitacearum* *Didymella bryoniae* Angular Leaf Spot *Pseudomonas syringae* Anthracnose *Colletotrichum lagenarium* Downy Mildew *Pseudoperonospora cubensis* Bacterial Fruit Blotch *Acidovorax avenae*	**1- 6**	Begin applications soon after emergence or transplant When environmental conditions in the greenhouse and plant stage are conducive to rapid disease development. Repeat on **7-10** day intervals or as needed. Thorough coverage is essential. For improved performance, use Serenade AS in a rotational program with other registered fungicides. **7 – 10** day intervals or as needed.
Fruiting Vegetables Pepper Tomato Eggplant and other fruiting vegetables	**Gray mold** *Botrytis cinerea*	**1- 6**	**For suppression Begin** applications soon after emergence or transplant and continue on a **7 -10** day interval or as needed. When environmental conditions in the greenhouse are conducive to rapid disease development, use Serenade AS in a rotational program with other registered fungicides. Thorough coverage is essential.
	Powdery mildew ***Leveillula taurica*** *Oidiopsis taurica* ***Erysiphe* spp.** ***Sphaerotheca* spp.** Downy Mildew *Pseudoperonospora cubensis*	**1- 6**	For suppression, begin applications soon after emergence or transplant and continue on a **7- 10** day interval or as needed. Thorough coverage is essential. Use maximum label rates under conditions conducive to rapid disease development. For improved performance, use Serenade AS in **a tank mix** or in a rotational program with other registered fungicides.
	Bacterial Spot *Xanthomonas* spp. Target Spot *Corynespora cassiicola*	**1- 6**	Begin applications soon after emergence or transplant and when environmental conditions are conducive to disease development. Continue applications on a 5- to 7- day interval or as needed. When conditions are conducive to rapid disease development, for improved performance, use Serenade AS in a tank mix program with copper-based bactericides registered for control of bacterial spot.
	Bacterial Speck ***Pseudomonas syringae pv tomato***	**1- 6**	Begin application soon after emergence or transplant and when environmental conditions are conducive to disease development. Continue applications on a 5 to 7 day interval or as needed. Use higher rates when conditions are conducive to rapid disease development. For improved performance, use Serenade AS in a tank mix or in a rotational program with other registered fungicides.
	Buck-eye Rot *Phytophthora parasitica* **Anthracnose** *Colletotrichum candidum*	1-6	Begin application soon after emergence or transplant and continue on a 7 to 10 day interval or as needed. For improved performance of Serenade AS add a surfactant [such as Biotune] to the spray tank to improve coverage.
	Bacterial Canker *Clavibacter michiganensis*	1-6	Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed.

Green-house Crops	Diseases	Rate Qt/100 gallons spray mix	Application Instructions
Fruiting Vegetables Pepper Tomato Eggplant and other fruiting vegetables	**Early Blight** ***Alternaria solani*** **Late Blight suppression** ***Phytophthora infestans***	**1- 6**	For suppression, begin application when plants are 4- to 6-inches high. Repeat applications on a 5- to 7-day interval or as needed. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for late blight control. Use shorter spray intervals under conditions conducive to rapid disease development.
Herbs/ Spices	**Bacterial Blight** *Pseudomonas syringae* **Anthracnose** *Colletotrichum* spp. **Alternaria Leaf Blight** *Alternaria* spp. **Botrytis** *Botrytis spp.*	**1- 6**	Begin application when environmental conditions in the greenhouse are conducive to disease development. Repeat on a –7- to 10-day interval or as needed.
Leafy Vegetables Lettuce Celery Spinach Parsley Radicchio and other leafy vegetables	**Downy Mildew** *Bremia lactucae* *Peronospora* spp. **Powdery Mildew** *Erysiphe cichoracearum* *Erysiphe* spp. **Pink Rot** Sclerotinia sclerotiorum **Anthracnose** suppression *Colletotrichum spp.* **Bacterial Leaf Spot** *Xanthomonas campestris* pv. *vitians* **Bacterial Blight** *Xanthomonas campestris*	**1- 6**	Downy mildew / powdery mildew - For suppression, apply as a foliar spray and begin applications when conditions are conducive to disease development. Repeat on a 7- to 10-day interval or as needed. Apply in sufficient water to ensure complete coverage of entire plant. For improved performance as a preventative treatment in early crop stages or when conditions are conducive to rapid disease development use Serenade AS in a tank mix or alternating spray program with other registered fungicides. Pink rot – Begin application approximately 8 weeks before harvest and repeat on a 14-day day interval. Apply Serenade AS as a directed spray in sufficient water to ensure thorough coverage of the base of the plants and the surrounding soil surface. Light irrigation following application to incorporate Serenade may improve disease control. **Anthracnose** suppression - Begin application prior to disease development when environmental conditions and plant stage are conducive to rapid disease development and repeat on a day 7 to 10 day interval or as needed. Use higher rates and shorter application intervals under heavy disease pressure.. **Bacterial Blight /Bacterial Leaf Spot-** Begin applications when environmental conditions are conducive to disease development. Repeat on 7 to 10 day intervals or as needed.

Green-house Crops	Diseases	Rate Qt/100 gallons spray mix	Application Instructions
Leafy Vegetables Lettuce Celery Spinach Parsley Radicchio and other leafy vegetables	**Sclerotinia Head and Leaf Drop** *Sclerotinia* spp.	**1- 6**	**For control of early Sclerotinia head and leaf drop:** Apply at planting or immediately following planting but prior to crop emergence as a 4- to 6-inch seed line treatment. Make a second application as a directed spray with multiple nozzles per each seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning. Additional applications should be made on **10-14** day intervals if conditions for disease development persist. Use higher rates under conditions conducive to moderate to severe disease pressure. Light irrigation after application to incorporate the product may improve disease control. Thorough coverage is essential. OR **For control of Sclerotinia head and leaf drop:** Apply as a directed spray with multiple nozzles per each seed line in sufficient water to ensure thorough coverage of lower plant leaves and surrounding soil surface within 7 days of thinning or transplanting. Repeat applications on **10-14** day intervals if conditions for disease development persist. Use higher rates under conditions conducive to moderate to severe disease pressure. Light irrigation after application to incorporate the product may improve disease control. Thorough coverage is essential.
Root / Tuber Carrot Potato Sweet Potato Beets Ginger Horseradish Radish Ginseng Turnip and other root/ Tuber crops	Black Rot/ Black Crown Rot *Alternaria* spp. Alternaria Leaf Blight *Alternaria dauci* Bacterial Leaf Spot *Xanthomonas campestris pv. carotae*	**1- 6**	Begin applications soon after emergence or transplant when environmental conditions in the greenhouse are conducive to rapid disease development. Continue sprays at 7- 10 day intervals or as needed. Use high rates and shorter intervals when conditions are conducive to rapid disease development. Apply in sufficient water to provide thorough coverage.
	Bacterial Leaf Blight *Xanthomonas campestris* Downy Mildew *Peronospora* spp. Powdery Mildew *Erysiphe* spp. Gray Mold *Botrytis* spp. White Mold *Sclerotinia sclerotiorum*	**1- 6**	Begin applications when environmental conditions in the greenhouse are conducive to rapid disease development. Continue sprays at **7 to 10**-day intervals or as needed. Use high rates and shorter intervals when conditions are conducive to rapid disease development. Thorough coverage is essential.
	Early Blight *Alternaria solani* Late Blight suppression *Phytophthora infestans*	**1- 6**	For suppression, begin application soon after emergence and when conditions are conducive to disease development. Repeat on a 5 to 7 day interval or as needed. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for late blight control.

Green-house Crops	Diseases	Rate Qt/100 gallons spray mix	Application Instructions
Strawberry	Powdery Mildew *Sphaerotheca macularis* *Erysiphe* spp Anthracnose *Colletotrichum acutatum* Botrytis *Botrytis cinerea* *Gray Mold* *Botrytis* spp. Angular Leaf Spot *Xanthomonas fragariae*	1- 6	Botrytis/Powdery mildew - For suppression, begin application at or before flowering and repeat on a 7 to 10 day interval or as needed through harvest. For improved performance, use Serenade in a tank mix or rotational program with other registered fungicides for powdery mildew and botrytis control. Anthracnose – Begin application prior to disease development and repeat on a 7 to 10 day interval or as needed. Angular Leaf Spot - Begin application when conditions are conducive to disease development. Continue sprays at 7 to 10-day intervals or as needed. Use high rates and shorter intervals when conditions are conducive to rapid disease development. For improved performance, use Serenade AS in a tank mix or rotational program with other registered fungicides. Thorough coverage is essential. Serenade may be applied up to and including the day of harvest.

FOR USE ON ORNAMENTALS, TREES, SHRUBS, FLOWERS, BEDDING PLANTS, TROPICAL PLANTS (ORNAMENTALS - Poinsettia, Orchids, Dieffenbachia, Palms, Spathiphyllum, Rhaphiolepsis, Aglaonema and FRUIT – Bananas, Mangos, Papaya), TURF, LAWNS, SOD, GOLF COURSES (GREENS, TEES, FAIRWAYS AND ROUGHS), SEEDLINGS, CONIFERS -[Agricultural Use], [Commercial], [Residential Use] [Reforestation]

Serenade AS is a protectant fungicide for use indoors and outdoors for control of certain foliar diseases in the field, greenhouses [open or enclosed], interiorscape, residential and commercial landscapes, nurseries [open or enclosed]
shade house environments, seedling production sites, golf courses (greens, tees, fairways and roughs), forests, forestry seedling production sites.

Serenade AS can be applied to ornamentals, trees, shrubs, flowers, annual and perennial bedding plants, potted flowers, cut flowers, tropical foliage, container grown trees and shrubs, forestry seedlings, turf, lawns, sod, golf courses (greens, tees, fairways and roughs) and conifer production for reforestation purposes (greenhouses, shade houses, nurseries, indoors, outdoors, containers or field).

Foliar Application Use on Ornamentals, Trees, Shrubs, Flowers, Bedding Plants, Tropical Plants, Seedlings, Conifers:

APPLICATION INSTRUCTIONS: Apply Serenade AS at rates ranging from 1 to 6 quarts of product in 100 gallons of water per acre. Make applications on a 3- to 10-day schedule. Begin applications when conditions favor disease development prior to the onset of disease. [Begin applications prior to or in the early stages of disease development.]

Under normal conditions apply Serenade AS at a rate of 4 quarts of product per 100 gallons of spray solution per acre on a 7-day schedule. When conditions favor severe disease development shorten the spray interval or use a higher rate. Thorough coverage is essential for effective disease control. When more diluted or concentrated spray solutions are needed for the type of equipment being used, follow the "Use Determination" section of this label.
See application rate tables for more detailed application instructions.

PLANTS EVALUATED FOR PHYTOTOXICITY

Serenade AS has been tested for phytotoxicity on the ornamental species listed below. Since it is impossible to test all of the species and cultivars listed on this label under all conditions it is recommended that a small-scale preliminary trial be conducted to check for sensitivity before using this product on a large number of plants, using the product in accordance with all label use directions.

TABLE 1

PLANTS EVALUATED FOR PHYTOTOXICITY

Annual and Perennial Flowering Plants:

Alyssum	Asters	Azalea
Begonia	Calla lily	
Chrysanthemum	Cyclamen	Dianthus
Dwarf Bee-Balm		Easter lily
Garden phlox	Geraniums	Gerbera
Golden star	Hydrangea	Impatiens
Kalanchoe	Linaria	Lisianthus
Lobelia	Marigolds	Orchids
Pansies	Petunia	Poinsettia
Portulaca	Ranunculus	Roses
Salvia spp.	Snapdragons	Stock
Verbena spp.	Vinca	Violas
Zinnias		

Tropical foliage:

Aglaonema	Dieffenbachia
Dracaena spp.	English Ivy
Hibiscus	Leatherleaf Fern
Spathiphyllum	

Trees and Shrubs:

Azalea	Boxwood
Crape myrtle	Dogwood
Jumbo azalea	Indian Hawthorn
Japanese maple	*Ligustrum japonicum*
Lilac	Loropetalum
Photinia	Rhododendron
Rosaceae spp.	Soft Touch Holly
Spirea	

FOR USE AS SOIL DRENCH on Ornamentals, Trees, Shrubs, Flowers, Bedding Plants, Tropical Plants, Seedlings, Conifers: [Agricultural], [Commercial], [Residential Use] [Indoors and Outdoors] [Greenhouses, Glasshouses, Nurseries] [Open and Enclosed]

Serenade AS is a broad spectrum biofungicide for the prevention, suppression and control of soil borne diseases on a wide range of annual and perennial bedding plants, potted flowers, foliage plants, deciduous trees and shrubs, and fruits and vegetables grown in protected environments. Serenade AS enhances germination and plant growth by

suppressing diseases caused by Rhizoctonia, Pythium, Fusarium and Phytophthora.

APPLICATION INSTRUCTIONS: Mix 1qt (32 fl oz) to 6 qt (192 fl oz) of Serenade AS with 100 gallons of water. Use higher application rates under conditions of heavy disease pressure. Apply finished mixture at a rate to thoroughly soak the growing media through the root zone (1 pint / sq. ft. for each 3 inches of soil depth) as a drench or directed spray using hand held, mechanical or motorized spray equipment, or as a chemigation drench or directed spray using applicable sprinkler irrigation systems. Begin applications during or after seeding, sticking of cuttings or after transplanting to propagation beds, containers, pots or trays. Optimal performance is obtained with preventative treatments repeated every 21 – 28 days throughout the growing cycle. Serenade AS can be mixed with chemical fungicides registered for soil applications.

See application rates tables for rates and application instructions.

FOR USE ON TURF, LAWNS, SOD, GOLF COURSES (GREENS, TEES, FAIRWAYS AND ROUGHS) ORNAMENTAL TURF- [Agricultural], [Commercial], [Residential Use]

Serenade AS is a broad spectrum biofungicide for use in the prevention, suppression and aiding in control of turf and lawn diseases; brown patch, dollar spot, powdery mildew, rust and anthracnose.

Turf, Lawns, Sod, Greens, Ornamental Turf Use:

APPLICATION INSTRUCTIONS: Apply at the rate of 2.0 to 10.0 fl. oz. of Serenade AS per 1000 sq. ft. of surface area. Apply in sufficient water to provide thorough coverage, depending on the application equipment. Two gallons of water per 1000 sq. ft of surface is commonly used.

See application rate tables for more detailed application instructions.

Application Rates for Turf, Lawns, Sod , Golf Courses (Greens, Tees, Fairways and Roughs), Ornamental Turf

Serenade AS has a 0-Day PreHarvest Interval for all crops contained on this label.
Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides.

Crops	Disease	Rate fl. oz./1000 sq. ft of surface area	Application Instructions
Turf, Sod, Lawns, Golf Course, (Fairways, Roughs, Greens, Tees) Seed production grasses, turf, etc. **Bluegrass** **Bentgrass** **Bermuda grass** **Dichondra** **Fescue** **Orchard grass** **Poa Annua** **St. Augustine** **Ryegrass** **Zoysia** **Mixtures and other grasses or ornamental turf**	**Brown patch** (*Rhizoctonia solani*) **Dollar Spot** (*Lanzia spp, Moellerodiscus*, spp. formerly *Sclerotinia homeocarpa*) **Powdery Mildew** (*Erysiphe graminis*) **Rust** (*Puccinia spp*) **Anthracnose** (*Colletotrichum graminicola*) **Gray Leaf Spot** ***Pyricularia grisea***	**2.0-10 fl. oz**	Apply at the rate of 2.0 to 10.0 fl. oz. of Serenade AS per 1000 sq. ft. of surface area. Apply in sufficient water to provide thorough coverage, depending on the application equipment. Two gallons of water per 1000 sq. ft of surface is commonly used. Begin applications when conditions are conducive to disease development. Continue applications on 7 to 10 day intervals or as needed. Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides. Aids in control of; brown patch, dollar spot, powdery mildew, rust and anthracnose. [Optional/Alternate Statements/Examples of Mixing/Application Instructions are in Brackets below] [Mix at the rate of 1 to 5 fl. oz of Serenade AS per gallon of water and apply spray solution at the rate of 2 gallons per 1000 sq. ft. (equivalent to 2 to 10 fl. oz per 1000 sq. ft. of turf.] [Mix at the rate of 5 fl. oz. of Serenade AS per gallon of water when included in a tank mix with other registered fungicides.]
		[1% - 4% solution]	[Mix a 1 % to 4% solution and apply solution spray at the rate of 2 gallons of spray solution per 1000 sq. ft. turf (equivalent to 2.5 to 10 fl. oz of Serenade AS per 1000 sq. ft. of turf)]
		[2% - 8% solution]	[Mix a 2 % to 8 % solution and apply solution spray at the rate of 1 gallon of spray solution per 1000 sq. ft. turf (equivalent to 2.5 to 10 fl. oz of Serenade AS per 1000 sq. ft. of turf)]

Application Rates for Use as a Foliar Spray on Ornamentals, Trees, Shrubs, Flowering Plants

Serenade AS has a 0-Day PreHarvest Interval for all crops contained on this label.
Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides.

Crops	Disease	Rate* qts/100 gallons spray mix	Application Instructions
Ornamentals **Trees, Shrubs** **Flowering Plants** **Tropical Plants** **Outdoors, Indoors, Fields, Greenhouses, Nurseries** **Annuals** **Perennials** **Bedding plants** **Potted flowers** **Cut flowers** **Foliage plants** **Deciduous trees** **Deciduous shrubs** **Tropical foliage** **Container grown plants**	**Anthracnose** -- *Colletotrichum* spp. **Bacteria** – *Erwinia* spp *Pseudomonas* spp *Xanthomonas* spp **Black spot of rose** -- *Diplocarpon rosea* **Botrytis** -- *Botrytis cinerea* **Downy Mildew** -- *Peronospora* spp. **Leaf spots** – *Alternaria* spp *Cercospora* spp *Entomosporium* spp *Helminthsporium* spp *Myrothecium* spp *Septoria* spp. **Powdery mildew** – *Erysiphe* spp *Oidium* spp *Podosphaera* spp *Sphaerotheca* spp. ***Phytophthora* spp** -- **Rust** – *Puccinia* spp. **Scab** – *Venturia* spp.	**1-6**	**Indoors, Outdoors, Field, Greenhouse, Nursery Grown Plants:** Apply Serenade AS at rates ranging from 1-6 quarts of product in 100 gallons of water per acre. Make applications on a 3- to 10-day schedule. Begin applications when conditions favor disease development prior to the onset of disease. or [Begin applications prior to or in the early stages of disease development.] Under normal conditions apply Serenade AS at a rate of 4 quarts of product per 100 gallons of spray solution per acre on a 7-day schedule. When conditions favor severe disease development shorten the spray interval or use a higher rate. Thorough coverage is essential for effective disease control. When more diluted or concentrated spray solutions are needed for the type of equipment being used, follow the "Use Determination" section of this label.

*** Rate presented in quarts/100 gallons of spray mix otherwise noted.**

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Application Rates for Soil Drench Uses in Field, Greenhouses, Glasshouses, Shadehouses, Nurseries [Outdoors and Indoors] [Open or Enclosed]

Serenade AS has a 0-Day PreHarvest Interval for all crops contained on this label.
Under moderate to severe disease pressure, for improved performance, increase rates and reduce spray intervals or use Serenade AS in a tank mix or rotational program with other registered fungicides.

Crops	Disease	Rate* qts/100 gallons spray mix	Application Instructions
Ornamentals **Trees** **Shrubs** **Annuals** **Perennials** **Flowering plants** **Tropical plants** **Bedding plants** **Container plants** **Potted plants** **Foliage plants** **Deciduous trees** **Deciduous shrubs** **Forestry** **Seedlings** **Fruits** **Vegetables and other crops grown in greenhouses and open and enclosed nurseries**	*Rhizoctonia spp.* *Pythium spp.* *Fusarium spp.* *Phytophthora spp.*	**1-6**	**Soil Drench Uses: Field, Greenhouses, Glasshouse Shadehouses, Indoors/Outdoors, Open And Enclosed Nurseries** Mix 1qt (32 fl. oz) to 6 qt (192 fl. oz) of Serenade AS with 100 gallons of water. Use higher application rates under conditions of heavy disease pressure. Apply finished mixture at a rate to thoroughly soak the growing media through the root zone (1 pint / sq. ft. for each 3 inches of soil depth) as a drench or directed spray using hand held, mechanical or motorized spray equipment, or as a chemigation drench or directed spray using applicable sprinkler irrigation systems. Begin applications during or after seeding, sticking of cuttings or after transplanting to propagation beds, containers, pots or trays. Optimal performance is obtained with preventative treatments repeated every 21 – 28 days throughout the growing cycle. Serenade AS can be mixed with chemical fungicides registered for soil applications.

*** Rate presented in quarts/100 gallons of spray mix otherwise noted.**

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[Serenade® AS]

[Alternate Names for Turf Label when sold for hose end sprayers:]
'Serenade AS Lawn (or Turf) – Ready to Spray' and 'Serenade AS for Lawns (or Turf) - Ready to Spray']
[For Home and Garden Use]
[For Home, Garden and Lawn (Turf) Use]

[Optional Claims:]
[Attacks over 40 diseases]
[Attacks both fungal & bacterial diseases]
[Apply any time of day]
[Will not burn or injure leaves, lawns (turf)]
[Fungicide (or Biofungicide) that attacks harmful garden and lawn diseases]
[Use on Roses, Vegetables, Fruits, Flowering Plants, Trees, Shrubs and Lawns (Turf)]
[Controls Bacterial Spot, Powdery Mildew, Rust, Grey Mold, Leaf Blight, Scab[]
[Concentrate]
[Same active ingredient used by farmers]
[Optional Claims for Lawn and Turf Label:]
[Prevents and controls harmful (major) lawn diseases (including brown patch, dollar spot [)"]
[Controls Brown Patch, dollar spot and other common lawn diseases]
[Use anytime on all lawns to prevent and control major lawn diseases]
[Promotes healthy disease-free lawns]
["Easy! Attach Hose and Spray!"]
[Same active ingredient used on golf courses]
[Promotes Greener, Healthier Lawns]

ACTIVE INGREDIENT	
QST 713 strain of *Bacillus subtilis*	1.34%
INERT INGREDIENTS	98.66%
Total	100.00%

Contains a minimum of 1×10^9 CFU/g

EPA Reg. No. 69592-12
EPA Est. No.:

1	2	3	4	5
69592-	67545-	66728-	37429-	69592-
MEX-1	AZ-1	GA-2	GA-2	CA-1

[Superscript corresponds to last digit of lot number stamped on container]

U.S. Patent Nos. 6,060,051, 6,103,228, 6,291,426, and 6,417,163 on QST 713 strain of *Bacillus subtilis*

Net contents: [16 fluid ounces OR 20 fluid ounces OR 24 fluid ounces OR 28 fluid ounces OR 32 fluid ounces

[Makes up to 4 gallons of spray (16 fl oz size), Makes up to 5 gallons of spray (20 fl oz size), Makes up to 6 gallons of spray (24 fl oz size), Makes up to 8 gallons of spray (32 fl oz size)]

SUB LABEL
[Lawn Use: Treats up to 4000 sq. ft. (16 fl oz), Treats up to 5000 sq. ft. (20 fl oz), [Treats 5,600 sq ft],
Treats up to 6000 sq. ft. (24 fl ox), Treats up to 8000 sq. ft. (32 fl oz)]

KEEP OUT OF REACH OF CHILDREN

CAUTION

[For smaller container sizes:]
[See attached booklet for First Aid Statements.]
[Peel back tab for First Aid and Precautionary Statements and Directions for Use.]

PRECAUTIONARY STATEMENTS– Home and Garden

HAZARDS TO HUMANS & DOMESTIC ANIMALS
Harmful if inhaled. Avoid breathing spray mist. Remove contaminated clothing and wash clothing before use. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

FIRST AID

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a doctor or poison control center for further treatment advice. Have the product label with you when calling a doctor or poison control center.

ENVIRONMENTAL HAZARDS – Home and Garden

Do not apply directly to water. Do not contaminate water when disposing of equipment wash waters or rinsate.

DIRECTIONS FOR USE – Home and Garden

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

GENERAL USE INFORMATION – Home and Garden

Serenade AS **[Alternate Statement:** is a broad spectrum, preventative biofungicide recommended for the control or suppression of many important plant diseases and**]** **[Alternate Statement: effectively controls or prevents a wide range of important fungal and bacterial plant diseases and]** [Serenade AS] may be used on **roses,** vegetables, fruits, nuts, flowers**, houseplants**, foliage, trees, shrubs**, [lawns, turf, sod, and ornamental turf[[** located in residential landscapes].

[Serenade AS may be applied any time of day, in full sun and high temperatures, without stressing or burning foliage.]

As a general precaution, when exposed to high concentrations of a living microbial product such as this, wear a dust particle mask when applying this product.

MIXING AND APPLICATION INSTRUCTIONS – Home and Garden

Serenade AS can be applied in commonly used pressurized hand-held sprayers, hose-end sprayers and spray trigger bottles. Spray to ensure thorough coverage of the plant.

For best results, treat prior to foliar disease development or at the first sign of foliar disease infection. Repeat at 7-day intervals or as needed. [Under conditions of high disease pressure] When environmental conditions favor rapid disease development (high humidity, excessive rain, extreme moisture condition, etc.) spray more often [Alternate: shorten the spray interval].

Serenade AS can be applied up to and including the day of harvest.

Pressurized Hand-Held Sprayer Application Instructions:

Mixing and Application:
For all applications mix the spray solution thoroughly and keep spray solution agitated during application. Do not allow spray mixture to stand overnight or for prolonged periods.

For Fruits, Vegetables, Nuts (e. g. Apples/Pears, Broccoli, Carrot, Cherries, Cucurbits, Grapes, Leafy Vegetables, Onions/Garlic, Pepper, Tomato, and Walnuts): Mix 2 fl oz (¼ cup = 4 TBSP) to 4 fl oz (½ cup = 8 TBSP) of Serenade AS per gallon of water. Spray plants to runoff, covering both top and bottom surface of foliage to ensure thorough coverage.

For Annual and Perennial Ornamental Plants, Flowering Plants, Tropical Foliage, Trees and Shrubs: Mix 2 fl oz (¼ cup = 4 TBSP) to 4 fl oz (½ cup = 8 TBSP), of Serenade AS per gallon of water. Spray plants to runoff, covering both top and bottom surface of foliage to ensure thorough coverage.

For Lawns, Turf and Ornamental Turf: Mix 2 fl oz (¼ cup = 4 TBSP) to 8 fl oz (1 cup = 16TBSP), of Serenade AS per gallon of water. Apply at a rate of 2 gallons of spray solution per 1,000 square feet (equivalent to 4 to 8 fl oz of Serenade AS per 1,000 square feet of turf).

[Optional/Alternate: For Lawns, Turf and Ornamental Turf: Mix 1 fl oz (1/8 cup = 2 TBSP) to 4 fl oz (½ cup = 8 TBSP), of Serenade AS per gallon of water. Apply at a rate of 2 gallons of spray solution per 1,000 square feet (equivalent to 2 to 8 fl oz of Serenade AS per 1,000 square feet of turf).]

Hose-End Sprayer Application Instructions:

Follow hose end sprayer directions to determine how to fill, set dial, spray, clean and disconnect from hose. Set dial on sprayer to deliver rates per gallon below. Do not allow spray mixture to stand overnight or for prolonged periods.

Application:
For Fruits, Vegetables, Nuts (e. g. Apples/Pears, Broccoli, Carrot, Cherries, Cucurbits, Grapes, Leafy Vegetables, Onions/Garlic, Pepper, Tomato, and Walnuts): Set sprayer to apply 2 fl oz (¼ cup = 4 TBSP) to 4 fl oz (½ cup = 8 TBSP) of Serenade AS per gallon of water. Spray plants to runoff, covering both top and bottom surface of foliage to ensure thorough coverage.

For Annual and Perennial Ornamental Plants, Flowering Plants, Tropical Foliage, Trees and Shrubs: Set sprayer to apply 2 fl oz (¼ cup = 4 TBSP) to 4 fl oz (½ cup = 8 TBSP) of Serenade AS per gallon of water. Spray plants to runoff, covering both top and bottom surface of foliage to ensure thorough coverage.

For Lawns, Turf and Ornamental Turf Mix: Set sprayer to apply 2 fl oz (½ cup = 8 TBSP) to 8 fl oz (1cup = 16 TBSP) of Serenade AS per gallon of water. Apply one gallon of spray to thoroughly cover 1000 square feet.

[Optional/alternative: Set sprayer to apply 2 fl oz (¼ cup = 4 TBSP) to 4 fl oz (½ cup = 8 TBSP) per gallon of water and apply one gallon of spray to thoroughly cover 500 square feet. (equivalent to 4 - 8 fl oz of Serenade AS per 1,000 square feet of turf).]

[Optional/alternative: Set sprayer to apply 1 fl ounce (1/8 cup = 2 TBSP) to 2 fl oz(¼ cup = 4 TBSP) per gallon of water and apply one gallon of spray to thoroughly cover 250 square feet. (equivalent to 4 - 8 fl oz of Serenade AS per 1,000 square feet of turf).]

[SERENADE AS] MAY BE USED ON [THE FOLLOWING]: [Alternate: VEGETABLES, FRUIT, NUTS, AND ORNAMENTAL PLANTS] [Alternate; PLANTS, CROPS, SITES]

HOME and GARDEN [VEGETABLES, FRUITS AND NUTS] PLANTS:
Artichoke, Asparagus,

Berries (Blueberries, Blackberry, Raspberry, Loganberry, Huckleberry, Cranberry, Gooseberry, Elderberry, Currant, Caneberry , and other berry crops)

Brassica (Broccoli, Cabbage, Cauliflower, Brussels Sprouts,

Collards, Kale, Mustard Greens, Kohlrabi and other brassica crops)

Bulb Vegetables (Onion, Garlic, Shallots and other bulb vegetables)

Citrus (Orange, Grapefruit, Lemon, Tangerine, Tangelo, Pummelo and other citrus crops)

Cucurbits (Cucumber, Cantaloupe, Melon, Muskmelon, Squash, Watermelon and other cucurbit crops)

Fruiting Vegetables (Pepper, Tomato, Eggplant and other fruiting vegetables)

Grape, Herbs/ Spices, Hop,

Leafy Vegetables (Lettuce, Celery, Spinach, Parsley, Radicchio and other leafy vegetable crops)

Legumes/vegetables (Beans, Green beans, Snap beans, Shell beans, Dry Beans, Garbanzo beans, Lima beans, Peas, Chick peas, Split peas, Lentils and other legume/ vegetable crops)

Mango, Mint, Olive, Papaya, Peanuts,

Pome Fruit (Apple, Crabapple, Pear, Quince, Mayhaw and other pome fruit)

Root / Tuber (Carrot, Potato, Sweet Potato, Beets, Ginger, Horseradish, Radish, Ginseng, Turnip and other root/ tuber crops)

Roses

Stone Fruit (Apricot, Cherry, Nectarine, Peach, Plum, Prune, and other stone fruit crops)
Strawberry, Sweet Corn, Tobacco, Watercress,

Tree Nut (Almond, Pistachio, Pecan, Walnut, Filberts, Chestnut, Cashew, Beechnut, Butternut and other tree nut crops)

GREENHOUSE PLANTS:

Brassica (Broccoli, Cabbage, Cauliflower, Brussels Sprouts, Collards, Kale, Mustard Greens, Kohlrabi and other brassica crops)

Bulb Vegetables (Onion, Garlic, Shallots and other bulb vegetables)

Cucurbits (Cucumber, Cantaloupe, Melon, Muskmelon, Squash, Watermelon and other cucurbits)
Fruiting Vegetables (Pepper, Tomato, Eggplant and other fruiting vegetables)

Herbs/ Spices

Leafy Vegetables (Lettuce, Celery, Spinach, Parsley, Radicchio, and other leafy vegetables)

Root / Tuber (Carrot, Potato, Sweet Potato, Beets, Ginger, Horseradish, Radish, Ginseng, Turnip and other root/ tuber crops)

Strawberry

ORNAMENTALS, TREES, SHRUBS, FLOWERING PLANTS, TROPICAL PLANTS:

PLANTS EVALUATED FOR PHYTOTOXICITY

Annual and Perennial Flowering Plants:

Alyssum	Asters	Azalea
Begonia	Calla lily	
Chrysanthemum	Cyclamen	
Dianthus		
Dwarf Bee-Balm	Easter lily	
Garden phlox	Geraniums	Gerbera
Golden star	Hydrangea	Impatiens
Kalanchoe	Linaria	
Lisianthus		
Lobelia	Marigolds	Orchids
Pansies	Petunia	
Poinsettia		
Portulaca	Ranunculus	Roses
Salvia spp.	Snapdragons	Stock
Verbena spp.	Vinca	Violas
Zinnias		

Tropical foliage:

Aglaonema	Dieffenbachia
Dracaena spp.	English Ivy
Hibiscus	Leatherleaf Fern
Spathiphyllum	

Trees and Shrubs:

Azalea	Boxwood
Crape myrtle	Dogwood
Jumbo azalea	Indian Hawthorn
Japanese maple	*Ligustrum japonicum*
Lilac	Loropetalum
Photinia	Rhododendron
Rosaceae spp.	Soft Touch Holly
Spirea.	

[Optional Statement; It is impossible to test all plants for phytotoxicity. To assure that the plants to be treated are not sensitive to the treatment, apply a small amount of the highest application rate of the product to a few leaves or the above ground portion of a plant and check within 3 days. Use product according to label directions.]

DISEASES CONTROLLED [OR SUPRESSED] [OR PREVENTED] [BY SERENADE AS] [ON VEGETABLES, FRUIT, NUTS, ORNAMENTAL PLANTS] [Alternate; ON PLANTS, CROPS, SITES]

Anthracnose -- *Colletotrichum* spp.

Bacteria-*Erwinia* spp, *Pseudomonas* spp, *Xanthomonas* spp

Bacterial Leaf Blight *(Xanthomonas campestris)*

Bacterial Speck (Pseudomonas syringae pv. Tomato

Bacterial Spot *(Xanthomonas* spp.*)* - suppression
Bean Rust *(Uromyces appendiculatus)* – suppression

Black Mold (*Alternaria alternata)*

Black Root Rot/Black Crown Rot *(Alternaria* spp.*)*

Black spot of rose -- *Diplocarpon rosea*

Botrytis *(Botrytis spp)*

Botrytis Leaf Blight *(Botrytis squamosa)*

Botrytis Neck Rot *(Botrytis* spp.*)*

Downy Mildew *(Bremia lactucae, Peronospora* spp., and *Plasmopara viticola)* - suppression

Early Blight *(Alternaria solani)* – suppression

Fire Blight *(Erwinia amylovora)* – suppression

Gray Mold *(Botrytis cinerea)*

Greasy spot *(Mycosphaerella citri)* - suppression

Late Blight *(Phytophthora infestans)* – suppression

Leaf spots – (*Alternaria* spp, *Cercospora* spp, *Entomosporium* spp, *Helminthsporium* spp, *Myrothecium* spp, *Septoria* spp.)

Onion Downy Mildew *(Peronospora destructor)*

Onion Purple Blotch *(Alternaria porri)*

Phytophthora spp

Pin Rot *(Alternaria/Xanthomonas* complex*)* - suppression

Powdery Mildew *(Uncinula necator, Sphaerotheca* spp., *Oidiopsis taurica, Leveillula taurica, Podosphaera leucotricha)*

Powdery Mildew – *Erysiphe* spp, *Oidium spp*, *Podosphaera* spp,
Rust – *Puccinia* spp.

Scab (*Venturia* spp.*)* - suppression

Sclerotinia head and leaf drop *(Sclerotinia* spp.*)*

Sour Rot

Target Spot (*Corynespora cassiicola*)

Walnut Blight *(Xanthomonas campestris)*

White Mold *(Sclerotinia sclerotiorum)* – suppression

[SERENADE AS] MAY BE USED ON LAWNS, TURF AND ORNAMENTAL TURF and Golf Courses.(Fairways, GREENS, roughs, tees)

LAWNS, TURF AND ORNAMENTAL TURF, GOLF COURSES (Fairways, GREENS, Roughs, Tees):
Bluegrass, Bentgrass, Bermudagrass, Dichondra, Fescue,
Orchard grass, Poa Annua, St. Augustine, Ryegrass, Zoysia, Mixtures and other grasses or ornamental turf.

DISEASES CONTROLLED [OR SUPRESSED] [OR PREVENTED] [BY SERENADE AS] [ON LAWNS, TURF AND ORNAMENTAL TURF and Golf Courses.(Fairways, GREENS, roughs, tees)]]

Lawn and Turf Diseases:
Brown patch (*Rhizoctonia solani)*
Dollar Spot (*Lanzia spp, Moellerodiscus*, spp. formerly *Sclerotinia homeocarpa*)
Powdery Mildew (*Erysiphe graminis*)
Rust (*Puccinia spp*)
Anthracnose (*Colletotrichum graminicola)*

STORAGE AND DISPOSAL – Home and Garden

STORAGE: Store in original container only, [Alternate: in an area inaccessible to children] [or Alternate: out of reach of children]. Keep container closed when not in use

CONTAINER DISPOSAL:
[16-, 20-, 24-, or 32-ounce bottle]
If empty: Do not reuse this container. Place in trash or offer for recycling if available.

If partly filled: Call your local solid waste agency for disposal instructions. Never place unused product down any indoor or outdoor drain.

Questions or Comments call 800 962-8980
www.agraquest.com

CONDITIONS FOR SALE AND WARRANTY

Except to the extent prohibited by applicable law, AgraQuest offers this product with the following conditions: 1) buyers and users of this product assume the risk of any storage, handling or use contrary to AgraQuest's label and directions and 2) AgraQuest's liability shall in no case exceed the purchase price of the applicable AgraQuest product.

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