Ratchet®

ACTIVE INGREDIENT:

LCO SP104: D-Glucose,O-2-deoxy-2-[[(11Z)-1-oxo-11-octadecen-1-yl]amino]-ß-D-glucopyranosyl-(1º⟶4)-O-2-(acetylamino)-2-deoxy-ß-D-glucopyranosyl-(1⟶4)-O-2-(acetylamino)-2-deoxy-ß-D-glucopyranosyl-(1⟶4)-O-2-(acetylamino)- 2-deoxy-ß-D-glucopyranosyl-(1⟶4)-2-(acetylamino)-2-deoxy- **0.000025%**

OTHER INGREDIENTS .....> 99.999975%

100.000000%

Contains 0.0000021 pounds SP104 per U.S. gallon (0.00025 grams AI/liter)

KEEP OUT OF REACH OF CHILDREN

CAUTION

EPA Reg. No. 73314-16
EPA Est.: 73314-WI-1

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BATCH CODE:

novozymes®

Manufactured By:
Novozymes BioAg, Inc.
3101 W. Custer Ave
Milwaukee, WI 53209
1-888-744-5662

Made in USA
www.novozymes.com/bioag

Net Contents: 2.5 gal (9.5L)
Net Weight: 21 lbs (9.5 kg)

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

Caution. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Wear the appropriate Personal Protective Equipment (PPE). Remove and wash contaminated clothing before reuse.

PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Gloves
- Shoes and socks

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

USER SAFETY RECOMMENDATIONS

Users should:

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

ENVIRONMENTAL HAZARDS

For terrestrial uses: Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean highwater mark. Do not contaminate water when disposing of equipment washwater or rinsate.

DIRECTIONS FOR USE

Read the entire label before using this product.

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

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

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

- Long-sleeved shirt and long pants
- Gloves
- Shoes and socks

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep unprotected persons out of treated areas until sprays have dried.

PRODUCT DESCRIPTION

Ratchet® is a liquid formulation for use in terrestrial and greenhouse foliar applications that features lipo-chitooligosaccharide (LCO) technology. The LCO mode of action supports the growth and yield potential of the crop by increasing each of the following:

- Stomata conductance
- Transpiration rate
- Photosynthesis
- Sugar content
- Nutrient uptake

APPLICATION INFORMATION

PRE-HARVEST INTERVAL: Pre-harvest interval for Ratchet® is zero (0) days. Ratchet® may be applied up to the day of harvest.

SITES FOR USE

TERRESTRIAL FOOD CROPS: Ratchet® can be used on the crops listed below, including greenhouse, nursery and outdoor agricultural sites.

CROPS ON WHICH Ratchet® MAY BE USED:

Crop Group 2: Leaves of Root and Tuber Vegetables (Human Food or Animal Feed) Group – Commodities
Crop Group 4. Leafy Vegetables (Except Brassica Vegetables) Group.
Crop Group 6: Legume Vegetables (Succulent or Dried)
Crop Group 7: Foliage of Legume Vegetables Group
Crop Group 8-10: Fruiting Vegetable Group
Crop Group 9: Cucurbit Vegetables
Crop Group 15. Cereal Grains Group.
Crop Group 16. Forage, Fodder and Straw of Cereal Grains Group.
Crop Group 17. Grass Forage, Fodder, and Hay Group.
Crop Group 18. Non-grass Animal Feeds (Forage, Fodder, Straw, and Hay)
Crop Group 20. Oilseed Group
Hemp
Turf and ornamentals

APPLICATION INSTRUCTIONS

MIXING INSTRUCTIONS: **Shake well before using**. Ratchet® may be applied using hand-held, ground and/or aerial spray equipment. Ratchet® mixes readily in water. Fill spray tank with half of the desired amount of water and start agitation. Slowly add desired amount of Ratchet® to spray tank. Add remaining desired amount of water. Triple rinse empty Ratchet® container with water and add rinse water to spray tank.

TERRESTRIAL FIELD APPLICATIONS: Dilute 2 or 4 oz of Ratchet® into 5 to 20 gallons of water. For aerial applications apply 5 gallons of diluted product per acre. For ground or boom sprayer applications apply 10-20 gallons of diluted product per acre. Use sufficient carrier to adequately cover crop foliage. As needed, apply a second application at least 14 days later. Do not exceed 2 applications or 8 oz LCO ai/A per season.

GREENHOUSE APPLICATIONS: Apply final solution of Ratchet® at a rate of 2 or 4 fluid ounces per acre. Volume of water in tank depends on instructions for other tank-mixed chemistry. Use sufficient carrier to adequately cover crop foliage. As needed, apply a second application at least 14 days later. Do not exceed 2 applications or 8 oz LCO ai/A per season.

APPLICATION TIMING: Apply at mid-vegetative stage and/or early reproductive stage for row crops. For specialty crops, apply in vegetative stage for leaf quality and early flowering stage for increased flowers and fruit.

CROP ROTATION: There are no restrictions on crop rotation.

TANK MIX COMPATIBILITY: Ratchet® is chemically compatible with a wide range of pesticides and spray adjuvants. If adjuvants are required when applying Ratchet® in combination with other pesticides, contact your dealer or Novozymes BioAg, Inc. for specific recommendations.

Observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

CONTROLLING DRIFT: Do not allow spray to drift from the application site and contact people, nontarget crops, or animals.

For ground boom applications, apply with nozzle height no more than 4 feet above the ground or crop canopy and when wind speed is 10 mph or less at the application site as measured by an anemometer. Use a fine or medium spray according to ASAE 572 definition for standard nozzles or VMD for spinning atomizer nozzles.

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.

The applicator also must use all other measures necessary to control drift.

CHEMIGATION OR FERTIGATION APPLICATIONS:

Overall Requirements:

- Apply Ratchet® only through 1) overhead boom and mist-type systems; 2) sprinklers such as impact, micro-sprinkler, center pivot, lateral move, end tow, side (wheel) roll, traveler, solid set, or hand-move systems; 3) pressurized drench (flood) or drip (trickle) systems; 4) micro-irrigation such as spaghetti tube or individual tube irrigation; 5) hand-held calibrated irrigation equipment such as hand-held wand with injector; and 6) ebb and flow systems. Do not apply this product through any other type of irrigation system.
- Crop injury and/or lack of effectiveness can result from non-uniform distribution of treated water.
- If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.
- Do not connect an irrigation system used for chemical application to a public water system unless the chemistry label-prescribed safety devices for public water systems are in place.
- A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Requirements for Chemigation Systems Connected to Public Water Systems:

1) Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
2) Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, back flow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of chemical introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to chemical introduction. There shall be a complete physical break (air gap) between the flow outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3) The chemical injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
4) The chemical injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
5) The system must contain functional interlocking controls to automatically shut off the chemical 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 distribution is adversely affected.
6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with chemistries or fertilizers and capable of being fitted with a system interlock.
7) Do not apply when wind speed favors drift beyond the area intended for treatment.
8) Continuous agitation is not required in the supply tanks unless tank mixing with other products or fluid fertilizers that require it.
9) Application of the product may be made continuously for the duration of the water application or can be applied at the end or after the water application.
10) To mix in supply tank, fill tank halfway with water and add product. Stir until completely dissolved. Fill tank with remaining amount of water.
11) Use appropriate amount of water so as not to create excessive leaching or runoff.

Sprinkler Chemigation Requirements:

1) 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.
2) The chemical injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

3) The chemical 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.
4) The system must contain functional interlocking controls to automatically shut off the chemical injection pump when the water pump motor stops.
5) The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where chemistry or fertilizer distribution is adversely affected.
6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with the chemistries in use and capable of being fitted with a system interlock.
7) Do not apply when wind speed favors drift beyond the area intended for treatment.
8) Continuous agitation is not required in supply tanks unless tank mixing with other products or fluid fertilizers that require it.
9) Application of the product may be made continuously for the duration of the water application or can be applied at the end or after the water application.
10) To mix in supply tank, fill tank halfway with water and add product. Stir until completely dissolved. Fill tank with remaining amount of water.
11) Use appropriate amount of water so as not to create excessive leaching or runoff.

Drip Chemigation Requirements:

1) 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.
2) The chemistry injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3) The chemical 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.
4) The system must contain functional interlocking controls to automatically shut off the injection pump when the water pump motor stops.
5) The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where chemistry or fertilizer distribution is adversely affected.
6) Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with chemistries or fertilizers and capable of being fitted with a system interlock.
7) Use of a supply tank is recommended. Continuous agitation is not required in the supply tanks unless tank mixing with other products or fluid fertilizers that require it.
8) Application of the product may be made continuously for the duration of the water application or can be applied at the end or after the water application.
9) To mix in supply tank, fill tank halfway with water and add product. Stir until completely dissolved. Fill tank with remaining amount of water.
10) Use appropriate amount of water so as not to create excessive leaching or runoff.

Flood Chemigation Requirements:

1) Systems using a gravity flow chemical dispensing system must meter the chemistries or fertilizer into the water at the head of the field and downstream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential for water source contamination from back flow if water flow stops.
2) Systems utilizing a pressurized water and injection system must meet the following requirements:
   a. 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.

b. The chemical injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

c. The chemical 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.

d. The system must contain functional interlocking controls to automatically shut off the chemical injection pump when the water pump motor stops.

e. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where chemistry or fertilizer distribution is adversely affected.

f. 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 the chemistries or fertilizers and capable of being fitted with a system interlock.

3) Use of a supply tank is recommended. Continuous agitation is not required in supply tanks unless tank mixing with other products or fluid fertilizers that require it.

4) Application of the product may be made continuously for the duration of the water application or can be applied at the end or after the water application.

5) To mix in supply tank, fill tank halfway with water and add product. Stir until completely dissolved. Fill tank with remaining amount of water.

6) Use appropriate amount of water so as not to create excessive leaching or runoff.

APPLICATION INSTRUCTIONS FOR ALL CHEMIGATION METHODS: Apply final solution of Ratchet® at a rate of 2 or 4 fluid ounces per acre. Volume of water in tank depends on instructions for other tank-mixed chemistry. Use sufficient carrier to adequately cover crop foliage or crop area. As needed, apply a second application at least 14 days later. Do not exceed 2 applications or 8 oz LCO ai/A per season.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage, disposal, or cleaning of equipment.

PESTICIDE STORAGE: Store in original container away from feed and food. Store in a cool, dry place. Do not store in direct sunlight.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. If these wastes cannot be used according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in proper disposal methods.

CONTAINER HANDLING AND DISPOSAL: Non-refillable container (5 gallons (19 liters) or less). Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available, or puncture and dispose of in a sanitary landfill or by incineration. Do not burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

LIMITS OF LIABILITY AND WARRANTY

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully.

Novozymes BioAg, Inc. warrants that at the time of the first sale of this product, it conforms to the chemical description on this label, and when used according to the label directions under normal growing conditions, it is reasonably fit for the purposes referred to above. To the extent consistent with applicable law, buyers/users of this product assume full risk for any use contrary to the specified directions. If this product does not perform as warranted above, customer's sole remedy for breach of warranty, to the extent consistent with applicable law, shall be replacement of the product or refund of the purchase price paid, at the option of Novozymes BioAg, Inc.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF NOVOZYMES OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER OF THE PRODUCT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF LIABILITY AND WARRANTY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

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