BICYCLOPYRONE | GROUP 27 | HERBICIDE

PULL HERE TO OPEN

Optogen™

syngenta®

For Weed Control in Banana, Broccoli, Garlic, Hops, Horseradish, Lemongrass, Onion (dry bulb), Onion (green), Papaya, Plantain, Rosemary, Strawberry, Sweet Potato, Timothy grown for seed, Watermelon, and Wormwood.

Active Ingredients:	
Bicyclopyrone*	18.5%
Other Ingredients:	81.5%
Total:	100.0%

*CAS No. 352010-68-5

This product contains 1.67 pounds of active ingredient bicyclopyrone per gallon.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use on label.

EPA Reg. No. 100-1465

EPA Est. 100-LA-001

SCP 1465A-L1 0322
4158052

1 gallon
Net Contents

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1.0 FIRST AID

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
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 poison control center or doctor for further treatment advice.
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • **DO NOT** induce vomiting unless told to do so by the poison control center or doctor. • **DO NOT** give anything by mouth to an unconscious person.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
HOTLINE NUMBER For 24-Hour Medical Emergency Assistance (Human or Animal), or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident) Call **1-800-888-8372**	

PRECAUTIONARY STATEMENTS

2.0 PRECAUTIONARY STATEMENTS

2.1 Hazards to Humans and Domestic Animals

CAUTION

Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

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2.2 Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves made of barrier laminate, butyl rubber >14 mils, nitrile rubber >14 mils, neoprene rubber >14 mils, natural rubber >14 mils, polyethylene, polyvinyl chloride (PVC) >14 mils, or Viton™ >14 mils

2.3 User Safety Requirements

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

2.4 Engineering Controls

When handlers use closed systems or enclosed cabs in a manner that meets the 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.

2.5 User Safety Recommendations

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.

2.6 Environmental Hazards

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

2.6.1 GROUNDWATER ADVISORY

This product is known to leach through soil into ground water under certain conditions as a result of label use. This chemical may leach into ground water if used in areas where soils are permeable, particularly where the water table is shallow.

2.6.2 SURFACE WATER ADVISORY

This product has a high potential for reaching surface water via runoff for several months or more after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features including as ponds, streams, and springs will reduce the potential loading of bicyclopyrone from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

2.7 Physical or Chemical Hazards

DO NOT use or store near heat or open flame.

DIRECTIONS FOR USE

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

Use Optogen™ only in accordance with specifications on this label or in separately EPA approved labeling instructions for this product.

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

FAILURE TO FOLLOW DIRECTIONS AND PRECAUTIONS ON THIS LABEL MAY RESULT IN CROP INJURY, POOR WEED CONTROL, AND/OR ILLEGAL RESIDUES.

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 24 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, including plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves made of barrier laminate, butyl rubber ≥14 mils, nitrile rubber ≥14 mils, neoprene rubber ≥14 mils, natural rubber ≥14 mils, polyethylene, polyvinyl chloride (PVC) ≥14 mils, or Viton ≥14 mils

3.0 PRODUCT INFORMATION

Optogen is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds. When used preemergence, weeds take up the product through the soil during germination and emergence. Dry conditions following application may reduce the preemergence activity of Optogen. If an activating rain (0.25 inches) is not received within 7-10 days after a preemergence application, where appropriate, rotary hoeing is suggested to activate the herbicide. When used postemergence, susceptible weeds take up the herbicide through the treated foliage and cease growth soon after application. Complete death of the weeds may take up to two weeks. The product is absorbed through the soil and/or by the foliage of emerged weeds.

Optogen can be used in combination with a burndown herbicide, prior to planting, to provide added burndown and residual weed control

3.1 Resistance Management

BICYCLOPYRONE	GROUP	27	HERBICIDE

Optogen is a **Group 27 Herbicide** (contains the active ingredient bicyclopyrone).

Naturally occurring biotypes of certain weed species with resistance to triazines, ALS, PPO, Glycine (glyphosate) and HPPD herbicides are known to exist. If biotypes of weeds resistant to triazines, ALS, PPO and glycine inhibitors are present in the field, this herbicide controls them if they are listed in **Section 8.0**.

3.1.1 PRINCIPLES OF HERBICIDE RESISTANT WEED MANAGEMENT

Scout and know your field

- Know weed species present in the field to be treated through scouting and field history. An understanding of weed biology is useful in designing a resistance management strategy. Ensure the weed management program will control all weeds present.
- Scout fields prior to application to determine species present and growth stage. Always apply this herbicide at the full labeled rate and correct timing for the weeds present in the field.

Utilize non-herbicidal practices to add diversity

- Use diversified management tactics including cover crops, mechanical weed control, harvest weed seed control, and crop rotation as appropriate.

Use good agronomic practices, start clean and stay clean

- Use good agronomic practices that enhance crop competitiveness.
- Plant into weed-free fields utilizing tillage or an effective burndown herbicide for control of emerged weeds.
- Sanitize farm equipment to avoid spreading seed or vegetative propagules prior to leaving fields.

Difficult to control weeds

- Plant fields with difficult to control weeds in rotation with crops that allow the use of herbicides with an alternative mode of action or different management practices.
- Difficult to control weeds may require sequential applications, including a broad spectrum preemergence herbicide followed by one or more postemergence herbicide applications. Utilize herbicides containing different modes of action effective on the target weeds in sequential applications.

DO NOT overuse the technology

- **DO NOT** use more than two applications of this or any other herbicide with the same mode of action in a single growing season unless mixed with an herbicide with a different mode of action which provides overlapping spectrum for the difficult to control weeds.

Scout and inspect fields following application

- Prevent an influx of weeds into the field by controlling weeds in field borders.
- Scout fields after application to verify that the treatment was effective.

- Suspected- herbicide resistant weeds may be identified by these indicators
  - o Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
  - o A spreading patch of non-controlled plants of a particular weed species; and
  - o Surviving plants mixed with controlled individuals of the same species.
- Report non-performance of this product to your Syngenta retailer, Syngenta representative, or call 1-866-Syngent(a) (866-796-4368). If resistance is suspected ensure weed escapes are controlled using an herbicide with an effective mode of action and/or use non-chemical means to prevent further seed production.

Prevent weed escapes before, during, and after harvest

- **DO NOT** allow weed escapes to produce seed or vegetative structures, example, tubers or stolons which contribute to spread and survival. Consider harvest weed seed management and control weeds post-harvest to prevent seed production.

Resistant Weeds

- Contact your local Syngenta representative, retailer, crop advisor or extension agent to determine if weeds resistant to this mode of action are present in your area. If resistant biotypes have been reported, use the full labeled rate of this product, apply at the labeled timing, and tank-mix with a different mode of action product so there are multiple effective modes of application for each suspected resistant weed.

4.0 APPLICATION DIRECTIONS

4.1 Methods of Application

Applications with Optogen alone or in tank mixtures are permitted by ground application. Preemergence and postemergence applications are allowed as specified in **Section 9.0** unless otherwise restricted in **Section 7.0**.

4.2 Application Equipment

- Configure spray equipment to provide accurate and uniform coverage of the target area and minimize potential for spray drift.
- To ensure accuracy, calibrate sprayer before each use.
- For information on spray equipment and calibration, consult spray equipment manufacturers and/or state specifications.
- All ground application equipment must be properly maintained.
- Spray nozzles must be uniformly spaced; the same size and type, and must provide accurate and uniform application.
- Use spray nozzles that provide medium to coarse droplet size to provide good coverage and avoid drift.
- Use a pump that can maintain the manufacturer's specified pressure at the nozzles and provide proper agitation within the tank to keep the product dispersed.

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- Lower pressures may be used with extended range or drift reduction nozzles.
- Nozzles may be angled forward 45° to enhance penetration of the crop and provide better coverage.
- Ensure that all in line strainer and nozzle screens in the sprayer are 50-mesh or coarser.
- For postemergence applications, boom height for broadcast over-the-top applications must be based on the height of the crop – at least 15 inches above the crop canopy.
- For postemergence applications, flat fan nozzles of 80° or 110° are advised.
- **DO NOT** use floodjet nozzles or controlled droplet application equipment for postemergence applications.

4.3 Application Volume and Spray Coverage

- Good weed coverage is essential for optimum weed control.
- For preemergence applications, apply Optogen preemergence with a carrier volume of 10-60 gal/A using water or up to 80 gal/A using liquid fertilizer (excluding suspension fertilizers) as the carrier.
- For postemergence applications, apply in a spray volume of 10-30 gal/A using water as a carrier.
- For postemergence applications, when weed foliage is dense, use a minimum of 20 gal.

4.4 Mixing Directions

1. Thoroughly clean spray equipment before using this product. Dispose of the cleaning solution in a responsible manner.
2. Prepare no more spray mixture than is needed for the immediate operation.
3. Keep product container tightly closed when not in use.
4. Agitate the spray solution before and during application.
5. **DO NOT** let the spray mixture stand overnight in the spray tank.

4.4.1 OPTOGEN ALONE

1. For postemergence applications, use only clean water for the spray solution.
2. Liquid fertilizer (excluding suspension fertilizers) may be used as the carrier for preemergence (i.e. before crop emergence) applications.
3. Begin to fill sprayer tank or premix tank with clean water and engage agitator.
4. Agitation must be continued throughout the entire mixing and spraying procedure.
5. If the agitation is stopped for more than 5 minutes, resuspend the spray solution by running on full agitation prior to spraying.
6. When the sprayer or premix tank is half full of water, add AMS (if needed or allowed) and agitate until completely dispersed.
7. Next add Optogen slowly and agitate until completely dissolved.
8. Wait at least 1 minute after the last of the Optogen has been added to the tank to allow for complete dispersion.
9. A longer agitation period may be required to disperse Optogen when using cold water from sources including deep drilled wells.
10. Finally, add adjuvant if needed, and then continue to fill tank to desired level with water.

4.4.2 TANK-MIX PRECAUTIONS

- It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions, limitations and directions for use on all product labels involved in tank mixing. User must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.
- Tank mixes of Optogen with other pesticides, fertilizers, or any other additives not specifically labelled for use with Optogen may result in tank mix incompatibility or unsatisfactory performance. In such cases, always check tank mix compatibility by conducting a jar test according to guidance in **Section 4.4.3** before actual tank mixing.

4.4.3 TANK-MIX COMPATIBILITY

- Conduct a jar test using a 1 pt to 1 qt container with lid by adding water or other intended carrier such a liquid fertilizer to the jar.
- Next, add the appropriate amount of pesticides(s) or tank-mix partner(s) in their relative proportions based on specified label rates. Add tank-mix components separately in the order described in the tank-mixing section, **Section 4.4.4**. After each addition, shake or stir gently to thoroughly mix.
- After all ingredients have been added, put the lid on the jar, tighten and invert the jar 10 times to mix.
- After mixing, let the mixture stand 15–30 minutes and then examine for signs of incompatibility including obvious separation, large flakes, precipitates, gels or heavy oily film on the jar.
- If the mixture remains mixed or can be remixed readily, it is physically compatible and can be used.
- If the mixture is incompatible, repeat the test using a compatibility agent at the specified rate. Or, if applicable, slurry dry formulations in water before adding to the jar. If incompatibility is still observed after following these procedures, **DO NOT** use the mixture.
- After compatibility testing is complete, dispose of any pesticide wastes in accordance with the storage and disposal section, **Section 10.0**, of this label.

4.4.4 OPTOGEN IN TANK MIXTURES

1. For postemergence applications, use only clean water for the spray solution.
2. Liquid fertilizer (excluding suspension fertilizers) may be used as the carrier for preemergence (i.e. before crop emergence) applications.
3. Begin to fill sprayer tank or premix tank with clean water and engage agitator.
4. Agitation must be continued throughout the entire mixing and spraying procedure.
5. If the agitation is stopped for more than 5 minutes, suspend the spray solution by running on full agitation prior to spraying.
6. When the sprayer or premix tank is half full of water, add AMS and agitate until completely dispersed.
7. Next add Optogen slowly and agitate until completely dissolved.
8. Wait at least 1 minute after the last of the Optogen has been added to the tank to allow for complete dispersion.
9. A longer agitation period may be required to disperse Optogen when using cold water from sources including deep drilled wells.
10. Add the tank mix product.
11. Finally, add adjuvant and UAN, if needed, and then continue to fill tank to desired level with water.

4.4.5 SPRAY ADDITIVES

When an adjuvant is to be used with this product, the use of an adjuvant that meets the standards of the Chemical Producers and Distributors Association (CPDA) adjuvant certification program is advised.

Preemergence Adjuvants

- For preplant or preemergence applications, and where weeds are present, the use of any adjuvant for agricultural use is permitted.
- In these situations, methylated seed oil (MSO) type adjuvants are typically better than crop oil concentrate (COC) type adjuvants, which are typically better than nonionic surfactant (NIS) type adjuvants for enhancing weed control.
- Spray grade ammonium sulfate (AMS) can be added and typically provides better weed control and consistency of control.
- If Optogen is being tank mixed with another registered herbicide in this situation, refer to the tank mix partner label for adjuvant precautions and restrictions.

Postemergence Adjuvants

- For postemergence applications made after the crop has emerged or been transplanted, refer to the crop use directions (**Section 9.0**) for specific instructions.

4.5 Sprayer Cleanout

Special attention must be given to cleaning equipment before spraying a crop. Mix only as much spray solution as needed.

1. Flush tank, hoses, boom, and nozzles with clean water.
2. Prepare a cleaning solution of 1 gal of household ammonia per 25 gal of water. Many commercial spray tank cleaners may be used.
3. Use a pressure washer to clean the inside of the spray tank with this solution. Take care to wash all parts of the tank, including the inside top surface. If a pressure washer is not available, completely fill the sprayer with the cleaning solution to ensure contact of the cleaning solution with all internal surfaces of the tank and plumbing. Start agitation in the sprayer and thoroughly recirculate the cleaning solution for at least 15 minutes. All visible deposits must be removed from the spraying system.
4. Flush hoses, spray lines, and nozzles for at least 1 minute with the cleaning solution.
5. Dispose of rinsate from steps 1-3 in an appropriate manner.
6. Repeat steps 2-5.
7. Remove nozzles, screens, and strainers and clean separately in the ammonia solution after completing the above procedures.
8. Rinse the complete spraying system with clean water.

5.0 REPLANT AND ROTATIONAL CROPS

5.1 Replant and Rotational Crops

- If a crop treated with Optogen is lost, any crop on this label, or on a supplemental Optogen label, may be replanted or rotated at any interval provided that the rate of Optogen applied to the previous crop was not greater than the labeled rate for the crop to be replanted.

The crops listed in the table below may be planted at the specified interval following application of Optogen.

Crop	Replant/Rotational Interval
Corn (field, seed) Corn, sweet Garlic Horseradish Lemongrass Onion, bulb Onion, green Rosemary Sweet Potato Timothy grown for seed Watermelon Wormwood Yellow popcorn	Anytime
Small grain cereals including wheat, barley and rye	4 Months
Alfalfa Cotton Peanuts Potato Rice Sorghum Soybeans	10 Months
All other rotational crops	18 Months

6.0 COVER CROPS

A cover crop can be an important tool for the overall farm cropping system. Cover crops are planted for conservation purposes, soil erosion control, soil health improvement, water quality improvement and weed management. A cover crop can be a single crop or a combination of crops, including grasses and/or broadleaf crops.

After harvest of a Optogen treated crop, planting of a cover crop is allowed provided the cover crop is not grazed or fed to livestock nor harvested for food. Terminate the cover crop through natural causes including frost or intentional termination by herbicide application, crimping, rolling, tillage or cutting.

All possible cover crops or cover crop combinations have not been tested for tolerance to this product. Before planting the cover crop, determine the level of tolerance for the intended cover crops by conducting a field bioassay. Refer to **Section 6.1** for instructions on how to conduct a field bioassay.

6.1 Field Bioassay for Cover Crops

A field bioassay is a method of determining if herbicide residues are present in the soil at concentrations high enough to adversely affect crop growth.

Conduct the field bioassay by planting several strips of the desired cover crop across the field which has been previously treated with Optogen. Plant the cover crop strips perpendicular to the direction of the product application. Locate the strips so that all the different field conditions are encountered, including differences in field terrain, soil texture, organic matter, pH, and drainage.

If the cover crop does not show adverse effects including crop injury and/or stand reduction, the field can be planted to this cover crop. If injury and/or stand reduction are visible, wait two to four weeks for further herbicide degradation to occur and repeat the bioassay. Alternatively, select a different cover crop and repeat the bioassay. Only plant cover crops that show acceptable tolerance in the field bioassay.

7.0 RESTRICTIONS

7.1 Use Restrictions

- **DO NOT** apply this product through any type of irrigation system.
- **DO NOT** use aerial application to apply Optogen.

7.2 Spray Drift Management

Mandatory Spray Drift Requirements

Ground Applications

- Apply with the nozzle height specified by the manufacturer, but no more than 3 feet above the ground or crop canopy.
- For all applications, applicators are required to use a medium or coarser spray droplet size (ASABE S572.1).
- **DO NOT** apply when wind speeds exceed 10 miles per hour at the application site.
- **DO NOT** apply during temperature inversions.

7.3 Spray Drift Advisories

- THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT.
- BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

7.3.1 IMPORTANCE OF DROPLET SIZE

- An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control.
- While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

7.3.2 CONTROLLING DROPLET SIZE

- **Volume** – Increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- **Pressure** – Use the lowest spray pressure directed for the nozzle to produce the target spray volume and droplet size.
- **Spray Nozzle** – Use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

7.3.3 BOOM HEIGHT

- Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage.
- For ground equipment, the boom should remain level with the crop and have minimal bounce.

7.3.4 SHIELDED SPRAYERS

- Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers.
- Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

7.3.5 TEMPERATURE AND HUMIDITY

- When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

7.3.6 TEMPERATURE INVERSIONS

- Drift potential is high during a temperature inversion.
- Temperature inversions are characterized by increasing temperature with altitude and are common on nights with limited cloud cover and light to no wind.
- The presence of an inversion can be indicated by ground fog or 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.
- Avoid applications during temperature inversions.

7.3.7 WIND

- Drift potential increases with wind speed.
- AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.
- Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

7.3.8 BUFFER ZONE

- Leave a 25 foot buffer downwind of the application to avoid drift to non-target areas.

8.0 WEEDS CONTROLLED OR PARTIALLY CONTROLLED BY Optogen

Where reference is made to weeds partially controlled, partial control can either mean erratic control from good to poor, or inconsistent control at a level below that isconsidered acceptable for commercial weed control.

C = Control, PC = Partial Control

8.1 Weeds Controlled or Partially Controlled with a Soil Application of Optogen

Optogen applied as instructed in this label will provide 3-4 weeks of residual weed control or partial control of the weeds listed.

Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Barnyardgrass	*Echinochloa crus-galli*	Grass	PC
Crabgrass, large	*Digitaria ischaemum*	Grass	PC
Crabgrass, smooth	*Digitaria sanguinalis*	Grass	PC
Goosegrass	*Elucine indica*	Grass	PC
Foxtail, giant	*Setaria faberi*	Grass	PC
Panicum, fall	*Panicum dichotomiflorum*	Grass	PC
Amaranth, Palmer	*Amaranthus palmeri*	Broadleaf	PC
Amaranth, slender	*Amaranthus viridis*	Broadleaf	PC
Carpetweed	*Mollugo verticillata*	Broadleaf	C
Chickweed, common	*Stellaria media*	Broadleaf	PC
Cocklebur, common	*Xanthium strumarium*	Broadleaf	PC
Galinsoga, hairy	*Galinsoga quadriradiata*	Broadleaf	C
Jimsonweed	*Datura stramonium*	Broadleaf	C
Kochia	*Bassia scoparia*	Broadleaf	C
Ladysthumb	*Persicaria maculosa*	Broadleaf	PC
Lambsquarters, common	*Chenopodium album*	Broadleaf	C
Mallow, Venice	*Hibiscus trionum*	Broadleaf	PC
Morningglory, entireleaf	*Ipomoea hederacea*	Broadleaf	PC
Morningglory, ivyleaf	*Ipomoea hederacea*	Broadleaf	PC
Mustard, wild	*Sinapis arvensis*	Broadleaf	PC
Nightshade, Eastern black	*Solanum ptychanthum*	Broadleaf	C

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Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Pigweed, prostrate	*Amaranthus blitoides*	Broadleaf	C
Pigweed, redroot	*Amaranthus retroflexus*	Broadleaf	C
Pigweed, smooth	*Amaranthus hybridus*	Broadleaf	C
Purslane, common	*Portulaca oleracea*	Broadleaf	PC
Purslane, horse	*Trianthema portulacastrum*	Broadleaf	C
Ragweed, common	*Ambrosia artemisiifolia*	Broadleaf	C
Ragweed, giant	*Ambrosia trifida*	Broadleaf	PC
Smartweed, Pennsylvania	*Persicaria pensylvanica*	Broadleaf	PC
Thistle, Russian	*Salsola tragus*	Broadleaf	C
Velvetleaf	*Abutilon theophrasti*	Broadleaf	C
Waterhemp	*Amaranthus tuberculatus*	Broadleaf	PC

Procedures that might improve control of weeds listed above:

- Thoroughly till soil to destroy germinating and emerged weeds.
- If A16003E Herbicide is to be used preemergence, apply at planting or immediately after planting.
- If available, sprinkler irrigate within 2 days after application.
- If irrigation is not possible and rain does not occur within 2 days after application, weed control may be decreased.

8.2 Weeds Controlled or Partially Controlled with Postemergence Application of Optogen

Optogen applied postemergence as instructed in this label will provide control or partial control of the weeds listed. Unless instructed otherwise, apply A16003 Herbicide to weeds that are 4 inches in height or less.

Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Barnyardgrass	*Echinochloa crus-galli*	Grass	PC
Crabgrass, large	*Digitaria ischaemum*	Grass	PC
Foxtail, giant	*Setaria faberi*	Grass	PC
Foxtail, yellow	*Setaria pumila*	Grass	PC
Amaranth, Palmer	*Amaranthus palmeri*	Broadleaf	PC
Cocklebur, common	*Xanthium strumarium*	Broadleaf	PC
Henbit	*Lamium amplexicaule*	Broadleaf	C

continued...

8.2 Weeds Controlled or Partially Controlled with Postemergence Application of Optogen *(continued)*

Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Kochia	*Bassia scoparia*	Broadleaf	PC
Lambsquarters, common	*Chenopodium album*	Broadleaf	PC
Mallow, Venice	*Hibiscus trionum*	Broadleaf	PC
Morningglory, entireleaf	*Ipomoea hederacea*	Broadleaf	PC
Morningglory, ivyleaf	*Ipomoea hederacea*	Broadleaf	PC
Nightshade, Eastern black	*Solanum ptychanthum*	Broadleaf	C
Pigweed, prostrate	*Amaranthus blitoides*	Broadleaf	C
Pigweed, redroot	*Amaranthus retroflexus*	Broadleaf	C
Pigweed, smooth	*Amaranthus hybridus*	Broadleaf	C
Purslane, common	*Portulaca oleracea*	Broadleaf	C
Ragweed, common	*Ambrosia artemisiifolia*	Broadleaf	C
Ragweed, giant	*Ambrosia trifida*	Broadleaf	C
Sicklepod	*Senna obtusifolia*	Broadleaf	PC
Thistle, Russian	*Salsola tragus*	Broadleaf	C
Velvetleaf	*Abutilon theophrasti*	Broadleaf	C
Waterhemp	*Amaranthus tuberculatus*	Broadleaf	PC

- Apply to Palmer amaranth and waterhemp before they reach 2 inches in height.
- If environmental conditions result in stressed weeds, Optogen applied at less than 3.5 fl oz/A (0.045 lb ai/A) as a postemergence treatment may not provide control or partial control of the weeds listed in **Section 8.2**.

9.0 CROP USE DIRECTIONS

SOIL TEXTURES

Where rates are based on coarse, medium, or fine textured soils, it is understood that soil textural classes are categorized as follows:

Coarse	Medium	Fine
Loamy sand Sand Sandy loam	Loam Silt Silt loam	Clay Clay loam Sandy clay Sandy clay loam Silty clay Silty clay loam

9.1 Banana, Plantain, and Papaya

Crop		
Banana	Plantain	Papaya
Application Timing	**Rate fl oz/A**	**Use Directions**
Row Middle or Post-Directed	3.5	Apply to established planting of banana, plantain, and papaya. Avoid contacting the crop with spray or crop injury may occur.. Using a hooded or shielded sprayer will minimize potential crop injury when applying as a post-directed application. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Avoid direct or indirect spray contact to foliage and bark or injury may occur. • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** make more than 1 application per crop per year. 6) **Pre-harvest Interval (PHI):** 1 day		

9.2 Broccoli

Crop		
Broccoli		
Application Timing	**Rate fl oz/A**	**Use Directions**
Row Middle or Post-Directed	3.5	Apply after broccoli emergence or transplanting as either a row middle or post-directed application. Avoid contacting the broccoli foliage during application or crop injury will occur. Using a hooded or shielded sprayer will minimize potential crop injury when applying as row middle or post-directed applications. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** use preemergence on mineral soils. 6) **DO NOT** make more than 1 application per crop per year. 7) **Pre-harvest Interval (PHI):** 14 days		

9.3 Garlic

Crop		
Garlic		
Application Timing	**Rate fl oz/A**	**Use Directions**
Preplant	2.6 - 3.5	Apply before transplanting garlic. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the garlic row will be reduced.
Row Middle or Post-Directed	3.5	Apply after transplanting as either a row middle or post-directed application. Avoid contacting the garlic foliage during application or crop injury will occur. Using a hooded or shielded sprayer will minimize potential crop injury when applying as row middle or post-directed applications. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe. • There is an increased risk of unacceptable crop injury following preplant applications, including stunting where herbicide application overlap occurs. • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		

continued...

9.3 Garlic *(continued)*

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** use preemergence on mineral soils. 6) **DO NOT** make more than 1 application per crop per year. 7) **Pre-harvest Interval (PHI):** 45 days

9.4 Hops

Crop		
Hops		
Application Timing	**Rate fl oz/A**	**Use Directions**
Row Middles or Post-Directed	3.5	Using a hooded or shielded sprayer will minimize potential crop injury when applying as a post-directed application. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe. • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** make more than 1 application per crop per year. 6) **Pre-harvest Interval (PHI):** 30 days

9.5 Horseradish

Crop		
Horseradish		
Application Timing	**Rate fl oz/A**	**Use Directions**
Preemergence	2.6 - 3.5 Use the higher rate on medium and fine textured soils and the lower rate on coarse textured soils	Apply after planting but at least 3 days prior to horseradish emergence. For additional weed control, Optogen can be tank mixed with Dual Magnum.

continued...

9.5 Horseradish *(continued)*

Crop		
Horseradish		
Application Timing	**Rate fl oz/A**	**Use Directions**
Row Middle or Post-Directed	3.5	Apply after horseradish emergence or up to 30 days after emergence as either a row middle or post-directed application. Avoid contacting the horseradish foliage during application or crop injury will occur. Using a hooded or shielded sprayer will minimize crop injury when applying as row middle or post-directed applications. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS **or** COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Application at 0-3 days prior to horseradish emergence will result in increased risk of unacceptable crop injury. The increased injury risk is attributed to herbicide uptake by crop tissue at the soil surface during crop emergence. • If Optogen is applied following the cultural practice of tillage to bury the horseradish plants after emergence, significant crop injury can occur. Applying Optogen after this tillage practice must be avoided. • Preemergence tank mixtures with herbicides other than Dual Magnum increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe. • Avoid preplant incorporation applications or unacceptable crop injury can occur. • There is an increased risk of unacceptable crop injury, including stunting where herbicide application overlap occurs. • Applications in muck soils will result in reduced residual weed control.		

continued...

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** make more than 1 application per crop per year. 6) **DO NOT** apply Optogen as a preplant incorporated (PPI) treatment. 7) Unless applying with a hooded or shielded sprayer, **DO NOT** apply Optogen as a row middle or post-directed application when wind will result in drift onto the horseradish row. 8) **Pre-harvest Interval (PHI):** NA a. **DO NOT** apply more than 30 days after emergence.

9.6 Lemongrass

9.6.1 PREPLANT, PREPLANT INCORPORATED OR POSTEMERGENCE APPLICATIONS

Crop		
Lemongrass		
Application Timing	**Rate fl oz/A**	**Use Directions**
Preplant	3.5	Apply before transplanting lemongrass. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the lemongrass row will be reduced.
Preplant Incorporated (PPI)	3.5	Apply before transplanting lemongrass. Avoid incorporating to a depth of more than 2 inches. Weed control can be reduced if the incorporation depth is greater than 2 inches. For best weed control results, preemergence applications are more consistent and more effective than preplant incorporated applications.

continued…

9.6 Lemongrass *(continued)*

Application Timing	Rate fl oz/A	Use Directions
Postemergence	3.5	Apply as a broadcast treatment after transplanting lemongrass. Application can also be made to a direct seeded crop provided the lemongrass is at least 5 inches in height. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS **or** COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve weed control consistency. For optimal control, make application to small (<2") weeds.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1.**

Precautions:
- Preplant, preplant incorporated or preemergence applications to **direct seeded** lemongrass can result in significant injury including stunting and in severe cases, plant death.
- Applications to muck soils will result in reduced residual weed control.
- Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following postemergence application.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A per single application
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** make more than 1 application per year.
6) **Pre-harvest Interval (PHI):** 60 days

9.7 Onion

9.7.1 PREEMERGENCE, ROW MIDDLE OR POST-DIRECTED APPLICATIONS

Crop		
Onion, dry bulb		Onion, green
Application Timing	**Rate fl oz/A**	**Use Directions**
Preemergence	2.6 - 3.5	Apply after planting and before onion emergence. Use on muck soils. Use on mineral soil will result in crop injury. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the lemongrass row will be reduced.
Row Middle or Post-Directed	3.5	Apply after onion emergence or transplanting as either a row middle or post-directed application. Avoid spray contact with the onion foliage during application or crop injury will occur. Use on muck soils. Use on mineral soil will result in crop injury. Using a hooded or shielded sprayer will minimize potential crop injury when applying as row middle or post-directed applications. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe. • There is an increased risk of unacceptable crop injury following preplant applications, including stunting where herbicide application overlap occurs. • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		

continued...

9.7 Onion *(continued)*

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** use preemergence on mineral soils. 6) **DO NOT** make more than 1 application per crop per year. 7) **Pre-harvest Interval (PHI):** a. Onion, green: 21 days b. Onion, dry bulb:45 days

9.8 Rosemary

9.8.1 PREPLANT, PREPLANT INCORPORATED OR POSTEMERGENCE APPLICATIONS

Crop		
Rosemary		
Application Timing	**Rate fl oz/A**	**Use Directions**
Preplant	3.5	Apply before transplanting rosemary. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the Rosemary row will be reduced.
Preplant Incorporated (PPI)	3.5	Apply before transplanting rosemary. Avoid incorporating to a depth of more than 2 inches. Weed control will be reduced if the incorporation depth is greater than 2 inches. For best weed control results, preemergence applications are more consistent and more effective than preplant incorporated applications.

9.8 Rosemary *(continued)*

Application Timing	Rate fl oz/A	Use Directions
Postemergence	3.5	Apply as a broadcast treatment after transplanting rosemary. Application can also be made to a direct seeded crop provided the rosemary is at least 4 inches tall. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). When using NIS, Dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Where AMS is used, liquid AMS may be substituted at an equivalent rate. The use of AMS with NIS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1.**

Precautions:
- Preplant, preplant incorporated or preemergence applications to **direct seeded** rosemary can result in significant injury including stunting and in severe cases, plant death.
- Crop oil concentrate (COC) tends to provide better weed control and consistency compared to nonionic surfactant (NIS) but COC will provide a higher risk for leaf burn. If crop injury occurs from an application including COC, the plants will recover.
- The use of crop oil concentrate (COC) plus ammonium sulfate (AMS) provides a higher risk of crop injury that COC alone. If COC plus AMS is applied with Optogen, crop injury including leaf burn and plant stunting can occur.
- Applications to muck soils will result in reduced residual weed control.
- Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following postemergence application.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A per single application
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** make more than 1 application per year.
6) **Pre-harvest Interval (PHI):** 60 days

9.9 Strawberry

Crop		
Strawberry		
Application Timing	**Rate fl oz/A**	**Use Directions**
Row Middle or Post-Directed	3.5	Apply after strawberry emergence or transplanting as either a row middle or post-directed application. Avoid contacting the crop with direct or indirect spray or crop injury will occur. Using a hooded or shielded sprayer will minimize potential crop injury when applying as a post-directed application. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS or COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. Liquid AMS may be substituted at an equivalent rate. The use of AMS will improve the consistency level of weed control. For optimal control, make application to small (<2") weeds.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1**.

Precautions:
- Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe.
- Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
3) **Minimum Application Interval:** NA
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** allow direct or indirect spray to contact plant foliage.
6) **DO NOT** make more than 1 application per crop per year.
7) **Pre-harvest Interval (PHI):** 30 days

9.10 Sweet Potato

Crop		
Sweet potato		
Application Timing	**Rate fl oz/A**	**Use Directions**
Pre-Transplant	2.6 - 3.5 Use the 3.5 fl oz/A on medium and fine textured soils and 2.6 fl oz/A on coarse textured soils	Apply before transplanting sweet potato. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the sweet potato row will be reduced. For best results, apply irrigation prior to transplanting and avoid tillage after application. Exposed sweet potato roots could result in unacceptable crop injury if irrigation or rainfall moves the herbicide into the root zone.
Row Middle	2.6 - 3.5 Use the 3.5 fl oz/A on medium and fine textured soils and 2.6 fl oz/A on coarse textured soils	Apply after transplanting to row middles. Avoid contacting the sweet potato foliage during application or crop injury will occur. Using a hooded **or** shielded sprayer will minimize crop injury when applying as row middle treatment. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • The 3.5 fl oz/A rate may be used on coarse textured soils for extended weed control but the risk for unacceptable crop injury is higher than with the 2.6 fl oz/A rate. • If sweet potato roots are not sealed prior to herbicide application, irrigation or rainfall within 2-3 days after application increases the risk of unacceptable crop injury. • Application to sweet potatoes grown on sandy loam soils with <1% organic matter (OM) are at a higher risk for unacceptable crop injury than soils with >1% OM. • Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe. • Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.		

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9.10 Sweet Potato *(continued)*

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A) 3) **Minimum Application Interval:** NA 4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A) a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products. 5) **DO NOT** make more than 1 application per crop per year. 6) **DO NOT** apply to sweet potatoes grown on sand or loamy sand soils with <1% organic matter (OM). 7) **DO NOT** apply to greenhouse grown transplants. 8) **Pre-harvest Interval (PHI):** 60 days

9.11 Timothy grown for seed

Crop		
Timothy grown for seed		
Application Timing	**Rate fl oz/A**	**Use Directions**
Preplant	3.5	Apply prior to planting. Minimize the movement of treated soil during the planting process. If a significant amount of treated soil is moved, weed control in the crop row will be reduced.
Preemergence	3.5	Apply after planting but prior to crop emergence.
Postemergence	3.5	Apply as a broadcast treatment when timothy grown for seed has a minimum of 2 leaves but before timothy reaches 18" in height. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) or a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). For optimal control, make application to small (<2") weeds.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		

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Precautions:

- Avoid preplant incorporation applications or unacceptable crop injury can occur.
- Temporary crop bleaching and/or stunting may be observed after application to cool, wet soils or during poor crop growth.
- Tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe.
- Crop oil concentrate (COC) provides increased and more consistent weed control compared to non-ionic surfactant (NIS) but COC will provide a higher risk for temporary leaf burn.
- Adding a nitrogen-containing fertilizer to a postemergence application of Optogen may cause temporary crop bleaching or leaf burn.
- There is an increased risk of temporary crop injury where herbicide application overlap occurs.
- Applications to muck soils will result in reduced residual weed control.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
3) **Minimum Application Interval:** NA
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** make more than 1 application per crop per year.
6) **Pre-harvest Interval (PHI):** NA
   a. **DO NOT** apply to timothy greater than 18" in height.

9.12 Watermelon

Crop		
Watermelon		
Application Timing	**Rate fl oz/A**	**Use Directions**
Pre-Transplant	3.5	Apply before transplanting watermelon. Minimize the movement of treated soil during the transplanting process. If a significant amount of treated soil is moved, weed control in the watermelon row will be reduced.
Row Middle	2.6 - 3.5	Apply to row middles of watermelon. Avoid contacting the watermelon foliage during application or crop injury will occur. Using a hooded or shielded sprayer will minimize crop injury when applying as row middle treatment. Add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). For optimal control, make application to small (<2") weeds.

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9.12 Watermelon *(continued)*

For Weed Control:
- Refer to Section 8.0 for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1**.

Precautions:
- Preemergence tank mixtures with other herbicides may increase the risk of crop injury. Before applying these tank mixtures, test on a small portion of the field to ensure the mixture will be safe.
- There is an increased risk of unacceptable crop injury following preplant applications, including stunting where herbicide application overlap occurs.
- Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following application.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
3) **Minimum Application Interval:** NA
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** make more than 1 application per crop per year.
6) **Pre-harvest Interval (PHI):** 14 days

9.13 Wormwood

9.13.1 PRE-GREENUP, POST-GREENUP OR POSTEMERGENCE APPLICATIONS

Crop		
Wormwood		
Application Timing	**Rate fl oz/A**	**Use Directions**
Pre-Greenup or Post-Greenup on Established Wormwood	3.5	Apply to wormwood that has been established for at least one year. Make the pre-Greenup application while wormwood is dormant and prior to spring green up. Make the post-Greenup application after wormwood has broken dormancy. If weeds are emerged at the time application, add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS **or** COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. The use of AMS will improve the weed control consistency versus NIS or COC alone. For optimal control, make application to small (<2") weeds.

continued…

Application Timing	Rate fl oz/A	Use Directions
Postemergence on Newly Planted Wormwood	3.5	A newly planted crop is any wormwood that is less than one year old. Apply to wormwood that is at least 2" inches tall. If weeds are emerged at the time application, add a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) **or** a crop oil concentrate (COC) at the rate of 1 gal/100 gallons of water (1.0% v/v). In addition to NIS **or** COC, dry spray grade ammonium sulfate (AMS) may be added at a rate of 8.5 to 17 lb/gal of water. The use of AMS will improve the weed control consistency versus NIS or COC alone. For best optimal control, make application to small (<2") weeds.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1.**

Precautions:
- Preplant incorporated or preemergence applications at the time of wormwood planting can result in significant injury including stunting and in severe cases, plant death.
- For newly planted wormwood postemergence applications, the use of ammonium sulfate (AMS) will improve the level and consistency of weed control but will also increase the risk of crop injury.
- For fall planted crops, the use of AMS in the fall is of higher risk than a spring application.
- For newly planted wormwood, there is an increased risk of postemergence crop injury, including stunting where herbicide application overlap occurs. The wormwood plants will fully recover.
- Applications to muck soils will result in reduced residual weed control.
- Under adverse weather conditions (cool, wet, poor crop growth), temporary crop bleaching may be observed following postemergence application.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 3.5 fl oz/A (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A per single application
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 3.5 fl oz/A/year (0.045 lb ai/A)
   a. **DO NOT** exceed 0.045 lb ai/A/year of bicyclopyrone-containing products.
5) **DO NOT** make more than 1 application per year.
6) **Pre-harvest Interval (PHI):** 60 days

10.0 STORAGE AND DISPOSAL

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

Pesticide Storage

Keep container tightly closed when not in use. **DO NOT** store near seeds, fertilizers, or foodstuffs. Keep away from heat and flame.

Pesticide Disposal

Open dumping is prohibited. Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Handling [less than or equal to 5 gallons]

Non-refillable container. 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 mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or 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, or, by other procedures allowed by state and local authorities.

Container Handling [greater than 5 gallons]

Non-refillable container. 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. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

continued...

Container Handling [greater than 5 gallons]

Refillable container. Refill this container with pesticide only. **DO NOT** use this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the person refilling. To clean container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, by other procedures allowed by state and local authorities.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to contain spills, leaks, and other accidents to prevent further exposure of facilities and equipment. Absorb spilled product with absorbing materials and dispose of in an approved waste disposal facility. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

CONTAINER IS NOT SAFE FOR FOOD, FEED OR DRINKING WATER.

11.0 CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, LLC or Seller. To the extent permitted by applicable law, Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. To the extent permitted by applicable law: (1) this warranty does not extend to the use of the product contrary to label instructions, or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and (2) Buyer and User assume the risk of any such use. TO THE EXTENT PERMITTED BY APPLICABLE LAW, SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS WARRANTED BY THIS LABEL.

To the extent permitted by applicable law, in no event shall SYNGENTA be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

12.0 APPENDIX

12.1 Tank Mix Product Information

Product Name	EPA Reg. No.	Active Ingredient(s)
AAtrex 4L	100-497	Atrazine
Aatrex Nine-O	100-585	Atrazine
Bicep II Magnum	100-817	Atrazine, *S*-metolachlor
Bicep Lite II Magnum	100-827	Atrazine, *S*-metolachlor
Dual II Magnum	100-818	*S*-metolachlor
Princep 4L	100-526	Simazine
Princep Caliber 90	100-603	Simazine
Peak	100-763	Prosulfuron
Liberty	264-829	Glufosinate ammonium

AAtrex®, AAtrex® Nine-O®, Bicep II Magnum®, Bicep Lite II Magnum®,
Dual II Magnum®, Gramoxone®, Optogen™, Peak®, Princep®,
Princep® Caliber® 90, the ALLIANCE FRAME,
the SYNGENTA Logo and the PURPOSE ICON
are Trademarks of a Syngenta Company

Viton™ is a trademark of The Chemours Company FC, LLC

Liberty® is a trademark of BASF Ag Products

Roundup® is a trademark of Monsanto Company

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For non-emergency (e.g., current product information), call
Syngenta Crop Protection at 1-800-334-9481.

Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 27419-8300

BICYCLOPYRONE | GROUP 27 | HERBICIDE

Optogen™

For Weed Control in Banana, Broccoli, Garlic, Hops, Horseradish, Lemongrass, Onion (dry bulb), Onion (green), Papaya, Plantain, Rosemary, Strawberry, Sweet Potato, Timothy grown for seed, Watermelon, and Wormwood.

Active Ingredients:	
Bicyclopyrone*	18.5%
Other Ingredients:	81.5%
Total:	100.0%

*CAS No. 352010-68-5

This product contains 1.67 pounds of active ingredient bicyclopyrone per gallon.

See additional precautionary statements and directions for use on label.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in Directions for Use section for information about this standard.

EPA Reg. No. 100-1465
EPA Est. 100-LA-001

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Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 27419-8300

SCP 1465A-L1 0322
4158052

1 gallon

Net Contents

KEEP OUT OF REACH OF CHILDREN.

CAUTION

FIRST AID **If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. **If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. **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 poison control center or doctor for further treatment advice. **If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. **DO NOT** induce vomiting unless told to do so by the poison control center or doctor. **DO NOT** give anything by mouth to an unconscious person. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. **HOTLINE NUMBER:** For 24-Hour Medical Emergency Assistance (Human or Animal), or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident) Call **1-800-888-8372**

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION

Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Environmental Hazards: DO NOT apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment wash water or rinsate.

Groundwater Advisory: This product is known to leach through soil into ground water under certain conditions as a result of label use. This chemical may leach into ground water if used in areas where soils are permeable, particularly where the water table is shallow.

Surface Water Advisory: This product has a high potential for reaching surface water via runoff for several months or more after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features including as ponds, streams, and springs will reduce the potential loading of bicyclopyrone from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

Physical or Chemical Hazards: DO NOT use or store near heat or open flame.

STORAGE AND DISPOSAL

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CONTAINER IS NOT SAFE FOR FOOD, FEED OR DRINKING WATER.

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