

# **BLUEBERRY, CURRANT (BLACK AND RED), LINGONBERRY, RASPBERRY (BLACK AND RED), AND BLACKBERRY - PREEMERGENCE**

General Information

## **PRODUCT INFORMATION**

Callisto Herbicide is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn, seed corn, yellow popcorn, sweet corn, and other listed crops. When used preemergence, weeds take up the product through the soil during emergence. Dry conditions following application may reduce the preemergence activity of Callisto Herbicide. 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 2 weeks. The product is absorbed through the soil and/ or by the foliage of emerged weeds.

Callisto Herbicide is not effective for the control of most grass weeds. Preemergence grass herbicides or postemergence grass herbicides can be tank mixed with Callisto Herbicide to provide broad spectrum weed control in corn (see appropriate section of label for this information).

Callisto Herbicide can be applied postemergence following a preemergence grass herbicide application. Callisto Herbicide can also be used in combination with a burndown herbicide, prior to planting, to provide added burndown and residual weed control in field corn, seed corn, yellow popcorn, and sweet corn.

## **WEED RESISTANCE MANAGEMENT**

Naturally occurring biotypes of certain broadleaf weed species with resistance to triazines, glyphosate, PPO, HPPD and ALS inhibiting herbicides are known to exist. Performance of Callisto Herbicide is not affected by the presence of biotypes resistant to triazines, glyphosate, PPO or ALS inhibiting herbicides.

To prevent the risk of weeds developing resistance to Callisto Herbicide in corn, always use full labeled rates. If applying Callisto Herbicide postemergence after a mesotrione containing preemergence herbicide, always add atrazine as a tank mix partner. No more than 0.24 lb of mesotrione active ingredient must be applied per acre of corn per year (equivalent of 7.7 fl oz per acre per year of Callisto Herbicide). If additional herbicide must be applied, it is recommended that a different mode of action be used, i.e., other than an HPPD inhibitor (Group 27 Herbicide). Callisto Herbicide must be applied at full label rates to help prevent selection for, or population shifts toward, marginally resistant weed species and/or species biotypes.

## 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.
- Fields should be scouted 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 such as 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

- Fields with difficult to control weeds should be planted 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, such as 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
- Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
- A spreading patch of non-controlled plants of a particular weed species; and
- 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-Syngenta (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 such as

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.

#### USE RESTRICTIONS

Do not apply Callisto Herbicide to white popcorn or ornamental (Indian) corn.

Do not cultivate corn within 7 days before or after a Callisto Herbicide application as weed control from the Callisto Herbicide application may be reduced.

Do not apply this product through any type of irrigation system unless specified otherwise under the specific crop section on the label.

Do not apply this product with suspension fertilizers as the carrier.

Do not apply Callisto Herbicide postemergence in a tank mix with emulsifiable concentrate grass herbicides, unless specifically addressed under one of the tank mix sections of this label, or injury may occur.

Do not use aerial application to apply Callisto Herbicide unless specified otherwise under the specific crop section on the label.

#### USE PRECAUTIONS

Severe corn injury resulting in yield loss may occur if Callisto Herbicide is applied postemergence to corn that was treated with Counter or Lorsban.

Severe corn injury resulting in yield loss may occur if Callisto Herbicide is applied foliar postemergence to corn in a tank mix with any organophosphate or carbamate insecticide.

Severe corn injury resulting in yield loss may occur if any organophosphate or

carbamate insecticide is applied foliar postemergence within 7 days before or 7 days after Callisto Herbicide application.

When weeds are stressed due to drought, heat, lack of fertility, flooding, or prolonged cool temperatures, control can be reduced or delayed since the weeds are not actively growing. Weed escapes or regrowth may occur when application is made under prolonged stress conditions. Optimum weed control will be obtained if an application of Callisto Herbicide is made following label directions when weeds are actively growing.

Callisto Herbicide may be applied with pyrethroid type insecticides (e.g., Warrior).

## SPRAY DRIFT

### Ground Boom Applications

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy unless making a turf, pasture, or rangeland application, in which case applicators may apply with a nozzle height no more than 4 feet above the ground.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser 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.

### ADDITIONAL SPRAY DRIFT DIRECTIONS FOR AERIAL APPLICATIONS

The distance of the outer-most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.

Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be observed.

Spray must be released at the lowest height consistent with effective weed control

and flight safety.

For best results, ensure that each specific aerial application vehicle used is quantifiably pattern tested for aerial application of Callisto Herbicide initially and every year thereafter.

**RESTRICTION:** For aerial application use only nozzles producing coarse-ultra coarse droplets. Do not use nozzles producing fine-medium size droplets.

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

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

When applications are made with a crosswind, the swath will be displaced downwind.

Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Increase swath adjustment distance with increasing drift potential (higher wind, smaller drops, etc.).

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Avoid application below 2 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Ensure that every applicator is familiar with local wind patterns and how they affect drift.

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

Do not apply during a temperature inversion, because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are

common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

The pesticide must only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

## APPLICATION INFORMATION

### PREEMERGENCE GROUND APPLICATION

Apply Callisto Herbicide preemergence with a carrier volume of 10-60 gal/A.

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. Apply in a spray volume of 10-60 gal/A using water or liquid fertilizer (excluding suspension fertilizers) as the carrier. Use a pump that can maintain a pressure of at least 35-40 psi at the nozzles and provide proper agitation within the tank to keep the product dispersed. Lower pressures may be used with extended range or drift reduction nozzles.

Always ensure that agitation is maintained until spraying is completed, even if stopped for brief periods of time. If the agitation is stopped for more than 5 minutes, resuspend the spray solution by running on full agitation prior to spraying.

### POSTEMERGENCE GROUND APPLICATION

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. Good weed coverage is essential for optimum weed control. 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.

Apply in a spray volume of 10-30 gal/A using water as a carrier. Use a pump that can maintain a pressure of at least 35-40 psi at the nozzles and provide proper agitation within the tank to keep the product dispersed. Lower pressures may be used with extended range or drift reduction nozzles. When weed foliage is dense, use a minimum of 20 gal.

Flat fan nozzles of 80° or 110° are recommended for optimum postemergence coverage.

Do not use floodjet nozzles or controlled droplet application equipment for postemergence applications.

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.

Always ensure that agitation is maintained until spraying is completed, even if stopped for brief periods of time. If the agitation is stopped for more than 5 minutes, resuspend the spray solution by running on full agitation prior to spraying.

#### Aerial Application

**RESTRICTION:** Callisto Herbicide can be applied aerially only to corn and sugarcane.

**RESTRICTION:** For aerial application use only nozzles producing coarse-ultra coarse droplets.

Do not use nozzles producing fine-medium size droplets.

Callisto Herbicide may be applied aerially for preemergence or postemergence weed control in corn only in the following states: Alabama, Arkansas, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, North Dakota, Nebraska, Ohio, Oklahoma, South Dakota,



Tennessee, and Texas.

Callisto Herbicide may be applied aerially for preemergence or postemergence weed control in sugarcane only in the following states: Florida, Louisiana and Texas.

Applications must be made in a minimum of 2 gallons of water per acre.

#### SPRAY ADDITIVES

#### POSTEMERGENCE ADJUVANTS

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 recommended.

The following adjuvant recommendations are intended primarily for Callisto Herbicide use in corn. Refer to the use directions section of each crop section for specific adjuvant recommendations.

#### POSTEMERGENCE APPLICATIONS TO FIELD CORN AND SEED CORN

For postemergence applications made after the crop has emerged, add crop oil concentrate (COC) to the spray solution at the rate of 1.0 gal/100 gal of water (1.0% v/v). The use of a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) instead of COC is allowed, but the weed control achieved with COC is consistently better than NIS. The use of methylated seed oil (MSO) adjuvants or MSO blend adjuvants for postemergence applications of Callisto Herbicide may cause severe crop injury to occur. Do not use MSO adjuvants for postemergence use unless directed for a specific tank mix under the CALLISTO HERBICIDE TANK MIXTURES FOR CORN section of this label, or unless permitted by a supplemental Callisto Herbicide label. In addition to COC, always add spray grade UAN (e.g., 28-0-0) to the spray solution at a rate of 2.5% (v/v) or AMS at 8.5 lb/100 gal of spray solution, except if precluded elsewhere on this label or by a supplemental Callisto Herbicide label.

#### POSTEMERGENCE APPLICATIONS TO SWEET CORN AND YELLOW POPCORN

Do not add UAN or AMS when making postemergence applications of Callisto Herbicide to yellow popcorn or sweet corn, or severe crop injury may occur.

For postemergence applications to yellow popcorn and sweet corn, the use of a nonionic surfactant (NIS) instead of a crop oil concentrate (COC) is recommended, so as to minimize the risk of crop injury. A COC may be used, and will increase the level of weed control achieved, especially under dry growing conditions, but the risk of crop injury is increased significantly under lush growing conditions. For optimum control, the addition of atrazine is recommended wherever rotational or local atrazine restrictions allow.

## PREEMERGENCE ADJUVANTS

For Callisto Herbicide preplant or preemergence applications, and where weeds are present, the use of any adjuvant for agricultural use is permitted. In these situations, MSO type adjuvants are typically better than COC type adjuvants, which are typically better than NIS type adjuvants for enhancing weed control. UAN or AMS can be added and typically provides better weed control than not adding one of these. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

## WEEDS CONTROLLED

Callisto Herbicide applied as directed in this label will control or partially control the weeds listed in Tables 1 and 2.

Where reference is made to weeds partially controlled, partial control can either mean erratic control (good to poor) or consistent control at a level below that generally considered acceptable for commercial weed control.

For best postemergence results, apply Callisto Herbicide to actively growing weeds. Dry weather following preemergence application of Callisto Herbicide may reduce residual weed control effectiveness. If irrigation is available, apply 1/2 to 1 inch of water after preemergence application. If irrigation is not available, a uniform shallow cultivation is recommended as soon as weeds emerge.

Callisto Herbicide applied alone or in mixture with atrazine will not provide consistent or effective control of weeds identified as resistant to postemergence

HPPD inhibiting herbicides.

Refer to the crop sections on this label for specific rates and use directions.

#### Limitations, Restrictions, and Exceptions

#### BLUEBERRY, CURRANT (BLACK AND RED), LINGONBERRY, RASPBERRY (BLACK AND RED), AND BLACKBERRY

Callisto Herbicide may be applied as a pre-bloom post-directed spray in high bush blueberry, lingonberry, red currant, black currant, black raspberry, red raspberry, and blackberry. For a list of weeds controlled see Tables 1 and 2. Callisto Herbicide may be applied in bush or caneberries at a rate up to 6 fl oz/A. If a split application weed control program is desired, 3 fl oz/A followed by 3 fl oz/A may be used. The use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended, but avoid using COC adjuvants that are injurious to blueberry and lingonberry leaves.

In low bush blueberries, Callisto Herbicide may only be applied in the non-bearing year. This application may be a broadcast application. Up to 6 fl oz/A of Callisto Herbicide may be applied in a single application, or 3 fl oz/A followed by 3 fl oz/A if used in a split application program. The use of a crop oil concentrate (COC) type adjuvant at 1% v/v is recommended. Applications of Callisto Herbicide during dry weather conditions and/or temperatures above 85° can cause injury to Lowbush blueberries. Applications of Callisto Herbicide can cause yellowing or necrosis of leaves and under severe conditions, leaf drop may occur especially on “Sourtop” variety blueberries.

#### Restrictions:

1. Do not make more than two applications of Callisto Herbicide per year.
2. Do not apply more than 6 fl oz/A (0.19 lb ai/A) of Callisto Herbicide per year.
3. If two applications are made, they must be made no closer than 14 days apart.
4. Do not apply Callisto Herbicide to bush or caneberries after the onset of the bloom stage or illegal residues may occur.

#### Method

#### [Post-directed Spray](#)

Rates

[field\\_rates 0](#)

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Restricted Entry Interval

12 hours

Exception: If the product is soil-injected or soil-incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

Timings

[Preemergence \(Weed\)](#)

[Pre-bloom](#)