



State Regulatory Affairs  
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March 12, 2009

Mr. Henry Jennings  
Maine Department of Agriculture  
28 State House Station  
Augusta, ME 04333-0028

**SUBJECT:** Callisto® (EPA Reg. No. 100-1131)  
Request for SLN to Allow Chemigation in Cranberry  
Active Ingredient: Mesotrione

Dear Mr. Jennings:

Please find a submission to allow chemigation for weed control in cranberry. Cranberry is currently on the federal label for Callisto. The federal label prohibits chemigation since chemigation is not a practical or agronomical important use pattern on the majority of crops on the label. However, it is important for cranberry production in Maine. The majority of Callisto application now occurs by hand spraying.

The directions for use have been modified to add several weed species important to Maine production, allow the use of a nonionic surfactant, and specific instructions for use of chemigation under Maine growing conditions.

Efficacy data is supplied by Dr. Hilary Sandler of the UMASS Cranberry Station

To satisfy EPA SLN requirements, I've included the following documentation in this submission:

- Draft Special Local Need label for Maine
- EPA Application form 8570-25
- Efficacy data prepared by Dr. Hilary Sandler of the UMASS Cranberry Station
- Support letter from Charles Armstrong, Cranberry Professional, University of Maine
- Federal Label and MSDS for Callisto herbicide

Mr. Henry Jennings  
March 12, 2009  
Page 2

Syngenta believes it has included sufficient evidence to support approval of this application. However, please feel free to contact me at 1 (800) 334-9481, ext. 2146 if you have questions or require any further data or information.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Zang". The signature is written in a cursive, flowing style.

Larry Zang  
Senior Regulatory Manager

Enclosures

March 11, 2009



Pest Management Office

491 College Ave.  
Orono, ME 04473

*Putting Knowledge to Work with the People of Maine*

Henry Jennings  
Maine Board of Pesticides Control  
28 State House Station  
Augusta, ME 04333

Dear Henry:

I am writing to support the Special Local Needs application to permit chemigation of Callisto (mesotrione) for weed control in cranberry in the state of Maine. An SLN request for that same purpose was granted to growers in Massachusetts earlier this year. The request is not a case of having the herbicide or not; rather, our cranberry industry is merely seeking an addition in application methodology—one that comes with considerable cost savings to growers.

Chemigation is the most common form of pesticide application used in cranberries. The ability to chemigate an effective herbicide such as Callisto would save our growers time, labor, and money. For example, a grower can chemigate 10 acres in approximately 30-60 minutes, whereas it might take a machine operator 1 to 2 days to apply the herbicide with a ground rig, or a crew of two to three laborers several days to hand-apply Callisto (backpack sprayer or similar method). A recent cost estimate completed by Cranberry Growers Service in West Wareham, Massachusetts, calculated that the total cost of applying Callisto to 10 acres with a ground rig application would be \$802 compared to \$125 for chemigation (a savings of \$67.70 per acre per treatment, which—assuming two applications per year in accordance with the label—would translate to just over \$135 per acre per year in savings)! The cost to apply Callisto by backpack—the method used by the majority of our Maine cranberry growers this past growing season—requires even more labor and time than with a ground rig, so any savings on equipment usage would be negated by labor expenditures. The ability to chemigate with Callisto would thus truly help our cranberry growers to manage their weeds more efficiently and help them to remain economically solvent.

Callisto provides good to excellent weed control under simulated chemigation conditions [from field trials conducted in 2008 in Massachusetts and Washington – unpublished data, but data that I have obtained and studied]. UMass Extension's Cranberry IPM Specialist, Dr. Hilary Sandler, found from her field trials she conducted in 2008 that Callisto gave excellent control of their primary target weed, nutsedge and provided good control of grasses and other susceptible weeds in the treated area. What excites me the most, however, is that the MA and WA field trials found that even with low rates of mesotrione (0.25-0.375 lb ai/acre), yellow loosestrife (a stubborn perennial) was suppressed, and this is a weed that has not only been escaping prior control efforts (with our other available herbicides) by several of our growers, but has been spreading quickly and even taking over some of the beds I've visited [*see photos*].

I strongly support the proposed supplemental labeling to allow application of the approved herbicide, Callisto, by chemigation. Chemigation of Callisto will provide cranberry growers with an effective and efficient tool to achieve broad spectrum weed control and subsequently, improve yields. Please feel free to contact me if you have further questions.

Respectfully submitted,

A handwritten signature in black ink that reads 'Charles Armstrong'.

Charles Armstrong  
Cranberry Professional, M.S.

Phone: 207-581-2967; FAX: 207-581-3881  
email: charlesa@umext.maine.edu





Yellow Loosestrife (early July—while the cranberries are in bloom) on a 1-acre cranberry bed in Washington County. This is the only bed belonging to this particular part-time cranberry grower, and one needs to look hard to be able to see any cranberries. Yellow loosestrife—considered a high priority weed—is a perennial, and its blossoms compete with the cranberry blossoms for pollinators.





**Section 24(c) Special Local Need Label**

**FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF MAINE**

**Callisto® Herbicide**

**EPA REG. NO. 100- 1131  
EPA SLN NO. ME-XXXXX**

**CHEMIGATION APPLICATION METHOD FOR WEED CONTROL IN CRANBERRY**

*Active Ingredient:*

Mesotrione: (CAS No. 104206-82-8) . . . . . 40.0%

*Other Ingredients:* . . . . . 60.0%

*Total:* . . . . . 100.0%

Contains 4 lbs. of active ingredient mesotrione per gallon.

**CAUTION**

**KEEP OUT OF REACH OF CHILDREN**

FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR PEST CONTROL, CROP INJURY, OR ILLEGAL RESIDUES.

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**DIRECTIONS FOR USE**

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

Follow all applicable directions, restrictions, and precautions including statements pertaining to the Worker Protection Standards, on the EPA-registered Callisto Herbicide label.

This label must be in the possession of the user at the time of application.

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## Specific Use Directions- Application by Chemigation in Cranberry

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Callisto may be applied through irrigation systems (chemigation) including center pivot or solid set.

Callisto may be applied to bearing or non-bearing cranberry beds for control or suppression of bog St. John's wort (*Hypericum boreala*), rushes (*Juncus canadensis*, *J. effuses*, *J. bufonlus*, *J. tenuis*), sedges spp. (*Cyperus*, *Carex* spp.), yellow loosestrife (*Lysimachia terrestris*), silverleaf (*Potentilla pacifica*), narrow-leafed goldenrod (*Euthamia tenuifolia*), clover (*Trifolium* spp.), sawbriar (*Smilax* spp.) dewberry (*Rubus* spp.), cinquefoil (*Potentilla* spp.) and dodder (*Cuscuta* spp.) in addition to the weeds listed in Tables 1 and 2. Callisto may be applied in cranberries at a rate up to 8 fl. oz./A. Apply no more than two applications per crop per year and not more than 16 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. The use of a crop oil concentrate (COC) type adjuvant at 1% v/v or a non-ionic surfactant at 0.25%v/v is recommended. Avoid using COC adjuvants that are injurious to cranberry leaves. In non-bearing cranberries, make the Callisto application(s) after the bud break stage, but not less than 45 days before flooding in fall or winter. In bearing cranberries, make the Callisto application(s) after the bud break stage, but not less than 45 days prior to flooding or harvest.

Wait at least 18 months after the last Callisto application in cranberries before replanting cranberries or before rotating to another crop.

Additional Restrictions: 1) Do not apply directly to water or areas where surface water is present outside the bog system. 2) Do not contaminate water when disposing of equipment wash water or rinsate. 3) Do not apply within 10 feet of surface water outside the bog system. 4) Do not spray to runoff. 5) Do not apply if rainfall is expected within 48 hours. 6) When sprinkler irrigation is being used for frost protection, do not apply Callisto.

### CHEMIGATION

**Sprinkler Irrigation Application:** Apply Callisto herbicide at rates and timing described on this label. Check the irrigation system to insure uniform application of water to all areas. Thorough coverage of foliage is required for good control. Good agitation in the pesticide supply tank should be maintained prior to and during the entire application period. Apply by injecting the recommended rate of Callisto herbicide into the irrigation system using a metering device that will introduce a constant flow and by distributing the product to the target areas in 0.1-0.2 acre-inch of water. In general, use the least amount of water required for proper distribution and coverage. It is recommended that the product be injected into the main irrigation line ahead of a right angle turn in the line to insure adequate dispersion or mixing in the irrigation water.

Once the application is completed, flush the entire irrigation and injection system with clean water before stopping the system. In addition to the above recommendations, if application is being made during a normal irrigation set of a stationary sprinkler, the recommended rate of Callisto herbicide for the area covered should be injected into the system only during the end of the irrigation set for sufficient time to provide adequate coverage and product distribution. It is not recommended that Callisto herbicide be applied through an irrigation system connected to a public water system. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

## Use Precautions – Sprinkler Irrigation Application

- 1) Apply this product only through sprinkler irrigation systems including center pivot or solid set. Do not apply this product through any other type of irrigation system.
- 2) Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.
- 3) If you have any questions about calibration, you should contact State Extension Service Specialists, equipment manufacturers or other experts.
- 4) Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water.
- 5) A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.
- 6) The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back-flow.
- 7) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- 8) The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- 9) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 10) The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when pressure decreases to the point where pesticide distribution is adversely affected.
- 11) Systems must use a metering pump, such as a positive displacement injection pump (e.g. diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and are capable of being fitted with a system interlock.
- 12) Any alternatives to the above required safety devices must conform to the list of EPA approved alternative devices.
- 13) Do not apply when wind speed favors drift beyond the area intended for treatment or nonuniform distribution of treated water.

Callisto® is a trademark of a Syngenta Group Company

24(c) registrant:  
Syngenta Crop Protection, Inc.  
P.O. Box 18300  
Greensboro, NC 27419-8300

ME1131XXXAA0309

GROUP 27 HERBICIDE

PULL HERE TO OPEN ►



# Callisto®

## Herbicide

*A Postemergence and Preemergence Herbicide for Control of Annual Broadleaf Weeds in Field Corn, Production Seed Field Corn, Field Corn Grown for Silage, Yellow Popcorn, Sweet Corn, and Other Listed Crops*

Active Ingredient:

Mesotrione: (CAS No. 104206-82-8) ..... 40.0%

Other Ingredients: ..... 60.0%

Total: ..... 100.0%

Contains 4 lbs. of active ingredient mesotrione per gallon.

**KEEP OUT OF REACH OF CHILDREN.**

**CAUTION**

See additional precautionary statements and directions for use inside booklet.

EPA Reg. No. 100-1131 EPA Est. 100-NE-001

**SCP 1131A-L1H 0308**

**258939**

 **Callisto Plant Technology®**

**1 gallon**

Net Contents

**syngenta®**

<b>FIRST AID</b>	
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>If swallowed</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
<b>HOTLINE NUMBER</b> For 24-Hour Medical Emergency Assistance (Human or Animal), or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident) Call <b>1-800-888-8372</b>	

**PRECAUTIONARY STATEMENTS**

**Hazards to Humans and Domestic Animals**

**CAUTION**

Harmful if absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin, eyes, or clothing.

*continued...*

## **PRECAUTIONARY STATEMENTS (*continued*)**

### **Personal Protective Equipment (PPE)**

Some materials that are chemical resistant to this product are listed below. If you want more options, follow the instructions for Category A on an EPA chemical resistance category selection chart.

#### **Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves - Category A (e.g. barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinyl chloride (PVC), or viton)

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

### **Engineering Control Statements**

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.

### **User Safety Recommendations**

#### **Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### **Environmental Hazards**

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

### **Surface Water Advisory**

This product may contaminate water through drift of spray in wind. This product has a high potential for runoff for several weeks after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential for contamination of water from runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours. Sound erosion control practices will reduce this product's contribution to surface water contamination.

## Physical and Chemical Hazards

Do not use or store near heat or open flame.

## 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, Inc. 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.

## DIRECTIONS FOR USE

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

Callisto should be used only in accordance with recommendations on this label or in separately published Syngenta supplemental labeling recommendations 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.

### 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 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.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Shoes plus socks
- Chemical-resistant gloves – Category A (e.g., barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinyl chloride (PVC), or viton)

## GENERAL INFORMATION

Callisto is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn, production seed field corn, field corn grown for silage, 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. If an activating rain (0.25 inches) is not received within 7-10 days after a preemergence application, 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 is not effective for the control of most grass weeds. Preemergence grass herbicides or postemergence grass herbicides can be tank mixed with Callisto to provide broad spectrum weed control in corn (see appropriate section of label for this information). Callisto can be applied postemergence following a preemergence grass herbicide application. Callisto can also be used in combination with a burndown herbicide, prior to planting, to provide added burndown and residual weed control in field corn, production seed field corn, field corn grown for silage, yellow popcorn, and sweet corn.

## WEEDS CONTROLLED

**Table 1. Weeds Controlled with Postemergence Applications of Callisto**

Common Name	Scientific Name	3.0 fl. oz./A + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS
		Apply to Weeds <5 inches Tall		Apply to Weeds 5-10 inches Tall
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C	C
Amaranth, Powell	<i>Amaranthus powellii</i>	C	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C	C
Atriplex	<i>Chenopodium orach</i>	C	C	C
Broadleaf signalgrass	<i>Bracharia platphylla</i>	C <sup>1</sup>	C <sup>1</sup>	PC
Buckwheat, wild	<i>Polygonum convolvulus</i>	PC	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C	C
Burcucumber	<i>Sicyos angulatus</i>	PC	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C	C
Carrot, wild	<i>Daucus carota</i>	C	C	C
Chickweed, common	<i>Stellaria media</i>	C	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	C	C	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C <sup>1</sup>	C <sup>1</sup>	PC
Dandelion	<i>Taraxacum officinale</i>	NC	PC	PC
Dock, curly	<i>Rumex crispus</i>	PC	PC	PC

Common Name	Scientific Name	3.0 fl. oz./A + COC + UAN or AMS		
		3.0 fl. oz./A + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS
		Apply to Weeds <5 inches Tall	Apply to Weeds 5-10 inches Tall	
Galinsoga	<i>Galinsoga parviflora</i>	C	C	C
Hemp	<i>Cannabis sativa</i>	C	C	C
Horse nettle	<i>Solanum carolinense</i>	C	C	C
Horseweed/Marestail	<i>Conyza canadensis</i>	PC	C	PC
Jimsonweed	<i>Datura stramonium</i>	C	C	C
Knotweed, prostrate	<i>Polygonum aviculare</i>	PC	PC	PC
Kochia	<i>Kochia scoparia</i>	PC <sup>1</sup>	C <sup>2</sup>	PC
Lambsquarters, common	<i>Chenopodium album</i>	C	C	C
Mallow, Venice	<i>Hibiscus trionum</i>	NC	C	PC
Morningglory, entireleaf; ivyleaf	<i>Ipomoea hederacea</i>	PC	C	PC
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C	PC
Mustard, wild	<i>Brassica kaber</i>	C	C	C
Nightshade, black	<i>Solanum nigrum</i>	C	C	C
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C	C

continued...

**Table 1. Weeds Controlled with Postemergence Applications of Callisto  
(continued)**

Common Name	Scientific Name	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS		
		3.0 fl. oz./A + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS
		Apply to Weeds <5 inches Tall		Apply to Weeds 5-10 inches Tall
Nutsedge, yellow	<i>Cyperus esculentus</i>	PC	PC	PC
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C	C
Pokeweed, common	<i>Phytolacca americana</i>	PC	PC	PC
Potatoes, volunteer	<i>Solanum</i> spp.	C	C	C
Pusley, Florida	<i>Richardia scabra</i>	C <sup>1</sup>	C <sup>1</sup>	PC
Ragweed, common	<i>Ambrosia artemisiifolia</i>	PC	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	C	C	C
Sesbania, hemp	<i>Sesbania exaltata</i>	C	C	C
Sida, prickly (teaweed)	<i>Sida spinosa</i>	NC	C <sup>1</sup>	PC
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C	C	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C	C	C

Common Name	Scientific Name	3.0 fl. oz./A + COC + UAN or AMS		
		3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1/2 pt. (0.25 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	Apply to Weeds <5 inches Tall
				Apply to Weeds 5-10 inches Tall
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	C	C	C
Sunflower, common	<i>Helianthus annuus</i>	C	C	C
Thistle, Canada	<i>Cirsium arvense</i>	NC	C	PC
Velvetleaf	<i>Abutilon theophrasti</i>	C	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C	C

<sup>1</sup> Apply before weed exceeds 2 inches in height.

<sup>2</sup> For control add atrazine at 1 pt. (0.5 lb.) per acre.

C = Control

PC = Partial Control

NC = No Control

**Table 2. Weeds Controlled With Preemergence Applications of Callisto**

Common Name	Scientific Name	6.0-7.7 fl. oz./A When Used Alone or Applied With a Preemergence Grass Herbicide	Controlled by 5.0-6.0 fl. oz./A Used With an Atrazine Premix
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C
Amaranth, Powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Broadleaf signalgrass	<i>Bracharia platyphylla</i>	C <sup>1</sup>	C
Buffalobur	<i>Solanum rostratum</i>	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C
Chickweed, common	<i>Stellaria media</i>	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	PC	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C <sup>1</sup>	C
Galinsoga	<i>Galinsoga parviflora</i>	C	C
Jimsonweed	<i>Datura stramonium</i>	C	C
Kochia	<i>Kochia scoparia</i>	PC	C
Lambsquarters, common	<i>Chenopodium album</i>	C	C
Morningglory, entireleaf; ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C

Common Name	Scientific Name	6.0-7.7 fl. oz./A When Used Alone or Applied With a Preemergence Grass Herbicide	Controlled by 5.0-6.0 fl. oz./A Used With an Atrazine Premix
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C
Ragweed, common	<i>Ambrosia artemisiifolia</i>	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	PC	C
Smartweed, ladythumb	<i>Polygonum persicaria</i>	C	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C	C
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	C	C
Sunflower, common	<i>Helianthus annuus</i>	C	C
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C

C = Control      PC = Partial Control      C1 = Partial Control When Callisto is Applied Alone

## ROTATIONAL CROPS

Corn (all types) may be replanted immediately. Small grains and sugarcane may be planted 120 days after application. Soybeans, sorghum, cotton, peanuts, potatoes, sunflowers, canola, tobacco, flax, grasses grown for seed (Kentucky bluegrass, perennial ryegrass, and tall fescue), and alfalfa can be planted back the following season but not less than 10 months after the last Callisto application. Sugar beets, peas, dry beans, snap beans, cucurbits, red clover, and all other rotational crops may be replanted 18 months after application of Callisto. Planting unspecified rotational crops, or those rotational crops that are specified at shorter than recommended intervals may result in injury to the rotational crop.

## USE PRECAUTIONS

Callisto can be used preemergence (alone or with listed tank mix herbicides) and/or post-emergence (alone or with listed tank mix herbicides) in field corn, production seed field corn, field corn grown for silage, yellow popcorn, and sweet corn. Do not apply to white popcorn or ornamental (Indian) corn.

Avoid drift onto adjacent crops.

Severe corn injury may occur if Callisto is applied postemergence to corn crops that were treated with Counter® or Lorsban®, which may result in corn crop yield loss.

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

Severe corn injury may occur if any organophosphate or carbamate insecticide is applied foliar postemergence within 7 days before or 7 days after Callisto application, which may result in corn crop yield loss.

Do not add the adjuvants UAN or AMS when making postemergence applications to yellow popcorn or sweet corn, or severe crop injury may occur. Special adjuvant restrictions must be followed for postemergence applications of Callisto to yellow popcorn and sweet corn (see the **Adjuvant** section of this label).

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

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 is made following label directions when weeds are actively growing.

**Do not** apply this product through any type of irrigation system.

**Do not** apply with suspension fertilizers as the carrier.

**Do not** apply Callisto 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.

Callisto may be applied with pyrethroid type insecticides like Warrior®.

## **RESISTANCE MANAGEMENT**

Callisto is a **Group 27 Herbicide** (contains the active ingredient mesotrione).

Naturally occurring biotypes of certain broadleaf weed species with resistance to triazines or ALS inhibiting herbicides are known to exist. However, no known resistance to Callisto exists, and there are no known instances of cross resistance between Callisto (HPPD inhibitor) and other classes of herbicides, or modes of action. Performance of Callisto is not affected by the presence of biotypes resistant to triazines or ALS inhibiting herbicides.

To help prevent the development of resistance to Callisto in corn, do not apply Callisto after mesotrione containing preemergence herbicides have been applied, i.e. Lumax® or Camix®. No more than 0.24 lb. of mesotrione active ingredient should be applied per acre per year (equivalent of 7.7 fl. oz. per acre per year of Callisto). 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 should be applied at full label rates to help prevent selection for, or population shifts toward, marginally tolerant weed species and/or species biotypes.

## **INTEGRATED PEST (WEED) MANAGEMENT**

Callisto should be integrated into an overall weed and pest management strategy whenever the use of a herbicide is required. Practices known to reduce weed development (tillage, crop competition) and herbicide use (weed scouting, proper application timing, banding) should be followed wherever possible. Consult local agricultural and weed authorities for additional IPM strategies established for your area.

## **SPRAY DRIFT**

Do not apply when weather conditions may cause drift to nontarget areas. Drift may result in injury to adjacent crops and vegetation. To avoid spray drift, **DO NOT** apply when wind speed is greater than 10 mph or during periods of temperature inversions. Use of larger droplet sizes will also reduce spray drift.

**AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.**

The interaction of equipment and weather related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making a decision.

### **Information on Droplet Size**

The most effective way to reduce spray drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly or under unfavorable environmental conditions.

### **Controlling Droplet Size**

- Volume – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure – Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher rate nozzles instead of increasing pressure.
- Number of Nozzles – Use the minimum number of nozzles that provide uniform coverage.

### **Sensitive Areas**

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

## **APPLICATION PROCEDURES**

### **POSTEMERGENCE**

For best results, apply Callisto to actively growing weeds. For a list of weeds controlled see Table 1. Susceptible weeds which emerge soon after application of Callisto may be controlled after they absorb the herbicide from the soil. Callisto will not control most grass weeds.

### **Ground Spray Equipment**

Spray nozzles should be uniformly spaced, the same size and type, and should 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 should be based on the height of the crop – at least 15 inches above the crop canopy.

Apply in a spray volume of 10-30 gals./A. 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 gals.

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.

## **ADJUVANTS**

### **Postemergence Applications to Field Corn, Production Seed Field Corn, and Field Corn Grown for Silage**

For postemergence applications made after the crop has emerged, add crop oil concentrate (COC) to the spray solution at rate of 1.0 gal./100 gals. of water (1.0% v/v). The use of a non-ionic surfactant (NIS) at 1 qt./100 gallons of water (0.25%) 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 may cause severe crop injury to occur. MSO adjuvants are not recommended unless directed for a specific tank mix under the CALLISTO COMBINATIONS – POSTEMERGENCE section of this label, or unless permitted by a supplemental Callisto label.** In addition, 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 lbs./100 gals. of spray solution, except if precluded for a specific tank mix under **CALLISTO COMBINATIONS – POSTEMERGENCE** section of this label, or unless precluded by a supplemental Callisto label.

### **Postemergence Applications to Sweet Corn and Yellow Popcorn**

**Do not add UAN or AMS when making postemergence applications of Callisto 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. Because the adjuvant benefits of UAN or AMS are not available in yellow popcorn or sweet corn, weeds less than five inches should be targeted, and the addition of atrazine is recommended wherever rotational or local atrazine restrictions will allow, in order to achieve the level of weed control that is listed for Callisto plus COC plus UAN or AMS (third column) in Table 1.

## **Preemergence Applications for Field Corn, Production Seed Field Corn, Field Corn Grown for Silage, Yellow Popcorn, and Sweet Corn**

For Callisto 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. If Callisto is being tank mixed with another registered herbicide in this situation, refer to the tank mix partner label for adjuvant precautions and restrictions.

### **PREEMERGENCE**

#### **Ground Spray Equipment**

Spray nozzles should be uniformly spaced, the same size and type, and should 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 10-80 gals./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.

## **SPRAY EQUIPMENT**

### **Cleaning Equipment After Callisto Application**

Special attention must be given to cleaning equipment before spraying a crop other than corn. 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 gals. 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.

## MIXING PROCEDURES

Refer to the **Crop Use Directions** section of this label for recommended tank mixes.

Always refer to labels of other pesticide products for mixing directions and precautions which may differ from those outlined here. Use in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded. This product cannot be mixed with any product containing a label prohibition against such mixing. Do not tank mix Callisto with any other insecticide, fungicide, fertilizer solution, or adjuvant not recommended on the label without testing compatibility, as poor mixing may result. It is recommended that the compatibility of any tank mix combination be tested on a small scale such as a jar test before actual tank mixing.

Follow the mixing instructions for adding Callisto to the spray tank:

1. Only use sprayers in good running condition with good agitation. Ensure the sprayer is cleaned according to instructions on label of the product used prior to Callisto. For post-emergence applications, use only clean water for the spray solution. Ensure that all in-line strainer and nozzle screens in the sprayer are 50-mesh or coarser. Screens finer than 50-mesh should not be used.
2. Liquid fertilizer (excluding suspension fertilizers) may be used as the carrier for preemergence applications.
3. Begin to fill sprayer tank or premix tank with clean water and engage agitator. Agitation must be continued throughout the entire mixing and spraying procedure.
4. When the sprayer or premix tank is half full of water, add Callisto slowly and agitate until completely dispersed. Wait at least 1 minute after the last of the Callisto has been added to the tank to allow for complete dispersion. A longer agitation period may be required to disperse Callisto when using cold water from sources such as deep drilled wells.
5. If tank mixing, add the tank mix product next.
6. Finally, add adjuvant and UAN or AMS, if needed, and then continue to fill tank to desired level with water.

## CROP USE DIRECTIONS

Callisto may be used preemergence or postemergence on field corn, production seed field corn, field corn grown for silage, yellow popcorn, sweet corn, and other listed crops. Refer to seed company recommendations for use on field corn inbred lines. Special adjuvant restrictions must be followed for postemergence applications of Callisto in yellow popcorn or sweet corn (see the **Adjuvant** section of this label). Do not apply Callisto to white popcorn or ornamental (Indian) corn.

Postemergence applications (after crop emergence) of Callisto may cause crop bleaching in some yellow popcorn and sweet corn hybrids. Crop bleaching is typically transitory and has no effect on final yield or quality. However, herbicide sensitivity in yellow popcorn and sweet corn varies widely, and all yellow popcorn and sweet corn hybrids have not been tested. Contact your popcorn or sweet corn company Fieldman or University Specialist about hybrid recommendations before making a postemergence application of Callisto to yellow popcorn or sweet corn. Do not include nitrogen based adjuvants (UAN or AMS) when making post-emergence applications of Callisto to yellow popcorn or sweet corn.

Temporary crop response (transient bleaching) from postemergence applications to field corn may occur under extreme weather conditions or when the crop is suffering from stress. Field corn quickly outgrows these effects and develops normally.

Do not apply more than a total of 7.7 fl. oz. (0.24 lb. mesotrione active ingredient) of Callisto per acre per season. Do not apply Callisto to ground that has been treated with Lexar®, Lumax, or Camix in the same season. Do not make more than 2 applications of Callisto per season. Do not exceed 3.0 fl. oz. (0.094 lb. a.i./A) in a single postemergence application. Do not make the second application of Callisto within 14 days of the first application.

Apply Callisto for the control of broadleaf and grass weeds listed in Tables 1 and 2. Corn may be treated up to 30 inches tall or up to the 8-leaf stage of corn growth. Do not feed or harvest forage, grain, or stover within 45 days after application.

### **FIELD CORN, PRODUCTION SEED FIELD CORN, FIELD CORN GROWN FOR SILAGE, YELLOW POPCORN, AND SWEET CORN**

#### **CALLISTO USED ALONE – POSTEMERGENCE RATES**

Apply Callisto at 3.0 fl. oz./A per application. Always add an appropriate adjuvant to the spray tank (see the **Adjuvant** section under **APPLICATION PROCEDURES** of this label).

For best results, apply Callisto to actively growing weeds. For a list of weeds controlled see Table 1. Susceptible weeds which emerge soon after application of Callisto may be controlled after they absorb the herbicide from the soil. Callisto will not control most grass weeds.

Two postemergence applications of Callisto may be made with the following restrictions.

- Only one postemergence application may be made if Callisto has been applied preemergence. Do not exceed a total of two applications per season. Do not exceed a total of 7.7 fl. oz./A (0.24 lb. a.i./A) of Callisto per season.
- Do not make the second application within 14 days of the first application.
- Application of Callisto at rates less than 3.0 fl. oz./A (0.094 lb. a.i./A) postemergence may result in incomplete weed control and loss of residual control.
- Do not exceed a total of 6.0 fl. oz./A (0.19 lb. a.i./A) for the two postemergence applications.
- Do not apply Callisto to ground that has already been treated with Lexar, Lumax or Camix in the same season.
- Corn may be treated up to 30 inches tall or up to the 8-leaf stage of corn growth. Do not harvest forage, grain, or stover within 45 days after application.

#### **CALLISTO USED ALONE – PREEMERGENCE RATES**

Apply Callisto alone at 6.0-7.7 fl. oz./A (0.188-0.24 lb. a.i./A) by ground sprayers in a spray volume of 10-30 gals. of water (up to 80 gals. if applied with liquid fertilizers) per acre for broadleaf weed control. For a list of weeds controlled, refer to Table 2. Callisto may be tank mixed with preemergence grass herbicides for grass control. Refer to the tank mix section for a list of partners.

#### **CALLISTO COMBINATIONS – POSTEMERGENCE**

Application of Callisto at rates less than 0.094 lb. a.i./A (3.0 fl. oz.) postemergence may result in incomplete weed control and loss of residual control. Syngenta advises against the use of rates less than 0.094 lbs. a.i./A (3.0 fl. oz.) postemergence with all tank mix partners. Always add an appropriate adjuvant to the spray tank (see the **Adjuvant** section under **APPLICATION PROCEDURES** of this label). Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled. Not all of the tank mix pesticides listed are registered for field corn, yellow popcorn, or sweet corn.

#### **Tank Mixed with AAtrex® 4L or AAtrex® Nine-O® - Postemergence (see Table 1)**

In these tank mixes, apply Callisto at 3.0 fl. oz./A. If weeds are more than 5 inches tall, or for improved control of common ragweed, Florida pusley, kochia, large crabgrass, morningglory spp., palmer amaranth, prickly sida, prostrate knotweed, Venice mallow, and wild buckwheat, or for faster weed control, add AAtrex 4L or AAtrex Nine-O at a minimum rate of 0.5-1.0 pt./A (or equivalent rate of other formulations of atrazine). **Do not use any atrazine formulation if corn is greater than 12 inches tall.**

Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

### **Tank Mixed with Liberty® and Liberty® ATZ – Postemergence**

Callisto at a rate of 3.0 fl. oz./A (see Table 1) can be tank mixed with Liberty or Liberty ATZ. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Use tank mixes with Liberty only on seed designated as LibertyLink® or warranted by Bayer CropScience as being tolerant to Liberty Herbicide. Failure to follow these directions will lead to severe crop injury. Follow all other directions for use, including adjuvants, as specified on the Liberty product label. However, do not use crop oil concentrate (COC) as an adjuvant when tank mixing Callisto with Liberty or Liberty ATZ, or severe crop injury may occur.

### **Callisto Tank Mixed with Glyphosate – Postemergence**

Callisto may be applied postemergence at a rate of 3 fl. oz./A in tank mixture with a solo glyphosate product (such as Touchdown® or Roundup® brands) that is registered for use over-the-top in glyphosate tolerant (such as Agrisure™ GT Corn or Roundup Ready®) field corn. See Table 1 for the weeds controlled by Callisto postemergence.

Always add spray-grade ammonium sulfate (AMS) at 8.5-17.0 lb./100 gallons to the tank mixture of Callisto plus solo glyphosate. When using liquid AMS products, use a rate that delivers an AMS equivalent of 8.5-17.0 lb./100 gallons of water.

If the glyphosate product has a built-in adjuvant system (i.e. the product label does not recommend additional adjuvant), add only AMS to the tank mixture. If the glyphosate product label calls for an adjuvant in addition to AMS, add a non-ionic surfactant (NIS) at 0.25-0.5% v/v (1-2 quarts/100 gallons).

*Precautions: 1) Do not add urea ammonium nitrate (UAN), crop oil concentrate (COC), or methylated seed oil (MSO) type adjuvants to the tank mixture of Callisto plus glyphosate or crop injury may occur. 2) Application of the tank mixture of Callisto plus glyphosate to a corn hybrid that is not glyphosate tolerant will result in crop death. 3) Read and follow the Roundup Ready Gene or Glyphosate Tolerant Gene requirements on the glyphosate product label.*

### **Tank Mixed with Lightning® – Postemergence**

Callisto at a rate of 3.0 fl. oz./A (see Table 1) can be tank mixed with Lightning Herbicide. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Use Callisto tank mixes with Lightning only on seed designated as CLEARFIELD™ corn, or warranted by BASF as being tolerant to Lightning Herbicide. Failure to follow these directions will lead to severe crop injury. Follow all other directions for use as specified on the Lightning product label. However, do not use a Methylated Seed Oil (MSO), or an MSO blend, as an adjuvant when tank mixing Callisto with Lightning, or severe crop injury may result.

#### **Tank Mixed with Basagran® – Postemergence**

Callisto at a rate of 3.0 fl. oz./A (see Table 1) can be tank mixed with Basagran. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

#### **Tank Mixed with Accent®, Basis®, Steadfast®, Steadfast® ATZ, or Stout™ – Postemergence**

Callisto at a rate of 3.0 fl. oz./A can be tank mixed with Accent, Basis, Steadfast, Steadfast ATZ, or Stout. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

#### **Tank Mixed with Buctril® or Moxy™ (2 lb./gallon) – Postemergence**

To aid in the control of certain broadleaf weeds (e.g. ragweeds), Callisto at a rate of 3.0 fl. oz./A can be tank mixed with Buctril or Moxy at a rate up to 6 fl. oz./A. Buctril or Moxy can be used in place of atrazine in corn that is greater than 12 inches tall, which is the corn height limit for the use of atrazine. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

#### **Tank Mixed with Dual Magnum® or Dual II Magnum® – Postemergence**

Callisto at a rate of 3.0 fl. oz./A can be tank mixed with Dual Magnum or Dual II Magnum, but special attention must be paid to adjuvant selection and/or application method. As EC formulations, Dual Magnum and Dual II Magnum can act like an adjuvant in certain combinations and thus increase the risk of crop injury. If either of these tank mixtures are used, the user should either leave the crop oil concentrate (COC) out of the adjuvant mix or apply as a post-directed spray to minimize contact with crop foliage. In either case, the control of emerged weeds may be reduced somewhat due to less than optimum adjuvant effect or weed coverage and there is still a risk of temporary crop injury in the form of leaf burn with these mixtures. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

### **Tank Mixed with Bicep II Magnum® or Bicep Lite II Magnum® – Postemergence**

Callisto at a rate of 3.0 fl. oz./A can be tank mixed with Bicep II Magnum or Bicep Lite II Magnum, but special attention must be paid to adjuvant selection and/or application method. If either of these tank mixtures are used, the user should either leave the nitrogen based adjuvant (UAN or AMS) out of the mix or apply as a post-directed spray to minimize contact with crop foliage. There is still a risk of temporary crop injury in the form of leaf burn with these mixtures. To further reduce the risk of crop injury, the user may also leave out the crop oil concentrate (COC), or replace it with a nonionic surfactant (NIS). In all cases, the control of emerged weeds may be reduced somewhat due to less than optimum adjuvant effect or weed coverage. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled. Do not apply either of these tank mixtures to corn greater than 12 inches tall.

### **CALLISTO COMBINATIONS – PREEMERGENCE**

#### **Tank Mixed with Axiom®, Define™ DF, Degree™, Doubleplay®, Dual II Magnum, Dual Magnum, Frontier®, Harness®, Outlook™, Surpass® EC, Prowl®, or Topnotch® – Preemergence**

Callisto at a rate of 6.0-7.7 fl. oz./A (see Table 2) can be tank mixed with Axiom, Define DF, Degree, Doubleplay, Dual II Magnum, Dual Magnum, Frontier, Harness, Outlook, Surpass EC, Prowl, or Topnotch. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

#### **Tank Mixed with AAtrex, Bicep II Magnum, Bicep Lite II Magnum, Degree Xtra™, Guardsman®, Guardsman Max®, Fultime™, Harness Xtra®, Harness Xtra® 5.6L, Keystone™ LA, or Keystone™ – Preemergence**

Callisto at a rate of 5.0-6.0 fl. oz./A (see Table 2) can be tank mixed with AAtrex, Bicep II Magnum, Bicep Lite II Magnum, Degree Xtra, Guardsman, Guardsman Max, Fultime, Harness Xtra, Keystone LA, or Keystone. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

#### **Used in Combination with Preemergence Burndown Herbicides: Tank Mixed with Expert®, Gramoxone Inteon®, Roundup Brands, Touchdown Brands, and/or 2,4-D – Preemergence**

For improved broadleaf weed control with limited residual control prior to planting corn and before corn emergence, apply Callisto at 3.0 fl.oz./A by ground sprayers in tank mixes with Gramoxone Inteon, Roundup brands, Touchdown brands, and/or 2,4-D. For greater residual control, use 6.0-7.7 oz./A of Callisto (see Table 2) with the above products. Use the adjuvant system recommended by the burndown herbicide. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

## **CROPS OTHER THAN FIELD CORN, PRODUCTION SEED FIELD CORN, FIELD CORN GROWN FOR SILAGE, YELLOW POPCORN AND SWEET CORN**

For crops other than field corn, production seed field corn, field corn grown for silage, yellow popcorn and sweet corn, specific directions for the use of Callisto in these crops are provided below. These crops can have application rates, timings and methods, and/or precautions and restrictions that are very different than those for the use of Callisto in registered corn crops. Be sure to read and follow these specific crop instructions before making an application of Callisto to these crops.

### **CRANBERRY**

Callisto may be applied to bearing or non-bearing cranberry beds for control or suppression of bog St. John's wort (*Hypericum boreala*), rushes (*Juncus canadensis*, *J. effuses*, *J. bufonlus*, *J. tenuis*), sedges spp. (*Carex* spp.), yellow loosestrife (*Lysimachia terrestris*) and silverleaf (*Potentilla pacifica*) in addition to the weeds listed in Tables 1 and 2. Callisto may be applied in cranberries at a rate up to 8 fl. oz./A. Apply no more than two applications per crop per year and not more than 16 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. The use of a crop oil concentrate (COC) type adjuvant at 1% v/v is recommended, but avoid using COC adjuvants that are injurious to cranberry leaves. In non-bearing cranberries, make the Callisto application(s) after the bud break stage, but not less than 45 days before flooding in fall or winter. In bearing cranberries, make the Callisto application(s) after the bud break stage, but not less than 45 days prior to flooding or harvest.

Wait at least 18 months after the last Callisto application in cranberries before replanting cranberries or before rotating to another crop.

Additional Restrictions: 1) Do not apply directly to water or areas where surface water is present. 2) Do not contaminate water when disposing of equipment wash water or rinsate. 3) Do not apply within 10 feet of surface water or where there is no buffer strip of vines between the treated area and any surface water. 4) Do not spray to runoff. 5) Do not apply through any type of irrigation system. 6) Do not apply if rainfall or sprinkler irrigation for frost protection is expected within 48 hours.

### **BLUEBERRY AND LINGONBERRY**

Callisto may be applied as a pre-bloom post-directed spray in high bush blueberry and lingonberry. For a list of weeds controlled see Tables 1 and 2. Callisto may be applied 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, but no more than two applications per crop per year are allowed and not more than 6 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. 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. Do not apply Callisto to blueberries and lingonberries after the onset of the bloom stage or illegal residues may occur.

In low bush blueberries, Callisto may only be applied in the non-bearing year. This application may be a broadcast application. Up to 6 fl. oz./A of Callisto 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. No more than two applications per year are allowed and not more than 6 fl. oz./A in total per year. If two applications are made, they must be made no closer than 14 days apart. The use of a crop oil concentrate (COC) type adjuvant at 1% v/v is recommended.

Wait at least 18 months after the last Callisto application in blueberries and lingonberries before replanting blueberries and lingonberries or before rotating to another crop.

### **FLAX**

Callisto may be applied preemergence in flax, i.e. after planting but before crop emergence, at a rate up to 6 fl. oz./A. For a list of weeds controlled see Tables 1 and 2. Do not apply more than one application, and not more than 6 fl. oz./A, per crop or per year in flax. If weeds are emerged at the time of application, the use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended. In addition, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5 % (v/v) or AMS at the rate of 8.5 lb./100 gals. of spray solution may be added to improve the burndown of existing weeds. Applications of Callisto to emerged flax can result in severe crop injury.

Rotational crop options following Callisto use in flax are the same as those for corn, which can be found under the ROTATIONAL CROPS heading within the corn section of this label.

### **PEARL MILLET**

Callisto may be applied preemergence in pearl millet, i.e. after planting but before crop emergence, at a rate up to 6 fl. oz./A. For a list of weeds controlled see Table 2. Do not apply more than one application, and not more than 6 fl. oz./A per crop or per year in pearl millet. If weeds are emerged at the time of application, the use of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v is recommended. In addition, a spray grade UAN (e.g., 28-0-0) at the rate of 2.5 % (v/v) or AMS at the rate of 8.5 lb./100 gals. of spray solution may be added to improve the burndown of existing weeds. Applications of Callisto to emerged pearl millet can result in severe crop injury.

Rotational crop options following Callisto use in pearl millet are the same as those for corn, which can be found under the ROTATIONAL CROPS heading within the corn section of this label.

### **ASPARAGUS**

Callisto can be applied broadcast or banded at a rate of 3.0-7.7 fl. oz./A to asparagus as a spring application prior to spear emergence, as a post-harvest application (after final harvest), or both.

Use the 3.0 fl. oz./A rate for postemergence control or partial control of the emerged weeds listed in Table 1. Use the 6.0-7.7 fl. oz./A rate for preemergence control or partial control of the weeds listed in Table 2. For banded applications, the application must be made to account for band width, i.e. to deliver 3.0-7.7 fl. oz. per treated acre. For the best preemergence weed control with spring applications, Callisto should be applied after fern mowing, disking or other tillage operation but prior to asparagus spear emergence.

When making post-harvest applications, the rate applied preemergence in the spring must be taken into account so as not to exceed the 7.7 fl. oz./A/year rate limit. Post-harvest applications should be made in a way that minimizes contact with any standing asparagus spears or ferns and maximizes contact with the weeds and/or soil, e.g. by using a directed or semi-directed type application, or crop injury may occur. With post-harvest applications, the use of an adjuvant will increase the risk of crop injury.

If weeds are emerged at the time of the Callisto application, the addition of a crop oil concentrate (COC) type adjuvant at the rate of 1% v/v or a nonionic surfactant (NIS) at the rate of 0.25% v/v is recommended. In addition to COC or NIS, a spray grade UAN (e.g. 28-0-0) at the rate of 2.5% v/v or ammonium sulfate (AMS) at the rate of 8.5 lb./100 gallons of spray solution may be added for improved burndown of emerged weeds. If weeds have not yet emerged, no adjuvant is recommended.

#### **Restrictions:**

1. Do not apply more than 7.7 fl. oz./A of Callisto per year.
2. Do not make more than two Callisto applications per year.

#### **BLUEGRASS, PERENNIAL RYEGRASS AND TALL FESCUE GROWN FOR SEED**

Callisto can be applied to bluegrass, perennial ryegrass, or tall fescue which is grown for seed. Callisto can be applied as a preemergence application to bare soil (new seeding) or as a postemergence application to an emerged grass crop, but not both.

**Preemergence Application:** Apply Callisto as a broadcast, surface spray at a rate of 6.0 fl. oz./A to a newly seeded crop. The Callisto application should be made prior to crop and weed emergence. Rainfall or irrigation as the newly seeded grass crop emerges from the soil may increase the risk of injury from Callisto. Grass crop injury symptoms include temporary bleaching of newly emerged leaves, or in extreme conditions, stunting. For a list of preemergence weeds controlled or partially controlled see Table 2.

**Postemergence Application:** Apply Callisto as a broadcast postemergence spray at a rate of 3.0–6.0 fl. oz./A to emerged bluegrass, perennial ryegrass or tall fescue grown for seed. Use the 3.0 fl. oz./A rate for postemergence control or partial control of the weeds listed in Table 1. Use the 6.0 fl. oz./A rate for postemergence weed control plus extended residual weed control (see Table 2). The addition of a crop oil concentrate type adjuvant at 1% v/v or a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v is recommended. Postemergence applications of Callisto may result in temporary bleaching of the grass crop.

In addition to COC or NIS, a spray grade UAN (e.g. 28-0-0) at the rate of 2.5% v/v or ammonium sulfate (AMS) at the rate of 8.5 lb./100 gallons of spray solution may also be added for improved control of emerged weeds. The addition of UAN or AMS will improve consistency of postemergence weed control but will also increase the risk of grass crop injury, especially at Callisto rates greater than 3.0 fl. oz./A. If grass crop injury is a concern, do not add UAN or AMS to the spray solution.

Tank mixing other pesticides with Callisto postemergence may increase the risk of crop injury. Avoid adding pesticides with emulsifiable concentrate (EC) type formulations to Callisto for applications made postemergence to the crop.

### **Restrictions:**

1. Do not harvest the grass crop for seed or straw within 60 days following the application of Callisto.
2. Do not graze or feed forage from treated areas within 14 days following harvest of seed or straw and least 74 days after application of Callisto.
3. Do not make more than one application of Callisto per year.
4. Do not apply more than 6 fl. oz./A of Callisto per year.
5. Do not apply Callisto to grasses grown for seed species not listed on this label.

### **OATS**

Callisto can be applied preemergence or postemergence (but not both) for weed control in oats.

For preemergence control or partial control of the weeds listed in Table 2, apply Callisto broadcast at a rate of 6.0 fl. oz./A prior to oat emergence. For best preemergence weed control, the Callisto application should be made prior to weed emergence.

For postemergence (after oat emergence) control or partial control of the weeds listed in Table 1, apply Callisto at a rate of 3.0 fl. oz./A. For best results, Callisto should be applied to emerged weeds that are less than 5" tall. Postemergence applications of Callisto may result in temporary injury of the oat crop. Injury symptoms may include leaf bleaching, leaf burn and in extreme conditions, stunting.

If emerged weeds are present at the time of the Callisto application, the addition of a crop oil concentrate (COC) type adjuvant at a rate of 1% v/v or a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v is recommended. In addition to COC or NIS, a spray grade UAN (e.g. 28-0-0) at the rate of 2.5% v/v or ammonium sulfate (AMS) at the rate of 8.5 lb./100 gallons of spray solution may be added for improved weed control. If emerged weeds are not present at the time of the Callisto application, no additives are recommended. If oat injury is a concern, eliminating the use of UAN or AMS will reduce the risk for postemergence crop injury. Additionally, the use of NIS instead of COC will also reduce the oat injury risk. However, weed control is also reduced if UAN or AMS is eliminated and when switching from COC to NIS.

Tank mixing other pesticides with Callisto postemergence may increase the risk of injury. Avoid adding pesticides with emulsifiable concentrate (EC) type formulations to Callisto for applications made postemergence to the crop.

#### **Restrictions:**

1. Do not graze or feed forage from treated areas within 30 days following an application of Callisto.
2. Do not harvest oats within 50 days following the application of Callisto.
3. Do not make more than one application of Callisto per year.
4. Do not apply Callisto preemergence (prior to oat emergence) at more than 6.0 fl. oz./A/year.
5. Do not apply Callisto postemergence at more than 3.0 fl. oz./A/year.
6. If the oat crop treated with Callisto is lost or destroyed, oats may be replanted immediately. If Callisto was applied to the lost oat crop, no additional Callisto can be applied to the replanted oat crop.

#### **RHUBARB**

Callisto can be applied prior to crop emergence for weed control in established rhubarb.

Apply Callisto at a rate of 6.0 fl. oz./A to dormant (prior to spring green-up) rhubarb for control or partial control of the weeds listed in Table 2. If weeds are emerged at the time of application, it is recommended that a crop oil concentrate (COC) type adjuvant at 1% v/v or a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v be added to the spray solution. Applications of Callisto to rhubarb that is not dormant may result in a temporary bleaching symptomology. Rainfall or irrigation after the Callisto application may increase the risk of injury to emerging rhubarb.

#### **Restrictions:**

1. Do not harvest rhubarb within 21 days following the application of Callisto.
2. Do not make more than one application of Callisto per year.
3. Do not apply Callisto at more than 6.0 fl. oz./A/year.

#### **GRAIN SORGHUM (KANSAS AND NEBRASKA ONLY) AND SWEET SORGHUM**

Callisto can be applied preemergence or pre-plant non-incorporated up to 21 days before planting sorghum for control or partial control of the weeds listed in Table 2.

Apply Callisto preemergence at a rate of 6.0–6.4 fl. oz./A as a broadcast non-incorporated application prior to sorghum emergence. Applying Callisto less than 7 days before sorghum planting will increase the risk of crop injury, especially if irrigation or rainfall is received following the application. Injury symptoms include temporary bleaching of newly emerging sorghum leaves. Applying Callisto more than 7 days (but not more than 21) prior to planting will reduce the risk of crop injury.

If Callisto is applied prior to planting, minimize disturbance of the herbicide treated soil barrier during the planting process in order to lessen the potential for weed emergence.

If emerged weeds are present at the time of the preemergence application, it is recommended that a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v or a crop oil concentrate (COC) type adjuvant at a rate of 1% v/v be added to the spray solution. In addition to COC or NIS, a spray grade UAN at a rate of 2.5% v/v or ammonium sulfate (AMS) at a rate of 8.5 lb./100 gallons of spray solution can be added to the spray solution.

### **Restrictions:**

1. Do not apply more than 6.4 oz./A of Callisto per year.
2. Do not apply Callisto to emerged sorghum or severe crop injury may occur.
3. Do not use Callisto in the production of forage sorghum, sudangrass, sorghum-sudangrass hybrids, or dual purpose sorghum.
4. Do not apply Callisto to sorghum that is grown on coarse textured soils (e.g. sandy loam, loamy sand, sand).

### **SUGARCANE**

Callisto can be applied preemergence, postemergence over-the-top or postemergence directed for weed control in sugarcane.

**Preemergence Applications:** Apply Callisto for preemergence weed control at 6.0–7.7 fl. oz./A after the planting of plant-cane or after harvest of ratoon-cane. For a list of weeds controlled preemergence, refer to Table 2. If some weeds are already emerged at the time of application, add a crop oil concentrate (COC) type adjuvant at a rate of 1% v/v or a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v to the spray solution. In addition to COC or NIS, a spray grade UAN at a rate of 2.5% v/v or ammonium sulfate (AMS) at a rate of 8.5 lb./100 gallons of spray solution can be added to the spray solution. For improved preemergence weed control, AAtrex or Evik® can be tank mixed with Callisto. Refer to the tank mix partner label for specific rates and use directions.

**Postemergence Applications:** Apply Callisto postemergence at 3.0 fl. oz./A for control of the weeds listed in Table 1. Postemergence applications may be made as a post-over-the-top or as a post-directed spray to the base of the sugarcane. If a preemergence application was made earlier in the season, only one postemergence application can be made. If no preemergence application was made earlier in the season, both a post-over-the-top and a post-directed application can be made. For best results, Callisto should be applied to actively growing weeds.

For postemergence applications, it is recommended that a crop oil concentrate (COC) type adjuvant at a rate of 1% v/v or a nonionic surfactant (NIS) type adjuvant be added to the spray solution. In addition to COC or NIS, the use of a spray grade UAN (e.g. 28-0-0) at 2.5% v/v or ammonium sulfate (AMS) at a rate of 8.5 lb./100 gallons of spray solution can be added for improved control of weeds.

For additional postemergence weed control, Callisto can be tank mixed with atrazine, asulox and/or Envoke®. Refer to the tank mix product labels for specific rates and use directions.

**Restrictions:**

1. Do not apply more than 7.7 fl. oz./A of Callisto as a preemergence application.
2. Do not apply more than 3.0 fl. oz./A of Callisto in a postemergence application.
3. Do not make more than two applications of Callisto per year.
4. Do not make two Callisto applications less than 14 days apart.
5. If a preemergence application is made, do not apply more than 10.7 fl. oz./A of Callisto per year.
6. If only postemergence applications are made, do not apply more than 6 fl. oz./A of Callisto per year.
7. Do not harvest sugarcane within 114 days following a post-ever-the-top application of Callisto (114 day PHI).
8. Do not harvest sugarcane within 100 days following a post-directed application of Callisto (100 day PHI).

## **STORAGE AND DISPOSAL**

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

**Pesticide Storage**

Keep container tightly closed when not in use. Do not store near seed, fertilizers, or food-stuffs. Can be stored at temperatures as low as -20°F. 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 Disposal**

Triple rinse or equivalent. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

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This product is protected by U.S. Patent Nos. 5,006,158 and 5,698,493. Other patents pending. No license granted to prepare any tank mixtures other than those expressly provided herein.

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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, Inc.  
P. O. Box 18300  
Greensboro, North Carolina 27419-8300  
[www.syngenta-us.com](http://www.syngenta-us.com)

**SCP 1131A-L1H 0308  
258939**

GROUP 27 HERBICIDE



## Herbicide

A Postemergence and Preemergence Herbicide for Control of Annual Broadleaf Weeds in Field Corn, Production Seed Field Corn, Field Corn Grown for Silage, Yellow Popcorn, Sweet Corn, and Other Listed Crops

Active Ingredient:	
Mesotrione: (CAS No. 104206-82-8)	40.0%
Other Ingredients:	60.0%
Total:	100.0%

Contains 4 lbs. of active ingredient mesotrione per gallon.

### 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 the Directions for Use section for information about this standard.

EPA Reg. No. 100-1131  
EPA Est. 100-NE-001



**1 gallon**  
Net Contents

**KEEP OUT OF REACH OF CHILDREN.**

## CAUTION

See additional precautionary statements, pesticide storage and disposal statements, and directions for use inside booklet.

### Precautionary Statements

Hazards to Humans and Domestic Animals

#### CAUTION

Harmful if absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin, eyes, or clothing.

**Pesticide Storage:** Keep container tightly closed when not in use. Do not store near seed, fertilizers, or foodstuffs. Can be stored at temperatures as low as -20°F. Keep away from heat and flame.

### Container Disposal

Triple rinse or equivalent. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

See Callisto booklet for complete Storage and Disposal instructions.

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Manufactured for:  
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SCP 1131A-L1H 0308  
258939



# KEEP OUT OF REACH OF CHILDREN. CAUTION

BAR CODE # IS  
(01) 0 07 02941 76824  
LAST DIGIT IS CHECK DIGIT  
UCC/EAN 128

FIRST AID	
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If inhaled</b>	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li> <li>• Call a poison control center or doctor for further treatment advice.</li> </ul>
<b>If swallowed</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
<p align="center"><b>HOTLINE NUMBER</b></p> <p align="center">For 24-Hour Medical Emergency Assistance (Human or Animal), or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident) Call <b>1-800-888-8372</b></p>	

## Precautionary Statements

Hazards to Humans and Domestic Animals

### CAUTION

Harmful if absorbed through skin. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin, eyes, or clothing.

### Environmental Hazards

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

### Surface Water Advisory

This product may contaminate water through drift of spray in wind. This product has a high potential for runoff for several weeks after application. Poorly draining soils and soils with shallow water tables are more prone to produce runoff that contains this product. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential for contamination of water from runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours. Sound erosion control practices will reduce this product's contribution to surface water contamination.

### Physical and Chemical Hazards

Do not use or store near heat or open flame.

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Manufactured for:  
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P. O. Box 18300  
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**SCP 1131A-L2D 0308  
258940**

**Syngenta Crop Protection, Inc.**  
**Post Office Box 18300**  
**Greensboro, NC 27419**

**In Case of Emergency, Call**  
**1-800-888-8372**

**1. PRODUCT IDENTIFICATION**

Product Name: **CALLISTO** Product No.: A12738A  
 EPA Signal Word: Caution  
 Active Ingredient(%): Mesotrione (40.0%) CAS No.: 104206-82-8  
 Chemical Name: 2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione  
 Chemical Class: Benzoylcyclohexanedione Herbicide  
 EPA Registration Number(s): 100-1131 **Section(s) Revised: 2, 3, 8**

**2. HAZARDS IDENTIFICATION**
Health and Environmental

Causes mild eye and skin irritation. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Hazardous Decomposition Products

None known.

Physical Properties

Appearance: Beige to tan liquid  
 Odor: Faint; pleasant

Unusual Fire, Explosion and Reactivity Hazards

Flammable hydrogen gas may be formed on contact with incompatible metals. See "Conditions to Avoid", Section 10.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen
Ethylene Glycol (< 14%)	Not Established	100 mg/m <sup>3</sup> (ceiling) [aerosol]	Not Established	No
Mesotrione (40.0%)	Not Established	Not Established	10 mg/m <sup>3</sup> TWA ***	No

\*\*\* Syngenta Occupational Exposure Limit (OEL)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.  
 Syngenta Hazard Category: B

**4. FIRST AID MEASURES**

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison control center or doctor, or going for treatment.

Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment

advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

**Eye Contact:** If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

**Skin Contact:** If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

**Inhalation:** 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 Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

#### Notes to Physician

There is no specific antidote if this product is ingested.

Treat symptomatically.

#### Medical Condition Likely to be Aggravated by Exposure

None known.

## **5. FIRE FIGHTING MEASURES**

### Fire and Explosion

Flash Point (Test Method): > 200°F  
Flammable Limits (% in Air): Lower: Not Applicable Upper: Not Applicable  
Autoignition Temperature: Not Available  
Flammability: Can burn in fire, releasing toxic vapors.

### Unusual Fire, Explosion and Reactivity Hazards

Flammable hydrogen gas may be formed on contact with incompatible metals. See "Conditions to Avoid", Section 10.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

### In Case of Fire

Use dry chemical, foam or CO2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

## **6. ACCIDENTAL RELEASE MEASURES**

### In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

## **7. HANDLING AND STORAGE**

Spray solutions of this product should be mixed, stored and applied using only plastic, plastic-lined steel, stainless steel or fiberglass containers. Concentrate should not be stored in mild steel, cast iron or aluminum containers.

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.**

**FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.**

- Ingestion: Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.
- Eye Contact: Where eye contact is likely, use chemical splash goggles.
- Skin Contact: Where contact is likely, wear chemical-resistant gloves (such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride [PVC] or Viton), coveralls, socks and chemical-resistant footwear.
- Inhalation: A respirator is not normally required when handling this substance. Use effective engineering controls to comply with occupational exposure limits.

In case of emergency spills, use a NIOSH approved respirator with any N, R, P or HE filter.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: Beige to tan liquid
- Odor: Faint; pleasant
- Melting Point: Not Applicable
- Boiling Point: Not Available
- Specific Gravity/Density: 1.20 g/ml
- pH: 2.4 - 2.8 @ 68°F (20°C)

### Solubility in H<sub>2</sub>O

Mesotrione : 160mg/l @ 68°F (20°C) (99.7% pure)

### Vapor Pressure

Mesotrione : < 4.3 x 10<sup>(-8)</sup> mmHg @ 68°F (20°C)

## 10. STABILITY AND REACTIVITY

- Stability: Stable under normal use and storage conditions.
- Hazardous Polymerization: Will not occur.
- Conditions to Avoid: Concentrate should not be stored in mild steel, cast iron or aluminum containers. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass.
- Materials to Avoid: See "Conditions to Avoid", Section 10.
- Hazardous Decomposition Products: None known.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity/Irritation Studies (Finished Product)

- Ingestion:
- Oral (LD50 Rat) : > 5000 mg/kg body weight
- Dermal:
- Dermal (LD50 Rat) : > 5000 mg/kg body weight
- Inhalation:
- Inhalation (LC50 Rat) : > 5.19 mg/l air - 4 hours
- Eye Contact: Mildly Irritating (Rabbit)
- Skin Contact: Slightly Irritating (Rabbit)
- Skin Sensitization: Not a Sensitizer (Guinea Pig)

### Reproductive/Developmental Effects

Mesotrione : Not mutagenic. Not a reproductive hazard.

### Chronic/Subchronic Toxicity Studies

Mesotrione : Animal studies showed evidence of reduced bodyweight gain, increased liver and kidney weights, blood effects (polycythemia, reduced white blood cell count) and eye effects (cataract formation, keratitis).  
No known neurotoxic effects based on animal studies.

### Carcinogenicity

Mesotrione : Not carcinogenic in animal studies.

### Other Toxicity Information

None

### Toxicity of Other Components

Ethylene Glycol (< 14%)

Test results reported in Section 11 for the final product take into account any acute hazards related to the ethylene glycol in the formulation.

### Target Organs

#### Active Ingredients

Mesotrione : Eye

#### Inert Ingredients

Ethylene Glycol: Not Applicable

## **12. ECOLOGICAL INFORMATION**

### Summary of Effects

Mesotrione :  
Toxic to aquatic life.

### Ecotoxicity Effects

Mesotrione :  
Fish (Rainbow Trout) 96-hour LC50 > 114 ppm  
Green Algae 5-day EC50 1.9 ppm  
Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 840 ppm  
Bird (Bobwhite Quail) 14-day LD50 > 2000 mg/kg

### Environmental Fate

Mesotrione :  
The information presented here is for the active ingredient, mesotrione.  
Not persistent in soil. Stable in water. Moderate mobility in soil. Sinks in water (after 24 h).

## **13. DISPOSAL CONSIDERATIONS**

### Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

## **14. TRANSPORT INFORMATION**

### DOT Classification

Ground Transport - NAFTA  
Not regulated.

B/L Freight Classification

Herbicides, NOI

Comments

None.

**15. REGULATORY INFORMATION**

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard

Section 313 Toxic Chemicals: Ethylene Glycol (< 14%) (CAS No. 107-21-1)

California Proposition 65

Not Applicable

CERCLA/SARA 302 Reportable Quantity (RQ)

Report product spills > 3260 gal. (based on ethylene glycol [RQ = 5000 lbs.] content in the formulation)

RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

TSCA Status

Exempt from TSCA, subject to FIFRA

**16. OTHER INFORMATION**

NFPA Hazard Ratings

Health: 2  
Flammability: 1  
Instability: 0

HMIS Hazard Ratings

Health: 1  
Flammability: 1  
Reactivity: 0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 11/26/2000

Revision Date: 11/21/2008

Replaces: 5/3/2005

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

End of MSDS

Mesotrione on Cranberry  
Efficacy Study by Dr. Hillary Sandler, UMASS Cranberry Station

Appendix 1. Effect of various rates of mesotrione applied at a rate of 400 gal/A water (simulating chemigation) on percent cover and control of nutsedge in two commercial cranberry farms in SE Massachusetts, 2008. Site R was treated June 12 and June 27; Site S was treated June 20 and July 10. Values are the mean of 4 replicates.

SITE R Trmt	% weed cover			
	Evaluation date			
	19-Jun	2-Jul	18-Jul	12-Aug
Untreated	2.5	2.8	4.0	4.0 a
4 oz (2 appl)	2.5	3.0	3.8	1.0 b
8 oz (1 appl)	2.3	3.5	3.3	1.0 b
8 oz (2 appl)	2.8	2.8	3.8	1.0 b
p-value	NS	NS	NS	<0.001

SITE R Trmt	Injury rating			
	Evaluation date			
	19-Jun	2-Jul	18-Jul	12-Aug
Untreated	0.0	0.0 b	0.0 c	0.0 b
4 oz (2 appl)	0.0	2.4 a	2.4 b	3.8 a
8 oz (1 appl)	0.0	2.3 a	2.8 a	4.0 a
8 oz (2 appl)	0.0	2.4 a	2.0 b	3.5 a
	NS	<0.001	<0.001	<0.001

SITE S Trmt	% weed cover			
	Evaluation date			
	27-Jun	10-Jul	18-Jul	7-Aug
Untreated	2.8	4.3 a	5.0 a	5.0 a
4 oz (2 appl)	2.5	3.0 ab	2.8 b	2.0 b
8 oz (1 appl)	2.3	2.5 b	3.5 b	3.0 b
8 oz (2 appl)	2.8	2.5 b	2.5 b	1.5 b
	NS	0.029	<0.015	<0.003

SITE S Trmt	Injury rating			
	Evaluation date			
	27-Jun	10-Jul	18-Jul	7-Aug
Untreated	0.0 b	0.0 b	0.0 c	0.0 b
4 oz (2 appl)	1.1 a	2.8 a	2.9 ab	4.3 a
8 oz (1 appl)	0.9 a	2.7 a	3.3 a	4.3 a
8 oz (2 appl)	1.1 a	2.8 a	2.7 b	4.5 a
	<0.001	<0.001	<0.005	<0.001

Means followed by similar letters are not significantly different according to adjusted Tukey HSD test, P=0.05

% cover rated as: 1 = <10%; 2 = 11-25%; 3 = 26-50%; 4 = 51-75%; and 5 = >75%.  
Injury rated as: 0 = healthy; 1 = minor injury; 2 = moderate; 3 = severe; and 4 = dead/gone.