



John Elias Baldacci
GOVERNOR

STATE OF MAINE
MAINE DEPARTMENT OF AGRICULTURE, FOOD & RURAL RESOURCES
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0028

SETH H. BRADSTREET III
COMMISSIONER
HENRY JENNINGS
DIRECTOR

To: Board of Pesticides Control Members
From: Mary Tomlinson, Pesticides Registrar
Re: EPA Special Local Need (SLN) [FIFRA, Section 24(c)] application to approve the use of Callisto Herbicide (EPA Reg. No. 100-1131) for control of broadleaf weeds in lowbush blueberries in the crop year
Date: February 10, 2012

Enclosed is the SLN application and supporting documents for the use of Callisto Herbicide (EPA Reg. No. 100-1131) to control broadleaf weeds, in lowbush blueberry fields, in the crop year. This request is in response to the reduced quality and yields resulting from limited weed control options for bearing years and insufficient control of tenacious perennial weeds with non-crop year applications. This use is permitted in Canada which provides an advantage to Canadian growers. This product is currently registered in the U.S., although not for use on lowbush blueberries during crop-bearing years.

An expiration date of five years is suggested to ensure timely review for continued use.

- Your package includes the additional documents listed below for your review:
- Cover letter from Larry Zang, Senior Regulatory Manager, Syngenta Crop Protection, Inc.
 - Support letter from David E. Yarborough, Ph.D, University of Maine Cooperative Extension
 - Support letter from Bill Malay, Farm Manager, Cherryfield Foods, Inc.
 - Memorandum from Lebel Hicks, Ph.D., Toxicologist
 - Proposed SLN supplemental label for this use
 - State product Section 3 label and MSDS for Callisto Herbicide

Please review these materials and let me know if you have any questions.



PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, FOOD AND RURAL RESOURCES
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28 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0028

WALTER E. WHITCOMB
COMMISSIONER

HENRY S. JENNINGS
DIRECTOR

TO: Board Members
FROM: Lebelle Hicks PhD DABT
RE: Callisto 24(c) Request from Syngenta for Use on Blueberries in the Bearing Year

February 9, 2012

Attached is the supporting information for a Special Local Needs 24(c) registration for Syngenta’s Callisto herbicide (EPA# 100-1131) for use on low bush blueberries in the bearing year to control or suppress the following broadleaf weeds; lambs quarter, redroot pigweed, velvetleaf, wild mustard, spreading dogbane, blue velvet, sheep sorrel, goldenrod and common ragweed. The proposed use rate is a single yearly rate of 4 fl oz/A (0.12 lbs ai/A) with a 60 day pre-harvest interval. (Syngenta 2011a). Callisto is an emulsifiable concentrate with 40% mesotrione (CAS# 104206-82-8) [4 lbs ai/gal] (Syngenta 2009). The comparable Canadian product has 480g mesotrione/L and already lists the use for low bush blueberries in the bearing year at 0.3 L/Ha (4 fl oz/A) (Syngenta 2011b).

In EPA’s 2007 human health risk assessment for mesotrione, they reported that mesotrione has low acute toxicity, is a mild eye irritant, but is not a skin irritant or sensitizer. It’s mechanism of toxicity in mammals is the inhibition of metabolism of the amino acid tyrosine resulting in high tyrosine levels in the blood. In plants the mode of action is also inhibition of tyrosine catabolism resulting in depleted chlorophyll levels. The ocular effects observed in laboratory animals are related to these high levels of tyrosine. The only registered uses for mesotrione are food uses, therefore exposure of the general population to mesotrione is dietary (food and water) (EPA 2007).

The toxic endpoint used for chronic reference dose (RfD) and the chronic population adjusted doses (cPAD) for mesotrione was an increase in levels of tyrosine in the offspring of treated mice and ocular discharge. The No Observable Adverse Effect Level (NOAEL) was not determined in this study and the Lowest Observable Adverse Effect Level (LOAEL) was 2.1 mg/kg/day. This means that the total uncertainty factors for setting the cRfD for mesotrione were 10 for extrapolation from lab animals to humans, 10 for variability in the human population and 3 for use of a LOAEL instead of a NOAEL. This resulted in a cRfD of 0.007 mg/kg/day for all populations (EPA 2007).

Because there were quantitative increases in sensitivity of pups in the developmental studies, the Food Quality Protection Safety Factor (FQPA SF) was retained at 10X. This resulted in a cPAD of 0.0007 mg/kg/day for the general population. There were no hazards in oral acute studies, therefore aRfD and aPADs were not set. With uses, including the berry uses, the highest exposed population is infants < 1 year old receiving 51% of the cPAD. The population as a whole would be exposed to 17% of the cPAD. Mesotrione is rated at “not likely to be carcinogenic to humans” (EPA 2007).

The tolerance for mesotrione on berries is 0.01 ppm (40CFR180.571). Blueberries are included in Group 13B (Bush berries) 40CFR180.41 (17) (ii) (CFR 2011). The proposed 24(c) use directions are for use prior to bloom, the timing from bloom to harvest is around 90 days (Yarborough 2012), making the pre-harvest interval longer than the required 60 days. Use rates and tolerances are based on annual usage, therefore the maximum use rate of 6 fl oz/A per year is not exceeded by use of 4 fl oz/A in the bearing year. Syngenta submitted seven residue studies to support the tolerance. These trials performed at the rate of 0.30L/Ha (4 fl oz/A) on low bush blueberries in New Brunswick, Nova Scotia and Quebec. The residues of mesotrione were not quantifiable with a detection limit of 0.002 ppm of quantitation of 0.01 ppm (Syngenta 2010).

Mesotrione has a water solubility of 160 ppm and a half-life of 18 days. According to WIN-PST it has a low potential for leaching into ground water (USDA 2008).

Conclusion

Issuance of this 24(c) registration on low bush blueberries will not increase the dietary risk from exposure to mesotrione.

References

Code of Federal Regulations 2011, 40CFR180.41 Tolerance Groups

Code of Federal Regulations 2011, 40CFR180.571 Tolerances for Mesotrione

EPA 2007, Mesotrione: Petition 6F7023 Human Health Risk Assessment for Proposed Section 3 New Uses on Berries, Cranberries, Millet, Flax, Grain Sorghum (Section 18)

Syngenta 2009, Callisto Herbicide (EPA# 100-1131) 40% mesotrione [4 lbs/gal] State Label

Syngenta 2010, Mesotrione: Magnitude of the Residue on Blueberries, Highbush and Lowbush

Study Number, AAFC06-006R

Syngenta 2011a, Callisto Herbicide (EPA# 100-1131) 40% mesotrione [4 lbs/gal] proposed 24(c) Label

Syngenta 2011b, Callisto Herbicide (480 g/L) Canadian Label

USDA WIN-PST 2008, USDA-NRCS Windows Pesticide Screening Tool

Yarborough, D., 2012, Personal communication



CHERRYFIELD FOODS, INC.

Park Street . P.O. Box 128 . Cherryfield, Maine 04622
Phone (207) 546-7573. Fax (207) 546-2182



November 10, 2011

Mary Tomlinson
Pesticides Registrar/Water Quality Specialist
Maine Board of Pesticides Control
28 State House Station
Augusta. ME 04333

Dear Mary:

I am writing on behalf of Cherryfield Foods Inc. and our growers in the state of Maine in support of Syngenta's recent request for a 24C label for the expanded use of the herbicide Callisto for broad leaf weed control during the cropping phase of production in our Maine wild blueberry fields.

A critical component of wild blueberry growing Best Management Practices (BMP's) and Integrated Crop Management (ICM) is to properly rotate herbicides to avoid weed resistance and to allow weeds to grow on otherwise bare soil between blueberry plants to avoid soil erosion. By limiting and rotating from traditional herbicides and treatments to achieve these goals, farmers are struggling to manage weed populations in the second or cropping year of production. Weeds can devastate yield and harvestability if not managed. Callisto is a powerful tool that could help farmers limit weed pressures and successfully and efficiently increase harvestable yields while keeping weed pressures under check if it can be used early in the crop year.

Callisto is also presently the only post emergent selective herbicide available for broadcast application that has effect on some of the worst perennial weeds that are presently difficult to control (Eg. Spreading Dog Bane). The key to Callisto's success is through repetitive applications to deplete the perennial weed's root system. The current label allows treatment in the vegetative year of production but not in the crop year of production. Consequently weeds can completely recover in the cropping year of production despite best control efforts in the vegetative year of production. This new label would help allow farmers to use Callisto the way it is intended to manage these weeds.

In addition, Callisto is currently registered for crop year use in Canada. Granting the same advantage to growers in Maine will allow them to remain competitive in the tightening market.

Please feel free to contact me with further questions, suggestions or comments.

Sincerely yours,

Bill Malay

Farming Development, Cherryfield Foods Inc.
Email: bmalay@cherryfieldfoods.com

November 7, 2011

Mary Tomlinson
Pesticides Registrar/Water Quality Specialist
Maine Board of Pesticides Control
28 State House Station
Augusta, ME 04333

Dear Mary:

This letter is in support of the Syngenta request for a 24C crop year label use for Callisto to control weeds in wild blueberry fields in Maine. Wild blueberry growers have limited options for crop year control of weeds such as dogbane which are not sufficiently controlled with non-crop year applications. Roundup may be used for weeds taller than wild blueberries but would have to be used later in the season when the crop is present, so growers do not want to incur the fruit loss incurred by this type of application. The pre-bloom application of Callisto which has a different mode of action will control small dogbane plants and prevent them from growing so that they will not be present at harvest to cause both crop loss and quality when harvest occurs.

The reduction and yield and quality caused by weeds such as dogbane put the wild blueberry growers in Maine at a disadvantage, since this use is allowed in Canada. This 24C label will give Maine growers the same opportunity as growers in Atlantic Canada to control early emerging weeds in their wild blueberry fields.

Sincerely,



David Yarborough, PhD.
Blueberry Specialist
Professor of Horticulture
the University of Maine
5722 Deering Hall Rm. 414
Orono, ME 04469-5722

CC: Jeff Zelna, Larry Zang



Larry Zang
Senior State Regulatory
Manager

Syngenta Crop Protection, Inc.
P.O. Box 18300
Greensboro, NC 27419-8300
www.syngenta.com

Tel. 336 632 2146
Fax: 336 632 2884
larry.zang@syngenta.com

December 12, 2011

Ms. Mary Tomlinson
Pesticides Registrar
Board of Pesticides Control
28 State House Station
Augusta, ME 04333-0028

<p>SUBJECT: Callisto[®] Herbicide (EPA Reg. No. 100-1131) Request for SLN to Allow Use on Bearing Lowbush Blueberry Active Ingredient: Mesotrione</p>
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Dear Ms. Tomlinson:

Syngenta Crop Protection is requesting a Section 24(c) label to allow the use of Callisto Herbicide on lowbush blueberry in bearing years. The rationale is there is not another product as efficacious as the one proposed. Callisto currently has a Section 3 label allowing application in non-bearing years. A permanent tolerance for mesotrione (see 40 CFR 180.571) on Crop Group 13 is established at 0.01 ppm. The tolerance is set at the limit of quantification.

Canada also has a permanent tolerance of 0.01 ppm for mesotrione covering lowbush blueberries. It was established on the basis of the magnitude of residue study submitted with this application. The cultural practices and growing season are similar between Maine and the Canadian trial sites. The study includes three trials in lowbush blueberries conducted in similar areas to Maine- New Brunswick, crop zone 1, Nova Scotia, crop zone 1A, and Quebec, crop zone 5. Maine is in Region 1 and is geographically surrounded on 3 sides by the trials conducted in Canada. In the Canadian study, there were no residues above limit of quantification (LOQ) of 0.01 ppm. The directions for use on the proposed SLN match those on the approved Canadian label. The use rate on the proposed SLN is lower than that of federal Section 3 label.



Ms. Tomlinson
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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
- Support letter from Dr. Dave Yarborough with the University of Maine
- Support letter from Mr. Bill Malay with Cherryfield Foods, Inc. in Cherryfield, Maine
- Study entitled "Mesotrione: Magnitude of Residue on Blueberries, Highbush and Lowbush". Study number AAFC06-006R conducted by Minor Use Pesticide Program, Pesticide Management Centre, Agriculture and Agri-Food Canada, Ottawa, Canada.
- Efficacy studies conducted by the Nova Scotia Agricultural College
- PMRA approved label for Callisto with the lowbush blueberry use.
- Federal Label and MSDS for Callisto Herbicide

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 "Lang Zang". The signature is written in a cursive, flowing style.



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-XXXXXX**

FOR WEED CONTROL IN LOWBUSH BLUEBERRY

Active Ingredient:

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

Other Ingredients: 60.0%

Total:100.0%

Callisto 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.

DIRECTIONS FOR USE

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.

General Information

Callisto is used lowbush blueberry for control or suppression of many broadleaf weeds.

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 label.

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

Specific Use Directions- Lowbush Blueberry

Apply Callisto as a broadcast spray at a rate of 4.0 fl. oz/A to lowbush blueberry for control or suppression of common lambsquarters, redroot pigweed, velvetleaf, wild mustard, spreading dogbane, blue violet, sheep sorrel, goldenrod and common ragweed. The application of Callisto can be made prior to weed emergence or after weed emergence but before weeds reach 5" in height.

The use of a non-ionic surfactant (NIS) type adjuvant at 0.25% v/v (1 qt/100 gallons of spray volume) is recommended.

Applications of Callisto during dry weather conditions and/or temperatures above 85 degrees can cause injury to lowbush blueberries. Applications of Callisto can cause yellowing or necrosis of leaves and under severe conditions, leaf drop may occur especially on "Sourtop" variety blueberries.

Restrictions:

1. Make only one application per year.
2. The application of Callisto must be made prior to lowbush blueberry bloom.
3. Do not harvest within 60 days of application.
4. Do not apply by air.

Callisto® is a trademark of a Syngenta Group Company

24(c) registrant:

Syngenta Crop Protection, LLC
P.O. Box 18300
Greensboro, NC 27419-8300

ME1131XXXAA11110



GROUP 27 HERBICIDE

PULL HERE TO OPEN ►

Callisto®

syngenta®

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.



Callisto Plant Technology®

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

SCP 1131A-L1L 0511
341956

1 gallon
Net Contents

TM

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

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, LLC or Seller. To the extent permitted by applicable law, Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

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

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

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

DIRECTIONS FOR USE

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

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

PRODUCT 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, where appropriate, rotary hoeing is suggested to activate the herbicide. When used postemergence, susceptible weeds take up the herbicide through the treated foliage and cease growth soon after application. Complete death of the weeds may take up to 2 weeks. The product is absorbed through the soil and/or by the foliage of emerged weeds.

Callisto 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.

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, glyphosate, 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, glyphosate, or ALS inhibiting herbicides.

To help prevent the development of resistance to Callisto in corn, always use full labeled rates. If applying Callisto postemergence after a mesotrione-containing preemergence herbicide, always add atrazine as a tank mix partner. No more than 0.24 lb. of mesotrione active ingredient should be applied per acre of corn 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.

WEEDS CONTROLLED

Table 1. Weeds Controlled with Postemergence Applications of Callisto

Common Name	Scientific Name	Callisto Alone	Additional Callisto Recommendations for Corn and Sugarcane Only		
		Callisto Applied Alone on all Labeled Crops ¹	2.5 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 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>	PC ²	C ³	C	C
Amaranth, Powell	<i>Amaranthus powellii</i>	C	C	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C	C	C
Atriplex	<i>Chenopodium orach</i>	C	C	C	C
Broadleaf signalgrass	<i>Bracharia platphylla</i>	C ²	C ³	C ³	PC
Buckwheat, wild	<i>Polygonum convolvulus</i>	PC	PC	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C	C	C
Burcucumber	<i>Sicyos angulatus</i>	PC	C ²	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C	C	C
Carrot, wild	<i>Daucus carota</i>	PC	C	C	C
Chickweed, common	<i>Stellaria media</i>	C	C	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	C	C	C	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C ²	C ²	C ¹	PC
Dandelion	<i>Taraxacum officinale</i>	NC	PC	PC	PC
Dock, curly	<i>Rumex crispus</i>	PC	PC	PC	PC

Common Name	Scientific Name	Callisto Alone	Additional Callisto Recommendations for Corn and Sugarcane Only		
		Callisto Applied Alone on all Labeled Crops ¹	2.5 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 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	C
Hemp	<i>Cannabis sativa</i>	C	C	C	C
Horse nettle	<i>Solanum carolinense</i>	PC	C	C	C
Jimsonweed	<i>Datura stramonium</i>	C	C	C	C
Knotweed, prostrate	<i>Polygonum aviculare</i>	PC	PC	PC	PC
Kochia	<i>Kochia scoparia</i>	PC ²	C ²	C	PC
Lambsquarters, common	<i>Chenopodium album</i>	C ²	C	C	C
Mallow, Venice	<i>Hibiscus trionum</i>	NC	C	C	PC
Morningglory, entireleaf; ivyleaf	<i>Ipomoea hederacea</i>	PC	C ²	C	PC
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C ²	C	PC
Mustard, wild	<i>Brassica kaber</i>	C	C	C	C
Nightshade, black	<i>Solanum nigrum</i>	C	C	C	C
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C	C	C

continued...

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

Common Name	Scientific Name	Callisto Alone	Additional Callisto Recommendations for Corn and Sugarcane Only		
		Callisto Applied Alone on all Labeled Crops ¹	2.5 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS
		Apply to Weeds <5 inches Tall			
Nutsedge, yellow	<i>Cyperus esculentus</i>	PC	PC	PC	PC
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C	C	C
Pokeweed, common	<i>Phytolacca americana</i>	PC	PC	PC	PC
Potatoes, volunteer	<i>Solanum</i> spp.	C	C	C	C
Pusley, Florida	<i>Richardia scabra</i>	C ²	C ²	C ³	PC
Ragweed, common	<i>Ambrosia artemisiifolia</i>	PC	C ³	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	C ²	C ³	C	C
Sesbania, hemp	<i>Sesbania exaltata</i>	C	C	C	C
Sida, prickly (teaweed)	<i>Sida spinosa</i>	NC	C ²	C ³	PC
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C ²	C ³	C	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C ²	C ³	C	C

Common Name	Scientific Name	Callisto Alone	Additional Callisto Recommendations for Corn and Sugarcane Only		
		Callisto Applied Alone on all Labeled Crops ¹	2.5 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 lb. a.i./A) Atrazine 4L/A or Equivalent + COC + UAN or AMS	3.0 fl. oz./A + 1 pt. (0.5 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 pensylvanicum</i>	C ²	C ³	C	C
Sunflower, common	<i>Helianthus annuus</i>	C	C	C	C
Thistle, Canada	<i>Cirsium arvense</i>	NC	PC	C	PC
Velvetleaf	<i>Abutilon theophrasti</i>	C	C	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C ²	C ³	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C ²	C ³	C	C

¹ Refer to the specific crop section on this label for specific rates and use directions.

² Apply before weed exceeds 2 inches in height.

³ Apply before weed exceeds 3 inches in height.

C = Control PC = Partial Control NC = No Control

Table 2. Weeds Controlled With Preemergence Applications of Callisto

Common Name	Scientific Name	Callisto Applied Alone on all Labeled Crops ¹	Callisto + AAtrex 4L (or equivalent) for Use on Corn, Sorghum and Sugarcane ¹
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C
Amarath, Powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Broadleaf signalgrass	<i>Bracharia platyphylla</i>	PC	PC
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>	PC	PC
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	Callisto Applied Alone on all Labeled Crops ¹	Callisto + AAtrex 4L (or equivalent) for Use on Corn, Sorghum and Sugarcane ¹
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, ladysthumb	<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

¹ Refer to the specific crop section on this label for specific rates and use directions.

C = Control PC = Partial Control

ROTATIONAL CROPS

Immediate: Corn (all types), asparagus, cranberry, flax, millet (pearl), grasses grown for seed (Kentucky bluegrass, perennial ryegrass, and tall fescue), oats, rhubarb, sorghum (grain and sweet), and sugarcane may be replanted immediately.

120 Days: Small grains may be planted 120 days after application.

10 Months: Alfalfa, blueberry, canola, cotton, lingonberry, peanuts, potatoes, soybeans, sunflowers, and tobacco can be planted back the following season but not less than 10 months after the last Callisto application. If Callisto is applied postemergence following a mesotrione-containing preemergence herbicide, only corn (all types) or grain sorghum may be replanted the year following application, or severe crop injury may occur.

18 Months: 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

Do not apply Callisto 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 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®.

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.

Postemergence 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.

Postemergence Adjuvants

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

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

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 the rate of 1.0 gal./100 gals. of water (1.0% v/v). The use of a nonionic surfactant (NIS) at 1 qt./100 gallons of water (0.25% v/v) instead of COC is allowed, but the weed control achieved with COC is consistently better than NIS. **The use of methylated seed oil (MSO) adjuvants or MSO blend adjuvants for postemergence applications of Callisto 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 to COC, always add spray grade UAN (e.g., 28-0-0) to the spray solution at a rate of 2.5% (v/v) or AMS at 8.5 lbs./100 gals. of spray solution, except if precluded elsewhere on this label or 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

For a list of weeds controlled preemergence, refer to Table 2.

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.

Preemergence Adjuvants

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.

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 pre-emergence 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 AMS and agitate until completely dispersed.
5. Next add Callisto slowly and agitate until completely dissolved. 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.
6. If tank mixing, add the tank mix product next.
7. Finally, add adjuvant and UAN, if needed, and then continue to fill tank to desired level with water.

CROP USE DIRECTIONS

CORN

Callisto may be used preemergence or postemergence on field corn, production seed field corn, field corn grown for silage, yellow popcorn, and sweet corn. 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 **Postemergence 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 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.

CALLISTO USED ALONE – POSTEMERGENCE

Apply Callisto at 3.0 fl. oz./A per application. Always add an appropriate adjuvant to the spray tank (see the **Postemergence 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.
- If Callisto is applied postemergence to ground that received a preemergence application of a mesotrione-containing herbicide, atrazine must be tank mixed with Callisto.
- If atrazine is mixed with Callisto, do not apply to corn that is more than 12 inches in height.
- 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

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 a loss of residual control. Always add an appropriate adjuvant to the spray tank (see the **Postemergence 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 2.5-3.0 fl. oz./A. If weeds are more than 5 inches tall, or for improved control of common ragweed, Florida pusley, kochia, large crabgrass, morning-glory 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 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® or Ignite® 280 SL – Postemergence

Callisto at a rate of 3.0 fl. oz./A (see Table 1) can be tank mixed with Liberty or Ignite 280 SL. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Use tank mixes with Liberty or Ignite 280 SL only on seed designated as LibertyLink® or warranted by Bayer CropScience as being tolerant to Liberty or Ignite 280 SL Herbicides. 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 Ignite 280 SL, 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 for Glyphosate Mixtures:

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™, 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, 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®, Fulltime™, 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, Fulltime, 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.

CRANBERRY

Callisto may be applied to bearing or non-bearing cranberry beds for control or suppression of bog St. John's wort (*Hypericum boreale*), 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 or non-ionic surfactant (NIS) at 0.25% v/v is recommended. Avoid using COC or NIS 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.

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 12 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.

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.

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 non-ionic 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 at 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. Applications of Callisto to grasses grown for seed species not listed on this label may result in severe injury.

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 any 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 AND SWEET SORGHUM

Callisto can be applied preemergence or preplant 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).
5. In the State of Texas, do not apply Callisto to sorghum grown south of Interstate 20 (I-20) or east of Highway 277.

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-over-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 Handling [Less Than 5 Gallons]

Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix tank or store rinsate for later use and disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Container Handling [Bulk/Mini-Bulk]

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

AAtrex®, Agrisure™, Bicep II Magnum®, Bicep Lite II Magnum®, Callisto®, Callisto Plant Technology®, Dual II Magnum®, Dual Magnum®, Envoke®, Evik®, Expert®, Gramoxone Inteon®, Touchdown®, Warrior®, the ALLIANCE FRAME  the SYNGENTA Logo and the PURPOSE ICON  are Trademarks of a Syngenta Group Company

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

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

SCP 1131A-L1L 0511
341956

GROUP 27 HERBICIDE



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.

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



Callisto Plant Technology[®]

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.

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

Container Handling: Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or mix tank or store rinsate for later use and disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

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Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300

Greensboro, North Carolina 27419-8300

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syngenta[®]

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

Precautionary Statements

Hazards to Humans and Domestic Animals

CAUTION

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

**SCP 1131A-L2F 0511
341957**

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: 14**

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 (< 15%)	Not Established	100 mg/m ³ (ceiling) [aerosol]	Not Established	No
Mesotrione (40.0%)	Not Established	Not Established	10 mg/m ³ 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 AND PACKAGING 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:	1.2 g/ml
pH:	2.4 - 2.8 @ 68°F (20°C)
Solubility in H ₂ O	
Mesotrione :	160 mg/l @ 68°F (20°C) (99.7% pure)
Vapor Pressure	
Mesotrione :	< 4.3 x 10 ⁻⁸ 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 Rabbit) :	> 5000 mg/kg body weight
Dermal:	Dermal (LD50 Rabbit) :	> 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 (< 15%)

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

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.

Note: Packages imported into the US and packages prepared for export will be shipped under the IMDG (water) Classification.

Comments

Water Transport - International

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Mesotrione), Marine Pollutant

Hazard Class or Division: Class 9

Identification Number: UN 3082

Packing Group: PG III

Air Transport - International

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Mesotrione)

Hazard Class or Division: Class 9

Identification Number: UN 3082

Packing Group: PG III

Note: This product is currently not regulated for airfreight within the NAFTA region. However, effective 01/01/2011 the above classification must be used.

15. REGULATORY INFORMATION

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard

Section 313 Toxic Chemicals: Ethylene Glycol (< 15%) (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: 7/15/2010

Replaces: 6/30/2009

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