

100-1131

6/4/2001

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Registration Division (7505C)
401 "M" St., S.W.
Washington, D.C. 20460

EPA Reg. Number:
100-1131

Date of issuance:
JUN 4 2001
Expiration Date:
Jun 4, 2005

NOTICE OF PESTICIDE:

Registration
 Reregistration
(under FIFRA, as amended)

Term of Issuance:
Conditional

Name of Pesticide Product:
Callisto Herbicide

Name and Address of Registrant (include ZIP Code):

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

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act.

Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with FIFRA sec. 3(c)(7)(C) provided that you:

1. Comply with all the terms and conditions as stated in attached correspondence dated June 1, 2001 from Syngenta Crop Protection concerning additional data requirements for mesotrione, [2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione.

2. Make the following label changes listed below before you release the product for shipment:

a. Add the phrase, "EPA Reg. No. 100-1131".

b. Reinstate the 120 day crop rotation interval. If you wish a 90 day rotation you must submit or cite data supporting the shorter interval.

Signature of Approving Official:

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Date:

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c. In the Aerial Spray Drift Advisory section at the end reinstate:

Where states have more stringent regulations, they should be observed.

d. If mesotrione is the common chemical name for the active ingredient it must be included in the active ingredient declaration. Refer to PR Notice 97-5.

e. The cleaning directions include recommendations for use of household ammonium and commercial spray tank cleaners. Since these compounds are unlikely to be cleared for application to growing crops, modify the directions so it is clear the only water rinsate solutions can be applied to growing crops.

3. Submit production information (pounds or gallons produced) for this product for the fiscal year in which the use on field corn is conditionally registered, in accordance with FIFRA section 29. The fiscal year begins October 1, and ends September 30. The product information will be submitted to the Agency no later than November 15, following the end of the preceding fiscal year.

This information is to be submitted to:

Registration Support Branch
Registration Division (7505C)
Environmental Protection Agency
Washington, DC 20460

4. Submit one (1) copy of your final printed labeling before you release the product for shipment. Refer to the A-79 enclosure for a further description of final printed labeling.

5. Submit by June 4, 2005 the following Studies conducted on accordance with the Good Laboratory Practice Standards, 40 CFR Part 160 and appropriate test guidelines as referenced in EPA's Data Requirements for Registration Regulations, 40 CFR Part 158:

a. Adequate storage stability data in the plant and livestock metabolism studies.

b. A revised interference study

c. A Developmental Neurotoxicity Study in the mouse.

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- d. A 28-day inhalation study.
- e. Phytotoxicity studies
- f. Improvement in the extraction method in the soil analytical method
- g. A Prospective Groundwater Monitoring Study at a vulnerable site in the Southern USA.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

A stamped copy of the label is enclosed for your records.

Joanne I. Miller
Product Manager (23)
Herbicide Branch
Registration Division (7505C)

Enclosure

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**ACCEPTED
with COMMENTS
In EPA Letter Dated:**

JUN 4 2001

**Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under EPA Reg. No.
100-112**

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CALLISTO™ Herbicide

**A Preemergence and Postemergence Herbicide
for Control of Annual Broadleaf Weeds in Field Corn**

ACTIVE INGREDIENT:

2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione 40.0%

INERT INGREDIENTS: 60.0%

Total 100.0%

Contains 4 pounds of active ingredient mesotrione per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See back panel for First Aid and additional
Precautionary Statements and attached
booklet for Directions for Use

EPA Reg No. 100-xxx

EPA Est. No. xxx

Product of USA

Syngenta Crop Protection, Inc.
Greensboro, North Carolina 27409
www.syngenta-us.com

SCP xxxx

Net Weight/U.S. Standard Measure

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FIRST AID	
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 by mouth-to-mouth, if possible.• Call a poison control center or doctor for further 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 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 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 style="text-align: center;">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>	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	

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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.

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.

When handlers use closed systems, enclosed cabs, or aircraft 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 washwater or rinsate.

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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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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 should be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of Syngenta Crop Protection, Inc. or Seller. All such risks shall be assumed by Buyer and User, and 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. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or Syngenta, and Buyer and User assume the risk of any such use. **SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.**

In no event shall Syngenta or Seller be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **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 limitations of warranty and of liability, which may not be modified except by written agreement signed by a duly authorized representative of Syngenta.

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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).

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STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited. Keep away from heat and flame.

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 minus 20° F.

PESTICIDE DISPOSAL: Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

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

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GENERAL INFORMATION

CALLISTO is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn. 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") is not received within 7-10 days after a preemergence application, rotary hoeing is suggested to activate the herbicide. When used postemergence, susceptible weeds take up the herbicide through the treated foliage and cease growth soon after application. Complete death of the weeds may take up to 2 weeks. The product is absorbed through the soil 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 corn.

CALLISTO is rainfast in one hour.

GENERAL USE PRECAUTIONS

- CALLISTO can be used preemergence (alone or with listed tankmix herbicides) and/or postemergence (alone or with listed tankmix herbicides) in field corn. Do not apply to popcorn, sweet corn, or ornamental (Indian) corn.
- Avoid drift onto adjacent crops.
- Do not apply CALLISTO postemergence if the corn crop was treated with Counter® or Lorsban® insecticide as severe corn injury may occur. Syngenta Crop Protection will not be held responsible for losses or damage resulting from such use.
- Do not make foliar postemergence applications of CALLISTO in a tankmix with any organophosphate or carbamate insecticide.
- Do not make a foliar postemergence application of any organophosphate or carbamate insecticide within 7 days before or 7 days after a CALLISTO application or severe corn injury may occur. Syngenta Crop Protection will not be held responsible for losses or damage resulting from such use.
- Do not cultivate corn within 7 days before or after a CALLISTO application.

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- 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.
- Rotational Crops: Corn may be replanted immediately. Small grains may be planted 90 days after application. All other rotational crops may be planted the spring following application of CALLISTO. Planting at shorter than recommended intervals may result in injury to the rotational crop.
- 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 tankmix with emulsifiable concentrate grass herbicides or injury may occur.
- CALLISTO may be applied with pyrethroid type insecticides like WARRIOR®.

RESISTANCE MANAGEMENT

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

INTEGRATED PEST (WEED) MANAGEMENT

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

SPRAY DRIFT

Do not apply when weather conditions may cause drift to nontarget areas. Drift may result in injury to adjacent crops and vegetation. To avoid spray drift, DO NOT apply by ground or aurally 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 decisions.

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The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops:

- The distance of the outer most nozzles on the boom must not exceed $\frac{3}{4}$ the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.
- If more stringent state regulations are present, they should be observed.
- The applicator should be familiar with and take into account the information covered in the "Aerial Drift Reduction Advisory" below.

AERIAL DRIFT REDUCTION ADVISORY

(This section is advisory in nature and does not supersede the mandatory label requirements.)

- **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 flow rate nozzles instead of increasing pressure.

Number of Nozzles

Use the minimum number of nozzles that provide uniform coverage.

Nozzle Orientation

Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.

Nozzle Type

Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

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- **Boom Length**
For some use patterns, reducing the effective boom length to less than $\frac{3}{4}$ of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application Height**
Applications should not be made at a height greater than 10 feet above the top of the target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.
- **Swath Adjustment**
When applications are made with a cross wind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator should compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).
- **Wind**
Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided at wind speeds below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.
- **Temperature and Humidity**
When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.
- **Temperature Inversions**
Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates, indicates good vertical air mixing.
- **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).

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CROPS

CALLISTO may be used on field corn, production seed corn, and corn grown for silage. Refer to seed company recommendations for use on inbred lines. Do not apply to popcorn, sweet corn, or ornamental (Indian) corn.

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

Do not apply more than a total of 0.34 pounds active ingredient (10.7 fl oz) of CALLISTO per acre per season. Do not exceed 0.24 lb ai/A (7.7 fl oz) preemergence and 0.188 lb ai/A (6.0 fl oz) postemergence. Do not make more than 2 applications of CALLISTO per season. Do not exceed 0.094 lb ai/A (3.0 fl oz) in a single postemergence application. Do not make the second application of CALLISTO within 14 days of the first application. Do not apply less than 0.094 lb ai/acre (3.0 fl oz) postemergence.

Apply CALLISTO to broadleaf weeds listed in Tables 1 and 2. Corn may be treated up to 30" tall or up to the 8-leaf stage of corn growth.

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SPRAYER LOADING AND MIXING INSTRUCTIONS

Refer to the preemergence and postemergence sections on this label for recommended tankmixes.

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

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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 gallon of household ammonia per 25 gallons 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 one minute with the cleaning solution.
5. Dispose of rinsate from steps 1 - 3 in an appropriate manner. Spray the cleaning solution on untreated corn or return to a rinsate tank for later use as makeup for spraying corn or use other approved disposal.
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.

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PREEMERGENCE APPLICATION PROCEDURES

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 to 80 gallons per acre. Use a pump that can maintain a pressure of at least 35 to 40 PSI at the nozzles to 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 five minutes, resuspend the spray solution by running on full agitation prior to spraying.

CALLISTO Used Alone - Preemergence (see Table 1)

Apply CALLISTO alone at 6 to 7.7 fluid ounces per acre (0.188 to 0.24 pounds active ingredient per acre) by ground sprayers in a spray volume of 10 to 30 gallons of water (up to 80 gallons if applied with liquid fertilizers) per acre for broadleaf weed control. For a list of weeds controlled, refer to Table 1. CALLISTO may be tank mixed with preemergence grass herbicides for grass control. Refer to the tankmix section for a list of partners.

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Table 1
Weeds Controlled with Preemergence Applications of CALLISTO

Common Name	Scientific Name	6 - 7.7 fluid ounces per acre when used alone or applied with a preemergence grass herbicide	Controlled by 6 - 6 fluid ounces per acre used with an atrazine premix
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Buffalobur	<i>Solanum rostratum</i>	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C
Chickweed, common	<i>Stellaria media</i>	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	PC	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C ¹	C
Galinsooga	<i>Galinsooga 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, entrelleaf, ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C
Ragweed, common	<i>Ambrosia artemisiifolia</i>	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	PC	C
Smartweed, ladythumb	<i>Polygonum persicaria</i>	C	C
Smartweed, pale	<i>Polygonum lepathifolium</i>	C	C
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	C	C
Sunflower, common	<i>Helianthus annuus</i>	C	C
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C

C = Control PC = Partial Control C¹ = Partial Control when CALLISTO is applied alone

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Tank Mixed with Axiom®, Degree™, DOUBLEPLAY®, DUAL II®, DUAL II MAGNUM®, DUAL MAGNUM®, Frontier®, Harness®, Outlook™, Surpass® EC, or Topnotch® - Preemergence

CALLISTO at a rate of 6 to 7.7 fluid ounces per acre (see Table 1 for weeds controlled by CALLISTO) can be tank mixed with Axiom, Degree, DOUBLEPLAY, DUAL II, DUAL II MAGNUM, DUAL MAGNUM, Frontier, Harness, Outlook, Surpass EC, 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®, BICEP LITE II®, BICEP II MAGNUM®, Degree Xtra™, Guardsman®, Fultime™, Harness Xtra®, or LeadOff™ - Preemergence

CALLISTO at a rate of 5 to 6 fluid ounces per acre (see Table 1 for weeds controlled by CALLISTO) can be tank mixed with AATREX, BICEP, BICEP LITE II, BICEP II MAGNUM, Degree Xtra, Guardsman, Fultime, Harness Xtra, or LeadOff. 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 GRAMOXONE® EXTRA, GRAMOXONE MAX, Roundup Ultra™, Roundup UltraMax™, TOUCHDOWN®, and/or 2,4-D - Preemergence

For improved broadleaf weed control with limited residual control prior to planting corn, apply CALLISTO at 3 fluid ounces per acre by ground sprayers in tankmixes with GRAMOXONE EXTRA, GRAMOXONE MAX, Roundup Ultra, Roundup Ultra Max, TOUCHDOWN, and/or 2,4-D. For greater residual control, use 6 to 7.7 ounces per acre of CALLISTO (see Table 1 for weeds controlled by CALLISTO) 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.

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POSTEMERGENCE APPLICATION PROCEDURES

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" above the crop canopy.

Apply in a spray volume of 10 to 30 gallons per acre. Use a pump that can maintain a pressure of at least 35 to 40 PSI at the nozzles to 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 gallons.

Flat fan nozzles of 80 or 110 degrees 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 degrees 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 five minutes, resuspend the spray solution by running on full agitation prior to spraying.

Aerial Spray Equipment: Apply CALLISTO in a minimum spray volume of 5 gal/A. When foliage is dense, higher water volumes should be used. Avoid application under conditions where uniform coverage cannot be obtained or where excessive spray drift may occur. Use sufficient spray volume to ensure complete dispersion of CALLISTO in the spray tank when mixing and during applications to target broadleaf weeds.

Select nozzles and boom configurations that produce medium-coarse droplets (250-400 microns VMD). Make applications at the maximum spray height of 10 ft above the crop with low drift nozzles at a maximum pressure of 40 PSI. Boom length should be a maximum of 75% of the wingspan of the aircraft when fixed-wing aircraft are used. Nozzles must always point backwards, parallel with the air stream and never be pointed downwards more than 45 degrees. Use swath adjustment to manage wind displacement of the spray. DO NOT spray when wind speed exceeds 10 mph to help assure accurate application within the target area.

CALLISTO Used Alone - Postemergence (see Table 2 for weeds controlled)

Apply CALLISTO at 3 fluid ounces per acre. For postemergence applications of CALLISTO, always add crop oil concentrate (COC) to the spray solution at a rate of 1 gallon per 100 gallons of water (1.0% v/v). Do not use Methylated Seed Oil (MSO) or MSO blend adjuvants.

Always add spray grade UAN (28-0-0) to the spray solution at a rate of 2.5% (v/v) or AMS at 8.5 lb/100 gal spray solution. For best results, apply CALLISTO to actively growing weeds. 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. Corn may be treated up to 30" tall or up to the 8-leaf stage of corn growth.

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Table 2
Weeds Controlled with Postemergence Applications of CALLISTO

		3 fluid oz/A plus COC plus UAN or AMS	3 fluid oz per acre plus ½ pint (0.26 lb a/A) Atrazine 4L per acre or equivalent plus COC plus UAN or AMS	3 fluid oz per acre plus ½ pint (0.25 lb a/A) Atrazine 4L per acre or equivalent plus COC plus UAN or AMS
Common Name	Scientific Name	Apply to weeds less than 6" tall		Apply to weeds 6" to 10" tall
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C	C
Atriplex	<i>Chenopodium orach</i>	C	C	C
Buckwheat, wild	<i>Polygonum convolvulus</i>	PC	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C	C
Carpetweed	<i>Mollugo verticillata</i>	C	C	C
Chickweed, common	<i>Stellaria media</i>	C	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	C	C	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C'	C'	PC
Galinsoga	<i>Galinsoga parviflora</i>	C	C	C
Jimsonweed	<i>Datura stramonium</i>	C	C	C
Knotweed, prostrate	<i>Polygonum aviculare</i>	PC	PC	PC
Kochia	<i>Kochia scoparia</i>	PC'	C'	PC
Lambsquarters, common	<i>Chenopodium album</i>	C	C	C
Mallow, Venice	<i>Hibiscus trionum</i>	NC	C	PC
Morningglory, entireleaf, ivyleaf	<i>Ipomoea hederacea</i>	PC	C	PC
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C	PC
Nightshade, black	<i>Solanum nigrum</i>	C	C	C
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C	C
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C	C
Pusley, Florida	<i>Richardia scabra</i>	C'	C'	PC
Ragweed, common	<i>Ambrosia artemisiifolia</i>	PC	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	C	C	C

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Sesbania, hemp	<i>Sesbania exaltata</i>	C	C	C
Sida, prickly (teaweed)	<i>Sida spinosa</i>	NC	C ¹	PC
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C	C	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C	C	C
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	C	C	C
Sunflower, common	<i>Helianthus annuus</i>	C	C	C
Velvetleaf	<i>Abutilon theophrasti</i>	C	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C	C
¹ Apply before weed exceeds 2" in height				
C = Control PC = Partial Control NC = No Control				

Tank Mixed with AATREX 4L OR 90DF - Postemergence (see Table 2 for weeds controlled)

In these tankmixes, apply CALLISTO at 3 fluid ounces per acre. If weeds are more than 5" tall, or for improved control of common ragweed; Florida pusley; kochia; large crabgrass; morningglory, spp.; palmer amaranth; prickly sida; prostrate knotweed; Venice mallow; and wild buckwheat, or for faster weed control, add AATREX 4L OR 90DF at a minimum rate of 1/2 to 1 pint per acre (or equivalent rate of other formulations of atrazine). Do not use any atrazine formulation if corn is greater than 12" tall.

For best results, apply CALLISTO to actively growing weeds. Susceptible weeds which emerge soon after application may be controlled after they absorb the herbicide from the soil. CALLISTO will not control most grass weeds. For postemergence applications, always add crop oil concentrate (COC) to the spray solution at a rate of 1 gallon per 100 gallons of water (1% v/v). Always add spray grade UAN (28-0-0) at a rate of 2.5% (v/v) or AMS (8.5 lb/100 gallons spray solution) to the spray solution. Do not use Methylated Seed Oil (MSO) or MSO blend adjuvants. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Tank Mixed with Liberty® and Liberty ATZ

Postemergence: CALLISTO at a rate of 3 fluid ounces per acre (see Table 2 for weeds controlled by CALLISTO) can be tank mixed with Liberty or Liberty ATZ. Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Use tankmixes with Liberty only on seed designated as LibertyLink® or warranted by Aventis CropScience as being tolerant to Liberty herbicide. Failure to follow these directions will lead to severe crop injury. Follow all other directions for use, including adjuvants, as specified on the Liberty product label.

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