



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

BOARD OF PESTICIDES CONTROL

May 12, 2017

**Room 118
Marquardt Building
32 Blossom Lane, Augusta, Maine**

AGENDA

9:00 AM

1. Introductions of Board and Staff

2. Minutes of the May 12, 2017 Board Meeting

Presentation By: Cam Lay
Director

Action Needed: Amend and/or Approve

3. Consideration of Three Plant Incorporated Protectants (PIP) for Late Blight Control in Potatoes

J.R. Simplot Company submitted registration requests for three new seed potato products that contain VNT1 protein and feature late blight protection. The Board toxicologist and the Chair of the PIP Technical Committee have reviewed the VNT1 protein technology and are prepared to present and discuss their findings.

Presentation By: Lebelle Hicks
Staff Toxicologist

John Jemison
Board Member and PIP Technical Committee Chair

Action Needed: Approve/Disapprove PIP Registration Request or Pursue a Medical Advisory Committee and/or a PIP Technical Committee Review of the Late Blight Resistant PIP Products

CAM LAY, DIRECTOR
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG

4. Syngenta Crop Protection, Inc., Request for FIFRA Section 24(c) Registration for Callisto Herbicide on Lowbush Blueberries in the Bearing and Nonbearing Years

Syngenta Crop Protection, Inc. is requesting a Special Local Need [24(c)] Application to allow use of Callisto® herbicide for broadleaf weed control on low bush blueberries in the bearing and non-bearing years. This request is supported by Dave Yarborough, University of Maine Blueberry Extension Specialist. The expiring 24(c) for Callisto is for use in low bush blueberries during the crop-bearing year. Because the additional applications will be made in the non-bearing year, residues are expected to be below the established tolerance.

Presentation By: Mary Tomlinson
Pesticides Registrar

Action Needed: Approve/Disapprove 24(c) Registration Request

5. Loveland Products, Inc., Request for FIFRA Section 24(c) Registration for Malathion 8 Aquamul on Blueberries

Loveland Products, Inc. is requesting a Special Local Need [24(c)] registration to increase the maximum application rate of Malathion 8 Flowable agricultural insecticide to control spotted wing drosophila (SWD) on high and low bush blueberries. This request is supported by David Yarborough, University of Maine Blueberry Extension Specialist, and is based on economic considerations. The SLN is for the same rate as the current SLN for Gowan Malathion 8 Flowable.

Presentation By: Mary Tomlinson,
Pesticides Registrar

Action Needed: Approve/Disapprove 24(c) Registration Request

6. Arkion Life Sciences LLC Request to extend FIFRA Section 24(c) Registration for the Use of Avipel Hopper Box (dry) Corn Seed Treatment to Discourage Consumption of Corn Seed by Grackles, Black Birds, and Crows

Arkion Life Sciences LLC is requesting an extension of the Special Local Need [24(c)] registration for the use of Avipel® Hopper Box (dry) Corn Seed Treatment (anthraquinone) to reduce predation of corn seed by grackles, black birds, and crows. This extension is supported by Richard Kersbergen, University of Maine Cooperative Extension Corn Specialist.

Presentation By: Mary Tomlinson,
Pesticides Registrar

Action Needed Approve/Disapprove the Section 18 Emergency Exemption Registration Request

7. Overview of Pesticide Laws that Currently Pertain the Use of Unmanned Aircraft for Pesticide Application

At the March 2017 meeting, the Board discussed current pesticide regulations and their pertinence to the use of unmanned aircraft to apply pesticides. Following the March discussion, the Board requested that

staff invite Federal Aviation Administration staff to provide explanation of the current aviation regulations pertaining to use of unmanned aircraft for the application of pesticides.

Presentation By: Daniel Jockett,
FAA Aviation Safety Inspector

Action Needed: None—Informational Only

8. Continuing Discussion of Rulemaking Priorities

At an earlier meeting, the Board discussed undertaking rulemaking to address Section 5 of Chapter 29 concerning browntail moth. Rulemaking is time-consuming and expensive so a list of all potential rulemaking was developed and, at the last meeting, the Board pared that list down to Chapters 27, 29 and 36. The Board will now discuss whether to proceed with rulemaking and consideration of amendments.

Presentation By: Megan Patterson,
Manager of Pesticide Programs

Action Needed: Determine Whether to Initiate Rulemaking and Schedule a Hearing

9. Discussion of the Definition of Wetlands as it Pertains to Chapter 29 Section 6

Ron Lemin, Crop Production Services, has requested that the Board clarify whether the definition of wetlands in Chapter 29 Section 6(c): “dominated by emergent or aquatic plants” was intended to include dry areas which contain plants such as phragmites, cattails, purple loosestrife, etc. The Board will now discuss the attached memo and provide clarification on the intended interpretation of the definition of wetlands.

Presentation By: Megan Patterson,
Manager of Pesticide Programs

Action Needed: Provide Definition Interpretation Clarification

10. Discussion of Provision of Worker Protection Standard Handler and Worker Training by Licensed Agricultural Basic Pesticide Applicators

In June of 2016, staff submitted an equivalency request to EPA regarding certification requirements for trainers of handlers and workers as defined by the Worker Protection Standard (WPS). The equivalency request argued that the licensing and certification requirements for Maine Private Applicators of General Use Pesticides (ag basic applicators) exceed the federal standards for certification of private applicators certified to use restricted use pesticides. Agreement with this argument would allow licensed and certified agricultural basic applicators to train their workers/handlers in compliance with the WPS. The Board will now discuss the attached staff memo and equivalency request and determine whether to consider agricultural basic applicators suitably trained to provide training to workers and handlers as defined by the WPS.

Presentation By: Megan Patterson,
Manager of Pesticide Programs

Action Needed: Determine Whether to Consider Ag Basic Applicators as Equivalent to Private Applicators for the Sole Purpose of Training WPS Defined Workers and Handlers

11. Consideration of Consent Agreement with Goodall Enterprises DBA NaturaLawn of America of Bangor, Maine

The Board's Enforcement Protocol authorizes staff to work with the Attorney General and negotiate consent agreements in advance on matters not involving substantial threats to the environment or public health. This procedure was designed for cases where there is no dispute of material facts or law, and the violator admits to the violation and acknowledges a willingness to pay a fine to resolve the matter. This case involves the unauthorized application of a pesticide by a commercial applicator.

Presentation By: Raymond Connors
Manager of Compliance

Action Needed: Approve/Disapprove the Consent Agreement Negotiated by Staff

12. Consideration of Consent Agreement with Salmon Falls Resort & Golf Club LLC

The Board's Enforcement Protocol authorizes staff to work with the Attorney General and negotiate consent agreements in advance on matters not involving substantial threats to the environment or public health. This procedure was designed for cases where there is no dispute of material facts or law, and the violator admits to the violation and acknowledges a willingness to pay a fine to resolve the matter. This case involves the commercial use of a pesticide by an unlicensed applicator.

Presentation By: Raymond Connors
Manager of Compliance

Action Needed: Approve/Disapprove the Consent Agreement Negotiated by Staff

13. Request for Clarification of Minimum State-level Labeling Requirements for Minimum Risk (Section 25(b) of FIFRA) Pesticides

In 1996, EPA exempted minimum risk pesticides from federal regulation under section 25(b) of FIFRA. The Pesticide Control Act of 1975 has not been revised to reflect the new reality of minimum risk pesticides. Staff request that the Board provide definitive guidance on requiring the minimum protective language of "caution" and the Child Hazard Statement for all pesticide products registered in Maine.

Presentation By: Cam Lay
Director

Action Needed: Approve/Disapprove Proposed Minimum Label Language

14. Election of Officers

The Board's statute requires an annual election of officers. The members will choose a chair and vice-chair to serve for the coming year.

Presentation By: Cam Lay
Director

Action Needed: Nominations and Election of Officers

15. Other Old or New Business

- a. Board fund report
- b. Homeowner outreach update
- c. Revised biological policy pertaining to browntail moth control
- d. Email and article submitted by Heather Spalding
- e. Email and letter submitted by Lynn Hower Allen
- f. Email and articles submitted by Heather Spalding
- g. CMP 2017 Foliar Herbicide Plan
- h. Asplundh variance
- i. RWC variance
- j. Woodland Club variance

16. Schedule of Future Meetings

June 23, 2017 and August 4, 2017 are tentative Board meeting dates. The Board will decide whether to change and/or add dates.

- The August 4, 2017 meeting will be held in Fairfield

Adjustments and/or Additional Dates?

17. Adjourn

NOTES

- The Board Meeting Agenda and most supporting documents are posted one week before the meeting on the Board website at www.thinkfirstspraylast.org.
- Any person wishing to receive notices and agendas for meetings of the Board, Medical Advisory Committee, or Environmental Risk Advisory Committee must submit a request in writing to the Board's office. Any person with technical expertise who would like to volunteer for service on either committee is invited to submit their resume for future consideration.
- On November 16, 2007, the Board adopted the following policy for submission and distribution of comments and information when conducting routine business (product registration, variances, enforcement actions, etc.):

- *For regular, non-rulemaking business*, the Board will accept pesticide-related letters, reports, and articles. Reports and articles must be from peer-reviewed journals. E-mail, hard copy, or fax should be sent to the Board's office or pesticides@maine.gov. In order for the Board to receive this information in time for distribution and consideration at its next meeting, all communications must be received by 8:00 AM, three days prior to the Board meeting date (e.g., if the meeting is on a Friday, the deadline would be Tuesday at 8:00 AM). Any information received after the deadline will be held over for the next meeting.
- During rulemaking, when proposing new or amending old regulations, the Board is subject to the requirements of the APA (Administrative Procedures Act), and comments must be taken according to the rules established by the Legislature.



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PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

TO: Board Members
FROM: Lebelle Hicks PhD DABT
RE: Review of VNT1 Protein in Potatoes
DATE: April 19, 2016

We have a request to register three new plant-incorporated protectants for late blight control in potatoes. These products are registered by J.R. Simplot Co and the varieties and EPA registration numbers are: Russet Burbank (W8), 8917-1 (J.R. Simplot 2016a), Ranger Russet (X17), 8917-2 (J.R. Simplot 2016b) and Atlantic (Y9) 8917-3 (J.R. Simplot 2016c) (attached). The gene, *Rpi-Vnt1* was taken from the wild tomato, *Solanum venturii* and the protein VNT1 inhibits the hypersensitivity response in the fungi causing cell death (EPA 2016m).

In November 2016, J.R. Simplot submitted product characterization (description of the transformation process and the genetics of the product), and bioinformatics (protein similarities to allergens and plant toxins) to support waivers for toxicity testing.

In all three potato varieties, the gene expression was higher in the foliage (comparable to expression in the parent wild tomato) than in the tuber. The protein VNT1 was below the limit of quantitation in all plant materials for all cultivars. Due to the variation in the background level of expression, the conservative estimate of VNT1 in all tissues was set at < 100 ppb (ug/kg tissue) (EPA 2016m).

EPA granted the waivers for the entire battery of mammalian toxicity tests based on submitted data demonstrating that the gene and the VNT1 protein are very similar to 70 to 90% of genes found in widely consumed varieties of tomatoes that have no impacts on human health. In addition, no significant similarity between the VNT1 protein and known allergens or toxins was identified. It is highly unlikely that introduction of this gene into potatoes would represent a safety risk (EPA 2016m, EPA 2016n).

References Cited

EPA 2016m, Review of Product Characterization, Toxicity Waiver Requests, Allergenicity and Human Health Data for the Plant incorporated Protectant (PIP) X17 Ranger Russet, W8 Russet Burbank, and Y9 Atlantic Potato [EPA Reg No 8917-R, 8917-E, 8917-G] in support for a Sec 3 Registration and an exemption from tolerance [Petition 5F8425]

EPA 2016n, Federal Food Drug and Cosmetic Act (FFDCA) Considerations for VNT1 Protein in Potato

J.R. Simplot 2016a, W8 Late Blight Protection, EPA# 8917-1 containing < 1.0 x 5E-5% VNT1 protein from Plasmid pSIM1678 Federal label

J.R. Simplot 2016b, X17 Late Blight Protection, EPA# 8917-2 containing < 1.0 x 5E-5% VNT1 protein from Plasmid pSIM1678 Federal label

J.R. Simplot 2016c, Y9 Late Blight Protection, EPA# 8917-3 containing < 1.0 x 5E-5% VNT1 protein from Plasmid pSIM1678 Federal label

CAM LAY, DIRECTOR
32 BLOSSON LANE MARQUADT BUILDING



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Plant-Incorporated Protectant

W8 late blight protection
OECD Unique Identifier: SPS-~~000~~W8-4

Active Ingredient:

The VNT1 protein product of the *Rpi-vnt1* gene from plasmid pSIM1678.....<1.0x10⁻⁵ %*

*Percent VNT1 protein expressed in fresh potato tubers.

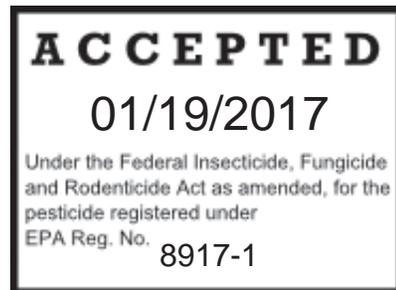
KEEP OUT OF REACH OF CHILDREN

CAUTION

EPA Registration Number: 8917-1

EPA Establishment Number: 8917-ID-35

J.R. Simplot Company
5369 W. Irving St.
Boise, ID 83706



DIRECTIONS FOR USE

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

Potatoes with W8 late blight protection have been transformed to express the *Rpi-vnt1* gene product, the VNT1 protein, for protection against foliar late blight caused by *Phytophthora infestans*. Controlled *P. infestans* strains include US-8, US-22, US-23, and US-24.

Under this registration, W8 late blight protection may be used for conventional breeding with non-PIP potatoes not regulated by EPA to develop new potato varieties containing VNT1 and the genetic material necessary for its production (pSIM1678 T-DNA).

This plant-incorporated protectant may be combined through conventional breeding with registered PIPs that are similarly approved for use in combination with registered PIPs to produce new potato varieties with combined pesticidal traits.

INTEGRATED PEST MANAGEMENT

Best management practices are recommended when using W8 late blight protection. Examples of appropriate BMPs include:

- using certified seed;
- crop rotation, including avoidance of planting to fields with infected potato volunteers;
- sanitizing seed-cutting equipment;
- monitoring late blight alerts;
- scouting for late blight lesions;
- killing vines prior to harvest if the crop will be stored; and
- destroying cull piles.

In order to prolong trait durability, late blight fungicide use may be recommended. Read the Late Blight Integrated Pest Management Guide for Innate® Generation 2 Varieties and follow the recommended number of fungicide applications.

W8 late blight protection is a patent-protected* product of the J.R. Simplot Company, Simplot Plant Sciences with unique genetic elements (*United States Patent No. 8,889,964).

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

1 IDENTIFICATION

Product Identifier:

Product Name: W8 late blight protection
EPA Reg. No.: 8917-1
Synonyms: W8

Distributor Information: J. R. Simplot Company
5369 West Irving Street
Boise, ID 83706

Toll Free: 800.635.9444
Fax: 208.780.6027
Email: stewardship@simplot.com
Website: www.simplot.com

Emergency Phone Number: 208.780.6000

Recommended Use: This product is late blight-protected potato seed for use in potato production.

Use Restrictions: Use only according to label directions and precautionary statements.

2 HAZARDS IDENTIFICATION

Hazard Classification: This potato seed is not considered hazardous by the 2012 OSHA Communication Standard (29 CFR 1910.1200).

GHS Label Elements: N/A

Signal Word: This potato seed contains no substances which are, at their given concentration, considered to be hazardous to health.

Hazards Statements: None

Precautionary Statements:

Prevention: None

Response: None

Storage: Store according to typical practices for seed potato. No special pesticide handling precautions.

Disposal: Unwanted material may be disposed of by systemic herbicide treatment, disking, tillage, or hand picking, deep pit burial, autoclave (121 °C for 30 min), freezing, freeze-drying, grinding, composting, desiccating, crushing, or burning. Potato tuber storage bags, boxes, and containers may be cleaned, frozen, or autoclaved.

Hazards Not Otherwise Classified: N/A

Unknown Toxicity: None

Other Information: None

Interactions with Other Chemicals: Not classified.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Active Ingredients: The VNT1 Protein and *Rpi-vnt1* gene necessary for production in potatoes. Potato seed contains 1.0×10^{-5}% VNT1 protein (as expressed in potato tubers).

4 FIRST-AID MEASURES

General Advice: No special first aid measures are necessary.

Eye Contact: If dust associated with the seed gets in the eye, remove with water.

Skin Contact: No known or anticipated hazards associated with handling of this product.

Inhalation: If any dust associated with the seed is inhaled, remove to fresh air.

Ingestion: This product is not toxic if swallowed.

Most Important Symptoms and Effects: N/A

Note to Physician: For additional information, call collect anytime day or night 208.780.6000.

5 FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media: N/A

Safety Data Sheet



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Specific Hazards Arising from this Mixture: Not classified.

Hazardous Combustion Product(s): N/A

Sensitivity to Mechanical Impact: No

Sensitivity to Static Discharge: No

Protective Equipment and Precautions for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: No special protective precautions are required when cleaning up spills.

Environmental Precautions: N/A

Containment Methods: Prevent further spillage if safe to do so.

Cleanup Methods: Pick up and transfer to properly labeled containers.

7 HANDLING AND STORAGE

Precautions for Safe Handling: Handle as any potato seed product.

Storage Recommendations: Keep containers closed in a cool, dry and well-ventilated place.

Incompatible Products: None known.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters - Exposure Guidelines: This product, as supplied, does not contain any hazardous material with occupational exposure limits established by the region specific regulatory bodies.

Appropriate Engineering Controls - Engineering Measures: None

Individual Protection Measures -Personal Protective Equipment:

Eye/Face: No specific protective equipment is needed.

Skin/Body: No specific protective equipment is needed.

Respiratory: Avoid breathing dusts. Use NIOSH approved respiratory protection equipment when airborne exposure is excessive (see below). Consult the respirator manufacturer to determine the appropriate type of equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134. No special requirement when used as recommended.

VENTILATION:

AIRBORNE EXPOSURE LIMITS:

COMPONENT: Late-blight protected potatoes

OSHA PEL: None established*

ACGIH TLV: None established

*OSHA has not established specific exposure limits for this material. However, OSHA has established limits for particulates not otherwise regulated (PNOR) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL: 15 mg/m³ (total dust) 8-hr TWA

5 mg/m³ (respirable) 8-hr TWA

Hygiene Measures: Handle in accordance with good industrial hygiene practices.

9 PHYSICAL AND CHEMICAL PROPERTIES

Auto-ignition temperature:	N/A
Color:	typical of potato seed
Decomposition temperature:	N/D
Evaporation rate:	N/A
Flammability (solid, gas):	N/A
Flash point:	N/A
Freezing point:	N/D
Initial boiling point and range:	N/A
Melting point:	N/A
Odor:	typical of potato seed

Partition coefficient: n-octanol/water:	N/A
pH:	N/A
Physical state:	Solid
Relative density:	N/D
Solubility(ies):	No
Upper/lower explosive limits:	N/A
Upper/lower flammability limits:	N/A
Vapor pressure:	N/A
Viscosity:	N/A
N/A = Not Applicable	N/D = Not Determined

10 STABILITY AND REACTIVITY

Safety Data Sheet



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Reactivity: Not classified.
Chemical Stability: Considered comparable to proteins.
Possibility of Hazardous Reactions: None
Hazardous Polymerization: Does not occur.
Conditions to Avoid: None known.
Incompatible Materials: None known.
Hazardous Decomposition Products: N/A

11 TOXICOLOGICAL INFORMATION

No toxicological data are available.

Product Information:

Inhalation: N/A
Eye Contact: N/A
Skin Contact: N/A
Ingestion: N/A

Information on Toxicological Effects: Not classified.

Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Sensitization: Not classified.
Mutagenic Effects: Not classified.
Carcinogenicity: Contains no ingredient listed as a carcinogen.
Reproductive Toxicity: Not classified.
STOT-single exposure: Not classified.
STOT-repeated exposure: Not classified.
Chronic Toxicity: No known effect based on information supplied.
Target Organ Effects: None known.
Aspiration Hazard: Not classified.

Numerical Measures of Toxicity – Product Information:

The following value is calculated based on Chapter 3.1 of the GHS document: N/A

12 ECOLOGICAL INFORMATION (NON-MANDATORY)

Adverse effects to non-target organisms, including birds, wild mammals, freshwater and marine/estuarine fish, invertebrates, insects, honey bees, soil invertebrates, and terrestrial and aquatic plants, are not anticipated. Horizontal gene transfer, gene flow, and the development of weediness are also not anticipated.

For additional information on this product or the protein, contact Simplot at stewardship@simplot.com or 800.635.9444.

Persistence and Degradability: Not classified.

Bioaccumulation: Not classified.

Other Adverse Effects: Not classified.

13 DISPOSAL CONSIDERATIONS (NON-MANDATORY)

Disposal Methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional or local regulations for additional requirements.

If treated with a seed treatment, dispose of any remaining product per container disposal instructions.

Contaminated Packaging: Dispose of contents/containers in accordance with local regulations.

Safety Data Sheet



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14 TRANSPORT INFORMATION (NON-MANDATORY)

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

15 REGULATORY INFORMATION (NON-MANDATORY)

International Inventories:

TSCA: N/A	DSL: All components are listed either on the DSL or NDSL
TSCA: United States Toxic Substances Control Act Section 8(b) Inventory; DSL/NDSL: Canadian Domestic Substances List/Non-Domestic Substances List	

U.S. Federal Regulations:

SARA 313: Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 ("SARA"). This product does not contain any chemicals that are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 313.312 Hazard Categories:

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act): This product does not contain any substances regulated as pollutants pursuant to the CWA (40 CFR 122.21 and 122.42).

CERCLA (Comprehensive Environmental Response Compensation and Liability Act): This material does not contain any substances regulated as hazardous under CERCLA (40 CFR 302).

SARA (Superfund Amendments and Reauthorization Act): This material does not contain any substances regulated as hazardous under SARA (40 CFR 355). There may be specific requirements at the local, regional or state level pertaining to releases of this material.

U.S. State Regulations:

California Proposition 65: This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations: N/A

International Regulations:

Mexico National Occupational Exposure Limits: N/A

Canada WHMIS Class: Not Determined

FIFRA Statement

This potato seed is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under Federal pesticide law. These requirements differ from the classification criteria and hazard information required for Safety Data Sheets ("SDS") and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including Directions for Use.

16 OTHER INFORMATION

NFPA:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No
HMIS:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No

SDS Information:

Date Prepared: 01/17/2017
Version: 1

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

DISCLAIMER

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, process, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific designated material and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Plant-Incorporated Protectant

X17 late blight protection

OECD Unique Identifier: SPS-ØØX17-5

Active Ingredient:

The VNT1 protein product of the *Rpi-vnt1* gene from plasmid pSIM1678.....<1.0x10⁻⁵ %*

*Percent VNT1 protein expressed in fresh potato tubers.

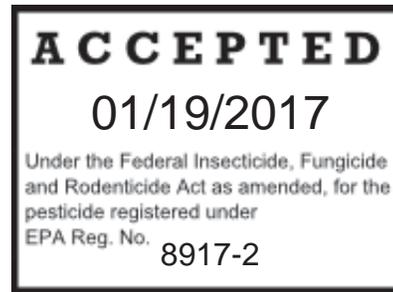
KEEP OUT OF REACH OF CHILDREN

CAUTION

EPA Registration Number: 8917-2

EPA Establishment Number: 8917-ID-35

J.R. Simplot Company
5369 W. Irving St.
Boise, ID 83706



DIRECTIONS FOR USE

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

Potatoes with X17 late blight protection have been transformed to express the *Rpi-vnt1* gene product, the VNT1 protein, for protection against foliar late blight caused by *Phytophthora infestans*. Controlled *P. infestans* strains include US-8, US-22, US-23, and US-24.

Under this registration, X17 late blight protection may be used for conventional breeding with non-PIP potatoes not regulated by EPA to develop new potato varieties containing VNT1 and the genetic material necessary for its production (pSIM1678 T-DNA).

This plant-incorporated protectant may be combined through conventional breeding with registered PIPs that are similarly approved for use in combination with registered PIPs to produce new potato varieties with combined pesticidal traits.

INTEGRATED PEST MANAGEMENT

Best management practices are recommended when using X17 late blight protection. Examples of appropriate BMPs include:

- using certified seed;
- crop rotation, including avoidance of planting to fields with infected potato volunteers;
- sanitizing seed-cutting equipment;
- monitoring late blight alerts;
- scouting for late blight lesions;
- killing vines prior to harvest if the crop will be stored; and
- destroying cull piles.

In order to prolong trait durability, late blight fungicide use may be recommended. Read the Late Blight Integrated Pest Management Guide for Innate® Generation 2 Varieties and follow the recommended number of fungicide applications.

X17 late blight protection is a patent-protected* product of the J.R. Simplot Company, Simplot Plant Sciences with unique genetic elements (*United States Patent No. 8,889,964).

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

1 IDENTIFICATION

Product Identifier:

Product Name: X17 late blight protection
EPA Reg. No.: 8917-2
Synonyms: X17

Distributor Information: J. R. Simplot Company
5369 West Irving Street
Boise, ID 83706

Toll Free: 800.635.9444
Fax: 208.780.6027
Email: stewardship@simplot.com
Website: www.simplot.com

Emergency Phone Number: 208.780.6000

Recommended Use: This product is late blight-protected potato seed for use in potato production.

Use Restrictions: Use only according to label directions and precautionary statements.

2 HAZARDS IDENTIFICATION

Hazard Classification: This potato seed is not considered hazardous by the 2012 OSHA Communication Standard (29 CFR 1910.1200).

GHS Label Elements: N/A

Signal Word: This potato seed contains no substances which are, at their given concentration, considered to be hazardous to health.

Hazards Statements: None

Precautionary Statements:

Prevention: None

Response: None

Storage: Store according to typical practices for seed potato. No special pesticide handling precautions.

Disposal: Unwanted material may be disposed of by systemic herbicide treatment, disking, tillage, or hand picking, deep pit burial, autoclave (121 °C for 30 min), freezing, freeze-drying, grinding, composting, desiccating, crushing, or burning. Potato tuber storage bags, boxes, and containers may be cleaned, frozen, or autoclaved.

Hazards Not Otherwise Classified: N/A

Unknown Toxicity: None

Other Information: None

Interactions with Other Chemicals: Not classified.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Active Ingredients: The VNT1 Protein and *Rpi-vnt1* gene necessary for production in potatoes. Potato seed contains 1.0×10^{-5}% VNT1 protein (as expressed in potato tubers).

4 FIRST-AID MEASURES

General Advice: No special first aid measures are necessary.

Eye Contact: If dust associated with the seed gets in the eye, remove with water.

Skin Contact: No known or anticipated hazards associated with handling of this product.

Inhalation: If any dust associated with the seed is inhaled, remove to fresh air.

Ingestion: This product is not toxic if swallowed.

Most Important Symptoms and Effects: N/A

Note to Physician: For additional information, call collect anytime day or night 208.780.6000.

5 FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media: N/A

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

Specific Hazards Arising from this Mixture: Not classified.

Hazardous Combustion Product(s): N/A

Sensitivity to Mechanical Impact: No

Sensitivity to Static Discharge: No

Protective Equipment and Precautions for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: No special protective precautions are required when cleaning up spills.

Environmental Precautions: N/A

Containment Methods: Prevent further spillage if safe to do so.

Cleanup Methods: Pick up and transfer to properly labeled containers.

7 HANDLING AND STORAGE

Precautions for Safe Handling: Handle as any potato seed product.

Storage Recommendations: Keep containers closed in a cool, dry and well-ventilated place.

Incompatible Products: None known.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters - Exposure Guidelines: This product, as supplied, does not contain any hazardous material with occupational exposure limits established by the region specific regulatory bodies.

Appropriate Engineering Controls - Engineering Measures: None

Individual Protection Measures -Personal Protective Equipment:

Eye/Face: No specific protective equipment is needed.

Skin/Body: No specific protective equipment is needed.

Respiratory: Avoid breathing dusts. Use NIOSH approved respiratory protection equipment when airborne exposure is excessive (see below). Consult the respirator manufacturer to determine the appropriate type of equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134. No special requirement when used as recommended.

VENTILATION:

AIRBORNE EXPOSURE LIMITS:

COMPONENT: Late-blight protected potatoes

OSHA PEL: None established*

ACGIH TLV: None established

*OSHA has not established specific exposure limits for this material. However, OSHA has established limits for particulates not otherwise regulated (PNOR) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL: 15 mg/m³ (total dust) 8-hr TWA

5 mg/m³ (respirable) 8-hr TWA

Hygiene Measures: Handle in accordance with good industrial hygiene practices.

9 PHYSICAL AND CHEMICAL PROPERTIES

Auto-ignition temperature:	N/A
Color:	typical of potato seed
Decomposition temperature:	N/D
Evaporation rate:	N/A
Flammability (solid, gas):	N/A
Flash point:	N/A
Freezing point:	N/D
Initial boiling point and range:	N/A
Melting point:	N/A
Odor:	typical of potato seed

Partition coefficient: n-octanol/water:	N/A
pH:	N/A
Physical state:	Solid
Relative density:	N/D
Solubility(ies):	No
Upper/lower explosive limits:	N/A
Upper/lower flammability limits:	N/A
Vapor pressure:	N/A
Viscosity:	N/A
N/A = Not Applicable	N/D = Not Determined

10 STABILITY AND REACTIVITY

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

Reactivity: Not classified.
Chemical Stability: Considered comparable to proteins.
Possibility of Hazardous Reactions: None
Hazardous Polymerization: Does not occur.
Conditions to Avoid: None known.
Incompatible Materials: None known.
Hazardous Decomposition Products: N/A

11 TOXICOLOGICAL INFORMATION

No toxicological data are available.

Product Information:

Inhalation: N/A
Eye Contact: N/A
Skin Contact: N/A
Ingestion: N/A

Information on Toxicological Effects: Not classified.

Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Sensitization: Not classified.
Mutagenic Effects: Not classified.
Carcinogenicity: Contains no ingredient listed as a carcinogen.
Reproductive Toxicity: Not classified.
STOT-single exposure: Not classified.
STOT-repeated exposure: Not classified.
Chronic Toxicity: No known effect based on information supplied.
Target Organ Effects: None known.
Aspiration Hazard: Not classified.

Numerical Measures of Toxicity – Product Information:

The following value is calculated based on Chapter 3.1 of the GHS document: N/A

12 ECOLOGICAL INFORMATION (NON-MANDATORY)

Adverse effects to non-target organisms, including birds, wild mammals, freshwater and marine/estuarine fish, invertebrates, insects, honey bees, soil invertebrates, and terrestrial and aquatic plants, are not anticipated. Horizontal gene transfer, gene flow, and the development of weediness are also not anticipated.

For additional information on this product or the protein, contact Simplot at stewardship@simplot.com or 800.635.9444.

Persistence and Degradability: Not classified.

Bioaccumulation: Not classified.

Other Adverse Effects: Not classified.

13 DISPOSAL CONSIDERATIONS (NON-MANDATORY)

Disposal Methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional or local regulations for additional requirements.

If treated with a seed treatment, dispose of any remaining product per container disposal instructions.

Contaminated Packaging: Dispose of contents/containers in accordance with local regulations.

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

14 TRANSPORT INFORMATION (NON-MANDATORY)

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

15 REGULATORY INFORMATION (NON-MANDATORY)

International Inventories:

TSCA: N/A	DSL: All components are listed either on the DSL or NDSL
TSCA: United States Toxic Substances Control Act Section 8(b) Inventory; DSL/NDSL: Canadian Domestic Substances List/Non-Domestic Substances List	

U.S. Federal Regulations:

SARA 313: Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 ("SARA"). This product does not contain any chemicals that are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 313.312 Hazard Categories:

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act): This product does not contain any substances regulated as pollutants pursuant to the CWA (40 CFR 122.21 and 122.42).

CERCLA (Comprehensive Environmental Response Compensation and Liability Act): This material does not contain any substances regulated as hazardous under CERCLA (40 CFR 302).

SARA (Superfund Amendments and Reauthorization Act): This material does not contain any substances regulated as hazardous under SARA (40 CFR 355). There may be specific requirements at the local, regional or state level pertaining to releases of this material.

U.S. State Regulations:

California Proposition 65: This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations: N/A

International Regulations:

Mexico National Occupational Exposure Limits: N/A

Canada WHMIS Class: Not Determined

FIFRA Statement

This potato seed is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under Federal pesticide law. These requirements differ from the classification criteria and hazard information required for Safety Data Sheets ("SDS") and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including Directions for Use.

16 OTHER INFORMATION

NFPA:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No
HMIS:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No

SDS Information:

Date Prepared: 01/17/2017
Version: 1

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

DISCLAIMER

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, process, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific designated material and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Plant-Incorporated Protectant

Y9 late blight protection

OECD Unique Identifier: SPS-000Y9-7

Active Ingredient:

The VNT1 protein product of the *Rpi-vnt1* gene from plasmid pSIM1678.....<1.0x10⁻⁵ %*

*Percent VNT1 protein expressed in fresh potato tubers.

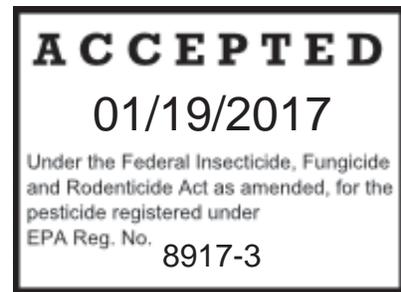
KEEP OUT OF REACH OF CHILDREN

CAUTION

EPA Registration Number: 8917-3

EPA Establishment Number: 8917-ID-35

J.R. Simplot Company
5369 W. Irving St.
Boise, ID 83706



DIRECTIONS FOR USE

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

Potatoes with Y9 late blight protection have been transformed to express the *Rpi-vnt1* gene product, the VNT1 protein, for protection against foliar late blight caused by *Phytophthora infestans*. Controlled *P. infestans* strains include US-8, US-22, US-23, and US-24.

Under this registration, Y9 late blight protection may be used for conventional breeding with non-PIP potatoes not regulated by EPA to develop new potato varieties containing VNT1 and the genetic material necessary for its production (pSIM1678 T-DNA).

This plant-incorporated protectant may be combined through conventional breeding with registered PIPs that are similarly approved for use in combination with registered PIPs to produce new potato varieties with combined pesticidal traits.

INTEGRATED PEST MANAGEMENT

Best management practices are recommended when using Y9 late blight protection. Examples of appropriate BMPs include:

- using certified seed;
- crop rotation, including avoidance of planting to fields with infected potato volunteers;
- sanitizing seed-cutting equipment;
- monitoring late blight alerts;
- scouting for late blight lesions;
- killing vines prior to harvest if the crop will be stored; and
- destroying cull piles.

In order to prolong trait durability, late blight fungicide use may be recommended. Read the Late Blight Integrated Pest Management Guide for Innate[®] Generation 2 Varieties and follow the recommended number of fungicide applications.

Y9 late blight protection is a patent-protected* product of the J.R. Simplot Company, Simplot Plant Sciences with unique genetic elements (*United States Patent No. 8,889,964).

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

1 IDENTIFICATION

Product Identifier:

Product Name: Y9 late blight protection
EPA Reg. No.: 8917-3
Synonyms: Y9

Distributor Information: J. R. Simplot Company
5369 West Irving Street
Boise, ID 83706

Toll Free: 800.635.9444
Fax: 208.780.6027
Email: stewardship@simplot.com
Website: www.simplot.com

Emergency Phone Number: 208.780.6000

Recommended Use: This product is late blight-protected potato seed for use in potato production.

Use Restrictions: Use only according to label directions and precautionary statements.

2 HAZARDS IDENTIFICATION

Hazard Classification: This potato seed is not considered hazardous by the 2012 OSHA Communication Standard (29 CFR 1910.1200).

GHS Label Elements: N/A

Signal Word: This potato seed contains no substances which are, at their given concentration, considered to be hazardous to health.

Hazards Statements: None

Precautionary Statements:

Prevention: None

Response: None

Storage: Store according to typical practices for seed potato. No special pesticide handling precautions.

Disposal: Unwanted material may be disposed of by systemic herbicide treatment, disking, tillage, or hand picking, deep pit burial, autoclave (121 °C for 30 min), freezing, freeze-drying, grinding, composting, desiccating, crushing, or burning. Potato tuber storage bags, boxes, and containers may be cleaned, frozen, or autoclaved.

Hazards Not Otherwise Classified: N/A

Unknown Toxicity: None

Other Information: None

Interactions with Other Chemicals: Not classified.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Active Ingredients: The VNT1 Protein and *Rpi-vnt1* gene necessary for production in potatoes. Potato seed contains $<1.0 \times 10^{-5}\%$ VNT1 protein (as expressed in potato tubers).

4 FIRST-AID MEASURES

General Advice: No special first aid measures are necessary.

Eye Contact: If dust associated with the seed gets in the eye, remove with water.

Skin Contact: No known or anticipated hazards associated with handling of this product.

Inhalation: If any dust associated with the seed is inhaled, remove to fresh air.

Ingestion: This product is not toxic if swallowed.

Most Important Symptoms and Effects: N/A

Note to Physician: For additional information, call collect anytime day or night 208.780.6000.

5 FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media: N/A

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

Specific Hazards Arising from this Mixture: Not classified.

Hazardous Combustion Product(s): N/A

Sensitivity to Mechanical Impact: No

Sensitivity to Static Discharge: No

Protective Equipment and Precautions for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: No special protective precautions are required when cleaning up spills.

Environmental Precautions: N/A

Containment Methods: Prevent further spillage if safe to do so.

Cleanup Methods: Pick up and transfer to properly labeled containers.

7 HANDLING AND STORAGE

Precautions for Safe Handling: Handle as any potato seed product.

Storage Recommendations: Keep containers closed in a cool, dry and well-ventilated place.

Incompatible Products: None known.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters - Exposure Guidelines: This product, as supplied, does not contain any hazardous material with occupational exposure limits established by the region specific regulatory bodies.

Appropriate Engineering Controls - Engineering Measures: None

Individual Protection Measures -Personal Protective Equipment:

Eye/Face: No specific protective equipment is needed.

Skin/Body: No specific protective equipment is needed.

Respiratory: Avoid breathing dusts. Use NIOSH approved respiratory protection equipment when airborne exposure is excessive (see below). Consult the respirator manufacturer to determine the appropriate type of equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134. No special requirement when used as recommended.

VENTILATION:

AIRBORNE EXPOSURE LIMITS:

COMPONENT: Late-blight protected potatoes

OSHA PEL: None established*

ACGIH TLV: None established

*OSHA has not established specific exposure limits for this material. However, OSHA has established limits for particulates not otherwise regulated (PNOR) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL: 15 mg/m³ (total dust) 8-hr TWA

5 mg/m³ (respirable) 8-hr TWA

Hygiene Measures: Handle in accordance with good industrial hygiene practices.

9 PHYSICAL AND CHEMICAL PROPERTIES

Auto-ignition temperature:	N/A
Color:	typical of potato seed
Decomposition temperature:	N/D
Evaporation rate:	N/A
Flammability (solid, gas):	N/A
Flash point:	N/A
Freezing point:	N/D
Initial boiling point and range:	N/A
Melting point:	N/A
Odor:	typical of potato seed

Partition coefficient: n-octanol/water:	N/A
pH:	N/A
Physical state:	Solid
Relative density:	N/D
Solubility(ies):	No
Upper/lower explosive limits:	N/A
Upper/lower flammability limits:	N/A
Vapor pressure:	N/A
Viscosity:	N/A
N/A = Not Applicable	N/D = Not Determined

10 STABILITY AND REACTIVITY

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

Reactivity: Not classified.
Chemical Stability: Considered comparable to proteins.
Possibility of Hazardous Reactions: None
Hazardous Polymerization: Does not occur.
Conditions to Avoid: None known.
Incompatible Materials: None known.
Hazardous Decomposition Products: N/A

11 TOXICOLOGICAL INFORMATION

No toxicological data are available.

Product Information:

Inhalation: N/A
Eye Contact: N/A
Skin Contact: N/A
Ingestion: N/A

Information on Toxicological Effects: Not classified.

Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Sensitization: Not classified.
Mutagenic Effects: Not classified.
Carcinogenicity: Contains no ingredient listed as a carcinogen.
Reproductive Toxicity: Not classified.
STOT-single exposure: Not classified.
STOT-repeated exposure: Not classified.
Chronic Toxicity: No known effect based on information supplied.
Target Organ Effects: None known.
Aspiration Hazard: Not classified.

Numerical Measures of Toxicity – Product Information:

The following value is calculated based on Chapter 3.1 of the GHS document: N/A

12 ECOLOGICAL INFORMATION (NON-MANDATORY)

Adverse effects to non-target organisms, including birds, wild mammals, freshwater and marine/estuarine fish, invertebrates, insects, honey bees, soil invertebrates, and terrestrial and aquatic plants, are not anticipated. Horizontal gene transfer, gene flow, and the development of weediness are also not anticipated.

For additional information on this product or the protein, contact Simplot at stewardship@simplot.com or 800.635.9444.

Persistence and Degradability: Not classified.

Bioaccumulation: Not classified.

Other Adverse Effects: Not classified.

13 DISPOSAL CONSIDERATIONS (NON-MANDATORY)

Disposal Methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional or local regulations for additional requirements.

If treated with a seed treatment, dispose of any remaining product per container disposal instructions.

Contaminated Packaging: Dispose of contents/containers in accordance with local regulations.

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

14 TRANSPORT INFORMATION (NON-MANDATORY)

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

15 REGULATORY INFORMATION (NON-MANDATORY)

International Inventories:

TSCA: N/A	DSL: All components are listed either on the DSL or NDSL
TSCA: United States Toxic Substances Control Act Section 8(b) Inventory; DSL/NDSL: Canadian Domestic Substances List/Non-Domestic Substances List	

U.S. Federal Regulations:

SARA 313: Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 ("SARA"). This product does not contain any chemicals that are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 313.312 Hazard Categories:

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act): This product does not contain any substances regulated as pollutants pursuant to the CWA (40 CFR 122.21 and 122.42).

CERCLA (Comprehensive Environmental Response Compensation and Liability Act): This material does not contain any substances regulated as hazardous under CERCLA (40 CFR 302).

SARA (Superfund Amendments and Reauthorization Act): This material does not contain any substances regulated as hazardous under SARA (40 CFR 355). There may be specific requirements at the local, regional or state level pertaining to releases of this material.

U.S. State Regulations:

California Proposition 65: This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations: N/A

International Regulations:

Mexico National Occupational Exposure Limits: N/A

Canada WHMIS Class: Not Determined

FIFRA Statement

This potato seed is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under Federal pesticide law. These requirements differ from the classification criteria and hazard information required for Safety Data Sheets ("SDS") and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including Directions for Use.

16 OTHER INFORMATION

NFPA:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No
HMIS:	Health Hazards:	0	Flammability:	0	Instability:	0	Physical and Chemical Hazards-Personal Protection:	No

SDS Information:

Date Prepared: 01/17/2017
Version: 1

Safety Data Sheet



According to OSHA HCS (29 CFR § 1910.1200(g)) as Published in the Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012

DISCLAIMER

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, process, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific designated material and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

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 bearing and non-bearing years
Date: May 3, 2017

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 bearing and non-bearing years. This request combines the previous Section 24(c) use for the bearing year with application during the non-bearing year. This product is currently registered in the U.S., but only for use on lowbush blueberries in the non-bearing year. The total application rate on the container label and the SLN are the same for the non-bearing year, but the timing is different. According to Dr. Yarborough, the changes in the application timing indicates improved effectiveness in the control of seeds such as dogbane.

Your package includes the additional documents listed below for your review:

- Section 24(c) application
- Proposed SLN supplemental label for this use
- Cover letter from Patricia Dinnen, Senior Regulatory Manager, Syngenta Crop Protection, Inc.
- Support letter from David E. Yarborough, Ph.D., University of Maine Cooperative Extension
- Efficacy data from Syngenta
- State product Section 3 label
- SDS for Callisto Herbicide

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

CAM LAY, DIRECTOR
32 BLOSSOM LANE, MARQUARDT BUILDING



PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG



Section 24(c) Special Local Need Label

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF MAINE

**Callisto® Herbicide
For Weed Control in Lowbush Blueberry**

**EPA Reg. No. 100-1131
EPA SLN No. ME-xxxxxx**

This label expires and must not be distributed or used in accordance with this SLN registration after December 31, 2022

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.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

DIRECTIONS FOR USE

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This label must be in the possession of the user at the time of application.
- Follow all applicable directions, restrictions, Worker Protection Standard requirements, and precautions on the EPA-registered label.

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

Specific Use Directions – Lowbush Blueberry – BEARING YEAR

For bearing year application only

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.

Specific Use Directions – Lowbush Blueberry – NON-BEARING YEAR

For Non-bearing year application only

Apply Callisto post-emergence to weeds up to three times on non-bearing pruned fields as a broadcast or spot spray at 2 oz/A when each new flush of weed regrowth has reached 4 to 6 inches or is at the 4-6 leaf stage. Inclusion of ammonium sulfate at 8.5 lb/100 gallons and 0.5% Activator 90 or other suitable non-ionic surfactant in the tank mix and sequential treatments as re-growth occurs are necessary for good control.

Restrictions:

1. Make no more than 3 applications in the non-bearing year.
2. Do not apply more than 6 oz/A in the non-bearing year.
3. The application of Callisto must be made in the non-bearing year of lowbush blueberry production.
4. Do not apply by air.

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

Label Code: ME1131021AA0417

Patricia (Pat) Dinnen
Regulatory Manager
State Registration/State
Affairs

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

Tel. 336 632 2494
Fax: 336 632 2884
pat.dinnen@syngenta.com



April 25, 2017

Ms. Mary E. Tomlinson
Pesticides Registrar & Water Quality Specialist
Board of Pesticides Control
Maine Department of Agriculture, Conservation and Forestry
28 State House Station
Augusta, ME 04333-0028

Subject: Callisto® Herbicide, EPA Reg. No. 100-1131
SLN Request for a Non-bearing Year Application to Lowbush Blueberry

Dear Ms. Tomlinson:

Syngenta Crop Protection, LLC is requesting to amend the ME-120001 Special Local Need label for Callisto Herbicide to add a non-bearing year application to lowbush blueberry. The current ME-120001 has a bearing year application to lowbush blueberry and Syngenta wishes to have one SLN label with both bearing year and non-bearing year application to lowbush blueberry. Dr. David Yarborough of The University of Maine has written a support letter and provided efficacy/crop safety data.

Enclosed in support of this submission are:

- EPA SLN Application Form 8570-25
- Draft SLN Label
- Letter of support from Dr. David Yarborough of The University of Maine
- Efficacy/Crop Safety Data from Dr. David Yarborough
- Federal Label for Callisto Herbicide
- SDS for Callisto Herbicide

If you have any questions please do not hesitate to call me at 336-632-2494 or email me at pat.dinnen@syngenta.com.

Sincerely,

A handwritten signature in cursive script that reads "Pat Dinnen".

Pat Dinnen
Regulatory Manager

Enclosures



Wild Blueberry Office Deering Hall University of Maine, Orono 04469

March 10, 2017

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 to renew the 24C crop year label use for Callisto to control weeds in wild blueberry fields in Maine. It also has a non-bearing section that supports changes in the application timing to make this treatment much more effective. Wild blueberry growers have limited options for crop year control of weeds such as dogbane which are not sufficiently controlled with the current label timing for the 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 sequential timing for the non-crop use was developed from research done at the University of Maine which showed this was much more effective than the current two applications at two week intervals.

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.

A handwritten signature in black ink, reading "David E. Yarborough".

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

CC: Jeff Zelna, Syngenta

WEED MANAGEMENT

INVESTIGATORS: David E. Yarborough, Professor of Horticulture
Jennifer L. D'Appollonio, Assistant Scientist

13. TITLE: Comparison of multiple post-emergence Callisto applications for spreading dogbane (*Apocynum androsaemifolium*) control in wild blueberry fields.

METHODS: Spreading dogbane (*Apocynum androsaemifolium*) continues to be a major weed pest in wild blueberry fields. In spring 2015 we initiated a trial at the University of Maine's Blueberry Hill Experiment Station Farm, to examine the effect of Callisto and Matrix on dogbane control. Dogbane was sprayed post-emergence either once at 6 oz/a or twice at 3 oz/a, but neither rate fully controlled dogbane in either the prune or crop year.

In 2016, a follow-up trial was initiated at Cherryfield Foods' Pike Brook 3 Lot, which has had a large dogbane population. The trial was set up as a Completely Randomized Design with each plot split in half; the main treatments consisted of an untreated check, Callisto 2 oz/a + COC 1% v/v and Callisto 3 oz/a + COC 1% v/v. Six replications of 4-m² plots per main treatment were staked pre-emergence and half of each plot was treated pre-emergence with Velpar 2 lb/a on 10 May 2016. Once wild blueberry emerged, dogbane emergence and growth were tracked on a weekly basis and the plots were sprayed in entirety at approximately two week intervals for a total of three post-emergence Callisto applications on 26 May, 8 June and 22 June. Prior to each Callisto application, wild blueberry cover and phytotoxicity, dogbane cover and phytotoxicity, broadleaf weed cover and grass cover were assessed, and at 2.5 weeks after the last application, on 11 July. Cover data were determined by using the Daubenmire Cover Class system converted to percent, and phytotoxicity using a scale of 0-10 (0=no damage, 10=100% damaged/dead) which was converted to percent. The treatments were compared using Tukey's tests ($\alpha=0.05$) to determine significant differences among all treatments, and t-tests ($\alpha=0.05$) to compare Velpar versus no Velpar for each main treatment.

RESULTS:

All treatment comparisons

There were no significant differences in wild blueberry cover (Figure 1) or phytotoxicity (Figure 2). As expected, blueberry cover increased over time, with the Callisto 2 oz/a treatment ultimately having the highest cover regardless of Velpar application. There was initially some phytotoxicity observed at the May evaluation in all treatments; it was determined that this was due to Cherryfield Foods' driving through the trial area while spraying the rest of the field with Callisto 3 oz/a + NIS + Request on 18 May. Although they turned off the tractor's spray boom, residual pressure in the boom caused spray solution leakage from the nozzles onto plants in the trial area, and therefore was assessed as background injury because it could not be separated from injury due to our trial applications (Figures 2, 4). The wild blueberry recovered by the second evaluation and from thereon out, all blueberry and dogbane phytotoxicity was assumed to be from trial treatment effects.

Dogbane cover was not significantly different among treatments at the first three evaluations, but by the fourth evaluation Callisto at 2 oz/a with Velpar, and Callisto at 3 oz/a both with and without Velpar, controlled dogbane significantly better than the check, Velpar alone or Callisto 2 oz/a (Figure 3, Photo 1A-C). In fact, the former three treatments reduced

dogbane cover to less than 10% by July, and no new seedlings were observed (new seedlings had been observed in May and at both June evaluations). The two June evaluations and July evaluation had significant differences in dogbane phytotoxicity (Figure 4). The treatments with Velpar tended to have slightly more injury to dogbane than those without, but at all evaluations there were no differences between the Callisto treatments with Velpar compared to without Velpar. There was also no difference between the check and Callisto only treatments on 8 June, but on 22 June and 11 July the Callisto treatments resulted in significantly more dogbane injury compared to the check or Velpar alone. The greatest dogbane injury was ultimately in the Callisto 3oz/a + Velpar treatment, which correspondingly resulted in the lowest dogbane cover (2%).

There were no significant differences among treatments for broadleaf weed cover (Figure 5) or grass cover (Figure 6). Grass cover was extremely low in 2016, likely due to the hot dry summer; even the check had <1% grass cover at all evaluations and therefore, treatment differences or lack thereof could not be determined with certainty. Although there were no differences in broadleaf weed cover, the Callisto 2 oz/a treatment had the lowest cover overall at each evaluation, regardless of Velpar, while the 3 oz/a treatment had the highest regardless of Velpar.

T-tests

T-tests for examining the effects of Velpar addition to the main treatments yielded no significant differences for any of the variables assessed, for any of the treatments at any evaluation date. Therefore, the results are not presented here.

Figure 1. Wild blueberry cover following pre-emergence application of Velpar and post-emergence applications of Callisto ($\alpha=0.05$, no significant differences).

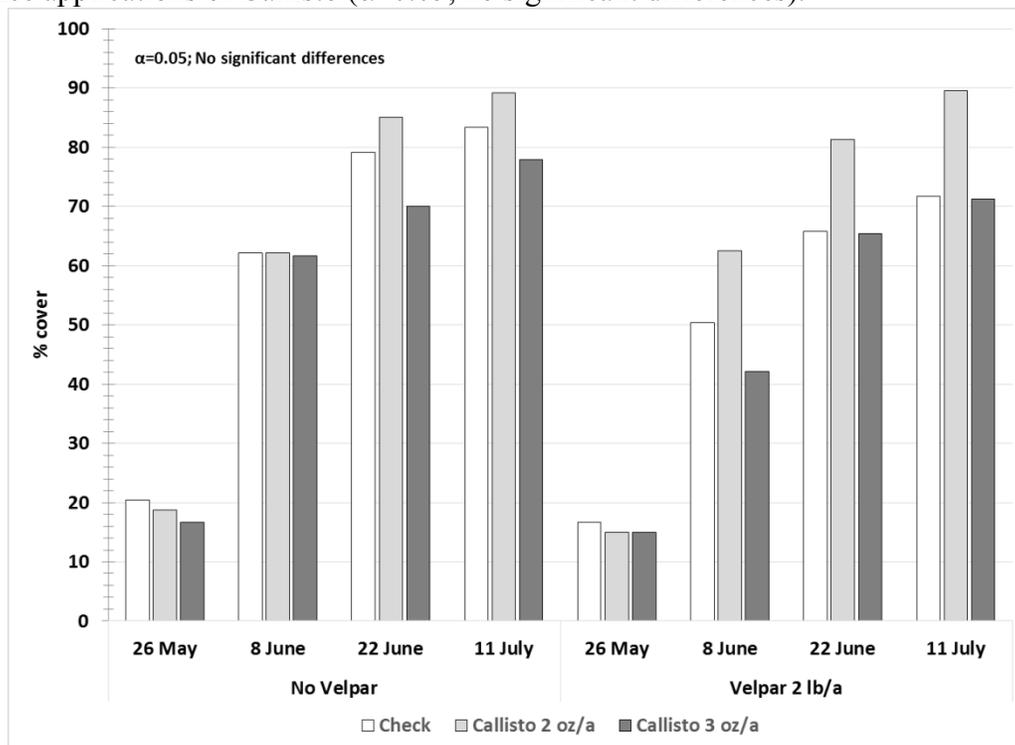


Figure 2. Wild blueberry phytotoxicity following pre-emergence application of Velpar and post-emergence applications of Callisto ($\alpha=0.05$, no significant differences).

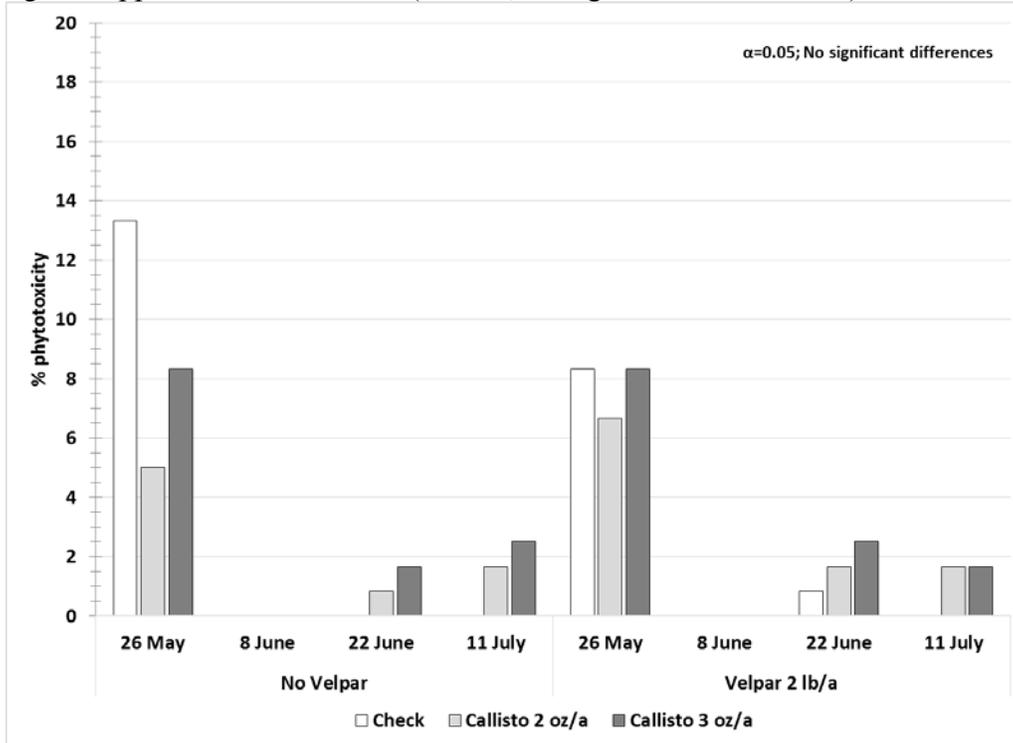


Figure 3. Dogbane cover following pre-emergence application of Velpar and post-emergence applications of Callisto (letters denote significant results only, at $\alpha=0.05$).

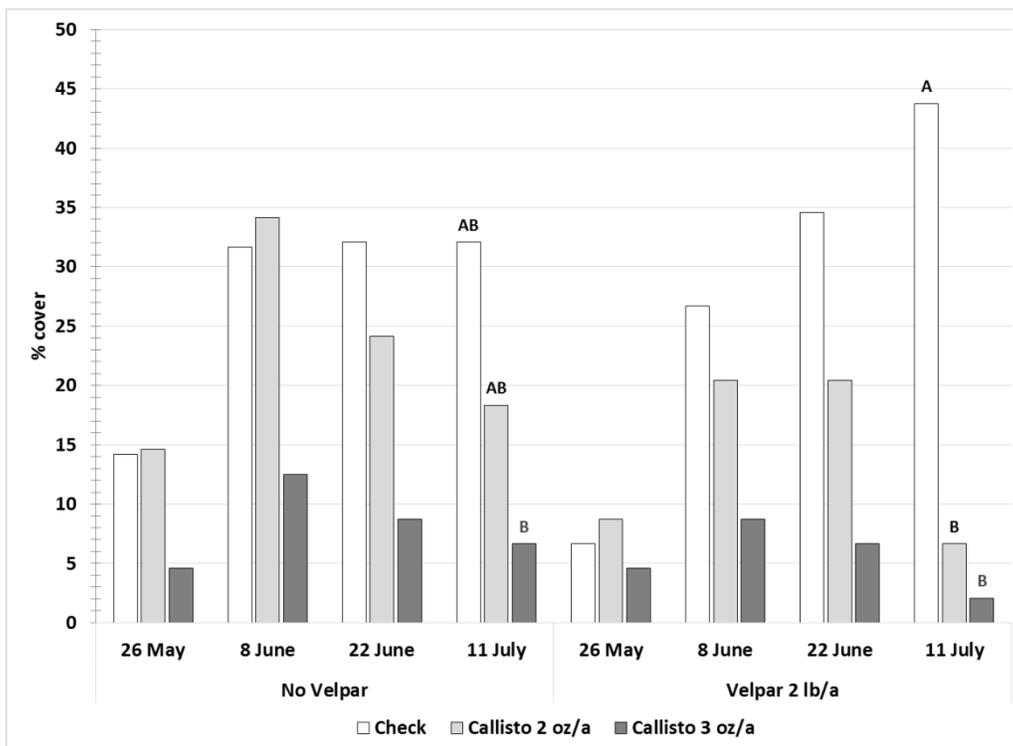


Figure 4. Dogbane phytotoxicity following pre-emergence application of Velpar and post-emergence applications of Callisto ($\alpha=0.05$).

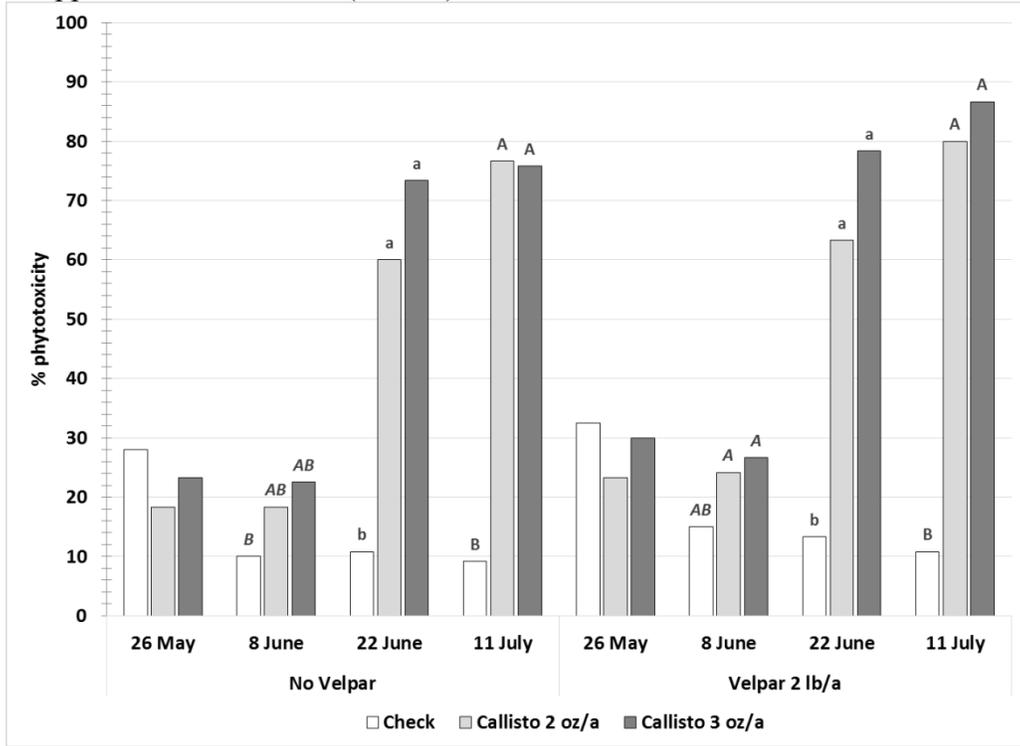


Figure 5. Broadleaf weed cover following pre-emergence application of Velpar and post-emergence applications of Callisto ($\alpha=0.05$, no significant differences).

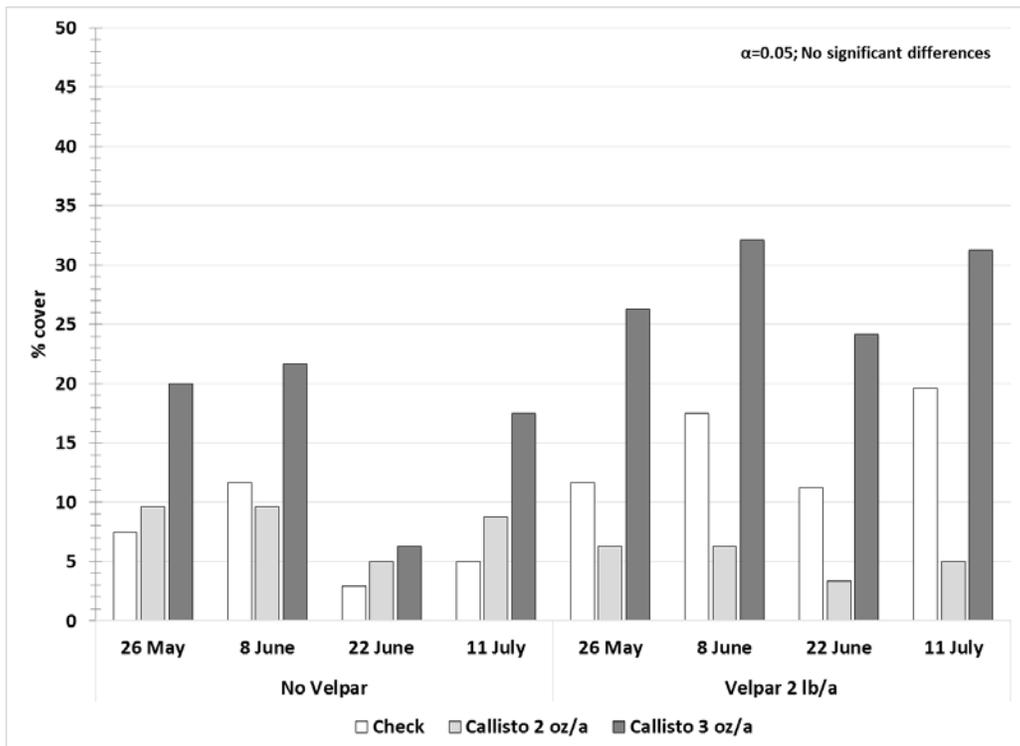
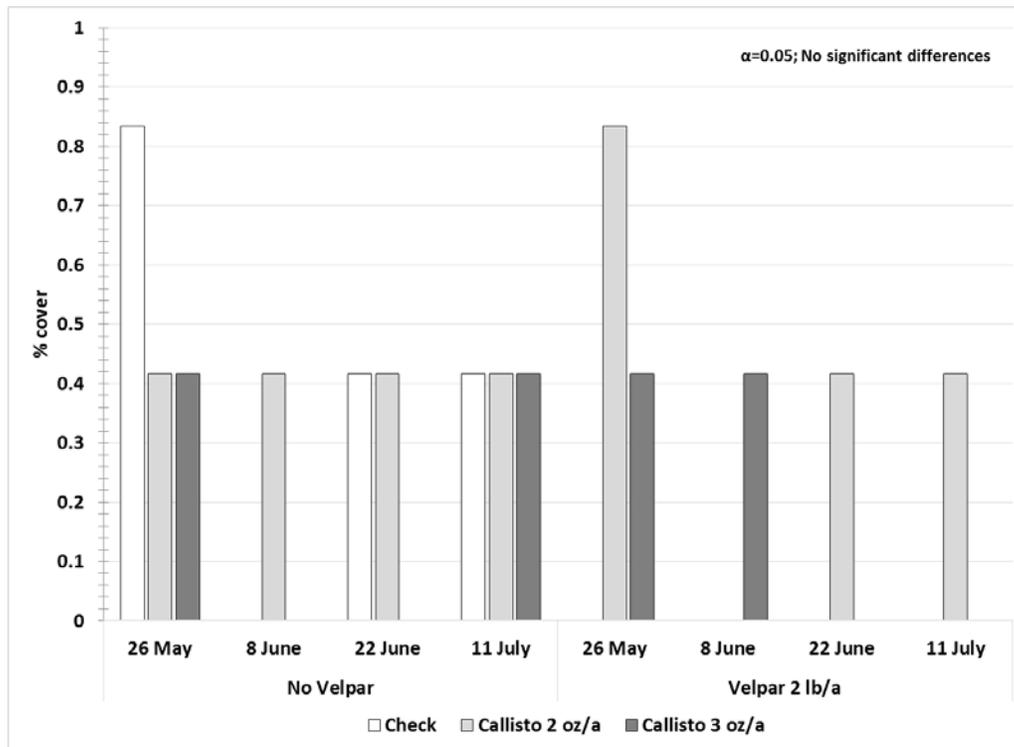


Figure 6. Grass cover following pre-emergence application of Velpar and post-emergence applications of Callisto ($\alpha=0.05$, no significant differences).



CONCLUSIONS: Although the Velpar combinations and Callisto 3 oz/a alone almost eliminated dogbane and no new seedlings were observed in July, dogbane was not completely controlled by any treatment. Some stems which appeared dead on 22 June showed slight regrowth of lateral leaves in July (Photo 2). Because dogbane is perennial, it is uncertain whether the reduction in root reserves from leafing out again would reduce or prevent emergence or reproduction the next year.

In contrast to the effects on dogbane cover, in which the Callisto 3 oz/a treatment was most effective in reducing dogbane and more so when combined with Velpar, the effect on other broadleaf weeds was the opposite. The higher rate of Callisto resulted in higher broadleaf weed cover, more so when combined with Velpar. The principal weed in this category was red sorrel (*Rumex acetosella*), another problem weed which is hard to control with Velpar or Callisto and is the subject of several University of Maine trials. We posit that the increase in broadleaf weeds with the higher rate of Callisto, namely red sorrel, is because the reduction of dogbane opened up the over story and increased the amount of light available which increased the growth of red sorrel, while at the same time any dogbane over story still present intercepted some spray solution so the red sorrel did not receive as much herbicide (Photo 1C).

The results of the t-tests indicate that the addition of Velpar does not significantly change the effects of Callisto on dogbane, although as stated above, there was a non-significant effect of slightly increased dogbane control and injury. Cherryfield Foods' herbicide regime for the same field resulted in less lateral regrowth of dogbane compared to the plants in the trial area. They applied Callisto 3 oz/a on 18 and 31 May with NIS and Request adjuvant, but they also hand wiped the plants with Roundup + Request on 18-20 June (Photo 1D).

Photo 1. Dogbane cover at the July 2016 evaluation in A) the untreated check, B) Callisto 2 oz/a no Velpar, C) Callisto 3 oz/a with Velpar, and D) Cherryfield Foods' treatments.



Photo 2. Example of lateral regrowth from nodes, in the trial area.



RECOMMENDATIONS: Pursue a 24-C label change to allow for more applications of Callisto



GROUP 27 HERBICIDE

PULL HERE TO OPEN ►

Callisto® Herbicide

syngenta®

For Control of Annual Broadleaf Weeds in Field Corn,
Seed Corn, 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 lb of active ingredient mesotrione per gallon.

KEEP OUT OF REACH OF CHILDREN. CAUTION

See additional precautionary statements and directions for use
inside booklet.



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

Product of Switzerland
Formulated in the USA

SCP 1131A-L1P 0515
4054864

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 by the poison control center or doctor. • Do not give anything 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)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves

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

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 clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

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.

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.

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

PRODUCT INFORMATION

Callisto is a systemic preemergence and postemergence herbicide for the selective contact and residual control of broadleaf weeds in field corn, seed corn, yellow popcorn, sweet corn, and other listed crops. When used preemergence, weeds take up the product through the soil during emergence. Dry conditions following application may reduce the preemergence activity of Callisto. 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, seed corn, 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, PPO, HPPD and ALS inhibiting herbicides are known to exist. Performance of Callisto is not affected by the presence of biotypes resistant to triazines, glyphosate, PPO or ALS inhibiting herbicides.

To prevent the risk of weeds developing resistance to Callisto 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 must 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 must 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.

USE RESTRICTIONS

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

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

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

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

Do not apply Callisto 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 unless specified otherwise under the specific crop section on the label.

USE PRECAUTIONS

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

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

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

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

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

SPRAY DRIFT DIRECTIONS

Avoid drift onto adjacent crops and other nontarget areas.

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

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. Refer to the Aerial Application section for specific instructions regarding droplet size.

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

ADDITIONAL SPRAY DRIFT DIRECTIONS FOR AERIAL APPLICATIONS

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

Spray must be released at the lowest height consistent with effective weed control and flight safety.

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

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

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

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

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

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

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

Do not apply during a temperature inversion, because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

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

APPLICATION INFORMATION

PREEMERGENCE GROUND APPLICATION

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

Spray nozzles must be uniformly spaced, the same size and type, and must provide accurate and uniform application. Use spray nozzles that provide medium to coarse droplet size to provide good coverage and avoid drift. Apply in a spray volume of 10-60 gal/A using water or liquid fertilizer (excluding suspension fertilizers) as the carrier. Use a pump that can maintain a pressure of at least 35-40 psi at the nozzles and provide proper agitation within the tank to keep the product dispersed. Lower pressures may be used with extended range or drift reduction nozzles.

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

POSTEMERGENCE GROUND APPLICATION

Spray nozzles must be uniformly spaced, the same size and type, and must provide accurate and uniform application. Use spray nozzles that provide medium to coarse droplet size to provide good coverage and avoid drift. Good weed coverage is essential for optimum weed control. Boom height for broadcast over-the-top applications must be based on the height of the crop – at least 15 inches above the crop canopy.

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

Flat fan nozzles of 80° or 110° are recommended for optimum postemergence coverage. Do not use floodjet nozzles or controlled droplet application equipment for postemergence applications.

Nozzles may be angled forward 45° to enhance penetration of the crop and provide better coverage. Ensure that all in-line strainer and nozzle screens in the sprayer are 50-mesh or coarser.

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

Aerial Application

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

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

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

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

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

SPRAY ADDITIVES

POSTEMERGENCE ADJUVANTS

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

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

POSTEMERGENCE APPLICATIONS TO FIELD CORN AND SEED CORN

For postemergence applications made after the crop has emerged, add crop oil concentrate (COC) to the spray solution at the rate of 1.0 gal/100 gal of water (1.0% v/v). The use of a nonionic surfactant (NIS) at 1 qt/100 gallons of water (0.25% v/v) instead of COC is allowed, but the weed control achieved with COC is consistently better than NIS. **The use of methylated seed oil (MSO) adjuvants or MSO blend adjuvants for postemergence applications of Callisto may cause severe crop injury to occur. Do not use MSO adjuvants for postemergence use unless directed for a specific tank mix under the CALLISTO TANK MIXTURES FOR CORN 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 lb/100 gal 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. For optimum control, the addition of atrazine is recommended wherever rotational or local atrazine restrictions allow.

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

MIXING PROCEDURES

Refer to the **Crop Use Directions** sections 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 may 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 the 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. Do not use screens finer than 50-mesh.
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 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.

WEEDS CONTROLLED

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

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

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

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

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

Table 1. Weeds Controlled With Postemergence Applications of Callisto

Weed Common Name	Weed Scientific Name	Callisto 3 fl oz/A	Callisto 2.5-3.0 fl oz/A + Atrazine ¹
		Apply to Weeds <5 Inches Tall ²	
Amaranth, palmer	<i>Amaranthus palmeri</i>	PC ³	C ³
Amaranth, powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Atriplex	<i>Chenopodium orach</i>	C	C
Broadleaf signalgrass	<i>Urochloa platyphylla</i>	C ³	C ³
Buckwheat, wild	<i>Polygonum convolvulus</i>	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C
Burcucumber	<i>Sicyos angulatus</i>	PC	C ³
Carpetweed	<i>Mollugo verticillata</i>	C	C
Carrot, wild	<i>Daucus carota</i>	PC	C
Chickweed, common	<i>Stellaria media</i>	C	C
Cocklebur, common	<i>Xanthium strumarium</i>	C	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	C ³	C ³
Dandelion	<i>Taraxacum officinale</i>	NC	PC
Dock, curly	<i>Rumex crispus</i>	PC	PC
Galinsoga	<i>Galinsoga parviflora</i>	C	C
Hemp	<i>Cannabis sativa</i>	C	C
Horsenettle	<i>Solanum carolinense</i>	PC	C
Jimsonweed	<i>Datura stramonium</i>	C	C
Horseweed (marestail)	<i>Conyza canadensis</i>	PC	C
Knotweed, prostrate	<i>Polygonum aviculare</i>	PC	PC
Kochia	<i>Kochia scoparia</i>	PC ³	C ³
Lambsquarters, common	<i>Chenopodium album</i>	C	C
Mallow, Venice	<i>Hibiscus trionum</i>	NC	C
Morningglory, entireleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C

Weed Common Name	Weed Scientific Name	Callisto 3 fl oz/A	Callisto 2.5-3.0 fl oz/A + Atrazine ¹
		Apply to Weeds <5 Inches Tall ²	
Mustard, wild	<i>Brassica kaber</i>	C	C
Nightshade, black	<i>Solanum nigrum</i>	C	C
Nightshade, Eastern black	<i>Solanum ptycanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Nutsedge, yellow	<i>Cyperus esculentus</i>	PC	PC
Pigweed, redroot	<i>Amaranthus retroflexus</i>	C	C
Pigweed, smooth	<i>Amaranthus hybridus</i>	C	C
Pigweed, tumble	<i>Amaranthus albus</i>	C	C
Pokeweed, common	<i>Phytolacca americana</i>	PC	PC
Potatoes, volunteer	<i>Solanum</i> spp.	C	C
Pusley, Florida	<i>Richardia scabra</i>	C ³	C ³
Ragweed, common	<i>Ambrosia artemisiifolia</i>	PC	C
Ragweed, giant	<i>Ambrosia trifida</i>	C ³	C
Sesbania, hemp	<i>Sesbania exaltata</i>	C	C
Sida, prickly (teaweed)	<i>Sida spinosa</i>	NC	C ³
Smartweed, ladysthumb	<i>Polygonum persicaria</i>	C ³	C
Smartweed, pale	<i>Polygonum lapathifolium</i>	C ³	C
Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>	C ³	C
Sunflower, common	<i>Helianthus annuus</i>	C	C
Thistle, Canada	<i>Cirsium arvense</i>	NC	PC
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C ³	C
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C ³	C

¹Callisto tank mixture with atrazine is approved only for use on corn and sugarcane.

²Under certain situations weeds can be controlled at larger than listed sizes, however to protect crop yield, manage weed resistance and provide consistent control, treat weeds before they exceed 5 inches in height.

³Apply before weed exceeds 3 inches in height.

C = Control PC = Partial Control NC = Not Controlled

Table 2. Weeds Controlled With Preemergence Applications of Callisto

Common Name	Scientific Name	Callisto Applied Alone	Callisto + Atrazine ¹
Amaranth, palmer	<i>Amaranthus palmeri</i>	C	C
Amaranth, powell	<i>Amaranthus powellii</i>	C	C
Amaranth, spiny	<i>Amaranthus spinosus</i>	C	C
Broadleaf signalgrass	<i>Urochloa platyphylla</i>	PC	PC
Buffalobur	<i>Solanum rostratum</i>	C	C
Burclover, California	<i>Medicago polymorpha</i>	C	-
Carpetweed	<i>Mollugo verticillata</i>	C	C
Carrot, wild	<i>Daucus carota</i>	C	-
Chickweed, common	<i>Stellaria media</i>	C	C
Chickweed, mouseear	<i>Cerastium vulgatum</i>	C	-
Cocklebur, common	<i>Xanthium strumarium</i>	PC	C
Crabgrass, large	<i>Digitaria sanguinalis</i>	PC	PC
Dandelion, common (seedling)	<i>Taraxacum officinale</i>	C	-
Deadnettle, purple	<i>Lamium purpureum</i>	C	-
Dock, curly	<i>Rumex crispus</i>	C	-
Eveningprimrose, cutleaf	<i>Oenothera laciniata</i>	C	-
Fiddleneck, coast	<i>Amsinckia intermedia</i>	C	-
Filaree, redstem	<i>Erodium cicutarium</i>	C	-
Filaree, whitestem	<i>Erodium moschatum</i>	C	-
Fleabane, hairy	<i>Conyza bonariensis</i>	C	-
Galinsoga	<i>Galinsoga parviflora</i>	C	C
Geranium, Carolina	<i>Geranium carolinianum</i>	C	-
Groundcherry, smooth	<i>Physalis subglabrata</i>	C	-
Groundsel, common	<i>Senecio vulgaris</i>	C	-
Henbit	<i>Lamium amplexicaule</i>	C	-
Horsenettle	<i>Solanum carolinense</i>	PC	-
Horseweed/marestail	<i>Conyza canadensis</i>	C	-
Jimsonweed	<i>Datura stramonium</i>	C	C
Kochia	<i>Kochia scoparia</i>	PC	C
Lambsquarters, common	<i>Chenopodium album</i>	C	C
Lettuce, prickly	<i>Lactuca serriola</i>	C	-
Mallow, common	<i>Malva neglecta</i>	C	-
Mayweed, chamomile	<i>Anthemis cotula</i>	C	-

Common Name	Scientific Name	Callisto Applied Alone	Callisto + Atrazine ¹
Morningglory, entireleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, ivyleaf	<i>Ipomoea hederacea</i>	PC	C
Morningglory, pitted	<i>Ipomoea lacunosa</i>	PC	C
Nettle, burning	<i>Urtica urens</i>	C	-
Nightshade, eastern black	<i>Solanum ptycanthum</i>	C	C
Nightshade, hairy	<i>Solanum sarrachoides</i>	C	C
Pansy	<i>Viola tricolor</i>	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
Pineappleweed	<i>Matricaria matricariodes</i>	C	-
Puncturevine, common	<i>Tribulus terrestris</i>	C	-
Purslane, common	<i>Portulaca oleracea</i>	C	-
Pusley, common	<i>Richardia scabra</i>	PC	-
Ragweed, common	<i>Ambrosia artemisiifolia</i>	C	C
Ragweed, giant	<i>Ambrosia trifida</i>	PC	C
Redmaids	<i>Calandria caulescens</i>	C	-
Rocket, London	<i>Sisymbrium irio</i>	C	-
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	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
Sowthistle, annual	<i>Sonchus oleraceus</i>	C	-
Spanishneedles	<i>Bidens bipinnata</i>	C	-
Sunflower, common	<i>Helianthus annuus</i>	PC	C
Swinecress	<i>Coronopus didymus</i>	C	-
Tasselflower, red	<i>Emilia sonchifolia</i>	C	-
Velvetleaf	<i>Abutilon theophrasti</i>	C	C
Waterhemp, common	<i>Amaranthus rudis</i>	C	C
Vetch, common	<i>Vicia sativa</i>	C	-
Vetch, purple	<i>Vicia benghalensis</i>	PC	-
Waterhemp, tall	<i>Amaranthus tuberculatus</i>	C	C
Willowherb, panicle	<i>Epilobium brachycarpum</i>	C	-

¹Callisto tank mixture with atrazine is approved only for use on corn grain sorghum and sugarcane. Refer to the crop sections on this label for specific use directions.

C = Control PC = Partial Control

ROTATIONAL CROPS

When Callisto is applied as directed on this label, follow the crop rotation intervals in Table 3. If Callisto is tank mixed with other products, follow the most restrictive product's crop rotation interval.

Table 3. Time Interval Between Callisto Application and Replanting or Planting of Rotational Crop

Crop	Replant/Rotational Interval
Asparagus Corn (all types) Cranberry Flax Kentucky bluegrass grown for seed Millet, pearl Oats Rhubarb Ryegrass (perennial and annual) grown for seed Sorghum (grain and sweet) Sugarcane Tall fescue grown for seed	Anytime
Small grain cereals including wheat, barley and rye	4 Months
Alfalfa Blueberry Canola Cotton Currant Lingonberry Okra Peanuts Peas ^{1,2} Potato Rice Snap beans ^{1,2} Soybeans Sunflowers Tobacco	10 Months

Crop	Replant/Rotational Interval
Cucurbits Dry beans Red clover Sugar beets All other rotational crops	18 Months

¹Plant these rotational crops only if the following criteria below have been met. If all criteria are not met, plant peas and snap beans a minimum of 18 months following Callisto application.

- A minimum of 20" of rainfall plus irrigation has been received between application and planting of the rotational crop.
- Soil pH is 6.0 or greater.
- Application of Callisto at 3 fl oz/A or less applied no later than June 30th the year preceding rotational crop planting.
- No other HPPD herbicides (e.g., Callisto® Xtra, Halex® GT, Lexar® EZ, Lumax® EZ, Zemax®, Armezon™, Balance® Flexx, Capreno®, Corvus®, Impact®, or Laudis®) were applied the year prior to planting peas and snap beans.

²Do not plant peas or snap beans on sand, sandy loam or loamy sand soils in Minnesota or Wisconsin.

CROP USE DIRECTIONS

CORN

Callisto may be applied by ground for preemergence or postemergence weed control in field corn, seed corn, yellow popcorn, and sweet corn.

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

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 **SPRAY ADDITIVES** 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 year. Do not make more than 2 applications of Callisto per year. Do not exceed 3.0 fl oz (0.094 lb ai/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 **SPRAY ADDITIVES** section 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 year. Do not exceed a total of 7.7 fl oz/A (0.24 lb ai/A) of Callisto per year.
- 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 ai/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 ai/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 ai/A) by ground sprayers in a spray volume of 10-30 gal of water (up to 80 gal 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 TANK MIXTURES FOR CORN

Callisto may be tank mixed with other registered herbicides for improved spectrum of weed control in burndown, preemergence or postemergence applications. Additionally these tank mixtures can be used to include a different mode of action herbicide to help control or manage the development of resistant weed biotypes.

Burndown Tank Mixtures in Corn

Callisto may be applied in tank mixture with other registered herbicides for burndown plus residual weed control.

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 in tank mixes with Gramoxone® brands, Roundup® brands, Touchdown® brands, dicamba brands (e.g. Banvel®) and/or 2,4-D. For greater residual control, use 6.0-7.7 fl 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.

Preemergence Tank Mixtures in Corn

Callisto may be applied at a rate of 5.3-7.7 fl oz/A in tank mixture with other registered herbicides (Table 4) for preemergence residual weed control. Refer to Table 2 for a list of weeds controlled by Callisto and Callisto plus AAtrex® applied preemergence.

Table 4. Callisto Tank Mixtures for Preemergence Application in Corn¹

AAtrex	Degree Xtra®	Harness Xtra® 5.6L
Bicep Lite II Magnum®	Dual II Magnum®	Keystone®
Bicep II Magnum®	Expert®	Keystone® LA
Cinch®	Fultime®	Outlook®
Cinch® ATZ	Guardman Max®	Prowl®
Cinch® ATZ Lite	Harness®	Surpass® EC
Degree®	Harness Xtra®	TopNotch®

¹Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

Postemergence Tank Mixtures in Corn

The tank mixtures with Callisto identified in Table 5 may be applied postemergence to corn (i.e., after corn has emerged). Unless specified otherwise on this label or a Syngenta supplemental label, do not apply Callisto at less than 3.0 fl oz/A. Application of Callisto at rates less than 3.0 fl oz (0.094 lb ai/A) postemergence may result in a loss of residual control.

Always add an appropriate adjuvant to the spray tank (see the **SPRAY ADDITIVES** section 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.

Table 5. Callisto Tank Mixtures for Postemergence Application in Corn

Tank-Mix Partners ¹	Directions
AAtrex® 4L AAtrex® Nine-O®	<ul style="list-style-type: none"> Refer to Table 1 on this label for application rates and weeds controlled.
Accent® Accent® Q	<ul style="list-style-type: none"> Use this mixture for additional grass control. Refer to product label for list of weeds controlled.
Basagran®	<ul style="list-style-type: none"> Use this mixture for additional broadleaf weed control. Refer to product label for list of weeds controlled.
Basis® Basis Gold®	<ul style="list-style-type: none"> Use this mixture for additional weed control. Refer to product label for list of weeds controlled.
Bicep II Magnum Bicep Lite II Magnum	<ul style="list-style-type: none"> When using these tank mixtures, it is recommended to leave the nitrogen based adjuvant (UAN or AMS) out of the mixture or apply as a post-directed spray to minimize contact with crop foliage. 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.
Buctril® Moxy®	<ul style="list-style-type: none"> Use this mixture for additional broadleaf weed control. Add Buctril (2 lb/gal) or Moxy (2 lb/gal) at a rate up to 6 fl oz/A. Add Buctril (4 lb/gal) at a rate up to 3 fl oz/A.

Tank-Mix Partners ¹	Directions
Expert	<ul style="list-style-type: none"> • For use only in glyphosate tolerant corn (e.g. Agrisure® GT, Roundup Ready®). • Application of this mixture to a corn hybrid that is not glyphosate tolerant will result in crop death. • Do not add urea ammonium nitrate (UAN) or methylated seed oil (MSO) type adjuvants to this tank mixture or crop injury may occur.
Ignite® Ignite® 280 SL	<ul style="list-style-type: none"> • Use this tank mixture only on corn designated as LibertyLink® or warranted as being tolerant to glufosinate. • Application of this mixture to a corn hybrid that is not glufosinate tolerant will result in severe crop injury or death. • Do not use crop oil concentrate (COC) as an adjuvant for this mixture or severe crop injury may occur.
Lightning®	<ul style="list-style-type: none"> • For use only on corn designated as Clearfield® corn or warranted by BASF as being tolerant to Lightning Herbicide. • Application of this mixture to a corn hybrid that is not Lightning tolerant will result in severe crop injury or death. • Do not use a Methylated Seed Oil (MSO), or an MSO blend with this mixture or severe crop injury may result.
Northstar®	<ul style="list-style-type: none"> • Use this mixture for additional weed control. Refer to product label for list of weeds controlled.
Peak®	<ul style="list-style-type: none"> • Use this mixture for additional weed control. Refer to product label for list of weeds controlled.
Spirit®	<ul style="list-style-type: none"> • Use this mixture for additional weed control. Refer to product label for list of weeds controlled.
Steadfast® Steadfast® ATZ Steadfast® Q	<ul style="list-style-type: none"> • Use this mixture for additional weed control. Refer to product label for list of weeds controlled.
Stout®	<ul style="list-style-type: none"> • Use this mixture for additional weed control. Refer to product label for list of weeds controlled.

continued...

**Table 5. Callisto Tank Mixtures for Postemergence Application in Corn
(continued)**

Tank-Mix Partners ¹	Directions
Touchdown Roundup Solo glyphosate products	<ul style="list-style-type: none"> • For use only in glyphosate tolerant corn (e.g. Agrisure GT, Roundup Ready). • Application of this mixture to a corn hybrid that is not glyphosate tolerant will result in crop death. • Add spray-grade ammonium sulfate (AMS) at a rate that delivers 8.5-17.0 lb of AMS/100 gallons of water. • 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 quart/100 gallons). • Do not add urea ammonium nitrate (UAN), crop oil concentrate (COC), or methylated seed oil (MSO) type adjuvants to this tank mixture or crop injury may occur.

¹Refer to individual product labels for precautionary statements, restrictions, rates, approved uses, and a list of weeds controlled.

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 must 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 must 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.

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

Callisto may be applied as a pre-bloom post-directed spray in high bush blueberry, lingonberry, red currant, black currant, black raspberry, red raspberry, and blackberry. For a list of weeds controlled see Tables 1 and 2. Callisto may be applied in bush or caneberries at a rate up to 6 fl oz/A. If a split application weed control program is desired, 3 fl oz/A followed by 3 fl oz/A may be used, 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. Applications of Callisto during dry weather conditions and/or temperatures above 85° 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.

BLUEGRASS, RYEGRASS (ANNUAL AND PERENNIAL) AND TALL FESCUE GROWN FOR SEED

Callisto can be applied to bluegrass, annual ryegrass, 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.

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 must 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. In addition to the weeds listed in Table 2, Callisto applied preemergence will control mannagrass.

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. In addition to the weeds listed in Table 2, Callisto applied postemergence will control mannagrass (up to 3 tillers).

Use the 6.0 fl oz/A rate for postemergence weed control plus extended residual weed control (see Table 2). The addition of a crop oil concentrate type adjuvant at 1% v/v or a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v is recommended. Postemergence applications of Callisto may result in temporary bleaching of the grass crop.

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

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

Restrictions:

1. Do not harvest the grass crop for seed or straw within 60 days following the application of Callisto.
2. Do not graze or feed forage from treated areas within 14 days following harvest of seed or straw and at least 74 days after application of Callisto.
3. Do not make more than two applications of Callisto per year.
4. Do not apply more than 6 fl oz/A in a single application and not more than 9 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.

CRANBERRY

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

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

Chemigation – Sprinkler Irrigation Application for Cranberry Only

Check the irrigation system to ensure uniform application of water to all areas. Thorough coverage of foliage is required for good control. Good agitation in the pesticide supply tank should be maintained prior to and during the entire application period. Apply by injecting the recommended rate of Callisto Herbicide into the irrigation system using a metering device that will introduce a constant flow and by distributing the product to the target areas in 0.1-0.2 acre-inch of water. In general, use the least amount of water in this range required for proper distribution and coverage.

Once the application is completed, flush the entire irrigation and injection system with clean water before stopping the system. In addition to the above recommendations, if application is being made during a normal irrigation set of a stationary sprinkler, the recommended rate of Callisto Herbicide for the area covered should be injected into the system only during the end of the irrigation set for sufficient time to provide adequate coverage and product distribution.

Chemigation Use Precautions – Sprinkler Irrigation Application

1. Apply this product only through sprinkler irrigation systems including center pivot or solid set. Do not apply this product through any other type of irrigation system.
2. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.
3. If you have any questions about calibration, you should contact State Extension Service Specialists, equipment manufacturers or other experts.

4. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
5. A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person shall shut the system down and make necessary adjustments should the need arise.
6. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back-flow.
7. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
8. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
9. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
10. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when pressure decreases to the point where pesticide distribution is adversely affected.
11. Systems must use a metering pump, such as a positive displacement injection pump (e.g. diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and are capable of being fitted with a system interlock.
12. Any alternatives to the above required safety devices must conform to the list of EPA approved alternative devices.
13. Do not apply when wind speed favors drift beyond the area intended for treatment or nonuniform distribution of treated water.

Additional Restrictions: 1) Do not apply directly to water or areas where surface water is present outside the bog system. 2) Do not contaminate water when disposing of equipment wash water or rinsate. 3) Do not apply within 10 feet of surface water outside the bog system. 4) Do not spray to runoff.

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 gal 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.

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 must 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 must 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.

OKRA

Callisto can be applied as a row-middle or a hooded post-direct treatment (but not both) for weed control in okra.

Preemergence row-middle application: Apply Callisto at a rate of 6.0 fl oz/A as a banded application to the row middles prior to weed emergence. For this banded application, leave one foot of untreated area over the okra row or 6" to each side of the planted row. For banded applications, the application must be made to account for band width, i.e. to deliver 6.0 fl oz per treated acre. Do not apply Callisto directly over the planted okra row or severe crop injury may occur. Injury risk is greatest on coarse textured soils (sand, sandy loam or loamy sand).

Postemergence hooded application: Apply Callisto at a rate of 3.0 fl oz/A as a postemergence directed application using a hooded sprayer for control or partial control of the weeds listed in Table 1. Okra must be at least 3" tall at the time of this application. It is recommended that a nonionic surfactant (NIS) type adjuvant at a rate of 0.25% v/v be added to the spray solution. For postemergence hooded applications, the spray equipment must be set up to minimize the amount of Callisto that contacts the okra foliage or crop injury will occur. For best postemergence results, Callisto must be applied to actively growing weeds.

Restrictions:

1. Do not harvest okra within 28 days following the application of Callisto.
2. Do not make more than one application of Callisto per okra crop.
3. Do not apply Callisto as a row-middle application at more than 6.0 fl oz per treated acre per year.
4. Do not apply Callisto as a post-directed application at more than 3.0 fl oz per acre per year.
5. Do not apply Callisto as a broadcast preemergence or broadcast postemergence application to okra or severe injury will occur.
6. If the okra crop treated with Callisto is lost or destroyed, okra can be replanted only in the soil band that was not treated with Callisto.

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 gal 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.

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.

SORGHUM (GRAIN AND SWEET)

Preemergence Application: 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.

Preemergence Application Restrictions:

1. Do not apply more than 6.4 fl 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.

Post-Directed: Callisto can be applied post-directed to grain sorghum for control or partial control of the weeds listed in Table 1. For best results, apply Callisto to actively growing weeds.

Apply Callisto at a rate of 3 fl oz/A as a post-directed application when the grain sorghum is a minimum of 8 inches tall. Make the application by directing the spray between the crop rows and towards the base of the grain sorghum plant. Direct application of Callisto onto grain sorghum foliage can result in crop injury including temporary bleaching. If crop injury does occur, newly emerging leaves following application are typically unaffected.

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 Urea Ammonium Nitrate (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.

Callisto may be tank mixed with other herbicides registered for grain sorghum for improved spectrum of weed control. Additionally, these tank mixtures can be used to include a herbicide with a different mode of action to help control or manage the development of resistant weed biotypes.

Post-Directed Restrictions:

1. Do not apply more than one post-directed application of Callisto.
2. Do not apply more than 3.0 fl oz/A of Callisto post-directed and not more than 6.4 fl oz/A of Callisto per grain sorghum crop year.
3. Do not apply Callisto broadcast over-the-top to emerged sorghum or severe crop injury may occur.
4. Do not harvest grain sorghum for forage for 30 days following application.
5. Do not harvest for grain or stover for 60 days following application.
6. Do not apply Callisto after the sorghum seedhead has begun to emerge.
7. Do not use Callisto in the production of forage sorghum, sudangrass, or sorghum-sudangrass hybrids.

SUGARCANE

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

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

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 must 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. If a preemergence application of Callisto is made, only one postemergence application is allowed.
4. Do not make two Callisto applications less than 14 days apart.
5. Do not apply more than 10.7 fl oz/A of Callisto per year.
6. Do not harvest sugarcane within 114 days following a post-over-the-top application of Callisto (114 day PHI).
7. 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 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 [Less Than or Equal to 5 Gallons]

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

Container Handling [Greater Than 5 Gallons]

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

Container Handling [Greater Than 5 Gallons]

Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container $\frac{1}{4}$ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

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.

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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-L1P 0515
4054864

GROUP 27 HERBICIDE



Callisto[®]

Herbicide

For Control of Annual Broadleaf Weeds
in Field Corn, Seed Corn, 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 lb 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



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Manufactured for:

Syngenta Crop Protection, LLC

P. O. Box 18300

Greensboro, North Carolina 27419-8300

SCP 1131A-L1P 0515 4054864

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.

STORAGE AND DISPOSAL

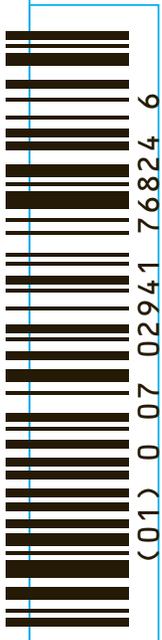
Do not contaminate water, food, or feed by storage or disposal.

Pesticide Storage: Keep container tightly closed when not in use. Do not store near seed, fertilizers, or 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 or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

**KEEP OUT OF REACH OF CHILDREN.
CAUTION**



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 by the poison control center or doctor. • Do not give anything 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.

©2015 Syngenta

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

**SCP 1131A-L2J 0515
4054861**

CALLISTO® Herbicide

Date: 1/9/2015
 Replaces: 1/9/2015

1. PRODUCT IDENTIFICATION

Product identifier on label: **CALLISTO® Herbicide**
 Product No.: A12738A
 Use: Herbicide
 Manufacturer: Syngenta Crop Protection, LLC
 Post Office Box 18300
 Greensboro NC 27419
 Manufacturer Phone: 1-800-334-9481

Emergency Phone: 1-800-888-8372

2. HAZARDS IDENTIFICATION

Classifications: Specific Target Organ Toxicity: Repeated Category 2
 Signal Word (OSHA): Warning
 Hazard Statements: May cause damage to organs through prolonged or repeated exposure

Hazard Symbols:



Precautionary Statements: Do not breathe mist, vapors, spray.
 Get medical advice if you feel unwell.
 Dispose of contents and container in accordance with local regulations.

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Common Name	CAS Number	Concentration
Ethylene Glycol	Ethylene Glycol	107-21-1	<15%
Other ingredients	Other ingredients	Trade Secret	>45%
2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione	Mesotrione	104206-82-8	40.0%

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

CALLISTO® Herbicide

Date: 1/9/2015

Replaces: 1/9/2015

4. FIRST AID MEASURES

Have the product container, label or 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. Do not give any liquid to the person. 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.

Most important symptoms/effects:

Not Applicable

Indication of immediate medical attention and special treatment needed:

There is no specific antidote if this product is ingested.

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

Use dry chemical, foam or CO2 extinguishing media. If water is used to fight fire, dike and collect runoff.

Specific 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.

Special protective equipment and precautions for firefighters:

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.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures:

Follow exposure controls/personal protection outlined in Section 8.

Methods and materials for containment and cleaning up:

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.

CALLISTO® Herbicide

Date: 1/9/2015
 Replaces: 1/9/2015

7. HANDLING AND STORAGE

Precautions for safe handling:

Spray solutions of this product should be mixed, stored and applied using only plastic, plastic-lined steel, stainless steel or fiberglass/plastic containers. Concentrate should not be stored or maintained in long-term contact with galvanized steel, carbon steel, aluminum, brass or cast iron.

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.

Conditions for safe storage, including any incompatibilities:

Not Applicable

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.

Occupational Exposure Limits:

Chemical Name	OSHA PEL	ACGIH TLV	Other	Source
Ethylene Glycol	Not Established	100 mg/m ³ (ceiling) [aerosol]	Not Established	Not Applicable
Other ingredients	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Mesotrione	Not Established	Not Established	5 mg/m ³ TWA	Syngenta

Appropriate engineering controls:

Use effective engineering controls to comply with occupational exposure limits (if applicable).

Individual protection measures:

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.

CALLISTO® Herbicide

Date: 1/9/2015
Replaces: 1/9/2015

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Beige to tan liquid
Odor: Faint; pleasant
Odor Threshold: Not Available
pH: 2.4 - 2.8 @ 68°F (20°C)
Melting point/freezing point: Not Available
Initial boiling point and boiling range: Not Available
Flash Point (Test Method): > 200°F
Flammable Limits (% in Air): Not Available
Flammability: Can burn in fire, releasing toxic vapors.
Vapor Pressure: Mesotrione < 4.3 x 10⁻⁸ mmHg @ 68°F (20°C)
Vapor Density: Not Available
Relative Density: 1.2 g/ml ; 10 lbs/gal @ 68°F (20°C)
Solubility (ies): Mesotrione 160 mg/l @ 68°F (20°C) (99.7% pure)
Partition coefficient: n-octanol/water: Not Available
Autoignition Temperature: Not Available
Decomposition Temperature: Not Available
Viscosity: Not Available
Other: None

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.
Chemical stability: Stable under normal use and storage conditions.
Possibility of hazardous reactions: Will not occur.
Conditions to Avoid: Spray solutions of this product should be mixed, stored and applied using only plastic, plastic-lined steel, stainless steel or fiberglass/plastic containers. Concentrate should not be stored or maintained in long-term contact with galvanized steel, carbon steel, aluminum, brass or cast iron.
Incompatible materials: None known.
Hazardous Decomposition Products: Not Available

11. TOXICOLOGICAL INFORMATIONHealth effects information

Likely routes of exposure: Dermal, Inhalation

Symptoms of exposure: Not Applicable

Delayed, immediate and chronic effects of exposure: Not Applicable

CALLISTO® Herbicide

Date: 1/9/2015
Replaces: 1/9/2015

Numerical measures of toxicity (acute toxicity/irritation studies (finished product))

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

Reproductive/Developmental Effects

Mesotrione : Did not show reproductive effects in animal experiments.

Chronic/Subchronic Toxicity Studies

Mesotrione : No adverse effect has been observed in chronic toxicity tests.

Carcinogenicity

Mesotrione : Did not show carcinogenic effects in animal experiments.

Chemical Name	NTP/IARC/OSHA Carcinogen
Ethylene Glycol	No
Other ingredients	No
2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-cyclohexanedione	No

Other Toxicity Information

None

Toxicity of Other Components

Ethylene Glycol

Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice. Exposure to high concentrations of mists or aerosols may result in effects on the hematopoietic system and central nervous system with headache, dizziness and drowsiness. Severe kidney damage results from swallowing large amounts of ethylene glycol.

Other ingredients

Not Applicable

Target Organs

Active Ingredients

Mesotrione : Blood, eye, kidney, liver.

Inert Ingredients

Ethylene Glycol: Blood, kidney, CNS

Other ingredients: Not Applicable

CALLISTO® Herbicide

Date: 1/9/2015
Replaces: 1/9/2015

12. ECOLOGICAL INFORMATION

Eco-Acute Toxicity

Mesotrione :

Fish (Rainbow Trout) 96-hour LC50 >120 mg/l
Fish (Bluegill Sunfish) 96-hour LC50 >120 mg/l
Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 900 mg/l
Green Algae 72-hour EbC50 4.5 mg/l

Environmental Fate

Mesotrione :

The substance has low potential for bioaccumulation. Mesotrione has medium to high mobility in soil.

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

Comments

Water Transport - International
Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Mesotrione), Marine Pollutant
Hazard Class: Class 9
Identification Number: UN 3082
Packing Group: PG III

Air Transport

Proper Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S. (Mesotrione)
Hazard Class: Class 9
Identification Number: UN 3082
Packing Group: PG III

15. REGULATORY INFORMATION

Pesticide Registration:

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

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.

CALLISTO® Herbicide

Date: 1/9/2015
 Replaces: 1/9/2015

EPA Registration Number(s):
 100-1131

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)

CERCLA/SARA 304 Reportable Quantity (RQ):

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

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
*	Chronic

Syngenta Hazard Category: B

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 11/26/2000

Revision Date: 1/9/2015

Replaces: 1/9/2015

Section(s) Revised: 2, 4, 7, 11

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.



STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

To: Board of Pesticides Control Members
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist
RE: EPA Special Local Need (SLN) [FIFRA, Section 24(c)] application to approve the use of Malathion 8 Aquamul, EPA Reg. No. 34704-474, on lowbush and highbush blueberries to control spotted wing drosophila
Date: May 3, 2017

Enclosed is the above referenced Special Local Need (SLN) [FIFRA, Section 24(c)] application and supporting documents for your consideration.

On February 25, 2013, the Board of Pesticides Control approved a Section 24(c) registration for use of Gowan Malathion 8 Flowable, to control spotted wing drosophila, in blueberries. On February 17, 2017, the Board also approved the use of Gowan Malathion 8 Flowable in cane berries. This request to approve a 24(c) registration for Malathion 8 Aquamul, EPA Reg. No. 34704-474, manufactured by Loveland Products, Inc., is based on economic considerations. The product is reported to be less expensive than the Gowan brand, thus, reducing costs to Maine growers. The SLN is for the same rate as Gowan brand.

The expiration date will be December 31, 2018 to align with the expiration date of the two Gowan malathion SLNs.

Please review the following documents and let me know if you have any questions.

- FIFRA, Section 24(c) application
- Malathion 8 Aquamul draft Maine SLN label
- Letter of support from Kelsey Riccio, Registration Manager, Loveland Products, Inc.
- Letter of support from Dave Yarborough, Ph.D., Maine Cooperative Extension Wild Blueberry Specialist
- Malathion 8 Aquamul Section 3 label
- Malathion 8 Aquamul MSDS

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

CAM LAY, DIRECTOR
32 BLOSSOM LANE, MARQUARDT BUILDING



PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG

United States Environmental Protection Agency
Office of Pesticide Programs, Registration Division (7505C)
Washington, DC 20460



**Application for/Notification of State Registration
of a Pesticide To Meet a Special Local Need**
*(Pursuant to section 24(c) of the Federal Insecticide,
Fungicide, and Rodenticide Act, as Amended)*

For State Use Only
Registration No. Assigned
Date Registration Issued

1. Name and Address of Applicant for Registration	2. Product is (Check one)	
	<input type="checkbox"/> EPA-Registered	EPA Registration Number
	<input type="checkbox"/> New (not EPA-registered) Attach EPA Form 8570-4, Confidential Statement of Formula for new products.	EPA Company Number
3. Active Ingredient(s) in Product		

4. Product Name	5. If this is a food/feed use, a tolerance or other residue clearance is required. Cite appropriate regulations in 40 CFR Part 180, 185, and/or 186.
-----------------	--

6. Type of Registration (Give details in Item 13 or on a separate page, properly identified and attached to this form): a. To permit use of a new product. b. To amend EPA registrations for one or more of the following purposes: (1) To permit use on additional crops or animals. (2) To permit use at additional sites. (3) To permit use against additional pests. (4) To permit use of additional application techniques or equipment. (5) To permit use at different application rates. (6) Other (specify below)	7. Nature of Special Local Need (check one) <input type="checkbox"/> There is no pesticide product registered by EPA for such use. <input type="checkbox"/> There is no EPA-registered pesticide product which, under the conditions of use within the State, would be as safe and/or as efficacious for such use within the terms and conditions of EPA registration. <input type="checkbox"/> An appropriate EPA-registered pesticide product is not available.
	8. If this registration is an amendment to an EPA-registered product, is it for a "new use" as defined in 40 CFR 152.3? <input type="checkbox"/> Yes (discuss in Item 13 below) <input type="checkbox"/> No
	9. Has an EPA Registration or Experimental Use Permit for this chemical ever been (check applicable box(es), if known): <input type="checkbox"/> Sought <input type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Cancelled <input type="checkbox"/> Suspended <input type="checkbox"/> Registration <input type="checkbox"/> Experimental Use Permit <input type="checkbox"/> No Previous Permit Action
	10. Has FIFRA section 24(c) registration for this use of the product ever, by another State, been (check appropriate box(es), if known): <input type="checkbox"/> Sought <input type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Revoked If any of the above are checked, list States in item 13 below. <input type="checkbox"/> No FIFRA section 24(c) Action
	11. Endangered Species Act: (Give details in item 13 or on a separate page, properly identified and attached to this form) Identify the counties where this pesticide will be used. If Statewide, indicate "all." Provide a list of Federally protected endangered/threatened species which occur in the areas of proposed use.

10. Has FIFRA section 24(c) registration for this use of the product ever, by another State, been (check appropriate box(es), if known): <input type="checkbox"/> Sought <input type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Revoked If any of the above are checked, list States in item 13 below. <input type="checkbox"/> No FIFRA section 24(c) Action	11. Endangered Species Act: (Give details in item 13 or on a separate page, properly identified and attached to this form) Identify the counties where this pesticide will be used. If Statewide, indicate "all." Provide a list of Federally protected endangered/threatened species which occur in the areas of proposed use.
--	--

<p>Certification</p> <p>I certify that the statements I have made on this form and all attachments thereto are true, accurate, and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.</p>	12. Indicate use status of Special Local Need, i.e., planned dates of use: From: _____ To: _____
--	---

Signature of Applicant or Authorized Representative	13. Comments (attach additional sheet, if needed)
Title	
Telephone Number _____ Date _____	

Determination by State Agency

This registration is for a Special Local Need and is being issued in accordance with section 24(c) of FIFRA, as amended. To the best of our knowledge, the information above is correct, except as noted in "Comments" below or in attachments.

Name, Title, and Address of State Agency Official Mary Tomlinson Maine Board of Pesticides Control 28 State House Station Augusta, ME 04333	Comments (by State Agency Only)	Received by EPA
Title Pesticides Registrar		
Telephone Number 207-287-7544 Date _____		

Paperwork Reduction Act Notice

The public reporting burden for this collection of information is estimated to average 2.5 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining needed data, and completing and reviewing this application form. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460; and to Office of Management and Budget, Paperwork Reduction Project (2070-0055), Washington, DC 20503, marked "Attention Desk Officer for EPA."

SECTION 24[c] REGISTRATION
FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE
OF MAINE

MALATHION 8 AQUAMUL Organophosphate Insecticide

EPA Reg. No. 34704-474

EPA SLN No.

Expiration Date: 12/31/2018

DIRECTIONS FOR USE

- IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.
- THIS LABELING MUST BE IN THE POSSESSION OF THE USER AT THE TIME OF APPLICATION.
- FOLLOW ALL APPLICABLE DIRECTIONS, RESTRICTIONS, WORKER PROTECTION STANDARD REQUIREMENTS, AND PRECAUTIONS ON THE EPA REGISTERED LABEL.

SPOTTED WING DROSOPHILA CONTROL IN BLUEBERRIES

CROP	PEST	RATE (Pts./A)	DIRECTIONS	PRE-HARVEST INTERVAL (PHI)
Blueberries	Spotted Wing Drosophila	Up to 2.5	<ul style="list-style-type: none"> • The maximum application rate is 2.5 lbs AI/A (2.5 pts Malathion 8 Aquamul); and the maximum number of applications per year is 2. • Do not exceed a total maximum use rate of malathion from all sources of 5 lbs AI per acre per season. • The minimum retreatment interval is 7 days. • The Restricted Entry Interval (REI) is 12 hrs 	1 Day

24[c] Registrant
Loveland Products, Inc.
PO Box 1286
Greeley, Colorado 80632-1286



May 2, 2017

Mary E. Tomlinson
Pesticide Registrar/Water Quality Specialist
Maine Board of Pesticides Control
28 State House Section
Augusta, ME 04333

Subject: EPA Reg No 34704-474-Malathion 8 Aquamul

Dear Ms. Tomlinson,

Please find enclosed an application for a 24c for Malathion Aquamul for the control of Spotted Wing Drosophila on Blueberries. Loveland is submitting this application per the request of the Cooperative Extension and Blueberry growers in Maine.

Enclosed please find the following:

24c label
Current label for Malathion 8 Aquamul (34704-474)
Registration Application
EPA form 8570-25
Letter from Main Cooperative Extension

Loveland Products, Inc. and Main Blueberry Growers request approval for this request as soon as possible. Thank you for your cooperation. Should you have any questions, or need additional documents, please contact me at 970-685-3558 or email me at Kelsey.Riccio@cpsagu.com.

Sincerely

A handwritten signature in blue ink that reads "Kelsey L. Riccio".

Kelsey L. Riccio
Senior Manager, State Registrations
Loveland Products, Inc.
PO Box 1286
Greeley, CO 80632
Phone: (970)685-3558
Email: Kelsey.Riccio@cpsagu.com



Wild Blueberry Office Deering Hall University of Maine, Orono 04469

March 13, 2017

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

Dear Mary:

The consensus is that a 24(c) label with the higher use rates is the best approach that we should take to obtain control of the spotted wing drosophila. This insecticide is needed to insure we can have different active ingredients for resistance management and it has a short PHI as well. This pest is increasing and will continue to be a serious threat, so this label is needed to insure its control. The Loveland product has the advantage of being 40% less expensive than the competitor, so its registration would provide an economic advantage for this new cost of production and enable Maine blueberry growers to remain economically competitive with Canadian and cultivated blueberries.

I request that the Board of Pesticides control approve the request from LOVELAND PRODUCTS, INC. for the renewal of the State of Maine 24(c) label for MALATHION 8 AQUAMUL EPA Registration Number: 34704-474 for the control of the spotted wing drosophila in blueberries in Maine for 2017.

Sincerely,

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

Phone: [207-581-2923](tel:207-581-2923)
TollFree: [800-897-0757 x 1](tel:800-897-0757)
Fax: [207-581-2941](tel:207-581-2941)
EMail Davidy@Maine.edu
www.wildblueberries.maine.edu

One of Maine's public universities

Published and distributed in furtherance of Cooperative Extension work, Acts of Congress of May 8 and June 30, 1914, by the University of Maine and the U.S Department of Agriculture cooperating. Cooperative Extension and other agencies of the U.S.D.A. provide equal opportunities in programs and employment



MALATHION 8 AQUAMUL

Organophosphate Insecticide

**FOR INSECT CONTROL ON LISTED ORNAMENTALS, FRUIT AND NUT TREES
AND VEGETABLE PLANTS.**

ACTIVE INGREDIENT:	% BY WT.
Malathion (O,O-Dimethyl phosphorodithioate of diethyl mercaptosuccinate)	81.8%
OTHER INGREDIENTS:	<u>18.2%</u>
	TOTAL 100.0%

Contains 8.0 pounds of Malathion per gallon.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

**For Additional Precautionary Statements, Complete First Aid, Directions for Use, Storage
and Disposal and Other Use Information, See Inside This Label Booklet.**

EPA REG. NO. 34704-474

120815 V1D 01Y16

FORMULATED FOR
LOVELAND PRODUCTS, INC.®, P.O. BOX 1286, GREELEY, COLORADO 80632-1286

PEEL FILM HERE ↑

EPA EST. NO. 34704-MS-002



NET CONTENTS 2.5 GAL (9.46 L)



GROUP 1 B INSECTICIDE

MALATHION 8 AQUAMUL

Organophosphate Insecticide

**FOR INSECT CONTROL ON LISTED ORNAMENTALS, FRUIT AND NUT TREES
AND VEGETABLE PLANTS.**

ACTIVE INGREDIENT:	% BY WT.
Malathion (O,O-Dimethyl phosphorodithioate of diethyl mercaptosuccinate)	81.8%
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TOTAL	100.0%

Contains 8.0 pounds of Malathion per gallon.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

**For Additional Precautionary Statements, Complete First Aid, Directions for Use, Storage
and Disposal and Other Use Information, See Inside This Label Booklet.**

EPA REG. NO. 34704-474

120815 V1D 01Y16

FORMULATED FOR
LOVELAND PRODUCTS, INC.®, P.O. BOX 1286, GREELEY, COLORADO 80632-1286

FIRST AID	
If swallowed:	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have a person sip a glass of water if able to swallow. • Do not induce vomiting unless told to by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 to 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 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 to 20 minutes. • Call a poison control center or doctor for treatment advice.
<p>NOTE TO PHYSICIAN: This product may cause cholinesterase inhibition. Atropine is antidotal. 2-PAM may be effective as an adjunct to atropine.</p> <p>FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-866-944-8565.</p> <p>Have the product container or label with you when calling a poison control center or doctor, or going for treatment.</p>	

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if swallowed, inhaled, or absorbed through the skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist or vapor. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are barrier laminate, butyl rubber, nitrile rubber, and viton. If you want more options, follow the instructions for category (F) on an EPA chemical resistance category selection chart.

For all formulations and all use patterns – mixers, loaders, applicators, flaggers, and other handlers must wear:

- Long sleeved shirt and long pants,
- Shoes plus socks,
- Chemical resistant gloves made of barrier laminate or butyl rubber, nitrile rubber, or viton \geq 14 mils.

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

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. See engineering controls for additional requirements.

ENGINEERING CONTROLS

Pilots must use an enclosed cockpit in a manner that is consistent with the WPS for Agricultural Pesticides [40 CFR 170.240(d)(6)]. Pilots must wear the PPE required on this labeling for applicators.

USER SAFETY RECOMMENDATIONS

Users should:

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

ENVIRONMENTAL HAZARDS

This pesticide is toxic to aquatic organisms, including fish and invertebrates. This product may contaminate water through drift of spray in wind. This product has a high potential for runoff after application. Use care when applying in or to an area which is adjacent to any body of water, and do not apply when weather conditions favor drift from target area. 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 rainfall-runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours.

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. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters.

This pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. **Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.**

For commercial, industrial, and institutional use products packaged in containers equal or greater than 5.0 gallons or 50.0 pounds:

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame. This product is incompatible with other chemicals (e.g. oxidizing agents).

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

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.

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 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 (REI). 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). The REI for each crop is listed in the directions for use associated with each crop.

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 made of any waterproof material.

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, or nurseries.

Do not enter or allow others to enter until sprays have dried.

PRECAUTIONS AND RESTRICTIONS

BUFFER ZONES FOR AERIAL APPLICATION: When making a non-ULV application with aerial application equipment, a minimum buffer zone of 25 feet must be maintained along any water body.

SPRAY DRIFT REQUIREMENTS

Observe the following requirements when spraying in the vicinity of aquatic areas such as, but not limited to, lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish ponds.

Droplet Size – Use the largest droplet size consistent with acceptable efficacy. Formation of very small droplets may be minimized by appropriate nozzle selection, by orienting nozzles away from the air stream as much as possible, and by avoiding excessive spray boom pressure.

For groundboom and aerial applications, use only medium or coarser spray nozzles according to ASAE (S572) definition for standard nozzles, or a volume mean diameter (VMD) of 300 microns or greater for spinning atomizer nozzles. In conditions of low humidity and high temperatures, applicators should use a coarser droplet size.

Wind Direction and Speed – Make aerial or ground applications when the wind velocity favors on target product deposition (approximately 3 to 10 mph). Do not apply when wind velocity exceeds 15 mph. Avoid applications when wind gusts approach 15 mph. For all non-aerial applications, wind speed must be measured adjacent to the application site on the upwind side, immediately prior to application. **Temperature Inversion** – Do not make aerial or ground applications into areas of temperature inversions.

Inversions are characterized by stable air and increasing temperatures with increasing distance above the ground. Mist or fog may indicate the presence of an inversion in humid areas. Where permissible by local regulations, the applicator may detect the presence of an inversion by producing smoke and observing a smoke layer near the ground surface.

In conditions of low humidity and high temperatures, applicators should use a coarser droplet size.

Additional Requirements for Ground Applications – Spray should be released at the lowest height consistent with pest control and flight safety. Applications more than 10 feet above the crop canopy should be avoided. For groundboom applications, apply with nozzle height no more than 4 feet above the ground or crop canopy.

Additional Requirements for Aerial Applications – For aerial applications, the spray boom should be mounted on the aircraft as to minimize drift caused by wingtip or rotor vortices. The minimum practical boom length should be used and must not exceed 75% of wing span or 90% rotor diameter. Aerial applicators must consider flight speed and nozzle orientation in determining droplet size.

When applications are made with a cross-wind, the swath will be displaced downwind. The applicator must compensate for this displacement at the downwind edge of the application area by adjusting the path of the aircraft upwind.

APPLICATION THROUGH IRRIGATION SYSTEMS – CHEMIGATION

Apply this product only through sprinkler, including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move; flood (basin); furrow; border or drip (trickle) irrigation systems. Do not apply this product through any other type of irrigation system. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

Do not connect an irrigation system used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise. Mix in clean supply tank the recommended amount of this product for acreage to be covered, and needed quantity of water.

Do not tank mix this product with other pesticides, surfactants or fertilizers unless prior use has shown the combination noninjurious under your conditions of use.

Follow precautionary statements and directions for all tank-mixed products.

On all crops, use sufficient gallonage of water to obtain thorough and uniform coverage, but not cause runoff or excessive leaching. This will vary depending on equipment, pest problem and stage of crop growth. Application of more or less than optimal quantity of water may result in decreased chemical performance, crop injury or illegal pesticide residues.

Meter this product into the irrigation water uniformly during the period of operation. Do not overlap application. Follow specified label rates, application timing, and other directions and precautions for crop being treated.

Continuous mild agitation of pesticide mixture may be needed to assure a uniform application, particularly if the supply tank requires a number of hours to empty.

CHEMIGATION SYSTEMS CONNECTED TO PUBLIC WATER SYSTEMS

Note: Loveland Products, Inc. does not encourage connecting chemigation systems to public water supplies. The following information is provided for users who have diligently considered all other application and water supply options before electing to make such a connection.

Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the flow outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection.

The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Do not apply when wind speed favors drift beyond the area intended for treatment.

SPRINKLER CHEMIGATION (FOLIAR SPRAY USES)

The system must contain a functional check valve vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from

the supply tank when the irrigation system is either automatically or manually shut down.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Do not apply when wind speed favors drift beyond the area intended for treatment.

FLOOD (BASIN), FURROW AND BORDER CHEMIGATION (SOIL DRENCH USES)

Systems using a gravity flow pesticide dispensing system must meter the pesticide into the water at the head of the field and downstream of a hydraulic discontinuity such as a drop structure or weir box to decrease potential for water source contamination from backflow if water flow stops.

Systems utilizing a pressurized water and pesticide injection system must meet the following requirements:

- a. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
- b. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- c. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- d. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- e. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- f. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

DRIP (TRICKLE) CHEMIGATION (SOIL DRENCH USES)

The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.

Systems must use a metering pump such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

APPLICATIONS

Use rates and use directions as noted below. Use higher rate when foliage is heavy or infestation is severe. Apply when pests first appear. Apply the following specified rates in sufficient water to thoroughly cover 1 acre. By ground, apply using a minimum of 10.0 gallons of water per acre and by air apply using a minimum of 2.0 gallons of water per acre (standard is 100 gallons of water for thorough coverage sprays). Do not apply orchard rates in less than 10.0 gallons of water per acre.

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Alfalfa Birdsfoot Trefoil Clover Lespedeza Vetch	Aphids Armyworm Clover leaf weevil Grasshoppers Leafhopper Spider mites	1.25	Apply to alfalfa in bloom only in the evening or early morning when bees are not working in the fields or are not hanging on the outside of hives. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications is 2/ cutting; and the minimum retreatment interval is 14 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	0
Apricots	Aphids Codling moth Orange tortrix Soft brown scale Terrapin scale	1.5	Full coverage spray. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	6
Asparagus	Asparagus beetle Thrips	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	1
Avocados	Green house thrips Latania scale Omnivorous looper Orange tortrix Soft brown scale	4.0 to 4.7	The Restricted Entry Interval (REI) is 48 hrs. The maximum application rate is 4.7 lbs A/A (4.7 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 30 days. Do not apply more than a total of 9.4 lbs of malathion per acre per calendar year.	7
Barley	Aphids Cereal leaf beetle Grasshoppers Greenbugs	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Beets (Garden) Do not apply to Sugar Beets	Aphids	1.0 to 1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	7
Blackberries Boysenberries Dewberries Gooseberries Loganberries Raspberries	Aphids Rose scale Japanese beetle Leafhoppers Mites Thrips	2.0 1.0 to 2.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 2.0 lbs A/A (2.0 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 6.0 lbs of malathion per acre per calendar year.	1
Blueberries	Cherry fruitworm Cranberry fruitworm Japanese beetle Plum curculio Sharpnose leafhopper	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 5 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	1

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Broccoli Broccoli Raab (Rapini) Brussels Sprouts Cauliflower Chinese Broccoli Cavalo Broccolo Mizuna Mustard Spinach Rape Greens	Aphids Cabbage looper Flea beetle Imported cabbageworm	1.25	The Restricted Entry Interval (REI) is 48 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	2
Cabbage	Aphids Cabbage looper Flea beetle Imported cabbageworm	1.25	The Restricted Entry Interval (REI) is 48 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 6; and the minimum retreatment interval is 7 days. Do not apply more than a total of 7.5 lbs of malathion per acre per calendar year.	7
Cabbage, Chinese (Bok Choy, Napa) Cabbage Chinese Mustard	Aphids Cabbage looper Flea beetle Imported cabbageworm	1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Carrots, roots	Aphids Leafhoppers	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Celery	Aphids Spider mites	1.0 to 1.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7
Cherries (sweet & tart)	Black cherry aphid Bud moth Cherry fruit fly Forbes scale Fruit tree leafroller Lesser peach tree borer San jose scale	1.75	May injure foliage of varieties such as Brooks, Tulare, Coral and some others. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.75 lbs A/A (1.75 pts Malathion 8 Aquamul); the maximum number of applications/year is 4; and the minimum retreatment interval is 3 days. Do not apply more than a total of 7.0 lbs of malathion per acre per calendar year.	3
Chestnuts	Mites	2.0 to 2.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 2.5 lbs A/A (2.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 7.5 lbs of malathion per acre per calendar year.	2
Citrus (Grapefruit, Lemons, Limes, Oranges, Tan- gerines, Tangelos)	Aphids Black scale California red scale Citricola scale Florida red & Mediterranean fruit fly Purple scale Soft scale Thrips Yellow scale	CA: 7.5 pts or 1.5 pts; All other states: 4.5 pts or 1.5 pts	Do not apply during full bloom. California Only: At the maximum application rate of 7.5 lbs A/A (7.5 pts Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 72 hrs and the maximum number of applications/year is 1; OR at the maximum application rate of 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul) the REI is 24 hrs, the maximum number of applications/year is 3, the minimum application interval is 30 days and the minimum preharvest interval is 7 days. Do not apply more than a total of 7.5 lbs of malathion per acre per calendar year. All States other than CA: At the maximum application rate of 4.5 lbs A/A (4.5 pts Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 72 hrs and the maximum number of applications/year is 1; OR at the maximum application rate of 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul) the REI is 12 hrs, the maximum number of applications/year is 3, the minimum application interval is 30 days and the minimum preharvest interval is 7 days. Do not apply more than a total of 4.5 lbs of malathion per acre per calendar year.	7

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Collards	Aphids Cabbage looper Flea beetle Imported cabbageworm	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7
Corn (field)	Aphids Cereal leaf beetle Corn earworm Corn rootworm-adults Grasshoppers Sap beetle Thrips	1.0	For corn earworm, apply to silks as soon as they appear. The Restricted Entry Interval (REI) is 72 hrs for detasseling, and 12 hrs for all other activities. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	7
Corn, Sweet	Japanese beetles	1.0	The Restricted Entry Interval (REI) is 72 hrs for detasseling, and 12 hrs for all other activities. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 5 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	5
Cotton	Aphids Boll weevil Cotton leaf perforator Cotton leafworm Fall armyworm Fleahopper Garden webworm Grasshopper Leafhoppers Lygus bug Mites Thrips White Flies	1.5 to 2.5	The Restricted Entry Interval (REI) is 48 hrs. The maximum application rate is 2.5 lbs A/A (2.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 7.5 lbs of malathion per acre per calendar year.	7
Cucumbers	Aphids Pickworm Spider mites Thrips Cucumber beetle	1.0 to 1.75 1.75	Do not apply unless plants are dry. The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.75 lbs A/A (1.75 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.5 lbs of malathion per acre per calendar year.	1
Currants	Currant aphid Imported currantworm Japanese beetle Mites	1.25 1.0 to 1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	1
Dandelions	Aphids	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Eggplant	Aphids Spider mite Lace bugs	0.75 to 1.56 1.56	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 4; and the minimum retreatment interval is 5 days. Do not apply more than a total of 6.24 lbs of malathion per acre per calendar year.	3

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Endive	Aphids Mites	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Figs	Dried fruit beetle Vinegar flies	2.0 pts plus 2.0 gals unsulfurized molasses as a bait spray	At the maximum application rate of 2.0 lbs A/A (2.0 pts Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 24 hrs. The maximum number of applications/year is 2, and the minimum application interval is 5 days; OR at the maximum application rate of 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 12 hrs. The maximum number of applications/year is 2, and the minimum application interval is 5 days. Do not apply more than a total of 4.0 lbs of malathion per acre per calendar year.	5
Flax	Grasshoppers	0.5	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 0.5 lb A/A (0.5 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 1.5 lbs of malathion per acre per calendar year.	52
Garlic	Aphids Thrips	1.0 to 1.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 4.68 lbs of malathion per acre per calendar year.	3
Grapes	Drosophila Japanese beetle Leafhopper Mealybugs Spider mite Terrapin scale	1.88	May cause injury to foliage on some varieties. The Restricted Entry Interval (REI) is 72 hrs for girdling and tying, and 24 hrs for all other activities. The maximum application rate is 1.88 lbs A/A (1.88 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 14 days. Do not apply more than a total of 3.76 lbs of malathion per acre per calendar year.	3
Grass Hay Grasses	Aphids Armyworms Grasshoppers Leafhoppers	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 1. Do not apply more than a total of 1.25 lbs of malathion per acre per calendar year.	0
Guava	Fruit flies	0.75 pt + 1.0 lb partially hydrolyzed yeast protein or enzymatic yeast hydrolyzate	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 13; and the minimum retreatment interval is 3 days. Do not apply more than a total of 16.25 lbs of malathion per acre per calendar year.	2
Hops	Aphids	0.63	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 0.63 lb A/A (0.63 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 1.89 lbs of malathion per acre per calendar year.	10
Horseradish	Aphids	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	7
Kale	Aphids Cabbage looper Flea Beetle Imported cabbageworm	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 5 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Kohlrabi	Aphids Cabbage looper Flea Beetle Imported cabbageworm	1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Kumquats	Aphids Black scale California red scale Citricola scale Florida red scale Florida purple scale Soft scale Thrips Yellow scale Mediterranean fruit fly	4.5 1.0 to 4.5	Do not apply during full bloom. The Restricted Entry Interval (REI) is 48 hrs. The maximum application rate is 4.5 lbs A/A (4.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 1; and the minimum retreatment interval is 30 days. Do not apply more than a total of 4.5 lbs of malathion per acre per calendar year.	7
Leeks	Aphids Thrips	1.0 to 1.56	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.12 lbs of malathion per acre per calendar year.	3
Lettuce	Aphids Leafhoppers Cabbage looper Mites	1.25 to 1.88 1.88	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.88 lbs A/A (1.88 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 6 days for head and 5 days for leaf. Do not apply more than a total of 3.76 lbs of malathion per acre per calendar year.	14
Macadamia Nuts	Green stink bug	0.94	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 0.94 lb A/A (0.94 pt Malathion 8 Aquamul); the maximum number of applications/year is 6; and the minimum retreatment interval is 7 days. Do not apply more than a total of 5.64 lbs of malathion per acre per calendar year.	1
Mango	Fruit flies	0.75 pt + 1.0 lb partially hydrolyzed yeast protein or enzymatic yeast hydrolyzate	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 0.9375 lb A/A (0.9375 pt Malathion 8 Aquamul); the maximum number of applications/year is 10; and the minimum retreatment interval is 7 days. Do not apply more than a total of 9.375 lbs of malathion per acre per calendar year.	1
Melons (other than watermelon)	Aphids Cucumber beetle Pickworm Spider mites Thrips	1.0	Do not apply unless plants are dry. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	1
Mustard Greens	Aphids Cabbage looper Flea beetle Imported cabbageworm	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 5 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Nectarines	Aphids (Black cherry, Black peach, Green peach, Rusty plum) Japanese beetle Mites (European red, Two-spotted)	2.5 to 3.0	Full coverage spray. The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 3.0 lbs A/A (3.0 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 9.0 lbs of malathion per acre per calendar year.	7
	Cottony peach scale Lesser peach tree borer Oriental fruit moth Plum curculio Terrapin scale	3.0		
Oats	Aphids Cereal leaf beetle Grasshoppers Greenbugs	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	7
Okra	Aphids Japanese beetle	1.2	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.2 lbs A/A (1.2 pts Malathion 8 Aquamul); the maximum number of applications/year is 5; and the minimum retreatment interval is 7 days. Do not apply more than a total of 6.0 lbs of malathion per acre per calendar year.	1
Onions (bulb and green)	Onion thrips	1.0 to 1.56	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.12 lbs of malathion per acre per calendar year.	3
	Onion maggots	1.56		
Papaya	Aphids Mealybugs	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 8; and the minimum retreatment interval is 3 days. Do not apply more than a total of 10.0 lbs of malathion per acre per calendar year.	1
Parsley	Aphids	1.0 to 1.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.5 lbs A/A (1.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7
Parsnips	Aphids	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	7
Passion Fruit	Fruit flies	0.75 pt + 1.0 lb partially hydrolyzed yeast protein or enzymatic yeast hydrolyzate	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 8; and the minimum retreatment interval is 7 days. Do not apply more than a total of 8.0 lbs of malathion per acre per calendar year.	3

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Peaches	Aphids (Green peach, Black cherry, Black peach, Rusty plum) Japanese beetle Mites (European red, Two-spotted)	2.5 to 3.0	Full coverage spray. The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 3.0 lbs A/A (3.0 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 11 days. Do not apply more than a total of 9.0 lbs of malathion per acre per calendar year.	7
	Cottony peach scale Lesser peach tree borer Oriental fruit moth Plum curculio Terrapin scale	3.0		
Peas	Aphids Pea weevil	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	3
Pecans	Aphids Mites Pecan bud moth Pecan leaf casebearer Pecan nut casebearer Pecan phylloxera	2.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 2.5 lbs A/A (2.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 5.0 lbs of malathion per acre per calendar year.	7
Peppers	Aphids	0.75 to 1.5	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 5 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	3
	Pepper maggots	1.5		
Peppermint Spearmint	Aphids Flea beetle - adults Leafhoppers Spider mites	0.94	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 0.94 lb A/A (0.94 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.82 lbs of malathion per acre per calendar year.	7
Pineapples	Mealybugs	2.0	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 2.0 lbs A/A (2.0 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 6.0 lbs of malathion per acre per calendar year.	7
Potatoes	Aphids False chinch bugs Leafhoppers Mealybugs	1.0 to 1.5	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	0
Pumpkins	Aphids Cucumber beetle Pickleworms Spider mites Thrips	1.0	Do not apply unless plants are dry. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	1
Radishes	Aphids	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Rice	Rice leafminers Rice stink bugs	1.25	Broadcast use only over intermittently flooded areas. Application may not be made around bodies of water where fish or shellfish are grown and/or harvested commercially. The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.5 lbs of malathion per acre per calendar year.	7
Rutabagas	Aphids	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7
Rye	Aphids Cereal leaf beetles Grasshoppers Greenbugs	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	7
Salsify (including tops)	Aphids	1.0 to 1.25	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.25 lbs A/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	7
Shallots	Aphids Thrips	1.0 to 1.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.56 lbs A/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	3
Sorghum, Grain	Greenbugs	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	7
Spinach	Aphids	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	7
Squash	Aphids Cucumber beetles Pickleworms Spider mites Thrips	Summer: 1.75; Winter: 1.0	Do not apply unless plants are dry. For Summer Squash , the Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 1.75 lbs A/A (1.75 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 5.25 lbs of malathion per acre per calendar year. For Winter Squash , the Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb A/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.0 lbs of malathion per acre per calendar year.	1
Strawberries	Aphids Field crickets Lygus bugs Potato leafhoppers Spider mites Spittle bugs Strawberry leafroller Strawberry root weevil Thrips Whitely	1.0 to 2.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 2.0 lbs A/A (2.0 pts Malathion 8 Aquamul); the maximum number of applications/year is 4; and the minimum retreatment interval is 7 days. Do not apply more than a total of 8.0 lbs of malathion per acre per calendar year.	3

Crop	Pest	Rate Pts/A	Directions	Pre-Harvest Interval (PHI) (days)
Sweet Potatoes	Leafhoppers	1.0 to 1.56	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs AI/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 3.12 lbs of malathion per acre per calendar year.	0
	Leafminers, morningglory	1.56		
Swiss Chard	Aphids	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb AI/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	14
Tomatoes	Aphids	1.0 to 1.56	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.56 lbs AI/A (1.56 pts Malathion 8 Aquamul); the maximum number of applications/year is 4; and the minimum retreatment interval is 5 days. Do not apply more than a total of 6.24 lbs of malathion per acre per calendar year.	1
	Spider mites Armyworms Drosophila Fruit worms Tomato russet mites	1.56		
Turnips	Aphids Cabbage loopers Flea beetles Imported cabbageworms	1.25	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.25 lbs AI/A (1.25 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 5 days for greens and 7 days for roots. Do not apply more than a total of 3.75 lbs of malathion per acre per calendar year.	1
Walnuts	Aphids Mites Walnut husk fly	2.5	The Restricted Entry Interval (REI) is 24 hrs. The maximum application rate is 2.5 lbs AI/A (2.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 3; and the minimum retreatment interval is 7. Do not apply more than a total of 7.5 lbs of malathion per acre per calendar year.	7
Watercress	Aphids	1.0 to 1.25	At the maximum application rate of 1.25 lbs AI/A (1.25 pts Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 24 hrs. The maximum number of applications/year is 5, and the minimum application interval is 3 days; OR at the maximum application rate of 1.0 lb AI/A (1.0 pt Malathion 8 Aquamul), the Restricted Entry Interval (REI) is 12 hrs. The maximum number of applications/year is 5, and the minimum application interval is 3 days. Do not apply more than a total of 6.25 lbs of malathion per acre per calendar year.	3
Watermelon	Aphids Cucumber beetle Leafhopper Pickworms Spider mites	1.5	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.5 lbs AI/A (1.5 pts Malathion 8 Aquamul); the maximum number of applications/year is 4; and the minimum retreatment interval is 7 days. Do not apply more than a total of 6.0 lbs of malathion per acre per calendar year.	1
Wheat (spring & summer)	Aphids Cereal leaf beetles Grasshoppers Greenbugs	1.0	The Restricted Entry Interval (REI) is 12 hrs. The maximum application rate is 1.0 lb AI/A (1.0 pt Malathion 8 Aquamul); the maximum number of applications/year is 2; and the minimum retreatment interval is 7 days. Do not apply more than a total of 2.0 lbs of malathion per acre per calendar year.	7

OUTDOOR ORNAMENTALS

Precaution: Before treating a large number of ornamental plants with Malathion 8 Aquamul alone or as a tank mixture with any other material, make a test application on a few plants and observe 7 to 10 days prior to treating large areas to reduce the possibility of plant injury.

Crop	Rate	Pests	Comments
Ornamental Herbaceous Plants Ornamental and/or Shade Trees Ornamental Woody Shrubs	1.0 pt in 100 gals of water as a dilute spray	Aphids Euonymus scales European pine shoot moth Four-lined leaf bug Japanese beetle adults Lace scale Mealybugs Millipedes Oyster shell scale Potato leafhopper Rose leafhopper Scurfy scale Spider mites Springtails Sowbugs Tarnished plant bug Thrips Whiteflies	IMPORTANT: Avoid use on certain ferns including Boston, Maidenhair and Pteris, as well as some species of Crassula and Canaetri Juniper. For Oyster shell, Fletch, Juniper, Oak kermes and Pine needle scales, apply when scale crawlers have settled on foliage. The Restricted Entry Interval (REI) is 12 hrs. Maximum of 2 applications/year/growing cycle; 10 day minimum retreatment interval; maximum single application rate 2.5 lbs AI/100 gals.
	1.25 pts in 100 gals of water as a dilute spray	Azalea scale Bagworm Birch leafminer Boxwood leafminer Fletch scale Florida-red scale Juniper scale Magnolia scale Oak kermes Pine leaf scale Tent caterpillar	
	1.6 pts in 100 gals of water	Black scale crawler Monterey pine scale	
	2.5 pts in 100 gals of water	Pine needle scale Wax scale	
Slash Pine Pine Seed Orchards and Christmas Tree Plantations	For ground application, mix 3.2 pts of Malathion 8 Aquamul in 100 gals of water	European pine sawfly Slash pine flower thrips	Apply 6.0 pts of the mixture/tree on the smallest flowering trees. Mist blowers or airblast sprays may be used. The Restricted Entry Interval (REI) is 12 hrs. Maximum of 2 applications/year/ growing cycle; 10 day minimum retreatment interval; maximum single application rate 3.2 lbs AI/100 gals.
	For air application, mix 3.2 pts of Malathion 8 Aquamul in at least 10.0 gals of water		Apply a minimum of 5.0 gals of mixture/acre. Make 2 applications, the first when female flowers are in twig bud stage, the second one week prior to maximum flower receptivity to pollen.

SMALL GRAIN STORAGE FACILITIES (Grain Elevators/Silos)

Only for use in storage facilities being prepared to store corn, wheat, rye, oats, and barley grain. For a residual wall, floor, and machinery spray in grain elevators/silos prior to loading grain, apply 5.0 pints per 25.0 gallons of water making thorough application. Before applying spray, clean grain elevators/silos thoroughly. Remove and burn all sweeping as debris. Do not apply directly to grain. REI = 12 hours. The maximum single application rate is 0.6 pound active ingredient per 1000 square feet. The maximum number of applications is 1 per storage period.

FLY CONTROL

Amount of Spray	Amount Malathion 8 Aquamul	Directions for Use
1.0 gal	1.2 fl oz	For use around the lower foundation of homes and as a spot treatment only on yards. Apply spray at rate of 1.0 gal/1000 sq ft on painted surfaces and 2.0 gals/1000 sq ft on unpainted surfaces where flies alight or congregate.
10.0 gals	12.0 fl oz	
100 gals	7.5 pts	

For Bait Sprays - add the following sugar or unsulfurized molasses/corn syrup.

Amount of Spray	Amount of Sugar	Amount of Unsulfurized Molasses/ Corn Syrup
1.0 gal	0.5 cup	4.0 fl oz
10.0 gals	2.0 lbs	26.0 fl oz
100 gals	20.0 lbs	2.0 gals

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Malathion 8 Aquamul should be stored in the original unopened container in a secure, dry place. Do not contaminate with other pesticides or fertilizers. The product should never be heated above 55 °C (131 °F), and should not be stored for long periods of time at a temperature in excess of 25 °C (77 °F). Store in a cool, dry, well-ventilated area. Store separately from strong alkalis and strong oxidizers. Keep container tightly closed when not in use.

PESTICIDE DISPOSAL: To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying.

For containers up to 5 gallons: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

For containers greater than 5 gallons or 50 pounds: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. If not recycled, then puncture and dispose of in a sanitary landfill. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

For refillable containers: Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container.

Storage & Disposal cont'd.:

Cleaning before refilling is the responsibility of the refiller. To clean the 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.

For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC – 1-800-424-9300.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY BEFORE BUYING OR USING THIS PRODUCT.

read the entire Directions for Use and the following Conditions of Sale and Limitation of Warranty and Liability. By buying or using this product, the buyer or user accepts the following Conditions of Sale and Limitation of Warranty and Liability, which no employee or agent of LOVELAND PRODUCTS, INC. or the seller is authorized to vary in any way.

Follow the Directions for Use of this product carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop or other plant injury, ineffectiveness, or other unintended consequences may result from such risks as weather or crop conditions, mixture with other chemicals not specifically identified in this product's label, or use of this product contrary to the label instructions, all of which are beyond the control of LOVELAND PRODUCTS, INC. and the seller. The buyer or user of this product assumes all such inherent risks.

Subject to the foregoing inherent risks, LOVELAND PRODUCTS, INC. 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 when the product is used in strict accordance with such Directions for Use under normal conditions of use. EXCEPT AS WARRANTED IN THIS LABEL AND TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THIS PRODUCT IS SOLD "AS IS," AND LOVELAND PRODUCTS, INC. MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ELIGIBILITY OF THIS PRODUCT FOR ANY PARTICULAR TRADE USAGE.

IN THE UNLIKELY EVENT THAT BUYER OR USER BELIEVES THAT LOVELAND PRODUCTS, INC. HAS BREACHED A WARRANTY CONTAINED IN THIS LABEL AND TO THE EXTENT REQUIRED BY APPLICABLE LAW, BUYER OR USER MUST SEND WRITTEN NOTICE OF ITS CLAIM TO THE FOLLOWING ADDRESS: LOVELAND PRODUCTS, INC., ATTENTION: LAW DEPARTMENT, P.O. BOX 1286, GREELEY, CO 80632-1286.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE BUYER'S OR USER'S EXCLUSIVE REMEDY FOR ANY INJURY, LOSS, OR DAMAGE RESULTING FROM THE HANDLING OR USE OF THIS PRODUCT, INCLUDING BUT NOT LIMITED TO CLAIMS OF BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR OTHER TORTS, SHALL BE LIMITED TO ONE OF THE FOLLOWING, AT THE ELECTION OF LOVELAND PRODUCTS, INC. OR THE SELLER: DIRECT DAMAGES NOT EXCEEDING THE PURCHASE PRICE OF THE PRODUCT OR REPLACEMENT OF THE PRODUCT. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, LOVELAND PRODUCTS, INC. AND THE SELLER SHALL NOT BE LIABLE TO THE BUYER OR USER OF THIS PRODUCT FOR ANY CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES, OR DAMAGES IN THE NATURE OF A PENALTY.

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 PRODUCT IDENTIFIER:

TRADE NAME: MALATHION 8 AQUAMUL

1.2 RECOMMENDED USE: GROUP 1B INSECTICIDE – FOR INSECT CONTROL

1.3 SUPPLIER DETAILS:

LOVELAND PRODUCTS, INC.

P.O. Box 1286 • Greeley, CO 80632-1286

1.4 24 Hour Emergency Phone: 1-800-424-9300 - **Medical Emergencies:** 1-866-944-8565 – **Product Information:** 1-888-574-2878 (LPI-CUST)

U.S. Coast Guard National Response Center: 1-800-424-8802

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to 29 CFR 1910.1200

Acute Toxicity - Oral	Category 4	H302
Acute Toxicity - Dermal	Category 4	H312
Sensitization – Skin	Category 1	H317
Eye Damage/Irritation	Category 2B	H320
Acute Toxicity – Inhalation	Category 4	H332
Specific Target Organ Toxicity (Single Exposure)	Category 2	H371
Specific Target Organ Toxicity (Repeated Exposure)	Category 2	H373
Aquatic Toxicity	Category 2	H401
Combustible Liquid	Category 4	H227

2.2 Label elements



Signal word: WARNING

Hazard Statement: H302 – Harmful if swallowed.
H312 – Harmful in contact with skin.
H317 – May cause an allergic skin reaction.
H320 – Causes eye irritation.
H332 – Harmful if inhaled.
H371 – May cause damage to organs.
H373 – May cause damage to organs through prolonged or repeated exposure.
H401 – Toxic to aquatic life.
H227 – Combustible liquid.

Precautionary Statement: P260 – Do not breathe dust/fume/gas/mist/vapors/spray.
P262 – Do not get in eyes, on skin, or on clothing.
P264 – Wash thoroughly after handling.

(Prevention): P270 – Do not eat, drink or smoke when using this product.
P280 – Wear protective gloves/eye protection/face protection.
P210 – Keep away from heat/sparks/open flames/hot surfaces – No smoking.
P102 – Keep out of reach of children.



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Precautionary Statement:

P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 – Rinse mouth.

P302+P312: IF ON SKIN: Call a POISON CENTER or doctor/physician if you feel unwell.

P352 – Wash with soap and water.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

(Response):

P101 – If medical advice is needed, have the product container or label at hand.

P362 – Take off contaminated clothing and wash before reuse.

P333+P313 – If skin irritation or rash occurs: Get medical advice/attention.

P337 – If eye irritation persists: Get medical advice/attention.

P363 – Wash contaminated clothing before reuse.

P370 – In case of fire: Use dry chemical, carbon dioxide, foam, water spray or fog to extinguish.

P391 – Collect spillage.

Precautionary Statement:

(Storage):

P403+P235 – Store in a well-ventilated place. Keep cool.

2.3 Other hazards

Cholinesterase inhibitor.

3. COMPOSITION, INFORMATION ON INGREDIENTS

3.1 Substances

3.2 Mixtures

Classification according to 29 CFR 1910.1200

Chemical Name:	CAS No.	Classification	Concentration [%]
Malathion	121-75-5	Oral tox. 4; H302 Dermal tox. 4; H312 Sens. Skin. 1; H317	81.80
*Other ingredients	n/a	Eye Dam/Irrit. 2B; H320 Inh. tox. 4; H332 STOT-SE 2; H371 STOT-RE 2; H373 Aquatic tox. 2; H401	18.20

*Ingredients not specifically listed are non-hazardous or are to be considered proprietary or confidential business information per 29 CFR 1910.1200(i)

4. FIRST AID MEASURES

4.1 Description of First Aid Measures

General Advice: Get medical attention if symptoms occur.

- If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
- If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
- If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
- If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.



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4.2 Most Important Symptoms and Effects, Acute and Delayed

Symptoms: Eyes: Causes eye irritation.
Oral: Harmful if swallowed.
Dermal: Harmful in contact with skin.

4.3 Immediate Medical Attention and Special Treatment

Treatment: Treat symptomatically. Symptoms may be delayed.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-866-944-8565

Take container, label or product name with you when seeking medical attention.

NOTES TO PHYSICIAN: This product may cause cholinesterase inhibition. Atropine is antidotal. 2-PAM may be effective as an adjunct to atropine.

5. FIRE FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA:

Suitable Extinguishing Media: Use medium appropriate to surrounding fire. Dry chemical, carbon dioxide (CO₂), alcohol foam, foam, water spray or fog.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:

Specific Hazards During Firefighting: Product will decompose rapidly when heated to temperatures at or over 280°F (140°C). Release of volatile, toxic compounds such as dimethyl sulfide, sulfur dioxide, carbon monoxide, and phosphorus pentoxide are possible.

5.3 SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS

Special Protective Equipment for Firefighters: Self-contained breathing apparatus and full protective gear should be worn in fighting large fires involving chemicals. Use water spray to keep fire exposed containers cool. Keep people away. Isolate fire and deny unnecessary entry.

6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Personal Precautions: Avoid inhalation of vapors and spray mist and contact with skin and eyes. Ensure adequate ventilation. Wear suitable protective clothing.

6.2 ENVIRONMENTAL PRECAUTIONS

Environmental Precautions: This pesticide is toxic to aquatic organisms, including fish and invertebrates. This product may contaminate water through drift of spray in wind. This product has a high potential for runoff after application. Use care when applying in or to an area which is adjacent to any body of water, and do not apply when weather conditions favor drift from target area. 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 rainfall-runoff. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours. 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. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. This pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

6.3 METHODS AND MATERIALS FOR CONTAINMENT AND CLEAN-UP

Methods for Clean-Up: Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. After removal flush contaminated area thoroughly with water.
Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to Remove residual contamination.
Never return spills to original containers for re-use.



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7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:

Advice on Safe Handling:

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

7.2 CONDITIONS FOR SAFE STORAGE:

Requirements for Storage Areas and Containers:

Product should be stored in the original unopened container in a secure dry place. Do not contaminate other pesticides or fertilizers. Product should never be heated above 55°C (131°F), and should not be stored for long periods of time at temperatures in excess of 25°C (77°F). Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS:

OCCUPATIONAL EXPOSURE LIMITS

U.S. Workplace Exposure Level (ACGIH) TLVs

Components	Type	Value
Malathion	TLV	1 mg/m ³ (IFV: Measured as inhalable fraction and vapor)
	TLV	

U.S. Workplace Exposure Level (OSHA) PELs

Components	Type	Value
Malathion	TLV	15 mg/m ³ (Total dust), Skin

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Specimen
Acetylcholinesterase Inhibiting Pesticides	70% of individual's baseline	Cholinesterase activity in red blood cells

8.2 EXPOSURE CONTROLS:

Engineering Measures

Provide adequate general and local exhaust ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors and spray mists. Provide eyewash station and safety shower.

Individual Protection Measures:

Eye / Face Protection: Goggles or shielded safety glasses are recommended.

Skin Protection: Long-sleeved shirt and long pants. Chemical-resistant gloves. Shoes plus socks.

Respiratory Protection: In case of inadequate ventilation or risk of inhalation of mists or vapors, use suitable respiratory equipment such as MSHA/NIOSH TC-84A with NIOSH equipped N, R, or P class filter media. Wear respiratory protection during operations where spraying or misting occurs. If respirators are used, a program should be in place to assure compliance with 29 CFR 1910.134, the OSHA Respiratory Protection standard. Wear air supplied respiratory protection if exposure concentrations are unknown.



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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 APPEARANCE :	Liquid
ODOR:	Mild petroleum.
ODOR THRESHOLD:	No data available.
COLOR:	Straw to amber-colored.
pH:	3.69 (10% v/v)
MELTING POINT / FREEZING POINT:	No data available
BOILING POINT:	No data available
FLASH POINT:	198.5°F/ 92.5°C (TCC).
FLAMMABILITY (solid, gas):	No data available.
UPPER / LOWER FLAMMABILITY OR EXPLOSIVE LIMITS:	No data available.
VAPOR PRESSURE:	No data available.
SOLUBILITY:	Soluble.
PARTITION CO-EFFICIENT, n-OCTANOL / WATER:	No data available.
AUTO-IGNITION TEMPERATURE:	No data available.
DECOMPOSITION TEMPERATURE:	No data available.
VISCOSITY:	No data available.
SPECIFIC GRAVITY (Water = 1):	1.19 g/ml
DENSITY:	9.89 lbs./gal / 1.19 kg/L

Note: These physical data are typical values based on material tested but may vary from sample to sample.
Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

10. STABILITY AND REACTIVITY

10.1 REACTIVITY

Stable

10.2 CHEMICAL STABILITY

Stable under normal temperature conditions

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

No data available. Will not polymerize.

10.4 CONDITIONS TO AVOID

Keep away from heat or flame.

10.5 INCOMPATIBLE MATERIALS

Strong bases and oxidizers. This product can corrode iron, steel, tin plate and copper. Rapidly hydrolyzed at pH >7.0

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

Volatile, toxic compounds such as dimethyl sulfide, sulfur dioxide, carbon monoxide, and phosphorus pentoxide may be released in a fire situation.

11 TOXICOLOGICAL INFORMATION

11.3 LIKELY ROUTES OF EXPOSURE

Eye contact. Skin absorption. Skin contact. Inhalation.

LC₅₀ (rat): > 5.1 mg/L (4 HR)

LD₅₀ Oral (rat): > 550 mg/kg

LD₅₀ Dermal (rat): > 2,000 mg/kg

Acute Toxicity Estimates: No data available

Skin Irritation (rabbit): Mild irritant.

Eye Irritation (rabbit): Causes moderate eye irritation.

Specific Target Organ Toxicity: Eyes, skin, respiratory system, liver, blood cholinesterase, CNS, CVS, GI tract.

Aspiration: No data available.

Skin Sensitization (guinea pig): Sensitizer

Carcinogenicity: ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans).

Germ Cell Mutagenicity: No data available

Interactive Effects: None known



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12 ECOLOGICAL INFORMATION

12.3 ECOTOXICITY

The product is toxic to fish and aquatic invertebrates. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Information below is based on the technical ingredient Malathion.

Ecotoxicological Data

	Species	Test Results
Malathion	Oncorhynchus mykiss	0.18 mg/L – 96-hour LC ₅₀
	Daphnia magna	0.72 µg/L – 96-hour EC ₅₀
	Bees	0.38 µg/bee – LD ₅₀ acute oral
	Bees	0.27 µg/bee – LD ₅₀ topical

Drift or runoff may adversely affect non-target plants.

Do not apply directly to water.

Do not contaminate water when disposing of equipment wash water.

Do not apply when weather conditions favor drift from target area.

12.2 PERSISTENCE AND DEGRADABILITY

Biodegradability: Malathion is biodegradable but does not fulfill criteria for being readily biodegradable.

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: Bioconcentration potential is low (BCF 95).

12.4 MOBILITY IN SOIL

Malathion is of medium mobility in soil under normal conditions, but degrades rapidly.

12.5 OTHER ADVERSE EFFECTS

Assessment: No data available.

13 DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Wastes may be disposed of on site or at an approved waste disposal facility. Triple rinse (or equivalent), adding rinse water to spray tank. Offer container for recycling or dispose of in a sanitary landfill or by other procedures approved by appropriate authorities. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your state and local ACRC recycler visit the ACRC web page at <http://www.acrecycle.org>. Do not contaminate water, food or feed by storage or disposal.

14 TRANSPORT INFORMATION

14.3 LAND TRANSPORT

DOT Shipping Description: 12.5 GALLONS AND LESS: NOT REGULATED BY DOT

DOT Shipping Description: GREATER THAN 12.5 GALLONS: RQ UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (MALATHION), 9, III ERG GUIDE 171

U.S. Surface Freight Classification: INSECTICIDES, INSECT REPELLENTS, NOI, OTHER THAN POISON (NMFC 102120, CLASS: 60)



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15 REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS

NFPA & HMIS Hazard Ratings:	NFPA		HMIS
	2 Health	0 Least	2 Health
	2 Flammability	1 Slight	2 Flammability
	0 Instability	2 Moderate	0 Reactivity
		3 High	H PPE
		4 Severe	

SARA Hazard Notification/Reporting

SARA Title III Hazard Category:	Immediate	<u>Y</u>	Fire	<u>N</u>	Sudden Release of Pressure	<u>N</u>
	Delayed	<u>Y</u>	Reactive	<u>N</u>		

Reportable Quantity (RQ) under U.S. CERCLA: Malathion (CAS: 121-75-5) 100 pounds.

SARA, Title III, Section 313: Malathion (CAS: 121-75-5) 81.8%.

RCRA Waste Code: Not listed.

CA Proposition 65: **WARNING:** This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm..

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Harmful if swallowed, inhaled, or absorbed through skin.

Causes moderate eye irritation

Avoid contact with skin, eyes, or clothing.

Avoid breathing spray mist or vapor.

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

16 OTHER INFORMATION

SDS STATUS: Section 15 revised.

PREPARED BY: Registrations and Regulatory Affairs

REVIEWED BY: Environmental Health and Safety

EPA REG. NO.: 34704-474

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