



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

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

**BOARD OF PESTICIDES CONTROL**

**July 24, 2020  
9:00 AM**

Video conference hosted in Zoom  
To join the meeting:

Web link for the Zoom meeting: <https://zoom.us/j/94976628725?pwd=b2crWGRpSTR0bXA4cmd4TkxkbUxXdz09>  
Meeting ID: 949 7662 8725  
Password: 105419  
Dial in phone number: 1 (312) 626-6799

**AGENDA**

1. Introductions of Board and Staff
2. Minutes of the June 5, 2020 Board Meeting  
  
Presentation By: Megan Patterson, Director  
Action Needed: Amend and/or Approve
3. Report on Annual Funding to Maine CDC for Mosquito Monitoring

The Maine Center for Disease Control and Prevention (Maine CDC) coordinates state activities around preventing vector-borne diseases. As part of its responsibilities, the CDC coordinates mosquito and disease monitoring in Maine. The presence of mosquito-borne diseases and the species of vector mosquitoes present in Maine have been on the rise in recent years. Maine CDC and BPC entered into a Memorandum of Understanding in 2013 to establish cooperation to conduct surveillance for mosquito-borne diseases to protect public health. At the March 8, 2019 meeting Sara Robinson of the Maine CDC provided an overview of the trends and the state's monitoring program. At the April 19, 2019 meeting, the Board voted to approve funding in the amount of \$100,000 for Maine CDC's mosquito monitoring efforts. The Board will now review a report on work accomplished in the previous year and work projected for the current year.

MEGAN PATTERSON, DIRECTOR  
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-2731  
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Presentation By: Representative from Maine CDC or Maine Medical Research Institute

Action Needed: Review Work Accomplished and Approve/Disapprove Future Funding to CDC for Environmental Monitoring of Mosquitoes

4. Request to Extend Special Local Need [24(c)] Registration for Milestone Herbicide (Corteva Agrisciences) for Herbaceous Broadleaf Weeds and Woody Plants for Forest Site Preparation

This SLN has been requested on behalf of the Maine forest industry. Milestone Herbicide reduces competition by controlling herbaceous broadleaf weeds and woody plants, including native conifers. The industry is seeking to replace the use of glyphosate with aminopyralid. This SLN has already been approved in eleven states indicating this is no longer a local need, but rather interregional or national in scope.

Presentation By: Mary Tomlinson, Pesticides Registrar and Water Quality Specialist

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

5. Review of Biological Pesticides for Treatment of Browntail Moth Near Marine Waters

On January 25, 2008, the Board adopted Section 5 of Chapter 29 which regulates the use of insecticides used to control browntail moth within 250 feet of marine waters. Section 5 limits insecticide active ingredients to those approved by the Board. At the April 19, 2019 meeting of the Board inquiries were received about active ingredients for removal from and addition to the list. Subsequently, the staff was directed to update the list of approved active ingredients for browntail moth control. Due to the differences in performing the risk assessments biological pesticides were assess separately from conventional products. This submission provides the remainder of the active ingredients to be reviewed and focuses solely on biological pesticides. The Board will now consider the list.

Presentation By: Pam Bryer, Toxicologist

Action Needed: Review and Approve/Disapprove the Draft Policy

6. Proposed Minimum Standards for Live and Pre-recorded Online Recertification Courses

Due to the ongoing pandemic, in person recertification training meetings have become difficult to both host and attend. Applicators are seeking, and will likely continue to seek, alternatives to in person, live events. Board staff have developed minimum standards for online courses.

Presentation By: John Pietroski, Manager of Pesticide Programs

Action Needed: Review and Approve/Disapprove the Draft Policy

7. Updating the Notification Process to Facilitate Improved Communication

At the February 28, 2020 meeting of the Board, staff was directed to follow up on approaches to identifying the party responsible for notification. Staff have identified numerous ways in which the notification process could be streamlined. These approaches have been divided into two groups, those best addressed through policy and those that may be accomplished through routine staff efforts. Two documents detailing this information have been provided for the Board's consideration.

Presentation By: Megan Patterson, Director

Action Needed: Approve/Disapprove the Proposed Policy and Approaches

8. Review of Budget

In early 2017, the Board reviewed the budget with a goal of identifying potential resources that could be allocated to Board priorities. At that time the Board requested ongoing annual updates on the status of the Pesticide Control Fund.

Presentation By: Megan Patterson, Director

Action Needed: Provide Guidance to the Staff on Board Budget Priorities

9. Water Quality Monitoring Proposal

7 M.R.S. § 607-A, Section 2-A, directs the Board to conduct water residue surveys, for both ground and surface water, to prepare profiles of the kinds and amounts of pesticides present. At the November 2018 Board meeting, Board staff proposed a continuation of past groundwater monitoring efforts. Due to multiple staff vacancies, ground water monitoring work planned for 2019 was scheduled for 2020. In 2020, this work was underway and unexpectedly terminated by issues related to the ongoing pandemic. Staff will now provide a review of the work completed in 2020 and a proposal and budget for ground water monitoring work tentatively planned for 2021.

Presentation By: Mary Tomlinson, Pesticides Registrar and Water Quality Specialist

Action Needed: Approve/Disapprove Funding the Proposed Water Quality Projects

10. Other Old and New Business

a. Variance Permit for Taylor's Invasive Plant Control

b. Future Format for Board Meetings

11. Schedule of Future Meetings

September 18, 2020 and November 6, 2020 are proposed meeting dates.

Adjustments and/or Additional Dates?

12. 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](http://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](mailto: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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2

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

**BOARD OF PESTICIDES CONTROL**

**June 5, 2020  
9:00 AM**

Video conference hosted in Zoom Meeting

**MINUTES**

Present: Bohlen, Flewelling, Jemison, Granger, Morrill, Waterman

1. Introductions of Board and Staff

- The Board, Assistant Attorney General Randlett, and Staff introduced themselves
- Staff Present: Brown, Bryer, Connors, Couture, Nelson, Patterson, Peacock, Pietroski, Tomlinson

2. Minutes of the February 28, 2020 Board Meeting

Presentation By: Megan Patterson, Director

Action Needed: Amend and/or Approve

- The Board noted a few small amendments that needed to be made to the minutes.

- **Jemison/Flewelling: Moved and seconded to accept minutes as amended**
- **In Favor: Unanimous**

3. Annual Report on Funding for the University of Maine Extension Manual Writer/PSEP Position

At the April 19, 2019 meeting, the Board voted to approve a \$65,000 grant to the University of Maine Cooperative Extension, for one year, for a combined Pesticide Safety Education Program and Pesticide Applicator Training position. As part of the approval, the Board requested that it revisit the grant in June every year to confirm the availability of funding for the state fiscal year (October 1-September 30). The Board heard a report on work accomplished in the previous year and work projected for the coming year.

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Presentation By: Megan Patterson, Director

Action Needed: Discussion of Accomplishments and Projected Work Plan

- Kerry Bernard, Manual Writer/PSEP, gave the Board an overview and update on which manuals and other work was completed last year.
- Patterson explained to the Board that Public Law 2019, Chapter 243 was enacted on June 7, 2019 and this law provides funding for Bernard's position through a legislative transfer that must be completed annually on or about April 1<sup>st</sup>.
- Bernard stated that she plans to complete rewrites of the Commercial Structural and the Private Small Fruit manual this coming year, as well as conduct recertification meetings for commercial applicators. Bernard said that she may have to move toward online modules for some of the training, and they will include interactive PowerPoints with quizzes throughout that must be answered before the user may progress through the slide show. At the end of the modules a certificate could be generated and emailed to Board staff. She added that she has updated the UMaine pesticide safety website where the manuals are located and added more safety information to the page, including respirator brochures and disinfectant safety.
- Morrill noted that he liked idea of online trainings to help applicators receive their recertification credits, and thanked Bernard for all of her work.

4. Request to Extend Special Local Need [24(c)] Registration for Dual Magnum (Syngenta Crop Protection, LLC) for Yellow Nutsedge and Hairy Galinsoga in Vegetables

In 2014, the Board approved a Section 24(c) registration for Dual Magnum (EPA Reg. No. 100-816). The 24(c) was renewed in 2014, but the registration expired December 2019. The University of Maine Cooperative Extension submitted this renewal request for a 24(c) registration. The proposed SLN will expire December 31, 2024.

Presentation By: Mary Tomlinson, Pesticides Registrar and Water Quality Specialist

Action Needed: Approve/disapprove 24(c) registration request

- Mark Hutton, UMaine Extension, explained to the Board that this SLN request came from about a dozen medium sized mixed vegetable growers looking for products to use, especially in spinach and beets, for weed control. He added that use in these crops is not extensive, but it is an important tool for them to use.
- Jemison stated that the EPA planned to release new tolerances between April and June and then the pandemic hit. He asked about Bryer's thoughts on approving the SLN for a shortened approval period until we receive the new info from EPA.
- Bryer stated that she did email the EPA product manager regarding tolerance changes. The EPA reported no further changes. Bryer indicated that she will continue to monitor EPA's active ingredient review process.

- Hutton stated that he supported a shorter approval period with a plan to review the anticipated EPA guidance.
- Randlett told the Board that they had the option to set SLN time periods as they see fit.
- The Board discussed the approval period for the SLN label and agreed to renew approval for the remainder of the year and then, should growers continue to require the SLN, reassess the SLN request following receipt of the anticipated EPA guidance.

- **Jemison/Granger: Moved and seconded to approve the SLN registration for Dual Magnum through to December 31, 2020**

- **In Favor: Unanimous**

5. Consideration of Consent Agreement with Bath Housing Authority, of Bath, 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 an unlicensed application in an area open to the public, posting, and use of a pesticide inconsistent with the product labeling.

Presentation By: Raymond Connors, Manager of Compliance

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

- Connors told the Board that he received a call from a tenant who reported witnessing an application of herbicide from an unlicensed individual. An inspector followed up and discovered that Bath Housing Authority had asked an employee to do a crack and crevice treatment on sidewalks and on the pavement around a few of the buildings. Connors stated that several violations were identified:
  - application by an unlicensed individual,
  - no provision of notification to tenants,
  - label-required personal protective equipment was not worn, and
  - the product label prohibited the product from use around homes and walkways.
- Connors stated that the consent agreement included a penalty of \$1,000. Bath Housing Authority has signed and paid the agreement.
  - **Morrill/Flewelling: Moved and seconded to approve the consent agreement**
  - **In Favor: Unanimous**

6. Consideration of Consent Agreement with Hughes Inc., of Freeport, 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 an unauthorized pesticide application.

Presentation By: Raymond Connors, Manager of Compliance

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

- Connors stated that this case involved a licensed commercial applicator that had been hired for the previous two years to control browntail moth in oak trees on a customer's property. The owner of Hughes, Inc sent out a renewal notice to that customer that advertised services, including new alternative products that could be used for control of browntail moth. The customer was interested in the service but wanted more information regarding the new products and how they compared to products applied in the previous years. No one from Hughes Inc. got back to the customer to discuss the new products. Connors stated that the customer both emailed and phoned Hughes that she had made alternative arrangements for browntail moth control on her property and asked the owner of Hughes Inc. to remove her from his schedule. The customer and her family returned from a vacation to find that Hughes had made an application of Acephate 97 UP while they were gone. The customer did not authorize this application and did not want this pesticide applied.

Connors told the Board that Hughes, Inc was fined \$600 for the unauthorized pesticide application. The fine has been paid.

- **Jemison/Waterman: Moved and seconded to approve the consent agreement**
- **In Favor: Unanimous**

7. Consideration of Consent Agreement with The Turf Doctor Inc., of Augusta, 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 notification registry and broadcast application of a pesticide within 25 feet of water other than those applied to control arthropod vectors of human disease or stinging insects.

Presentation By: Raymond Connors, Manager of Compliance

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

- Connors told the Board that this was a combination of two complaints. The first complaint involved a neighbor of a Turf Doctor customer who was on the notification registry and was not notified before the application. Connors added that the second



complaint involved a violation of a broadcast application made within the 25 feet buffer zone around surface water.

- Connors stated that the proposed fine was \$750, and both violations were included in the consent agreement. Turf Doctor, Inc. has paid the assessed fine.

- **Morrill/Jemison: Moved and seconded to approve consent agreement**
- **In Favor: Unanimous**

## 8. 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: Megan Patterson, Director

Action Needed: Nominations and Election of Officers

- **Granger: nominated Morrill for Board of Pesticides Control, chair**
- **Morrill: nominated Bohlen for Board of Pesticides Control, Vice Chair**
- **Jemison: seconded both nominations**
- **In Favor: Unanimous for both nominations**

## 9. Other Old and New Business

### a. Certification and Licensing Program Update

- Morrill indicated that staff should send information to commercial applicators informing them of the new training requirement for non-certified applicators because it seemed like many companies may not be aware of this new rule.
- Patterson stated that staff can definitely send another email blast and a GovDelivery to let companies know they need to have non certified applicators take pesticide safety training.
- Patterson summarized the protocol for drive up certification exams that staff were currently hosting.
- Pietroski stated that staff is also reaching out to licensed applicators to let those who are low on credits know that there are online recertification courses available. He added that staff have administered 353 commercial applicator exams since the beginning of the COVID pandemic and inspectors have given 12 private agricultural exams. Pietroski told the Board that the commercial pass rate is currently around 66%.
- Morrill asked if staff had explored options for web-based exams.

- Pietroski replied that staff had given it much thought, but ultimately chose the current option in order to keep the integrity of the exams.
- There was further discussion about offering exams during this time. Patterson stated that colleagues in Massachusetts are thinking about initializing online exams and they will share outcome of that effort with us. She added that there is concern regarding test security and the downside of utilizing an outside testing center is that they charge a significant fee that would need to be passed along to the people taking exams.

#### b. Neonicotinoid Registration Reviews

- Morrill commended Bryer's memo for summarizing the review in a clear and easy to understand manner.
- There was further discussion about neonics and the proposed changes. Bryer told the Board that EPA has extended the comment periods multiple times so it is unclear when EPA will move forward with the process.
- Patterson also noted stewardship changes, but that many of them are voluntary and cannot be enforced. She added that the comment period was extended again about a week ago.

#### c. Pesticide Container Fee Webpage

- Patterson stated that the new fee on all containers of pesticides sold to unlicensed applicators was now Public Law 2020, Chapter 548, and it went into effect January 1, 2020, but there was a substantial delay. She added that the Maine Revenue Service suspected to go live any day. Patterson told the Board that BPC staff will create outreach services for licensed applicators to let them know they can receive a Certificate of Exemption.
- Patterson told the Board that our obligation is to provide a monthly update of registered products in the state of Maine, which will be posted on the website and we will send out a monthly GovDelivery detailing these products. Maine Revenue Service will also have guidance on their website. A small amount of funding goes to the BPC to offset costs of addressing the responsibilities identified in statute. Patterson stated that Maine Revenue Service also receives a small amount of funding for administration of the fee, The remaining funds collected the University of Maine Cooperative Extension Diagnostic and Research Laboratory. She explained that half of the remaining funds are to be distributed to the tick laboratory for various non administrative costs. The other half of the remaining funds are to be shared equally between efforts toward pest management and pest research. The funding allocated to pest research will be overseen by a seven-member pest research committee.

#### d. Notification Update

- Patterson told the Board that she spoke with Pluecker to brainstorm ways in which the approach to notification could be changed without going through rulemaking. Ideas included providing an online sign up for the Non-Agricultural Registry and considering removing the associated fee. She added that staff could conduct more outreach and

education for the public about the Non-Agricultural Registry and Self-Initiated Notification. Patterson stated that we could also create resources for applicators to make notification easier.

e. Budget Update

- Patterson will come back at July Board meeting with information on the budget.
- There was discussion amongst the Board about keeping within statutory requirements that the budget is to be created with input from the Board.
- Bohlen stated that colleagues at other state agencies are asking about directions for cuts and asked if the Board would have input into these relevant conversations if we are at an appropriate time to weigh in.
- Gibbs stated that the timing is perfect because staff is dealing with finalizing end of budget now, so July would be a great time. She added that they would have to start looking at cuts and are being directed to only purchase items that are necessary.
- Morrill asked that ideas about the upcoming budget be added to the next agenda.

f. Variance Permit for Asplundh Tree Experts—Railroad Division

g. Variance Permit for Dubois Contracting

h. Letter from Emera Maine

i. Water Quality Monitoring Update

- Patterson stated that the Water Quality Monitoring Program had begun sampling wells this year and was about one third through before it was cut short this year due to the pandemic. She commented that staff had only completed about 55-60 out of the 200 wells they planned to test. Patterson told the Board that the inspectors were extremely efficient and did their best to get as much done as possible in the time allotted. She added that they did not want to cut short the water quality program, but the COVID-19 pandemic left staff with no choice because people were not answering their doors. This response was presumed to be related to corona virus and folks being concerned about people entering their homes. This initiative is typically very well received, and people are typically eager to participate.
- Morrill asked if staff had intentions of picking the project back up after the COVID-19 pandemic was over.
- Patterson responded that staff intended to continue the work in late 2020 and/or early 2021. The conversation about proceeding will necessarily include a discussion of how to move forward as well as the consideration of contingency plans for how the project might change to address continued complications resulting from the pandemic.
- Morrill suggested sending out flyers or calling individuals ahead of time.

j. Falmouth Municipal Ordinance

9. Schedule of Future Meetings

July 24, 2020; September 18, 2020 and November 6, 2020 are proposed meeting dates.

- Flewelling asked if the July meeting would be held on Zoom as well.
- Patterson stated that at this time it looks like it will be unless the office building is open by then. She offered to find a facility if the Board would prefer to meet in person.
- Flewelling stated that the Zoom meeting worked well.
- Jemison stated that he thought this was a successful meeting and really appreciated having an extra three hours in his day from not having to drive to Augusta for the meeting. He added that it would be great to hold virtual meetings in the winter when there is bad weather.

8. Adjourn

- **Morrill/Flewelling: Moved and seconded to adjourn at 11:04am**
- **In Favor: Unanimous**

Janet T. Mills  
Governor

Jeanne M. Lambrew, Ph.D.  
Commissioner



Maine Department of Health and Human Services  
Maine Center for Disease Control and Prevention  
11 State House Station  
286 Water Street  
Augusta, Maine 04333-0011  
Tel (800) 821-5821; Fax (800) 293-7534  
TTY: Dial 711 (Maine Relay)

## Maine 2019 Arboviral Surveillance Summary

- 1,539 mosquito pools tested for Eastern Equine Encephalitis (EEE) and West Nile virus (WNV)
  - 2 pools tested positive for EEE in York County
  - Increase from 758 pools in 2018
  - Mosquitoes collected from 44 towns in 12 counties
- 0 human cases of domestic arboviral illnesses
  - 63 individuals tested at HETL
- 1 horse tested positive for EEE
  - 13 animals tested at HETL

Maine CDC sponsored pesticide resistance monitoring testing:

- At least 10 pesticide resistance tests using the CDC bottle bioassay
  - *Culex pipiens* tested for resistance to bifenthrin
- 0 tests showed resistance

### Current regional situation

- New Hampshire identified first Jamestown Canyon Virus cases of the 2020 Arboviral Season in early July
- Massachusetts has early arboviral activity
  - 4 mosquito pools positive for WNV
  - 7 mosquito pools positive for EEE

For more information contact:

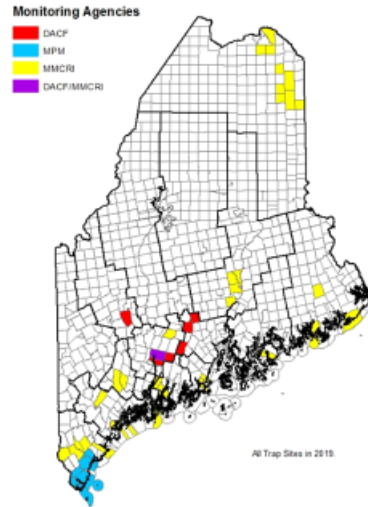
Sara Robinson, MPH  
Infectious Disease Epidemiology  
Maine CDC

[sara.robinson@maine.gov](mailto:sara.robinson@maine.gov)

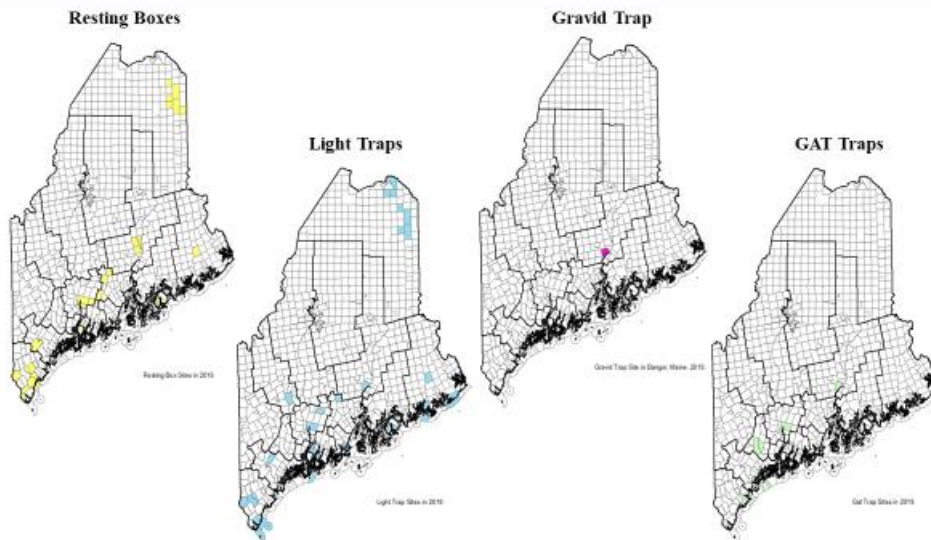
207-287-4610

# Mosquito Trapping

- 115 sites surveyed
- Traps used for surveillance:
  - CDC Miniature Light Traps
  - Resting boxes (n=270)
  - BG-GATs
  - Gravid traps
- 10 to 12 BG-GATs per town
  - 5 municipal areas:
    - Augusta
    - Bangor
    - Biddeford/Saco
    - Lewiston/Auburn
    - Portland



# Mosquito Trap Sites





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

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

To: Board of Pesticides Control Members  
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist  
Re: EPA Special Local Need (SLN) [FIFRA 24(c)] application to approve application of Corteva Agriscience Milestone Herbicide, EPA Reg. No. 62719-519, for control of herbaceous broadleaf weeds and woody plants for forest site preparation  
Date: July 13, 2020

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Please find enclosed the above-referenced SLN application and supporting documents for your consideration.

Ronald Lemin, Jr., Vegetation Management Sales Consultant, Nutrien Solutions, submitted the request on behalf of the Maine forest industry to permit the use of Milestone Herbicide on forested sites for site preparation with planting the next spring. The industry is seeking to replace the use of glyphosate with 40.6 % aminopyralid (triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro-), the active ingredient in this product, due to public concerns related to glyphosate.

The use of Milestone Herbicide for forest site preparation is not included in the approved EPA master label. The permitted rate under this SLN is up to 7 fl oz applied in a total spray volume of 10-30 gal/A which is consistent with other uses on the Section 3 label.

Milestone Herbicide reduces competition by controlling herbaceous broadleaf weeds and woody plants, including native conifers. Mr. Lemin reported two site preparation trials in 2018 with the Milestone site resulting in good brush control and good seedling vigor. Corteva Agrisciences provided additional data from 2007 and 2008 to support this SLN and those documents are attached for your review. Please note, the studies used Milestone VM, EPA Reg. No. 62719-537, that also contained 40.6 % aminopyralid.

Aminopyralid is highly soluble in water. Solubility of 203-212 mg/L reported in the table below may be erroneous because other sources report 2480 mg/L (Corteva Agrisciences, National Center for Biotechnology Information 2020, U.S. EPA 2005a, U.S. EPA 2005b). It demonstrates moderately high adsorption in soils high in organic matter and low potential for movement and leaching below the root zone (WIN-PST 3.1). Dow Agrosciences research demonstrates low potential for groundwater contamination due to “slow use rates, moderate field degradation rates and limited motility observed in field studies” (Dow AgroSciences LLC).

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Aminopyralid has not been detected in Maine groundwater studies. The potential to runoff in solution or attach to soil particles is intermediate (WIN-PST 3.1).

It is moderately persistent, stable to hydrolysis and anaerobic metabolism (U.S. EPA 2005a, U.S. EPA 2005b). However, the half-life in soils and water is highly variable dependent upon aerobic or anaerobic conditions, pH, soil type, and amount of sunlight.

Aminopyralid exhibits low human and environmental toxicity (U.S. EPA 2005a, U.S. EPA 2005b, WIN-PST 3.1). It is “practically nontoxic to mammals, birds, fish, honeybees, and aquatic invertebrates”. Please refer to the memorandum from Pam Bryer, BPC toxicologist, for further information on toxicity.

WIN-PST Results based on a broadcast application at a rate of greater than ¼ lb AI/A.

HL	Koc	SOL	PLP	PSRP	PARP	HumanT	HumanToxT	MATC
26	1000	203-212	Low	Intermediate	Intermediate	3500	HA	1360

WIN-PST 3.1. Windows Pesticide Screening Tool

HL -Half-life in the soil in days

Koc – Soil organic carbon sorption coefficient in mL/g

SOL -Solubility in water in mg/L (ppm)

PLP – Pesticide leaching potential

PSRP – Pesticide solution runoff potential

PARP – Pesticide adsorbed runoff potential

Human T – Human toxicity value – long term (ppb)

HumanToxT – Human toxicity type

MATC – Maximum acceptable toxicant concentration – fish (ppb)

A broader SLN including this use has already been approved in eleven states indicating this is no longer a local need, but rather interregional or national in scope. Therefore, this office submitted a request to Corteva Agrisciences to include the site on the EPA master and market labels.

Your package includes the following documents for your review:

- EPA Form 8570-25 FIFRA, Section 24(c) application
- Corteva Agriscience Milestone Herbicide draft Section 24(c) label
- Memo from Pamela J. Bryer, Ph.D., BPC Toxicologist
- Letter of request from Ron Lemin, Jr., Vegetation Management Sales Consultant, Nutrien Solutions
- Letter of support from Corteva Agrisciences
- Forestry Data
  - Cummings, D. Chad. Key Answer File for NA07LIB066 Milestone Applied Pre-Plant for Pine Tree Site Prep. 2007 R&P/IVM Data Review.



- Kline, Bill. Milestone VM for Forestry SLN label strategy & Progress to-date 12/10/08. 16 pages.
- Corteva Agriscience Milestone Herbicide Section 3 container label
- Safety Data Sheet

Please review these materials and contact me at (207) 287-7544 if you have any questions.

#### Citations

Dow AgroSciences LLC. Aminopyralid Family of Herbicides. Indianapolis, IN.  
<https://www.corteva.us/dam/products/us-land-management/pdf> (accessed on July 13, 2020).

National Center for Biotechnology Information. PubChem Database. Aminopyralid, CID=213012,  
<https://pubchem.ncbi.nlm.nih.gov/compound/Aminopyralid> (accessed on July 13, 2020).

U.S. EPA. Pesticide Fact Sheet. Aminopyralid. 2005a. United States Office of Prevention, Pesticides, Environmental Protections and Toxic Substances Agency.  
[https://www3.epa.gov/pesticides/chem\\_search/reg\\_actions/registration/fs\\_PC-005100\\_10-Aug-05.pdf](https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-005100_10-Aug-05.pdf) (accessed on July 13, 2020).

U.S. EPA. Environmental Fate and Ecological Risk Assessment for the Registration of Aminopyralid. 2005b.  
<https://archive.epa.gov/pesticides/chemicalsearch/chemical/foia/web/html/005100.html> (accessed on July 6, 2020).

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**  
Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268-1054

**2. Product is (Check one)**  
 EPA-Registered  
 New (not EPA-registered)  
Attach EPA Form 8570-4, Confidential Statement of Formula for new products.

EPA Registration Number  
62719-519

EPA Company Number

**3. Active Ingredient(s) in Product**  
Aminopyralid

**4. Product Name**  
Milestone

**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. Nonfood use**

**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)**

There is no pesticide product registered by EPA for such use.

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.

An appropriate EPA-registered pesticide product is not available.

**10. Has FIFRA section 24(c) registration for this use of the product ever, by another State, been (check appropriate box(es), if known):**

Sought     Issued     Denied     Revoked

If any of the above are checked, list States in item 13 below.

No FIFRA section 24(c) Action

**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 ?**

Yes (discuss in item 13 below)     No

**9. Has an EPA Registration or Experimental Use Permit for this chemical ever been (check applicable box(es), if known):**

Sought     Issued     Denied     Cancelled     Suspended

Registration     Experimental Use Permit     No Previous Permit 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.

**Certification**  
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.

**12. Indicate use status of Special Local Need, i.e., planned dates of use:**  
From: July 2020    To: Dec 31, 2024

**Signature of Applicant or Authorized Representative**  
*Elaine Bauer*

**13. Comments (attach additional sheet, if needed)**  
6.b.6. For Control Of Herbaceous Broadleaf Weeds And Woody Plants in Conifer Forest Site Preparation Sites

**Title**  
Regulatory Specialist

**Telephone Number**  
317-337-4073

**Date**  
July 10, 2020

10. Issued: AR, CA, FL, GA, LA, MN, MS, NC, SC, TX, VA

**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	Comments (by State Agency Only)	Received by EPA
<p><b>Title</b></p> <p><b>Telephone Number</b></p> <p><b>Date</b></p>		

# FIFRA Section 24(c) Special Local Need Label

Dow AgroSciences, LLC, 9330 Zionsville Road, Indianapolis, IN 46268-1054 USA

## Milestone®

EPA Reg. No. 62719-519

FIFRA Section 24(c) Special Local Need Registration  
EPA SLN ME-2000\_\_\_\_\_

This SLN expires and must not be used or distributed after December 31, 2024.  
For Distribution and Use Only Within the State of Maine

**For Control Of Herbaceous Broadleaf Weeds And Woody Plants  
in Conifer Forest Site Preparation Sites**

### Directions for Use

#### ATTENTION

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This Special Local Need (SLN) labeling and the federal label for this product must be in the possession of the user at the time of pesticide application.
- Read this SLN labeling and the label affixed to the container for Milestone before applying.
- Follow all applicable use directions, precautions, restrictions, and statements pertaining to the Worker Protection Standard on this SLN labeling and the label affixed to the product container.

Refer to product label for Use Precautions, Restrictions, Worker Protection Standards, Mixing Instructions, and Application Methods.

### Conifer Forest Site Preparation Areas

Milestone may be applied to conifer forests areas as an aerial or ground broadcast application, as a spot application, or as a high-volume foliar application to control herbaceous broadleaf weeds and woody plants. Avoid spray containing Milestone coming in contact with foliage of desirable tree species.

Milestone may be applied alone or in tank-mix combinations with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated, and (2) mixing is not prohibited by the label of the registered tank mixed products. Use as directed in the Directions for Use section of the tank-mix partner.

### Forest Management Applications

Use up to 7 fl oz of Milestone per acre. Use a non-ionic agricultural surfactant for all foliar applications. Tank mixtures with other herbicides registered for forest use may be necessary to control woody brush if brush is not susceptible to Milestone. When tank mixtures of herbicides are used for forest site preparation, labels for all products in the mixture must be followed and the longest recommended waiting period before planting observed.

For best control from broadcast and directed spray applications of Milestone, use a spray volume that will provide thorough plant coverage. Recommended spray volumes are usually 10 to 25 gallons per acre by air or 10 to 100 gallons per acre by ground. To improve spray coverage of spray volumes less than 50 gallons per acre, add an agriculturally labeled non-ionic surfactant at the recommended rate specified on the surfactant label.

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R879-083

Accepted: \_\_/\_\_/\_\_

Initial



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

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

## Memorandum

To: Board of Pesticides Control  
From: Pamela J. Bryer, Ph.D. | Toxicologist  
Subject: Milestone Special Local Need 24c Registration 2020 Review

July 9, 2020

---

### Summary:

Aminopyralid is a low toxicity herbicide that is unlikely to cause undue risk to people or the environment from the proposed uses in this Special Local Need, 24c, registration.

### Rationale:

Aminopyralid is a reduced risk herbicide used for controlling weedy dicots. EPA designated aminopyralid as reduced risk when it was registered in 2005 because the human health and environmental risks posed by its use are less than many other commonly used herbicides.

Aminopyralid's residence time in the environment covers an expansive range. The compound breaks down rapidly -so rapidly its half-life can be measured in hours, but only when it is in sunlight and sunlit water. In dark soil and sediment, aminopyralid can take hundreds of days to over a year to breakdown. This long half-life is part of the reason aminopyralid can offer residual control.

Aminopyralid is highly soluble in water (an attribute that makes chemicals likely to leach), however, its ability to leach is variable and dependent on soil characteristics. In soil movement studies, aminopyralid largely stayed in the top portion of the soil. The maximum leaching recorded in field trails was 15 to 90 cm deep.

The primary toxic effects of aminopyralid are to terrestrial dicots, as can be expected with an herbicide. Even in simulated worst-case spill events, a tank release into a small pond, EPA found aminopyralid did not pose unacceptable risk to algae, some plants, fish, or aquatic invertebrates.

Aminopyralid is practically non-toxic to mammals and birds. Even after accounting for ingestion of grasses and seeds sprayed in the target application zone, EPA determined there would be no

MEGAN PATTERNSON, DIRECTOR  
90 BLOSSOM LANE, DEERING BUILDING



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

harm to birds and small mammals. In feeding and contact studies, aminopyralid was considered to be practically non-toxic to bees.

EPA is scheduled to complete a new round of risk assessments in 2020 as part of aminopyralid's 15-year registration renewal. No dates have been announced for Proposed or Interim Decisions on re-registration.

Aminopyralid is commonly used in southern and western states for pasture as can be seen in Figure 1.

There are tolerances set for aminopyralid based on its use on wheat and pasture. These details can be found at: [https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=b069684783771469b656e65a48e2a7df&ty=HTML&h=L&mc=tr ue&r=SECTION&n=se40.26.180\\_1610](https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=b069684783771469b656e65a48e2a7df&ty=HTML&h=L&mc=tr ue&r=SECTION&n=se40.26.180_1610)

#### Source documents:

Aminopyralid Fact Sheet. Issued August 10, 2005. US EPA Office of Prevention, Pesticides. Available at: [https://www3.epa.gov/pesticides/chem\\_search/reg\\_actions/registration/fs\\_PC-005100\\_10-Aug-05.pdf](https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-005100_10-Aug-05.pdf)

Preliminary Problem Formulation for the Environmental Fate and Ecological Risk, Endangered Species, and Human Health Drinking Water Exposure for Aminopyralid, Potassium salt of Aminopyralid, and Triisopropanolamine Salt of Aminopyralid. Issued February 12, 2014. US EPA Office of Pesticide Programs, Environmental Fate and Effects Division. Available at: <https://www.regulations.gov/document?D=EPA-HQ-OPP-2013-0749-0011>

Addendum to the Problem Formulation for the Environmental Fate and Ecological Risk, Endangered Species, and Drinking Water Assessments in Support of the Registration Review of Aminopyralid Regarding Tier I Honey Bee Toxicity Testing. Issued September 3, 2014. US EPA Office of Chemical Safety and Pollution Prevention. Available at: <https://www.regulations.gov/document?D=EPA-HQ-OPP-2013-0749-0044>

Aminopyralid Human Health and Ecological Risk Assessment -Final Report. Prepared for USDA/Forest Service and National Park Service. Issued June 28, 2007. Prepared by Syracuse Environmental Research Associates Inc., Fayetteville, New York. SERA TR-052-04-04a. Available at: [https://www.fs.usda.gov/nfs/11558/www/nepa/101135\\_FSPLT3\\_2537846.pdf](https://www.fs.usda.gov/nfs/11558/www/nepa/101135_FSPLT3_2537846.pdf)

Aminopyralid Estimated Agricultural Use. National Water-Quality Assessment (NAWQA) Project. USGS Website. Accessed July 7, 2020. Available at: [https://water.usgs.gov/nawqa/pnsp/usage/maps/show\\_map.php?year=2017&map=AMINOPYRALID&hilo=L&disp=Aminopyralid](https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2017&map=AMINOPYRALID&hilo=L&disp=Aminopyralid)





*Ronald C. Lemin, Jr.  
Vegetation Management Sales Consultant  
291 Lincoln Street  
Bangor, Maine 04401  
207-944-6160 (m)  
Ronald.lemine@nutrien.com*

May 13, 2020

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

Dear Mary and the Board of Pesticides Control,

I am in support of a 24(c) Special Local Need registration for Milestone, EPA Registration Number 62719-519 for use on forested sites in Maine to control broad-leaved plants, woody brush and native conifer species in the silvicultural site preparation process. In July forest industry applies primarily glyphosate, imazapyr, and sulfometuron methyl to control competition on forested sites prior to planting the following spring. Forestry companies are actively looking to replace the common herbicide glyphosate in the mix due to its political ramifications in the industry. In the south and other parts of the country, forest industry is site preparing with triclopyr, fluroxypyr (Vista XRT), aminopyralid (Milestone), imazapyr, and sulfometuron methyl with great success.

Based on the success of Milestone in the south and in Minnesota, I aeri ally applied (in July 2018) two site preparation trials with Vista (fluroxypyr) and Milestone (aminopyralid) to study the effects on brush control and planted seedling survival the following year. The following year the sites were planted with spruce seedlings and evaluated for mortality and vigor. There was no detected loss of seedlings due to the herbicide application the previous year, and seedling vigor was good on 98% of the seedlings. Brush control results from the site preparation trial were also good.

The forest industry would like to potentially use Milestone this July/August in the site preparation treatment using a 24(C) approved by The Maine Board of Pesticides Control and supported by both Corteva and the Maine forest industry.

The attached 24(C) approved for use in MN would be similar to the one we would use in Maine. MN forestry grows planted spruce and native fir on forested sites very similar to Maine. I have attached this label as an example that the Milestone product has been working effectively as a site preparation tool in other states with crop species and forested soils very similar to Maine

I appreciate your time and consideration in this label request. If you should have any further questions, please feel free to contact me at the address above. I would also be available to answer questions at the next Board Meeting if necessary.

Sincerely,

A handwritten signature in black ink, appearing to read "Ronald C. Lemin, Jr.", written in a cursive style.

Ronald C. Lemin, Jr



July 13, 2020

Maine Department of Agriculture, Conservation and Forestry  
Board of Pesticides Control  
Marquardt Building  
32 Blossom Lane  
Augusta, ME 04333-0028

**APPLICATION FOR SPECIAL LOCAL NEED SECTION 24(c) REGISTRATION  
MILESTONE (A.I. AMINOPYRALID)  
EPA REG. NO. 62719-519  
FOR CONTROL OF HERBACEOUS BROADLEAF WEEDS AND WOODY PLANTS IN CONIFER FOREST  
SITE PREPARATION SITES**

Dow AgroSciences LLC respectfully requests registration of FIFRA Section 24(c) Special Local Need (SLN) for Milestone<sup>®</sup>, EPA Registration Number 62719-519, for control of herbaceous broadleaf weeds and woody plants in conifer forest site preparation sites. This request is being made with the support of Ronald Lemin, Jr. of Nutrien Solutions. Dow AgroSciences has a similar Sec 24(c) label registered in Minnesota (SLN MN-120005) as well as in Arkansas, California, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas, and Virginia.

Currently, Capstone<sup>®</sup> herbicide is labeled for forestry uses: Capstone is a combination of aminopyralid + triclopyr. Triclopyr is not needed on all sites, and use of Milestone herbicide alone (aminopyralid only, without the triclopyr in Capstone) will fit forestry site preparation uses better on many sites. As a tool in forestry, Milestone enhances the ability to establish conifer species generally intolerant to the other existing herbicides used in forestry. Milestone, when added to current forest site prep mixtures, provides control of wildling pines that cannot be achieved with currently available commercial herbicides or herbicide mixtures. It has the added benefit of reducing the overall amount of chemical used in forestry treatments.

Milestone has shown excellent herbaceous vegetation and brush control when applied alone or in combination with low rates of other forestry herbicides. Milestone has demonstrated the ability to suppress or inhibit germination of difficult-to-control species such as scotch broom – a characteristic not found in other forestry herbicides. Milestone also provides excellent control of legume species such as mimosa, locust, and redbud that cannot be achieved with currently available commercial herbicides or herbicide mixtures.

Research results and commercial applications have demonstrated that Milestone can safely be used for forest site preparation as close as 2 months prior to planting crop conifer trees (bare root or container seedlings) without damage or growth reduction impacts to the planted trees.

Milestone herbicide has some soil activity and has been shown to provide residual pre-emerge control of germinating weed seed, particularly weeds in the aster and composite weed families. Applications of Milestone as part of fall forest site preparation programs provides residual soil activity and spring weed control of susceptible weed species. In certain situations, site prep programs with Milestone can reduce or eliminate the need for spring “over-the-top” (of planted pines) herbicide applications – an additional potential to reduce herbicide usage and total environmental pesticide loading.

In most situations, the addition of Milestone provides reductions in per acre use rates of other herbicides typically used in forest site preparation mixtures. Maximum use rate of Milestone is very low at 1.75 oz ai/acre. This low use rate can substitute for as much as 1 lb+ of current herbicides such as glyphosate, triclopyr, imazapyr, etc.

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Maine Department of Agriculture, Conservation and Forestry  
APPLICATION FOR SPECIAL LOCAL NEED SECTION 24(c) REGISTRATION  
MILESTONE (A.I. AMINOPYRALID)  
EPA REGISTRATION NUMBER: 62719-519  
FOR CONTROL OF HERBACEOUS BROADLEAF WEEDS AND WOODY PLANTS IN CONIFER FOREST SITE  
PREPARATION SITES  
JULY 13, 2020

Page 2 of 2

**Attachments/enclosures**

Please find the following documents attached/enclosed:

- Letter/request and justification from registrant (this letter)
- US EPA Form 8570-25: Application for SLN
- Proposed Sec 24(c) SLN labeling entitled, "Milestone For Control Of Herbaceous Broadleaf Weeds And Woody Plants In Conifer Forest Preparation Sites" (Supplemental Label Code R879-083)
- Letter of Support from Ronald C. Lemin, Jr. of Nutrien Solutions dated May 13, 2020
- Summary presentation of commercial brush control data. Milestone VM for Forestry SLN label strategy & Progress to-date "The Data" Commercial Brush Control Results. Additive value of Aminopyralid in tank-mix combinations for brush control. Bill Kline. 12110/08, 16 pages
- Summary presentation of crop safety data: Key Answer File for NA07L1B066 MILESTONE Applied Pre-plant for Pine Tree Site Prep., D. Chad Cummings 2007, 10 pages

If you have any questions or require additional information, please feel free to contact me by email or phone. You may also contact Jamey Thomas, State Regulatory Lead, at 317-337-4138 / [jamey.thomas@corteva.com](mailto:jamey.thomas@corteva.com).

Sincerely,



Elaine Bauer  
Crop Protection Regulatory Specialist, US  
317-337-4073 or [elaine.bauer@corteva.com](mailto:elaine.bauer@corteva.com)

Attachments/enclosures

**KEY ANSWER FILE FOR  
NA07LIB066 MILESTONE  
APPLIED PRE-PLANT FOR  
PINE TREE SITE PREP**

**D. Chad Cummings  
2007 R&P/IVM Data Review**

# Trial Locations

## **Trial Location Summary Report** **Protocol No.: NA07L1B066**

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<b>Trial No.</b>	<b>City/Town</b>	<b>State</b>	<b>Country</b>	<b>DAS Rep</b>
PBL0735	Critz	VA	US	Burch, Pat L
WNK0708	Arnoldsville	GA	US	Kline, William N
VBL0605	Brookshire	TX	US	Langston, Vernon B
VBL0742	Nacodoches	TX	US	Langston, Vernon B
VFP0701	Molalla	OR	US	Peterson, Vanelle F

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# Treatments

Trt Num	Appl Code	Treatment Name	Form Conc	Conc Unit	Form Type	Rate	Rate Unit
1	A	MILESTONE VM	2 lb ae/gal		SL	511.5 ml pr/ha	
2	A	MILESTONE VM	2 lb ae/gal		SL	1023.1 ml pr/ha	
3	B	MILESTONE VM	2 lb ae/gal		SL	511.5 ml pr/ha	
4	B	MILESTONE VM	2 lb ae/gal		SL	1023.1 ml pr/ha	
5	B	MILESTONE VM	2 lb ae/gal		SL	1023.1 ml pr/ha	
5	B	OUST EXTRA	712.5 %AI W/W		WG	280212.8 mg pr/ha	
6	AB	UNTREATED					

Trt Num	Appl Code	Treatment Name	Form Conc	Conc Unit	Form Type	Rate	Rate Unit
1	A	MILESTONE VM	2 lb ae/gal		SL	7 fl oz pr/a	
2	A	MILESTONE VM	2 lb ae/gal		SL	14 fl oz pr/a	
3	B	MILESTONE VM	2 lb ae/gal		SL	7 fl oz pr/a	
4	B	MILESTONE VM	2 lb ae/gal		SL	14 fl oz pr/a	
5	B	MILESTONE VM	2 lb ae/gal		SL	14 fl oz pr/a	
5	B	OUST EXTRA	712.5 %AI W/W		WG	4 oz pr/A	
6	AB	UNTREATED					

# Trial Crop Species

## Crop/Host Information Summary Report

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Protocol#	Trial#	Crop (Bayer Code)	Crop (Scientific)	Crop (Common)
NA06L1B000	PLB0735	PIUTD	<i>Pinus taeda</i>	Loblolly pine
NA06L1B000	PLB0735	PIUEC	<i>Pinus echinata</i>	Short-leaf pine
NA06L1B066	WNK0708	PIUTD	<i>Pinus taeda</i>	Loblolly pine
NA06L1B066	WNK0708	PIUEL	<i>Pinus elliottii</i>	Slash pine
NA07L1B066	VBL0605	PIUTD	<i>Pinus taeda</i>	Loblolly pine
NA07L1B066	VBL0605	PIUEL	<i>Pinus elliottii</i>	Slash pine
NA07L1B066	VBL0605	PIUVI	<i>Pinus virginiana</i>	Virginia pine
NA06L1B066	VBL0742	PIUTD	<i>Pinus taeda</i>	Loblolly pine
NA06L1B066	VBL0742	PIUEL	<i>Pinus elliottii</i>	Slash pine
NA07L1B066	VFP0701	PSTME	<i>Pseudotsuga menziesii</i>	Douglas fir
NA07L1B066	VFP0701	PIUPO	<i>Pinus ponderosa</i>	Ponderosa pine

---

# KEY QUESTIONS

- Does Milestone VM provide a viable option when applied pre-plant for site prep in pine plantings?

# KEY ANSWERS

- In the five trials across the US, no conifer species exhibited significant injury from a pre-plant (site-prep) application of 7 or 14 fl oz/A of Milestone VM
  - Conifer spp. included: PIUEC, PIUEL, PIUPO, PIUTD, PIUVI, and PSTME



# Results

## GA, VA

VA – drought  
and weevils

Treatment	Crop				VA – drought and weevils	
	PIUTD	PIUEL	PIUTD	PIUEL	PIUTD	PIUEC
	Dead of 20 200DAAA	Dead of 20 200DAAA	Dead of 20 270DAAA	Dead of 20 270DAAA	Alive of 10 290DAAA	Alive of 10 290DAAA
Milestone VM 511 ml/ha	1.3	15.3	13.7	18.7	2	5.3
Milestone VM 1023 ml/ha	2.7	15.7	11.7	20	0.3	5.7
Untreated	1.7	12	8.7	16.7	0.7	5.7
LSD	NSD	NSD	NSD	NSD	NSD	NSD
n=3						

# Results OR

Trt No.	Treatment	Appl. Code	Crop	
			PSTME %Injury 295DAAA	PIUPO %Injury 295DAAA
1	Milestone VM 511 ml/ha	A	26	23
2	Milestone VM 1023 ml/ha	A	25	26
3	Milestone VM 511 ml/ha	B	34	28
4	Milestone VM 1023 ml/ha	B	37	25
5	Milestone VM 1023 ml/ha	B	35	35
5	Oust Extra 280 g/ha	B		
6	Untreated	AB	31	21
	LSD		NSD	NSD

N=4, 15 Sub-samples

# Results

## TX

Treatment	Crop									
	PIUTD %Injury 90DAAA	PIUEL %Injury 90DAAA	PIUTD %Injury 120DAA	PIUEL %Injury 120DAAA	PIUTD %Injury 150DAAA	PIUEL %Injury 150DAAA	PIUTD %Injury 180DAAA	PIUEL %Injury 180DAAA	PIUTD %Injury 200DAAA	PIUEL %Injury 200DAAA
Milestone VM 511 ml/ha										
Milestone VM 1023 ml/ha	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD
Untreated										
LSD	3.3	2	6.5			3.5	7	4	14.3	21

Treatment	Crop		
	PIUVI %Injury 100DAAA	PIUVI %Injury 150DAAA	PIUVI %Injury 175DAAA
Milestone VM 511 ml/ha	7.5 b	5	1.3
Milestone VM 1023 ml/ha	12.5 a	7.5	1.3
Untreated	0.0 c	0	0
LSD	4.1	NSD	NSD

# 6 MAT WEED DENSITIES

## GA

Growth Form	Weed Code	Weed Species	<u>Milestone VM 7 oz/A</u>	<u>Milestone VM 14 oz/A</u>
			Diff. from Untreated 180DAAA Density	Diff. from Untreated 180DAAA Density
A	AMBEL	common ragweed	-7	-13
A	CVNGL	tropic croton	-1	-1
A	ERICA	horseweed	0	-2
A	GERCA	carolina geranium	1	1
A	GNASS	cudweed	-2	-2
A	LAMAM	henbit	3	4
A	OXAST	woodsorrel	0	7
P	EUPCP	dogfennel	-1	-2
P	POLPE	smartweed	0	0
P	RUMCR	curly dock	0	-1
P	SOOVI	goldenrod	0	1
P	ELEIN	goosegrass	-1	0
P	FESAR	tallfescue	2	4
P	SORHA	johnsongrass	-4	-2
<b>LSD (0.05)=</b>			<b>NSD</b>	<b>NSD</b>

# Milestone VM for Forestry

## SLN label strategy & Progress to-date

Prepared by Bill Kline to support submissions  
to State Dept of Ag for forestry SLN labels

12/10/08

# “The Data” - Commercial Brush Control Results

## Additive value of Aminopyralid in tank-mix combinations for brush control

- Collected information from Sales Reps that installed demo/operational “plots” in 2006 & 2007 and rated at 1 YAT; no brownout data... just year after brush control.
- This “updated” data set includes both forestry site prep/understory and Electric Utility programs.
- Used comparisons of mixtures with aminopyralid vs mixtures without aminopyralid.
- These results and summary provide very positive information and present a strong case for use of aminopyralid in commercial brush control tank mixtures.
  - For use in forestry – site prep + most all other potential forestry uses except over-the-top conifer release programs (except longleaf – more on this later).
  - For use in Elec Utility brush control programs – both IPT and broadcast.
  - General brush control in other IVM & R&P markets – railroad, encroaching brush, etc.

# The analysis...

- The data sets – both forestry site prep/understory and Electric Utility - were sorted into treatment groups:
  - 1) Tank mixtures with aminopyralid
  - 2) Tank mixtures without aminopyralid
- Average control over all species was calculated for each group to provide an overall estimate of “added brush control” due to use of aminopyralid in brush control programs.
- On an as needed basis, we can also provide differences on key species such as pines and legume species.
  - Example – improvement in pine control – included here.

All data is from operational spray programs.

Data was collected and organized in a spreadsheet.

Estimates of % Control are visual estimates from Sales Reps, Landowners/managers, Field Scientists.

Sales Rep	Milestone Y/N	Herbicide Mix	Rate - % V/V	% Control ~		Species	Application	Comments	Location
				1 YAT					
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	90%		yaupon, mim	Backpack LV foliar		AL - Jackson South
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		yaupon, mim	Backpack LV foliar		AL - Jackson South
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	95%		Mimosa ced	Backpack LV foliar		AL - Jackson North
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	75%		Mimosa ced	Backpack LV foliar		AL - Jackson North
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	95%		longleaf pine	Backpack LV foliar		AL - Southern Div - SE port
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		longleaf pine	Backpack LV foliar		AL - Southern Div - SE port
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	98%		privit mimosa	Backpack LV foliar		AL - Southern Div - Montgor
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		privit mimosa	Backpack LV foliar		AL - Southern Div - Montgor
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	98%		mimosa bay l	Backpack LV foliar		AL - Tuscaloosa - South
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	80%		mimosa bay l	Backpack LV foliar		AL - Tuscaloosa - South
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	95%		mimosa virgii	Backpack LV foliar		AL - Tuscaloosa - North
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		mimosa virgii	Backpack LV foliar		AL - Tuscaloosa - North
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	95%		virginia pine	Backpack LV foliar		AL - Birmingham
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		virginia pine	Backpack LV foliar		AL - Birmingham
Cobb/Oden	Yes	Accord Conc + Arsenal + Milestone VM (2006)	4 + 0.75 + 0.25	95%		virginia pine	Backpack LV foliar		AL - Anniston
Cobb/Oden	No	Accord Conc + Arsenal + Escort (2005)	4 + 0.75 + 2 oz/100gal	70%		virginia pine	Backpack LV foliar		AL - Anniston
Ditmarsen	No	Aqua Star + Habitat	1.0 + 0.25	98%		scrub oak an	Handgun - 100 GPA	Aqua Star conta	Progress Energy Hardwood
Ditmarsen	Yes	Aqua Star + Habitat + Milestone VM	1.0 + 0.25 + 0.11	85%		scrub oak, pe	Handgun - 100 GPA	sumac defoliate	Progress Energy Hardwood
Ditmarsen	No	Aqua Star + Habitat + Vista	1.0 + 0.25 + 0.33	95%		scrub oak, m	Handgun - 100 GPA		Progress Energy Hardwood
Ditmarsen	Yes	Garlon 4 + Vista + Milestone VM	1.0 + 0.33 + 0.11	95%		scrub oak	Handgun - 100 GPA		Progress Energy Hardwood
Ditmarsen	Yes - alone	Milestone VM	0.11	25%		scrub oak	Handgun - 100 GPA		Progress Energy Hardwood
Ditmarsen	No	Aqua Star + Habitat	1.0 + 0.25	98%		scrub oak an	Handgun - 100 GPA	Aqua Star conta	Progress Energy Hardwood
Ditmarsen	Yes	Aqua Star + Habitat + Milestone VM	1.0 + 0.25 + 0.11	85%		scrub oak, pe	Handgun - 100 GPA	sumac defoliate	Progress Energy Hardwood
Ditmarsen	No	Aqua Star + Habitat + Vista	1.0 + 0.25 + 0.33	95%		scrub oak, m	Handgun - 100 GPA		Progress Energy Hardwood
Ditmarsen	Yes	Garlon 4 + Vista + Milestone VM	1.0 + 0.33 + 0.11	95%		scrub oak	Handgun - 100 GPA		Progress Energy Hardwood
Ditmarsen	Yes - alone	Milestone VM	0.11	25%		scrub oak	Handgun - 100 GPA		Progress Energy Hardwood
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	95%		ash alanthius	High volume foliar		APS
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	98%		ash alanthius	High volume foliar		APS
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	90%		ash alanthius	High volume foliar		APS
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	100%		ash alanthius	High volume foliar		APS
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	92%		ash alanthius	High volume foliar		APS
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	100%		ash alanthius	High volume foliar		APS
Quattrocchi	No	Accord C 4% + Arsenal .25%	4 + 0.25	98%		ash alanthius	High volume foliar		APS
Quattrocchi	Yes	Accord C 4% + Milestone .5%	4 + 0.5	100%		ash alanthius	High volume foliar		APS
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	95%		ash locust(B,	High volume foliar		AEP
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	95%		ash locust(B,	High volume foliar		AEP
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	95%		ash locust(B,	High volume foliar		AEP
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	100%		ash locust(B,	High volume foliar		AEP
Quattrocchi	No	Garlon 3A 0.5 + Tordon K 0.25	0.5 + 0.25	98%		ash alanthius	High volume foliar		1st Energy
Quattrocchi	Yes	Garlon 3A 0.5 + Tordon K 0.12 + Milestone 7flocz/10.5 + 0.12 + 7flocz/100gal	10.5 + 0.12 + 7flocz/100gal	100%		ash alanthius	High volume foliar		1st Energy
Quattrocchi	No	Tordon + Arsenal + Thinvert	2 qts + 8flocz + 5 gal/acre	95%		ash alanthius	Cut stubble		PECO
Quattrocchi	Yes	Tordon + Milestone + Thinvert	2 qts + 7flocz + 5 gal/acre	100%		ash alanthius	Cut stubble		PECO
Russell	Yes	Garlon 3A + Milestone VM	2 + 0.5	100%		mimosa	Backpack LV foliar		Sumpter Elec
Russell	No	Accord + Arsenal	4 + 0.33	50%		mimosa	Backpack LV foliar		Sumpter Elec



**Forestry Data – All Broadcast Foliar applied at a set “per acre” rate - mostly site prep aerial or ground broadcast (some mid-rotation release & broadcast on ROW brush) collected in 2008.**

**All ratings are at 1 YAT –**

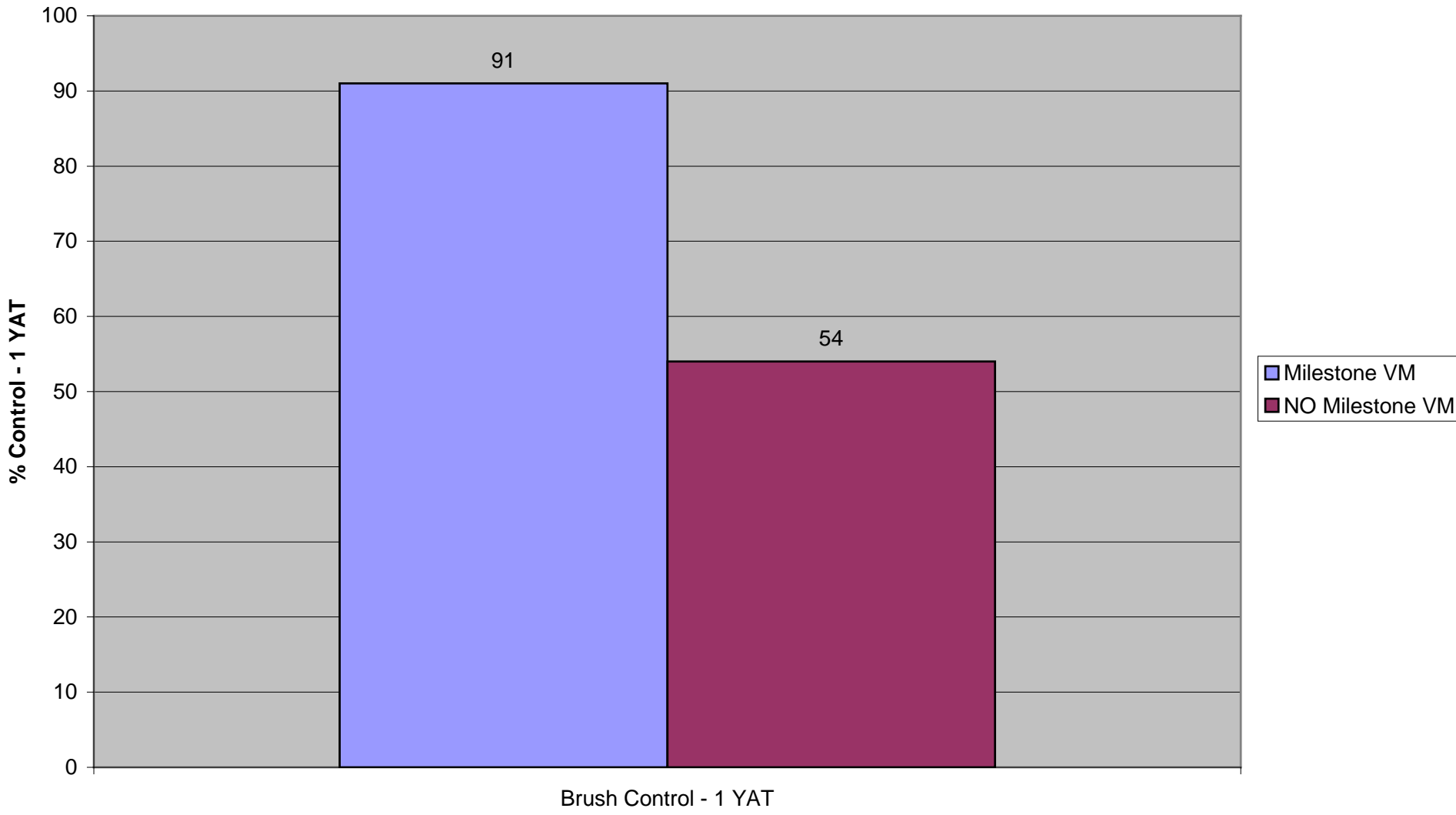
**The average control achieved from mixtures containing Milestone VM was 91%**

**The average control achieved from mixtures not containing Milestone VM was 54%**

**Addition of Milestone VM to brush control mixtures, on average, increased the level of control by 37%**

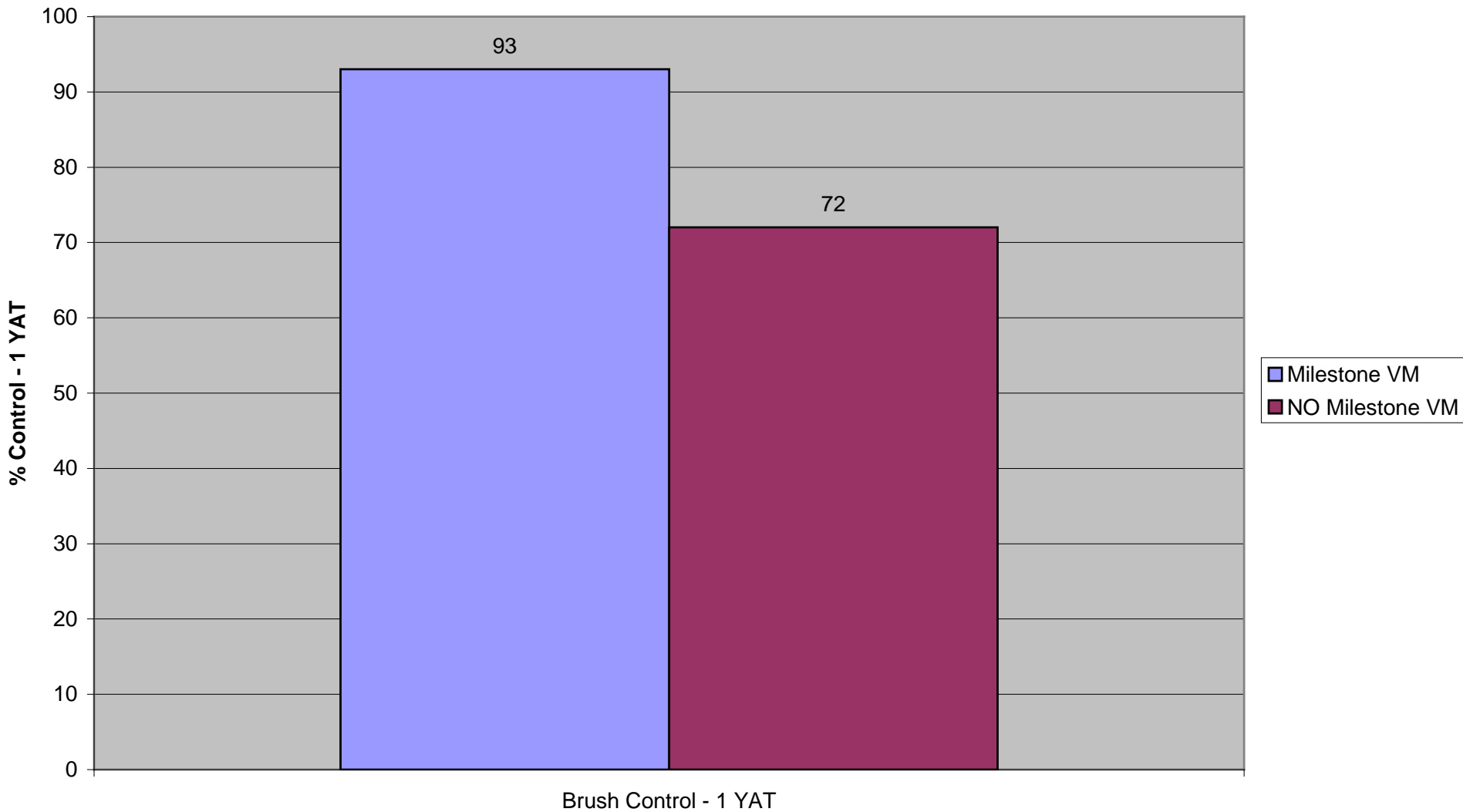
DAS Sales Rep	Location	Tract Name	Landowner	Local Forester/	Milestone Y/N	Herbicide Mix/ Rate - %	Control - 1	Species	Applicatio
Cobb	Birmingham	n/a	Molpus Timb Don Sanford, 20		Y	1 gal Milestone	n/a	100	Loblolly Pine
Cobb	Birmingham	n/a	Molpus Timb Don Sanford, 20		Y	1 gal Milestone	n/a	85	Virginia Pine
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		Y	1.9 qts Garlon )	n/a	75	Loblolly Pine
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		Y	1.9 qts Garlon )	n/a	95	gallberry
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		Y	1.9 qts Garlon )	n/a	90	oak
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		Y	1.9 qts Garlon )	n/a	100	maple
Cobb	Fulton, AL		Scotch Lumt George Robertsr		Y	5 qts Accord XF	n/a	100	pine
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		Y	5 qts. Accord X	n/a	95	Locust Aerial Broa
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		Y	5 qts. Accord X	n/a	90	Virginia Pir Aerial Broa
Cobb	Walnut Hill,	n/a	Amsouth Bai Mark Parrot, Sur		Y	7floc Milestone	n/a	95	Loblolly Pir Aerial Broa
Neal	Warren Col	Warren Cour	Warren Cour Tommy Walker,		Y	21oz Transline	n/a	88	Locust Aerial Broa
Neal	Warren Col	Warren Cour	Warren Cour Tommy Walker,		Y	21oz Transline	n/a	100	Redbud Aerial Broa
Rogers		Wise Batten Forestry Tract			Y	Accord XRT - 4	n/a	99	Bay Aerial Broa
Rogers		Wise Batten Forestry Tract			Y	Accord XRT - 4	n/a	100	Yaupon Aerial Broa
Rogers	Broad River	n/a	Broad River Elec		Y	Accord XRT - 5	n/a	98	Virginia Pir Ground Brc
Rogers	Broad River	n/a	Broad River Elec		Y	Accord XRT - 5	n/a	90	Jap Honey:Ground Brc
Rogers	Broad River	n/a	Broad River Elec		Y	Accord XRT - 5	n/a	98	Water/willo Ground Brc
Rogers	Broad River	n/a	Broad River Elec		Y	Accord XRT - 5	n/a	85	Elm Ground Brc
Rogers		Brosman Forest Understory			Y	Garlon Ultra - 3	n/a	80	Lob Pine - Ground Brc
Russell	Eastman, GA		Rayonier Wc Jimmie Walton, I		Y	4 qts Accord XF	n/a	95	Loblolly Pir Aerial Broa
Russell	Abbeville, GA		Rayonier Cub Smith UAP		Y	4 qts. Milestone	n/a	95	Loblolly Pir Aerial Broa
Russell	Abbeville, GA		Rayonier Cub Smith UAP		Y	4 qts. Milestone	n/a	85	Virginia Pir Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		Y	7 qts. Accord X	n/a	90	Loblolly Pir Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		Y	7 qts. Accord X	n/a	95	Maple Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		Y	7 qts. Accord X	n/a	95	Blackberry Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		Y	7 qts. Accord X	n/a	60	Gallberry Aerial Broa
<b>Average % Control - 1 YAT &gt;&gt;&gt;&gt;&gt;&gt;&gt;</b>							<b>91</b>		
DAS Sales Rep	Location	Tract Name	Landowner	Local Forester/	Milestone Y/N	Herbicide Mix/ Rate - %	Control - 1	Species	Applicatio
Cobb	Birmingham	n/a	Molpus Timb Don Sanford, 20		N	1 gal Accord XF	n/a	65	Loblolly Pine
Cobb	Birmingham	n/a	Molpus Timb Don Sanford, 20		N	1 gal Accord XF	n/a	50	Virginia Pine
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		N	1.9 qts Garlon )	n/a	50	Loblolly Pine
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		N	1.9 qts Garlon )	n/a	95	gallberry
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		N	1.9 qts Garlon )	n/a	85	oak
Cobb	Atmore AL	n/a	Rayonier Wc Wayne Foley, 2E		N	1.9 qts Garlon )	n/a	90	maple
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		N	15 floz Translin	n/a	50	Locust Aerial Broa
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		N	15 floz Translin	n/a	0	Virginia Pir Aerial Broa
Cobb	Fulton, AL		Scotch Lumt George Robertsr		N	5 qts Accord XF	n/a	75	pine
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		N	5 qts. Accord X	n/a	25	Locust Aerial Broa
Cobb	Atmore, AL	n/a	Private Land Randy Rilling 25		N	5 qts. Accord X	n/a	60	Virginia Pir Aerial Broa
Cobb	Walnut Hill,	n/a	Amsouth Bai Mark Parrot, Sur		N	6 qts Razor Pro	n/a	60	Loblolly Pir Aerial Broa
Neal	Warren Col	Warren Cour	Warren Cour Tommy Walker,		N	21oz Transline	n/a	55	Locust Aerial Broa
Neal	Warren Col	Warren Cour	Warren Cour Tommy Walker,		N	21oz Transline	n/a	55	Redbud Aerial Broa
Rogers	Broad River	n/a	Broad River Elec		N	Accord XRT - 5	n/a	80	Virginia Pir Ground Brc
Rogers	Broad River	n/a	Broad River Elec		N	Accord XRT - 5	n/a	75	Jap Honey:Ground Brc
Rogers	Broad River	n/a	Broad River Elec		N	Accord XRT - 5	n/a	80	Water/willo Ground Brc
Rogers	Broad River	n/a	Broad River Elec		N	Accord XRT - 5	n/a	30	Elm Ground Brc
Rogers		Wise Batten Forestry Tract			N	Garlon XRT - 2i	n/a	40	Bay Aerial Broa
Rogers		Wise Batten Forestry Tract			N	Garlon XRT - 2i	n/a	40	Yaupon Aerial Broa
Rogers		Brosman Forest Understory			N	Garlon XRT - 8.	n/a	55	Lob Pine - Ground Brc
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		N	7.5 qts. Accord	n/a	85	Loblolly Pir Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		N	7.5 qts. Accord	n/a		Maple Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		N	7.5 qts. Accord	n/a		Blackberry Aerial Broa
Russell	Eulonia, GA		FIA Tim Gahl 912-7C		N	7.5 qts. Accord	n/a		Gallberry Aerial Broa
Russell	Abbeville, GA		Rayonier Cub Smith UAP		N	8 qts Razor Pro	n/a	10	Loblolly Pir Aerial Broa
Russell	Abbeville, GA		Rayonier Cub Smith UAP		N	8 qts Razor Pro	n/a	10	Virginia Pir Aerial Broa
Russell	Eastman, GA		Rayonier Wc Jimmie Walton, I		N	8 qts Razor Pro	n/a	20	Loblolly Pir Aerial Broa
<b>Average % Control - 1 YAT &gt;&gt;&gt;&gt;&gt;&gt;&gt;</b>							<b>54</b>		

**Brush Control from Operational 2008 Broadcast Programs - 2007 - Rated at 1 YAT**  
**Comparisons between broadcast (per acre) spray mixtures containing Milestone VM vs mixtures not containing Milestone VM**





**Brush Control from Operational IPT & Handgun Programs - 2006 & 2007 - Rated at 1 YAT**  
Comparisons between spray mixtures containing Milestone VM vs mixtures not containing Milestone VM



# Improvement in Pine Control:

DAS Sales Rep	Location	Tract Name	Landowner	Local Forester/	Milestone	Y/N	Herbicide Mix/	Rate - %	V% Control ~ 1 YAT	Species	Application Comments
Rogers		Brosman Forest		Understory		Y	Garlon Ultra -	n/a	80	Lob Pine -	Ground Broadcast
Cobb	Birmingham, A	n/a	Molpus Tin Don Sanford, 2		Y	1 gal Mileston	n/a	100		Loblolly Pine	
Cobb	Atmore AL	n/a	Rayonier V Wayne Foley, 2		Y	1.9 qts Garlon	n/a	75		Loblolly Pine	Ragweed &
Russell	Eastman, GA		Rayonier V Jimmie Walton		Y	4 qts Accord X	n/a	95		Loblolly Pir Aerial Broa Pine Belt aj	
Russell	Abbeville, GA		Rayonier Cub Smith UAF		Y	4 qts. Milestor	n/a	95		Loblolly Pir Aerial Broa Pine Belt aj	
Russell	Eulonia, GA		FIA Tim Gahl 912-7		Y	7 qts. Accord	n/a	90		Loblolly Pir Aerial Broa Pine Belt aj	
Cobb	Walnut Hill, AL	n/a	Amsouth B Mark Parrot, St		Y	7floz Mileston	n/a	95		Loblolly Pir Aerial Broa Seedling pi	
Cobb	Fulton, AL		Scotch Lun George Robert:		Y	5 qts Accord X	n/a	100		pine	50 acres of
Cobb	Birmingham, A	n/a	Molpus Tin Don Sanford, 2		Y	1 gal Mileston	n/a	85		Virginia Pine	Small seed
Russell	Abbeville, GA		Rayonier Cub Smith UAF		Y	4 qts. Milestor	n/a	85		Virginia Pir Aerial Broa Pine Belt aj	
Cobb	Atmore, AL	n/a	Private Lar Randy Rilling 2:		Y	5 qts. Accord	n/a	90		Virginia Pir Aerial Broa north Baldv	
Rogers	Broad River El	n/a	Broad River Elec		Y	Accord XPT	n/a	98		Virginia Pir Ground Broadcast	

**Average % Control - 1 YAT >>>>>**

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DAS Sales Rep	Location	Tract Name	Landowner	Local Forester/	Milestone	Y/N	Herbicide Mix/	Rate - %	V% Control ~ 1 YAT	Species	Application Comments
Cobb	Birmingham, A	n/a	Molpus Tin Don Sanford, 2		N	1 gal Accord X	n/a	65		Loblolly Pine	
Cobb	Atmore AL	n/a	Rayonier V Wayne Foley, 2		N	1.9 qts Garlon	n/a	50		Loblolly Pine	Ragweed &
Cobb	Walnut Hill, AL	n/a	Amsouth B Mark Parrot, St		N	6 qts Razor Pr	n/a	60		Loblolly Pir Aerial Broadcast	
Russell	Eulonia, GA		FIA Tim Gahl 912-7		N	7.5 qts. Accor	n/a	85		Loblolly Pir Aerial Broa Pine Belt aj	
Russell	Abbeville, GA		Rayonier Cub Smith UAF		N	8 qts Razor Pr	n/a	10		Loblolly Pir Aerial Broa Pine Belt aj	
Russell	Eastman, GA		Rayonier V Jimmie Walton		N	8 qts Razor Pr	n/a	30		Loblolly Pir Aerial Broa Pine Belt aj	
Cobb	Fulton, AL		Scotch Lun George Robert:		N	5 qts Accord X	n/a	75		pine	50 acres of
Cobb	Birmingham, A	n/a	Molpus Tin Don Sanford, 2		N	1 gal Accord X	n/a	50		Virginia Pine	
Cobb	Atmore, AL	n/a	Private Lar Randy Rilling 2:		N	15 floz Transli	n/a	0		Virginia Pir Aerial Broa north Baldv	
Cobb	Atmore, AL	n/a	Private Lar Randy Rilling 2:		N	5 qts. Accord	n/a	60		Virginia Pir Aerial Broa north Baldv	
Russell	Abbeville, GA		Rayonier Cub Smith UAF		N	8 qts Razor Pr	n/a	10		Virginia Pir Aerial Broa Pine Belt aj	
Rogers	Broad River El	n/a	Broad River Elec		N	Accord XPT	n/a	80		Virginia Pir Ground Broadcast	

**Average % Control - 1 YAT >>>>>**

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# Is it safe to plant conifers following applications of aminopyralid?

- Results presented at 2007 Fall Data Review by D. Chad Cummings:
  - In the five trials across the US, no conifer species exhibited significant injury from a pre-plant (site-prep) application of 7 or 14 fl oz/A of Milestone VM
  - Conifer spp. included: PIUEC, PIUEL, PIUPO, PIUTD, PIUVI, and PSTME
- Vanelle provided additional data in 2008 – no difference with or without aminopyralid as site prep treatment prior to planting – Doug fir, ponderosa pine, cedar, Western hemlock. Box plots of these data included in “Additional Slides” at end of this presentation.
- Bottomline, We are good to go on this part of the project.

# Conclusions

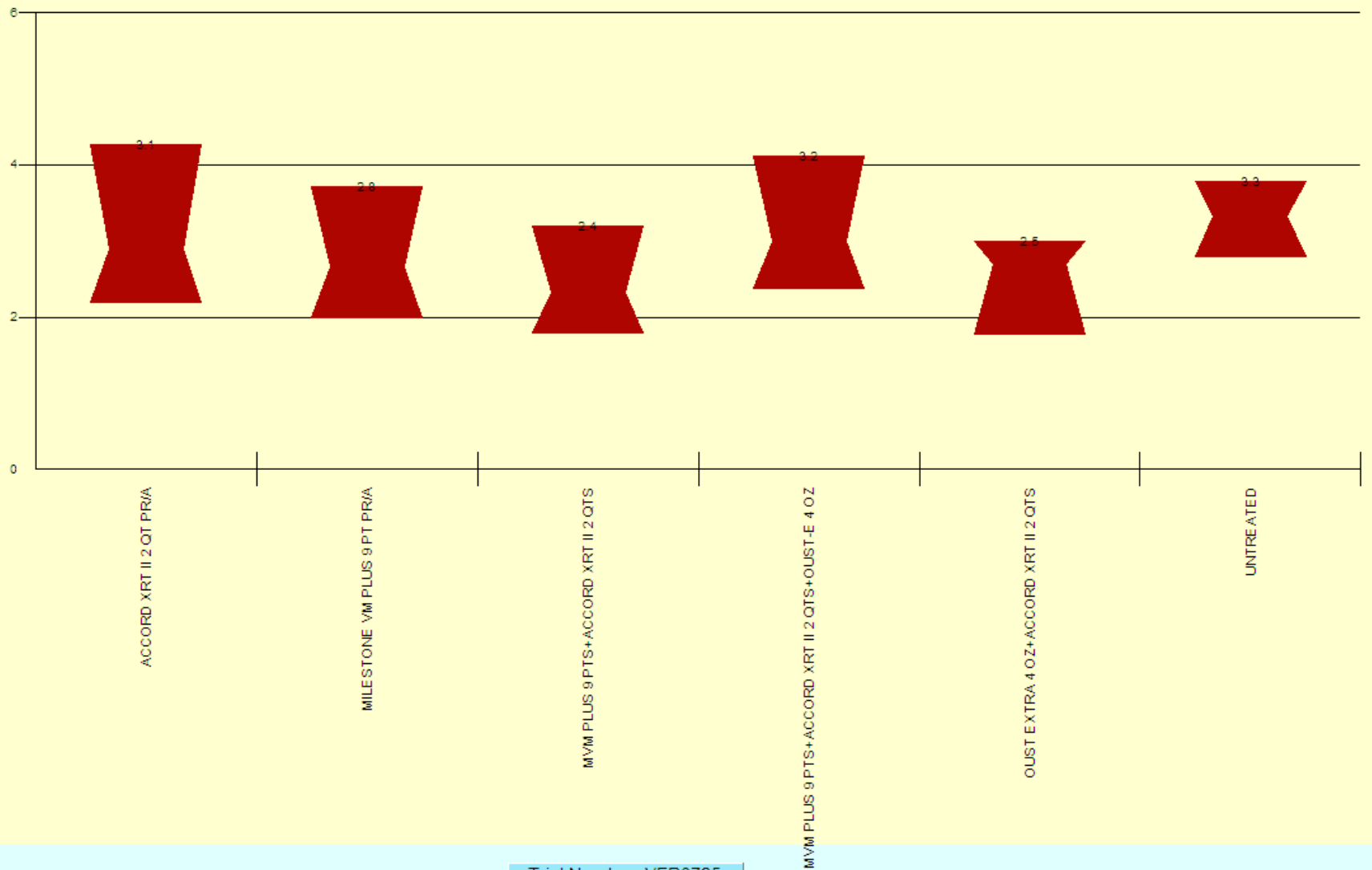
- Based on these data, collected over large geographic areas for 2 years, mostly in the SE:
  - The average control from **mixtures containing** Milestone VM was
    - 91% on broadcast foliar (mostly forestry sites)
    - 93% on IPT (mostly backpack electric utility ROW's).
  - The average control from **mixtures not containing** Milestone VM was
    - 54% on broadcast foliar (mostly forestry sites)
    - 72% on IPT (mostly backpack electric utility ROW's).
  - On average, addition of Milestone VM to brush control mixtures increased the level of control by
    - 37% on broadcast foliar sites
    - 21% on IPT/backpack.

**Additional Slides**



# Milestone applied pre-plant for site prep - mixed conifers

1-6SCAL INJURY

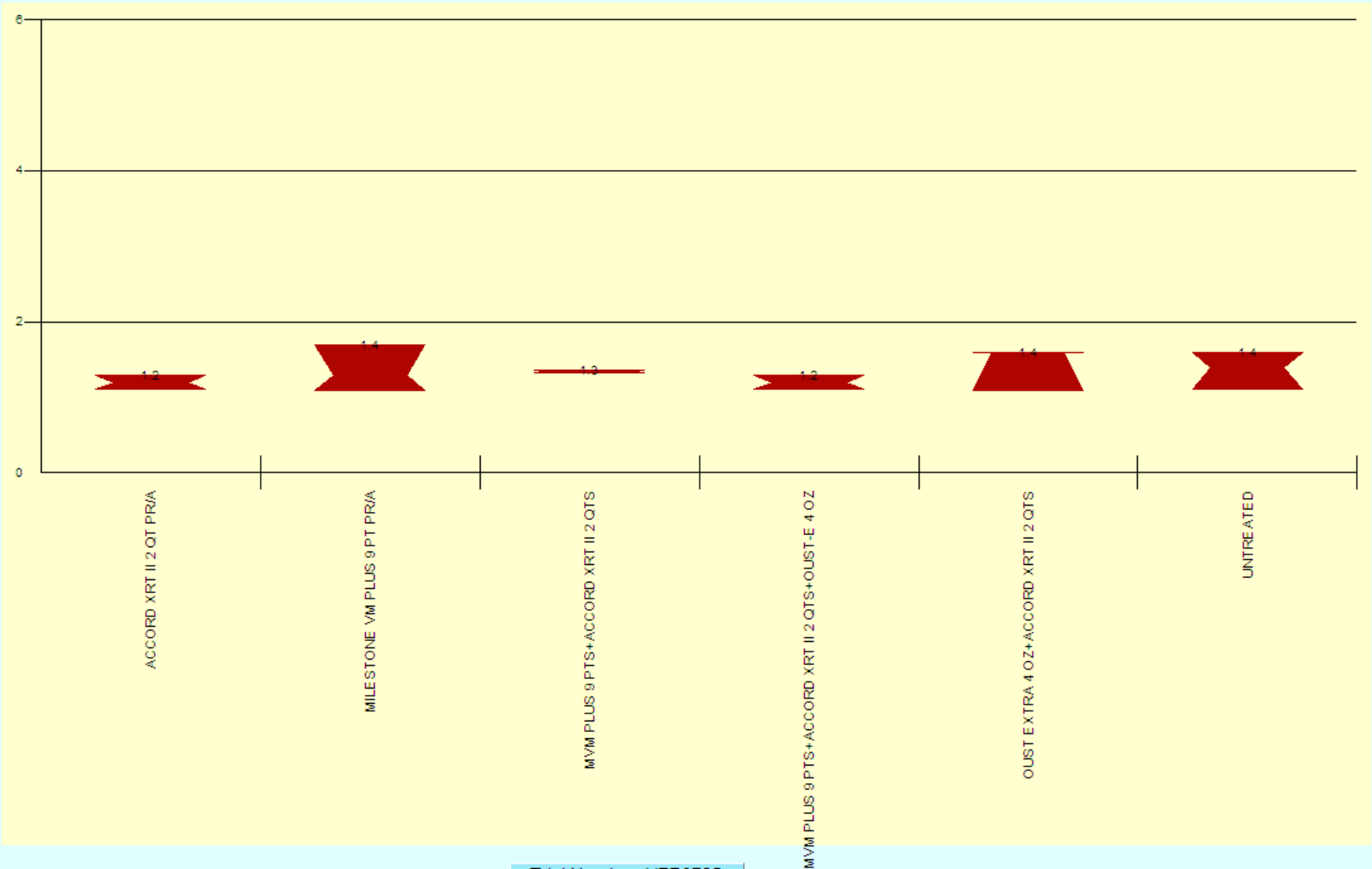


Trial Number: VFP0725

DOUGLAS FIR 297DAAA

# Milestone applied pre-plant for site prep - mixed conifers

1-6SCAL INJURY

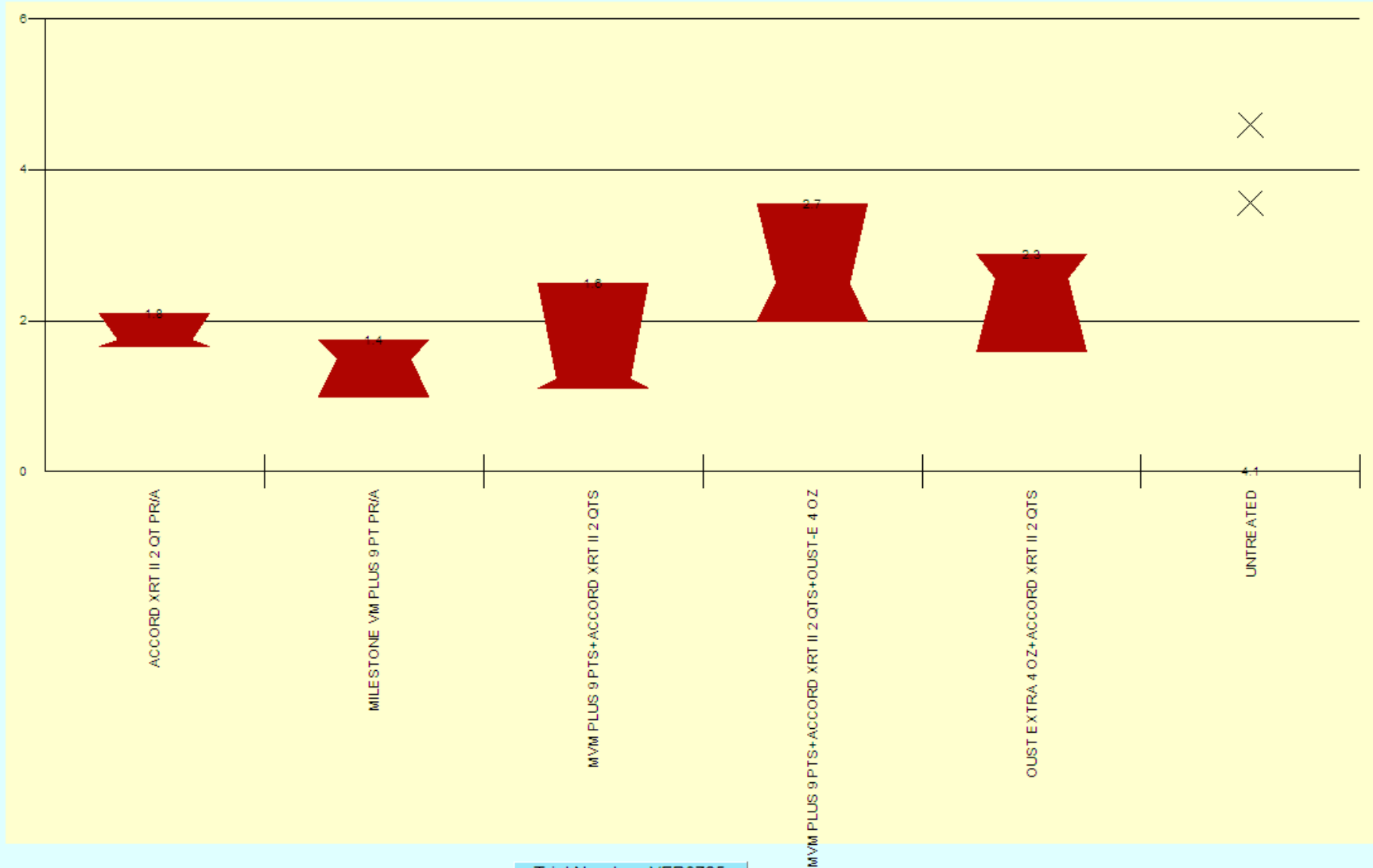


Trial Number: VFP0725

PONDEROSA PINE 297DAAA

# Milestone applied pre-plant for site prep - mixed conifers

1-6SCAL INJURY

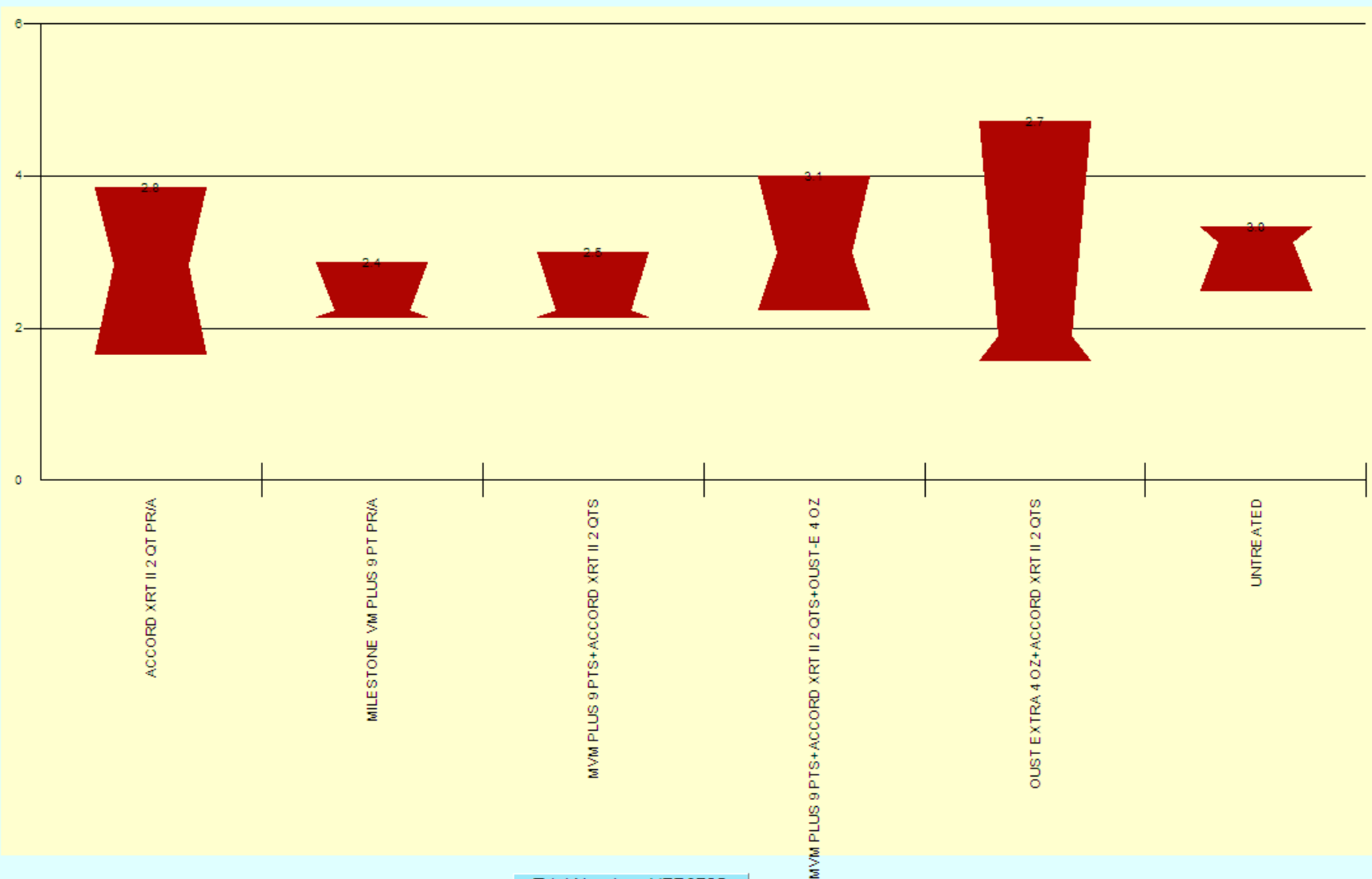


Trial Number: VFP0725

E RED CEDAR 297DAAA

# Milestone applied pre-plant for site prep - mixed conifers

1-6SCAL INJURY



Trial Number: VFP0725

WESTERN HEMLOCK 297DAAA

*(Base label):*

# Milestone<sup>®</sup>

## HERBICIDE

- **For control of annual and perennial broadleaf weeds including invasive and noxious weeds, certain annual grasses, and certain woody plants and vines, on:**
  - **rangeland, permanent grass pastures (including grasses grown for hay\*), Conservation Reserve Program (CRP)**
  - **non-crop areas for example, airports, barrow ditches, communication transmission lines, electric power and utility rights-of-way, fencerows, gravel pits, industrial sites, military sites, mining and drilling areas, oil and gas pads, non-irrigation ditch banks, parking lots, petroleum tank farms, pipelines, roadsides, railroads, storage areas, dry storm water retention areas, substations, unimproved rough turf grasses; and**
  - **natural areas (open space) for example, campgrounds, parks, prairie management, trailheads and trails, recreation areas, wildlife openings, and wildlife habitat and management areas including seasonally dry flood plains, deltas, marshes, prairie potholes, or vernal pools;**
  - **including grazed areas in and around these sites.**

**\*Hay from grass treated with Milestone within the preceding 18-months can only be used on the farm or ranch where the product is applied unless allowed by supplemental labeling**

**IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS**

- Carefully read the section “*Restrictions in Hay or Manure Use.*”
- It is mandatory to follow the “*Use Precautions and Restrictions*” section of this label.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.
- Consult with a Dow AgroSciences representative if you do not understand the “Use Precautions and Restrictions”. **Call 800-258-3033 Customer Information Group.**

**Forage and Manure Management**

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<b>GROUP</b>	<b>4</b>	<b>HERBICIDE</b>
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Active Ingredient:


Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro- .....	40.6%
Other Ingredients .....	59.4%
Total .....	100.0%

Acid Equivalent: aminopyralid (2-pyridine carboxylic acid, 4-amino-3,6-dichloro-) - 21.1% - 2 lb/gal

**[Editor’s Note: The following Container Use Directions should be included on the label for product that is packaged in a 1-quart Tip-and-Dispense bottle]**


**Container Use Directions**

**1 - Tip**




Tilt container to angle as shown and fill head to desired amount – use vertical scale for measuring. Container should be closed.

**2 - Level**



Hold container up-right and check the amount for accuracy. Add or subtract as needed, using pour-back scale as guide.

**3 - Dispense**



Remove cap on head and pour into sprayer or other devices. No fluid will pour from the main container. Replace cap for storage in sealed condition.

**Keep Out of Reach of Children****CAUTION**

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**Precautionary Statements**

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**Hazard to Humans and Domestic Animals****Causes Moderate Eye Irritation**

Avoid contact with eyes or clothing.

**Personal Protective Equipment (PPE)****Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Shoes plus socks

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.

**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.

**First Aid**

**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. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

**Environmental Hazards**

Do not apply directly to water. Take care to minimize the incidental overspray along the shoreline when applying to terrestrial plants at the water's edge or to water in areas where surface water is present. Do not apply directly to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

**Agricultural Use Requirements**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the "Directions for Use" section for information about this standard.

**Nonrefillable containers 5 gallons or less:**

**Storage and Disposal**

Do not contaminate water, food, feed or fertilizer by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **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 1/4 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. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable containers larger than 5 gallons:****Storage and Disposal**

Do not contaminate water, food, feed or fertilizer by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Handling:** 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 refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

**Nonrefillable containers larger than 5 gallons:****Storage and Disposal**

Do not contaminate water, food, feed or fertilizer by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure 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 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. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refer to label booklet for Directions for Use.**

**Notice:** Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of label booklet. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-519

EPA Est. \_\_\_\_\_

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**Produced for  
Dow AgroSciences LLC  
9330 Zionsville Road  
Indianapolis, IN 46268**

**NET CONTENTS \_\_**

(cover / shipping container):

# **Milestone<sup>®</sup>**

## **HERBICIDE**

- **For control of annual and perennial broadleaf weeds including invasive and noxious weeds, certain annual grasses, and certain woody plants and vines, on:**
  - **rangeland, permanent grass pastures (including grasses grown for hay\*), Conservation Reserve Program (CRP)**
  - **non-crop areas for example, airports, barrow ditches, communication transmission lines, electric power and utility rights-of-way, fencerows, gravel pits, industrial sites, military sites, mining and drilling areas, oil and gas pads, non-irrigation ditch banks, parking lots, petroleum tank farms, pipelines, roadsides, railroads, storage areas, dry storm water retention areas, substations, unimproved rough turf grasses; and**
  - **natural areas (open space) for example, campgrounds, parks, prairie management, trailheads and trails, recreation areas, wildlife openings, and wildlife habitat and management areas including seasonally dry flood plains, deltas, marshes, prairie potholes, or vernal pools;**
  - **including grazed areas in and around these sites.**

**\*Hay from grass treated with Milestone within the preceding 18-months can only be used on the farm or ranch where the product is applied unless allowed by supplemental labeling**

**IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS**

- Carefully read the section “*Restrictions in Hay or Manure Use.*”
- It is mandatory to follow the “*Use Precautions and Restrictions*” section of this label.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.
- Consult with a Dow AgroSciences representative if you do not understand the “Use Precautions and Restrictions”. **Call 800-258-3033 Customer Information Group.**

**Forage and Manure Management**

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<b>GROUP</b>	<b>4</b>	<b>HERBICIDE</b>
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Active Ingredient:

Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro- .....	40.6%
Other Ingredients .....	59.4%
Total .....	100.0%

Acid Equivalent: aminopyralid (2-pyridine carboxylic acid, 4-amino-3,6-dichloro-) - 21.1% - 2 lb/gal

**Keep Out of Reach of Children**

## CAUTION

### Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to label booklet under "Agricultural Use Requirements" in the "Directions for Use" section for information about this standard.

**Refer to inside of label booklet for Directions for Use.**

**Notice:** Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of label booklet. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

EPA Reg. No. 62719-519

EPA Est. \_\_\_\_\_

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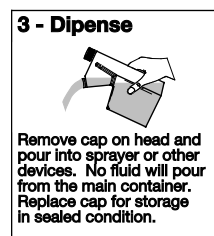
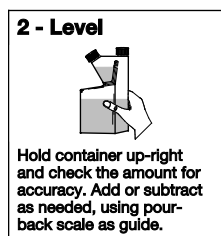
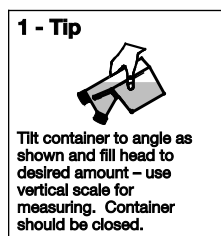
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(Page 1 through end):

**[Editor's Note: The following Container Use Directions should be included on the label for product that is packaged in a 1-quart Tip-and-Dispense bottle]**

### Container Use Directions



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## Precautionary Statements

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### Hazards to Humans and Domestic Animals

# CAUTION

**Causes Moderate Eye Irritation**

**Avoid contact with eyes or clothing.**

### Personal Protective Equipment (PPE)

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Shoes plus socks

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.

### 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.

### First Aid

**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. Call a poison control center or doctor for treatment advice.

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

### Environmental Hazards

Do not apply directly to water. Take care to minimize the incidental overspray along the shoreline when applying to terrestrial plants at the water's edge or to water in areas where surface water is present. Do

not apply directly to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

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### Directions for Use

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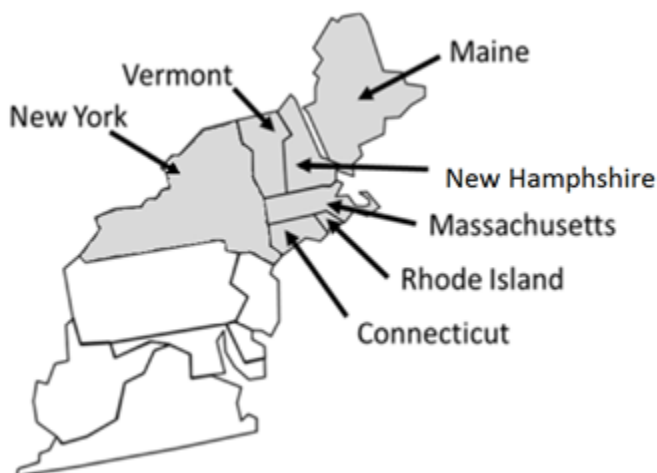
It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

**This product is not intended for reformulation or repackaging into other end-use products.**

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.

**Not for Sale, Sale into, Distribution, and/or Use in Nassau and Suffolk counties of New York State. Not For Sale, Distribution, or Use in the San Luis Valley of Colorado.**

**Not for use on pastures in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. All other labeled uses are permitted in these states including grazed areas in and around these sites.**



Grey = states where use in pasture is not permitted

### 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 48 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
- Chemical-resistant gloves made of any waterproof material as polyethylene or polyvinyl chloride
- Shoes plus socks
- Protective eyewear

### 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 does not pertain to non-agricultural use on sites, such as, rangeland, permanent grass pastures, or non-cropland. See the Agricultural Use Requirements section below for information where the WPS applies.

**Entry Restrictions for Non-WPS Uses:** For applications on rangeland and permanent grass pastures (not harvested for hay) and non-cropland areas, do not enter or allow worker entry into treated areas until sprays have dried.

### Storage and Disposal

Do not contaminate water, food, feed or fertilizer by storage or disposal. Open dumping is prohibited.

**Pesticide Storage:** If this product is exposed to subfreezing temperatures, the active ingredient may crystallize and settle out of solution. Under these conditions the product should be warmed to at least 40°F and agitated well to dissolve any crystallized active ingredient prior to use.

**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

#### Nonrefillable containers 5 gallons or less:

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **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 1/4 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. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

#### Refillable containers larger than 5 gallons:

**Container Handling:** 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 refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

#### Nonrefillable containers larger than 5 gallons:

**Container Handling:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Triple rinse or pressure 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 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. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

### Resistance Management Guidelines

- Development of plant populations resistant to this herbicide mode of action is usually not a problem on rangeland, permanent grass pastures, Conservation Reserve Program (CRP), or non-cropland sites since these sites receive infrequent pesticide applications.
- In croplands, use an effective integrated pest management (IPM) program, integrating tillage or other mechanical methods, crop rotation or other cultural control methods into weed control programs whenever practical.
- Similar looking biotypes of a given weed species occurring in a treated area may vary in their susceptibility to a herbicide. Application of a herbicide below its labeled rate may allow more tolerant weeds to survive and a shift to more tolerant biotypes within the treated area.
- Where identified, spreading of resistant weeds to other fields may be prevented by cleaning harvesting and tillage equipment before moving to other areas and by planting weed-free seed.
- Contact your extension specialist, certified crop consultant, or Dow AgroSciences representative for the latest resistance management information.

### Use Precautions

- Applications made during periods of intense rainfall, to soils saturated with water, surfaces paved with materials such as asphalt or concrete, or soils through which rainfall will not readily penetrate may result in runoff and movement of Milestone. Injury to crops may result if treated soil and/or runoff water containing Milestone is washed or moved onto land used to produce crops. Exposure to Milestone may injure or kill susceptible crops and other plants, such as grapes, soybeans, tobacco, sensitive ornamentals.
- **Grass revegetation:**
  - Milestone can be used to control broadleaf plants in grass revegetation programs. Consult Dow AgroSciences' literature for more details about Milestone applications and grass stand establishment.
- **Application before seeding grasses**
  - Milestone can be applied to control broadleaf weeds prior to grass planting. Grass seed germination and seedling development can be adversely affected by many factors such as seed viability and seedling vigor, soil condition (sub-optimal soil temperatures or soil water content), weather after planting, seedbed preparation and seed placement, disease, insects, or animals. Milestone applications will help to reduce competition from weeds and improve the chance for successful grass stand establishment. Some grass species are more sensitive to Milestone; consult Dow AgroSciences' literature for more details.
  - **Postemergence applications on grass:** During the season of establishment, Milestone should be applied only after perennial grasses are well established (have developed a good secondary root system and show good vigor. Most perennial grasses are tolerant to Milestone at this stage of development. Milestone may suppress certain established grasses, such as smooth bromegrass (*Bromus inermis*), especially when plants are stressed by



adverse environmental conditions. Plants should recover from this transient suppression with the onset of environmental conditions favorable to grass growth and upon release from weed competition.

- **Seeding Broadleaf Plants (Forbs) and Wildflowers**

Milestone can be applied in the summer to control broadleaf weeds prior to forb planting. Forbs can be seeded 90 days after a summer application as a dormant fall planting or the following spring. Consult Dow AgroSciences literature for details.

- **Field Bioassay Instructions:** In fields previously treated with this product, plant short test rows of the intended rotational crop across the original direction of application in a manner to sample variability in field conditions such as soil texture, soil organic matter, soil pH, rainfall pattern or drainage. The field bioassay can be initiated one year after the last application of aminopyralid in that field. Observe the test crop for symptoms of herbicidal activity, such as poor stand (effect on seed germination), chlorosis (yellowing), epinasty, and necrosis (dead leaves or shoots), or stunting (reduced growth). If herbicidal symptoms do not occur, the test crop can be grown. If there is apparent herbicidal activity, do not plant the field to the intended rotational crop; plant only to wheat, forage grasses, native grasses or grasses grown for hay.

**Consult with a Dow AgroSciences representative if you do not understand the “Use Precautions and Restrictions.” Call 800-258-3033 for more information.**

<p><b>IMPORTANT USE PRECAUTIONS AND RESTRICTIONS TO PREVENT INJURY TO DESIRABLE PLANTS</b></p> <ul style="list-style-type: none"> <li>• Carefully read the section “<i>Restrictions in Hay or Manure Use</i>.”</li> <li>• It is mandatory to follow the “<i>Use Precautions and Restrictions</i>” section of this label.</li> <li>• Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.</li> <li>• Hay can only be used on the farm or ranch where product is applied unless allowed by supplemental labeling.</li> <li>• Consult with a Dow AgroSciences representative if you do not understand the “Use Precautions and Restrictions”. <b>Call 800-258-3033 Customer Information Group.</b></li> </ul>	<p><b>Forage and Manure Management</b></p> <p>©Copyright 2011 Dow AgroSciences LLC</p>
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### Pasture and Rangeland Restrictions

- **Do not use grasses treated with Milestone in the preceding 18-months for hay intended for export outside the United States.**

- **Hay from areas treated with Milestone in the preceding 18-months CAN NOT be distributed or made available for sale off the farm or ranch where harvested unless allowed by supplemental labeling.**
- **Hay from areas treated with Milestone in the preceding 18-months CAN NOT be used for silage, haylage, baylage and green chop unless allowed by supplemental labeling.**
- **Do not move hay made from grass treated with Milestone within the preceding 18-months off farm unless allowed by supplemental labeling.**
- **Do not use hay or straw from areas treated with Milestone within the preceding 18-months or manure from animals feeding on hay treated with Milestone in compost.**
- **Do not use grasses treated with Milestone in the preceding 18-months for seed production.**

### Restrictions for All Uses

**Maximum Application Rate:** On all labeled use sites do not broadcast apply more than 7 fl oz per acre of Milestone per year. The total amount of Milestone applied broadcast, as a re-treatment, and/or spot treatment cannot exceed 7 fl oz per acre per year. Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot or repeat applications.

Obtain Required Permits: Consult with appropriate state or local water authorities before applying this product around public waters. State or local public agencies may require permits.

- **Avoiding Injury to Non-Target Plants:** Do not aerially apply Milestone within 50 feet of a border downwind (in the direction of wind movement), or allow spray drift to come in contact with, any broadleaf crop or other desirable broadleaf plants, including, but not limited to, alfalfa, cotton, dry beans, flowers, grapes, lettuce, potatoes, radishes, soybeans, sugar beets, sunflowers, tobacco, tomatoes or other broadleaf or vegetable crop, fruit trees, ornamental plants, or soil where sensitive crops are growing or will be planted. Avoid application under conditions that may allow spray drift because very small quantities of spray may seriously injure susceptible crops. Read and consider the "Precautions for Avoiding Spray Drift and Spray Drift Advisory" to help minimize the potential for spray drift.
- **Chemigation:** Do not apply this product through any type of irrigation system.
- **Do not contaminate water intended for irrigation or domestic purposes.** Do not treat inside banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water that may be used for irrigation or domestic purposes.
- Do not apply this product to lawns, turf, ornamental plantings, urban walkways, driveways, tennis courts, golf courses, athletic fields, commercial sod operations, or other high-maintenance, fine turfgrass areas, or similar areas.
- Trees adjacent to or in a treated area can occasionally be affected by root uptake of Milestone. Do not apply Milestone within the root zone of desirable trees unless such injury can be tolerated. Use special caution near roses, and leguminous trees such as locusts, redbud, mimosa, and caragana.

- Do not treat frozen soil where runoff could damage sensitive plants.
- **Grazing and Haying Restrictions:** There are no restrictions on grazing or grass hay harvest following application of Milestone at labeled rates. Cutting hay too soon after spraying weeds will reduce weed control. Wait 14 days after herbicide application to cut grass hay to allow herbicide to work. Do not transfer grazing animals from areas treated with Milestone to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- **Grazing Poisonous Plants:** Herbicide application may increase palatability of certain poisonous plants. Do not graze treated areas until poisonous plants are dry and no longer palatable to livestock.
- **Restrictions in Hay or Manure Use:**
  - ◆ Do not use aminopyralid-treated plant residues, including grass, wood plants, trees, hay or straw from areas treated within the preceding 18-months, in compost, mulch wood chips, or mushroom spawn.
  - ◆ Do not use manure from animals that have eaten aminopyralid-treated forage or hay within the previous 3 days in compost, mulch or mushroom spawn. Livestock must have 3 days of eating non-aminopyralid-treated materials in order to clear their system of aminopyralid. Do not use aminopyralid-treated plants in areas where commercially grown mushrooms or susceptible broadleaf plants may be grown.
  - ◆ Do not spread manure from animals that have consumed aminopyralid-treated forage or hay within the previous 3 days on land used for growing susceptible broadleaf crops.
  - ◆ Manure from animals that have consumed aminopyralid-treated forage or hay within the previous 3 days may only be used on areas used for pasture, grass grown for seed, wheat and corn.
  - ◆ Do not plant a broadleaf crop (including soybeans, sunflower, tobacco, vegetables, field beans, peanuts, and potatoes) in fields or areas treated with aminopyralid or manure from animals that have grazed forage or eaten hay harvested from aminopyralid-treated areas until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at level that is not injurious to the crop to be planted.
  - ◆ Do not plant a broadleaf crop in fields or areas treated in the previous year with manure from animals that have consumed aminopyralid-treated forage or hay until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at level that is not injurious to the crop to be planted.
  - ◆ To promote herbicide decomposition, plant residues should be evenly incorporated in the surface soil or burned. Breakdown of aminopyralid in plant residues or manure is more rapid under warm, moist soil conditions and may be enhanced by supplemental irrigation.
- **Crop Rotation:** Do not rotate to any crop from rangeland, permanent pasture or CRP acres within one year following treatment. Cereals and corn can be planted one year after treatment. Broadleaf crops are sensitive to aminopyralid residues in the soil and prediction of crop safety by field bioassay (see instructions below) is the BEST way to determine planting options. Broadleaf crops such as canola, flax, and alfalfa can require **at least** 2 to 3 years depending on the crop and environmental conditions. More sensitive crops such as soybeans, tobacco, peanuts, potatoes, and peas may require a longer plant back interval and should not be planted until a field bioassay shows that the level of aminopyralid present in the soil will not adversely affect that broadleaf crop.

## Precautions for Avoiding Spray Drift

Avoid application under conditions that may allow spray drift because very small quantities of spray, which may not be visible, may injure susceptible crops. This product should be applied only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, non-target crops and other plants) is minimal (e.g., when wind is blowing away from the sensitive areas). A drift control aid may be added to the spray solution to further reduce the potential for drift. If a drift control aid is used, follow the use directions and precautions on the manufacturer's label. Do not use a thickening agent with

Microfoil, Thru-Valve booms, or other spray delivery systems that cannot accommodate thickened spray solutions.

**Ground Equipment:** With ground equipment spray drift can be lessened by keeping the spray boom as low as possible; by applying 10 gallons or more of spray per acre; by keeping the operating spray pressures at the manufacturer's specified minimum pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); and by spraying when the wind velocity is low (follow state regulations). Avoid calm conditions which may be conducive to thermal inversions. Direct sprays no higher than the tops of target vegetation and keep spray pressures low enough to provide coarse spray droplets to minimize drift.

**Aerial Application:** Avoid spray drift at the application site. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. Users are responsible for considering all these factors when making decisions.

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

1. The boom length must not exceed 75% of the fixed wing span and must be located at least 8 -10 inches below the trailing edge of the fixed wing; the boom length must not exceed 85% of the rotary blade.
2. Nozzles should be pointed backward parallel with the air stream or not pointed downwards more than 45 degrees.

State regulations must be followed.

The applicator should be familiar with and take into account the information covered in the following **Aerial Drift Reduction Advisory**. This information is advisory in nature and does not supersede mandatory label requirements.

## **Aerial Drift Reduction Advisory**

**Information on Droplet Size:** The most effective way to reduce 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 (see Wind, Temperature and Humidity, and Temperature Inversions).

### **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 specified pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that will provide uniform coverage.
- **Nozzle Orientation** - Orient nozzles so that the spray is released parallel to the airstream to produce larger droplets than other orientations. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

**Boom Length:** The distance of the outer most operating nozzles on the boom must not exceed 75% of wingspan or 85% of rotor diameter.

**Application Height:** Applications should not be made 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.

**Swath Adjustment:** 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. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

**Wind:** Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain such as valleys and ravines can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

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

**Temperature Inversions:** Applications should not occur during a local, low level 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 the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

### **Sprayer Clean-Out Instructions**

**It is recommended to use separate spray equipment on highly sensitive crops such as tobacco, soybeans, potatoes, peanuts and tomatoes.**

Do not use spray equipment used to apply Milestone for other applications to land planted to, or to be planted to, broadleaf plants unless it has been determined that all residues of this herbicide have been removed by thorough cleaning of equipment.

Equipment used to apply Milestone should be thoroughly cleaned before reusing to apply any other chemicals as follows:

1. Rinse and flush application equipment thoroughly after use. Dispose of rinse water in non-cropland area away from water supplies.
  2. Rinse a second time, adding 1 quart of household ammonia or tank cleaning agent for every 25 gallons of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15 to 20 minutes). Let the solution stand for several hours, preferably overnight.
  3. Flush the solution out of the spray tank through the boom.
  4. Rinse the system twice with clean water, recirculating and draining each time.
  5. Spray nozzles and screens should be removed and cleaned separately.
- Do not apply this product with mist blower systems that deliver very fine spray droplets. Use of mist blower equipment can reduce control achieved with the herbicide and increase spray drift potential.

### **Use Information**

Apply the specified rate of Milestone as a coarse low-pressure spray. Do not apply this product with mist blower systems that deliver very fine spray droplets. Spray volume should be sufficient to uniformly cover

foliage or intended application site. Increase spray volume to ensure thorough and uniform coverage when target vegetation is tall and/or dense. To enhance foliage wetting and coverage, a non-ionic agricultural surfactant or other adjuvant may be added to the spray mixture as specified by the adjuvant label.

Milestone may be applied by ground or aerial application equipment on any registered use site specified on this label.

**Ground Broadcast Application:** Higher spray volumes (greater than 10 gallons per acre) generally provide better coverage and better control, particularly in dense and/or tall foliage.

**Aerial Broadcast Application:** Do not apply less than 2 gallons per acre total spray volume. Five gallons per acre or greater will generally provide better coverage and better control, particularly in dense and/or tall foliage.

**High-Volume Foliar Application:** High volume foliar treatments may be applied at rates equivalent to a maximum of 7 fl oz per acre per year. Use sufficient spray volume to thoroughly and uniformly wet foliage and stems.

For basal bark and cut stubble and all types of cut surface applications, see woody plant section.

#### Low-Volume Foliar Treatment

To control susceptible woody plants, use Milestone alone or in tank mixes with other herbicides in water. The spray concentration of Milestone tank mixes and total spray volume per acre should be adjusted according to the size and density of target woody plants and type of spray equipment used. With low-volume application, use sufficient spray volume to obtain uniform coverage of target plants including the surfaces of all foliage, stems, and root collars.

For best results, an adjuvant should be added to all spray mixtures. Match equipment and delivery rate of spray nozzles to height and density of woody plants. When treating tall, dense brush, a truck mounted spray gun with spray tips that deliver up to 2 gallons per minute at 40 to 60 psi may be required. Backpack or other types of specialized spray equipment with spray tips that deliver less than 1 gallon of spray per minute may be appropriate for short, low to moderate density brush.

**Spot Application:** Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot or repeat applications.) Spray volume should be sufficient to thoroughly and uniformly wet weed foliage, but not to the point of runoff. Repeat treatments may be made, but the total amount of Milestone applied must not exceed 7 fl oz per acre per year. To prevent misapplication, spot treatments should be applied with a calibrated sprayer with a known volume per acre. Table 1 shows Milestone amount to mix for various sprayer outputs in gallons per acre (GPA)

**Table 1:** Amount of Milestone (in mL) to mix in 1 gallon of water

Gallons per acre GPA	Milestone amount (in mL) to mix to achieve target application rates		
	5 fl oz/a	7 fl oz/a	14 fl oz/a
20	7.5	10.5	21.0
30	5.0	7.0	14.0
40	3.8	5.3	10.5
50	3.0	4.2	8.4
60	2.5	3.5	7.0
70	2.1	3.0	6.0

Use a syringe to measure cc

80	1.9	2.6	5.3
90	1.7	2.3	4.7
100	1.5	2.1	4.2

Note: Table 1 above shows mixes for various sprayer outputs in gallons per acre (GPA).

#### Conversions:

1 tsp = 5 mL    30 ml = 1 fluid ounce    1 cc = 1 mL  
 3 tsp = 1 Tbsp    2 Tbsp = 1 fluid ounce

## Mixing Instructions

**Mixing with Water:** To prepare the spray, add about half the required amount of water in the spray tank. Then, with agitation, add the specified amount of Milestone and other herbicides, if tank mixing. Finally, with continued agitation, add the rest of the water and additives such as adjuvants, surfactants or drift control and deposition aids.

**Addition of Surfactants or Adjuvants on All Labeled Use Sites:** The addition of a high quality non-ionic surfactant (of at least 80% active principal) or adjuvant at 0.25 to 0.5 % volume per volume (1 to 2 quarts per 100 gallons of spray) is recommended to enhance herbicide activity under adverse environmental conditions (such as, high temperature, low relative humidity, drought conditions, dusty plant surfaces) or when weeds are heavily pubescent or more mature.

**Tank Mixing with Other Herbicides:** Milestone may be applied in tank mix combination with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated and (2) mixing is not prohibited by the label of the tank mix product(s), and (3) that the tank mix combination is physically compatible (see tank mix compatibility testing below). When tank mixing, use only in accordance with the restrictions, precautions and limitations on the respective product labels.

- It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.
- Do not exceed specified application rates. If products containing the same active ingredient are mixed, do not exceed the maximum allowable active ingredient use rates.
- For direct injection or other spray equipment where the product formulations will be mixed in undiluted form, special care should be taken to ensure tank mix compatibility.
- Always perform a jar test to ensure the compatibility of products to be used in tank mixture.

**Tank Mix Compatibility Testing:** Perform a jar test prior to mixing in a spray tank to ensure compatibility of Milestone and other pesticides or carriers. Use a clear glass jar with lid and mix ingredients in the same order and proportions as will be used in the spray tank. The mixture is compatible if the materials mix readily when the jar is inverted several times. The mixture should remain stable after standing for 1/2 hour or, if separation occurs, should readily remix if agitated. An incompatible mixture is indicated by separation into distinct layers that do not readily remix when agitated and/or the presence of flakes, precipitates, gels, or heavy oily film in the jar. Use of an appropriate compatibility aid may resolve mix incompatibility. If the mixture is incompatible do not use that tank mix partner in tank mixtures.

#### Invert emulsion spray mixtures

Milestone can be applied in an invert emulsion using oil and an appropriate inverting agent. Follow label directions of the inverting agent.

**Mixing with Sprayable Liquid Fertilizer Solutions:** Milestone is usually compatible with liquid fertilizer solutions. It is anticipated that Milestone will not require a compatibility agent for mixing with fertilizers;

however, a compatibility test (jar test) should be made prior to mixing. Jar tests are particularly important when a new batch of fertilizer or pesticide is used, when water sources change, or when tank mixture ingredients or concentrations are changed. Compatibility may be determined by mixing the spray components in the desired order and proportions in a clear glass jar before large scale mixing of spray components in the spray tank.

**Note:** The lower the temperature of the liquid fertilizer, the greater the likelihood of mixing problems. Use of a compatibility aid may be required if Milestone is mixed with a 2,4-D-containing product and liquid fertilizer. **Mixing Milestone and 2,4-D in N-P or N-P-K liquid fertilizer solutions is more difficult than mixing with straight nitrogen fertilizer and should not be attempted without first conducting a successful compatibility jar test.** Agitation in the spray tank must be vigorous to be comparable with jar test agitation. Apply the spray mixture the same day it is prepared while maintaining continuous agitation. Rinse the spray tank thoroughly after use.

**Note:** Foliar-applied liquid fertilizers themselves can cause yellowing of the foliage of forage grasses and other vegetation.

## Use Rates and Timing

Milestone may be applied as a broadcast spray by ground or aerial equipment or as a spot application to control weeds including, but not limited to, those listed on this label. When a rate range is given use the higher rate to control weeds at advanced growth stages, or under less than favorable growing conditions, or for longer residual control. Best results are obtained when spray volume is sufficient to provide uniform coverage of treated weeds. For optimum uptake and translocation of Milestone, avoid mowing, haying, shredding, burning or soil disturbance in treated areas for at least 14 days following application.

Milestone provides post emergence control and preemergence control of emerging seedlings of susceptible weeds, and re-growth of certain perennial weeds following application. Preventing establishment of weeds will depend upon application rate, season of application, and environmental conditions after application.

Milestone can provide long-term control of susceptible weeds. The length of control is dependent upon the application rate, condition and growth stage of target weeds, environmental conditions at and following application, and the density and vigor of competing desirable vegetation. Long-term weed control is most effective where grass vegetation is allowed to recover from overgrazing, drought, etc., and compete with weeds.

Milestone can be an important component of integrated vegetation management programs designed to renovate or restore desired plant communities. To maximize and extend the benefits of weed control provided by Milestone, it is important that other vegetation management practices, including proper grazing management, biological control agents, replanting, fertilization, prescribed fire, etc., be used in appropriate sequences and combinations to further alleviate the adverse effects of weeds on desirable plant species and to promote development of desired plant communities. Agricultural and natural resources specialists with federal and state government agencies can provide guidance on best management practices and development of integrated vegetation management programs.

## Plants Controlled

The following weeds and woody plants will be controlled with the rates of Milestone indicated below (table 2). For best results, most weeds and woody plants should be treated when they are actively growing and under conditions favorable for growth. Use a higher rate in the rate range when growing conditions are less than favorable or when weed foliage is tall and dense, or when optimal longer term residual control is desired. Milestone also provides preemergence control of germinating seeds or seedlings of susceptible weeds following application.

**Table 2:** Weeds and Woody Plants Controlled



**Note:** Numbers in parentheses (-) refer to specific use directions for a particular weed species.

Common Name	Scientific Name	Rate Range (fl oz/acre)	Life Cycle	Plant Family
amaranth, spiny	<i>Amaranthus spinosus</i>	4 to 7	annual	Amaranthaceae
bedstraw	<i>Galium spp.</i>	4 to 7	perennial	Rubiaceae
beggarticks	<i>Bidens spp.</i>	4 to 7	annual	Asteraceae
broomweed, annual	<i>Amphiachyris dracunculoides</i>	4 to 7	annual	Asteraceae
burdock, common	<i>Arctium minus</i>	4 to 7	biennial	Asteraceae
buttercup, hairy	<i>Ranunculus sardous</i>	4 to 7	annual	Ranunculaceae
buttercup, tall	<i>Ranunculus acris</i>	4 to 7	perennial	Ranunculaceae
buttercup spp	<i>Ranunculus spp</i>	4 to 7	various	Ranunculaceae
camelthorn	<i>Alhagi pseudalhagi</i>	5 to 7	perennial	Fabaceae
cat's ear, common	<i>Hypochaeris radicata</i>	5 to 7	perennial	Asteraceae
cat's ear	<i>Hypochaeris spp</i>	5 to 7	perennial	Asteraceae
chamomile, scentless	<i>Matricaria inodora</i>	4 to 7	annual	Asteraceae
chicory	<i>Cichorium intybus</i>	4 to 6	perennial	Asteraceae
chickweed	<i>Stellaria media</i>	7	annual	Caryophyllaceae
cinquefoil, sulfur (1)	<i>Potentilla recta</i>	4 to 7	perennial	Rosaceae
cocklebur	<i>Xanthium strumarium</i>	3 to 5	annual	Asteraceae
clover	<i>Trifolium spp.</i>	5 to 7	perennial	Fabaceae
crazyweed	<i>Oxytropis</i>	5 to 7	perennial	Fabaceae
croton, tropic	<i>Croton glandulosus</i>	3 to 5	annual	Euphorbiaceae
crownvetch	<i>Securigera varia</i>	5 to 7	perennial	Fabaceae
cudweed, purple	<i>Gamochaeta purpurea</i>	4 to 7	annual	Asteraceae
daisy, oxeye (1)	<i>Leucanthemum vulgare</i>	4 to 7	perennial	Asteraceae
dock, curly	<i>Rumex crispus</i>	4 to 7	perennial	Polygonaceae
evening primrose, cutleaf	<i>Oenothera laciniata</i>	4 to 7	annual	Onagraceae
fiddleneck	<i>Amsinckia spp</i>	4 to 7	annual	Boraginaceae
fireweed	<i>Epilobium angustifolium</i>	5 to 7	perennial	Onagraceae
fleabane, flax-leaf	<i>Conyza bonariensis</i>	4 to 7	annual	Asteraceae
fleabane, hairy	<i>Conyza bonariensis</i>	5-7	annual/biennial	Asteraceae
hawkweed, orange (2)	<i>Hieracium aurantiacum</i>	4 to 7	perennial	Asteraceae
hawkweed, yellow (2)	<i>Hieracium caespitosum</i>	4 to 7	perennial	Asteraceae
henbane, black	<i>Hyoscyamus niger</i>	5 to 7	annual/biennial	Solanaceae
henbit	<i>Lamium amplexicaule</i>	5 to 7	annual/ biennial	Lamiaceae
hogweed, giant	<i>Heracleum mantegazzianum</i>	7	perennial	Apiaceae
horsenettle, Carolina	<i>Solanum carolinense</i>	4 to 7	perennial	Solanaceae
horseweed (maretail)	<i>Conyza canadensis</i>	4 to 7	annual	Asteraceae
ironweed, tall	<i>Vernonia gigantea</i>	5 to 7	perennial	Asteraceae
ironweed, western	<i>Vernonia baldwinii</i>	7	perennial	Asteraceae
knapweed, diffuse (3)	<i>Centaurea diffusa</i>	5 to 7	biennial/ perennial	Asteraceae
knapweed, meadow	<i>Centaurea debeauxii</i>	5 to 7	perennial	Asteraceae
knapweed, Russian (4)	<i>Acroptilon repens</i>	5 to 7	perennial	Asteraceae
knapweed, spotted (3)	<i>Centaurea stoebe</i>	5 to 7	biennial/ perennial	Asteraceae

knapweed, squarrose	<i>Centaurea virgata</i>	5 to 7	biennial/ perennial	Asteraceae
knapweeds	<i>Centaurea spp.</i>	5 to 7	biennial/ perennial	Asteraceae
knotweeds, Japanese, bohemian (11)	<i>Reynoutria japonica</i>	7-14	perennial	Polygonaceae
kudzu	<i>Pueraria montana</i>	7	perennial	Fabaceae
lady's thumb	<i>Polygonum persicaria</i>	3 to 5	annual	Polygonaceae
lambsquarters	<i>Chenopodium album</i>	5 to 7	annual	Chenopodiaceae
lespedeza, annual	<i>Lespedeza striata</i>	5 to 7	annual	Fabaceae
licorice, wild	<i>Glycyrrhiza lepidota</i>	7	perennial	Fabaceae
locoweed	<i>Astragalus spp.</i>	5 to 7	perennial	Fabaceae
locust, black	<i>Robinia pseudoacacia</i>	7	woody perennial	Fabaceae
locust, honey	<i>Gleditsia triacanthos</i>	7	woody perennial	Fabaceae
loosestrife, purple (12)	<i>Lythrum salicaria</i>	7-14	perennial	Lythraceae
mayweed, scentless	<i>Tripleurospermum perforate</i>	4 to 7	annual	Asteraceae
mayweed, stinking	<i>Anthemis cotula</i>	7	annual	Asteraceae
medic, black	<i>Medicago lupulina</i>	4 to 7	perennial	Fabaceae
mimosa	<i>Albizia julibrissin</i>	7	woody perennial	Fabaceae
mullein (5)	<i>Verbascum spp.</i>	7	biennial	Scrophulariaceae
nightshade, silverleaf	<i>Solanum elaeagnifolium</i>	4-7	perennial	Solanaceae
oxtongue, bristly	<i>Picris echioides</i>	5 to 7	biennial	Asteraceae
pea, Swainson	<i>Sphaerophysa salsula</i>	5-7	perennial	Fabaceae
povertyweed	<i>Iva axillaris</i>	5-7	perennial	Asteraceae
ragweed, common	<i>Ambrosia artemisiifolia</i>	3 to 5	annual	Asteraceae
ragweed, western	<i>Ambrosia psilostachya</i>	4 to 7	perennial	Asteraceae
ragweed, giant	<i>Ambrosia trifida</i>	4 to 7	annual	Asteraceae
ragwort, tansy	<i>Senecio jacobaea</i>	5 to 7	perennial	Asteraceae
redbud	<i>Cercis Canadensis</i>	7	woody perennial	Fabaceae
rush skeletonweed	<i>Chondrilla juncea</i>	5 to 7	perennial	Asteraceae
sicklepod	<i>Cassia obtusifolia</i>	7	perennial	Fabaceae
smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>	3 to 5	annual	Polygonaceae
sneezeweed, bitter	<i>Helenium amarum</i>	4 to 7	annual	Asteraceae
soda apple, tropical (6)	<i>Solanum viarum</i>	5 to 7	perennial	Solanaceae
sowthistle, annual	<i>Sonchus oleraceae</i>	7	annual	Asteraceae
sowthistle, perennial	<i>Sonchus arvensis</i>	3 to 5	perennial	Asteraceae
spanishneedles	<i>Bidens bipinnata</i>	4 to 7	annual	Asteraceae
St. Johnswort, common	<i>Hypericum perforatum</i>	5 to 7	perennial	Clusiaceae
stiltgrass, Japanese	<i>Microstegium vimineum</i>	5-7	annual	Poaceae
starthistle, Malta (7)	<i>Centaurea melitensis</i>	3 to 5	annual	Asteraceae
starthistle, purple (7)	<i>Centaurea calcitrapa</i>	3 to 5	biennial	Asteraceae
starthistle, yellow (7)	<i>Centaurea solstitialis</i>	3 to 5	annual	Asteraceae
sunflower, common	<i>Helianthus annuus</i>	4 to 7	annual	Asteraceae
sweetclover, white	<i>Melilotus albus</i>	5 to 7	biennial	Fabaceae
sweetclover, yellow	<i>Melilotus officinalis</i>	5 to 7	biennial	Fabaceae
teasel	<i>Dipsacus spp.</i>	4 to 7	biennial	Dipsacaceae

thistle, artichoke	<i>Cynara cardunculus</i>	5 to 7	perennial	Asteracea
thistle, blessed milk	<i>Silybum marianum</i>	4-7	biennial	Asteraceae
thistle, bull (8)	<i>Cirsium vulgare</i>	3 to 5	biennial	Asteraceae
thistle, Canada (9)	<i>Cirsium arvense</i>	5 to 7	perennial	Asteraceae
thistle, woolly distaff	<i>Carthamus lanatus</i>	4 to 7	annual	Asteraceae
thistle, Italian	<i>Carduus pycnocephalus</i>	7	annual	Asteraceae
thistle, musk (8)	<i>Carduus nutans</i>	3 to 5	biennial	Asteraceae
thistle, plumeless (8)	<i>Carduus acanthoides</i>	3 to 5	biennial	Asteraceae
thistle, Scotch	<i>Onopordum acanthium</i>	5 to 7	biennial	Asteracea
thistle, Russian (preemergence)	<i>Salsola spp</i>	7	annual	Chenopodiaceae
tree of heaven	<i>Ailanthus altissima</i>	7	perennial	Simaroubaceae
vetch	<i>Vicia spp.</i>	3 to 7	perennial	Fabaceae
willoweed, panicle	<i>Epilobium brachycarpum</i>	5-7	annual	Onagraceae
wisteria	<i>Wisteria brachybotris</i>	7	woody perennial	Fabaceae
wormwood, absinth (10)	<i>Artemisia absinthium</i>	6 to 7	perennial	Asteraceae
yarrow, common	<i>Achillea millefolium</i>	7	perennial	Asteraceae

- (1) **Sulfur cinquefoil or oxeye daisy:** Apply Milestone at 4 to 6 fl oz per acre to plants in the prebud stage of development.
- (2) **Orange or yellow hawkweeds:** Apply Milestone at 4 to 7 fl oz per acre to plants in the bolting stage of development.
- (3) **Diffuse, spotted, and squarrose knapweeds:** Apply Milestone at 5 to 7 fl oz per acre when plants are actively growing with the optimum time of application occurring from rosette to the bolting stages of development or in the fall. Plants will be controlled by mid-summer and fall applications even though plants may not show any changes in form or stature the year of application.
- (4) **Russian knapweed:** Apply Milestone at 5 to 7 fl oz per acre to plants in the spring and summer at early bud to flowering stages and to dormant plants in the fall.
- (5) **Mullein:** Apply to the rosette stage
- (6) **Tropical soda apple:** Apply Milestone at 5 to 7 fl oz per acre at any growth stage, but application by flowering will reduce seed production potential.
- (7) **Malta, purple, and yellow starthistle:** Apply Milestone at 3 to 5 fl oz per acre to plants at the rosette through bolting growth stages.
- (8) **Bull, musk, and plumeless thistles:** Apply Milestone at 3 to 5 fl oz per acre in the spring and early summer to rosette or bolting plants or in the fall to seedlings and rosettes. Apply at 4 to 5 fl oz when plants are at the late bolt through early flowering growth stages. 2,4-D at 1 lb ae/acre should be tank-mixed with Milestone starting at the late bud stages
- (9) **Canada thistle:** Apply Milestone at 5 to 7 fl oz per acre in the spring after all plants have fully emerged (some may be budding) until the oldest plants are in full flower stage. Use the higher rate when applying to the flower stage. Applications are also effective in the fall before a killing frost. Use higher rates for older/dense stands or for longer residual control.
- (10) **Absinth wormwood:** Apply 6 to 7 fl oz per acre before wormwood is 12 inches tall. When applying by air on CRP, coverage is important and a minimum of 3 GPA is specified. Remove old duff and litter by fire or mowing for best results
- (11) **Invasive knotweeds:** Japanese, Bohemian, giant knotweeds: Optimum suppression of invasive knotweeds with Milestone herbicide is obtained when applications are made to plants that are at least 3 to 4 feet tall. Results of field trials conducted in the western U.S. indicate that high volume applications (100 gpa or greater) of Milestone at 7 fl oz/A or a spot treatment rate up to 14 fl oz/A applied in summer will provide good control of invasive knotweeds. In the upper Midwest, mowing in summer followed by fall application of Milestone (prior to frost) provided the best control. Infestations of invasive knotweed that are mowed should be allowed to regrow to at least 3 feet in height prior to herbicide treatment. Monitoring and follow-up herbicide treatments on regrowth will be necessary to control resprouts and achieve long-term control.

- (12) **Purple loosestrife:** For optimum control apply Milestone at 7 fl oz per acre plus 1 pt to 1 qt of 2,4-D amine or 1 to 2 qts of Garlon 3A. Spot treatments may also be made by applying Milestone at 14 fl oz (see Spot treatment section of the label) with or without the addition of 2,4-D or Garlon 3A.
- (13) **Fiddleneck:** For optimum control apply Milestone at 4 to 7 fl oz per acre when the plants are young and before flowering. Use higher rates if the plants are older and larger. In California optimal application timing is November through March.

## For Control or Suppression of Medusahead Rye

Milestone applied broadcast at 7 to 14 fl oz/A can suppress or control medusahead rye (*Taeniatherum caput-medusae*) and downy brome (*Bromus tectorum*, also called cheatgrass). The key to optimum results is the timing of application. Applications should be made in late summer prior to rains and seed germination in order to provide the best possibility of suppression or control. In general, control or suppression will be poor if any of the seeds have germinated prior to application even if they have not yet emerged through the soil surface. Tank mixes with Accord XRT II at 12 fl oz/A, where a non-selective herbicide can be used or where desired grasses are dormant and will not be harmed, and will aid in control. Spot treatment restrictions (see spot treatment section) apply for rates above 7 fl oz/A for broadcast applications.

## Control of Terrestrial Weeds near and up to the Water's Edge

Milestone can be used to treat terrestrial weeds that extend up to the water's edge. **Do not apply directly to water.** This product must not be used to treat vegetation standing in the water. When controlling terrestrial weed species near and up to the water's edge, take precautions to minimize incidental overspray to the adjacent water. Consult local public water control authorities before applying this product near public waters. Permits may be required to treat such areas. Apply the specified rate, listed in Table 2, of Milestone as a coarse low-pressure spray as ground broadcast or spot applications. Do not apply aerially for control of weeds growing at or near the water's edge. Spray volume should be sufficient to uniformly cover foliage. Increase the spray volume to ensure thorough and uniform coverage when target vegetation is tall and/or dense. It is also permissible to treat target weeds within dry non-irrigation ditches and seasonally dry transitional areas between upland and lowland sites (such as flood plains, deltas, marshes, prairie potholes or vernal pools), but only at times when those sites are dry and are forecasted or managed by water control systems to remain dry for at least 2 weeks following application.

### Use Rate Restrictions:

Do not broadcast apply more than 7 fl oz per acre of Milestone per year.

The total amount of Milestone applied broadcast, as a re-treatment, and/or spot treatment cannot exceed 7 fl oz per acre per year. Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year; however, not more than 50% of an acre may be treated at that rate. Do not apply more than a total of 0.11 lb acid equivalent (7 fl oz) per acre of Milestone per year as a result of broadcast, spot or repeat applications.

## Woody Plant Control

Milestone may be applied to control woody plants by any application method listed on the label on any site listed.

Milestone may be applied alone or in tank-mix combinations with labeled rates of other herbicides provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated and (2) mixing is not prohibited by the label of the registered tank mixed products. Use as directed in the Directions of Use section of the tank-mix partner. Follow Mixing Instructions under the General Mixing and Application Instructions section.

Add Milestone to tank mixes for improved brush control on species such as alder, aspen, blackberry, boxelder, cherry, coyote brush, conifers, cottonwood, elm, maple, poplar, oak, brooms (Scotch, Spanish, French, Portuguese), gorse, hackberry, Russian and Autumn olive, salt-cedar.

#### **Low or High Volume Foliar Applications:**

For broad spectrum brush control using a foliar application, Milestone may be added to tank mixes with Accord® XRT II, Arsenal Powerline, DMA® 4IVM, Garlon 4 Ultra, Remedy Ultra, Tordon 101M, Transline, Forestry Garlon XRT, or Garlon 3A, Rodeo®, Tordon® K, Tordon 22K or other products labeled for use on the intended site.

#### **Low Volume Basal Bark Applications:**

To control susceptible woody plants with stems less than 6 inches in basal diameter, apply herbicide mix (see below for rates) with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Spray the basal parts of brush and tree trunks to a height of 12 to 15 inches from the ground in a manner that thoroughly wets the lower stems but not to the point of runoff. The use of a Spraying Systems Y2 nozzle or similar nozzle is recommended, which will narrow the spray pattern to target individual stems. Herbicide concentration should vary with tree diameter, bark thickness, volume used per acre, and susceptibility of species treated. Apply anytime, including the winter months, except when snow or water prevent spraying to the ground line or when stem surfaces are saturated with water.

Milestone may be used as a low volume basal treatment alone, for sensitive woody species in the Fabaceae family (legumes), or in combination with other products such as Garlon 4 Ultra, Forestry Garlon XRT, Remedy Ultra for broader control of other sensitive woody species. Applications should not exceed the maximum use rate per acre for the site.

Mix Milestone at 0.5 to 5% v/v alone, or with Garlon 4 Ultra or Forestry Garlon XRT in a commercially available basal diluent (or other oils or basal diluents as recommended by the manufacturer); the basal oil should be compatible with a water soluble herbicide such as Milestone. See table 3 to calculate the amount of Milestone that can be applied per acre at the various volumes and rates. Make a stable tank mixture for basal bark application by first combining each product with a compatibility agent prior to final mixing in the desired ratio. If using a tank mix, mix the oil-based products such as Garlon 4 Ultra thoroughly with basal oil and add any other oil-based products before adding the water based products. If the mixture stands for more than 30 minutes, reagitation may be required.

Oil and water based mixtures can separate over time. Long-term storage is not recommended without vigorous agitation prior to use or without a recommended compatibility agent.

Use caution when treating areas adjacent to susceptible and desirable species to avoid root uptake and possible injury when using Milestone or other soil active herbicides

#### **Low Volume Stem Bark Band Treatment**

To control susceptible woody plants (see table 2) with stems less than 6 inches in basal diameter, mix 0.5 to 5 gallons of Milestone in enough oil to make 100 gallons of spray mixture. Apply with a backpack or knapsack sprayer using low pressure and a solid cone or flat fan nozzle. Apply the spray in a 6- to 10-inch wide band that completely encircles the stem. Spray in a manner that completely wets the bark, but not to the point of runoff. The treatment band may be positioned at any height up to the first major branch. For best results apply the band as low as possible. Spray mixture concentration should vary with size and susceptibility of species to be treated. Applications may be made anytime, including winter months.

**Table 3:**

<b>% of Milestone in Basal Mix</b>	<b>Fluid ounces of Milestone by GPA (gallons per acre)</b>
------------------------------------	--

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.0	1.3	2.6	3.8	5.1	6.4	7.7	9.0
1.5	1.9	3.8	5.8	7.7	9.6	11.5	13.4
2.0	2.6	5.1	7.7	10.2	12.8		
2.5	3.2	6.4	9.6	12.8			
3.0	3.8	7.7	11.5				
3.5	4.5	9.0	13.4				
4.0	5.1	10.2					
5.0	6.4	12.8					

within spot treatment labeled rate  
 in excess of spot treatment labeled rate

NOTE: Avoid treating high density of stems adjacent to desirable trees with roots in the treatment zone. See table 4 for guidance on estimated volume per acre by treated stem density. Trees adjacent to or in a treated area can occasionally be affected by root uptake of Milestone. Applications of Milestone within the root zone of desirable trees should not be made unless injury can be tolerated. Severe injury or plant death can occur if used near roses, or leguminous trees such as locusts, redbud, mimosa, and caragana.

**Table 4:**

<b>Estimated gallons of spray solution per acre for basal bark applications on various stem densities per acre</b>		
	Volume Range	Target Spacing
Number of Stems/Acre	(gal/acre)	(ft between brush/trees)
250	1.0 - 1.7	8.4
500	2.0 - 3.3	5.9
750	3.0 - 5.0	4.9
1000	4.0 - 6.6	4.2
1250	5.0 - 8.3	3.8
1500	5.9 - 9.9	3.4

### **Cut surface**

Apply Milestone in the cut surface applications listed below for control of susceptible tree species such as legumes like albizia, mimosa, locust, etc. Mixtures of Milestone and Garlon 3A or Garlon 4 Ultra may be effective on species other than legumes such as elm, maple, oak and conifers.

Cut surface applications may be used successfully at any season except during periods of heavy sap flow of certain species - for example, maples in the spring.

#### **Cut-Stump Treatment**

Apply Milestone as a 10% dilution v/v in water, by spraying or painting all the exposed cambium layer on the freshly cut surface. The cambium area next to the bark is the most vital area to wet.

#### **With Tree Injector Method**

Apply by injecting 1 milliliter of 10% v/v Milestone in water through the bark at intervals of 3 to 4 inches between centers of the injector wound. The injections should completely surround the tree at any convenient height. Note: No Worker Protection Standard worker entry restrictions or worker notification requirements apply when this product is injected directly into plants.

#### **With Hack and Squirt Method**

Make cuts around the tree trunk at a convenient height with a hatchet or similar equipment so that the cuts overlap slightly and make a continuous circle around the trunk. Spray 1 milliliter of 10% v/v Milestone in water into the pocket created between the bark and the inner stem/trunk by each cut.

#### **With Frill or Girdle Method**

Make a single girdle through the bark completely around the tree at a convenient height. The frill should allow for the herbicide to remain next to the inner stem and absorb into the plant. Wet the cut surface with 10% v/v Milestone in water.

#### **For use in Hawaii only:**

#### **Incision Point Application (IPA) also known as Tree Injection or Hack and Squirt**

For control of susceptible tree species such as albizia and other legumes and susceptible tree species, make cuts around the tree trunk at a convenient height with a machete, hatchet or similar equipment so that the cuts are about 6 inches apart between centers. Inject ½ to 1 milliliter of undiluted Milestone into the pocket created between the bark and the inner stem/trunk by each cut as soon as possible after cutting. The cambium area next to the bark is the most vital area to wet.

#### **Preemergent Weed Control**

Typically Milestone is used as a post emergent herbicide but it has preemergent activity on susceptible weeds. Use Milestone as a preemergence spray prior to weed seed germination. Control will depend upon species susceptibility, application timing, and environmental conditions, such as precipitation, following application. When applied at rates lower than 7 fl oz per acre, Milestone can provide short-term control of some susceptible weeds but when applied at 7 fl oz (broadcast) or 14 fl oz (spot treatment), weed control is extended.

Best results for use as a preemergent application for total vegetation control are obtained if Milestone at 7 fl oz per acre is tank mixed with other herbicides to broaden the weed spectrum and to control grasses. If grasses and broadleaf weeds tolerant to Milestone are present at the time of application or will germinate on the site, then tank mixtures with other herbicides, such as Accord® XRT II, Rodeo®, Dimension® 2EW or EC (annual grasses), Oust XP, Esplanade, flumioxazin, diuron, or other herbicides labeled for total vegetation control applications.

#### **SPOT TREATMENTS FOR AREAS SUCH AS SUBJECT POLES, SUBSTATIONS, AND OTHER SMALL AREAS**

Spot treatments may be applied at an equivalent broadcast rate of up to 0.22 lb acid equivalent (14 fl oz of Milestone) per acre per year to small spots for clearing around utility subject poles to help prevent fire damage, on small substations and other spot areas. To prevent misapplication, spot treatments should be applied with a calibrated sprayer.

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### **Terms and Conditions of Use**

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If terms of the following Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. To the extent permitted by law, otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies.

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### **Warranty Disclaimer**

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Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. To the extent permitted by law, Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

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### **Inherent Risks of Use**

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It is impossible to eliminate all risks associated with use of this product. Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

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### **Limitation of Remedies**

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To the extent permitted by law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Dow AgroSciences' election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

To the extent permitted by law, Dow AgroSciences shall not be liable for losses or damages resulting from handling or use of this product unless Dow AgroSciences is promptly notified of such loss or damage in writing. To the extent permitted by law, in no case shall Dow AgroSciences be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer, Inherent Risks of Use and this Limitation of Remedies cannot be varied by any written or verbal statements or agreements. No employee or sales agent of Dow AgroSciences or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or this Limitation of Remedies in any manner.

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EPA accepted 01/30/17



# SAFETY DATA SHEET

## DOW AGROSCIENCES LLC

**Product name:** MILESTONE™ Herbicide

**Issue Date:** 08/29/2019

**Print Date:** 08/29/2019

DOW AGROSCIENCES LLC encourages you and expects you to read and understand the entire SDS as there is important information throughout the document. This SDS provides users with information relating to the protection of human health and safety at the workplace, protection of the environment and supports emergency response. Product users and applicators should primarily refer to the product label attached to or accompanying the product container.

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### 1. IDENTIFICATION

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**Product name:** MILESTONE™ Herbicide

**Recommended use of the chemical and restrictions on use**

**Identified uses:** End use herbicide product

**COMPANY IDENTIFICATION**

DOW AGROSCIENCES LLC  
9330 ZIONSVILLE RD  
INDIANAPOLIS IN 46268-1053  
UNITED STATES

**Customer Information Number:**

800-992-5994  
info@corteva.com

**EMERGENCY TELEPHONE NUMBER**

**24-Hour Emergency Contact:** 800-992-5994

**Local Emergency Contact:** 352-323-3500

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### 2. HAZARDS IDENTIFICATION

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**Hazard classification**

GHS classification in accordance with 29 CFR 1910.1200

Not a hazardous substance or mixture.

**Other hazards**

No data available

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

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This product is a mixture.

<b>Component</b>	<b>CASRN</b>	<b>Concentration</b>
Aminopyralid Triisopropanolamine Salt	566191-89-7	40.6%

Triisopropanolamine	122-20-3	1.5%
Balance	Not available	57.9%

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## 4. FIRST AID MEASURES

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### Description of first aid measures

#### General advice:

If potential for exposure exists refer to Section 8 for specific personal protective equipment.

**Inhalation:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

**Skin contact:** 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.

**Eye contact:** Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice.

**Ingestion:** No emergency medical treatment necessary.

#### Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

#### Indication of any immediate medical attention and special treatment needed

**Notes to physician:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

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## 5. FIREFIGHTING MEASURES

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**Suitable extinguishing media:** To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

**Unsuitable extinguishing media:** None known.

#### Special hazards arising from the substance or mixture

**Hazardous combustion products:** Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

**Unusual Fire and Explosion Hazards:** Exposure to combustion products may be a hazard to health. Do not allow run-off from fire fighting to enter drains or water courses.

#### Advice for firefighters

**Fire Fighting Procedures:** Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Remove undamaged containers from fire area if it is safe to do so. Evacuate area. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers.

**Special protective equipment for firefighters:** Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal precautions, protective equipment and emergency procedures:** Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

**Environmental precautions:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

**Methods and materials for containment and cleaning up:** Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

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## 7. HANDLING AND STORAGE

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**Precautions for safe handling:** Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice. Smoking, eating and drinking should be prohibited in the application area. Take care to prevent spills, waste and minimize release to the environment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

**Conditions for safe storage:** Store in a closed container. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers. Store in accordance with the particular national regulations.

Do not store with the following product types: Strong oxidizing agents.  
Unsuitable materials for containers: None known.

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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#### Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value/Notation
Triisopropanolamine	Dow IHG	TWA	10 mg/m <sup>3</sup>

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

### Exposure controls

**Engineering controls:** Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

### Individual protection measures

**Eye/face protection:** Use safety glasses (with side shields).

#### Skin protection

**Hand protection:** Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

**Other protection:** No precautions other than clean body-covering clothing should be needed.

**Respiratory protection:** Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Appearance

Physical state	Liquid.
Color	Brown
Odor	Mild
Odor Threshold	No data available
pH	7.3 <i>pH Electrode</i>
Melting point/range	No data available
Freezing point	< -10 °C ( < 14 °F)
Boiling point (760 mmHg)	No data available
Flash point	<b>closed cup</b> > 100 °C ( > 212 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	Not Applicable
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available

<b>Relative Density (water = 1)</b>	No data available
<b>Water solubility</b>	Soluble
<b>Partition coefficient: n-octanol/water</b>	No data available
<b>Auto-ignition temperature</b>	none below 400 degC
<b>Decomposition temperature</b>	No data available
<b>Dynamic Viscosity</b>	12.2 cP at 20 °C (68 °F) <i>EPA OPPTS 830.7100 (Viscosity)</i>
<b>Kinematic Viscosity</b>	No data available
<b>Explosive properties</b>	No data available
<b>Oxidizing properties</b>	No data available
<b>Liquid Density</b>	1.1401 g/mL at 20 °C (68 °F) <i>Digital density meter</i>
<b>Molecular weight</b>	No data available
<b>Surface tension</b>	54.4 mN/m at 20 °C (68 °F)

NOTE: The physical data presented above are typical values and should not be construed as a specification.

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Not classified as a reactivity hazard.

**Chemical stability:** No decomposition if stored and applied as directed. Stable under normal conditions.

**Possibility of hazardous reactions:** None known.  
No hazards to be specially mentioned.

**Conditions to avoid:** None known.

**Incompatible materials:** Avoid contact with: Strong oxidizers.

**Hazardous decomposition products:** Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride. Nitrogen oxides.

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## 11. TOXICOLOGICAL INFORMATION

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*Toxicological information appears in this section when such data is available.*

### Acute toxicity

#### Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:

LD50, Rat, male and female, > 5,000 mg/kg

#### Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:  
LD50, Rat, male and female, > 5,000 mg/kg

**Acute inhalation toxicity**

No adverse effects are anticipated from single exposure to mist. Based on the available data, respiratory irritation was not observed.

As product:  
LC50, Rat, male and female, 4 Hour, dust/mist, > 5.79 mg/l

**Skin corrosion/irritation**

Essentially nonirritating to skin.

**Serious eye damage/eye irritation**

Essentially nonirritating to eyes.

**Sensitization**

Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:  
No relevant data found.

**Specific Target Organ Systemic Toxicity (Single Exposure)**

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

**Specific Target Organ Systemic Toxicity (Repeated Exposure)**

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

**Carcinogenicity**

For similar active ingredient(s). Aminopyralid. Did not cause cancer in laboratory animals.

**Teratogenicity**

Did not cause birth defects or any other fetal effects in laboratory animals.

**Reproductive toxicity**

For similar active ingredient(s). Aminopyralid. In animal studies, did not interfere with reproduction.

**Mutagenicity**

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

**Aspiration Hazard**

Based on physical properties, not likely to be an aspiration hazard.

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## 12. ECOLOGICAL INFORMATION

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*Ecotoxicological information appears in this section when such data is available.*

**Toxicity**

**Acute toxicity to fish**

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 360 mg/l, OECD Test Guideline 203 or Equivalent

LC50, Cyprinodon variegatus (sheepshead minnow), static test, 96 Hour, > 100 mg/l

**Acute toxicity to aquatic invertebrates**

EC50, Daphnia magna (Water flea), static test, 48 Hour, > 460 mg/l

LC50, saltwater mysid Mysidopsis bahia, static test, 96 Hour, > 104 mg/l

**Acute toxicity to algae/aquatic plants**

For similar material(s):

Material is very highly toxic to aquatic organisms on an acute basis (LC50/EC50 <0.1 mg/L in the most sensitive species).

For similar material(s):

ErC50, Myriophyllum spicatum, 14 d, 0.363 mg/l

For similar material(s):

NOEC, Myriophyllum spicatum, 14 d, 0.0639 mg/l

For similar material(s):

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, > 1,000 mg/l

**Toxicity to Above Ground Organisms**

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

dietary LC50, Colinus virginianus (Bobwhite quail), > 21422mg/kg diet.

oral LD50, Colinus virginianus (Bobwhite quail), > 10,000 ppm

oral LD50, Apis mellifera (bees), > 460micrograms/bee

contact LD50, Apis mellifera (bees), > 460micrograms/bee

**Toxicity to soil-dwelling organisms**

LC50, Eisenia fetida (earthworms), 14 d, survival, > 10,000 mg/kg

**Persistence and degradability**

**Aminopyralid Triisopropanolamine Salt**

**Biodegradability:** For similar material(s): Aminopyralid. Material is not readily biodegradable according to OECD/EEC guidelines.

**Triisopropanolamine**

**Biodegradability:** Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). Biodegradation rate may increase in soil and/or water with acclimation. Material is not readily biodegradable according to OECD/EEC guidelines.

10-day Window: Fail

**Biodegradation:** 0 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 301F or Equivalent

**Theoretical Oxygen Demand:** 2.35 mg/mg

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitization:** OH radicals

**Atmospheric half-life:** 3 Hour

**Method:** Estimated.

**Balance**

**Biodegradability:** No relevant data found.

**Bioaccumulative potential**

**Aminopyralid Triisopropanolamine Salt**

**Bioaccumulation:** For similar active ingredient(s). Aminopyralid. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Triisopropanolamine**

**Bioaccumulation:** Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

**Partition coefficient: n-octanol/water(log Pow):** -0.015 at 23 °C Measured

**Bioconcentration factor (BCF):** < 0.57 Fish 42 d Measured

**Balance**

**Bioaccumulation:** No relevant data found.

**Mobility in soil**

**Aminopyralid Triisopropanolamine Salt**

For similar active ingredient(s).

Aminopyralid.

Potential for mobility in soil is very high (Koc between 0 and 50).

**Triisopropanolamine**

Potential for mobility in soil is very high (Koc between 0 and 50).

**Partition coefficient (Koc):** 10 Estimated.

**Balance**

No relevant data found.

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## 13. DISPOSAL CONSIDERATIONS

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**Disposal methods:** If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.



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## 14. TRANSPORT INFORMATION

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**DOT**

Not regulated for transport

**Classification for SEA transport (IMO-IMDG):**

<b>Proper shipping name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(Aminopyralid Triisopropanolamine Salt)
<b>UN number</b>	UN 3082
<b>Class</b>	9
<b>Packing group</b>	III
<b>Marine pollutant</b>	Aminopyralid Triisopropanolamine Salt
<b>Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code</b>	Consult IMO regulations before transporting ocean bulk

**Classification for AIR transport (IATA/ICAO):**

<b>Proper shipping name</b>	Environmentally hazardous substance, liquid, n.o.s.(Aminopyralid Triisopropanolamine Salt)
<b>UN number</b>	UN 3082
<b>Class</b>	9
<b>Packing group</b>	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

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## 15. REGULATORY INFORMATION

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### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

No SARA Hazards

### Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Pennsylvania Right To Know**

The following chemicals are listed because of the additional requirements of Pennsylvania law:

**Components****CASRN**

Triisopropanolamine

122-20-3

**California Prop. 65**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**United States TSCA Inventory (TSCA)**

This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

**Federal Insecticide, Fungicide and Rodenticide Act**

EPA Registration Number: 62719-519

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**

Causes moderate eye irritation

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**16. OTHER INFORMATION**


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**Hazard Rating System****NFPA**

Health	Flammability	Instability
1	1	0

**Revision**

Identification Number: 266154 / A211 / Issue Date: 08/29/2019 / Version: 9.1

DAS Code: GF-871

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

**Legend**

Dow IHG	Dow Industrial Hygiene Guideline
TWA	Time weighted average

**Full text of other abbreviations**

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International

Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

#### Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

US

2020 Review of Biological Pesticides for Treatment of Browntail  
Moth Near Marine Waters

Submitted to the BPC Public Member Board at their July 24<sup>th</sup>, 2020 meeting

Pamela J. Bryer, Ph.D., Toxicologist  
Maine Board of Pesticides Control  
Department of Agriculture, Conservation, and Forestry

## Executive Summary

This risk assessment evaluates a suite of pesticide active ingredients used during treatment of browntail moth infestations when applied from 25 to 50 feet from the high-tide line with powered equipment.

The active ingredients assessed to have acceptable risk for this use near marine habitats include:

*Bacillus thuringiensis* subspecies *kurstaki* & *aizawai*

*Beauveria bassiana*

GS-omega/kappa-Hxtx-Hv1a

*Isaria fumosorosea*

Kaolin Clay

Spinosad

### Method

Based on selection criteria provided by the Maine Forest Service, pesticides with labeled uses for gypsy moths were queried in a database containing pesticides registered in Maine for 2020. Of those pesticides, candidates for the biological pesticides list were searched by use site and chemical categorization (biochemical and microbial pesticides were selected). Eight candidate active ingredients were identified for this risk assessment.

For each active ingredient, data were collected on environmental fate and transfer parameters along with toxicity data for marine and estuarine organisms. When insufficient data were available for quantitative risk assessment approaches, available data were summarized qualitatively. Risk was assessed by comparing expected environmental concentrations (EEC) to the concentrations known to produce toxic effects in marine and estuarine organisms.

### Outcome

Seven of the eight candidate active ingredients were deemed unlikely to cause undue harm to marine and estuarine organisms. The only candidate chemical that was not selected for the current list was azadirachtin. Azadirachtin is a biochemical extracted from neem seeds with high toxicity to aquatic organisms. Each of the remaining active ingredients were deemed unlikely to cause undue harm to marine and estuarine organisms when products were used as labelled.

This revised list includes two subspecies of one bacterium (*Bacillus thuringiensis*), two fungi (*Beauveria bassiana* and *Isaria fumosorosea*), one product of bacterial synthesis not including live bacterial spores (spinosad), one biochemical mechanical disruptor (kaolin clay), and one protein toxin that originates from spider venom (GS-omega/kappa-Hxtx-Hv1a). These additional pesticide options allow for more flexibility in the treatment strategies and resistance management.

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## Introduction

In 2016, the Maine Board of Pesticides Control (BPC) established that only “biological pesticides” were allowed for use in the zone of land 25 to 50 feet from the high-tide line during the treatment of browntail moth, including with powered application equipment. In 2017, the BPC clarified the meaning of biological pesticides with a policy that listed the active ingredients that met the definition of biological pesticide and was suitable for applications to treat browntail moths. The BPC clarification indicates that a biological pesticide is comprised of either 1) microbiological organisms or 2) products produced by and commonly associated with organisms. This document re-evaluates and provides updated suggestions for those pesticide active ingredients in the biological pesticides category for the purposes of Chapter 29 Section 5.

The rationale for this designation stems from general patterns that are frequently seen in biological pesticides. Biological pesticides often have modes of action that are targeted to a more specific group of pests. Also, some biological pesticides have a short residence time in the environment. The co-location of browntail moths and coastal habitat has warranted that the pesticides used as close as 25 feet from the ocean to represent the lowest risk products available.

This risk assessment document concerns the treatment of browntail moths in the area 25 to 50 feet from the marine coast. Pesticides allowed in the biological pesticides category are varied in their mechanism of action. This is a broad category and as such each pesticide in this group has required a unique approach to its risk assessment. Biochemical pesticides are naturally occurring substances with a pesticidal nature. The previous list of “biological pesticides” included azadirachtin and spinosad both of which are classified by US EPA as biochemical pesticides. Other examples of biochemical pesticides would include: kaolin clay, GS omega/kappa-Htx-Hv1a, and smothering oils like horticultural oil and caustic ingredients such as horticultural vinegar. Microbial pesticides, on the other hand, are comprised of the living organism itself. Examples of microbial pesticides include *Bacillus thuringiensis* subspecies *kurstaki* & *aizawai*, *Beauveria bassiana*, and *Isaria fumosorosea*.

This risk assessment evaluates the hazard of each of the proposed biological pesticides to understand the potential for exposure to marine organisms and then assess whether the risk from their use is acceptable in the marine environment.

### Method

Following guidance from the Maine Forest Service (MFS), identification of the pesticides to be reviewed started with a search for active ingredients effective against gypsy moths. Gypsy moths are used as a surrogate pest species because there is a lack of research and knowledge on effective pesticide approaches to browntail moth control. Pesticides with labeled uses for gypsy moths were queried in the National Pesticide Information Retrieval System database containing pesticides registered in Maine for 2020. Of those pesticides, candidates for the biological pesticides list were searched by use site and chemical categorization (biochemical and microbial pesticides were selected). Eight active ingredients were identified for this risk assessment.

For each active ingredient, data were collected on environmental fate and transfer parameters along with toxicity data for marine and estuarine organisms. Available data were summarized qualitatively when insufficient data were available for quantitative risk assessment approaches. Risk was assessed by comparing

expected environmental concentrations (EEC) to the concentrations known to produce toxic effects in marine and estuarine organisms.

Specific detail of the risk assessment methods are found in the sections for each candidate active ingredient. Each of these biopesticides are unique and vary in the types of assessment data available.



## Azadirachtin

Azadirachtin is a pesticidal extract taken from the seeds of the neem tree, *Azadirachta indica* A Juss.. In a technical sense “azadirachtin” is a term that represents a loosely described collection of chemicals; this group of active compounds is characterized by azadirachtin A, one of the most abundant compounds in the group. Azadirachtin is considered to be different from cold-pressed neem oil because there are more compounds in cold-pressed neem oil than in solvent extracted azadirachtin.

Azadirachtin has multiple effects. In some insects azadirachtin has been shown to be a repellent and feed inhibitor. It is also an insect growth regulator. Azadirachtin is understood to block the insect hormone ecdysone and it is lethal to insects because they cannot metamorphosize without proper ecdysone levels. It must be consumed to be effective.

### Toxicity

Azadirachtin is practically non-toxic to mammals and birds. In acute mammalian testing, azadirachtin had low toxicity (Category III) for both oral and dermal exposures and very low toxicity (Category IV) for inhalation and dermal irritation exposures. Due to the practically non-toxic profile US EPA did not require further testing or calculate a quantitative dietary and drinking water toxicity assessments.

Azadirachtin has moderate to high toxicity to aquatic organisms. There are no marine or estuarine data for azadirachtin, this risk assessment substituted freshwater data. In freshwater fish, exposures as low as 0.0047 ppm were found to potentially cause effects. Freshwater invertebrates varied in their sensitivity: the No Observed Adverse Effect Concentration (NOAEC) for water fleas, *Daphnia* species, was 0.615 ppm while the NOAEC for midges, *Chironomus* species, was 0.0016 ppm representing a difference over 350 times lower than the water flea.

Azadirachtin has an exemption for all raw agricultural commodities from the required tolerance when used at a rate of less than 20 grams per acre.

### Environmental Exposure

Exposures to aquatic organisms are predicted to be low when the product’s label instructions are followed. As a seed extract, this compound is more oily than watery in nature and is not highly mobile in soil. It breaks down quickly in sunlight on the foliage and on soil. The half-lives are measured in hours and days and it is expected to be half degraded in less than a day to two days. Once in the soil, it is rapidly consumed by soil organisms. The aquatic half-life is longer and considered to be around 30 days or less.

A quantitative risk assessment was possible with azadirachtin because substantial fate, transfer, and toxicity data are available. US EPA’s Pesticide in Water Calculator Version 1.52 was used to predict the Expected Environmental Concentration (EEC) under the standardized pond scenario used by US EPA. The modeled peak concentration was 0.0013 ppm following the predicted drift and runoff from an application to a modeled apple orchard with air blast sprayers. The modeled 21-day average EEC was 0.0007 ppm.

The calculated Risk Quotient (RQ) for an acute exposure was 0.85; any RQ value higher than 0.5 demonstrates unacceptable risk to aquatic organisms. For chronic exposures an RQ value less than 1 indicates acceptable risk. The calculated chronic RQ for azadirachtin was 0.16 indicating acceptable risk from the modeled use.

## Conclusion

The biochemical azadirachtin did not pass the risk assessment standards used to ensure there is no undue harm caused by lawful uses. The acute toxicity of azadirachtin was too high given the environmental concentrations predicted by the model following labeled uses. This active ingredient has not been included on the updated list of biological pesticides allowed within 25 to 50 feet of the high-tide line. A brief review of details of lobster and clam physiology confirms that ecdysone plays important roles in their normal development leaving open the possibility of azadirachtin directly affecting these organisms.

## *Bacillus thuringiensis* subspecies *kurstaki* & subspecies *aizawai*

*Bacillus thuringiensis* (*Bt*) is a widely used bacterial insecticide cultured from a soil bacterium. Different *Bt* subspecies and strains can affect different types of target pests including: Diptera, Coleoptera, Lepidoptera, Hemiptera, and Hymenoptera. On the whole “*Bt*” targets a range of organisms but in practice each subspecies and strain have limited selectivity. In this review, *Bt* is a term used to refer to all the species and strains of *B. thuringiensis* subspecies *kurstaki* and *B. thuringiensis* subspecies *aizawai* as a single group not because there are no important differences, but because as of to date none of the differences between subspecies *kurstaki* and *aizawai* are substantially dissimilar for the context of this risk assessment which focuses on risk to aquatic non-target organisms.

The mode of action for *Bt* is sometimes disputed but generally understood as follows. The primary toxins produced by the *Bt* bacteria,  $\delta$ (delta)-endospores, are only available after being activated by proteins in an insect’s midgut. Additionally, the pH must be alkaline for this activation to take place. The activated toxins interact with the cells of the intestines and cause those cells to die. A combination of intestinal trauma and secondary infection (once the intestinal lining is breached bacteria move throughout the body) contribute to the organism’s death over the course of a few days. Multiple risk reviews have demonstrated that *Bt* is not harmful to most organisms because the conditions are not right for the primary toxins to become available and active.

*Bt* subspecies *kurstaki* and *aizawai* are in the same family as *B. cereus* and *B. anthracis*. Contamination of the fermentation vats used in production of *Bt* with these similar taxa is a human health concern. Each batch of the product is tested in a live mouse assay and each change in formulation processing requires another round of assays demonstrating no additional genetic material has been added.

### Toxicity

In addition to the  $\delta$ -endospores, *Bt* subspecies produce scores of toxins which contribute to the specificity of *Bt*’s toxicity in different subspecies and strains. The complete complement of toxins for *Bt* organisms contains: the primary toxins ( $\delta$ -endotoxins) Cry and Cyto; and parasporins, Vips, Sips, Bins, 41.9-kDa protein, sphaericolysins, alveolysins,  $\beta$ -exotoxins (like thuringiensin), enhancin-like proteins, and P19/P20 helper proteins (Palma et al. 2014). The value of *Bt*’s selectivity stems from variations in the toxins produced. Toxicity of each *Bt* product is unique and determined by the mixture of: species and age of the pest, subspecies of *Bt* bacteria, strain of the *Bt* subspecies, the concentration of active ingredients (the crystal and cytolytic proteins, the  $\delta$ -endotoxins), the concentration of exotoxins and enterotoxins, inert ingredients of the formulation, and concentration of spores.

Non-target effects likely originate from these additional toxins that do not require a specific gut pH, however, these other toxins are currently not present at locations and quantities to cause significant toxicity.

While the specifics for each possible combination are not understood, 50 years of use has produced patterns that demonstrate very clearly a lack of vertebrate toxicity, only very minimal toxicity to non-target organisms, and expected toxicity to target organisms. *Bt* was found to be practically nontoxic to grass shrimp, sheepshead minnow, and copepods during standardized testing. Only one study out of many reviewed found negative effects from *Bt kurstaki*, in that study stonefly larvae increased their drift behavior when exposed to ten times the Expected Environmental Concentration (EEC) (USFS 2007). Other studies show aquatic invertebrates able to

withstand exposures 200,000 times the EEC. With the fish species tested, exposures have caused harm to fish when the test substance volume increased to a level that caused oxygen depletion and the fish suffocated.

#### Environmental Exposure

The persistence in the environment of *Bt* is generally thought to be short. Sunlight is a strong agent of breakdown and foliar half-lives are on the order of 2 to 3 days. Under better conditions *Bt* may remain viable for 4 to 5 days on the leaf surface. In soil, *Bt* spores can persist for weeks, spores are largely destroyed by sunlight and soil organisms. *Bt*'s ability to re-infect is considered to be poor, so the likelihood of those spores persisting beyond that point is very low. The persistence of the  $\delta$ -endotoxins is longer than the spores and it has been observed that they can be detected for around a month.

#### Conclusion

A review of the toxicity data indicated no patterns of toxicity to non-target aquatic organisms, from the products that target Lepidoptera. This review combines *Bt kurstaki* and *aizawai* and treats them as equivalent, this review specifically does not include *Bt israelensis*. *Bt israelensis* is frequently used in treatment of aquatic pests and clearly poses different risks to aquatic environments.

## *Beauveria bassiana*

*Beauveria bassiana* is a naturally occurring soil fungus used to control a variety of insects, such as: aphids, apple clearwing moth, codling moth, Douglas fir tussock moth, European corn borer, silkworms, thrips, and termites. *Beauveria bassiana* can be a highly efficient lethal agent to insects from contact exposure and does not need to be ingested to work. Its mode of action is to grow and feed on the insect's body, this leads to softening of the exoskeleton and destruction of inner tissues.

### Toxicity

Toxicity of *B. bassiana*, like all substances is highly dependent on concentration. *B. bassiana* is used in entomovectoring systems; in entomovectoring, insects like bumblebees, are used to disperse pesticide instead of the typical sprayer or irrigation technologies. The fact that *B. bassiana* can be used with bumblebees illustrates the importance of concentration in risk assessment as *B. bassiana* is also considered to be toxic to bees.

While the mode of action is infecting target organisms, fungi are capable of producing toxins that can also have toxic effects. The risks from unintentional toxin production (mycotoxins) is low. Beauvaricine is a known contaminant that can occur during the production of *B. bassiana* pesticide formulations. Changes to manufacturing and testing keep this toxin at low levels and below the level of concern.

Several studies have found that *B. bassiana* has toxicity to aquatic organisms. In a study with *Culex pipiens* Hamid et al. (2013) found high toxicity to exposed eggs and larvae. The method of exposure is noteworthy with respect to applicability to this risk assessment, eggs and larvae were dunked in a test solution containing *B. bassiana* and then returned to their home lake water. This study found complete mortality at a concentration of  $0.33 \times 10^{10}$  spores/L (higher than the Expected Environmental Concentration (EEC) for this product when used as labeled). An  $LC_{50}$  of 7,300 ppm was established for Rainbow Trout (*Oncorhynchus mykiss*), classifying *B. bassiana* as practically non-toxic to fish. When Inland Silversides (*Menidia beryllina*) embryos were exposed to *B. bassiana* at  $8.3 \times 10^4$  to  $1.5 \times 10^5$  conidia/mL the embryos had increased rate of rupture and death. These authors also tested the role of detergent-treated spores and concluded that the detergent prevented conidia from sticking to the embryos and lowered the mortality to the embryos.

In terrestrial invertebrates there were instances where the predicted environmental concentration would be expected to produce toxic effects. This is expected when evaluating an insecticide intended for terrestrial invertebrates. Earthworms showed no effects at concentrations as high as 1,000 ppm.

In other organisms, testing has produced no signs of toxicity beyond slight dermal irritation in rats at five times the labeled application rate. In mammals, there were no effects seen at doses produced by legal application. More specifically in rats, an oral dose of  $1.9 \times 10^8$  ppm cleared within 3 days with no toxic effects and similarly high doses were cleared following inhalation and injection to the abdominal cavity. Injection into the abdominal cavity reinforces that this organism is not likely to be pathogenic to mammals. In birds, there were no effects seen at doses produced by legal application.

This review considers the strains of *B. bassiana* together as one unit. However, one of the available strains does not have an established tolerance, there are no food uses registered for *B. bassiana* Strain 447 (PC Code 128815). *Beauveria bassiana* strains: ATCC 74040 (PC Code 128818), GHA (PC Code 128924) and HF23 (PC Code

090305) are exempted, with qualifications and uses, from the requirement of a tolerance (40 CFR 180.1205, 40 CFR 180.1146, and 40 CFR 180.1273 respectively).

#### Environmental Exposure

This fungus is considered to be worldwide in distribution and widespread in the soil. It is not common in water sampling; one survey found that only 2% of their freshwater samples contained evidence of *B. bassiana*. Label mixing instructions indicate the product dies within 24 hours of mixing with water. *Beauveria bassiana* is classified as persistent in soil. Testing demonstrated that environmental concentrations declined to almost normal background levels in 6 months to 1 ½ years. This property is considered a benefit as it means areas can be treated in a way that inoculates against future pest outbreaks. While persistent *B. bassiana* does not significantly amplify in the environment or bioaccumulate; in this case, the higher background levels plateau at levels above background but below levels considered to cause harm.

It is difficult to model the expected environmental concentrations of biological pesticides largely because the chemical parameters typically used in modeling simply do not apply to pesticides like these - especially living organisms like *B. bassiana*. In lieu of standard modeling, the alternative approach in aquatic systems is to predict the aquatic concentration as though the application was made directly to the water using the labeled application rate. This is a highly conservative approach that essentially represents 100% drift from the target site to the waterbody. Using this method the expected environmental concentration (EEC) is 0.037 ppm also expressed as  $3.7 \times 10^6$  conidia/L. Even with a conservative approach to estimating the EEC, the potential harm to non-target organisms is considered to be low. Fish showed effects over 100,000 times higher than the EEC. Mosquito larvae effects were seen at a brief exposure 10,000 times the EEC. And representing marine and estuarine organisms, silversides reacted to concentrations 1,000 times higher than the EEC. The risks stemming from use of *B. bassiana* focus on incidentally exposed terrestrial invertebrates and not aquatic organisms.

#### Conclusion

While much remains to be specifically determined about the potential for *B. bassiana* to persist and be effective in marine environments, *B. bassiana* is not expected to cause non-target harm when used as labeled. *Beauveria bassiana* is not expected to persist long in aquatic environments reducing the potential for exposure with marine and estuarine organisms. If terrestrial invertebrates are exposed to labeled dose rates mortality can be expected. However, harmful exposures to aquatic habitats are not expected from labeled uses due to the dilution of active ingredient that occurs during use.

## GS-omega/kappa-Hctx-Hv1a

GS-omega/kappa-Hctx-Hv1a is a relatively new insecticide. This compound has a variety of names including Versitude™ peptide; GS-UACTX-Hv1a-SEQ2; GS-U-ACTX-Hv1a-SEQ2; M-ACTX-HV1a+2; “the spider venom pesticide”; and its brand names of Spear, Spear T, VST-006325 TGAI, & VST-006330 EP. Currently, GS-omega/kappa-Hctx-Hv1a is the compound's active ingredient name as listed on current pesticide labels. This pesticide is manufactured by yeast using a gene sequence that produces a toxic peptide protein chain. In nature, this peptide is part of the venom used by Australian Blue Mountains Funnel Web Spiders (*Hadronyche versuta*) to kill their prey. It effects insects by depressing the central nervous system, specifically its action is to inhibit voltage-gated calcium and potassium channels highly specific to insect nervous systems.

Browntail moth is listed as a species on the label for GS-omega/kappa-Hctx-Hv1a. This product currently contains 2% GS-omega/kappa-Hctx-Hv1a and is marketed towards treatment of lepidopterans. The low risk nature of this insecticide stems from the targeted nature of the peptide, only organisms similar to the spider's natural diet in the wild appear to be affected, such as Coleoptera, Lepidoptera, and Thysanoptera.

### Toxicity

The active ingredient is produced by fermentation of yeast which are removed from the product as part of manufacture. The yeast species involved, *Kluyveromyces lactis*, is used in the manufacture of foods; it and any by-products are not anticipated to cause harm to humans. Cell culture studies have shown no effect on mammalian cells.

Acute toxicity testing on mammals, birds, fishes, and aquatic invertebrates demonstrated in all cases there was no mortality at the maximum dose that is feasible to administer. For bees, there was a contact LD<sub>50</sub> value lower than the maximum feasible dose, however, it is still expected to have practically no toxicity to bees. Oral exposure in bees produced no observable effects at the highest dose feasible. Additionally, no sublethal effects were seen during acute testing. Due to the lack of toxic effects, US EPA waived the testing requirements in the areas of carcinogenicity, development, reproduction, immunotoxicity, and endocrine function. Due to the lack of any toxicity to freshwater organisms US EPA waived estuarine/marine organism testing.

In the acute freshwater fish testing, trout showed no effects at 1,000 ppm. The highest dose tested for freshwater aquatic invertebrates, in this case *Daphnia*, was >100 ppm.

### Environmental Exposure

This pesticide risk assessment is complicated by the lack of data for this chemical. Being a low risk, practically non-toxic pesticide to vertebrates, US EPA waived some of the data requirements for registration. There are no physical parameters useful for calculating fate and transfer in the environment. It is estimated the half-life of the compound is 4 days in the field based on a half-life study. There is no current understanding of hydrolysis or other degradation processes for the compound. US EPA stated in its risk assessment that it anticipated the protein to lose its potency rapidly upon release in the environment because of its protein nature. In order to be effective, proteins must have a very specific conformation, or shape. This shape can be altered easily in solutions with different conditions, such as when dissolved in water versus venom fluid and this shape can also change when pH changes. The label of the product clearly states that the product must be mixed and applied within 24 hours, further adding to the understanding that this protein is not active very long after it's added to water.

In order to estimate the concentration that would be in the environment several assumptions were made. When data are not available a worst-case scenario is assumed. It was assumed that the compound does not degrade and that 100% of it moves off the targeted application site. The standard US EPA pond was used and the maximum application rate of the compound was applied to that pond. The US EPA pond is one hectare in size and 2 meters deep, containing 20,000,000 liters. The maximum rate on the currently registered product is “not to exceed 6 pints per year” with 2% active ingredient. Using these measurements, the calculated Expected Environmental Concentration (EEC) is 0.0028 ppm.

#### Conclusion

The EEC of 0.0028 ppm is much lower than the values produced by toxicity testing. The risk calculations suggest this pesticide is unlikely to cause nontarget effects in fish and other aquatic organisms; the EEC is over 35,000 times lower than the highest dose tested in aquatic invertebrates. Harmful non-target exposure would have to include very large quantities of the product before effects would be seen.

This is a newer insecticide and very few species have been tested. It is unlikely, but possible, that other non-target arthropods may have some toxicity to GS-omega/kappa-Htx-Hv1a. However, due to the short half-life and limited use it is expected that this product will breakdown rapidly in the environment and not reach concentrations that could pose risk to non-target organisms.



## *Isaria fumosorosea*

*Isaria fumosorosea* is a fungus that occurs naturally throughout the environment worldwide. It can be found chiefly in terrestrial habitats; however, it can also be spread via water and air. The fungus is vectored by insects and mites. *Isaria fumosorosea* can infect many species including several agricultural pest insects like the diamondback moth and the Russian wheat aphid. Its use in Maine for browntail moth treatment is limited to fruit trees.

The risk assessment process for microbes is different than it is for conventional pesticides. The US EPA requires less fate and transfer information about pathogens like *I. fumosorosea* because of the worldwide distribution of this species. US EPA acknowledges that this pesticide will be able to cause harm to some insects however the concentrations used on the application site are expected to be low enough to be an acceptable risk to non-target insects nearby. *Isaria fumosorosea* pesticide formulations need to be kept at four degrees Celsius in order to be shelf stable; the product decays rapidly in sunlight and at warm temperatures.

### Toxicity

A concern unique to microbial pesticides is the potential for the microbe to infect humans, birds, and other non-target organisms. In terms of its potential for infecting mammals, *I. fumosorosea* requires temperatures below 35 degrees Celsius to survive. The human body temperature is 37 degrees Celsius, therefore it is expected that *I. fumosorosea* cannot grow in mammals or birds because of their higher body temperatures. An additional concern evaluated by US EPA is the unintentional production of other components during the manufacturing process. *Isaria fumosorosea* manufacture was found to produce several other metabolites during processing, however, they were found to be less than 0.1% of the end product and US EPA does not consider them to pose undue risk.

Throughout toxicity testing, *I. fumosorosea* showed a low risk profile. *Isaria fumosorosea* is considered to be practically non-toxic to laboratory mammals in terms of ingestion, inhalation, injection into the abdominal cavity, contact with skin, and contact with the eye. However, it should be noted that dermal contact and contact with the eye can produce slight irritation that persists for a short period of time and is reversible. In terms of applicator safety this irritation potential is mitigated by the use of personal protective equipment such as long pants, long sleeves, gloves, and a respirator.

Two laboratory bird species were tested in an acute ingestion scenario and *I. fumosorosea* was considered to have acceptable risk to birds. Terrestrial insects that are not at the site of application are believed to have acceptable risk. *Isaria fumosorosea* showed toxicity to non-target terrestrial invertebrates at concentrations that were 10 to 1000 times higher than the Expected Environmental Concentration (EEC). Acute contact testing with bees demonstrated acceptable risk. Testing showed no effect at 10 times the EEC for both oral and contact exposures to bees. *Isaria fumosorosea* testing however was only performed in an acute setting and it is unknown about the longer-term pathogenicity to bees. US EPA expects the potential for pathogenicity to larval bees in chronic exposures to be mitigated by label directions specifying that this product should not be used on plants while they are in flower. The risk to terrestrial insects is mitigated by label language for reducing drift in non-target movement. *Isaria fumosorosea* was nonpathogenic to two species of marine invertebrates. There is no expectation of toxicity to fish.

*Isaria fumosorosea* has permanent exemption from tolerance for commodities in the United States.

## Environmental Exposure

*Isaria fumosorosea* is not expected to persist in water for extended periods of time because soil, not water, is its habitat. As packaged, the pesticide can persist on a shelf for 12 months. The product decays rapidly in sunlight and room temperatures.

## Conclusion

No toxicity is expected to occur in the marine and estuarine aquatic environment from labelled uses of *I. fumosorosea*. Rapid breakdown and low toxicity combine to keep the risks to non-target organisms acceptable.

## Kaolin Clay

Kaolin clay is a pesticide commonly used in organic agriculture to manage a variety of pests including: mites, fungi, bacteria, and insects. Like many biochemical minimum risk pesticides kaolin clay has a nontoxic mode of action. Application of the product forms a layer that physically protects plant tissues from sunburn and pest destruction.

Kaolin clay is unique even among minimal risk pesticides because of its long history of use. Currently, kaolin clay is used in cosmetics, paperboard, adhesives, cellophane, toothpaste, antiperspirants, and anti-caking agents in food. These uses have given kaolin clay the GRAS (generally recognized as safe) categorization by the USDA.

### Toxicity

Human exposure to kaolin clay stemming from its pesticidal uses is difficult to isolate. This product is found in thousands of consumer products making the ability to tease apart pesticidal influences and other influences impossible. These exposures however lead to the conclusion that this pesticide likely poses minimal risk to humans. Kaolin clay has been exempted by the US EPA for tolerance of residues when used on or in food commodities.

Despite the low likelihood of risk to applicators and bystanders, there is potential exposure to wildlife from the use of kaolin clay. Kaolin clay is a broad-spectrum pesticide which increases the potential for non-target effects. Typical use patterns, however, are what prevent significant non-target effects. This pesticide must be applied in a targeted fashion in order to be effective. Once it has shaken loose from its application site it returns to the soil simply as dust, and too dilute to affect organisms in the ecosystem. In honey bee testing studies, the toxic acute oral LD<sub>50</sub> concentration of kaolin clay concentration was greater than 1,000 ppm and the acute contact LD<sub>50</sub> concentration for honey bees was greater than 100 micrograms active ingredient per bee. These numbers indicate that kaolin clay is practically nontoxic to bees when used according to label directions.

In acute testing, kaolin clay is considered to have negligible toxicity to mammals. Toxicity testing of kaolin clay found the LD<sub>50</sub> value in rats was greater than 5,000 ppm. Dermal and inhalation toxicity tests on mammals found similar results, all demonstrating low risk nature of kaolin clay. Kaolin clay can be irritating to the eyes in a temporary basis, but it is not corrosive to the eye. The US EPA considers the risk to eyes to be mitigated by the appropriate personal protective equipment. Because of the consistent lack of toxicity (including mortality and sublethal effects) in the acute tests, US EPA waived the chronic toxicity tests for covering developmental, reproductive, immunological, endocrine disruption, and carcinogenic effects. Testing with kaolin clay supports the lack of toxic effects to fish and aquatic invertebrates.

### Environmental Exposure

There are virtually no data for modeling the environmental fate in transfer of kaolin clay because EPA waived those data requirements during its review. As a clay its half-life is indefinite and it is considered to be stable in the environment. Kaolin clay is known to be easily dispersed in water. In terms of chemical interactions, kaolin is chemically inert.

### Conclusion

The toxic action of kaolin clay is not latent - its insecticidal effects are immediate and organisms must interact with it directly to be affected. It is a basic constituent of the earth and soil with many uses and has been used by

people to the degree it is now generally recognized as safe. Aquatic organisms in the Gulf of Maine are not at risk of undue harm from labeled uses of pesticides containing kaolin clay.

## Spinosad

Spinosad is a widely used insecticide with a broad range of target pests and use sites. Commercial spinosad products are combinations of the spinosyn A and spinosyn D toxins. These toxins are produced by fermentation of the bacterium *Saccharopolyspora spinosa*. Spinetoram is another fermentation product of the same bacterium only differing from spinosad because it is the mixture of the spinosyn J and spinosyn L toxins. US EPA considers spinosad and spinetoram to be toxicologically similar for assessing human health endpoints but not for ecological endpoints. In the previous browntail moth risk assessment for pesticides used in the near marine shore zone, spinetoram was excluded from the 50- to 250-foot zone due to toxicity concerns for aquatic invertebrates.

Spinosad is a neurotoxin that has high selectivity for invertebrates. Its mode of action is to cause the excitation of neurons in the insect nervous system (via nAChR and GABA receptors) leading to excessive and uncontrollable neuron firing.

### Toxicity

Spinosad can cause effects in most animals, however, the sensitivity to spinosad is highest in invertebrates (target and non-target) and aquatic organisms. Spinosad is considered to be moderately toxic to fish. Few marine or estuarine invertebrate species have been tested and for those that were tested there was a large range of sensitivity responses between species.

Acute: The only marine or estuarine fish to be tested were sheepshead minnows which displayed acute toxic effects at 7,870 ppb. For marine invertebrates, Eastern oysters were the most sensitive to acute exposures with an LC<sub>50</sub> of 300 ppb. Among all aquatic invertebrates (fresh and marine/estuarine) the range in values seen in response to acute test exposures was 1.8 ppb to 51,700 ppb.

Chronic: The chronic effect threshold, called the No Observed Adverse Effect Concentration or NOAEC, for Sheepshead minnows was 1,150 ppb. In order to capture the range in variation of sensitivities for invertebrates, when the RQ was developed for chronic test exposures the arithmetic mean of all NOAEC values (fresh and marine/estuarine) was taken. Mysid shrimp displayed negative effects at 84.2 ppb in chronic tests. The 84.2 ppb for mysid shrimp is higher than most values and is an outlier when compared to the rest of the invertebrates; the lowest NOAEC was 0.5 ppb and the average without the 84.2 ppb value is 2.0 ppb.

### Environmental Exposure

Spinosad has a relatively short persistence in the environment which largely depends on the amount of sunlight exposure it receives. Spinosad is stable in water but will degrade within hours in sunlit water. Similarly, spinosad can have half-lives of up to 47 days in soil degradation studies; however, field dissipation studies find the half-life is typically only a few days at most. In soil, spinosad is actively broken down by soil organisms.

A quantitative risk assessment approach was possible with spinosad. US EPA's Pesticide in Water Calculator was used to predict the Expected Environmental Concentration (EEC) under the standardized pond scenario frequently used by US EPA. The modeled peak concentration was 2.65 ppb based on the predicted drift and runoff from an application to a modelled apple orchard with air blast sprayers. The calculated RQ for an acute exposure was 0.009; any RQ value higher than 0.05 is classified as unacceptable risk for listed species. The modeled 21-day average EEC was 2.12 ppb. The value for Eastern oysters and the average value of all chronic test exposures were used for the chronic RQ calculation, 300 ppb and 12.29 ppb respectively. The calculated RQ for chronic exposures was 0.17; in this case any RQ value higher than 1 is considered unacceptable risk. This

assessment used the strictest criteria for assessing risk by assessing the RQ values at the level used endangered organisms.

#### Conclusion

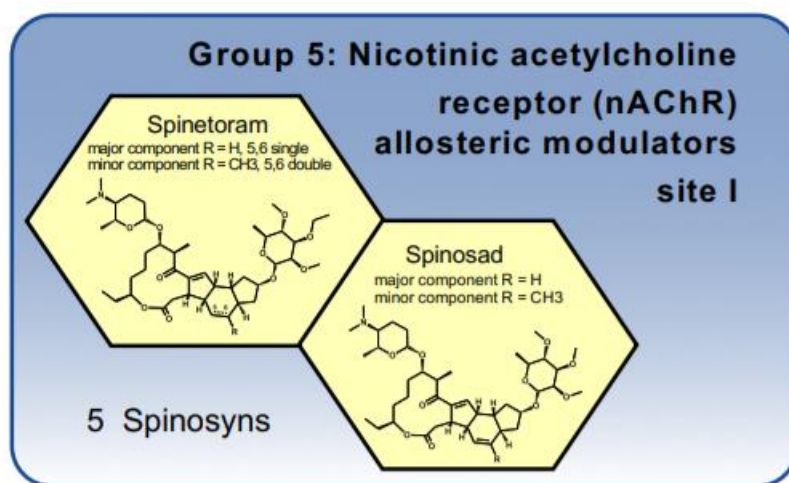
Spinosad is not expected to cause undue harm to the environment, and specifically to marine or estuarine organisms, when used as labeled. Spinosad can produce toxic effects, as seen when tested on aquatic fish and invertebrates. However, these effects are only seen at high concentrations and the labelled uses are currently protective.



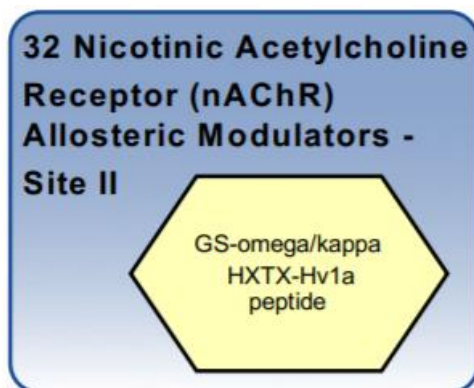
**Key to Targeted Physiology**

 Nerve & Muscle    Growth & Development    Respiration    Midgut    Unknown or Non-specific

Spinosad is in IRAC Group 5.



GS-omega/kappa HXTX-Hv1a is in the new IRAC Group 32.





**Bacillus thuringiensis is in IRAC Group 11.**

**Group 11: Microbial disruptors of insect midgut membranes** [ Includes transgenic crops expressing *Bacillus thuringiensis* toxins (however, specific guidance for resistance management of transgenic crops is not based on rotation of modes of action) ]

Different *B. t.* products that target different insect orders may be used together without compromising their resistance management.

Rotation between certain specific *B. t.* microbial products may provide resistance management benefits for some pests. Consult product-specific recommendations.

\* Where there are differences among the specific receptors within the midguts of target insects, transgenic crops containing certain combinations of these proteins provide resistance management benefits.

*Bacillus thuringiensis* and the insecticidal proteins produced  
*B. t. israelensis*, *B. t. aitzawai*, *B. t. kurstaki*, *B. t. tenebrionis*

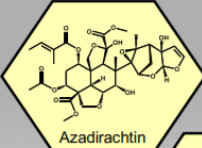
Bt crop proteins \*  
Cry1Ab, Cry1Ac, Cry1Fa, Cry1A.105, Cry2Ab, Vip3A, mCry3A, Cry3Ab, Cry 3Bb, Cry34Ab1/Cry35Ab1

**11A *Bacillus thuringiensis***

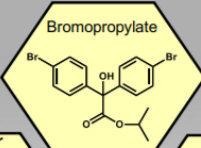
*Bacillus sphaericus*

**11B  
*Bacillus sphaericus***

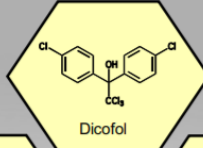
**Azadirachtin is in IRAC Group UN.**



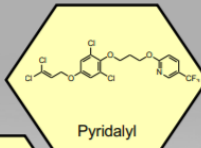
Azadirachtin



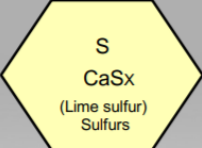
Bromopropylate



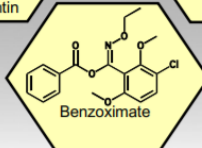
Dicofol



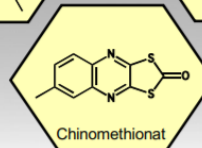
Pyridalyl



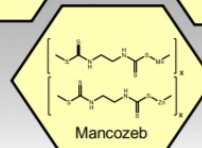
S  
CaSx  
(Lime sulfur)  
Sulfurs



Benzoximate



Chinomethionat

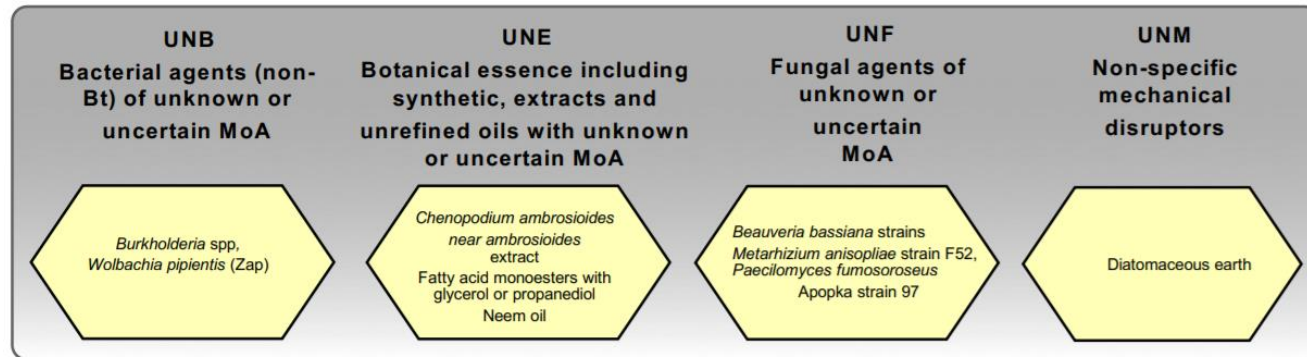


Mancozeb

**Group UN: Compounds of unknown or uncertain mode of action**

*Beauveria bassiana* & *Isaria fumosorosea* are in IRAC Group UNF.

Kaolin clay is in IRAC Group UNM.



## Updated Policy

An updated draft mock-up of the policy for allowable “biological pesticides” for the purposes of Chapter 29 Section 5, follows on the next page. This definition of “biological pesticides” is limited to application of pesticides on the length of land between the 25 to 50 foot marks from the high-tide line. In summary,

This risk assessment document provides a list of biological pesticides for consideration to be used in the zone of land 25 to 50 feet from the high-tide line during the treatments for browntail moths, potential active ingredients include:

*Bacillus thuringiensis kurstaki & aizawai*

*Beauveria bassiana*

GS-omega/kappa-Hxtx-Hv1a

*Isaria fumosorosea*

Kaolin Clay

Spinosad

This risk assessment document supports the removal of azadirachtin from the group of active ingredients currently allowed under the “biological pesticides” grouping.



**STATE OF MAINE**  
**DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY**  
**BOARD OF PESTICIDES CONTROL**  
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**AMANDA E. BEAL**  
 COMMISSIONER

**MAINE BOARD OF PESTICIDES CONTROL POLICY—DEFINITION OF  
 BIOLOGICAL PESTICIDE AS IT RELATES TO CHAPTER 29 SECTION 5**

Revised **Month Day**, 2020

**BACKGROUND**

The Board discussed questions that arose during the spring of 2016 relative to interpretation of the term “biological pesticide” as used in Section 5 of Chapter 29, which regulates pesticide applications for control of browntail moth adjacent to marine waters. The staff pointed out that when this rule was originally written, it contemplated that “biological pesticide” would primarily include strains of *Bacillus thuringiensis* and similar microbial pesticides. With the recent increase in browntail moth populations, questions have arisen about other active ingredients which are derived from organisms. Staff indicated that the term “biological pesticide” is now commonly perceived to include pesticide active ingredients consisting of single cell organisms or products derived from organisms. At the January 11, 2017 meeting, the Board reviewed various options and adopted an interpretation of the term “biological pesticide,” which was subsequently amended at the March 31, 2017 meeting.

In 2019, continued interest in expanding the number of available biological pesticides prompted the BPC to re-evaluate the list of biological pesticides. Qualitative and quantitative risk assessments were used to determine the active ingredients appropriate for this use.

**POLICY**

For the purposes of Chapter 29, Section 5, the term “biological pesticide” includes any microbial pesticide that contains the microorganism and byproducts normally associated with the organism, as approved by the Board.

As of **Month Day**, 2020 the Board has approved:

- Bacillus thuringiensis* subspecies *kurstaki*
- Bacillus thuringiensis* subspecies *aizawai*
- Beauveria bassiana*
- GS-omega/kappa-Hv1a
- Isaria fumosorosea*
- Kaolin Clay
- Spinosad

} Grey out text TO BE DETERMINED

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## Source Documents

Bordalo, M.D., C. Gravato, S. Beleza, D. Campos, I. Lopes, J.L.T. Pestana 2020. Lethal and sublethal toxicity assessment of *Bacillus thuringiensis* var. *israelensis* and *Beauveria bassiana* based bioinsecticides to the aquatic insect *Chironomus riparius*. Science of the Total Environment 698 (2020)  
<https://doi.org/10.1016/j.scitotenv.2019.134155>

European Food Safety Authority; Conclusion on the peer review of the pesticide risk assessment of the active substance aluminium silicate. EFSA Journal 2012;10(2):2517. [37 pp.] doi:10.2903/j.efsa.2012.2517. Available online: [www.efsa.europa.eu/efsajournal](http://www.efsa.europa.eu/efsajournal).

European Food Safety Authority; Conclusion on the peer review of the pesticide risk assessment of the active substance *Bacillus thuringiensis* subsp. *kurstaki* (strains ABTS 351, PB 54, SA 11, SA 12, EG 2348) EFSA Journal 2012;10(2):2540. [66 pp.] doi:10.2903/j.efsa.2012.2540. Available online: [www.efsa.europa.eu/efsajournal](http://www.efsa.europa.eu/efsajournal).

EFSA (European Food Safety Authority), 2015. Conclusion on the peer review of the pesticide risk assessment of the active substance *Beauveria bassiana* strain 147. EFSA Journal 2015;13(10):4261, 35 pp.  
doi:10.2903/j.efsa.2015.4261

Genthner, Fred and Douglas P. Middaugh 1992. Effects of *Beauveria bassiana* on Embryos of the Inland Silverside Fish (*Menidia beryllina*). Applied and Environmental Microbiology, Sept. 1992, p. 2840-2845 Vol. 58, No. 9.

Fanning, Philip, Anthony VanWoerkom, John C. Wise, Rufus Isaacs. 2018. Assessment of a commercial spider venom peptide against spotted-wing Drosophila and interaction with adjuvants. Journal of Pest Science  
<https://doi.org/10.1007/s10340-018-1016-7>. Published online: 12 July 2018.

Hamid, Sonia, Fatma Halouane, Fatma Zohra Bissaad & Farida Benzina. 2013. Study about the effect of *Beauveria bassiana* (Vuillemin in 1912) on the aquatic stages of *Culex pipiens* (Linné, 1758). International Journal of Bio-Technology and Research (IJBTR) Vol. 3, Issue 3, Aug 2013, 31-42.

Karise, Reet, Riin Muljar, Guy Smagghe, Tanel Kaart, Aare Kuusik, Gerit Dreyersdorff, Ingrid H. Williams, Marika Maänd. 2015. Sublethal effects of kaolin and the biopesticides Prestop-Mix and BotaniGard on metabolic rate, water loss and longevity in bumble bees (*Bombus terrestris*) J Pest Sci DOI 10.1007/s10340-015-0649-z Published online 13 February 2015.

Palma, Leopoldo, Delia Muñoz, Colin Berry, Jesús Murillo, and Primitivo Caballero. 2014. *Bacillus thuringiensis* Toxins: An Overview of Their Biocidal Activity. Toxins 2014, 6, 3296-3325; doi:10.3390/toxins6123296.

US EPA 2000. *Beauveria bassiana* Strain GHA (128924) Technical Document Reason for Issuance: Unconditional Registration Amendment of a Biological Insecticide. Date Issued: Sept. 6 2000.

US EPA 2000. Kaolin (100104) Registration Eligibility Document. Office of Pesticide Programs. April 2000.

US EPA 2008 Azadirachtin: Preliminary Non-Target Organisms Effects and Endangered Species Assessment for the Azadirachtin Registration Review Preliminary Work Plan (PWP). Office of Pesticides and Toxic Substances. Memorandum from Russel S. Jones 08/11/2008.

US EPA 2008. Azadirachtin: Proposed Interim Registration Review Decision, Case Number 6021. Docket Number EPA-HQ-OPP-2008-0632.

US EPA 2009. Cold Pressed Neem Oil PC Code 025006. Biopesticides Registration Action Document. Office of Pesticides Programs. Last updated October 14, 2009.

US EPA 2011. *Beauveria bassiana* Final Work Plan strains 447 (PC Code 128815), ATCC 74040 (PC Code 128818), GHA (PC Code 128924), and HF23 (PC Code 090305) Registration Review Case 6057. Biopesticides and Pollution Prevention Division. September 26, 2011. Docket number EPA-HQ-OPP-2010-0564.

US EPA 2011. *Isaria fumosorosea* (formerly *Paecilomyces fumosoroseus*) Apopka Strain 97. Biopesticides Registration Action Document PC Code 115002. September 15, 2011. Office of Pesticide Programs. Biopesticides and Pollution Prevention Division. Docket Identification EPA HQ-OPP-2010-0088.

US EPA 2011. Spinosad and Spinetoram Summary Document Registration Review: Initial Docket September 2011. Spinosad Case Number 7421 and Spinetoram Case Number 7448. Docket Numbers Spinosad EPA-HQ-OPP-2011-0667; Spinetoram EPA-HQ-OPP-2011-0666.

US EPA 2013. GS-omega/kappa-Htx-Hv1a: Qualitative Human Health Assessment PC Code: 006100. Office of Chemical Safety and Pollution Prevention. Memorandum from Elissa Reaves and PV Shah December 5, 2013.

US EPA 2013. VERSITUDE™ Peptide: Summary of Hazard and Science Policy Council (HASPOC) Electronic Review: Recommendations on the Need for Additional Toxicity Studies. Office of Chemical Safety and Pollution Prevention. Memorandum from Kristin Rury September 18, 2013.

US EPA 2014. *Bacillus thuringiensis* Revised Preliminary Work Plan and Summary Document Registration Review: Initial Docket. September 2014 Case 0247 *Bacillus thuringiensis* subsp. *galleriae* strain SDS-502 - PC Code 006399 *Bacillus thuringiensis* subsp. *israelensis* - PC Code 006401 *Bacillus thuringiensis* subsp. *kurstaki*- PC Code 006402 *Bacillus thuringiensis* subsp. *kurstaki* strain BMP 123 - PC Code 006407 *Bacillus thuringiensis* subsp. *kurstaki* strain EG2371 - PC Code 006423 *Bacillus thuringiensis* subsp. *kurstaki* strain EG2348 - PC Code 006424 *Bacillus thuringiensis* subsp. *aizawai* strain GC-91 - PC Code 006426 *Bacillus thuringiensis* subsp. *kurstaki* strain EG7841 - PC Code 006453 *Bacillus thuringiensis* subsp. *kurstaki* strain EG7826 - PC Code 006459 *Bacillus thuringiensis* subsp. *israelensis* strain EG2215 - PC Code 006476 *Bacillus thuringiensis* subsp. *aizawai* strain NB200 - PC Code 006494 *Bacillus thuringiensis* subsp. *kurstaki* strain SA-12 -PC Code 006518 *Bacillus thuringiensis* subsp. *kurstaki* strain SA-11 -PC Code 006519 *Bacillus thuringiensis* subsp. *israelensis* strain BMP 144- PC Code 006520 *Bacillus thuringiensis* subsp. *kurstaki* strain ABTS-351 -PC Code 006522 *Bacillus thuringiensis* subsp. *aizawai* strain ABTS-1857- PC Code 006523 *Bacillus thuringiensis* subsp. *tenebrionis* strain NB-176- PC Code 006524 *Bacillus thuringiensis* subsp. *israelensis* strain SUM-6218 -PC Code 006642 *Bacillus thuringiensis* subsp. *kurstaki* strain VBTS-2546- PC Code 006699 *Bacillus thuringiensis* subsp. *israelensis* strain AM 65-52- PC Code 069162 *Bacillus thuringiensis* subsp. *israelensis* strain SA3A- PC Code 069210. Docket location EPA-HQ-OPP-2011-0705.

US EPA 2014. GS-omega/kappa-Htx-Hv1a Pesticide Chemical (PC) Code: 006100 Biopesticides Registration Action Document. Office of Pesticide Programs Biopesticides and Pollution Prevention Division. Dated 02/03/14 Docket information EPA-HQ-OPP-2012-0391.

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US EPA 2014. Kaolin (PC Code: 100104) Preliminary Work Plan and Summary Document Registration Review: Initial Docket. Case 6039. Approved by Robert McNally, Biopesticides and Pollution Prevention Division. EPA-HQ-OPP-2014-0 107.

US EPA 2016 Environmental risk assessment for the FIFRA Section 3 registration of the TGAI, *Bacillus thuringiensis* subsp. *kurstaki* Strain EVB- 11 3-19 (PC Code: 006700); MP, Bioprotec Technical (EPA File Symbol 89046-G) and end-use products (EPA File Symbols 89046-RE, 89046-RG, 89046-RR and 89046-1). Office of Chemical Safety and Pollution Prevention. Memorandum from Gail Tomimatsu February 25, 2016.

US EPA 2016. Preliminary Environmental Fate and Ecological Risk Assessment for the Registration Review of Spinosad (PC Code 110003, DP Barcode 431523). Office of Chemical Safety and Pollution Prevention. Environmental Fate and Effects Division. Memorandum from Geoffrey Sinclair June 30, 2016.

US EPA 2019. Ecological Risk Assessment for the Active Ingredient *Isaria fumosorosea* strain FE 9901 contained in the Section 3 Registration New Outdoor and Residential Uses of NoFly WP and NoFly Technical. Memorandum from Milutin Djurickovic October 10 2019.

US EPA 2019. Human Health Risk Assessment Review for an Amendment to add New Use Sites including the First Outdoor Agricultural and Residential Exposures for Products Containing, *Isaria fumosorosea* strain FE 9901 (18%) End-Use Product (NoFly™ WP) and *Isaria fumosorosea* strain FE 9901 (69%) Technical (EPA Registration. Nos. 88664-1, -2, respectively; PC Code: 115003; Decision Nos.: 547605, 547604; DP Nos.: 450806, 450807). Office of Chemical Safety and Pollution Prevention, Biopesticides and Pollution Prevention Division. Memorandum from Jennifer Winegeart December 17, 2019.

USFS 2007. Control/Eradication Agents for the Gypsy Moth- Human Health and Ecological Risk Assessment for *Bacillus thuringiensis* var. *kurstaki* (B.t.k) Final Report. Prepared by Syracuse Environmental Research Associates Inc., Submitted to D. Thomas, Forest Health Protection Staff, USDA Forest Service BPA: WO-01-3187-0150. July 20, 2007.

USFS 2016. Spinosad: Human Health and Ecological Risk Assessment FINAL REPORT. Prepared by Syracuse Environmental Research Associates Inc., Submitted to D. Thomas, Forest Health Protection Staff, USDA Forest Service Order Number: AG-3187-D-15-0076. September 24, 2016.

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STATE OF MAINE  
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BOARD OF PESTICIDES CONTROL  
28 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

6

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

To: Maine Board of Pesticides Control  
From: John Pietroski, Manager of Pesticides Programs  
RE: Proposed Guidelines for Approving Online Recertification Courses  
Date: July 15, 2020

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In light of the ongoing pandemic, applicators will likely need alternatives to in-person group presentations for recertification credits. Board staff have developed the following guidelines for on-line recertification courses. In addition to these guidelines, approved courses must also meet or exceed all existing recertification course requirements in Chapters 31, 32 and 33.

1. Webinars

- a. The webinar must have at least an hour of presentation on appropriate topics.
- b. The organization must be able to verify the applicants seeking credits by:
  1. Offering a quiz after the presentation
    - a. The passing score must be 80 percent or greater
  2. Visual verification monitoring all applicant participation
- c. The organization must provide the BPC with a verified list of applicants which includes the applicants name, Maine pesticide applicator license number, and email address of all applicants within 2 weeks of the presentation.
- d. The organization must offer BPC staff free access to the webinar.

2. Videos

- a. The organization must provide a copy of the video to the BPC for review
- b. The video must have at least an hour of presentation on appropriate topics.
- c. The organization must be able to verify the applicants seeking credit by:
  1. Offering a quiz after the video.
    - a. The passing score needs to be 80 percent or greater
- d. The organization must provide the BPC with a verified list of the applicants which includes the applicants name, Maine pesticide applicator license number, and email address of all applicants.

This is a request to add these guidelines to current policy for on-line recertification courses.

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7

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

Memorandum

To: Board of Pesticides Control  
From: Megan Patterson  
Subject: Improving Application Notification—Proposed Policy

July 14, 2020

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At the February 28, 2020 meeting of the Board, staff was directed to follow up with Representative Pluecker on approaches to clearly identify the party responsible for notification. Based on feedback from this discussion and the public information gathering meeting on February 28, 2020, staff have identified numerous ways in which the notification process could be streamlined.

These approaches have been divided into two groups, those best addressed through policy or rule changes and those that may be accomplished through routine staff efforts. This document addresses two options that may be technically inconsistent with language in 01-026 CMR Chapter 28 Section 2. They are as follows:

1. Waive the registry fee for all individuals participating in the Maine Pesticide Notification Registry. Chapter 28.02(A)(1) requires persons requesting to be listed “pay all appropriate fees,” while chapter 28.02(G) gives the Board discretion to waive the fee where there’s an inability to pay or “where other extenuating circumstances exist which justify granting a waiver.” Given the possible ambiguities in this language, we believe the Board may issue an interim policy waiving the fee generally if it articulates the extenuating circumstances to justify that action. However, we recommend a rule change to implement the policy in the long term.
2. Make optional the inclusion of names for all landowners or lessees within 250 feet of the boundary of the listed registry residence. Currently, chapter 28.02(A)(1)(e) requires applicants to list the names and addresses of all such landowners on forms provided by the Board. Given that the names of property owners change when property is sold or transferred, we believe the name is less useful information than the property address. Again, this may be addressed in an interim policy with a subsequent rule change.

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7

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

Memorandum

To: Board of Pesticides Control  
From: Megan Patterson  
Subject: Improving Application Notification—Possible Staff Efforts

July 14, 2020

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At the February 28, 2020 meeting of the Board, staff was directed to follow up with Representative Pluecker on approaches to clearly identify the party responsible for notification. Based on feedback from this discussion and the public information gathering meeting on February 28, 2020, staff have identified numerous ways in which the notification process could be streamlined. This document addresses possible staff efforts that may aid in improving the notification process. They are as follows:

1. Develop guidance documents with clear yet comprehensive explanations of:
  - a. identification of the party responsible for notification
  - b. methods for receiving notification
  - c. notification responsibilities for applicators
2. Produce public assistance resources such as:
  - a. door hangers for use by applicators sharing contact information and/or individuals seeking notification
  - b. fillable postcards for hand or mail delivery that either serve as a request for notification or provide applicator contact information
3. Develop a web hosted fillable form for notification registry participation.
4. Develop an e-mail-based registry participation renewal. This approach may require changes to registry fee payment requirements, as discussed in a separate memorandum.
5. Develop and deliver notification specific training for private and commercial applicators.

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## Budget Synopsis for July 24, 2020 Board Meeting

Information included is for the state fiscal year (7/1/19-6/30/20)

### Revenues for FY 2020 primarily generated from:

- Applicator license fees--\$144K
- Product registration fees--\$2,071K
- EPA Cooperative Agreement Grant--\$358K

A total of \$200K is transferred annually to the University of Maine. This funding is provided in the form of two legislative transfers of \$135K and \$65 are for IPM education and support of the manual writer/Pesticide Safety Education Professional (PSEP) respectively.

Dicap Transfer (Dept. Wide Indirect Cost Allocation Plan) (\$218K)—Percentage of what we spend each month is used to pay for Dept. administrative staff (accountants, human resources, etc.), technology needs (computers, etc.) and other expenses that benefit all programs within the Dept. The funding is administered through the Commissioner's office.

**Expenses for 2020 = \$1,567,156\*** Expenses are divided into two categories: Personnel Services and All Other.

#### Personnel Services

BPC funds 10 permanent full time positions and four full time seasonal positions that work in the BPC program. Currently, an Environmental Specialist III position remains unfilled.

#### BPC Positions

(full time permanent)

2 Office Associate II

1 Env. Specialist II

3 Env. Specialist III

2 Env. Specialist IV

1 Toxicologist

1 BPC Director

(full time seasonal)

4 Env. Specialist II

The BPC also funds five permanent full time positions in the Plant Health Program. Non-dedicated BPC funds cover the salaries and some other expenses of the Plant Health positions.

Plant Health Positions

(full time permanent)

2 Asst. Horticulturist

1 State Horticulturist

2 Entomologist III (IPM Specialist and State Apiarist)

All Other

*Prof Services not by State* (line 40)—Contracts with consultants and speakers, but also temp agencies \$15K (hiring temp workers)

*Grants & Publications & Private Organizations* (line 64)—Maine Mobile Health, UMaine PSEP/Manual Writer, DACF Mosquito Monitoring (\$63 K)\*

*Statewide Cost Allocation Plan (STACAP)* (line 85)—The State of Maine provides un-billed central services to State Programs that operate with Federal and/or special revenue funds. In order to recover the costs of providing these services, the State must prepare a Statewide Indirect Cost Allocation Plan or STACAP also known as SWCAP (\$37 K)

BOARD OF PESTICIDES CONTROL - SUMMARY  
014-01A-0287-01 CASH REPORT

		CURRENT FISCAL YEAR 2020 (BY MONTH)												TOTAL
ERROR		Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	
	<b>BALANCE FORWARD</b>	1,625,992.69	1,512,144.88	1,386,072.93	1,270,708.76	1,076,360.26	1,613,393.89	2,479,830.56	2,450,338.95	2,360,083.84	2,302,015.11	1,926,720.99	1,861,450.83	
<b>Revenues:</b>														
1407	REG INSECT & FUNGICIDES	13,440.00	9,920.00	7,840.04	10,240.00	784,959.96	966,380.00	95,860.00	41,280.00	32,960.00	20,000.00	52,480.00	36,320.00	2,071,680.00
1448	SPECIAL LICENSES & LEASES	5,520.00	5,020.00	2,655.00	1,800.00	5,560.00	41,187.00	31,885.01	13,005.00	18,950.00	1,470.00	9,215.00	7,965.00	144,232.01
2631	REGISTRATION FEES	-	-	-	-	255.00	2,836.00	100.00	-	100.00	-	-	-	3,291.00
2686	MISC-INCOME	-	-	-	3.26	-	-	-	-	-	-	-	-	3.26
2690	RECOVERED COST	-	-	-	-	-	-	-	-	142.50	-	-	-	142.50
2953	ADJ OF ALL OTHER BALANCE FWD	-	-	-	-	-	-	-	-	-	(373.33)	-	-	(373.33)
2968	REG TRANSFER UNALLOCATED	-	-	-	-	(100,000.00)	-	-	-	-	-	-	-	(100,000.00)
2978	DICAP TRANSFER	(18,210.22)	(16,720.79)	-	(36,499.13)	(24,788.82)	(15,195.99)	(18,788.72)	(19,433.28)	-	(30,424.36)	(23,242.72)	(15,134.01)	(218,438.04)
2981	LEGIS TRANSFER OF REVENUE	-	-	-	-	-	-	-	-	-	(200,000.00)	-	-	(200,000.00)
	<b>TOTAL REVENUES</b>	<b>749.78</b>	<b>(1,780.79)</b>	<b>10,495.04</b>	<b>(24,455.87)</b>	<b>665,986.14</b>	<b>995,207.01</b>	<b>109,056.29</b>	<b>34,851.72</b>	<b>52,152.50</b>	<b>(209,327.69)</b>	<b>38,452.28</b>	<b>29,150.99</b>	<b>1,700,537.40</b>
<b>Expenditures:</b>														
32	SALARIES AND WAGES	55,182.43	55,406.43	53,335.39	79,127.91	52,904.80	53,504.45	53,813.20	55,046.40	53,882.30	80,209.22	53,472.79	53,472.81	699,358.13
33	SALARIES AND WAGES	5,545.60	5,095.02	5,513.55	8,323.80	5,771.55	2,841.60	-	-	2,916.00	8,433.15	5,597.85	5,463.00	55,501.12
34	SALARIES AND WAGES	1,920.00	1,800.00	960.00	-	-	-	-	-	-	-	-	-	4,680.00
36	SALARIES AND WAGES	583.50	1,102.11	907.94	1,717.09	741.93	1,722.54	1,143.48	621.48	637.48	1,595.46	897.49	1,032.34	12,702.84
38	SALARIES AND WAGES	925.48	220.00	165.00	-	385.00	342.77	-	330.00	-	165.00	3,355.35	-	5,888.60
39	FRINGE BENEFITS	39,344.52	39,221.56	37,786.38	46,770.80	36,591.16	34,955.48	33,588.46	33,677.19	33,710.68	45,833.54	35,497.26	35,497.22	452,474.25
40	PROF. SERVICES, NOT BY STATE	2,375.55	3,525.56	1,182.32	988.14	297.74	50.00	3,777.77	919.10	841.43	-	983.83	-	14,941.44
42	TRAVEL EXPENSES, IN STATE	185.01	642.01	116.39	782.60	63.71	599.94	781.14	757.07	160.20	110.96	10.02	101.94	4,310.99
43	TRAVEL EXPENSES, OUT OF STATE	-	1,689.24	(1,479.35)	1,303.34	12.00	(1,191.20)	1,864.02	159.70	2,274.73	306.00	-	-	4,938.48
46	RENTS	1,634.26	3,978.79	311.60	3,671.05	1,516.74	1,346.32	995.80	744.86	1,015.85	557.31	-	2,879.53	18,652.11
48	INSURANCE	2,460.20	-	-	-	-	-	-	40.00	-	-	-	129.60	2,629.80
49	GENERAL OPERATIONS	910.60	2,216.87	1,151.86	1,258.54	2,891.30	19,460.88	11,626.41	2,731.42	774.88	5,625.29	331.57	1,343.04	50,322.66
50	EMPLOYEE TRAINING	-	-	-	-	-	-	1,200.88	-	-	-	32.33	29.54	1,262.75
51	COMMODITIES - FOOD	91.03	-	14.84	-	28.96	-	267.00	29.35	28.93	-	-	66.69	526.80
53	TECHNOLOGY	52.37	66.69	22,460.45	20,444.10	-	10,626.14	20,274.00	-	10,156.61	10,843.60	-	30,623.00	125,546.96
54	CLOTHING	-	-	-	-	-	351.50	-	-	385.30	-	-	-	736.80
55	EQUIPMENT AND TECHNOLOGY	-	118.00	-	-	40.12	62.09	213.07	40.08	40.08	225.10	426.83	-	1,165.37
56	OFFICE & OTHER SUPPLIES	261.40	5,818.85	-	871.44	61.61	585.59	9.99	517.40	390.48	1,046.83	288.06	589.27	10,440.92
64	GRANTS TO PUB AND PRIV ORGNS	-	-	-	-	24,805.27	-	5,360.00	26,811.81	-	6,670.13	-	-	63,647.21
85	TRANSFERS	3,125.64	3,390.03	3,432.84	4,633.82	2,840.62	3,512.24	3,632.68	2,680.97	3,006.28	4,344.84	2,829.06	-	37,429.02
	<b>TOTAL EXPENDITURES</b>	<b>114,597.59</b>	<b>124,291.16</b>	<b>125,859.21</b>	<b>169,892.63</b>	<b>128,952.51</b>	<b>128,770.34</b>	<b>138,547.90</b>	<b>125,106.83</b>	<b>110,221.23</b>	<b>165,966.43</b>	<b>103,722.44</b>	<b>131,227.98</b>	<b>1,567,156.25</b>
	<b>CURRENT CASH BALANCE</b>	<b>1,512,144.88</b>	<b>1,386,072.93</b>	<b>1,270,708.76</b>	<b>1,076,360.26</b>	<b>1,613,393.89</b>	<b>2,479,830.56</b>	<b>2,450,338.95</b>	<b>2,360,083.84</b>	<b>2,302,015.11</b>	<b>1,926,720.99</b>	<b>1,861,450.83</b>	<b>1,759,373.84</b>	<b>1,759,373.84</b>



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9

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

To: Maine Board of Pesticides Control  
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist  
RE: Proposal for 2021 Groundwater Monitoring Program  
Date: July 10, 2020

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## Background

In 2019, the Board approved funding to sample 200 wells for the statewide sampling for pesticides in groundwater. The project met with several hurdles which slowed sampling including: refusals to participate, people not home or not answering the door, wells that failed to meet site criteria upon field reconnaissance, and impassable roads due to early thawing. Additional time is required to select potential replacement wells. Unfortunately, sampling was halted in early March as result of Covid-19 with approximately 35% of the samples collected.

The pros and cons of the following three options were discussed: continue with where the sampling ended in 2020, resample wells and continue the project, or start with an entirely new data set. It was determined the best option to provide the most reliable data would be resample the wells and continue with the remainder of the wells selected. This would also provide the opportunity to compare results in wells sampled over two years under different weather patterns.

The Hexazinone Statewide Management Plan is scheduled to be conducted in 2021. Sampling for hexazinone has been ongoing about every 4 years since 1994 and includes long-term data for some of the remaining original wells sampled. Efforts to complete the 2020 water quality monitoring project will now overlap with the hexazinone effort.

Due to the concerns with exposure to Covid-19, new protocols will be instituted to protect staff and conserve time selecting wells include:

1. Field reconnaissance of all potential sampling sites to be completed summer of 2020 to ensure sites meet criteria.
2. Tax maps and other resources will be used to obtain mailing addresses to initiate contact by mail with well owners and seek tentative agreements to participate in sampling.
3. Staff will followup by telephone in early winter to set appointments for sampling beginning in December.

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4. State employees will not enter homes, will wear proper PPE, and will follow disinfection procedures of equipment and materials.
5. Residents will collect their sample following instructions provided.

### **Study Objectives**

Study objectives remain the same but are expanded to include sampling to meet the requirements of the Hexazinone State Management Plan.

- Assess the occurrence of pesticides in private drinking water wells associated with active agricultural and blueberry fields throughout the state of Maine.
- Determine trends in agricultural pesticides detected in groundwater collected from private drinking water wells associated with active agricultural and blueberry fields.

### **Sampling Plans**

#### **Statewide Groundwater Survey**

- Samples for the statewide sampling program were drawn across the state from the 200 randomly-selected domestic wells selected in 2020. Sampling points are allocated uniformly across all areas within one quarter mile of agricultural land in the state. Sites selected must be down gradient of an active agricultural pesticide use site.
- Ten field duplicates and 10 field blanks will be collected for quality control and quality assurance purposes. The number of duplicates and blanks are collected on a 5% basis or one in 20 samples which will be distributed across all five inspection regions.
- All historical samples from the 2014 statewide groundwater monitoring will be incorporated as part of the 200 samples to assess trends in groundwater contamination over time. Any historical sites no longer viable for sampling will be replaced with new randomly selected sites.
- Samples will be shipped to Montana Analytical Laboratory, an accredited lab with a current Quality Assurance Project Plan (QAPP). The QAPP is required by the Environmental Protection Agency (EPA) as part of the Cooperative Agreement between the EPA and Maine and is also required under the **State of Maine Generic State Management Plan for Pesticides and Groundwater** (BPC, 1994). The analysis method employed will be the “Universal Method for the Determination of Polar Pesticides in Water Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry/ Mass Spectrometry” and analyzes for 102 pesticides.

#### **Hexazinone Survey**

- Samples for the hexazinone sampling program will be drawn from 50 randomly-selected domestic wells located across the state. Sampling points are allocated uniformly across all areas within one quarter mile of blueberry production sites in the state. Sites selected must be down gradient of an active agricultural pesticide use site.



- Four field duplicates and four field blanks will be collected for quality control and quality assurance purposes. The number of duplicates and blanks are generally collected on a 5% basis or one in 20 samples which will be distributed across the inspector regions involved.
- Remaining historical samples from the 1994 groundwater monitoring project will be incorporated to assess trends in groundwater contamination over time. Any historical sites no longer viable for sampling will be replaced with new randomly selected sites.
- Samples will be shipped to Montana Analytical Laboratory, an accredited lab with a current Quality Assurance Project Plan (QAPP). The QAPP is required by the Environmental Protection Agency (EPA) as part of the Cooperative Agreement between the EPA and Maine and is also required under the **State of Maine Generic State Management Plan for Pesticides and Groundwater** (BPC, 1994). The analysis method employed will be the “Universal Method for the Determination of Polar Pesticides in Water Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry/ Mass Spectrometry” and analyzes for 102 pesticides.

## Proposal

We propose to repeat the statewide survey, resampling the wells from 2020 and continuing with the remainder of the wells selected. In addition, we propose to add the hexazinone survey to be conducted following the conclusion of the statewide survey and request support for funding these projects. We believe this is feasible given that:

- The lack of enough oversample points to replace eliminated wells, as previously discussed, will reduce the number of wells sampled in the statewide survey by 25-50 wells. The additional 50 wells and associated QA/QC samples for hexazinone will not significantly increase the total number of wells sampled beyond the 200 wells initially planned for.
- One-third of the wells for the statewide survey have already been sampled and will simply require calling to verify participation and setting an appointment.
- All the preliminary site work will be completed this summer for both projects with precontact initiated in the fall to determine participation.

## Estimated Project Cost

The estimated cost for analysis and shipping of 220 samples is \$91,000. The final number of wells sampled will not be known until the end of the project. Montana Analytical Laboratory offers a 20% discount on six or more samples. When possible, they aggregate the samples shipped by different staff to provide the BPC greater benefit from the discount.

Project	Number of Samples	Cost
Statewide Groundwater Survey	220	\$91,000
Hexazinone Survey	54	\$23,210
Both projects	274	114,210



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10a

JANET T. MILLS  
GOVERNOR

AMANDA E. BEAL  
COMMISSIONER

July 13, 2020

Mr. Jeffrey Taylor  
Taylor's Invasive Plant Control  
323 Fitzwilliam Road  
Richmond, NH 03470-4304

Dear Mr. Taylor:

Thank you for your variance application.

In 2013, the Board adopted a policy allowing for the issuance of multi-year variances for the control of invasive species. In determining this policy the Board emphasized the need for a long-term plan for revegetation of the site and demonstration of knowledge of efficacy and appropriate practices—the goal being to ensure that the site is reverted to native species and not made available for another invasive species.

This letter will serve as your Chapter 29 variance permit until December 31, 2022 for the treatment of invasive plants within 25 feet of water on and around Bartlett Island in Mt. Desert.

Please bear in mind that your permit is based upon adherence to the precautions listed in Sections V and X of your variance application. If it is determined that a different product needs to be used, you must contact the Board first and get a new variance.

If you have any questions concerning this matter, please feel free to contact me at 287-2731.

Sincerely,

Megan Patterson  
Director

MEGAN PATTERNSON, DIRECTOR  
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