



PAUL R. LEPAGE
GOVERNOR

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

WALTER WHITCOMB
COMMISSIONER
HENRY S. JENNINGS
DIRECTOR

To: Board of Pesticides Control Members
From: Mary Tomlinson, Pesticides Registrar
RE: EPA Special Local Need (SLN) [FIFRA, Section 24(c)] application to approve the use of NuFarm Ethephon 2 Plant Regulator, EPA Reg. No. 228-660, EPA SLN No. ME-120003, on large-fruited greenhouse tomatoes
Date: June 7, 2012

Enclosed is the above referenced Special Local Need (SLN) [FIFRA, Section 24(c)] application and supporting documents for your consideration. This SLN, submitted by NuFarm America, Inc., will replace SLN ME-090001, Ethrel brand Ethephon Plant Regulator, EPA Reg. No. 264-267, as Bayer CropScience will no longer be maintaining the registration for the SLN. The active ingredient, application rate, and use are identical to the Bayer CropScience product.

Your package includes the additional documents for your review.

- State product label and MSDS
- Letter of support from Erika Roderick, Backyard Farms, dated June 7, 2012
- Cover letter from Martin Duebler, NuFarm Americas, Inc., dated June 6, 2012

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

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

June 7th, 2012

Mary:

On behalf of Backyard Farms, thank you for considering the continued use of Ethephon on greenhouse tomatoes in Maine. Backyard Farms is a 42 acre hydroponic greenhouse that strives to produce quality tomatoes year round. Ethephon is a great contribution to our ability to provide consistency in the quality of our tomatoes for our customers.

In order to provide tomatoes year round, Backyard Farms utilizes a unique growing technique. Every six months new plants are planted between our old crop, rather than waiting for a complete clean out. Shortly after planting the young crop, the tops are removed from the old crop causing stress on the fruits. By using this technique we are able to provide tomatoes year round, however, the quality of both crops is compromised during the transition. For up to 10 weeks, the new crop is deprived of sunlight because it is shaded by the crop that we continue to harvest. The result is that the young crop is delayed in vigor and productivity, while the fruit quality of the old crop declines due to softness and cracking.

Ethephon would allow a more efficient transition from the old crop to the new. Quicker removal of the old crop would minimize the new crops' deficiency and maximize the old crops' fruit quality. Over 80% of the tomatoes on the final clusters are lost due to softness and cracking, and over 50% of the first clusters on the new crop are deformed or aborted. Ethephon is a useful tool in minimizing the economic losses that we experience with both crops; as well as promote consistency in our ability to provide a quality product to our customers year round.

Ethrel, by Bayer CropScience has been previously approved on supplemental labeling for greenhouse tomatoes in Pennsylvania, Arizona, Texas, and Maine among other states. Now that NuFarm is taking over registration of this product, I ask for your support in the transfer of this registration to maintain the use of this ripening agent in the State of Maine on greenhouse tomatoes. We would like your support in the development of a supplemental label for Maine in order to assist Backyard Farms in its goal of continuously producing quality tomatoes.

If you have any questions or require any other information to move forward with this process please let me know. I look forward to working with you on this process.

Sincerely,



Erika Verrier
Manager of Integrated Pest Management
Backyard Farms



Nufarm Americas Inc.

150 Harvester Drive, Suite 200
Burr Ridge, IL 60527
Telephone: (630) 455.2000 Facsimile: (630) 455.2001
www.us.nufarm.com

June 7, 2012

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

**Subject: Nufarm Americas Inc.
Application for 24(c) Special Local Need Label
Nufarm Ethephon 2 Plant Growth Regulator
EPA Reg. No 228-660**

Dear Ms. Tomlinson:

Nufarm Americas Inc. wishes to submit for registration a 24(c) Special Local Need Label for Nufarm Ethephon 2 Plant Growth Regulator (EPA Reg. No. 228-660). Please note, the product is already registered in the State of Maine through 2012.

Nufarm has determined that there is still a need for this label's special local need within the State of Maine. The continued need for the SLN is still apparent as Bayer Crop Science is exiting the marketplace. The use is not for food or feed, and registration of the same use has not been previously denied. The submitted 24(c) mimics the use pattern of EPA SLN labeling for Ethrel Brand Ethephon Plant Regulator (EPA Reg. No. 264-267). Based on the letters of support Nufarm has received, we would like to provide continued support to the growers in your state for this particular need and continue with a proven product they can still rely upon.

As this need is rapidly upon us, an expedited review of this submission would be greatly appreciated.

Should you have any questions or require any additional information please do not hesitate to contact me via e-mail- martin.deubler@us.nufarm.com or via phone – (630) 455-2037.

Sincerely,

A handwritten signature in black ink that reads 'Martin Deubler'.

Martin Deubler
State Registrations Specialist
Nufarm Americas Inc.

Enclosures

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
ME-120003
Date Registration Issued

<p>1. Name and Address of Applicant for Registration Nufarm Americas Inc. 150 Harvester Drive, Suite 200 Burr Ridge, IL 60527</p>	<p>2. Product is (Check one) <input checked="" type="checkbox"/> EPA-Registered <input type="checkbox"/> New (not EPA-registered) <small>Attach EPA Form 8570-4, Confidential Statement of Formula for new products.</small></p> <p>3. Active Ingredient(s) in Product Ethephon: (2-Chloroethyl) phosphonic acid</p>
<p>4. Product Name Nufarm Ethephon 2 Plant Growth Regulator</p>	<p>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. 300 Ethephon:tolerences for residues:Tomatoes 2.0ppm</p>
<p>6. Type of Registration (Give details in Item 13 or on a separate page, properly identified and attached to this form): <input type="checkbox"/> a. To permit use of a new product. <input checked="" type="checkbox"/> b. To amend EPA registrations for one or more of the following purposes: <input type="checkbox"/> (1) To permit use on additional crops or animals. <input checked="" type="checkbox"/> (2) To permit use at additional sites. <input type="checkbox"/> (3) To permit use against additional pests. <input type="checkbox"/> (4) To permit use of additional application techniques or equipment. <input type="checkbox"/> (5) To permit use at different application rates. <input type="checkbox"/> (6) Other (specify below)</p>	<p>7. Nature of Special Local Need (check one) <input type="checkbox"/> There is no pesticide product registered by EPA for such use. <input checked="" type="checkbox"/> There is no EPA-registered pesticide product which, under the conditions of use within the State, would be as safe and/or as efficacious for such use within the terms and conditions of EPA registration. <input type="checkbox"/> An appropriate EPA-registered pesticide product is not available.</p>
<p>10. Has FIFRA section 24(c) registration for this use of the product ever, by another State, been (check appropriate box(es), if known): <input type="checkbox"/> Sought <input checked="" type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Revoked <small>If any of the above are checked, list States in item 13 below.</small> <input type="checkbox"/> No FIFRA section 24(c) Action</p>	<p>8. If this registration is an amendment to an EPA-registered product, is it for a "new use" as defined in 40 CFR 152.3 ? <input checked="" type="checkbox"/> Yes (discuss in item 13 below) <input type="checkbox"/> No</p> <p>9. Has an EPA Registration or Experimental Use Permit for this chemical ever been (check applicable box(es), if known): <input type="checkbox"/> Sought <input checked="" type="checkbox"/> Issued <input type="checkbox"/> Denied <input type="checkbox"/> Cancelled <input type="checkbox"/> Suspended <input type="checkbox"/> Registration <input type="checkbox"/> Experimental Use Permit <input type="checkbox"/> No Previous Permit Action</p>
<p>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.</p>	<p>11. Endangered Species Act: (Give details in item 13 or on a separate page, properly identified and attached to this form) Identify the counties where this pesticide will be used. If Statewide, indicate "all." Provide a list of Federally protected endangered/threatened species which occur in the areas of proposed use.</p>
<p>Signature of Applicant or Authorized Representative </p> <p><small>Digitally signed by Martin Deabler DN: cn=Martin Deabler, o=Nufarm Americas Inc, ou=Regulatory, email=martin.deabler@nufarm.com, c=US Date: 2012.06.06 15:46:06 -0500</small></p>	<p>12. Indicate use status of Special Local Need, i.e., planned dates of use: From: 07/01/2012 To: 07/01/2017</p>
<p>Title State Registration Specialist</p> <p>Telephone Number 630.455.2037</p> <p>Date 06/06/2012</p>	<p>13. Comments (attach additional sheet, if needed) Bayer discontinuing sale of Ethrel 2 (264-267) after 2011 use season. States having existing 24(c) for existing product are Texas, Arizona (AZ-090001), California, Florida, Maine, Pennsylvania and New York. Nufarm has me-too product and would like to assist in helping growers as Bayer exists product.</p>

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.

<p>Name, Title, and Address of State Agency Official Mary Tomlinson Maine Board of Pesticides Control 28 State House Station Augusta, ME 04333</p>	<p>Comments (by State Agency Only)</p>	<p>Received by EPA</p>
<p>Title Pesticides Registrar/Water Quality Specialist</p>		
<p>Telephone Number (207) 287-2731</p>	<p>Date</p>	

Paperwork Reduction Act Notice

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

FIFRA Section 24(c) Special Local Needs (SLN) Label

FOR DISTRIBUTION AND USE ONLY WITHIN MAINE



Nufarm Ethephon 2 Plant Growth Regulator

EPA Reg. No. 228-660

SLN No.: ME-XXXXX

DIRECTIONS FOR USE

SLN Label Expiration Date: 06/30/2017

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

All applicable directions, restrictions and precautions on the EPA registered label are to be followed.

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

Use on Large-Fruited Greenhouse Tomatoes (greater than 1" in diameter)

A foliar spray of Nufarm Ethephon 2 Plant Growth Regulator can be used to chemically accelerate fruit maturation or to facilitate uniform fruit ripening

Crop Situation	Product Application Rate	Specific Directions	Remarks
Directional application used to aid in uniform maturation of cluster tomatoes or individual fruit with irregular maturing	0.15% - 0.35% solution of product in water OR 1 – 2.5 teaspoons per gallon of water Buffer to pH 6.0	Apply directly to fruit to aid in uniform maturation.	Use a handheld sprayer or spray applicator directed specifically to individual fruit. DO NOT apply more than 5 pints of product per acre per year. Caution: To avoid damage to the plant, do not spray entire plant or foliage.
Late-season application	1.25 to 5 pints/Acre	Apply when fruit has reached a marketable size.	Spray the solution on the plant foliage.
Late-season application	Mix 1:6 ratio up to 5 pints/Acre		Apply with a brush or sponge directly to the stem in stripes 3 – 6 inches long just below the fruit. Caution: Avoid application to fruit if applying by brush or sponge
Note: Pre-Harvest Interval (PHI): 48 hours			

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), notification to workers, and restricted-entry intervals. 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 over long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material such as nitrile, butyl, neoprene, or barrier laminate, chemical-resistant footwear plus socks, protective eyewear, chemical-resistant headgear for overhead exposure

Notify workers of the application by warning them orally and posting warning signs at entrances to treated areas.

Restricted-Entry Interval (REI): 48 Hours

RESTRICTIONS / PRECAUTIONS

- DO NOT MIX NUFARM ETHEPHON 2 PLANT GROWTH REGULATOR WITH AMMONIUM THIOSULFATE. SUCH TANK MIXTURES MAY RESULT IN FORMATION OF TOXIC FUMES. Mix only the amount of spray solution you expect to use each day.
- Do not allow mixed solution to stand overnight.
- Do not contaminate water used for irrigation or domestic purposes. Do not contaminate water when disposing of equipment washwaters.
- DO NOT apply more than 5 pints of product per acre per year.
- Avoid spray drift to nearby crops as this product will cause modifications in plant growth.
- Plant injury or reduced yields may result.

IMPORTANT: Do not apply Nufarm Ethephon 2 Plant Growth Regulator through any type of irrigation system.

**For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
For Medical Emergencies Only, Call (877) 325-1840**

NOTICE

Read the "WARRANTY DISCLAIMER" and "LIMITATION OF LIABILITY" in the label booklet for this product before using this product. Those terms apply to this supplemental labeling and if those terms are not acceptable, return the product unopened at once.

**Manufactured For Nufarm Americas Inc.
150 Harvester Drive, Burr Ridge, IL 60527**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nufarm Ethephon 2 Plant Growth Regulator
EPA Reg. No.: 228-660
Synonyms: Ethephon: (2-chloroethyl) Phosphonic Acid
Product Type: Plant Growth Regulator

Company Name: Nufarm Americas Inc.
150 Harvester Drive, Suite 200
Burr Ridge, IL 60527

Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
Call CHEMTREC Day or Night: 1-800-424-9300
For Medical Emergencies Only, Call 1-877-325-1840

Date of Issue: October 13, 2009 **Supersedes:** New
Sections Revised: New

2. HAZARDS IDENTIFICATION**Emergency Overview:**

Appearance and Odor: Colorless to pale yellow colored liquid.

Warning Statements: Danger. Keep out of reach of children. Corrosive causes irreversible eye damage. Harmful if swallowed or absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin. Do not inhale vapors as product will irritate mucous membranes.

Potential Health Effects:

Likely Routes of Exposure: Inhalation, eye and skin contact.

Eye Contact: Causes irreversible eye damage. Vapors and mist can cause irritation, redness, tearing.

Skin Contact: Slightly toxic and moderately irritating based on toxicity studies.

Ingestion: Harmful if swallowed. May cause burns to mouth and esophagus, chest pain, abdominal pain if ingested.

Inhalation: Low inhalation toxicity based on toxicity studies. Mists may cause upper respiratory tract irritation, coughing, sore throat if inhaled.

Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:

Ethephon is slightly toxic to birds and aquatic invertebrates and practically non-toxic to slightly toxic to aquatic organisms

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Ethephon	16672-87-0	21.7
Other Ingredients		78.3

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

If on Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage. No specific antidote is available. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred.

Victims of severe overexposure by inhalation should be kept under medical observation for up to 72 hours for delayed onset of pulmonary edema. In a victim of overexposure by ingestion, careful gastric lavage is required due to the possibility of stomach or esophageal perforation. This material is an acid but the use of alkaline substances to neutralize it is contraindicated.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable due to aqueous formulation

Autoignition Temperature: Not determined

Flammability Limits: Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 3 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:

Do not get in eyes or on skin or on clothing. Avoid contact with skin. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing. Wash the outside of gloves before removing.

Storage:

Store in original container and keep tightly closed. Store in a cool, dry place. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:

Eye/Face Protection: To avoid contact with eyes, wear safety goggles. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves made of any waterproof material. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Ethephon	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Colorless to pale yellow colored liquid.

Boiling Point:	Not determined	Solubility in Water:	Soluble
Density:	9.7 pounds/gallon	Specific Gravity:	1.106 @ 20°C
Evaporation Rate:	Not determined	Vapor Density:	Not determined
Freezing Point:	Not determined	Vapor Pressure:	Not determined
pH:	1.98	Viscosity:	1.948 cSt @ 20°C

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.

Conditions to Avoid: Elevated temperatures and extreme humidity.

Incompatible Materials: Strong oxidizing agents and alkaline materials. Corrosive to metals such as iron, aluminum, zinc, mild steel and copper.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Except as noted, data from laboratory studies conducted on a similar, but not identical, formulation:

Oral: Rat LD₅₀: >500 mg/kg

Dermal: Rabbit LD₅₀: >2,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >4.5 mg/l (technical Ethephon)

Eye Irritation: Rabbit: Corrosive

Skin Irritation: Rabbit: Moderately irritating

Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure. (technical Ethephon)

Subchronic (Target Organ) Effects: Repeated overexposure to ethephon may cause cholinesterase inhibition, red blood cell effects and/or kidney effects.

Carcinogenicity / Chronic Health Effects: Prolonged overexposure to ethephon may cause cholinesterase inhibition, body weight decreases and organ effects (thyroid, kidney and liver). Ethephon did not cause cancer in laboratory animal studies.

Reproductive Toxicity: Ethephon caused decreased pup body weights at the highest does in a two generation study in rats. No effects were observed on fertility, gestation, mating, organ weights or histopathology.

Developmental Toxicity: Ethephon did not cause developmental effects in animals.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that ethephon is not genotoxic or mutagenic.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Ethephon (75%):

96-hour LC ₅₀ Fathead Minnow:	88 mg/L	Bobwhite Quail Oral LD ₅₀	596 mg/kg
48-hour EC ₅₀ Daphnia:	54 ppm	Mallard Duck 8-day Dietary LC ₅₀ :	>5,000 ppm

Environmental Fate:

Ethephon is stable to hydrolysis in acidic water, but does rapidly hydrolyze in neutral and alkaline environments with a half-life ranging from a few days to a few weeks. Ethephon is stable to photolysis in water with an estimated half-life of 139 days. Photodegradation on soil does not appear to be a significant route of dissipation. Ethephon degrades fairly rapidly in soil under aerobic and in water under anaerobic conditions with half-life ranging from 7 to 30 days. Ethephon is characterized as having moderate to low mobility in soil.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticides wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate, is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank 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. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT

UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (ETHEPHON), 8, III

IMDG

UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (ETHEPHON), 8, III

IATA

UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (ETHEPHON), 8, III

15. REGULATORY INFORMATION

U.S. Federal Regulations:

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Immediate

Section 313 Toxic Chemical(s):

None

Reportable Quantity (RQ) under U.S. CERCLA:

None

RCRA Waste Code:

None

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.



Nufarm
Ethephon 2

Plant Growth Regulator

Intended For Commercial or Agricultural Use Only

For use on Tobacco, Tomatoes, Cherries, Grapes, Apples, Walnuts, Peppers, Blackberries, Blueberries and Cantaloupes, Turf, for the removal of Dwarf Mistletoe in Ornamental Conifers and Leafy Mistletoe in Ornamental Deciduous Trees and for the elimination of undesirable fruit on Apple, Crabapple, Carob, and Olive trees and for decreasing lodging in Barley and Wheat.

ACTIVE INGREDIENT:	
Ethephon: (2-Chloroethyl) phosphonic acid*	21.7%
OTHER INGREDIENTS:	78.3%
TOTAL:	100.0%

*1 gallon contains 2 lbs. ethephon.

KEEP OUT OF REACH OF CHILDREN
DANGER/PELIGRO
 Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
 (If you do not understand the label, find someone to explain it to you in detail.)
 See Inside Label Booklet for FIRST AID and PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300
 For Medical Emergencies Only, Call (877) 325-1840

EPA Reg. No. 228-660
 EPA Est. No. indicated by 8th digit of the batch number on this package: (E)=70815-GA-001; (H)=70815-GA-002; (M)=51036-GA-001; (P)=34704-MS-001; (U)-34704-MS-002

Net Contents
2.5 Gal.
(9.46 L)

Manufactured for
 Nufarm Americas Inc.
 150 Harvester Drive
 Burr Ridge, IL 60527



FIRST AID	
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.	
NOTE TO PHYSICIAN	
Probable mucosal damage may contraindicate the use of gastric lavage. No specific antidote is available. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred. Victims of severe overexposure by inhalation should be kept under medical observation for up to 72 hours for delayed onset of pulmonary edema. In a victim of overexposure by ingestion, careful gastric lavage is required due to the possibility of stomach or esophageal perforation. This material is an acid but the use of alkaline substances to neutralize it is contraindicated.	

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
DANGER/PELIGRO**

CORROSIVE: Causes irreversible eye damage. Wear safety goggles when handling. Harmful if swallowed or absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin. Do not inhale vapors as this product will irritate mucous membranes.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

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

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants;
- Chemical-resistant gloves made of any waterproof material such as nitrile, butyl, neoprene or barrier laminate;
- Shoes plus socks, and
- Protective eyewear

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard for agricultural pesticides (WPS) [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. 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 REQUIREMENTS

Users should:

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

ENVIRONMENTAL HAZARDS

Do not contaminate water used for irrigation or domestic purposes. Do not apply directly to water, or to areas where surface is water present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Avoid spray drift to nearby crops, as this product will cause modifications in plant growth. Plant injury or reduced yields may result. Do not plant another crop within 30 days after treatment.

SPRAY DRIFT

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR. The interaction of many equipment and weather related factors determines the potential for spray drift. The applicator is 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 to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

When states have more stringent regulations, they should be observed. The applicator should be familiar with and take into account the information covered in the [Aerial Drift Reduction Advisory Information](#), below.

Aerial Drift Reduction Advisory Information

[This section is advisory in nature and does not supersede the mandatory label requirements.]

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 below).

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 provide uniform coverage.
- **Nozzle Orientation** – Orienting nozzles so that the spray is released parallel to the airstream produces 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

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

APPLICATION HEIGHT

Applications should not be made at a height greater than 10 feet above the top of the 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 can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY

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

TEMPERATURE INVERSIONS

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

SENSITIVE AREAS

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

IMPORTANT:

- Do not apply this product through any type of irrigation system.
- Do not use this product for purposes other than those listed on the label.
- Do not exceed the rate of this product per acre per year specified on this label.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

Read entire label before using this product.

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), notification to workers, and restricted-entry intervals. 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. The REI is 72 hours in areas where average rainfall is less than 25 inches per year.

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 over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material, such as nitrile, butyl, neoprene, or barrier laminate.
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

Notify workers of the application by warning them orally and posting warning signs at entrances to treated areas.

This product is a plant growth regulator which penetrates plant tissues and degrades to ethylene which affects the growth process of the plant. This product can be used to produce the following effects in treated crops:

Apples, Grapes, Peppers, Tomatoes:	earlier maturation and coloring of leaves
Apples, Cherries [except CA], Walnuts:	loosens crops for easier harvest
Blackberries [WA & OR only]:	earlier ripening, loosens fruit
Blueberry:	concentrates maturation for earlier harvest, reduces undesirable barrenberry fruit
Cantaloupes:	helps abscission of fruit
Sweet Cherries:	increases hardness of dormant fruit buds, delays spring bloom (Pacific Northwest)
Flue-Cured Tobacco:	uniform coloring of mature leaves, earlier harvest
Apples, Crabapples, Carob, Olive (Ornamental trees only):	prevents formation of undesirable fruit
Ornamental Conifers:	eliminates dwarf mistletoe
Ornamental Deciduous Trees:	eliminates leafy mistletoe
Turf:	slows growth of turfgrass; suppresses seedhead formation of <i>Poa annua</i> and white clover [except CA]

GENERAL INFORMATION

Additional information on how to use this product (including use rates, spray volumes [gallons of water per acre], and spray equipment) or if an application should be made based on weather conditions (such as variable temperatures or anticipated rainfall) can be obtained from your local Extension or Horticultural Specialist, Nufarm Representative or Farm Advisors.

MIXING DIRECTIONS

Do not prepare more spray solution than required for one day's use. Do not allow the spray solution to stand overnight. Do not allow any spillage of the concentrated product on any spray equipment or on airplane parts. This product is corrosive. CLEAN UP SPILLS IMMEDIATELY BY FLUSHING WITH PLENTY OF WATER.

OTHER PRECAUTIONS

- Do not allow spray to drift to nearby crop. This product will affect their growth and could injure the crop or lead to reduced yields.
- Do not plant another crop in treated fields until 30 days after the last application.
- Use only the additives specified on this label with this product.
- **DO NOT MIX THIS PRODUCT WITH AMMONIUM THIOSULFATE. SUCH TANK MIXTURES RESULT IN FORMATION OF TOXIC FUMES.**

APPLICATION VOLUMES AND SPRAY COVERAGE

Thorough spray coverage is essential for this product to produce maximum effects. Spray coverage is affected by choice of equipment, nozzle selection and spray boom setup as well as spray pressure, plant size and canopy density. For both air and ground applications, choose equipment that will assure thorough coverage of plant canopy (foliage and fruit). The actual spray volume required will vary with the size and density of the plant canopy and the equipment used. In California and Arizona use a minimum spray volume of 5 gallons per acre for aerial applications.

EQUIPMENT CLEANING

This product is acidic and can damage acrylic plastics, certain paints, and metals when exposed to spray droplets for extended periods of time. To prevent damage, rinse any exposed surface should thoroughly using soap and water within one hour of exposure.

APPLES

This product promotes fruit maturity and loosens apples. Hand and mechanical harvest will be easier and more efficient. It can be applied with FRUITONE® N to control pre-harvest drop. This mixture stimulates early development of red color and ripening without loosening fruit.

The effects of this product on apples will depend on the rate and time of application. Some of the benefits of this product include: fruit loosening, uniform ripening and coloring without loosening, thinning and return bloom, and increased flower bud development in young trees. Follow the specific instructions in the table below for the type of effect desired from applications of this product.

PRECAUTIONS AND RESTRICTIONS

- A number of environmental factors can affect thinning and return bloom. Test small plots of trees each year under the program desired to gain experience under local conditions.
- Over thinning and reduced fruit size results from applications of this product. Use caution when applying it to young trees just starting to bear as excessive fruit thinning and fruit size reduction occurs.
- When this product is applied to achieve early maturity, the fruit size is reduced especially if fruit are small at application.
- Reduced fruit quality and size is noticed in harvested apples if this product is applied earlier than 3 weeks before normal anticipated harvest.
- Apply this product only to vigorous trees. Weakened trees which are treated will show an excessive reduction in growth.
- Avoid overlap of spray applications in orchards.
- Do not graze or feed cover crops grown in treated apple orchards to livestock.
- Preharvest Interval: 7 days.
- Do not apply more than 8.0 pints of this product (2.0 lb ethephon) per acre per year.

WHEN TO HARVEST APPLES

Monitor fruit daily. The proper harvest period is shorter with this product treated fruit than untreated fruit. Harvest fruit before they become overripe on the trees. Check fruit intended for fresh markets for quality and maturity. In addition to fruit color, the internal maturity of apples must be checked using a pressure gauge or other suitable methods. Fruit which are harvested when over-ripe and then stored soften sooner than untreated fruit.

Crop	Product Application Rate Pints/Acre	Apples - Application Instructions
FOR FRUIT LOOSENING		
APPLES EARLY AND MID-SEASON MATURING VARIETIES (Varieties maturing with McIntosh or earlier)	2-1/2	Make foliar applications of this product 7 to 14 days before normal anticipated harvest. Apply in a sufficient amount of water for thorough, uniform spray coverage of foliage and fruit. Use a wetting agent to improve spray coverage. The application equipment and size of trees will affect the volume required. Make applications of this product when temperatures are between 60°F and 90°F, although applications can be made if temperatures are at 50°F but will rise during the day.
LATE MATURING VARIETIES IN THE EASTERN UNITED STATES (varieties maturing later than McIntosh)	5	High temperatures: fruit treated with this product experiences reduced color response, however ripening and loosening effects will be accelerated. Cool temperatures: longer periods of time between application and harvest is required.
FOR PROMOTION OF UNIFORM RIPENING AND COLORING OF RED VARIETIES WITHOUT LOOSENING		
APPLES EARLY OR MIDSEASON MATURING VARIETIES (varieties maturing with McIntosh or earlier)	1 to 4	Make foliar applications of this product with a preharvest drop control chemical registered for use on apples (such as FRUITONE® N). Follow the directions for use on the preharvest drop control label since instructions vary depending on location and apple variety. Time applications to begin 2 to 3 weeks before normal harvest and about 1 to 2 weeks before desired harvest date. Apply in a sufficient amount of water for thorough, uniform spray coverage of foliage and fruit. The application equipment and size of trees will affect the volume required. Use a wetting agent to improve spray coverage. For apples which will be stored after harvest, use the lower application rate. As long as harvested fruit are in good condition, they can be stored in cold air storage facilities.
LATE MATURING VARIETIES (varieties maturing later than McIntosh)	2 to 4	Do not apply this product to more acreage than can be harvested in 1 to 2 days.

(Continued)

Crop	Product Application Rate Pints/Acre	Apples - Application Instructions
FOR THINNING AND RETURN BLOOM		
APPLES Most Varieties	1.5 to 4	<p>Make applications of this product 10 to 20 days after full bloom.</p> <p>Tank mixes of the following products will provide greater thinning: AMID-THIN® W, SEVIN® brand 4F Carbaryl Insecticide, SEVIN brand 80 WSP Carbaryl Insecticide, SEVIN brand 80 S Carbaryl Insecticide, or SEVIN brand XLR Plus Carbaryl Insecticide. Read all labels for specific use directions on apples and follow the most restrictive of the label limitations and precautions. Do not exceed label use rates. Do not mix this product with any product with a label which prohibits such mixing. Consult local Extension Specialists for more information about which products can be mixed with this product. Add a non-ionic surfactant to improve effects.</p> <p>In locations where water is alkaline, add buffers to the spray solution to a pH of 3 to 5 for improved performance.</p> <p>Apply in a sufficient amount of water for thorough, uniform spray coverage of foliage and fruit. The application equipment and size of trees will affect the volume required.</p>
DIFFICULT TO THIN VARIETIES (such as Golden Delicious)	3 to 6	<p>Ensuring a good crop from one season to another can be a problem when a high percentage of spurs and lateral buds bloom in a single season. The trees in the following year will show a severe drop in bearing. This problem can be avoided with the application of this product or a combination of this product plus AMID-THIN W or this product plus one of the SEVIN products listed above. Make applications 7 to 21 days after full bloom. Selection of the best program to use will depend on the amount of thinning required and the biennial bearing history of the orchard.</p> <p>A reduction of "type" and fruit size of Red Delicious apples is expected particularly from applications to trees under stress.</p> <p>Higher Rates: reduced fruit size result.</p>

(Continued)

Crop	Product Application Rate Pints/Acre	Apples - Application Instructions
FOR INCREASED FLOWER BUD DEVELOPMENT		
APPLES NON-BEARING TREES	2 to 8	Make applications of this product 2 to 4 weeks after full bloom To minimize fruit thinning, time applications to occur 6 weeks after full bloom and after June drop. Apply in a sufficient amount of water to the point of runoff. The application equipment and size of trees will affect the volume required. Use a wetting agent to improve spray coverage. Higher Rate: for use on more vigorous trees.
BEARING TREES	1/2 to 3	Non-bearing trees: Make applications of this product 2 to 4 weeks after full bloom for increased flower bud development. This product causes excessive fruit thinning and reduced fruit size and yield reduction the year of use. However, vegetative growth should be reduced and flowering increased the following spring. Do not treat trees to initiate flower buds unless they are large enough to support a crop of apples.

BLACKBERRIES – OREGON AND WASHINGTON ONLY

This product applied to blackberries will concentrate maturity and loosen fruit. Harvest efficiency will improve and cane injury from mechanical harvest will be reduced.

PRECAUTIONS AND RESTRICTIONS

- Do not spray more blackberries than can be harvested three days after treatment as considerable fruit will drop.
- To prevent a reduction in berry size, only apply this product at the specified times and rates to healthy, vigorous plants and not to damaged or diseased plants.
- Preharvest Interval: 3 days.
- Do not apply more than 8 pints of this product (2 lbs ai ethephon) per acre per year.

Crop	Product Application Rate Pints/Acre	Blackberries - Application Instructions
BLACKBERRIES OREGON AND WASHINGTON ONLY (Cultivars: Chehalem Thornless and Evergreen)	5 to 8	Make foliar applications of this product at least three days before harvest. Wait to make applications when air temperatures are between 60°F and 90°F and when rain is not predicted within 24 hours. To obtain thorough, uniform coverage of the foliage and fruit, use sufficient spray volumes. Applications of this product can be made early in the harvest season to reduce the number of pickings, or late in the harvest season for a once-over final picking.

BLUEBERRIES

Applications of this product to blueberries will concentrate maturity of berries for easier and more efficient harvest. This product will abort black barrenberry (*Aronia melanocarpa*) flowers and/or fruit growing in Maine lowbush blueberry fields; this effect reduces the number of undesirable barrenberry fruit harvested with blueberries.

PRECAUTIONS AND RESTRICTIONS

- Do not apply to cultivars other than those listed in the table below, or excessive steminess and/or premature crops will result.
- **Note:** Applications of this product increases the number of berries with stems, and berries with slightly decreased fruit size or soluble solids and acidity. This product affects berry color more quickly than it will internal ripening.
- Do not make more than one application per season. If this product is used for barrenberry control in Maine, do not make a second application for blueberry concentration of maturity or coloring.
- Applications to blueberry plants under drought stress or when excessively high temperatures exist results in defoliation and reduced yield.

WHEN TO HARVEST BLUEBERRIES

Harvest when berries have reached maturity, i.e., when colored, which typically occurs one to two weeks after application of this product. Monitor berries often. The proper harvest timing for optimum internal and external berry quality is shorter with this product treated fruit than with untreated fruit. Berries will ripen faster at high temperatures (90°F).

Crop	Product Application Rate Pints/Acre	Blueberries - Application Instructions
FOR CONCENTRATION OF MATURITY AND EARLIER FRUIT COLORING		
BLUEBERRIES (Cultivars: Bluecrop, Weymouth, Jersey, Rancocas, Rubel, Bluetta, Eriblue, Wolcott, Croatan, Murphy, Angola, Morrow, Garden Blue, Trifblue and NC901)	4 to 8	<p>Make foliar applications of this product in 150 to 200 gallons per acre when air temperatures are 60° to 90°F. Thorough uniform spray coverage of foliage and fruit is essential. A wetting agent such as Triton B-1956™ at 0.5 pints per 100 gallons or X-77® at 2.0 pints per 100 gallons will help the uniform wetting of plants.</p> <p>High Rate: when using the high rate, use the higher spray volume on large dense foliage bushes or when temperatures are cool.</p> <p>When applying at first harvest: make applications when 15 to 20% of the berries are blue.</p> <p>When applying at final harvest: make applications of this product after the first or second picking.</p>

(Continued)

Crop	Product Application Rate Pints/Acre	Blueberries - Application Instructions
FOR BLACK BARRENBERRY CONTROL		
Lowbush Blueberries in Maine	4 to 8	<p>Make applications of this product in 100 to 200 gallons per acre for ground sprayers and 10 gallons per acre for aerial application. Thorough uniform spray coverage of foliage and fruit is essential. A wetting agent such as X-77 at 0.1% of spray volume will help the uniform wetting of plants.</p> <p>Lower Rate: use when black barrenberries are at 90 to 100% petal fall.</p> <p>Higher Rate: use when black barrenberry fruit is 1/8 to 3/16 inch in diameter which occurs generally 7 to 10 days after blueberries are in the same stages of development.</p> <p>Blueberry harvest can generally occur when fruit are ripe, 6 to 8 weeks after application.</p>

CANTALOUPE – ARIZONA, CALIFORNIA AND TEXAS ONLY

Applications of this product to cantaloupe results in abscission (slipping) of fruit, which results in a more efficient and economical harvesting.

PRECAUTIONS AND RESTRICTIONS

- Do not apply this product if night temperatures are below 60°F.
- Make applications of this product to fruit that have a fairly uniform fruit set, have vines in good condition, and have fruit with marketable soluble solids and internal flesh color. Do not treat fields where soluble solids are running less than 10%.
- Applications of this product can cause some yellowing or rapid aging of vines, and some plants with poor vigor will not respond properly.
- Rotation Crop Restriction: Do not plant another crop in treated fields within 30 days after treatment.
- Preharvest Interval: 2 days.
- Do not apply more than 3 pints of this product (0.75 lb ethephon) per acre per year.

WHEN TO HARVEST CANTELOUPE

Monitor treated fields closely. Harvest fruit when the quality is acceptable for marketing. Do not allow fruit to remain in the field too long or this quality will decline. Typically fruit can be harvested 2 to 5 days after treatment; however temperature will also affect the time to harvest after applications.

Crop	Product Application Rate Pints/Acre	Cantaloupes - Application Instructions
CANTALOUPE ARIZONA, CALIFORNIA AND TEXAS ONLY	3	<p>Make applications of this product in a minimum of 40 gallons per acre for ground sprayers.</p> <p>Texas Only: apply in a minimum of 10 gallons per acre for aerial application.</p> <p>Thorough uniform spray coverage of foliage and fruit is essential for uniform abscission.</p> <p>The effects of this product occur faster at higher temperatures.</p> <p>Time applications to occur once fruit quality (i.e., soluble solids and flesh color) have reached marketable levels since applications of this product do not increase these qualities. Applications made too early will yield fruit with poor color and unacceptable soluble solids.</p>

CHERRIES - EXCLUDING CALIFORNIA

Applications of this product to cherry trees will loosen fruit and allow an early, uniform ripening. These effects reduce the shaker force needed for mechanical harvest of fruit, and thereby increases efficiency and recoverable yields, while maintaining fruit quality and reducing tree injury. In the Pacific Northwest, applications to sweet cherries increases dormant bud hardiness and delays bloom the following spring.

PRECAUTIONS AND RESTRICTIONS

- DO NOT USE ON CHERRIES IN CALIFORNIA.
- Fruit drop with stems attached occurs if applications are made too early.
- Applications cause early leaf yellowing and drop and gummosis.
- Severe gummosis occurs if temperatures during and after application remain high. Do not treat trees that have experienced severe gummosis the previous year to prevent tree damage.
- Excessive gummosis will occur if applications are made to trees that are of low vigor or have experienced severe stress (such as winter injury, drought, or disease), and particularly if high temperatures and/or drought conditions follow treatment. Make applications when air temperatures are between 60° and 85°F. Do not treat when air temperatures exceed 85°F.
- Irrigation of orchards after application prevents drought stress which can lead to gummosis.
- Applications to sweet cherry trees under the fall bud hardiness treatment causes slight gummosis and reduced individual fruit sizes.
- Do not apply until all fruit, including those inside the tree canopy, are in stage 3 (defined as when fruit undergo rapid size increase and change from bright green to yellow background color).
- Thorough, uniform coverage of fruit and foliage is important. Use caution when applying with concentrated sprays and avoid erratic application as these can lead to gummosis and tip dieback.
- Preharvest Interval: 7 days
- Do not apply more than 4.0 pints of this product (1.0 lb ethephon) per acre per year.

Crop	Product Application Rate Pints/Acre	Cherries - Application Instructions
TART CHERRIES	Dilute Spray: 1 Concentrate Spray: 2/3 to 1	Make applications of this product as either a dilute or a concentrate spray. Concentrate sprays are typically less than 100 gallons per acre. Use sufficient water for thorough, uniform coverage. Several factors (such as trees size, density of trees, and type of application equipment) will determine the optimum spray volumes to select. When the lower use rates are used, the treatment to harvest interval are longer.
SWEET CHERRIES (including varieties such as Windsor, Napoleon-Royal Anne, Emperor Francis)	Dilute Spray: 3 to 4 Concentrate Spray: 2 to 3	
SWEET CHERRIES PACIFIC NORTHWEST ONLY	3	To increase dormant fruit bud hardiness and to delay spring bloom: An application of this product in the first two weeks of September increases fruit bud hardiness by decreasing the chance for winter injury and delays bloom by 3 to 5 days, which helps avoid frost injury. Bloom delay from treatment of early flowering varieties helps to coincide pollination from other varieties.

GRAPES – CALIFORNIA AND ARIZONA ONLY

TABLE GRAPES: Applications of this product cause early uniform color development in the table grape varieties listed below which allows a more efficient harvest of quality fruit.

GRAPES GROWN FOR RAISINS: A foliar spray of this product will speed the maturation of Thompson seedless grapes and result in higher quality raisins containing less acids and increased sugars.

PRECAUTIONS AND RESTRICTIONS

Table Grapes

- Do not use rates higher than 1 pint/A to avoid an increase in cracked fruit. Only use the higher rates when grapes had difficulty in coloring in previous seasons.
- Applications of this product to certain grape varieties cause berry softening which limits or influences storage of grapes.
- Preharvest Interval: 14 days.
- Do not apply more than 2 pints of this product (0.5 lb ethephon) per acre per year.

Tokay Grapes

- Do not store Tokay grapes.

Raisin Production (Thompson Seedless)

- Do not treat grapes which are under stress from insect damage or moisture. Monitor treated vineyards closely and harvest when grapes are mature as indicated by sugar acid levels.
- Do not apply more than 2 pints of this product (0.5 lb ethephon) per acre per year.

WHEN TO HARVEST GRAPES

Monitor treated vineyards closely and harvest when grapes are mature (usually two weeks or longer after application) as indicated by color and sugar acid levels. Harvest grapes before the berries become too dark. Contact your Farm Advisor or Extension Viticulturist for more information regarding local experiences with this product on grapes.

Crop	Product Application Rate Pints/Acre	Grapes - Application Instructions
TABLE GRAPES (such as Cardinal, Emperor, Flame Seedless, Red Malaga, and Queen) California and Arizona Only	1/2 to 2	High temperature conditions (above 85°F): apply this product at 1/2 to 1 pint per A. Low temperature conditions (but above 65°F): apply this product at the higher use rates. Thorough, uniform coverage of the fruit and vines are needed for optimum effect. Use sufficient water using conventional ground sprayers. Make applications when 5 to 30% of the berries show color.
TOKAY GRAPES California and Arizona Only	1 to 2	Make applications when 5 to 15% of berries show color.
RAISIN PRODUCTION (Thompson Seedless) California and Arizona Only	1 to 2	Make foliar applications at 5% berry softening and when 5 to 30% of berries show color. This product speeds the maturation of Thompson Seedless grapes and produces grapes with reduced acids, increased sugars and increased raisin quality. Contact your Farm Advisor or Extension Viticulturist for more information regarding local experiences with this product on grapes.

PEPPERS

This product can be applied as a foliar spray to peppers and leads to early, uniform ripening and coloring for more efficient harvesting, packaging and handling of fruit.

PRECAUTIONS AND RESTRICTIONS

- Do not make applications when temperatures exceed 100°F, or if prolonged temperatures of 95°F or more are expected after treatment. Applications under these conditions will cause excessive fruit ripening, yellowing of foliage, defoliation and immature fruit abscission.
- Do not treat when average temperatures are below 60°F as these temperatures reduce or negate the effects of this product. It will not ripen immature, green fruit.
- Applications cause yellowing and general aging of treated leaves.
- Preharvest Interval: 5 days.
- Do not apply more than 4 pints of this product (1.0 lb ai ethephon) per acre per year.
- Under certain conditions tank mixtures of this product with desiccants containing sodium chlorate could result in the formation of hypochlorous acids which on heating will emit toxic chloride fumes.

WHEN TO HARVEST PEPPERS

Monitor the crop in several locations for crop stage and degrees of maturity. Do not apply this product too early or if there is a lack of uniform, mature, green fruit (due to split fruit set or other soil cultural practices) or total yields will be reduced. Typically fruit can be harvested 14 or more days after treatment when fruit reach desired color and maturity.

Crop	Product Application Rate Pints/Acre	Peppers - Application Instructions
PEPPERS	1-1/4 to 4	<p>For optimum results, ensure thorough, uniform coverage of spray solution to fruit and foliage by selecting the appropriate application equipment (ground or air) and spray volumes.</p> <p>Make applications of this product to bell peppers when 10% of fruit turn red and chocolate in color and to chili and pimento pepper varieties when 10 to 30% of fruit turn red and chocolate in color. Be sure that there are sufficient mature green fruit to produce desired tonnage since this product will not ripen immature, green fruit.</p> <p>High Rate: for situations when cool temperatures are anticipated (less than 65°F), or when dense foliage is present. Also use when higher spray volumes (3 to 4 pints/40 gal/A) are required.</p> <p>Lower Rate: for use with lower spray volumes (1-1/4 to 2 pint rate in 20 gal/A).</p> <p>Note: Using the 3 to 4 pint rate in less than 40 gallons per acre causes foliage burn under hot dry conditions.</p>

TOBACCO – FLUE-CURED ONLY

This product, when applied as a foliar application to flue-cured tobacco, causes the mature leaves to uniformly turn yellow. This feature provides flexibility in scheduling harvest and also reduces curing time. The applications can be made by directing the spray to the bottom or middle part of the plant or by spraying over the top of the plants.

PRECAUTIONS AND RESTRICTIONS

- Do not apply this product to immature leaves as this can result in unsatisfactory coloring, weight loss and reduced leaf quality.
- Do not allow the crop to over ripen in the field after using this product since this causes some reduction in yield and quality.
- Do not treat before an anticipated major storm which could prevent harvest and result in crop loss.
- Do not apply this product if rain is expected within 6 hours.
- Do not harvest tobacco treated with this product sooner than 2 days after application.
- Do not apply more than 8 pints of this product (2 lb ethephon) per acre per year.

APPLICATION TIMING

For best results, apply this product to mature leaves. Treatment of immature leaves can lead to leaves that are not acceptable in color, quality or dryness. The correct timing for application can be tested by spraying a few plants in several different locations of the field. If the leaves begin to yellow within 24 to 72 hours, the leaves are mature. If some treated leaves do not change color within 72 hours, do not apply this product until another test is carried out a few days later to determine if the leaves are mature. To prepare a test spray solution, add 4 tsp. of this product to 1 qt. water. Apply about 1 oz of the test spray solution as a fine mist and thoroughly cover the leaves. Immature leaves won't change color.

When the test shows that the desired number of leaves per plant change color, calculate the number of acres to treat in order to fill the barn. Remove yellowed leaves before making an application as this will help yields and prevent leaf drop. Typical growing conditions will require the lower rates specified in the table below. If the higher rates are used, only apply if temperatures are below 65°F on the day of application.

WHEN TO HARVEST TOBACCO

Within 24 to 72 hours after the application of this product, mature, sprayed leaves will begin to turn yellow, but the exact timing is dependent on the weather so that under cooler temperatures, yellowing will be delayed while under warm, sunny conditions, yellowing occurs faster. Monitor weather conditions and intensity of tobacco leaves color to determine timing of harvest. Usually within 48 hours after the application of this product the leaves have reached the desired color intensity and can be harvested.

To avoid reduced yields and quality, harvest the tobacco before it over-ripens in the field after an application.

CURING PRODUCT TREATED TOBACCO

A number of factors must be considered when curing treated tobacco. These factors include, but are not limited to tobacco condition, timing between application of this product and harvest, weather conditions, and type of curing. Best quality tobacco is obtained when the curing process is closely monitored during late leaf coloring and early leaf drying stages.

Application of this product to tobacco begins the coloring process before harvest, so the amount of time required in the coloring phase and drying phase will be reduced. Harvested green leaves will need to be colored for a few hours. Harvested yellow leaves will require adjustment of temperature and ventilation so the tobacco dries as quickly as possible without scalding. At the point of 75% dried state, the leaves can be treated using normal procedures for curing. However, leaves treated with this product cure faster, so cure treated and untreated leaves in separate barns.

Type of Application	Product Application Rate Pints/Acre	Tobacco - Application Instructions
Directed Spray	4	Apply this product with drop nozzles and TG or OC spray tips designed to apply 50 to 60 gal/A at 35 to 40 psi and at tractor speed of 2 to 3 mph. Best results are obtained when thorough sprays are directed to the leaves to be ripened. Adjust the sprayer so that there are 2 nozzles per row placed low enough to direct the spray to the leaves. For this type of application, harvest when 20% or more of the leaves have yellowed.
Over-the-top Spray	4 to 8	Apply this product in a minimum spray volume of 40 gal/A. Make applications only to the mature leaves left on the stalk. Use the test procedure described in the Application Timing section above to determine if remaining leaves are mature and will respond to applications of this product. Apply the lower rate of this product for mature crop or if experience indicates that a minimum ripening inducement is required. The higher rate is used for heavy, more rank crops or when temperatures are lower than normal.

TOMATOES

TOMATOES FOR PROCESSING: This product, applied foliarly, will speed the ripening of tomatoes which leads to a uniform maturation of fruit. The uniform maturation generates a high yield of ripe tomatoes which are obtained from a once-over harvest. This early maturation extends the harvest season and allows growers to select when to harvest for more efficient handling of the processed commodity.

TOMATOES FOR FRESH MARKETS IN CALIFORNIA: This product, applied foliarly, will speed ripening of tomatoes and increase early yields of marketable tomatoes.

PRECAUTIONS AND RESTRICTIONS

- Apply this product only when there is sufficient mature green fruit to produce the desired tonnage since it does not ripen immature green fruit. Foliage becomes yellow or age after an application of this product.
- Do not treat plants with poor root systems or if growing under stress (from poor soil conditions, drought, disease, or insect damage) because these weakened plants will lose their foliage cover, and risk sunburn and sunscalding, especially under high temperature conditions.
- Do not apply this product if temperatures are expected to remain above 105°F. For sensitive varieties, do not apply if temperatures are above 100°F to prevent foliar damage. Particularly sensitive varieties include VF 10, VF 315, VF 145, 21-4, and 13L. Use the lower rates on these varieties when temperatures are high.
- Do not apply this product as a tank mix with sun protection products, sun protection whiteners, spray adjuvants or other additives.
- Do not apply this product to more acres than can be harvested in 2 to 3 days.
- Do not use on greenhouse tomatoes or on varieties which soften rapidly or shatter when ripe.
- Pre-harvest interval: 3 days.
- Do not apply more than 6.5 pints of this product (1.63 lb ethephon) per acre per year.

WHEN TO HARVEST TOMATOES

Observe treated fields closely and harvest fruit at proper maturity after application of this product.

Crop	Product Application Rate Pints/Acre	Tomato - Application Instructions
TOMATOES FOR PROCESSING	1-1/4 to 3-1/4	<p>Early and Midseason Crops OR High Temperatures</p> <p>Make the application of this product when enough mature green fruit will give the tonnage required and when 5 to 15% of the fruit are red and pink (includes breakers). To determine the proper application date, check the fruit weight and calculate the percent fruit which is red and pink, including breakers. Do not rely on fruit size alone and check for specific directions to determine treatment stage for your situation.</p> <p>Foliage and fruit must receive a thorough coverage of this product. Use settings on spray equipment (ground or air) and volumes that provide uniform spray coverage.</p> <p>When temperatures exceed 85°F, the lower rate is effective.</p> <p>Do not overlap spray swaths to prevent severe foliage injury. If banded spray applications are made, reduce the amount of this product in proportion to the area actually treated.</p> <p>Continue normal cultural practices after application and prior to harvest. Before making the application of this product, contact the processor to check delivery schedules and quotas.</p> <p>If you have questions on how to use this product, contact your local Nufarm Company Representative, Extension Horticultural Specialist or Farm Advisor. They can advise you especially if fields have variable plant vigor due to differences in soil conditions or cultural practices and can provide rates of fruit ripening as affected by temperature, within the rate and timing limitations shown on the label.</p>

(Continued)

Crop	Product Application Rate Pints/Acre	Tomato - Application Instructions
TOMATOES FOR PROCESSING <i>(cont.)</i>	3-1/4 to 6-1/2	<p>Late Season or Coastal Crops or Cool Temperatures</p> <p>Make the application of this product when enough mature green fruit will give the tonnage required and when 5 to 30% (for optimum response, 5 to 15%) of the fruit are red and pink (includes breakers).</p> <p>Foliage and fruit must receive a thorough coverage of this product. Use settings on spray equipment (ground or air) and volumes that provide uniform spray coverage.</p> <p>If night temperatures are expected to be cool (below 65°F) or if foliage is dense, use the higher rate of this product.</p> <p>When temperatures exceed 90°F, fruit ripens sooner.</p> <p>When temperatures fall below 65°F, the development of the fruit's natural color will be delayed and result in a longer period of time needed between application and harvest.</p>
TOMATOES FOR THE FRESH MARKET - CALIFORNIA	1-1/4 to 5	<p>Make an application of this product about 3 to 6 days prior to the desired harvest date but be sure that the desired tonnage of fruit has reached marketable size and maturity. No more than one harvest is expected from areas treated with this product.</p> <p>Foliage and fruit must receive a thorough coverage of this product. Spray equipment (ground or air) and spray volumes should be selected that will provide this uniform spray coverage.</p> <p>For late season crops, if temperatures are generally below 85°F and if foliage is dense, use the higher application rate and longer preharvest interval (3 days).</p> <p>When temperatures exceed 85°F, the lower rate is effective and does not damage foliage especially in sensitive varieties.</p> <p>To time harvest of different blocks of fruit on different days, apply this product to a different block each day. Then harvest the blocks daily in the same sequence.</p>

WALNUTS-CALIFORNIA ONLY

Applications of this product to walnut trees will loosen the nuts for a more efficient mechanical harvest. As a result of this application, nuts can be harvested earlier, their hull more effectively removed, and yields increased from a once-over harvest.

PRECAUTIONS AND RESTRICTIONS

- Reduced nut quality occurs if application is made before the packing tissue brown (mature) stage.
- Applications cause some leaf drop, which is enhanced if trees under stress (vigor, drought) are treated.
- Use caution when measuring the dosage. Injury to trees (excessive defoliation, reduced catkin formation and twig dieback) occur if higher than specified rates are used.
- Preharvest Interval: 5 days.
- Do not apply more than 5 pints of this product (1.25 lb ethephon) per acre per year.

WHEN TO HARVEST WALNUTS

Sample nuts from different parts of the tree to determine the percent nut maturity. When the packing tissue between the kernel halve has turned completely brown, the nuts are mature.

Advancing Harvest – Make an application of this product when 95 to 100% of the nuts have reached maturity. Continue to inspect the nuts to determine the harvest date, which typically occurs 10 to 16 days after the application. However, walnut varieties and weather conditions will determine the time when adequate hull-ability will occur. Schedule a second shake 10 to 12 days after the first shake.

Once-Over Harvest – Before deciding on a once-over harvest, contact an Extension Specialist or Farm Advisor to determine if your situation warrants this type of harvest. A number of factors will play a role in the walnut maturity timing for this type of harvest (i.e., variety, growing conditions and weather). Make an application of this product to mature walnuts 10 days before the expected harvest date. The timing of harvest actually ranges from 7 to 12 days after treatment.

Crop	Product Application Rate Pints/Acre	Walnuts - Application Instructions
WALNUTS CALIFORNIA ONLY	3 to 5	<p>For optimum results: Use spray concentrations between 300 and 900 ppm. These concentrations can be determined by checking the chart below. Make applications when the air temperature is between 60 and 90°F. The walnuts hull must be thoroughly covered by the spray solution to ensure maximum hull split and nut loosening. Use application equipment designed to provide penetration of the entire tree such as large air carrier sprayers or volute sprayer attachments.</p> <p>High rate: use under conditions of low humidity or low temperatures. Note that the time from application to harvest will be shorter with higher rates than with lower rates.</p> <p>At higher air temperatures (>90°F) and low humidity, this product evaporates and be less effective.</p>

**HOW TO PREPARE PRODUCT
SPRAY SOLUTIONS FOR USE IN WALNUTS**

Product Rate Pints/A (lb /A)	Spray		Volume (gallons/A)		
	100	200	300	400	500
	Concentration (ppm)				
3 (0.75)	900	450	300	--	--
4 (1.00)	--	600	400	300	--
5 (1.25)	--	750	500	375	300

-- = Not Applicable

WHEAT AND BARLEY (NOT REGISTERED FOR USE IN CALIFORNIA)

This product can be applied as a preventative measure in a tank-mix with certain cereal insecticides and fungicides approved for such use. Do not apply such a tank mix to plants stressed by cold, disease, heat, insect or moisture as a decrease in yield or injury to crops occur. When tank mixed with Tiit®, this product causes a decrease in yield or flag leaf burn.

Treatment timing of this product may or may not coincide with insecticide and fungicide treatments. Make an economic and plant condition assessment prior to deciding on a tank mix partner.

RESTRICTIONS

- Do not supplement this product with adjuvants, surfactants or wetting agents or tank mixed with nitrogen solutions or herbicides.
- Do not apply through any type of irrigation system. Failure to observe label instructions results in decreased product quality or yield.
- Lodging reduction effects may not occur for up to seven days following treatment. Once crops are lodged, this product is not effective.
- This product affects certain disease infestations, such as mildew, rust and Septoria. If this occurs, use this product in conjunction with a fungicide control program.
- Yield loss occurs if, during or after application, plants are subject to disease, moisture or temperature stress. Yield loss occurs if this product is applied under non-lodging conditions.
- Always follow label temperature restrictions.
- Harvest maturity will be delayed 1 to 4 days and heading by 1 to 2 days following use of this product. Additional harvest maturity delay occurs if crops are subject to extreme temperatures within five days following treatment. Extreme temperatures are under 35° F or above 85° F for non-irrigated crops, or over 90° F in irrigated crops.
- Do not use on late-seeded crops in short-season growing areas due to the potential for maturity and harvest delays.
- Secondary tillers increase following application of this product to certain spring barleys. This particularly occurs if crop is subject to temperature or moisture stress.
- Use of this product on Azure barley or Tyler wheat is prohibited.
- Do not apply this product when rain will likely occur within six hours.
- Grazing or foraging by livestock or cutting for hay or silage are prohibited. Mature straw at normal harvest can be consumed by animals.
- A 30-day plant-back interval is required.

TREATMENT DECISION GUIDE

Shortly before application, check the fields to be treated to determine the chance lodging will occur. Apply this product only under these circumstances:

- Lodging is anticipated with a considerable decrease in grain quality, harvest efficiency, and recoverable yield likely to occur.
- There is no disease stress or insect pressure on the crop.
- There is little to no chance of crop stress following application because of adequate irrigation or soil moisture. Extreme temperature fluctuations (as described above) are not anticipated to occur within five days following application.
- Crop is at the proper growth stage (Feekes 8 to 10).

APPLICATION TIMING

Apply this product at the point the flag leaf is slightly visible to the boot stage. Apply prior to awn emergence or sheath split. These visual cues correspond to Feekes-Large Scale 8 to 10 and Zadok's Code 37 to 45. Crop damage and decreased yields occur if application contacts exposed heads.

APPLICATION

For best results, post-treatment temperatures should be no less than 60° F. Do not allow overlapping sprays as yield and rate loss will be exaggerated.

Ground application: Make conventional ground equipment applications in at least 7 gals/A of water. Use of flat fan nozzles is suggested. Make air foil-type equipment or controlled droplet application (CDA) treatments in at least 5 gals/A of water. Adjust spray boom to drive at moderate speed and at the height of the plant canopy to avoid an uneven application.

Make aerial applications in at least 3 gals/A of water.

USE RATES

The specified application rate will be determined by environmental conditions and lodging pressure listed on the table. Contact your state extension specialist for information on local varying conditions. Use the 1 pint/A rate on more responsive varieties. Do not apply more than 2 pints (0.5 lb. ethephon) of this product per acre per year. The pre-harvest interval is forty (40) days.

BARLEY AND WHEAT APPLICATION RATES

CROP CONDITION	ANTICIPATED LODGING PRESSURE			COMMENTS
	MODERATE	HEAVY	SEVERE	
	APPLICATION RATE		pts/A)	
Barley (Spring and Winter Seasons)	1	1 to 1-1/2	1-1/2 to 2*	The 2 pts/A rate are necessary for use on certain vigorously growing tall varieties.
Winter Wheat	1	1 to 1-1/2	1-1/2 to 2*	For certain tall straw varieties (e.g., "Roughrider" and "Agassiz"), the listed rates will be unable to control lodging under severe lodging conditions.
Most Spring Wheats	1	1	1-1/2	For certain tall durum wheats (e.g., "Vic"), the listed rates will be unable to control lodging under severe lodging conditions.
Sensitive Variety or High Temperature **	1	1	1	
RESTRICTIONS				
* Restrict application with the 2-pint rate to the following anticipated yield-decreasing conditions: 1) very tall varieties that are lodging-prone, 2) cereal types like durum notorious for severe lodging, or 3) irrigated crops that are subject to abnormally severe lodging.				
** Do not apply this product if it is anticipated that anytime during the five days following treatment, temperatures are to go above 85° F for non-irrigated crops or 90° F for irrigated crops.				

NON-IRRIGATED WHEAT AND BARLEY

Application of this product to non-irrigated wheat and barley in states West of the Mississippi River is prohibited except West of the Cascade Range in the States of Oregon and Washington.

IRRIGATED WHEAT AND BARLEY

To prevent stress on the crop, irrigate prior to and after twenty-four (24) hours following application. Continue irrigation through the period of grain head filling if weather remains hot and dry. Please note that considerable decreases in yield and plant quality occurs if crop is subject to heat stress and moisture during grain fill and anthesis. As a result, it is imperative to avoid plant stress during these periods when treating with this product.

GROWTH STAGE CHART

Growth Class	2 nd Node Detectable	Flag leaf Barely Visible	Flag Leaf Ligule Visible	Swollen Boot	First Spikelet Visible	Inflorescence 3/4 complete
Feekes-Large Scale	7	8	9	10	10.1	10.4
Zadok's Code	32	37	39	45	50	57
Treatment time advice	Too early				Too late	

FRUIT ELIMINATION – ORNAMENTAL USE ONLY

TO ELIMINATE UNDESIRABLE FRUIT: This product will reduce or eliminate undesirable fruit development on ornamental apple, crabapple, carob and olive trees.

PRECAUTIONS AND RESTRICTIONS

- For optimum results, make applications before fruit set.
- Do not apply if trees are weak or under stress from drought, insect or disease pressure to prevent excessive leaf drop or twig drop.
- Applications of this product causes some leaf drop or temporary leaf yellowing.
- Do not apply this product to small red fruited varieties of crabapple to avoid unsatisfactory fruit elimination.
- Do not use this product on commercial fruit production as a thinning agent.

Crop	Product Application Rate	Ornamental Fruit Trees - Application Instructions
Apples Crabapples	8 to 12 fl. oz./20 gal	Make foliar applications of this product in a minimum of 20 gallons of water per acre. Ensure application gives a thorough, uniform coverage of tree foliage. Time application to occur at the flower bud to full bloom stage, but before fruit set. Do not over-apply this product or excessive leaf drop and/or tree defoliation occurs. Use the higher rates under cooler temperature conditions.
Carob <i>(Ceratonia siliqua)</i>	6 fl. oz./20 gal	Make foliar applications of this product in a minimum of 20 gallons of water per acre. Ensure application gives a thorough, uniform coverage of tree foliage.
Olive <i>(Olea europaea)</i>	12 fl. oz./20 gal	

ORNAMENTALS - MISTLETOE REMOVAL

DWARF AND LEAFY MISTLETOE REMOVAL: This product, applied to ornamental conifers or ornamental deciduous trees, will remove the mistletoe species noted in the table below.

Crop	Product Application Rate	Mistletoe Removal - Application Instructions
FOR DWARF MISTLETOE REMOVAL		
Ornamental Conifers	2 pints/20 gal	Make foliar applications of this product in a minimum of 20 gallons of water per acre. Direct sprays to dwarf mistletoe shoots and ensure thorough coverage of shoots with spray solution. Non-ionic surfactants at the specified use rates help increase the coverage of spray on shoots. Time applications to occur prior to mistletoe seed dispersal.
Douglas Fir Ornamentals	1 pint/20 gal	When this product is applied in conjunction with silvicultural mistletoe management, the spread of the mistletoe parasite to other parts of the tree and other trees is avoided. This product speeds the normal mature needle drop that occurs in the fall. Do not apply higher rates to Douglas fir to prevent excessive needle drop.
FOR LEAFY MISTLETOE REMOVAL		
Ornamental Deciduous Trees	2 quarts/20 gal	Make applications of this product in a minimum of 20 gallons of water per acre. Direct sprays to mistletoe shoots and ensure thorough coverage of shoots with spray solution. Non-ionic surfactants at the specified use rates help increase the coverage of spray on shoots. Time applications to occur after fall leaf drop through mid-winter. Make retreatment applications of mistletoe regrowth during the indicated application period. Retreat , if necessary, for severe mistletoe infestations and for mistletoe found in mesquite.

TURF

Not intended for Residential Use

Applications of this product to turf can be used to suppress seedheads of *Poa annua* and white clover and to suppress growth of turfgrass on golf courses and commercial turfgrass.

PRECAUTIONS AND RESTRICTIONS

- Do not allow entry to treated areas until sprays have dried.
- Make applications to turfgrass with good root systems growing under favorable conditions. Do not apply if turfgrass or the roots are stressed from poor soil conditions, drought, disease or insect damage.
- Make applications in sufficient amounts of water so that uniform coverage of the grass is achieved.
- Only apply this product to actively growing turf and which has not become dormant. Do not apply this product if excessive thatch is present in the turf.
- Use of more than 2 applications of this product to suppress *Poa* seedhead formation causes scalping on creeping bentgrass cultivars.
- Although this product has been used successfully on many bentgrass cultivars, test new cultivars for tolerance to it on small areas before applying it on large areas.
- Spreaders or stickers are not required when applying this product. If tank mix partners are used with this product, test the tank mix on a small plot before using on large areas.
- This product is acidic. Long term exposure to spray deposits will damage acrylic plastics, certain paints and metals. Wash any plastic materials and painted surfaces which came in contact with the spray mixture of this product thoroughly with detergent and water within one hour after exposure.
- Do not apply more than a maximum of 30 oz. of this product per 1000 sq. ft. per year.

Sites	Product Application Rate	Turf - Application Instructions
FOR <i>POA ANNUA</i> AND WHITE CLOVER SEEDHEAD SUPPRESSION - [Not registered for this use in CA]		
Golf courses including Greens, Tees, Fairways, and Roughs Commercial Turfgrasses including Bentgrass, Kentucky Bluegrass, Perennial Ryegrass, Tall and Fine Fescue, and Bermudagrass	5 fl. oz./1000 sq. ft.	Make a foliar application of this product before new seed heads emerge. Apply this product in 1 to 2 gallons of water per 1000 sq. ft. Two to three weeks is required for suppression to be observed. Make a repeat application if needed but no sooner than 2 weeks after the previous application.

(Continued)

Sites	Product Application Rate	Turf - Application Instructions
FOR GROWTH SUPPRESSION OF TURFGRASSES		
<p>Golf course turf including Greens*, Tees*, Fairways, and Roughs</p> <p>Commercial Turfgrasses including Bentgrass, Kentucky Bluegrass, Perennial Ryegrass, Tall and Fine Fescue</p> <p>*Not registered for use on tees and greens in California.</p>	<p>5 fl. oz./1000 sq. ft.</p>	<p>Applications of this product to turf will slow the growth of turfgrasses. Fewer mowings will be required and less clippings will be generated. Best results are obtained if this product is applied during the day when temperatures are 65°F and rising. Wait to make an application of this product until the turfgrass mowing heights have been established for the season. Do not make multiple applications of this product in areas where excessive thatch has accumulated since it must reach the turfgrass to be effective.</p> <p>Make multiple applications of this product at the following intervals after the previous application:</p> <p>Bentgrass – 4 weeks Kentucky Bluegrass – 7 weeks Perennial Ryegrass – 7 weeks Tall/Fine Fescue – 4 weeks</p>
FOR POA ANNUA AND WHITE CLOVER SEEDHEAD SUPPRESSION - Tank Mixtures of this product with Primo MAXX™ (or Nufarm T-Pac Pro MEC Plant Growth Regulator) – [Not registered for this use in California]		
<p>Golf courses including Greens, Tees, Fairways, and Roughs</p> <p>Commercial Turfgrasses including Bentgrass, Kentucky Bluegrass, Perennial Ryegrass, Tall and Fine Fescue, and Bermudagrass</p>	<p>This product at 5 fl. oz./1000 sq. ft.</p> <p>PLUS</p> <p>Primo MAXX (or Nufarm T-Pac Pro MEC Plant Growth Regulator) at 0.125 to 0.25 oz./1000 sq. ft.</p>	<p>This product can be tank mixed with Primo MAXX (or Nufarm T-Pac Pro MEC Plant Growth Regulator) at the given rates to suppress seedhead formation and to promote turfgrass quality. Make multiple applications of the tank mix but do not exceed the number of applications or total use rate or timings for either product applied once. Follow the directions for use on each product label for the most restrictive application interval for turfgrass. Temporary discoloration of turfgrass occurs if the tank mix is applied when frost is present.</p>

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in original container and keep tightly closed. Store in a cool, dry place.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank 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. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

WARRANTY DISCLAIMER

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