

66330-363

8/8/2012

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

Rodney Akers
Arysta LifeScience
15401 Weston Parkway, Suite 150
Cary, NC 27513

AUG 08 2012

Subject Labeling Amendment to Ethepon 3#
EPA Registration No 66330-363
Decision No 466368
Submission Date 6/18/12 and resubmission 8/3/12

Dear Ms Layton

The labeling referred to above, submitted under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to add "me-too" uses from the 66330-262 Ethepon 2# label, is acceptable, provided you make the following change

- 1 Add "blueberries" to the list of uses at the top of page 1

A copy stamped "Accepted with Comments" is enclosed for your records. Please submit one (1) final printed copy for the above mentioned label before releasing the product for shipment. If you have any questions, please contact Dominic Schuler at (703) 347-0260 or via email at schuler.dominic@epa.gov

Sincerely,

A handwritten signature in black ink that reads "Tony Kish". The signature is written in a cursive style with a large, sweeping "T" and "K".

Tony Kish
Product Manager 22
Fungicide Branch
Registration Division (7504P)

2/32

ACCEPTED
with COMMENTS
In EPA Letter Dated
AUG 08 2012

ETHEPHON 3# PLANT REGULATOR

For Agricultural Use Only Not for Residential Use

Under the Federal Insecticide,
Fungicide, and Rodenticide Act
as amended, for the pesticide
registered under EPA Reg No

66330-363

[For Use on Cotton as a Harvest Aid] [Cotton Harvest Aid]
[For Minimizing Lodging in Barley and Wheat]

For use on Apples, Blackberries, Cantaloupes, Cherries, Grapes, Peppers, Pineapple, Sugarcane (Hawaii only), Tobacco, Tomatoes, Walnuts and Turf Also, for the removal of Dwarf Mistletoe in Ornamental Conifers and Leafy Mistletoe in Ornamental Deciduous Trees and for the elimination of undesirable fruit on Ornamental Apple, Carob, Crabapple, and Olive trees

ACTIVE INGREDIENT

Ethephon [(2-chloroethyl)phosphonic acid]*	27 0%
INERT INGREDIENTS	73 0%
TOTAL	100 0%

*Contains 3 pounds ethephon per gallon

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)

FIRST AID	
IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15 20 minutes • Remove contact lenses if present after the first 5 minutes then continue rinsing • Call a poison control center or doctor for treatment advice
IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing • Rinse skin immediately with plenty of water for 15-20 minutes • Call a poison control center or doctor for treatment advice
HOTLINE 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 FOR 24 HOUR EMERGENCY MEDICAL ASSISTANCE CALL 1 866 303 6952 FOR CHEMICAL EMERGENCY Spill, leak, fire, exposure, or accident call CHEMTREC 1 800 424 9300	
NOTE TO PHYSICIAN Probable mucosal damage may contraindicate the use of gastric lavage Treat symptomatically as there is no specific antidote Additionally patient may have been exposed to materials other than this product This product is an acid therefore it is contraindicated to attempt to neutralize it with alkaline materials Gastric lavage should be undertaken with care to victims of overexposure by ingestion given the potential for esophageal or stomach perforation Due to a potential for pulmonary edema any patients that have had severe exposure to this product should be kept under medical observation for up to 72 hours	

See inside booklet for additional precautionary statements

EPA Reg No 66330-363
EPA Est No 51036 GA 1
ADXXXXXX
NET CONTENTS _____

Manufactured For
Arysta LifeScience North America, LLC
15401 Weston Parkway, Suite 150
Cary, NC 27513

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER Causes irreversible eye damage Do not get in eyes on skin or on clothing Wash thoroughly with soap and water after handling and before eating drinking chewing gum or using tobacco Remove and wash contaminated clothing before reuse

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 chart

Applicators and other handlers must wear

- Goggles Face shield Safety glasses with front brow and temple protection
- Long sleeve shirt
- Long pants
- Chemical resistant gloves
- Shoes
- Socks

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

USER SAFETY REQUIREMENTS

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

ENGINEERING CONTROL STATEMENTS

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

USER SAFETY RECOMMENDATIONS

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

ENVIRONMENTAL HAZARDS

Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark Do not contaminate water when disposing of equipment washwaters

IMPORTANT Use of Ethephon 3# other than as described on this label is prohibited Do not exceed the rate of Ethephon 3# 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 READ ENTIRE LABEL BEFORE USING THIS PRODUCT

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

Do not contaminate water used for irrigation or domestic purposes

Detrimental changes to plant growth reduced yields and plant injury may result from spray drift of this product to nearby crops and thus must be avoided

Do not plant another crop within 30 days after treatment

Do not apply Ethephon 3# through any type of irrigation system

[Language within brackets is optional state related text]

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 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.

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

The applicator must be familiar with and take into account the information covered in *SPRAY DRIFT MANAGEMENT* section below.

SPRAY DRIFT MANAGEMENT

INFORMATION ON DROPLET SIZE

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (See Wind, Temperature and Humidity, and Temperature Inversions).

CONTROLLING DROPLET SIZE

Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.

Pressure - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

Number of nozzles - Use the minimum number of nozzles that provide uniform coverage.

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

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

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 target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

SWATH ADJUSTMENT

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

WIND

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

TEMPERATURE AND HUMIDITY

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

TEMPERATURE INVERSIONS

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

SENSITIVE AREAS

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

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

Reentry workers must wear

- Goggles Face shield Safety glasses with front brow and temple protection
- Coveralls
- Chemical Resistant Gloves
- Shoes
- Socks

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants soil or water is coveralls chemical resistant gloves made of any waterproof material such as Nitrile or Butyl rubber shoes plus socks protective eyewear and chemical resistant headgear for overhead exposure

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

This Product

Encourages faster coloration and maturity of APPLES GRAPES PEPPERS and TOMATOES
 Loosens APPLES CHERRIES and WALNUTS for an earlier and more efficient harvest
 Encourages earlier uniform coloring of mature FLUE-CURED TOBACCO
 Encourages fruit abscission (slipping) in CANTALOUPEs
 Augments hardiness in dormant fruit buds and helps to delay the spring bloom of SWEET CHERRIES in the Pacific Northwest
 Accelerates the loosening and ripening of BLACKBERRIES
 Minimizes lodging in WHEAT and BARLEY
 Eliminates leafy mistletoe from ORNAMENTAL DECIDUOUS TREES and dwarf mistletoe from ORNAMENTAL CONIFERS
 Removes unwanted fruit on APPLE CRABAPPLE CAROB and OLIVE trees

PRODUCT INFORMATION

Contact your Extension Pomologist Farm Advisor Horticultural Specialist or Micro Flo Company Representative for local recommendations on product spray volume spray equipment and rates of application for varying weather conditions

APPLICATION VOLUMES AND SPRAY COVERAGE

For optimum product efficacy thorough spray coverage is necessary This can be influenced by type of spray equipment spray boom setup nozzle selection plant size canopy density and spray pressure Depending on these choices the necessary spray volume will vary For applications by air in California and Arizona more than 5 gallons per acre must be used

USE PRECAUTIONS

THE MIXTURE OF THIS PRODUCT WITH AMMONIUM THIOSULFATE IS PROHIBITED AS IT MAY CREATE TOXIC FUMES Other than recommended on this label this product must not be used with additives Observe the most restrictive of the labeling limitations and precautions of all products used in mixtures

Upon mixture this product must be applied as soon as possible in no case should the spray solution be stored overnight

Detrimental changes to plant growth reduced yields and plant injury may result from spray drift of this product to nearby crops and thus must be avoided Do not plant another crop within 30 days after treatment

This product is corrosive Therefore spills of concentrated product on the aircraft or other spray equipment must be avoided Should such contact be made immediately rinse with water

EQUIPMENT CLEANING

This product is corrosive As a result spray deposit exposure will over a period of time damage metal some paints and acrylic plastics No more than one hour after exposure to spray deposits these materials must be carefully rinsed with water and detergent

TOBACCO

(Flue-Cured Only)

(Not for use in California)

A foliar spray of Ethephon 3# promotes early uniform yellowing of mature tobacco Ethephon 3# reduces curing time allowing more efficient use of curing barn space and increased control over harvest schedules

Ethephon 3# increases the capacity of the curing barn by shortening the curing time and allows adjustments in harvest schedules Ethephon 3# can be used as a directed spray to the bottom or middle portion of the tobacco plant or as an over-the-top spray Ethephon 3# is not intended or recommended for use on immature tobacco

Crop Situation	Ethephon 3# Pt/A	Specific Directions
Directed Spray Application	2 2/3	Use drop nozzles Choose TG or OC spray tips designed to apply 50-60 gpa at 35-40 psi and at tractor speed of 2-3 mph Use 2 nozzles per row one on each side of the row dropped low enough to direct the spray to the leaves to be ripened and harvested Thorough spray coverage is essential With a directed spray be sure to harvest all leaves with 20% or more yellowing
Over-The Top Application	2 2/3 to 5 1/3	Treat only when leaves remaining on the stalk are mature To ensure remaining leaves are mature test spray several tobacco plants as described under the section Application Timing Use the lower rate in a normally mature crop when experience indicates that minimum ripening inducement is required Use the higher rate when the crop is heavy and has a tendency to be more rank or when temperatures are lower than normal Always test spray to determine if the tobacco is mature enough to respond to treatment with Ethephon 3# Apply over-the-top Ethephon 3# spray as a fine mist using three nozzles (one nozzle tip over the center of the plant and one on each side) to assure all leaves are covered thoroughly similar to the application pattern of systemic sucker control agents Use a spray pressure of 40 to 60 psi

RESTRICTIONS

Do not apply Ethephon 3# 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 Ethephon 3# since this may cause some reduction in yield and quality

Do not treat before anticipated major storm which could prevent harvest and result in crop loss
 Do not apply Ethephon 3# if rain is expected within 6 hours
 Do not harvest tobacco treated with Ethephon 3# sooner than 2 days after application
 Follow use rates listed above for labeled uses
 Do not exceed 5 1/3 pints of this product (2 lb ethephon) per acre per year

APPLICATION TIMING

Successful results with Ethephon 3# call for treatment when leaves are mature not overly rank green when sprayed To easily determine the proper treatment timing and the number of leaves per stalk ready for harvest test spray several plants in more than one location in each field and observe the response Mature leaves will begin to yellow in 24 to 72 hours Test leaves that fail to yellow in 72 hours are not mature and are not ready for Ethephon 3# treatment Wait a few days to permit further natural maturing then make another test spray or maturity check

Determine acres to treat by first confirming the number of leaves per plant that will color then use barn capacity to calculate the number of acres to treat
 A test spray can be prepared by mixing 2 2/3 teaspoons of Ethephon 3# in 1 quart of water Apply about 1 ounce to each test plant covering all leaves with a fine mist Ethephon 3# will not color immature leaves
 To avoid quality loss and/or possible leaf drop harvest any yellowed leaves prior to application Use lower rates under most conditions Limit use of higher rates to cool (below 65° F at the time of treatment) slow ripening conditions

WHEN TO HARVEST

All mature sprayed leaves will begin to color within 24 to 72 hours after Ethephon 3# application The yellowing process is weather dependent cool weather will delay while hot sunny weather can speed up the process Harvest treated tobacco when leaves have reached the desired color intensity

Harvest can commence 48 hours after Ethephon 3# application To determine harvest timing and avoid quality loss or leaf drop closely monitor treated crop and weather conditions

CURING Ethephon 3# TREATED TOBACCO

Curing procedures are as much an art as a science and each cure must be judged on the basis of tobacco condition interval between treatment and harvest weather and type of curing facility before prescription temperature and ventilation schedules can be established To obtain maximum quality care must be taken to observe and control the curing process closely especially during the late coloring and early drying stages of the leaf

Ethephon 3# treated tobacco will have started the coloring process when harvested reducing the time required in the coloring phase of curing Treated tobacco should be dried faster If tobacco leaves are green or contain some green when harvested it may be necessary to color them for a few hours If the leaves are completely yellow temperature and ventilation must be adjusted in a manner to dry the tobacco as fast as possible without scalding Once the leaf is dried (3/4 dry) you should follow normal procedures for curing Since Ethephon 3# treated leaves cure faster treated and untreated leaves should not be cured together in the same barn

TOMATOES[]**

PROCESSED Recoverable fruit yield from a once over harvest may be increased by a foliar spray of this product which will concentrate and speed up the ripening of tomatoes Ripening will begin earlier and mature plant ripening will converge This will concentrate maturity in the plants allowing the higher yield of ripe tomatoes in a once-over harvest In addition this will help to prolong the normal harvest season and assist in harvest scheduling and product handling

FRESH MARKET TOMATOES IN CALIFORNIA[]** Early marketable fruit yields may be increased by a foliar spray of this product which will speed up the ripening of tomatoes

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
<p>PROCESSED TOMATOES</p> <p>1) WARM TEMPERATURES</p> <p>OR</p> <p>2) EARLY TO MID SEASON</p>	<p>0.83 (13 1/3 fl oz) to 2.2 (34 2/3 fl oz)</p>	<p>This product should be applied when 5-15% of the tomato fruit in the treatment area including breakers are pink and red in color and there are enough mature green tomato fruit to create the desired amount of harvest When temperatures are over 85°F this product can be effective at rates as small as 0.83 Pt/A (13 1/3 fl oz/A)</p> <p>It is necessary to maintain thorough coverage of the fruit and foliage As a result spray volumes and aerial or ground equipment should be chosen to maximize coverage Please note however that overlapping spray nozzle patterns or swaths may result in overdosing and as a result extreme injury to foliage When applying the spray band over the row be sure to reduce the application rate in proportion to the actual treatment area The treatment area should be closely monitored and crops should be harvested once proper maturity is reached</p>	<p>Generally this product should be applied when the preferred amount of tomato fruit is mature and of a marketable size Before applying this product the treatment area should be observed closely including by sampling plants to determine the crop's stage of growth and degree of maturity While fruit size may be an indicator of maturity it is not enough sample plants including breakers should be weighed sorted and color determined</p> <p>The stage for treatment will vary based on Crops Using the specific directions on this label Crops may be determined during regular observations of the area to be treated After treatment and before harvest normal cultural practices should be observed For an optimum yield of high-quality fruit it is necessary for harvest to be well timed As a result it is recommended that application timing be coordinated with delivery schedules of the processor</p> <p>If the treatment area shows signs of inconsistent plant vigor as a result of cultural practices or soil conditions contact your local Arysta LifeScience representative Farm Advisor or Extension Horticulture Specialist for advice on correct use of this product and for temperature-specific rates of fruit ripening as allowed under the timing and rate limitations on this label</p>

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
<p>PROCESSED TOMATOES</p> <p>1) COOL TEMPERATURES</p> <p>OR</p> <p>2) LATE SEASON</p> <p>OR</p> <p>3) COASTAL CROPS</p>	<p>2 2 (34 2/3 fl oz) to 4 3 (69 1/3 fl oz)</p>	<p>This product should be applied when 5 30% of the tomato fruit in the treatment area including breakers are pink and red in color and there are enough mature green tomato fruit to create the desired amount of harvest For optimum efficacy this product should be applied when 5 15% of the tomato fruit in the treatment area including breakers are pink and red in color For dense vegetative growth or at cooler nighttime temperatures (less than 65°F) the higher rate of this product should be used It is necessary to maintain thorough coverage of the fruit and foliage As a result spray volumes and aerial or ground equipment should be chosen to maximize coverage</p>	<p>Crop should be harvested at time of suitable maturity Fruit may ripen earlier at temperatures above 90°F Natural color development may be slowed at temperatures below 65°F delaying the time of harvest</p>
<p>FRESH MARKET TOMATOES IN CALIFORNIA</p>	<p>0 83 (13 1/3 fl oz) to 3 3 (53 1/3 fl oz)</p>	<p>This product should be applied when the preferred amount of tomato fruit is mature and of a marketable size This time is usually 3 to 6 days prior to harvest Treated crops will only yield one harvest It is necessary to maintain thorough coverage of the fruit and foliage As a result spray volumes and aerial or ground equipment should be chosen to maximize coverage For dense vegetative growth and at cooler temperatures (generally under 85°F) the longer pre-harvest interval and higher rate of this product should be used on late season crops When temperatures are over 85°F this product can be effective at rates as small as 0 83 Pt/A (13 1/3 fl oz/A) In addition this lower rate may reduce damage to the foliage of certain sensitive varieties as noted below</p>	<p>Check treated fruit frequently and harvest at desired maturity When programming harvest spray a different block each day and harvest blocks daily in the same sequence</p>

RESTRICTIONS

[** Not currently registered for use in California]

Because this product is unable to cause immature green fruit to ripen it should not be applied prior to the development of enough green fruit to produce the necessary harvest size

After treatment some foliage may appear aged or yellowed

This product should not be applied to plants that are under stress because of drought disease insect pressure or soil conditions or with inferior root systems Such application particularly under high temperatures may cause foliage cover to quickly diminish resulting in a higher chance of sunburn and sun scald

This product should not be applied when expected temperatures at the treatment area are going to remain above

105°F

Sensitive plant varieties should not be treated during sustained times of temperatures over 100°F Under these conditions the lower rate should be used Some examples of plant varieties that are most sensitive to foliar damage include VF 10 VF 315 VF 145 21-4 and 13L

Tank mixing of this product with spray adjuvants sun protection whiteners sun protection products or any other additives is prohibited

This product should not be applied to an area greater than can be harvested within 2-3 days

This product should not be applied to plant varieties particularly susceptible to rapid softening or shattering when ripe

Do not use on greenhouse tomatoes

Pre-harvest interval is three (3) days

Per year do not apply more 4 3 Pt/A (69 1/3 fl oz/A) (1 63 lb ethephon) of this product per acre

BLUEBERRIES[]**

This product when applied as a foliar spray will contribute to an easier and more efficient harvest by concentrating blueberry maturity In addition growth of black barrenberry (*Aronia melanocarpa*) flowers and/or fruit growing in Maine lowbush blueberry fields will be slowed through use of this product in a foliar spray lowering the amount of unwanted fruit harvested with the desired crop

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
<p>FRUIT COLOR ACCELERATION AND MATURITY CONCENTRATION TREATMENT (Cultivars Bluecrop Weymouth Jersey Rancocaas Rubel Bluetta Eriblue Wolcott Croatan Murphy Angola Morrow Garden Blue Trifblue and NC901)</p>	<p>2 2/3 to 5 1/3</p>	<p>This product should be applied as a foliar spray at a rate of 2 2/3 to 5 1/3 pt/A and when air temperatures are between 60° and 90°F Spray volume should be 150-200 gal/A Use the higher spray volume and rate on large or dense foliage bushes or when temperatures are cool It is necessary to maintain thorough coverage of the fruit and foliage Use of a wetting agent is recommended to assist in the uniform wetting of crops For example Triton B 1956 can be applied at 0.5 pts per 100 gal or X 77 at 2.0 pt per 100 gals</p>	<p>First Harvest Concentration This product should be applied when 15-20% of the berries in the treatment area are blue</p> <p>Final Harvest Concentration This product should be applied following first or second picking Within one to two weeks following application blueberries generally have reached proper coloration indicating maturity and time for harvest Because this product accelerates maturity internal and external fruit quality should be observed daily to determine picking time Please note that this product may cause greater acceleration of fruit color than internal ripening The time for fruit ripening will shorten under higher temperatures (at least 90°F) This product may cause a slight decrease of acidity fruit size and soluble solids as well as a greater number of fruit with stems</p>
<p>CONTROL OF BLACK BARRENBERY IN LOW BUSH BLUEBERRIES IN MAINE</p>	<p>2 2/3 to 5 1/3</p>	<p>This product should be applied at a rate of 2 2/3 to 5 1/3 pt/A GROUND APPLICATION Apply in roughly 100-200 gal/A AERIAL APPLICATION Apply in roughly 10 gal/A It is necessary to maintain</p>	<p>When black barrenberries reach 90-100% petal fall the lower rates of this product should be applied Once black barrenberry fruit reaches a diameter of 1/8 - 3/16 in use the higher rates This stage is usually reached 7-10 days following the blueberry crop reaching this stage Once</p>

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
		thorough spray coverage Use of a wetting agent is recommended to assist in the uniform wetting of crops For example X-77 can be applied at 0.1% of the spray volume	blueberry fruit is ripe it should be harvested Usually blueberries should be ripe 6-8 weeks following treatment

RESTRICTIONS

[Not currently registered for use in California]**

Premature crops and extreme steminess may result from application of this product to cultivars not listed above
Per season a maximum of one application may be made

A second application for the purposes of maturity concentration or fruit color acceleration is not permitted when using to control barrenberries in Maine

Diminished fruit yield and defoliation may occur if plants under extreme heat or drought conditions are treated
Per year do not apply more than 5 1/3 pt (2 lb ethephon) of this product per acre

CHERRIES
Except California

This product when applied as a foliar spray will help to accelerate uniform ripening and loosen fruit thereby decreasing the mechanical shaking force needed during harvest This contributes to fruit quality yield size harvest efficiency minimizes injury to trees **DO NOT USE ON CHERRIES IN CALIFORNIA**

Pacific Northwest Sweet Cherries Dormant bud hardiness is increased and bloom is delayed when a fall application of this product is made

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
TART CHERRIES	2/3	It is necessary to maintain thorough spray coverage As a result this product should be applied as a dilute spray in plenty of water Planting density tree size and the application equipment will determine the optimal spray volume	Pre harvest intervals will increase when using lower rates
	7 1 fl oz to 2/3 pt	Apply as a concentrate spray For best results ensure uniform coverage when using a spray volume of less than 100 gal/A	
SWEET CHERRIES (varieties such as Windsor Napoleon Royal Anne Emperor Francis)	2 to 2 2/3	It is necessary to maintain thorough spray coverage As a result this product should be applied as a dilute spray in plenty of water Delivery type tree size and the application equipment will determine the optimal spray volume Application to yellow colored or light varieties should use the lower rates	
	1 1/3 to 2	Apply as a concentrate spray For best results ensure uniform coverage when using a spray volume of less than 100 gals/A	
INCREASED DORMANT FRUIT BUD HARDINESS AND DELAYED SPRING BLOOM (Sweet Cherries in the Pacific Northwest)	2	Treat in first two weeks of September	A fall application of Ethephon 3# will increase fruit bud hardiness by decreasing the chance for winter injury and delaying bloom by 3 to 5 days which may help avoid frost injury Treatment of early flowering varieties may delay bloom to better coincide with pollination from other varieties

RESTRICTIONS

Not for use on cherries in California
 Early treatment may result in unwanted premature fruit drop with attached stems
 Treatment may result in cherry tree gummosis especially when subjected to high temperatures during and after treatment
 Tree damage may occur if trees are treated in the year following exposure to severe gummosis
 Excessive gummosis may result if this product is applied to trees that have been exposed to extreme conditions of stress such as drought disease pressure winter injury or low vigor Gummosis will be intensified by periods of drought or high temperatures
 Orchards should be irrigated if feasible to prevent gummosis caused by drought stress
 Pre harvest interval is seven (7) days
 Treatment should occur at temperatures between 60 85 F and should not be made at temperatures over 85 F
 Application should be made once all fruit on the tree (including interior fruit) is in stage 3 This can be determined by observing the change of ground color from bright green to yellow and rapid increases in size
 It is necessary to maintain uniform spray coverage Otherwise tip dieback and gummosis may result from erratic application of this product
 After treatment you may observe some early yellowing and drop of leaves

Fall Bud Hardiness Treatment You may observe a decrease in individual fruit size and minor gummosis following this treatment
 Per year do not apply more than 2 2/3 pt (1 lb ethephon) of this product per acre

**GRAPES[]
 For Use Only in Arizona and California**

Table grapes in Arizona and California This product will accelerate uniform development of color on certain varieties of table grapes such as Cardinal Emperor Flame Seedless Red Malaga Queen and Tokay This contributes to harvest efficiency of quality fruit

Raisin Production This product when applied as a foliar spray will accelerate maturity of Thompson Seedless grapes This will result in raisins of higher quality lower acids and increased sugars

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
TABLE GRAPES (i e Cardinal Flame Seedless Red Malaga and Queen)	1/3 to 1 1/3	This product should be applied at the point of 5 30% berry coloration When temperatures are over 85 F this product can be effective at rates of 1/3 to 1 1/3 pt/A Use the higher rates when temperatures are cool but higher than 65 F Conventional ground sprayers should be used to uniformly apply this product to fruit clusters and vines using an adequate amount of water	Fruit should be harvested at time of suitable quality and maturity To determine proper time for harvest (usually at least two weeks following application) observe fruit coloration acidity and sugar content Be sure to harvest before coloration becomes too dark If needed confer with your Farm Advisor or Extension Viticulturist for local practices with this product
TOKAY GRAPES	2/3 to 1 1/3	This product should be applied at the point of 5 15% berry coloration Conventional ground sprayers should be used to uniformly apply this product to fruit clusters and vines using an adequate amount of water	

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
RAISIN PRODUCTION (Thompson Seedless)	2/3 to 1 1/3	This product should be applied at the point of 5 30% berry coloration or as a foliar spray at 5% berry softening Conventional ground sprayers should be used to uniformly apply this product to fruit clusters and vines using an adequate amount of water	This product when applied as a foliar spray will accelerate maturity of Thompson Seedless grapes This will result in raisins of higher quality lower acids and increased sugars If needed confer with your Farm Advisor or Extension Viticulturist for local practices with this product

RESTRICTIONS

[Not currently registered for use in California]

Table Grapes and Tokay Grapes

Because the number of cracked fruit may increase use of rates in excess of 2/3 pt/A is not recommended except when grapes are subject to poor weather conditions or a past history of difficult coloration

Application of this product may cause softening of berries Take this into consideration when determining proper storage

Tokay grapes should not be stored

Pre harvest interval is fourteen (14) days

Per year do not apply more than 1 1/3 pt (0 5 lb ethephon) of this product per acre

Raisin Production (Thompson Seedless)

To determine proper time for harvest observe acidity and sugar content

This product should not be applied to grapes exposed to moisture stress or insect pressure

Per year do not apply more than 1 1/3 pt (0 5 lb ethephon) of this product per acre

APPLES[]

This product when applied as a foliar spray will help to accelerate uniform ripening and loosen fruit thereby decreasing the mechanical shaking force needed during harvest This contributes to fruit quality yield size harvest efficiency and minimizes injury to trees This product will accelerate ripening and red coloration when applied along with FRUITONE® N to control pre harvest drop This product will contribute to formation of flower buds and restrict vegetative growth when applied to young trees

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
FRUIT LOOSENING			
1 VARIETIES MATURING IN EARLY TO MID SEASON (maturing with McIntosh or earlier)	1 2/3	This product should be applied 7 14 days before expected normal harvest time It is necessary to maintain thorough spray coverage As a result this product should be applied as a foliar spray in plenty of water Tree size and the application equipment will determine the optimal spray volume Fruit treated with this product will reach picking time faster as a result check fruit maturity daily	Different uses of this product as specifically directed will encourage 1) Uniform coloration and ripening while not contributing to loosening 2) development of flower buds on young trees 3) fruit loosening and/or 4) thinning and return bloom This product should be applied at temperatures between 60 F and 90 F except under the conditions of rising temperatures you may treat at 50 F Pre harvest intervals will increase when lower temperatures are present
2 LATE MATURING VARIETIES IN THE EASTERN UNITED STATES (maturing later than McIntosh)	3 1/3		

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
			<p>Warm daytime conditions will hasten loosening and ripening of fruit however color response will be diminished Overripe fruit on trees should not be tolerated as such fruit may soften earlier once harvested Be sure to check maturity and quality of any fruit to be sold at a fresh market While fruit color may be an indicator of maturity it is not enough internal maturity should also be checked using a pressure gauge or other method</p> <p>This product should not be applied to an area greater than can be harvested within 1 2 days Fruit in good condition can be stored in cold air storage</p>
<p>PROMOTION OF UNIFORM RIPENING AND COLORING OF RED VARIETIES WITHOUT LOOSENING</p> <p>1 VARIETIES MATURING EARLY TO MID SEASON (maturing with McIntosh or earlier)</p> <p>2 LATE MATURING VARIETIES (maturing later than McIntosh)</p>	<p>2/3 to 2 2/3</p> <p>1 1/3 to 2 2/3</p>	<p>This product should be applied with a pre harvest drop control chemical registered for use on apples (e g FRUITONE® N) as a foliar spray Observe all directions on both products labels Treatments should begin 2 to 3 weeks prior to the normal harvest time and 1 to 2 weeks prior to preferred harvest time It is necessary to maintain thorough spray coverage As a result this product should be applied as a dilute spray in plenty of water Type of delivery tree size and the application equipment will determine the optimal spray volume For apples to be stored use the lower rate</p>	<p>Check with your local extension Pomologist or Horticulturist and the pre harvest drop control chemical s label for best local practices</p>
<p>THINNING AND RETURN BLOOM</p> <p>1 Majority of Varieties</p> <p>2 Varieties Such as Golden Delicious that Are Difficult to Thin</p>	<p>1 to 2 2/3</p> <p>2 to 4</p>	<p>This product should be applied 10 20 days following full bloom You may mix this product with the following insecticides to promote 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 When using these products together you must abide by the most restrictive label guidelines Do not exceed</p>	<p>It may be difficult to regulate cropping from one season to the next Extreme alternate bearing may develop in a subsequent year if a large number of lateral buds and spurs bloom in one season This product should be used alone or together with AMID THIN® W or one of the SEVIN® products listed under Specific Directions to defeat this disorder Such an application should occur 7 21 days following full bloom The</p>

Crop	Ethephon 3# (P/A)	Instructions	Comments
		<p>any label s recommended dosages This product may not be mixed with other products whose labels prohibit such mixtures Consult local extension recommendations Optimal application efficacy may be reached by the addition of a non ionic surfactant In areas of water alkalinity product efficacy can be increased by buffering the spray solution to a pH of 3 to 5 It is necessary to maintain thorough spray coverage</p>	<p>necessary amount of thinning and your orchard s biennial history of bearing will determine which treatment program should be used</p> <p>On Red Delicious trees (especially those subject to stress) or trees treated with the higher rates you may observe a decrease in fruit size and type</p>
<p>FLOWER BUD DEVELOPMENT TREATMENT</p> <p>1 NONBEARING TREES</p> <p>2 BEARING TREES</p>	<p>1 1/3 to 5 1/3</p> <p>1/3 to 2</p>	<p>Trees should be treated uniformly and thoroughly up until runoff Trees with greater vigor will require the higher rate</p> <p>This product should be applied 2-4 weeks following full bloom Treatments should be delayed until after June drop and six weeks following full bloom to help prevent fruit thinning</p>	<p>This product should be applied as a foliar spray to non bearing trees 2 4 weeks following bloom to promote the development of flower buds</p> <p>Decreased fruit and yield size as well as thinning of fruit may result during the year of treatment however flowering should increase the following Spring</p> <p>Before using this treatment ensure the trees to be treated are large enough to be able to support a crop of apples</p>

RESTRICTIONS

[Not currently registered for use in California]

Decreased fruit and yield size as well as thinning of fruit may result from use of this product

This product should not be used on trees with lowered strength as it may result in excessive growth reduction

Double coverage should be avoided

Because return bloom and thinning may be influenced by environmental conditions testing any one program on a small batch of trees at first is recommended

Newly bearing young trees may be at risk of a reduction in fruit size and unwanted fruit thinning

It is necessary to maintain thorough coverage of the fruit and foliage Use of a wetting agent is recommended to assist in the uniform wetting of crops

Grazing or feeding of cover crops to livestock is prohibited

Pre Harvest interval is seven (7) days

When making application to accelerate maturity a decrease in fruit size may result particularly when fruit is small when treated

Decreased fruit size and quality may occur if treatment is made more than three weeks prior to the normal planned time for harvest

Per year do not apply more than 5 1/3 pt (2 lb ethephon) of this product per acre

WALNUTS[*]

THIS USE IS FOR WALNUTS IN CALIFORNIA ONLY This product when applied as a foliar spray will help to loosen walnuts thereby decreasing the mechanical shaking force needed during harvest This contributes to better hull removal yield size (from a once over harvest) harvest efficiency and earlier harvest

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
USE IN CALIFORNIA	2 to 3 1/3	<p>For spray concentration recommendations see the chart below Optimal results will occur when spray concentrations are between 200 900 ppm Higher rates should be used during low humidity or temperatures Pre harvest intervals will decrease when using higher rates Application should be made at temperatures between 60 95 F for optimal results Applications at temperatures above 90 F and low humidity may be less effective due to spray evaporation</p> <p>This product should be applied using equipment giving the highest spray penetration to provide thorough uniform coverage of walnut hulls This is necessary to achieve optimal nut loosening and hull split When the size of the tree inhibits optimal spray penetration use of large air carrier sprayers or volume sprayer attachments is recommended</p>	<p>Walnuts are mature when the packing tissue between kernel halves completes browning Collect nut samples from throughout the tree canopy when determining percent nut maturity</p> <p>Advancing Harvest This product should be applied when maturity has been achieved by 95 100% of the nuts Harvest should be made as soon as sufficient hullability occurs Depending on weather conditions and variety of walnut this usually happens approximately 10 16 days following application Inspect regularly Second shake should occur 10 12 days following the first</p> <p>Once Over Harvest Maturity and the chance for a once over harvest will be influenced by weather and growing conditions as well as the variety of nut Local fieldmen or Farm Advisors should be consulted to determine whether a once over harvest will be available Treatments to mature walnuts should begin 10 days prior to the normal harvest time and 7 12 days prior to preferred harvest time</p>

RESTRICTIONS

[Not currently registered for use in California]

Quality may be diminished if application is made prior to the packing tissue brown (mature) stage

Application of this product may cause some leaf drop

Trees which are moisture stressed diseased or have low vigor should not be treated as excessive leaf drop may result

Twig dieback extreme defoliation diminished catkin formation or other tree injuries may occur if higher than recommended rates are applied Be sure to measure accurately

Pre harvest interval is five (5) days

Per year do not apply more than 3 1/3 pt (1 25 lb ethephon) of this product per acre

Spray Preparation Chart

Application Rate		Spray Volume (Gallons/A)				
		100	200	300	400	500
Pt/A	Lb/A	Concentration (ppm)				
2	0 75	900	450	300		
2 2/3	1 00		600	400	300	
3 1/3	1 25		750	500	375	300

PEPPERS[]

This product when applied as a foliar spray will accelerate uniform coloration and ripening resulting in better handling and packing efficiency

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
PEPPERS	0.83 (13 1/3 fl oz) to 2 2/3 pt	<p>It is necessary to maintain thorough coverage of the fruit and foliage. As a result, spray volumes and equipment should be chosen to maximize coverage. If plants are strongly growing, subject to temperatures lower than 65 F, or have dense foliage, the higher rate should be used. Spray Volume Rates between 0.83 (13 1/3 fl oz) and 1 1/3 pt should be applied in 20 gal/A. Rates between 2 and 2 2/3 pt should be applied in 40 gal/A. Use of less than 40 gal/A at the higher rate under hot and dry weather may result in foliage burn.</p> <p>Application Timing Bell peppers: 10% of fruit have red or chocolate coloration Chili and pimento peppers: 10-30% of fruit have red or chocolate coloration</p> <p>Application should not be made until enough green fruit exists for a sufficient yield. This product will not ripen immature green fruit.</p>	<p>Crop is to be harvested at optimum maturity, generally 14 or more days after treatment. Maturity should be determined by sampling several field locations. Early application or application when there is a shortage of mature, uniform green fruit (as a result of variable soil cultural practices or split fruit set) may result in a decrease in total yield.</p>

RESTRICTIONS

[Not currently registered for use in California]
 If average temperatures are anticipated to persist at or above 95 F, treatment should be avoided. Treatments should not be made at temperatures above 100 F. Such treatments will cause additional foliage yellowing, immature fruit abscission, ripening, and defoliation.
 Treatments should also not be made if average temperatures are anticipated to persist below 60 F, as such conditions may diminish product efficacy.
 Application of this product may cause minor leaf aging and yellowing.
 Pre-harvest interval is five (5) days.
 Per year, do not apply more than 2 2/3 pt (1 lb ethephon) of this product per acre.

ATTENTION Tank mixing of this product with desiccants containing sodium chlorate may create hypochlorous acids under some conditions. Such acids will emit toxic chloride fumes if heated.

BLACKBERRIES[]

USE PERMITTED IN OREGON AND WASHINGTON ONLY This product when applied as a foliar spray will promote uniform maturity and loosen fruit thereby decreasing the mechanical force needed during harvest This contributes to fruit quality yield size harvest efficiency and minimizes injury to canes

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
APPLICATION IN OREGON AND WASHINGTON (Cultivars Chehalem Thornless and Evergreen)	3 1/3 to 5 1/3	This product should be applied 1) As a foliar spray 2) at temperatures between 60 90 F 3) more than three days before the planned harvest date and 4) when it is not to rain within the next 24 hours Uniform and thorough wetting of the fruit and foliage is necessary	This product can be used early in the harvest season to decrease the number of pickings or later in the harvest season for a final once over picking

RESTRICTIONS

Because of the potential for significant fruit drop this product should not be applied to more fruit than is possible to harvest within three days

This product should be used only as directed and on strong healthy plants Improper use or use on diseased or otherwise damaged plants will result in a decrease in berry size

Pre harvest interval is three (3) days

Per year do not apply more than 5 1/3 pt (2 lb ethephon) of this product per acre

CANTALOUPE[*]

ONLY FOR USE IN ARIZONA CALIFORNIA AND TEXAS This product when applied as a foliar spray encourages fruit abscission (slipping) This leads to more efficient harvests

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
ARIZONA CALIFORNIA TEXAS	2	For uniform abscission it is essential to have thorough spray coverage Ground and aerial applications should be made in a minimum of 40 and 10 gal/A respectively Aerial application is allowed only in Texas While the precise pre harvest interval will differ based on temperature you should be ready for harvest of abscised fruit within 2 5 days following application Harvest schedules should be planned with your packer and/or shipper	For more specific directions under varying temperature and moisture conditions consult your Extension Horticulturist or Farm Advisor for his experience with Ethephon 3# in your area This product s effects will accelerate when fruit is subjected to high temperatures Please note that timing of applications of this product may differ each season Do not apply this product before fruit is of marketable quality (as determined by flesh color and level of soluble solids) as these traits will not improve after application Fruit should be picked once it is of marketable quality as quality will diminish if fruit is left in the field As a result fields should be examined frequently Vines may exhibit rapid aging or yellowing after application Do not apply to plants with low vigor A 30 day plant back interval is required

RESTRICTIONS

- [Not currently registered for use in California]
- Do not apply this product at low nighttime temperatures (below 60 F)
- This product should not be applied to fields whose fruit are at less than 10% soluble solids
- This product should be applied only if the target fields vines are healthy fruit are of marketable quality (in both internal flesh color and soluble solids) and have a relatively uniform fruit set
- Pre harvest interval is two (2) days
- Per year do not apply more than 2 pt (0 75 lb ethephon) of this product per acre

PINEAPPLE AND SUGARCANE []

PINEAPPLE FLOWER INDUCTION Application of Ethephon 3# will induce uniform flower initiation of pineapple plants

PINEAPPLE MATURITY CONCENTRATION Application of Ethephon 3# will stimulate uniform shell color of pineapple fruit

SUGARCANE FLOWER PREVENTION A foliar spray of Ethephon 3# will reduce or prevent flowering of sugarcane

SUGARCANE BIOMASS INCREASE Ethephon 3# application to prevent flowering can result in increased biomass accumulation and increased recoverable sugars

Crop	Ethephon 3# (Pt/A)	Timing of Application	Instructions	Comments
PINEAPPLE Flower Induction Ethephon 3# applied to pineapple plants will stimulate uniform initiation of flowering	2 2/3 to 5 1/3	Bearing age about 12 months after planting Generally about 6 months prior to desired harvest	Proper rate will vary with local growing conditions varieties plantation management practices and time of year Use the higher rate where earlier harvest is desired Apply when pineapple foliage is dry	Do not graze pineapple forage treated with Ethephon 3# Do not harvest pineapples treated with Ethephon 3# sooner than 2 days after the last application
PINEAPPLE Maturity Concentration Ethephon 3# application will stimulate uniform shell color development	1 1/3 to 5 1/3	When the first fruit begin to change color	Use a broadcast spray thoroughly cover both foliage and fruit Use the higher rate during periods of cool or cloudy weather when normal ripening has slowed	
SUGARCANE (for use in Hawaii only) Flower Prevention Ethephon 3# application will prevent or reduce flowering and pithy tissue formation Biomass Increase Ethephon 3# used to prevent flowering can also result in increased biomass accumulation and recoverable sugar yield	1 1/3	Just prior to flower initiation	Apply by fixed wing aircraft or helicopter using equipment designed to give uniform coverage Actual biomass increase will be affected by the time between treatment and harvest Consider anticipated recoverable sugars as well as biomass to determine optimum harvest date	Apply no less than 7 gallons of spray mixture per acre Do not harvest sugarcane treated with Ethephon 3# sooner than 2 months after the last application Do not graze sugarcane forage treated with Ethephon 3#

RESTRICTIONS

[Not currently registered for use in California]

For pineapple do not exceed 8 pt of this product (3 lb ethephon) per acre per year

For sugarcane do not exceed 1 1/3 pt of this product (0.50 lb ethephon) per acre per year

COTTON

A foliar spray of Ethephon 3# will accelerate opening of mature unopened cotton bolls and enhance defoliation which can result in earlier harvest with an increased recoverable yield. Ethephon 3# treatment allows increased efficiency from a once-over harvest.

SPRAY PREPARATION

Add 1/2 to 3/4 of the required amount of water to the spray tank. Start agitation. Add the required amount of Ethephon 3#, and the remaining amount of water. Prepare only as much spray solution as can be used on the day of mixing. Do not allow spray solution to stand overnight. Do not spill the concentrated product on spray equipment, or any airplane parts.

ANY SPILLS SHOULD BE RINSED IMMEDIATELY WITH PLENTY OF WATER.

Use of a nurse tank is highly recommended for avoiding possible spills of concentrated formulation on spray equipment or any airplane parts.

APPLICATION INFORMATION

Thorough and uniform coverage of cotton leaves and bolls is required for optimum regrowth inhibition and boll opening. Apply as a dilute spray in 10 to 25 gallons of water per acre by ground or 3 to 5 gallons of water per acre by air.

Good agitation in the spray tank is essential and a tank mixture should not be allowed to stand without agitation for more than 5 to 10 minutes. Read and observe all appropriate label use directions and precautions for the defoliant and insecticides used.

EQUIPMENT CLEANING

Because of the acidic nature of this product, prolonged exposure to spray deposits will damage acrylic plastics, certain paints, and metals.

Rinse thoroughly with a detergent and water all exposed acrylic plastic-type materials (e.g., aircraft windshields), and painted surfaces within an hour after exposure to spray deposits.

At the end of each day, rinse thoroughly with a detergent and water all the metal parts of the aircraft and the associated spray equipment exposed to the spray deposits.

ETHEPHON 3# - ALONE							
USE	EXPECTED CONDITIONS	ETHEPHON 3# RATE PER ACRE		ONE GALLON ETHEPHON 3# TREATS	SPRAY VOLUME		TIMING
					GROUND	AIR	
ETHEPHON 3#	Hot and dry 80°F or higher	2 - 2 2/3 pt (32 - 43 fl oz)	0.75-1.0 lb ai	3.0-4.0 Acres	10-25 gallons	3-5 gallons	Apply when the number of mature unopened bolls is sufficient to produce the desired crop. See below for test of boll maturity. Treatment uniformly opens bolls 7 to 14 days earlier.
	Dry and 75° F to 80° F	2 2/3 - 4 pt (43 - 64 fl oz)	1.0-1.5 lb ai	2.0-3.0 Acres	10-25 gallons	3-5 gallons	Apply when the number of mature unopened bolls is sufficient to produce the desired crop. See below for test of boll maturity. Treatment uniformly opens bolls 7 to 14 days earlier.
	Cool but Above 65° F Or Rank cotton	3 1/3 - 5 1/3 pt (54 - 86 fl oz)	1.25-2.0 lb ai	1.5-2.4 Acres	10-25 gallons	3-5 gallons	Apply when the number of mature unopened bolls is sufficient to produce the desired crop. See below for test of boll maturity. Treatment uniformly opens bolls 7 to 14 days earlier.

TANK MIXTURES WITH DEFOLIANTS DESSICCANTS AND INSECTICIDES

Follow all applicable use precautions and rate per acre recommendations on labels of products applied as tank mixtures or in sequence with Ethephon 3# In some cases slight reduction in boll opening response has been observed when tank mixes with defoliants were used

Ethephon 3# can be applied in a tank mix with an EPA approved defoliant for consistent defoliation and regrowth inhibition Ethephon 3# can also be applied in a tank mix with EPA approved desiccants or herbicides Tank mixes should be made in accordance with the label that is more restrictive in limitations restrictions and/or precautions

DO NOT MIX WITH DESICCANTS IF COTTON IS TO BE SPINDLE HARVESTED

DO NOT TANK MIX ETHEPHON 3# WITH DEFOLIANTS CONTAINING SODIUM CHLORATE BECAUSE THIS RESULTS IN THE FORMATION OF HYPOCHLOROUS ACIDS WHICH UPON HEATING EMIT TOXIC CHLORINE FUMES

ETHEPHON 3# TANK MIX							
USE	EXPECTED CONDITIONS	ETHEPHON 3# RATE PER ACRE		ONE GALLON ETHEPHON 3# TREATS	SPRAY VOLUME		TIMING
					GROUND	AIR	
ETHEPHON 3# + DEFOLIANT (tribufos thidiazuron + diuron) and other EPA approved DESICCANTS	Dry and 75 F or higher	2 2 2/3 pt (32 43 fl oz)	0 75 1 0 lb ai	3 0 4 0 Acres	10 25 gallons	3 5 gallons	Apply 4 to 7 days prior to Ethephon 3# boll opening application To be used as a sequential treatment with not in place of Ethephon 3# boll opening treatment
	High soil moisture Or High fertility level Or Rank Cotton	2 5 1/3 pt (32 86 fl oz)	0 75 2 0 lb ai	1 5 4 00 Acres	10 25 gallons	3 5 gallons	Apply 4 to 7 days prior to Ethephon 3# boll opening application To be used as a sequential treatment with not in place of Ethephon 3# boll opening treatment

ETHEPHON 3# PRECONDITIONER							
USE	EXPECTED CONDITIONS	ETHEPHON 3# RATE PER ACRE		ONE GALLON ETHEPHON 3# TREATS	SPRAY VOLUME		TIMING
					GROUND	AIR	
Preconditioner for defoliation	Hot dry above 80 F	2/3 pt (11 fl oz)	0 25 lb ai	12 Acres	10 25 gallons	3 5 gallons	Apply 4 to 7 days prior to defoliant Enhances top crop defoliation reducing deterioration of bottom crop and allows for earlier harvest
	Cool above 65 F Or Rank cotton	2/3 1 1/3 pt (11 21 fl oz)	0 25 0 5 lb ai	6 12 Acres			

Pretreatment With Defoliants Prior to Ethephon 3# Treatment

If the cotton is overly rank or laying down in the middles and good spray coverage of the bolls with Ethephon 3# is difficult a pretreatment with defoliants will be useful to improve boll coverage with Ethephon 3# Use dosage rates of Ethephon 3# recommended for boll opening Read and observe all appropriate label use directions and precautions for the defoliant used

NOTE For California and Arizona use a volume of no less than 5 gallons per acre for aerial applications

Boll Maturity

A boll is mature when it is too hard to be dented when squeezed between thumb and fingers too hard to be sliced with a sharp knife and when the seed coat becomes light brown in color

Use Limitations

Do not exceed a maximum of 2 0 lb ai/A for combined uses of Ethephon 3# (or other ethephon containing products) per acre per year

Boll Opening Do not tank mix Ethephon 3# with a desiccant if the cotton is to be spindle harvested

Pre Condition for Defoliation Do not tank mix Ethephon 3# with desiccants unless plant desiccation is required Do not use a defoliant before there are sufficient mature unopened bolls to produce the desired yield (see General Information section on how to test for boll maturity)

When to Harvest

Do not harvest cotton sooner than 7 days after a treatment with Ethephon 3# Observe the treated crop and harvest when optimum boll opening has been reached Too early harvest might reduce the full advantage of the treatment and too late a harvest may result in reduced quality and loss of lint which will drop from the plant

**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 Such a tank mix should not be applied to plants stressed by cold disease heat insect or moisture as a decrease in yield or injury to crops may occur Application of a tank mix of this product with Tilt® may cause a decrease in yield or flag leaf burn

Assessment of economics and plant conditions should guide treatments of insecticides and fungicides which may or may not match with treatment timing of this product

RESTRICTIONS

Ethephon 3# does not require the supplemental use of adjuvants surfactants or wetting agents in most cases

Ethephon 3# should not be mixed with herbicides or liquid nitrogen solutions such as UAN 28% or 32%

This product should not be supplemented 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 may result 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 may affect certain disease infestations such as mildew, rust and Septoria and should be used in conjunction with a fungicide control program if necessary.

Yield loss may occur if during or after application plants are subject to disease, moisture or temperature stress.

Yield loss may occur if this product is applied under non lodging conditions.

Always follow label temperature restrictions.

Harvest maturity may be delayed 1-4 days and heading by 1-2 days following use of this product. Additional harvest maturity delay may occur if crops are subject to extreme temperatures within five days following treatment. Extreme temperatures are any under 35° F or above 85° F for non irrigated crops or over 90° F in irrigated crops.

Because of the potential for maturity delay and therefore harvest delays, this product should not be used on late seeded crops in short season growing areas.

Secondary tillers may increase following application of this product to certain spring barleys. This may particularly occur if crop is subject to temperature or moisture stress.

Use of this product on Azure barley or Tyler wheat is prohibited.

This product should not be applied 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 may be consumed by animals.

A 30 day plant back interval is required.

TREATMENT DECISION GUIDE

Shortly before application of this product, the fields to be treated should be checked to determine the chance lodging will occur. This product should only be applied under these circumstances:

Lodging is anticipated and likely will result in a considerable decrease in grain quality, harvest efficiency, and recoverable yield.

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

This product should be applied 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 8-10 and Zadoks Code 37-45.** Crop damage and decreased yields may occur if application contacts exposed heads.

APPLICATION

For best results, post treatment temperatures should be no less than 60° F. Overlapping sprays should be avoided as yield and rate loss may be exaggerated.

Ground application: Application with conventional ground equipment should be made in at least 7 gals/A of water. Use of flat fan nozzles is suggested. Application with air foil type equipment or by controlled droplet application (CDA) should be made in at least 5 gals/A of water. Spray boom should be adjusted to drive at moderate speed and at the height of the plant canopy to avoid an uneven application.

Aerial application: should be made in at least 3 gals/A of water.

USE RATES

The application rate will be determined by environmental conditions and lodging pressure. Contact your state extension specialist for local recommendations on rates of application for varying conditions. The 1 pint/A rate should be used on more responsive varieties. Per year, do not apply more than 1 1/3 pints (0.5 lb ethephon) of this product per acre. Pre harvest interval is forty (40) days.

BARLEY AND WHEAT APPLICATION RATES

CROP CONDITION	ANTICIPATED LODGING PRESSURE			COMMENTS
	MODERATE	HEAVY	SEVERE	
	APPLICATION RATE (Pt/A)			
Barley (Spring and Winter Seasons)	2/3	2/3 to 1	1 to 1 1/3	A 2 pt/A rate may be necessary for use on certain vigorously growing tall varieties
Winter Wheat	2/3	2/3 to 1	1 to 1 1/3	For certain tall straw varieties (e g Roughrider and Agassiz) the listed rates may be unable to control lodging under severe lodging conditions
Most Spring Wheats	2/3	2/3	1	For certain tall durum wheats (e g Vic) the listed rates may be unable to control lodging under severe lodging conditions
Sensitive Variety or High Temperature	2/3	2/3	2/3	

RESTRICTIONS

Application with the 2 pint rate should be restricted 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

This product should not be applied 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 it is recommended to irrigate prior to and after twenty four (24) hours following application Irrigation should continue through the period of grain head filling if weather remains hot and dry Please note that considerable decreases in yield and plant quality may occur if crop is subject to heat stress and moisture during grain fill and antithesis As a result it is imperative to avoid plant stress during these periods when treating with this product

GROWTH STAGE CHART

Growth Class	2 ^d Node Detect able	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	

MISTLETOE REMOVAL []

DWARF AND LEAFY MISTLETOE REMOVAL A foliar spray of Ethephon 3# will remove dwarf mistletoe shoots in ornamental conifers and leafy mistletoe from ornamental deciduous trees

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
DWARF MISTLETOE ON ORNAMENTAL CONIFERS	1 1/3 pt per 20 gal	Apply as a foliar spray to dwarf mistletoe shoots before mistletoe seed dispersal For effective removal all mistletoe shoots must be sprayed to wet Use of a nonionic surfactant at recommended rates may increase effectiveness Treat any mistletoe regrowth before seed dispersal	Applications made in conjunction with silvicultural mistletoe management will prevent spread of the mistletoe parasite to other parts of the tree and other trees
DOUGLAS FIR ORNAMENTALS	2/3 pt per 20 gal		Mature needle drop that normally occurs in the fall may be hastened by the use of Ethephon 3# Applications of higher rates on Douglas fir may result in excessive needle drop
LEAFY MISTLETOE ON ORNAMENTAL DECIDUOUS TREES	2 2/3 pt per 20 gal	Make applications after fall leaf drop through mid winter For effective removal all mistletoe shoots must be sprayed to wet Use of a nonionic surfactant at recommended rates may increase effectiveness Any mistletoe regrowth should be treated during the labeled application window	Large mistletoe infections and mistletoe found in mesquite may be difficult to control with a single application and retreatment may be necessary

[Not currently registered for use in California]

FRUIT ELIMINATION[]
(Ornamental Use Only)

UNDESIRABLE FRUIT ELIMINATION A foliar spray of Ethephon 3# will reduce or eliminate undesirable fruit development on apple crabapple carob and olive trees

Crop	Ethephon 3# (Pt/A)	Instructions	Comments
APPLES CRABAPPLES	0.33 (5 1/3 fl oz) to 0.5 (8 fl oz)	Apply as a foliar spray at the flower bud to full bloom stage prior to fruit set. Wet foliage thoroughly. Over application of Ethephon 3# can result in excessive leaf drop and/or tree defoliation. Use higher rates when temperatures are cool.	Application must be made before fruit set for best results. Do not treat weak trees or trees under stress (drought insect or disease damaged trees) as excessive leaf drop or twig drop can result. Some leaf drop or temporary leaf yellowing may occur after treatment.
CAROB (<i>Certonia siliqua</i>)	0.25 (4 fl oz)	Apply as a foliar spray. Wet all foliage thoroughly.	Do not use on small red fruited varieties of crabapple as fruit elimination will not be satisfactory.
OLIVE (<i>Olea europaea</i>)	0.5 (8 fl oz)	Amount of spray will depend on tree size.	

[Not currently registered for use in California]

TURF

(Do not use in California for Seedhead Suppression)

Ethephon 3# is a plant growth regulator that may be used to suppress the formation of seedheads of various plants including *Poa annua* and white clover. It may also be used to suppress the growth of certain cool season grasses. Ethephon 3# is foliarly absorbed and is most effective on actively growing healthy turf. For best results apply in sufficient volume of water to provide uniform coverage. Use of spreader/sticker with an application of Ethephon 3# is not necessary.

Ethephon 3# is rainfast within 2 hours. Do not allow entry into treated area until Ethephon 3# has dried. For maximum performance delay mowing until the day after application.

Precautions and Restrictions

Do not treat turfgrass with poor root systems or growing under stress due to poor soil conditions, drought, disease, or insect damage.

Do not use Ethephon 3# in areas where excessive thatch has accumulated.

Scalping may occur on creeping bentgrass cultivars after more than 2 applications of Ethephon 3# for *Poa* seedhead suppression.

Ethephon 3# has been used successfully on many bentgrass cultivars. Tolerance testing should be done in new cultivars before extensive use.

Do not exceed a maximum of 20 fl oz of Ethephon 3# per 1,000 sq ft per year.

Do not mix with ammonium thiosulfate. This tax mix may result in the formation of toxic fumes.

Seedhead Suppression Foliar application of Ethephon 3# will provide suppression of *Poa annua* and white clover seedheads. Make the initial application prior to the emergence of new seedheads. A period of 2-3 weeks after application is required for maximum performance. Repeat applications may be made to predominately *Poa annua* or white clover sites as needed, but not less than two weeks after the previous application.

APPLICATION	SITES	RATE	SPRAY VOLUME
<i>Poa annua</i> and White Clover Seedhead Suppression	Golf course turf including Greens, Tees, Fairways and Roughs	3 1/3 fl oz/1,000 sq ft	1.0-2.0 gal/1,000 sq ft

Reapplication interval 2 weeks or greater for all labeled grasses	Commercial Turfgrasses including Bentgrass Kentucky Bluegrass Perennial Ryegrass Tall and Fine Fescue and Bermudagrass		
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Tank Mixture with Products containing the active ingredient Trinexapac Ethyl

Tank mixtures of Ethephon 3# at 3 1/3 fl oz/1 000 sq ft and trinexapac ethyl containing products at 0.125 or 0.25 fl oz/1 000 sq ft can be used to promote seedhead suppression as well as turfgrass quality. Multiple applications of the tank mix combination may be needed. The number of applications must not exceed labeled rates or timings for either product applied once. Follow the recommendation on each product label for the most restrictive application interval for each turfgrass. Application of this tank mixture during frost periods may cause temporary turf discoloration.

Growth Suppression An application of Ethephon 3# slows the growth of turfgrasses thus reducing the required frequency of mowing and the volume of clippings collected. For best turfgrass growth regulation apply Ethephon 3# when daytime air temperatures are 65 F and rising. Ethephon 3# should only be applied once turfgrass mowing heights have been established for the season. Avoid multiple applications of Ethephon 3# in areas where excessive thatch has accumulated.

APPLICATION	SITES	RATE	SPRAY VOLUME
Turfgrass Growth Regulation Reapplication intervals Kentucky Bluegrass 7 weeks Perennial Ryegrass 7 weeks Tall/Fine Fescue 4 weeks Bentgrass 4 weeks	Golf course turf including Greens Tees Fairways and Roughs Commercial Turfgrasses Including Bentgrass Kentucky Bluegrass Perennial Ryegrass Tall and Fine Fescue	3 1/3 fl oz/1 000 sq ft	1.0 to 2.0 gal/1 000 sq ft

Do not use in California on greens or tees unless accompanied by supplemental labeling

NOTE Since Ethephon 3# is an acidic product prolonged exposure to spray deposits will damage acrylic plastics certain paints and metals. Thoroughly rinse all exposed acrylic plastic materials and painted surfaces with a detergent and water within one hour after exposure to spray deposits.

STORAGE AND DISPOSAL

Do not contaminate water food or feed by storage and disposal

PESTICIDE STORAGE Store pesticide in original container. If container is broken or contents have spilled, follow all precautions as outlined above and clean up immediately. Before starting clean up, put on the appropriate protective clothing such as long pants or coveralls, long sleeved shirt, appropriate footwear and gloves, and face shield or goggles if needed. Soak up spilled product with an appropriate media such as sand, earth, or clay cat litter and dispose of waste at an approved waste disposal facility.

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

Containers equal to or less than 5 gallons 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. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by other processes allowed by state and local authorities.

Containers greater than 5 gallons 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. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Offer for recycling, if available, or puncture and dispose of in a sanitary landfill, or by other processes allowed by state and local authorities.

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

Warranty and Disclaimer Statement

The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Such risks may arise from weather conditions, soil factors, off target movement, unconventional farming techniques, the presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Arysta LifeScience North America, LLC, and can cause crop injury, injury to non target crops or plants, ineffectiveness of the product, or other unintended consequences. All such risks shall be assumed by the user or buyer. Arysta LifeScience North America, LLC warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks described above, when used in accordance with the Directions for Use under normal conditions. This warranty does not extend to the use of this product contrary to label instructions or under conditions not reasonably foreseeable to Arysta LifeScience North America, LLC, and is subject to the inherent risks described above.

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