



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

JUL 17 1995

Micro Flo Company
P.O. Box 5948
Lakeland, Florida 33807

Attention: Lee Tharington

Subject: Ethephon 2#
EPA Registration No. 51036-243
Your label amendment application dated June 9, 1995

Dear Mr. Tharington,

The amendment referred to above, submitted in connection with registration under section 3(c)(7)(A) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, is acceptable provided that you:

1. Submit/cite all data required for registration or reregistration of your product under FIFRA section 3(c)(5) or 4(A) when the Agency requires all registrants of similar products to submit such data.

2. Make the labeling changes listed below before you release the product for shipment bearing the amended labeling:

a. Move the first sentence in the Environmental Hazards section:

"Do not contaminate water used for
irrigation or domestic purposes."

to a location in the same section that follows the first paragraph.

b. In the fourth paragraph of the "AGRICULTURAL USE REQUIREMENTS" section, make "entrance" plural:

"...by posting warning signs at entrances to treated areas."

- c. In the first table in the "TOMATOES" subsection of the "DIRECTIONS FOR USE", the column title "Spray Volume Gallons/Acres" should be changed to "Spray Volume Gallons/Acre".
- d. In the last table in the "TOMATOES" subsection of the "DIRECTIONS FOR USE", in the first sentence in the "SPECIFIC DIRECTIONS" column:

"... , generally 3 to 6 days before harvest rate."

change "rate" to "date".

- e. In the table in the "GRAPES" subsection of the "DIRECTIONS FOR USE", in the "REMARKS" column, the word "Vitriculturist" occurs twice. In both cases Change it to "Viticulturist".
- f. In the "LATE MATURING VARIETIES" part of the table (on page 13) in the "APPLES" subsection of the "DIRECTIONS FOR USE", change the first part of the parenthetical clause in the "CROP SITUATION" column from "(varities maturing later..." to "(varieties maturing later...".
- g. In the "THINNING AND RETURN BLOOM ON GOLDEN DELICIOUS ...SPUR GOLDEN DELICIOUS" part of the table (on page 14) in the "APPLES" subsection of the "DIRECTIONS FOR USE", change the second sentence in the "REMARKS" column from "Regulating cropping form one season to another..." to "Regulating cropping from one season to another...".
- h. In the "REMARKS" column of the table in the "BLACKBERRIES" subsection of the "DIRECTIONS FOR USE", change "...number of pickings or 2 #) treat later..." to "...number of pickings or 2) treat later...".
- i. About two-thirds of the way down in the "REMARKS" column of the table in the "CANTALOUPE" subsection of the "DIRECTIONS FOR USE", change "...Thus, using Ethephon 2 # too soon will result in poorly colored with substandard..." to "...Thus, using Ethephon 2 # too soon will result in poorly colored fruit with substandard...".
- j. The second bulleted item below the table in the "CANTALOUPE" subsection of the "DIRECTIONS FOR USE" begins with "Treat only those fruit that have a fairly uniform fruit set...". Should this instead read "Treat only those plants that have a fairly uniform fruit set..."?

3. Submit one (1) copy of your final printed labeling before you release the product for shipment. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product bearing the labeling constitutes acceptance of these conditions.

A copy of the labeling stamped "ACCEPTED with COMMENTS" is enclosed for your records.

If you have any questions about this letter, please contact John Bazuin at (703)305-5611.

Sincerely yours,



James M. Stone
Acting Product Manager (22)
Fungicide-Herbicide Branch
Registration Division (7505C)

Attachment: Label copy stamped "ACCEPTED with COMMENTS"

4/23

ETHEPHON 2#

PLANT REGULATOR

For Commercial or Agricultural Use Only. Not for Residential Use.

For use on Tomatoes, Cherries, Grapes, Apples, Walnuts, Peppers, Blackberries, Cantaloupes, Pineapple, and Sugarcane (Hawaii only).

ACTIVE INGREDIENT:

Ethephon [(2-chloroethyl)phosphonic acid]* 21.7%

INERT INGREDIENTS: 78.3%

TOTAL: 100.0%

*Contains 2 pounds ethephon per gallon.

KEEP OUT OF REACH OF CHILDREN

WARNING AVISO

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.)

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Do not induce vomiting. Promptly drink a large quantity of milk, egg whites, gelatin solution, or if these are not available, drink large quantities of water. Avoid alcohol. Call a physician immediately.

IF ON SKIN: Immediately wash with plenty of soap and water.

IF INHALED: Remove victim to fresh air. If not breathing, give artificial respiration. Administer oxygen if necessary. Get medical attention.

IF IN EYES: Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Get medical attention.

NOTE TO PHYSICIAN: 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.

EPA Reg. No. 51036-243

EPA Est. No. 51036-GA-1

ACCEPTED

with COMMENTS

In EPA Letter Dated:

Manufactured By:

MICRO FLO COMPANY

P.O. Box 5948

Lakeland, FL 33807

JUL 17 1995

the Federal Insecticide

and Fungicide Act

for the pesticide

EPA Reg. No.

51036-243

PRECAUTIONARY STATEMENTS

WARNING

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

HARMFUL IF SWALLOWED. May cause eye damage. Do not get in eyes. Avoid contact with skin or clothing and do not inhale vapors as this product will irritate skin and mucous membranes. Avoid contamination of food. If taken internally call a physician and promptly drink large quantities of milk, egg white, gelatin solution or if these are not available, large quantities of water.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves, 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 (WPS) for agricultural pesticides [40 CFR 170.24(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, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash body thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

Do not contaminate water used for irrigation or domestic purposes. 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.

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.

IMPORTANT: Do not apply Ethephon 2 # 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 Ethephon 2 #

For termites -
trial uses -
deleted

Approp-
riate
here?

per acre per year recommended 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.

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, waterproof gloves, shoes plus socks and protective eyewear.

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

STORAGE AND DISPOSAL

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

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

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

Ethephon 2 # HELPS NATURE HELP YOU Ethephon 2 # promotes earlier coloration and maturity of TOMATOES, GRAPES, APPLES, and PEPPERS. Loosens CHERRIES, WALNUTS, and APPLES for earlier, more efficient

harvest. Promotes fruit abscission (slipping) in CANTALOUPEs. Increases dormant fruit bud hardiness and delayed spring bloom of SWEET CHERRIES in the Pacific Northwest. Accelerates BLACKBERRY ripening and loosening.

GENERAL INFORMATION

When Ethephon 2# is applied to plants, the product decomposes within the plant tissue to release ethylene, a naturally occurring plant hormone. *misspelled*

For local recommendations on rates, spray volumes (gallons of water per acre), and spray equipment under varying temperature and rainfall conditions consult your Extension Pomologist, Horticultural Specialist, Micro Flo Company Representative or Farm Advisor for his experience with this product in your area.

TOMATOES (PROCESSED) A foliar spray of Ethephon 2 # accelerates and concentrates tomato ripening increasing recoverable fruit yield from a once-over harvest. Ethephon 2 # application starts the normal ripening process earlier and increases the rate of ripening of mature green fruit, concentrating maturity. Concentrated maturity enables high recoverable yields of ripe tomatoes in once-over harvest. Early concentrated maturity extends the normal harvest season and helps growers schedule harvest and handling more effectively.

TOMATOES (FRESH MARKET IN CALIFORNIA) A foliar spray of Ethephon 2 # accelerates tomato ripening increasing the early yields of marketable ripe fruit.

CHERRIES: A foliar spray of Ethephon 2 # loosens fruit and promotes early uniform ripening, and reduces the shaker force needed to mechanically harvest fruit. These effects are important for increasing efficiency, recoverable yields, maintaining fruit quality and reducing tree injury. **DO NOT USE ON CHERRIES IN CALIFORNIA.** A fall application of Ethephon 2 # to sweet cherries in the Pacific Northwest area increases dormant bud hardiness and delays bloom the following spring.

GRAPES (Table grapes in California and Arizona): An application of Ethephon 2 # promotes early uniform color development on table grape varieties. Cardinal, Emperor, Flame Seedless, Red Malaga, Queen and Tokay allowing more efficient harvests of quality fruit.

GRAPES (Raisin Production): A foliar spray of Ethephon 2 # will hasten maturity of Thompson Seedless grapes resulting in reduced acids, increased sugars and increased raisin quality.

APPLES: A foliar spray of Ethephon 2 # promotes fruit maturity and loosens apples, making harvest by hand or machine easier and more efficient. Ethephon 2 # applied in combination with FRUITONE N to

control pre-harvest drop, stimulates early development of red color and ripening without loosening fruit. Applied to young trees, Ethephon 2 # will suppress vegetative growth and promote flower bud formation.

WALNUTS IN CALIFORNIA: A foliar spray of Ethephon 2 # will loosen walnuts for increased efficiency of mechanical harvest, promote earlier harvest, improve hull removal, and increase recoverable yields from a once-over harvest.

PEPPERS: A foliar spray of Ethephon 2 # promotes early, uniform ripening and coloring for more efficient packing and handling of fruit.

BLACKBERRIES IN OREGON AND WASHINGTON: A foliar spray of Ethephon 2 # will concentrate maturity and loosen fruit, improving harvesting efficiency while reducing cane injury from mechanical harvest.

CANTALOUPE IN CALIFORNIA, ARIZONA AND TEXAS: A foliar spray of Ethephon 2 # promotes abscission (slipping) of fruit allowing more efficient and economical harvesting.

PINEAPPLE FLOWER INDUCTION: Application of Ethephon 2# will induce uniform flower initiation of pineapple plants.

PINEAPPLE MATURITY CONCENTRATION: Application of Ethephon 2# will stimulate uniform shell color of pineapple fruit.

SUGARCANE FLOWER PREVENTION: A foliar spray of Ethephon 2# will reduce or prevent flowering of sugarcane.

SUGARCANE BIOMASS INCREASE: Ethephon 2# application to prevent flowering can result in increased biomass accumulation and increased recoverable sugars.

USE PRECAUTIONS

Mix only the amount of spray you expect to use each day. Do not allow mixed solution to stand overnight.

Avoid spray drift to nearby crops as this product will cause modification in plant growth. Plant injury or reduced yields will result. Do not plant another crop within 30 days after treatment. Do not use Ethephon 2 # with additives other than recommended on this label.

Avoid spills of concentrated product on spray equipment or airplane parts.

TOMATOES

Crop Situation	Ethephon 2 # Pints/Acre	Spray Volume Gallons /Acre ^s	Specific Directions	Remarks
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should be deleted

<p>EARLY AND MID- SEASON CROPS OR WARM CON- DITIONS</p>	<p>1 1/4 TO 3 1/4</p>	<p>ground 20-100</p> <p>air 10-12</p>	<p>Apply when 5% to 15% of the fruit in the field are red and pink (including breakers) and there is sufficient mature green fruit to produce the desired tonnage. Under high temperatures (above 85 F), rates as low as 1 1/4 pints/acre can be effective.</p> <p>Uniform ripening requires uniform spray coverage of foliage and fruit. Overdosing from overlapping swaths or spray nozzle patterns can cause severe foliage injury. If bands are sprayed over the row, reduce the amount of Ethephon 2 # used in proportion to the area actually treated. Observe treated fields closely and harvest fruit at proper maturity.</p>	<p>Apply Ethephon 2 # when desired tonnage of fruit has reached marketable size and maturity. Check fields closely for stage and degree of uniform maturity prior to application. Sample several plants throughout the field to determine proper spray date. Sort, weigh and calculate the percent fruit which is red and pink, including breakers. Fruit size alone is not an adequate indicator. Observe specific directions to determine treatment stage for your situation. Walk treated fields frequently to evaluate crop condition. Maintain normal cultural practice between treatment and harvest. Timely harvest is essential for maximum return of high quality fruit. Consult processor representatives concerning delivery schedules and quotas prior to application of Ethephon 2 #. Consult your local Micro Flo Co. representative, Extension Horticulture Specialist or Farm Advisor for suggestions on the proper use of Ethephon 2 # when fields have variable plant vigor due to differences in soil conditions or cultural practices and for rates of fruit ripening as affected by temperature, within the rate and timing limitations shown on the label.</p>
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LATE SEASON OR COASTAL CROPS OR COOL CON- DITIONS	3 1/2 TO 6 1/2	ground 20-100 air 10-12	Apply when 5% to 30% of the fruit in the field are red and pink (including breakers) and there is sufficient mature green fruit to produce the desired tonnage. Maximum response is achieved when fruit to be treated is 5% to 15% pink and red. Use the higher rate of Ethephon 2 # when nighttime temperatures are cool (below 65°F) or vegetative growth is dense.	Harvest at proper maturity. Temperatures above 90°F may cause fruit to ripen sooner whereas temperatures below 65°F retard natural color development and may extend the time between treatment and harvest.
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Use Limitations

- Do not apply before there is sufficient mature green fruit to produce the desired tonnage. Ethephon 2 # will not ripen immature green fruit.
- Some yellowing and general aging of foliage may be observed following treatment.
- Do not treat plants with poor root systems or growing under stress due to poor soil conditions, drought, disease or insect damage. Treatment of weak plants will result in rapid loss of foliage cover increasing sunburn and sun scald potential, especially under high temperature conditions.
- Do not treat when sustained temperatures above 105°F are anticipated.
- Do not treat sensitive varieties during period when temperatures exceed 100°F. Foliar damage is more severe on certain varieties such as VF 10, VF 315, VF 145, 21-4, and 13L. During periods of high temperatures use the lower rates on sensitive varieties.
- Do not tank mix with sun protection products, sun protection whiteners, spray adjuvants or other additives.
- Do not apply Ethephon 2 # to more acreage than can be harvested in 2 to 3 days.
- Do not apply Ethephon 2 # to varieties known to soften rapidly or shatter when ripe.
- Do not use on greenhouse tomatoes.
- Do not harvest tomatoes treated with Ethephon 2 # sooner than 3 days after last application.

CROP SITUATION	Ethephon 2 # pts/acre	SPRAY VOLUME gal/acre	SPECIFIC DIRECTIONS	REMARKS
FRESH MARKET TOMATOES California	1 1/4 - 5	ground 40-100 air 10-12	Apply Ethephon 2 # when desired tonnage of fruit has reached marketable size and maturity, generally 3 to 6 days before harvest date. Expect only one harvest from treated areas. Use the higher rate and longer preharvest interval on late season crops, when temperatures are cool (generally below 85°F) and foliage is dense. Under high temperatures, rates as low as 1 1/4 pints per acre have been effective while reducing foliage damage particularly on more sensitive varieties - see above.	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.

Use Limitations

- Do not harvest fresh market tomatoes treated with Ethephon 2 # sooner than 3 days after last application.

CHERRIES

CROP SITUATION	Ethephon 2 # Pts/acre	SPRAY VOLUME gal/acre	SPECIFIC DIRECTIONS	REMARKS
TART CHERRIES	Dilute Spray 1/2 per 100 gal	300	Apply as a dilute spray with sufficient water for thorough coverage, generally 300 gallons per acre depending on the type of delivery of sprayer used and size of trees.	Expect a longer treatment to harvest interval with lower rates.
	Concentrate Spray 2/3 to 1	50-100	Uniform coverage is essential for optimum response.	

SWEET CHERRIES (varieties such as Windsor, Napoleon-Royal Anne, Emperor Francis)	Dilute Spray 2/3 to 1	300	Apply as a dilute spray with sufficient water for thorough coverage, generally 300 gallons per acre depending on the type of delivery of sprayer used and size of trees. Use low rates on the light or yellow-colored varieties.	
	Concen- trate Spray 2-3	50-100	Uniform coverage is essential for optimum response.	
INCREASED DORMANT FRUIT BUD HARDINESS AND DELAYED SPRING BLOOM (Sweet Cherries in the Pacific Northwest)	3	300-400	Treat in first two weeks of September.	A fall application of Ethephon 2 # 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.

Use Limitations

- Not for use on cherries in California
- Do not treat too early as this can cause early fruit drop with stems attached.
- Some gummosis of cherry trees is associated with treatment.
- High temperatures during and after application may cause severe gummosis.
- Do not treat trees that had severe gummosis the previous year as tree damage will result.
- Do not apply to trees that are of low vigor or have experienced severe stress (such as winter injury, drought, or disease), since gummosis will be excessive, particularly when high temperatures and/or drought follow treatment.
- If possible, irrigate orchards to prevent drought stress resulting in gummosis.
- Do not harvest cherries treated with Ethephon 2 # sooner than 7 days after last application.
- At the time of application, all fruit including those inside the tree canopy, should be in stage 3 as indicated by rapid size

increase and the presence of ground color (change from bright green to yellow back-ground color). Treat when air temperatures are between 60 and 85°F. Do not treat when air temperatures exceed 85°F. Uniform coverage is important, concentrated sprays associated with erratic application can result in gummosis and tip dieback.

- Some early leaf yellowing and drop may be noted following application.
- Slight gummosis and individual fruit size reduction may result with fall application bud hardiness treatment.

GRAPES
Only in California and Arizona

CROP SITUATION	Ethephon 2 # Pts/acre	SPRAY VOLUME gal/acre	SPECIFIC DIRECTIONS	REMARKS
TABLE GRAPES (such as Cardinal, Flame Seedless, Red Malaga, and Queen)	1-2	ground 50-30	<u>Apply in sufficient water to wet vines and fruit clusters uniformly, using conventional ground sprayers.</u> <u>Treat when 5-30% of berries show color.</u>	Harvest fruit at desired maturity and quality as indicated by sugar content, acidity and color. This is generally two weeks or more after treatment. Watch treated areas closely and harvest before berries become too dark. For more information regarding local experiences with this product on grapes, consult your Farm Advisor or Extension Viticulturist.
TOKAY GRAPES	1-2	ground 25-50 air 20	Treat Tokays 5-15% of berries show color.	
RAISIN PRODUCTION (Thompson Seedless)	1-2	ground 30-300	Apply as a foliar spray at 5% berry softening. Treat when 5-30% of berries show color.	A foliar spray of Ethephon 2 # will hasten maturity of Thompson Seedless grapes resulting in reduced acids, increased sugars and increased raisin quality. For more information regarding local experience with this product on grapes consult your Farm Advisor or Extension Viticulturist.

Use Limitations

- Rates higher than 1 pint/A may increase the incidence of cracked fruit and should be used only in areas or during weather conditions where grapes have been especially hard-to-color in.

past seasons.

- Some berry softening is associated with Ethephon 2 # treatment of some varieties which may limit or influence storage considerations.
- Do not store Tokays.
- Do not harvest grapes treated with Ethephon 2 # sooner than 14 days after last application.

Raisin Production (Thompson Seedless)

- Do not apply to grapes under stress from insect damage or moisture stress. Observe treated vineyards closely and harvest at proper maturity as determined by sugar and acid levels.

APPLES

CROP SITUATION	Ethephon 2 # Pts/acre	SPRAY VOLUME gal/acre	SPECIFIC DIRECTIONS	REMARKS
FRUIT LOOSENING EARLY AND MIDSEASON MATURING VARIETIES (such as Tydeman, Milton, Wealthy and McIntosh)	2 1/2	50-500	Apply a foliar spray to apple trees 7 to 14 days prior to normal anticipated harvest. Use sufficient water for thorough uniform spray coverage. The type of sprayer used and size of trees will effect volume required. Observe fruit daily as the proper picking period is shorter with Ethephon 2 # treated fruit than untreated fruit.	Ethephon 2 # provides several beneficial responses on apples. Depending on rate and time of application Ethephon 2 # will: promote fruit loosening, promote uniform ripening and coloring without loosening, promote thinning and return bloom, and increase flower bud development in young trees. For desired response follow specific directions. Treat when air temperatures are between 60°F and 90°F. However, application may be made at 50°F under rising temperature conditions. If day-time temperatures are warm, color response from Ethephon 2 # treatment will be reduced, but ripening and loosening effects will be accelerated. Cool weather may extend the interval between treatment and harvest.

<p>LATE MATURING VARIETIES (such as Cortland, Red Delicious, Rome, Idared and Jonathon)</p>	<p>5</p>	<p>50-500</p>		<p>Do not allow fruit to become overripe on trees. Fruit intended for fresh market must be checked for quality and maturity. Color alone is not an adequate guide for fruit maturity. Use a pressure gauge or other suitable methods for determining internal maturity. Fruit over-matured when harvested and stored may soften sooner than untreated fruit.</p> <p>Do not apply Ethephon 2 # to more acreage than can be harvested in 1 to 2 days. Treated fruit can be satisfactorily stored in a controlled atmosphere or regular cold air storage provided fruit is in good condition when put in storage.</p>
<p>PROMOTION OF UNIFORM RIPENING AND COLORING OF RED VARIETIES WITHOUT LOOSENING</p> <p>EARLY OR MID-SEASON MATURING VARIETIES (varieties maturing with McIntosh or earlier).</p>	<p>1/2-1 per 100 gal</p>	<p>200-400</p>	<p>Apply foliar spray of Ethephon 2 # and a preharvest drop control chemical such as FRUITONE brand N. Begin spraying 2 to 3 weeks before normal harvest period and about 1 to 2 weeks before desired harvest date.</p>	

add "e"

LATE MATURING VARIETIES (varieties maturing later than McIntosh)	1 per 100 gal	200-400	<p>Apply as a normal dilute spray using sufficient water for thorough coverage, generally 200 to 400 gallons per acre depending on size of trees. Use the lower rate on apples intended for storage.</p> <p>Since recommendations for chemical control of preharvest drop vary according to location and variety, follow directions on the FRUITONE brand N label or consult your local extension Pomologist or Horticulturist for his recommendations.</p>
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Use Limitations

- For best results a thorough uniform spray is needed. A wetting agent may improve spray coverage.
- Do not graze or feed cover crops grown in treated apple orchards.
- Do not harvest apples treated with Ethephon 2 # sooner than 7 days after last application.
- Fruit size reduction may occur when used to obtain early maturity, especially if fruit is small at time of treatment.
- Ethephon 2 # applied earlier than 3 weeks before normal anticipated harvest may result in reduced fruit quality and size.

CROP SITUATION	Ethephon 2 # Pts/acre	SPRAY VOLUME gal/acre	SPECIFIC DIRECTIONS	REMARKS
THINNING AND RETURN BLOOM ON GOLDEN DELICIOUS	1/2-1 per 100 gal	300-400	Treat 10 to 20 days after full bloom. For greater thinning apply AMID-THIN W at 3 to 4 oz plus Ethephon 2 # at 1/2 to 1 pint per 100 gallons of spray solution. Treat 10 to 20 days after full bloom.	Golden Delicious is a difficult variety to adequately thin. Regulating cropping from one season to another is also a serious problem. Whenever a high percent of the spurs and lateral buds bloom in a single season severe alternate bearing can develop the following year.
SPUR GOLDEN DELICIOUS	1-1 1/2 per 100 gal	300-400	The addition of a non-ionic surfactant can enhance treatment effectiveness.	To overcome this problem use Ethephon 2 # or a combination of Ethephon 2 # plus AMID-THIN W applied 7 to 21 days after full bloom. The program to use will depend on the amount of thinning required and the biennial bearing history of your orchard.
INCREASED FLOWER BUD DEVELOPMENT ON YOUNG TREES	1-2 per 100 gal	200-400	Spray trees thoroughly and uniformly to the point of runoff. Use the higher rate on more vigorous trees.	To increase flower bud development on young non-bearing trees apply a foliar spray of Ethephon 2 #, 3 to 4 weeks after bloom.
NON-BEARING TREES			Treat 2 to 4 weeks after full bloom period.	Treatment can result in excessive fruit thinning and reduced fruit size and yield reduction the year of usage. Ethephon 2 # should reduce vegetative growth and increase flowering the following spring.
YOUNG TREES JUST STARTING TO BEAR	1/2-1 per 100 gal	100-300	Apply Ethephon 2 #, 5 to 6 weeks after full bloom and after June drop.	Trees should be large enough to support a crop of apples before treatment to initiate flower buds.

Use Limitations

- The use of Ethephon 2 # can result in over thinning and reduced fruit size.
- Avoid double coverage and use on low vigor trees.
- Environmental factors can affect thinning and return bloom, it is

advisable to obtain experience under your conditions by initially testing only a small percent of your trees each year with any one program.

- User must consider risk of excessive fruit thinning and fruit size reduction when using Ethephon 2 # on young trees just starting to bear.
- Treat only vigorous trees since excessive growth reduction will result on weak trees.

WALNUTS

CROP SITUATION	Ethephon 2 # lbs/Acre	SPRAY VOLUME Gal/Acre	SPECIFIC DIRECTIONS	REMARKS
CALIFORNIA	3-5	100-500	Spray volumes will depend on spray equipment and size of trees. Treat when air temperatures are between 60°F and 90°F and after the packing tissue of all nuts inspected are completely brown. Use 5 pints per acre when minimum time interval between treatment and harvest is desired and with cool temperature harvest conditions. Uniform spray coverage of walnut hulls is essential for maximum hull split and loosening response. Be sure equipment provides good penetration of spray to all parts of the tree. Check nozzle systems frequently to assure uniform distribution of spray droplets. Do not operate equipment in excess of 3 mph. Use directional spray volume equipment when treating tall dense foliage trees.	Maximum benefit is obtained with application immediately after walnut packing tissue has turned brown. For a programmed harvest, spray a different orchard block each day and harvest blocks daily in same sequence starting 5 to 10 days after treatment. Inspect treated orchards frequently and harvest as soon as adequate hull split occurs, generally 5 to 10 days after treatment. Cool temperatures increase the time required for optimum harvest response. As with early harvest, longer drying time may be required.

Use Limitations

- Treatment prior to brown coloration of packing tissue may reduce nut quality.

- Some leaf drop is associated with treatment.
- * Do not treat disease, low vigor or moisture stressed trees as excessive leaf drop may occur.
- Rates above that recommended are illegal and may result in tree injury (such as excessive defoliation, reduced catkin formation, twig dieback).
- Do not harvest walnuts treated with Ethephon 2 # sooner than 5 days after last application.

PEPPERS

CROP SITUATION	Ethephon 2 # Pts/Acre	SPRAY VOLUME Gal/Acre	SPECIFIC DIRECTIONS	REMARKS
PEPPERS	3-4	40-100	Apply with ground equipment. Use the higher rate when cool temperatures are anticipated (less than 65°F), when plants are growing vigorously or when foliage is dense to assure thorough wetting of all leaves and fruit. Apply Ethephon 2 # to bell peppers when 10% of fruit are red and chocolate and to pepper varieties, chili and pimento when 10 to 30% of fruit are red and chocolate and there is sufficient mature green fruit to produce desired tonnage. Ethephon 2 # will not ripen immature, green fruit.	Check several field locations to determine crop stage and degree of maturity. Ethephon 2 # treatments may reduce total yields if applied too early or there is a lack of uniform, mature, green fruit resulting from split fruit set or variable soil cultural practices. Harvest fruit after desired color and maturity, generally 14 or more days after treatment.

Use Limitations

- Do not apply when prolonged average high temperatures of 95°F after treatment are expected.
- Do not treat when temperatures exceed 100°F. Applications made under high temperatures will accentuate fruit ripening, yellowing of foliage, defoliation and immature fruit abscission.
- Do not treat when average temperatures are below 60°F. Low temperatures after treatment may reduce or negate the effects of Ethephon 2 #.
- Some yellowing and general aging of leaves will be noted after treatment.
- Do not harvest peppers treated with Ethephon 2 # sooner than 5 days after last application.

NOTE: Under certain conditions tank mixtures of Ethephon 2 # with desiccants containing sodium chlorate could result in the formation

of hypochlorous acids which on heating will emit toxic chloride fumes.

BLACKBERRIES

CROP SITUATION	Ethephon 2 # Pts/Acre	SPRAY VOLUME Gal/Acre	SPECIFIC DIRECTIONS	REMARKS
IN OREGON AND WASHINGTON (Cultivars Chehalem Thornless and Evergreen)	5 per 100 gal	100-175	To loosen fruit and concentrate maturity, apply a foliar spray of Ethephon 2 # at least 3 days prior to expected harvest when air temperatures are between 60°F and 90°F and rain is not predicted within 24 hours.	Use Ethephon 2 #: 1) early in the harvest season to reduce the number of pickings or 2) treat later in the harvest season for a once-over final picking. delete

Use Limitations

- Do not spray more than can be harvested on the third day following treatment as considerable fruit may drop.
- Use only at recommended times and rates on healthy, vigorous plants, as a reduction in berry size may occur. Do not use on damaged or diseased plants.
- Do not harvest blackberries treated with Ethephon 2 # sooner than 3 days after application.

CANTALOUPE

CROP SITUATION	Ethephon 2 # Pts/Acre	SPRAY VOLUME Gal/Acre	SPECIFIC DIRECTIONS	REMARKS
CALIFORNIA AND ARIZONA	3	40-80	Good spray coverage is important for	For more specific directions under
TEXAS	3	ground 40-80 air 10-12	producing uniform abscission. Be prepared to harvest abscised fruit 2 to 5 days after treatment. The exact pre-harvest interval will vary with temperature. Be sure to coordinate your harvesting schedule with your packer/shipper.	<p>varying temperature and moisture conditions, consult your Extension Horticulturist or Farm Advisor for his experience with Ethephon 2 # in your area. The effect will be faster at higher temperatures. Proper timing of Ethephon 2 # treatment is critical, but may vary from season to season. Fruit quality, in terms of soluble solids and flesh color, does not improve following treatment. Therefore, Ethephon 2 # should not be used until after fruit has developed marketable levels of soluble solids and flesh color. Ethephon 2 # promotes abscission of immature fruit as well as marketable fruit. Thus, using Ethephon 2 # too soon will result in poorly colored with</p> <p>substandard soluble solids. Observe treated fields frequently and pick fruit when market quality is reached. Fruit allowed to remain in the field too long will lose quality. Some yellowing or rapid aging of vines will be seen following treatment. Plants with low vigor will not respond properly. Do not plant another crop within 30 days after treatment.</p>

add
"Fruit"

Use Limitations

- Ethephon 2 # should not be applied when night temperatures are below 60°F.
- Treat only those fruit ^{"plants"?} 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%.

- Do not harvest cantaloupes treated with Ethephon 2 # sooner than 2 days after last application.

PINEAPPLE AND SUGARCANE

CROP SITUATION	Ethephon 2# PTS/ACRE	SPRAY VOLUME gal/acre	APPLICATION TIMING	SPECIFIC DIRECTIONS	RESTRICTIONS
PINEAPPLE Flower Induction Ethephon 2# applied to pineapple plants will stimulate uniform initiation of flowering.	3-1/2 to 7-1/3	100 to 500	"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 2#. Do not harvest pineapples treated with Ethephon 2# sooner than 2 days after the last application.
PINEAPPLE Maturity Concentration Ethephon 2# application will stimulate uniform shell color development.	1-3/4 to 3-1/2	100 to 300	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.	

add "aircraft"

SUGARCANE (for use in Hawaii only) Flower Prevention Ethephon 2# application will prevent or reduce flowering and pithy tissue formation. Biomass Increase Ethephon 2# used to prevent flowering can also result in increased biomass accumulation and recoverable sugar yield.	1-3/4	7 minimum	Just prior to flower initiation	Apply by 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.	Do not harvest sugarcane treated with Ethephon 2# sooner than 2 months after the last application. Do not graze sugarcane forage treated with Ethephon 2#.
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