ETHEPHON 2#

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

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

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

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

- 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 SWALLOWED

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

IF ON SKIN OR CLOTHING

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

IF INHALED

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

NET CONTENTS_____

ACCEPTED
JAN 25 2001
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 51036-243

Complete copy

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

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

EPA Reg. No. 51036-243 EPA Est. No. 51036-GA-1

See inside booklet for additional precautionary statements.

Manufactured By:

MICRO FLO COMPANY
P.O. BOX 772099
MEMPHIS, TN 38117

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

DANGER. Causes irreversible eye damage and skin burns. Harmful if swallowed or absorbed through skin. Do not get in eyes on skin or on clothing. Avoid breathing spray mist. 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)

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:

- long-sleeved shirt and long pants
- chemical resistant gloves made of any waterproof material,
- shoes plus socks
- 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.
Users should remove clothing immediately if pesticide gets inside. Then wash body thoroughly and put on clean clothing.
Users should remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing. Wash the outside of gloves before removing.

ENVIRONMENTAL HAZARDS

Do not 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: Do not use this product for purposes other than those listed on the label. Do not exceed the rate of Ethephon 2# 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.

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

Do not apply Ethephon 2# through any type of irrigation system.

SPRAY DRIFT

Avoid spray drift. Do not apply when weather conditions may cause drift. Do not allow this product to drift on to non-target areas. Drift may result in illegal residues or injury to adjacent crops and vegetation, in the form of leaf yellowing and defoliation. To avoid spray drift, DO NOT apply aerially when wind speed is greater than 10 mph or during periods of temperature inversions. Use of larger droplet size will also reduce spray drift.

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

The interaction of many equipment-and-weather-related factors determine 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 should be observed.

The applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory below:

AERIAL DRIFT REDUCTION ADVISORY

INFORMATION ON DROPLET SIZE

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

CONTROLLING DROPLET SIZE

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

Pressure - Do not exceed the nozzle manufacturer's 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.

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, 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.

STORAGE AND DISPOSAL

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

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 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# promotes earlier, uniform coloring of mature FLUE-CURED TOBACCO. 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. Ethephon 2# reduces lodging in WHEAT and BARLEY. Removes dwarf mistletoe from ORNAMENTAL CONIFERS and leafy mistletoe from ORNAMENTAL DECIDUOUS TREES. Eliminates undesirable fruit on APPLE, CRABAPPLE, CAROB, and OLIVE.

GENERAL INFORMATION

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.

APPLICATION VOLUMES AND SPRAY COVERAGE

Thorough spray coverage is essential to achieve maximum product effectiveness. Spray coverage is affected by choice of equipment, nozzle selection and spray boom setup as well as spray pressure, plant size and canopy density. For both air and ground applications, it is important to choose an equipment setup that will assure thorough coverage of plant canopy (foliage and fruit). The actual spray volume required will vary with the size and density of the plant canopy and the equipment used. In California and Arizona use a volume of no less than 5 gallons per acre for aerial applications.

USE PRECAUTIONS

DO NOT MIX ETHEPHON 2# WITH AMMONIUM THIOSULFATE. SUCH TANK MIXTURES MAY RESULT IN FORMATION OF TOXIC FUMES.
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.
IMMEDIATELY RINSE ANY SPILLS WITH PLENTY OF WATER AS ETHEPHON 2# IS CORROSIVE.

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 all exposed acrylic-plastic materials and painted surfaces with a detergent and water within one hour after exposure to spray deposits.

TOBACCO
(Flue-Cured Only)
(Not for use in California)

TOBACCO (FLUE-CURED)
A foliar spray of Ethephon 2# promotes early, uniform "yellowing" of mature tobacco. Ethephon 2# reduces curing time, allowing more efficient use of curing barn space, and increased control over harvest schedules.

Ethephon 2# increases the capacity of the curing barn by shortening the curing time and allows adjustments in harvest schedules. Ethephon 2# 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 2# is not intended or recommended for use on immature tobacco.

CROP SITUATION	Ethephon 2# PINTS/ACRE	SPECIFIC DIRECTIONS
Directed Spray Application	4	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	4 to 8	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 2#. Apply over-the-top Ethephon 2# 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.

USE LIMITATIONS

- Do not apply Ethephon 2# 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 2#, 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 2# if rain is expected within 6 hours.

* Do not harvest tobacco treated with Ethephon 2# sooner than 2 days after application.
* Follow use rates listed above for labeled uses. Do not exceed 8 pints of this product (2 lb. ethephon) per acre per year.

APPLICATION TIMING

Successful results with Ethephon 2# 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 2# 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 4 teaspoons of Ethephon 2# in 1 quart of water. Apply about 1 ounce to each test plant covering all leaves with a fine mist. Ethephon 2# 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^{0} 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 2# 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 2# application. To determine harvest timing and avoid quality loss or leaf drop, closely monitor treated crop and weather conditions.

CURING Ethephon 2# 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 2# 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 2# treated leaves cure faster, treated and untreated leaves should not be cured together in the same barn.

TOMATOES

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.

Crop Situation	Ethephon 2# Pints/Acre	Specific Directions	Remarks
PROCESS TOMATOES EARLY AND MID-SEASON CROPS OR WARM CONDITIONS	1 1/4 TO 3 1/4	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.	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.
PROCESS TOMATOES EARLY AND MID-SEASON CROPS OR WARM CONDITIONS	1 1/4 TO 3 1/4	Thorough coverage is essential. For ground or air application choose equipment and spray volumes that will assure 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.	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.
PROCESS TOMATOES	3 1/4 TO	Apply when 5% to 30% of the fruit	Harvest at proper maturity. Temperatures

Crop Situation	Ethephon 2# Pints/Acre	Specific Directions	Remarks
LATE SEASON OR COASTAL CROPS OR COOL CONDITIONS	6 1/2	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. Thorough coverage is essential. For ground or air application choose equipment and spray volumes that will assure uniform spray coverage.	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.
FRESH MARKET TOMATOES California	1 1/4 to 5	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. Thorough coverage is essential. For ground or air application choose equipment and spray volumes that will assure uniform spray coverage. Use the higher rate and longer preharvest interval on late season crops, when temperatures are cool (generally below	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.

Crop Situation	Ethephon 2# Pints/Acre	Specific Directions	Remarks
		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.	

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.
- Follow use rates listed above for labeled uses. Do not exceed 6.5 pints of this product (1.63 lb. ethephon) per acre per year.

CHERRIES
Except California

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.

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
TART CHERRIES	Dilute Spray 1	Apply as a dilute spray with sufficient water for thorough, uniform coverage. The optimum spray volume will depend on tree size, planting density and equipment used.	Expect a longer treatment to harvest interval with lower rates.
	Concen-trate Spray 2/3 to 1	Concentrate sprays, generally less than 100 gallons per acre, require uniform coverage for optimum response.	
SWEET CHERRIES (varieties such as Windsor, Napoleon-Royal Anne, Emperor Francis)	Dilute Spray 3 to 4	Apply as a dilute spray with sufficient water for thorough, uniform coverage. Actual volume will depend on the type of delivery, sprayer used and size of trees. Use low rates on the light or yellow-colored varieties.	
	Concen-trate Spray 2 to 3	Concentrate sprays, generally less than 100 gallons per acre, require uniform coverage for optimum response.	
INCREASED DORMANT FRUIT BUD HARDINESS AND DELAYED SPRING BLOOM (Sweet Cherries in the Pacific	3	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.

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
Northwest)			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 background 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.
- Follow use rates listed above for labeled uses. Do not exceed 4.0 pints of this product (1.0 lb. ethephon) per acre per year.

GRAPES
Only in California and Arizona

GRAPES (Table grapes in California and Arizona): An application of Ethephon 2# promotes early uniform color development on table grape varieties such as 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.

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
TABLE GRAPES (such as Cardinal, Flame Seedless, Red Malaga, and Queen)	1/2 - 2	For high temperature conditions (above 85° F) use lower rates of 1/2 to 1 pint per acre. For low temperature conditions (but above 65° F) use higher rates. Apply in sufficient water to wet vines and fruit clusters uniformly, using conventional ground sprayers. Treat when 5-30% of berries show color.	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	Treat Tokays when 5-15% of berries show color.	
RAISIN PRODUC-TION (Thompson Seedless)	1-2	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
Table Grapes

- 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.

* Do not exceed 2 pints of this product (0.5 lb. ethephon) per acre per year.

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.

* Do not exceed 2 pints of this product (0.5 lb. ethephon) per acre per year.

APPLES

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.

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
FRUIT LOOSENING 1. EARLY AND MIDSEASON MATURING VARIETIES (varieties maturing with McIntosh or earlier)	2 1/2	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	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

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
		of trees will effect volume required. Observe fruit daily as the proper picking period is shorter with Ethephon 2# treated fruit than untreated fruit.	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 daytime 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.
2. LATE MATURING VARIETIES IN THE EASTERN UNITED STATES (varieties maturing later than McIntosh)	5		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. Do not apply Ethephon 2# to more acreage than can be harvested in 1 to 2 days. Treated fruit can be satisfactorily held in cold air storage provided fruit is in good condition.
PROMOTION OF UNIFORM RIPENING AND COLORING OF RED VARIETIES WITHOUT LOOSENING 1. EARLY OR MID-SEASON MATURING VARIETIES	1 - 4	Apply foliar spray of Ethephon 2# and a preharvest drop control chemical registered for use on apples such as FRUITONE® N. Use the preharvest drop control product according to	Since recommendations for chemical control of preharvest drop vary according to location and variety, follow directions on the FRUITONE® N label or consult your local extension Pomologist or Horticulturist for his recommendations.

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
(variet-ies matu-ring with McIntosh or earlier).		label directions. Begin spraying 2 to 3 weeks before normal harvest period and about 1 to 2 weeks before desired harvest date.	
2. LATE MATURING VARIETIES (variet-ies matu-ring later than McIntosh)	2 - 4	Apply as a normal dilute spray using sufficient water for thorough uniform coverage. Actual volume will depend on the type of delivery of sprayer used and size of trees. Use the lower rate on apples intended for storage.	
THINNING AND RETURN BLOOM 1. Most Varieties 2. Difficult to Thin Varieties Such as Golden Delicious	 1 1/2 to 4 3 - 6	Treat 10 to 20 days after full bloom. For greater thinning, this product can be mixed with 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 for use on apples in accordance with the most restrictive of the AMID-THIN® W, SEVIN®, AND Ethephon 2# label limitations and precautions. No label dosage rates should be exceeded. Ethephon 2# cannot be mixed with any product containing a label prohibition against such mixing. Consult local extension recommendations. The addition of a non-ionic surfactant can enhance treat-ment effectiveness. Buffering spray solution to a pH of 3 to 5 can improve	Regulating cropping from one season to another is a problem. Whenever a high percent of the spurs and lateral buds bloom in a single season, severe alternate bearing can develop the following year. To overcome this problem, use Ethephon 2# or a combination of Ethephon 2# plus AMID-THIN® W or Ethephon 2# plus one of the SEVIN® products listed under Specific Directions 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. Expect Red Delicious to show a reduction of "type" and fruit size particularly on trees

CROP SITUATION	Ethephon 2# Pts/acre	SPECIFIC DIRECTIONS	REMARKS
		performance where water is alkaline. Use a spray volume sufficient to cover trees thoroughly and uniformly.	under stress. Use of higher label rates may reduce fruit size.
INCREASED FLOWER BUD DEVELOP-MENT 1. NON-BEARING TREES 2. BEARING TREES	2 - 8 1/2 - 3	Spray trees thoroughly and uniformly to the point of runoff. Use the higher rate on more vigorous trees. Treat 2 to 4 weeks after full bloom period. To help minimize fruit thinning, delay application until 6 weeks after full bloom and after June drop.	To increase flower bud development on non-bearing trees, apply a foliar spray of Ethephon 2#, 2 to 4 weeks after bloom. 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. 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.
- 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.

* Follow use rates listed above for labeled uses. Do not exceed 8.0 pints of this product (2.0 lb. ethephon) per acre per year.

WALNUTS

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.

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
CALIFORNIA	3-5	Expect best results with spray concentrations of 300 to 900 ppm. Refer to Ethephon 2# spray preparation chart below. Under low temperatures and/or low humidity conditions use the higher label rates. Expect less time between application and harvest with higher label rates. For best results treat when air temperatures are between 60° F and 95° F. Expect reduced effectiveness if above 90° F with low humidity due to spray evaporation. Thorough uniform coverage of walnut hulls is essential for maximum hull split and nut loosening response. Choose equipment that provides maximum spray penetration of the entire tree canopy. Use large air carrier sprayers where tree size jeopardizes coverage. Or volute sprayer attachments may help.	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. Advancing Harvest -Apply when 95-100% of the nuts have reached maturity. Inspect frequently and harvest as soon as adequate hullability occurs generally 10-16 days after treatment depending on variety and weather conditions. Plan second shake 10-12 days after first shake. Once Over Harvest -Variety, growing conditions and weather affect maturity and the opportunity for once over harvest. Contact a local fieldman or Farm Advisor to determine if once over harvest can be expected in your situation. Apply to mature walnuts 10 days prior to expected harvest date. Expect actual harvest to range from 7-12 days after treatment.

Use Limitations

- Treatment prior to packing tissue brown (mature) stage may reduce nut quality.
- Some leaf drop is associated with treatment.
- Do not treat diseased, low vigor or moisture stressed trees as excessive leaf drop may occur.
- Assure that dosage rates are measured accurately since rates

higher than recommended may result in tree injury (such as excessive defoliation, reduced catkin formation and twig dieback).

- Do not harvest walnuts treated with Ethephon 2# sooner than 5 days after last application.

* Do not exceed 5 pints of this product (1.25 lb. ethephon) per acre per year.

Ethephon 2# Spray Preparation Chart						
		Spray volume (gallons/ acre)				
Ethephon 2#	Rate	100	200	300	400	500
Pints/A	Lbs/A	Concen- tration (ppm)				
3	0.75	900	450	300	....	....
4	1.00	....	600	400	300	....
5	1.25	....	750	500	375	300

PEPPERS

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

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
PEPPERS	1 1/4 -4	Thorough coverage is essential. For ground or air application choose equipment and spray volumes that will insure uniform coverage of foliage and fruit. Use the higher rate when cool temperatures are anticipated (less than	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

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
		65°F), when plants are growing vigorously or when foliage is dense to assure thorough wetting of all leaves and fruit. Use the lower rates with lower spray volumes (1 1/4 to 2 pint rate in 20 gal/A) and higher rates with higher volumes (3 - 4 pints/40 gal). The 3 - 4 pint rate in less than 40 gpa may cause foliage burn under hot dry conditions. Apply Ethephon 2# to bell peppers when 10% of fruit are red and chocolate and to chili and pimento pepper varieties, 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.	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.

* Do not exceed 4 pints of this product (1.0 lb. ai ethephon) per acre per year.

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

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.

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
IN OREGON AND WASHING-TON (Culti-vars Chehalem Thornless and Ever-green)	5 - 8	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 sufficient volume to insure thorough and uniform wetting of foliage and fruit.	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.

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.

* Do not exceed 8 pints of this product (2 lb. ai ethephon) per acre per year.

CANTALOUPES

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

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
CALIFOR-NIA, ARIZONA, TEXAS	3	Good spray coverage is important for producing uniform abscission.	For more specific directions under varying temperature and moisture conditions, consult your Extension Horticulturist or Farm Advisor for his

CROP SITUATION	Ethephon 2# Pts/Acre	SPECIFIC DIRECTIONS	REMARKS
		Use 40 or more gallons for ground and 10 or more gallons/acre for aerial application. (Aerial applications are only permitted in Texas.) 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.	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 fruit with 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.

Use Limitations

- Ethephon 2# should not be applied when night temperatures are below 60°F.
- Treat only those fields 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.

* Do not exceed 3 pints of this product (0.75 lb. ethephon) per acre per year.

PINEAPPLE AND SUGARCANE

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.

CROP SITUATION	Ethephon 2# PTS/ACRE	APPLICATION TIMING	SPECIFIC DIRECTIONS	RESTRICTIONS
PINEAPPLE Flower Induction Ethephon 2# applied to pineapple plants will stimulate uniform initiation of flowering.	4 to 8	"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.	2 to 8	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	2	Just prior to flower	Apply by fixed wing	Apply no less than 7 gallons

CROP SITUATION	Ethephon 2# PTS/ACRE	APPLICATION TIMING	SPECIFIC DIRECTIONS	RESTRICTIONS
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.		initiation.	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.	of spray mixture per acre. 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#.

Use Limitations

* For pineapple do not exceed 12 pints of this product (3 lbs. ethephon) per acre per year.
* For sugarcane do not exceed 2 pints of this product (0.50 lb. ethephon) per acre per year.

WHEAT AND BARLEY

Ethephon 2# can be tank mixed with approved cereal insecticides and fungicides. Treatment is intended as a preventative measure. Insecticide and fungicide treatment programs should be based on timely scouting and economic threshold assessments. This may not coincide with Ethephon 2# application timing. Do not use Ethephon 2# as a tank mixture with insecticides or fungicides on crops stressed by adverse weather conditions, referenced above, or by insect or disease damage.

Crop injury or yield loss may result with tank mix applications under stress conditions (i.e. moisture, heat, cold, insect, disease). Ethephon2# + Tilt® tank mix application by air made under stress conditions may result in flag leaf burn and yield loss.

Do not tank mix with herbicides or nitrogen solutions.

Do not add adjuvants, surfactants, or wetting agents to Ethephon 2#.

USE LIMITATIONS

- Do not apply through any type of irrigation system.
- Yield or product quality decreases may occur if Ethephon 2# is not properly used.
- Allow 7 days after application for lodging reduction activity to begin. Ethephon 2# is not effective on crops already lodged.
- Disease infestation (rust, setoria, mildew, etc.) may be affected by Ethephon 2# plant use. Use a fungicide control program where needed.
- Temperature, moisture, or disease stress at application or after Ethephon 2# use can result in yield loss.
- Ethephon 2# use in non-lodging situations may result in yield loss.
- Observe temperature limitations on this label at application.
- Ethephon 2# may delay heading 1 to 2 days and harvest maturity 1 to 4 days. Extreme temperatures (below 35° F or above 85° F in non-irrigated, or 90° F in irrigated crops) within 5 days after application may cause further maturity delay.
- Do not use on late-seeded crops in short season growing areas because possible maturity delay may cause harvest difficulties.
- Ethephon 2# treatment may increase secondary tillers in some spring barleys especially under moisture or temperature stress.
- Do not use Ethephon 2# on Azure barley or Tyler wheat.
- Do not apply Ethephon 2# if rain is expected within 6 hours.
- DO NOT GRAZE OR FORAGE TREATED CROP OR CUT FOR HAY OR SILAGE. Mature straw at normal harvest may be consumed by animals.
- Do not plant another crop within 30 days after treatment.

TREATMENT DECISION GUIDE

IMPORTANT-Inspect fields just prior to application to determine the probability of lodging. Use Ethephon 2# only under the following conditions:

1. The crop is expected to lodge and significant loss of recoverable yield, grain quality, and/or harvest efficiency is expected.
2. The crop is free of stress from disease or insect damage.
3. Soil moisture or irrigation is adequate to prevent crop stress after application.
4. Temperature fluctuations (below 35° F or above 85° F non-irrigate and 90° F irrigated) are not expected for 5 days after application.
5. Application can be made at the correct stage, Feekes 8 to 10-see growth stage chart.

APPLICATION TIMING

Apply when the flag leaf is just visible to the boot stage, but before the awns have emerged or the sheath has split (Feekes-Large Scale 8-10, Zadok's Code 37-45). Do not allow spray solution to contact exposed heads, as damage and reduced yield may result. Inspect fields carefully to determine that application can be made at the proper stage.

APPLICATION

For Ethephon 2# to be effective, temperature after application should be at least 60° F. Avoid Spray overlap which can result in excess rate and yield loss.

Ground: Use a minimum of 7 gallons of water per acre when applied by conventional ground equipment. Flat fan nozzles are recommended. Use a minimum of 5 gallons of water per acre with controlled droplet application (CDA) or air foil type equipment. To prevent uneven application, adjust spray boom to plant canopy height and operate at moderate speed.

Air: Use a minimum of 3 gallons of water per acre.

USE RATES

Lodging pressure and environmental conditions will affect the Ethephon 2# rate needed.

On more responsive varieties, use only a 1 pint per acre rate. Consult your state extension specialist for more information.

Do not apply more than a total of 2.0 pints (0.5 lb. active) of Ethephon 2# per acre per year.

Do not harvest wheat or barley within 40 days of last Ethephon 2# application.

ETHEPHON RATE GUIDE FOR BARLEY AND WHEAT

EXPECTED LODGING PRESSURE
(ETHEPHON PINTS/ACRE)

SITUATION	MODERATE	HEAVY	SEVERE	COMMENTS
Barley (Spring and Winter)	1	1 to 1 ½	1 ½ to 2	Some tall varieties with vigorous growth may require 2 pints per acre.
Winter Wheat	1	1 to 1 ½	1 ½ to 2	In severe lodging situations, these rates may not be adequate to control lodging in some tall straw varieties such as "Roughrider" and "Agassiz"
Most Spring Wheats	1	1	1 ½	In severe lodging situations, these rates may not be adequate to control lodging in some tall durum wheats such as "Vic".
High Temperature or Sensitive Variety**	1	1	1	

RESTRICTIONS AND LIMITATIONS
*Limit use of the 2 pint rate to situations where lodging is expected to result in a high loss of yield potential:1) an irrigated crop with unusually sever lodging pressure, 2) very tall lodging prone variety, or 3) a cereal type such as durum known to be subject to severe lodging.
** Do not use Ethephon 2# if daytime temperatures for the period 5 days after application are expected to exceed 85° F in non-irrigated or 90° F in irrigated wheat or barley crops.

NON-IRRIGATED BARLEY AND WHEAT

DO NOT apply Ethephon 2# to non-irrigated barley and wheat in States west of the Mississippi River except:

1. In the Sacramento Valley and west of the Coastal Range in California and,
2. West of the Cascade Range in Washington and Oregon.

Ethephon 2# plant is recommended in the non-irrigated areas in States east of the Mississippi River and:

1. In the Sacramento Valley and west of the Coastal Range in California and,
2. West of the Cascade Range in Washington and Oregon.

IRRIGATED BARLEY AND WHEAT

Irrigation prior to treatment is recommended to avoid stress and may be resumed 24 hours after treatment. If conditions are hot and dry continue irrigation through the grain head filling period.

Moisture and heat stress during antithesis and grain fill can cause significant yield loss. With Ethephon 2#, it is important to avoid plant stress during these growth periods in order to obtain optimum yield and quality.

(Note: space to include "Growth Stage Chart")

ETHEPHON 2# APPLICATION STAGE CHART
GROWTH STAGE CHART

Growth Description	2nd Node Detectable	Flag leaf Just Visible	Flag Leaf Ligule Visible	Boot Swollen	First Spikelet Visisble	¼ of Inflor-escence complet ed
Feekes-Large Scale	7	8	9	10	10.1	10.4
Zadok's Code	32	37	39	45	50	57
Recommended treatment time	Too Early				Too late	

MISTLETOE REMOVAL

DWARF AND LEAFY MISTLETOE REMOVAL: A foliar spray of Ethephon 2# will remove dwarf mistletoe shoots in ornamental conifers and leafy mistletoe from ornamental deciduous trees.

Crop Situation	Ethephon 2# Amount	Specific Directions	Remarks
DWARF MISTLETOE ON ORNAMENTAL CONIFERS	2 pints per 20 gallons	Apply as a foliar spray to dwarf mistletoe shoots before mistletoe seed dispersal. For effective removal, all mistletoe shoots must be sprayed to wet.	Applications made in conjunction with sylvicultural mistletoe management will prevent spread of the mistletoe parasite to other parts of the tree and other trees.
DOUGLAS FIR, ORNAMENTALS	1 pint per 20 gallons	Use of a nonionic surfactant at recommended rates may increase effectiveness. Treat any mistletoe regrowth before seed dispersal.	Mature needle drop, that normally occurs in the fall, may be hastened by the use of Ethephon 2#. Applications of higher rates on Douglas fir may result in excessive needle drop.
LEAFY MISTLETOE CN ORNAMENTAL DECIDUOUS TREES	2 quarts per 20 gallons	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	Large mistletoe infections and mistletoe found in mesquite may be difficult to control with a single application and retreatment may be necessary.

Crop Situation	Ethephon 2# Amount	Specific Directions	Remarks
		recommended rates may increase effectiveness. Any mistletoe regrowth should be treated during the labeled application window.	

FRUIT ELIMINATION
(Ornamental Use Only)

UNDESIRABLE FRUIT ELIMINATION: A foliar spray of Ethephon 2# will reduce or eliminate undesirable fruit development on apple, crabapple, carob and olive trees.

Crop Situation	Ethephon 2# Amount	Specific Directions	Remarks
APPLES, CRABAPPLES	8 to 12 ounces per 20 gallons	Apply as a foliar spray at the flower bud to full bloom stage, prior to fruit set. Wet foliage thoroughly. Over application of Ethephon 2# 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.
CAROB (Ceratonia siliqua)	6 ounces per 20 gallons	Apply as a foliar spray. Wet all foliage thoroughly.	Some leaf drop or temporary leaf yellowing may occur after treatment.
OLIVE (Olea auropaea)	12 ounces per 20 gallons	Amount of spray will depend on tree size.	Do not use on small red fruited varieties of crabapple as fruit elimination will not be satisfactory.

TURF

An application of Ethephon 2# slows the growth of turfgrasses thus reducing the required frequency of mowing and the volume of clippings collected.

Sites	Rate	Application	Spray Volume
Fairways, Roughs & Commercial Turfgrasses, including Bentgrass (Fairway cut), Kentucky Bluegrass, Perennial Ryegrass, Tall & Fine Fescue	6 fl.oz. per 1000 sq.ft.	Apply to actively growing turf. It will require 7-10 days for Ethephon 2# to act. Reapplication intervals: Kentucky Bluegrass-7 wks. Perennial Ryegrass-7 wks. Tall/Fine Fescue-4 wks. Bentgrass-4 wks.	0.5-4.0 gals per 1000 sq.ft.

Use Limitations:

- Do not allow entry to treated area until sprays have dried.
- For best results, apply with sprayer in sufficient volume of water to provide uniform coverage. Ethephon 2# is foliarly absorbed.
- Apply only to actively growing turf, under favorable growing conditions, that is not going into a dormancy period. Do not treat turfgrass with poor root systems or growing under stress due to poor soil conditions, drought, disease or insect damage.
- Do not apply to golf course greens.
- Use of spreader/stickers with Ethephon 2# is not necessary.
- Ethephon 2# is an acidic product and prolonged exposure to spray deposits will damage acrylic plastics, certain paints and metals. Rinse thoroughly all exposed acrylic plastic materials and painted surfaces with a detergent and water within one hour after exposure to spray deposits.

Test tank mixes with other products on a small area before using widely.

TRADEMARK INFORMATION
Tilt is a registered trademark of Ciba-Geigy Corp.

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