



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Andy Eimanis
Makhteshim-Agan of North America Inc.
551 Fifth Ave, Suite 1100
New York, NY 10176

JAN 11 2000

Subject: Chlorpyrifos 4E AG
EPA Reg No.: 66222-19
Submission Dated Oct 28, 1999

Dear Mr. Eimanis:

The revised labeling referenced to above, submitted in connection with the registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as amended, is acceptable, provided you incorporate the Agency's conditions as enumerated in this letter below and submit one copy of your final, printed label prior to releasing the product for shipment.

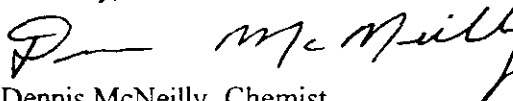
1. The use rate table on page 10 of the label must be corrected to indicate that the remarks section applies to all the pests listed on page 10. This can be done by either repeating the highlighted text in the lower box or by modifying the use rate table as indicated on page 10 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)
2. The use rate table on page 13 of the label must be corrected to indicate that the $\frac{1}{2}$ - 1 pt use rate applies to grasshoppers only. This can be accomplished by inserting a line as indicated on page 13 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)
3. The use rate table on page 15 of the label must be corrected to indicate that the 1 pt use rate applies to Spider mites only. This can be inserting a line as indicated on page 15 of the proposed label. The appropriate use rate must then be added in as indicated for the Beet armyworm and other four pests in that section of the use rate table as I have indicated. (Refer to previously approved label, Nov 6, 1995.)
4. The use rate table on page 19 of the label must be corrected to indicate that the "Specific directions" apply to Chinch bugs and Lesser cornstalk borer only. This can be accomplished by inserting a line as I have indicated on page 19 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)

5. The use rate table on page 24 of the label must be corrected to indicate that the use rate and remark, i.e., (Use a minimum of 1.5 pints/acre), applies to all the crops listed under Tree Fruits on page 24. This can be done by either repeating the highlighted text in all four crop sections or modifying the use rate table as I have indicated on page 24 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)
6. The use rate table on page 25 of the label must be corrected to indicate that the "Restrictions" section applies to walnuts also. This can be done by either repeating the highlighted text to indicate that it also applies to walnuts or by modifying the use rate table as I have indicated on page 25 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)
7. The use rate table on page 26 of the label must be corrected to indicate that the "Remarks and restrictions" section applies to all three groups of pests cited in the table. This can be done by either repeating the highlighted text to indicate that it also applies to the two other groups of pests or by modifying the use rate table as I have indicated on page 26 of the proposed label. (Refer to previously approved label, Nov 6, 1995.)

Your release for shipment of the product bearing the amended labeling constitutes acceptance of these conditions. If these conditions are not complied with, your registration will be subject to cancellation in accordance with FIFRA Section 6(e).

The Federal Register (FR) Notice announcing the deletion of popcorn use was published on Nov 10, 1999. Publication of that FR Notice allows the Agency to finalize this label. A stamped copy of the label is enclosed for your files. If you have questions, please contact me at (703) 308-6742 or electronically at McNeilly.Dennis@EPA.gov.

Sincerely,



Dennis McNeilly, Chemist
Insecticide-Rodenticide Branch
Registration Division (7505C)

Enclosure: (1) Stamped label, accepted with comments

CHLORPYRIFOS 4E AG

For control of various insects infesting certain field, fruit, nut and vegetable crops.

ACTIVE INGREDIENT:

Chlorpyrifos 0,0-diethyl-0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate..... 40.7%

INERT INGREDIENTS* 59.3%

TOTAL..... 100.0%

Contain 4 pounds of chlorpyrifos per gallon.

* Contains aromatic petroleum distillates

ACCEPTED
with COMMENTS
In EPA Label Office:

JAN 11 2000

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, this pesticide is registered under EPA Reg. No. 66222-19

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 this label, find someone to explain it to you in detail.)

FIRST AID

(Statement of Practical Treatment)

Organophosphate

If Swallowed: Do not induce vomiting. Contains aromatic petroleum solvent. Call a physician or Poison Control Center immediately.

If In Eyes: Flush with plenty of water for at least 15 minutes. Get medical attention.

If On Skin: Wash with plenty of soap and water. Get medical attention.

If Inhaled: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

Note To Physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM, protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

Manufactured by: MAKHTESHIM-AGAN OF NORTH AMERICA INC.
551 Fifth Avenue, Suite 1100
New York, N.Y. 10176

EPA Reg. No. 66222-19
EPA Est. No. 11678-IS-01
Net Weight:

PRECAUTIONARY STATEMENTS

Hazard to Humans and Domestic Animals

WARNING

May be fatal if swallowed. Harmful if absorbed through skin or inhaled. Causes eye irritation. Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco.

PERSONAL PROTECTIVE EQUIPMENT

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

Applicators and other handlers must wear:

1. Long-sleeved shirt and long pants
2. Chemical-resistant gloves, such as Barrier Laminate or Viton
3. Shoes plus socks
4. Protective eyewear

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 and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

User should:

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

ENVIRONMENTAL HAZARDS

This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills. Do not contaminate water by cleaning of equipment or disposal of equipment to washwaters. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weed if bees are visiting the treatment area. Protective information may be obtained from your cooperative agricultural extension service.

PHYSICAL OR CHEMICAL HAZARDS

Combustible. Do not use or store near heat or open flame.

DIRECTIONS FOR USE

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

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the Agency responsible for pesticide regulation. Read all Directions for Use carefully and before applying.

AGRICULTURAL USE REQUIREMENTS

Use this product in accordance with its labeling, and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry 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 24 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:

1. Coverall
2. Chemical-resistant gloves such as Barrier Laminate or Viton
3. Shoes plus socks
4. Protective eyewear

STORAGE AND DISPOSAL

Storage: Store in original container in secured dry storage area. Prevent cross-contamination with other pesticides and fertilizers. Do not store above 100° F for extended periods of time. Storage below 20° F may result in formation of crystals. If product crystallizes, store at 50 to 70° F and agitate to redissolve crystals. If container is damaged or spill occurs, use product immediately or dispose of product and damaged container as indicated below.

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

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal or 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 for Refillable Containers: Replace the dry disconnect cap, if applicable, and seal all openings which have been opened during use. Return the empty container to a collection sites designated by Makhteshim-Agan of North America Inc. (MANA). If the container has been damaged and cannot be returned according to the recommended procedures contact the MANA Customer Service Center at 1-212- 661-9800 to obtain proper handling instructions.

(STORAGE AND DISPOSAL continued)

Container Disposal for Non-Refillable Containers: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. Or, Triple rinse (or equivalent). Then puncture and dispose in a sanitary landfill, or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

GENERAL INFORMATION:

Chlorpyrifos 4E AG insecticide forms an emulsion when diluted with water and is suitable for use in all conventional spray equipment. Consult your state experiment station or state extension service for proper timing of applications.

GENERAL USE PRECAUTIONS:

Do not use on turf or for structural pest control. Do not formulate this product into other end use products.

Attention: Do not Cut or Weld Container.

MIXING DIRECTIONS:

To prepare the spray, add a portion of the required amount of water to the spray tank and with agitation add the Chlorpyrifos 4E AG. Complete filling the tank with the balance of water needed. Maintain sufficient agitation during both mixing and application to ensure uniformity of the spray mixture.

Chlorpyrifos 4E AG may also be used in tank mixtures with certain herbicides and/or with non-pressure fertilizer solutions as recommended under specific crop use directions. Prepare tank mixtures in the same manner as recommended above for use of Chlorpyrifos 4E AG alone. When tank mixtures of Chlorpyrifos 4E AG and herbicides are involved, add wettable powders first, flowables second, and emulsifiable concentrates last. Where a fertilizer solution is involved, it is strongly recommended that a fertilizer pesticide compatibility agent such as Unite or Compex be used. Maintain constant agitation during both mixing and application to ensure uniformity of the spray mixture. Do not allow spray mixtures to stand overnight.

Note: Test compatibility if the intended tank mixture before adding Chlorpyrifos 4E AG to the spray or tank mix. Add proportionate amounts of each ingredient to a pint or quart jar, cap, shake, and let set 15 minutes. Formation of precipitates that do not readily redisperse indicates an incompatible mixture that should not be used.

SPRINKLER IRRIGATION

Chlorpyrifos 4E AG may be applied by sprinkler irrigation for the following crop uses: alfalfa, citrus orchard floors, field corn, mint, sweet corn, cotton, cranberries, sorghum, and soybeans.

See the use sections for the individual crops for further application information. Do not apply this product to the above listed crops through any other type of irrigation system. Do not apply this product by chemigation to any other crop.

SPECIAL USE DIRECTIONS

The following use directions are to be followed when Chlorpyrifos 4E AG is applied through sprinkler irrigation systems. Thoroughly clean the injection system and tank of any fertilizer or chemical residues, and dispose of the residues according to state and federal laws. Flush the injector with soap and water. Determine the amount of insecticide needed to cover the desired acreage. Pump the required Chlorpyrifos 4E AG into a steel tank, start mechanical or hydraulic

agitation, and add in order the non-emulsifiable oil and/or water. Continually agitate the mixture containing Chlorpyrifos 4E AG. Set the sprinkler system to deliver the desired inches of water per acre. Start the water pump and sprinkler, and let the system achieve the desired pressure and speed before starting the injector. Start the injector and calibrate the injector system according to number 14 in "Special Use Precautions" section. The mixture containing Chlorpyrifos 4E AG must be injected continuously and uniformly into the irrigation water line as the sprinkler is moving. This procedure is necessary to deliver the desired rate per acre in a uniform manner. When the application is finished, allow the entire irrigation and injector system to be thoroughly flushed clean before stopping the system. *

SPECIAL USE PRECAUTIONS

The following use precautions will result in a safe and successful application of mixture containing Chlorpyrifos 4E AG.

1. Apply this product only through sprinkler irrigation systems including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, micro sprinkler, or hand move. Do not apply this product through any other type of irrigation system.
2. *Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.*
3. If you have questions about calibration, you should contact state extension service specialist, equipment manufacturers or other experts.
4. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system.
5. *A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.*
6. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. Refer to the *American Society of Agricultural Engineer's Engineering Practice 409* for more information.
7. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
8. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

(SPECIAL USE PRECAUTIONS continued)

9. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
10. The irrigation line or water pump include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
11. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock. The metering pump must provide a greater pressure than that of the irrigation system at the point of injection. The pump must meet Section 675 for "Electrically Driven or Controlled Irrigation Machines" NEC 70 and must contain Viton or Teflon seals.
12. To insure uniform mixing of the insecticide into the water line, inject the mixture through a nozzle place in the fertilizer injection port or just ahead of an elbow or tee in the irrigation line so that the turbulence created at those points will assist in mixing. It is suggested that the injection point be higher than the insecticide tank to prevent siphoning.
13. The steel tank holding the insecticide mixture should be large enough to allow the system to complete a revolution with one filling. It should be free of rust, fertilizer sediment, and foreign material, and equipped with an in-line strainer situated between the tank and the injector pump.
14. In order to calibrate the irrigation system and injector to apply the mixture containing Chlorpyrifos 4E AG, determine the following: 1) Calculate the number of acres irrigated by the system, 2) Set the irrigation rate and determine the number of minutes for the system to cover the intended treatment area, 3) Calculate the total gallons of insecticide mixture needed to cover the desired acreage. Divide the total gallons of insecticide mixture needed by the number of minutes to cover the treatment area. This value equals the gallons per minute output that the injector must deliver. Convert the gallons per minute to milliliters or ounces per minute. Calibrate the injector pump with the system in operation at the desired irrigation rate. It is suggested that the injector pump be calibrated at least twice before operation, and the system should be monitored during the operation.
15. Do not apply when wind speed favors drift beyond the area intended for treatment. End guns must be turned off during the application, if they irrigate nontarget areas.
16. Do not allow irrigation water to collect or runoff and pose a hazard to livestock, wells, or adjoining crops.
17. Allow foliage to dry before reentering the field.

18. Do not apply through sprinkler systems which deliver a low coefficient of uniformity such as certain water drive units.

APPROVED CROPS

ALFALFA

Use Chlorpyrifos 4E AG to control the following pests at the dosages indicated by application as a broadcast, foliar spray:

PESTS	Chlorpyrifos 4E AG
Aphids (suppression)	½ pint/acre
Corn rootworm adults (spotted cucumber beetle)	½ - 1 pint/acre
Grasshoppers	
Alfalfa blotch leafminer	1-2 pints/acre
Alfalfa looper	
Alfalfa weevil larvae and adults	
Armyworms	
Cutworms	
Egyptian alfalfa weevil larvae and adults	
Plant Bugs	
Leafhoppers	
Spittlebugs	

NOTE: Use higher rates to control spotted alfalfa aphid in California and Nevada. Stubble spray may be applied to control leafhopper in the Northeast.

Mix the required dosage with enough water to ensure thorough coverage of crop foliage and apply using aerial (fixed-wing or helicopter) or power-operated ground spray equipment. For aerial application use 2 to 5 gallons of water per acre.

For best coverage when using ground application, a minimum of 20 gallons of water per acre with hollow cone nozzles is recommended. Control may be reduced at low spray volumes under high temperature and wind conditions. Treat when field counts or crop injury indicates that damaging pest populations are developing or present; however, do not apply more than once per crop cutting. Some reduction in insect control may be evident under excessively cool conditions. For Egyptian alfalfa weevil control in California, apply the specified dosage in a minimum of 5 gallons of water per acre when larvae are actively feeding and populations reach 15 to 20 larvae per 180° sweep with a 15-inch diameter net.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" section for further information.

Chlorpyrifos 4E AG should not be tank mixed with pesticides, surfactants, or fertilizer formulations unless prior use has shown the combination noninjurious under your current conditions of use. Some phytotoxic symptoms may be observed on young, tender rapidly growing alfalfa when treated with Chlorpyrifos 4E AG. Alfalfa will outgrow the symptoms and no yield loss should be expected.

This product is highly toxic to bees exposed to direct treatment on alfalfa. Do not apply if nearby bees are clustered outside of hives and bees are foraging. Protective information may be obtained from your agricultural extension service.

RESTRICTIONS: Do not cut or graze treated alfalfa within 7 days after application of ½ pint or Chlorpyrifos 4E AG per acre, within 14 days after application of 1 pint per acre, or within 21 days after application of rates above 1 pint acre. Do not make more than 4 applications per year or apply more than once per crop cutting.

ASPARAGUS

Use Chlorpyrifos 4E AG to control cutworms, asparagus aphids, and asparagus beetles by application at the rate of 2 pints per acre. Mix the specified dosage in sufficient water to ensure thorough coverage of treated plants and apply a broadcast, foliar spray. For cutworms, it is preferable to apply Chlorpyrifos 4E AG when the soil is moist and worms are active on or near the soil surface. Applications may be made during the fern stage for control of asparagus beetles and asparagus aphids when field counts or crop injury indicates that damaging pest populations are developing or present.

RESTRICTIONS: Do not make more than one preharvest application per season or apply within one day of harvest. Do not make more than two postharvest applications during the fern stage. Based on available residue data, the use of Chlorpyrifos 4E AG on asparagus is limited to the Midwest and Pacific Northwest.

CHERRIES

Use Chlorpyrifos 4E AG for the control of lesser peach tree borer, greater peach tree borer, and American plum borer by application as a trunk spray. Mix 1 ½ to 3 quarts of Chlorpyrifos 4E AG with 100 gallons of water and apply as a coarse, low-pressure spray to give uniform coverage of tree trunks and lower limbs. Make a second application two weeks after the first one and a third application after harvest. Avoid contact with foliage in sweet cherries as premature leaf drop may result. Consult your state agricultural experiment station or extension service specialist for proper time to treat in your area.

In addition, one of the three allowable applications per year may be applied as a dormant spray for control of San Jose scale, peach twig borer, and climbing cutworms. For control of these pests, tank mix ½ to 1 pint of Chlorpyrifos 4E AG with 1 to 2 gallons of a petroleum oil recommended for dormant use in 100 gallons of water and spray the entire tree by application to runoff using ground spray equipment. For low volume (concentrate) sprays (40 to 100 gallons of spray mixture per acre) use the same amounts of Chlorpyrifos 4E AG and spray oil per acre required for application as a dilute spray and apply in a manner that will ensure thorough coverage of the trees. Use the higher dosage of Chlorpyrifos 4E AG for severe infestations. Use oil as recommended by your state agricultural experiment station or extension service specialist.

RESTRICTIONS: Make only three applications per year. Do not apply within 6 days before harvest. Do not allow meat or dairy animals to graze in treated orchards.

CHRISTMAS TREES (NURSERIES AND PLANTATIONS)

Use Chlorpyrifos 4E AG at the rate indicated to control the following insects on the tree varieties listed.

RESTRICTIONS: Use Chlorpyrifos 4E AG on tree plantations only in Connecticut, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, Washington, and Wisconsin. Do not allow livestock to graze in treated areas.

TREE VARIETY	INSECTS CONTROLLED	DOSAGE CHLORPYRIFOS 4E AG	REMARKS
Balsam fir	Ants	1 qt/acre	Do not treat plants under extreme heat and drought stress.
Blue spruce	Aphids (Cooley)		
Concolor fir	(Eastern spruce gall)		Apply to foliage in sufficient water to ensure adequate coverage.
Douglas fir	European pine sawfly		
Eastern white pine	European pine shoot moth		
	Grasshopper		
Fraser fir	Gypsy moth		For effective control of adult spider mites if large numbers of eggs are present, apply a second spray 7 -10 days after initial treatment to control newly hatched nymphs.
Grand fir	Mites (European red spider)		
Noble fir	(Two spotted spider)		
Scotch pine	(except in WA & OR)		
White spruce	Pales weevil (adult)		For scale control apply when scale crawlers are active.
	Pine spittlebug		
	Plant bugs		
	Spittlebugs		
	Spruce budworm		
	Spruce needleminer		
	Scale (pine needle)		
	(Spruce bud) (Black pine)		
	(Striped pine)		
	Pales weevil		
		3 qt/100 gal	Apply as a cut stump drench.

CITRUS FRUITS

Use Chlorpyrifos 4E AG at the rates indicated according to the designated geographic area to control the following pests. Use the lower rates for light infestations and increase the dosage for heavier infestations.

A petroleum spray oil recommended for use on citrus trees may be added to dilute spray mixtures only at a rate of up to 1.8 gallons per 100 gallons of water to improve control of aphids, mealybugs, scale insects and thrips. Treat when insects become a problem or in accordance with the local spray schedule recommended by your state extension service specialist.

Chlorpyrifos 4E AG may be applied in tank mixtures with ethion, dicofol, Agri-Mek or Vendex. See "Mixing Directions" for further instructions. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with Chlorpyrifos 4E AG.

PRECAUTIONS: Observe local use directions for tank mix combinations especially in regard to applications of Chlorpyrifos

4E AG plus spray oil. Consult with a county farm advisor, county agency, extension service personnel, agricultural commissioner, or pest control advisor for such information regarding a given locality.

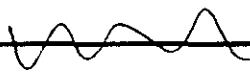
Do not apply when trees are stressed by drought or high temperatures.

Chlorpyrifos 4E AG should not be tank mixed with Difolatan 80 Sprills as crop injury may occur.

Chlorpyrifos 4E AG is highly toxic to bees exposed to direct treatment and should not be applied when bees are actively visiting the area. During the bloom period in California, apply from one hour after sunset until two hours before sunrise.

RESTRICTIONS: Do not apply more than 2 applications or more than 15 pints of Chlorpyrifos 4E AG per acre per year.

Do not make second foliar application within 30 days of the first application. Do not treat within 21 days of harvest for applications up to 7 pints of Chlorpyrifos 4E AG per acre nor within 35 days for application of rates above 7 pints per acre. Do not do any work involving contact with trees within 2 days after treatment. Do not allow livestock to graze in treated areas.

CITRUS FRUIT					
CROP	GEOGRAPHIC LOCATION	PEST	DOSAGE SPRAY OF Chlorpyrifos 4E AG PT/ACRE	VOLUME GAL ACRE	REMARKS
Grape-fruit Lemons Oranges and Other Citrus Fruit	California Arizona	Aphids Katydids Lepidopterous larvae Avocado leafroller Cutworms Fruit tree leafroller Orange tortrix Western tussock moth	2-7	ground: 100-750 aerial: min 15	Do not use a spray concentration of Chlorpyrifos 4E AG of less than 1/2 pt/100 gal. of total volume.
		Scale insects Black scale Brown soft scale California red scale Thrips (suppression) Mealy bugs	8-12 6-12	100-2400 100-750	
..					

insect

or
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the
line

Florida	Aphids	2-4	ground:	Do not use a spray concentrate of Chlorpyrifos 4E AG of less than ½ pt/100 gal of water per acre.
	Grasshoppers		100-1400	
	Orange dogs			
	Mealy bugs		aerial:	
	Scale-insects		min 20	
	Snow scale			
	Florida red scale			
	Purple scale			
	Long scale			
	Chaff scale			
	Black scale			
	Brown soft scale			
	Citrus rust mites	4-7	100-700	Do not use a spray concentration of Chlorpyrifos 4E AG of less than 1 pt/100 gal of water per acre.

Texas	Aphids	4-7	200-700	Do not use less than ½ pt of Chlorpyrifos 4E AG per 100 gallons of water in dilute applications.
	Cutworms			
	Katydid			
	Mealy bugs			
	Scale insects			
	Brown soft scale			
	California red scale			
	Chaff scale			
	Citrus rust mites (suppression)	4-7	200-700	
Small Trans-planted Grape-fruit, Orange and other Citrus Trees	Aphids	Max. of 7		Apply Chlorpyrifos 4E AG at a rate of 1 fl. oz./ 1 gal of water with a backpack sprayer. Apply to runoff.
	Cutworms			
	Katydid			
	Mealy bugs			
	Scale insects:			
	Brown soft scale			
	California red scale			
	Chaff scale			

** Additional Precautions for California and Arizona: Chlorpyrifos 4E AG should not be used in combination with spray oil when temperatures are expected to exceed 95°F the day of application or for several consecutive days thereafter. Do not apply during the months of December, January or February.

*** Lubber grasshoppers must be controlled when they are small (less than 1 inch in length) by direct contact with spray.

CITRUS ORCHARD FLOORS

Use Chlorpyrifos 4E AG to control red imported fire ants and other ant species by applying the specified dose in 25 or more gallons of water with ground application equipment that will uniformly apply the spray to the orchard floor. To control foraging ants and suppress mounds, apply Chlorpyrifos 4E AG to the orchard floor at the rate of 3/4 to 1 quart per acre.

Repeat as needed. For best insect control, uniform coverage of the orchard floor is necessary. Do not apply where weed growth or other obstructions would impede uniform coverage of the orchard floor. Do not apply in tank mixtures with Evik herbicide. Foliar applications of Chlorpyrifos 4E AG may be made in addition to the orchard floor.

Chlorpyrifos 4E AG may also be applied to citrus orchard floors through sprinkler irrigation systems only if the system uniformly covers the soil surface at the base of the tree. For best results, use the recommended amount of Chlorpyrifos 4E AG per acre. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: Do not apply more than 10 quarts of Chlorpyrifos 4E AG per acre per season. Do not apply last treatment within 28 days before harvest. Do not allow livestock to graze in treated areas. In Florida, do not apply more than 3 quarts per season.

CRANBERRIES

Use Chlorpyrifos 4E AG by application as a broadcast, foliar spray to control brown spanworm, cranberry fruitworm, cranberry weevil, cutworms, fireworms, and Sparganothis fruitworms at the rate of 3 pints per acre. Mix the specified dosage in enough water to ensure thorough coverage and apply no less than 5 gallons of spray per acre when using aerial equipment or no less than 15 gallons of spray per acre when using ground equipment. For weevil control, apply once at flower bud development (late May, early June) and, if weevils are present, once after 100% bloom (early to mid July).

For other insects, treat when field counts indicate damaging insect populations are developing or present. Apply only after the winter flood has been removed. To avoid pesticide contamination of flood water, make no applications while bogs are flooded.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems to control the above listed pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: Do not make than two applications per year or apply within 60 days before harvest.

FIELD CORN, SWEET CORN (INCLUDING CORN GROWN FOR SEED) For use to control cutworms, armyworms, corn earworm, corn rootworm, adults, chinch bugs, grasshoppers, wireworms, flea beetle larvae and adults, aphids, billbugs, grubs, western bean cutworm, corn borers, symphylans, common stalk borer, and lesser cornstalk borer.

Preplant Incorporation Treatment

Use Chlorpyrifos 4E AG at the following rates by application in sufficient water to the soil surface and incorporate into the soil:

PESTS	Chlorpyrifos 4E AG
Cutworms, symphylans	2-4 pints/acre
Wireworms, billbugs, flea beetle larvae, grubs, seed corn maggots, seed corn beetle	4 pints acre
Lesser cornstalk borer, corn rootworm larvae	6 pints acre

Use recommended rate in not less than 10 gallons of water per acre and apply as a broadcast spray to the soil surface using suitable power-operated ground spray equipment. On the same day of treatment, incorporate the insecticide into the top 2 to 4 inches of soil using a disc, field cultivator or equivalent equipment.

Chlorpyrifos 4E AG may also be applied in tank mixtures with non-pressure fertilizer solutions and/or with Bladex, Eradicane, Sutan, Lasso, Dual, and atrazine herbicides. See "Mixing Directions" section for further information. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with Chlorpyrifos 4E AG.

Preplant, At-Plant or Pre-emergence Treatment in Conservation Tillage

Use Chlorpyrifos 4E AG at the following rates by application in sufficient water to surface trash and exposed soil:

PESTS	Chlorpyrifos 4E AG
Cutworms	
Armyworms	1-2 pints/acre

Use recommended rate in not less than 20 gallons of water per acre and apply as a broadcast spray using suitable power-operated ground spray equipment. Use higher rates for residual control.

Chlorpyrifos 4E AG may also be applied in tank mixtures with non-pressure fertilizer solutions and/or with paraquat and Roundup. See "Mixing Directions" section for further information. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with Chlorpyrifos 4E AG.

Cultivation Time Treatment

Use Chlorpyrifos 4E AG at the rate of 2 pints per acre to control corn rootworm larvae. After Chlorpyrifos 4E AG as a water emulsion on both sides of the row at the base of the plants just ahead of the cultivator shovels. Cover the insecticide with soil around the brace roots. The best time to apply a basal treatment of a soil insecticide with cultivation is near the beginning of egg hatch. A cultivation application of Chlorpyrifos 4E AG may be made in addition to an at-planting application of Chlorpyrifos 15G granular insecticide.

Post-emergence Treatment

Use Chlorpyrifos 4E AG at the following rate by application in sufficient water to ensure thorough coverage of treated plants:

PESTS	Chlorpyrifos 4E AG
Grasshoppers	1/2 - 1 pint/acre
Armyworms	
Chinch bugs	
Aphids	
Corn rootworm adults	
Webworms	
Western bean cutworm	
European corn borer (see note)	1-2 pints/acre
Southern corn borer	
Corn earworm	1 1/2 - 2 pints/acre
Cutworms	
Billbugs	
Lesser cornstalk borer	
Flea beetle adults	
Common stalk borer	2-3 pints/acre

INSECT line

This use rate applies to grasshoppers

Note: The recommended dosage will control silk clipping by corn rootworm adults. For European corn borer control, use 1 ½ to 2 pints per acre when application is made with power-operated ground and aerial equipment and 1 to 2 pints per acre when application is made through a sprinkler irrigation system. See text below for generation specific treatment.

Treat when field counts indicate that pests are or may become a problem. For best billbug, chinch bug, and flea beetle control, apply with sufficient water to ensure a minimum spray volume of 20 to 40 gallons per acre and 40 psi using ground spray equipment. On corn less than 6 inches tall, apply the insecticide spray in a 9 to 12 inch wide band over the row. On corn greater than 6 inches tall, apply the insecticide spray using drop nozzles directed to the base of the plant. Do not reduce the dosage for banded or directed applications. Concentrate the full labeled dosage rate in the treated zone. When chinch bugs continue to immigrate to corn over a prolonged period or under extreme pressure, a second application of Chlorpyrifos 4E AG may be needed.

For cutworm, webworm, western bean cutworm, armyworm, aphid, European and southwestern corn borer, grasshopper, lesser cornstalk borer, corn rootworm adult, corn earworm, and common stalk borer control, apply as a broadcast spray using either aerial (fixed-wing or helicopter) or power-operated ground spray equipment.

For aerial application use 2 to 5 gallons of spray per acre. Control may be reduced at low spray volumes under high temperature and wind conditions. For cutworms, it is preferable to apply Chlorpyrifos 4E AG when soil is moist and worms are active on or near the soil surface.

If ground is dry, cloddy or crusty at the time of treatment, worms may be protected from the spray and effectiveness will be reduced. If such conditions exist, shallow incorporation using a rotary hoe may improve control. Consult your agricultural experiment station or extension service specialist for additional information concerning control practices in your area. For webworm control, shallow incorporation using a rotary hoe or other suitable equipment immediately before or soon after treatment is necessary. For first-generation European corn borer control, treat when 25 to 50 percent of the corn plants show pinhole feeding or leaf-feeding scars. For maximum control potential, ground applications of Chlorpyrifos 4E AG should be directed into the corn leaf whorls. Scout fields within 5 days after application to determine if a second application is needed.

University research indicates that achieving greater than 50% control of first-generation European borer with a single liquid insecticide treatment is highly dependent on timing, insecticide placement and weather conditions. Treatment for control of second-generation European corn borer should be applied when field counts of egg masses indicate an infestation is present or about to develop. For Southwestern corn borer control, treat when field counts of egg masses indicate pests are or may become a problem. A second application may be applied 10 to 14 days later, if needed due to reinfestation. For common stalk borer control, treat approximately 11 days after application of Roundup herbicide or after complete burn down with paraquat herbicide (3 to 5 days). Do not use Chlorpyrifos 4E AG in combination with the burn down herbicide for control of common stalk borer.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar insects. For best results, use the recommended rate of Chlorpyrifos 4E AG in a tank mix with 2 pints per acre of non-emulsifiable oil. Maintain vigorous tank agitation to assure uniformity of the Chlorpyrifos 4E AG plus oil mixture throughout the injection period. Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems at the rate of 2 to 3 pints per acre to control corn rootworm larvae. Time application to coincide with the appearance of the second instar larvae. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. Apply with enough water to wet the root zone to the depth control is needed. Under saturated soil conditions, allow enough soil drying to occur so that an application using a minimum water rate will not produce runoff.

Consult university extension personnel or other experienced consultants to determine the need to treat and to aid in application timing. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: Do not apply within 35 days before harvest of grain. Do not apply more a total of 15 pints of Chlorpyrifos 4E AG per acre per season. Do not allow livestock to graze in treated areas nor harvest treated corn silage as feed for meat and dairy animals within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 35 days after last treatment.

SWEET CORN (GROWN ONLY IN FLORIDA AND GEORGIA)

Use Chlorpyrifos 4E AG to control infestations of beet armyworm, fall armyworm and corn earworm by application as a broadcast, foliar spray at the rate of 1 to 2 pints per acre. Mix the specified dosage in enough water to ensure thorough coverage and apply using suitable aerial or ground spray equipment. For aerial application, use at least 2 gallons of spray per acre. Treat when field counts indicated damaging pest populations are developing or present. Re-treat as necessary to maintain control but do not apply more than twenty-two 1-pint or eleven 2-pint treatments per season.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar insects. For best results, use the recommended rate of Chlorpyrifos 4E AG in a tank mix with 2 pints per acre of non-emulsifiable oil. Maintain vigorous tank agitation to assure uniformity of the Chlorpyrifos 4E AG plus oil mixture throughout the injection period. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: Do not apply more than 22 pints of Chlorpyrifos 4E AG per acre per season. Do not harvest corn ears, allow livestock to graze in treated areas, nor feed treated silage, fodder, or grain to meat or dairy animals within 21 days after treatment. Do not use in conjunction with postplant broadcast, foliar applications of Chlorpyrifos 15G.

COTTON

Chlorpyrifos 4E AG for control of the following pests in all states except Arizona and California at the dosages indicated:

PESTS	Chlorpyrifos 4E AG
Cotton fleahopper	
Plant bugs (Lygus, Mirids)	3/8 - 1 pint/acre
Fall armyworm	
Grasshopper	
Thrips	
Yellow-striped armyworm	1/2 - 1 pint/acre
Cotton aphid	1/2 - 2 pints/acre
Spider mites	1 pint/acre
Beet armyworm	
Cotton budworm	
Tobacco budworm	
Cutworms	
Pink bollworm	
Salt marsh caterpillar	1 1/2 - 2 pints/acre

need use rate
1 1/2 - 2 pints/acre

NOTE: The recommended dosage rate of 3/8 pint per acre will not achieve the high degree of control of the highest label rate, but will minimize the damage done by plant bugs and cotton fleahopper and allow the beneficial insects to survive, build up, and be available to aid in the control of bollworms infesting cotton. For infestations of cotton aphids that difficult to control, use a higher dosage within the indicated rate range.

Use Chlorpyrifos 4E AG for control of the following pests in Arizona and California at the dosages indicated:

PESTS	Chlorpyrifos 4E AG
Armyworms	
Cotton Aphid	
Cotton fleahopper	
Lygus	
Salt marsh caterpillar	
Thrips	1 - 2 pints/acre
Cotton bollworm	
Tobacco budworm	
Boll weevil	
Cutworms	
Pink bollworm	2 pints/acre

Note: The 2 pint rate will aid in the suppression of cotton leafperforator and spider mites.

Mix the required dosage with sufficient water to ensure thorough coverage of plants and apply using aerial or power-operated ground spray equipment. For aerial application, use at least 1 gallon of spray per acre. Treat when field counts indicate damaging insect populations are developing or present. Re-treat as necessary to maintain control.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" section for further information.

For effective control of spider mites when large numbers of eggs are present, apply a second spray 3 to 5 days after initial treatment to control newly hatched nymphs.

For best results on bollworms and budworms, it is suggested that field be scouted twice per week and treatments made when worms are 1/4 inch or less in length. The following table illustrates the size of worms in relation to age and stage of development (instar) as a guide to timing of treatments for best control.

From the table it can be seen that a scouting schedule of only once per week will not be satisfactory since the worms may be too big to control effectively by the seventh or eighth day.

Timing for the best worm control

	Age (days)	Size	Instar	
Get the worms at this stage	*	Hatch	1/16"	Hatch
	3	3/32"	I	
	5	9/32"	II	
	6	7/16"	III	
	8	11/16"	IV	

1/16"

3/32"

9/32"

(Need pictures of worm and a dime)

7/16"

11/16"

Proper application techniques help to ensure thorough spray coverage and correct dosage and are thus important in obtaining good control of pests. Consider these suggestions when applying Chlorpyrifos 4E AG on cotton.

Aerial Application

Shorten boom length to avoid spray entering the vortices at the wing tips. Swath width should be reduced when wind direction is the same as direction of spraying.

The proper nozzle arrangement and swath width to avoid skips and vortices effect can be checked out by flying over a paper tape (adding machine paper) using water with or without soluble dye. (The dye gives a permanent record.)

Flying at a height of 5 to 15 feet above the target results in the best coverage.

Nozzle orientation of the boom is important. More break-up occurs when nozzles are pointed straight down versus the straight back position. Desired droplet size (100 to 200 microns) can be obtained by angling the nozzles somewhere in this range.

Marking of swath by flagging or permanent markers is essential.

Ground Application

Orient the boom and nozzles so that uniform coverage is obtained. The swath width should not be wider than the boom; drift spray is wasted spray so do not depend on it. Use flat fan or disc-core hollow cone nozzles with maximum spacing of 20 inches and a spray pressure of 40-60 psi with a droplet size of 100-200 microns.

RESTRICTIONS: Do not apply within 14 days before harvest or make more than 6 applications per season. Do not allow livestock to graze in treated areas. Do not feed gin trash or treated forage to livestock.

FIGS

Use Chlorpyrifos 4E AG at the rate of 2 quarts per acre for control of dried fruit beetle by application in sufficient water to the soil surface followed by incorporation into the top 3 inches of soil. Apply to fig orchard soil as a dormant application in late winter prior to beetle emergence and prior to leaf formation.

RESTRICTIONS: *Make only one application per year. Do not apply within 7 months of harvest. Based on available residue data, use of Chlorpyrifos 4E AG on figs is restricted to California.*

GRAPES

Use Chlorpyrifos 4E AG for control of grape root borer by application just before the pest emerges from the soil. Mix 4 ½ pints of Chlorpyrifos 4E AG with 100 gallons of water and apply 2 quarts of the diluted spray mixture to the soil surface on a 15 square foot area around the base of each vine. Do not allow spray to contact fruit or foliage.

RESTRICTIONS: *Do not make more than one application per season or apply within 35 days before harvest. Based upon available residue data, the use of Chlorpyrifos 4E AG in grapes is restricted to states east of the Rocky Mountains.*

MINT

Use Chlorpyrifos 4E AG by application as a broadcast, foliar spray to control cutworms at the rate of 2 to 4 pints per acre and mint root borer at the rate of 4 pints per acre. Mix the specified dosage in water to give no less than 10 gallons of spray per acre and apply using ground spray equipment. For cutworm control, treat during May and June when field counts indicate damaging insect populations are developing or present. When larvae are less than ¾ inch in length, use the 2 pint rate. When larvae are ¾ inch or more in length, use the higher rate. Make only one application during the growing season. Do not apply within 90 days before harvest. For mint root borer control, apply post-harvest when field counts indicate damaging insect populations are developing or present. Follow treatment with approximately 1 acre inch of sprinkler irrigation immediately after application to incorporate the insecticide into the soil. Make only one post-harvest application per season.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" on page x for further information.

NECTARINES, PEACHES

Use Chlorpyrifos 4E AG for the control of peach tree borers by application as a trunk spray before newly hatched borers enter the trees. Mix 3 quarts of Chlorpyrifos 4E AG with 100 gallons of water and apply as a coarse, low-pressure spray to give uniform coverage of tree trunks. Thoroughly wet all bark areas from ground level to scaffold limbs. Do not allow spray to contact fruit. Consult your state agricultural experiment station's or extension service specialist's written recommendations for proper time to treat in your area.

Chlorpyrifos 4E AG may also be used as a preplant dip application for non-bearing peach trees at the equivalent application rate of 3 quarts per 100 gallons of water for control of peach tree borer. Dip trees several inches above the grafting bud scar and plant immediately or allow to dry before returning to storage. Do not allow peach trees to remain in contact with the dip solution.

RESTRICTIONS: Make only one application per season. Do not apply within 14 days before harvest. Do not allow meat or dairy animals to graze in treated orchards.

ONIONS (DRY BULB)

Use Chlorpyrifos 4E AG to control onion maggot by application as an in-furrow drench. Apply Chlorpyrifos 4E AG at the rate of 1.1 fluid ounce per 1000 linear feet of row at an 18-inch row spacing. Use a minimum of 40 gallons of total drench per acre. Incorporate to a depth of 1 to 2 inches.

RESTRICTIONS: Do not make more than one application per year.

PEANUTS

For suppression of wireworms, apply Chlorpyrifos 4E AG at a rate of 4 pints per acre as a preplant broadcast spray to the soil surface followed by immediate soil incorporation to a depth of 3 to 4 inches. Use a minimum of 10 gallons of total spray per acre.

RESTRICTIONS: Do not make more than one application per season. Do not harvest within 21 days after treatment. Do not feed treated peanut forage or hay to meat or dairy animals.

SORGHUM

Use Chlorpyrifos 4E AG Insecticide for control of the following pests at the dosage indicated:

PESTS	Chlorpyrifos 4E AG	SPECIFIC DIRECTIONS
Sorghum midge	½ pint/acre	Apply when 30 to 50% of the seed heads are in bloom, repeat at 3 day intervals if necessary.
Grasshoppers Yellow sugar cane aphid and other aphids	½ - 1 pint/acre	
Greenbug	½ to 2 pints	For infestations of greenbug that are difficult to control, use a higher dosage within the indicated rate range.
Chinch bugs Lesser cornstalk borer	1 - 2 pints/acre	Apply as a directed spray toward the base of the plant using power-operated ground spray equipment with sufficient water to ensure coverage of an 8 - 12 inch band centered on the row. On plants less than 6 inches high, apply an 8 to 12 inch band over the row. Do not reduce the dosage for banded or directed applications. Concentrate the full labeled dosage rate in the treated zone.
Webworms	1 pint/acre	
Armyworms Corn earworm Cutworms	1 - 2 pints/acre	
European and Southwestern corn borer	1 ½ - 2 pints/acre	

Mix the specified dosage in enough water to ensure thorough coverage and apply using suitable aerial or ground spray equipment. To minimize chemical injury, do not apply Chlorpyrifos 4E AG to drought stressed grain sorghum within 3 days following irrigation or rain except where the product is applied in irrigation water.

Chlorpyrifos 4E AG may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: *The treated crop is not to be used for grain, forage, fodder, hay or silage within 30 days after application of 1 pint of Chlorpyrifos 4E AG per acre or within 60 days after application of rates above 1 pint per acre. Do not treat sweet varieties of sorghum. Do not apply more than 3 pints of Chlorpyrifos 4E AG per acre per season.*

SOYBEANS

For use to control armyworms, bean leaf beetle, corn earworm, cutworms, European corn borer, grasshoppers, green cloverworm, lesser cornstalk borer, Mexican bean beetle, saltmarsh caterpillar and other woollybears, southern green stink bug, spider mites, and velvetbean caterpillar.

Soil Treatment

Use Chlorpyrifos 4E AG at the rate of 1 to 2 pints per acre to control cutworms and lesser cornstalk borer. Mix the specified dosage in a minimum of 10 gallons of spray per acre and apply to the soil surface using suitable ground spray equipment. Equivalent rates of insecticide spray required per 100 feet of row for various row spacing are given in the accompanying table. For at-plant treatments apply the insecticide over the row in a 4 to 6-inch band in front of the planter shoe or press wheel or after the press wheel followed by a drag chain for light incorporation. Do not apply as an in-furrow treatment. For postemergence rescue treatments, apply as a directed spray in a 9 to 12-inch band at the base of the plant. To plants under 6 inches high apply over the top in a 6 to 12-inch band. Treat when field counts or conditions indicate that pests are or may become a problem.

Fluid Ounces of Spray Required Per 100 Feet of Row for Various Row Spacing

Volume of Spray Per Acre	36"	32"	28"	24"
10 gallons	8.8	7.9	6.9	5.9
15 gallons	13.2	11.8	10.3	8.8
20 gallons	17.6	15.7	13.7	11.8

Foliar Treatment

Use Chlorpyrifos 4E AG at the following rate by application in sufficient water to ensure thorough coverage of treated plants:

PESTS	Chlorpyrifos 4E AG
European corn borer Southern green stink bug	2 pints/acre
Bean leaf beetle Cutworms Corn earworm Saltmarsh caterpillar and other woollybears	1-2 pints/acre
Mexican bean beetle Armyworms	1-1 1/2 pints/acre
Velvetbean caterpillar Grasshoppers Green cloverworm Spider mites	1/2 - 1 pint/acre

Apply as a broadcast spray using either aerial or ground equipment when field counts indicate damaging insect populations are developing or present; re-treat as necessary to maintain control. For effective control of spider mites when large numbers of eggs are present, apply a second spray 3 to 5 days after initial treatment to control newly-hatched nymphs. On determinate soybeans do not apply more than one application after pod set.

Chlorpyrifos 4E AG insecticide may also be applied through sprinkler irrigation systems as a postemergence broadcast application to control the above listed foliar pests. For best results, use the recommended rate of Chlorpyrifos 4E AG per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" section for further information.

RESTRICTIONS: Do not apply more than 6 pints of Chlorpyrifos 4E AG per acre or 3 pounds of chlorpyrifos (active ingredient) per acre per season. Do not apply last treatment within 28 days before harvest nor apply last two treatments closer than 14 days apart. Do not allow livestock to graze in treated areas or otherwise feed treated soybean forage, hay, and straw to meat or dairy animals.

STRAWBERRIES

Use Chlorpyrifos 4E AG by application as a broadcast foliar spray to control strawberry bud weevil at the rate of 1 quart per acre. Apply in a minimum of 40 gallons of spray per acre when buds first appear and 10 to 14 days later. Do not apply after berries start to form or when berries are present. Chlorpyrifos 4E AG should not be tank mixed with pesticides, surfactants, or fertilizer formulations unless prior use has shown the combination noninjurious under your current conditions of use. Phytotoxicity may occur when Chlorpyrifos 4E AG is applied to strawberries experiencing high temperature and drought stress.

RESTRICTIONS: For pre-bloom use only. Do not make more than two applications per season or apply within 21 days before harvest.

SUNFLOWERS

For use to control cutworms, sunflower beetle larvae and adults, stem weevil, sunflower moth, banded sunflower moth, woollybears, seed weevil, and grasshoppers.

Preplant Incorporation Treatment

Use Chlorpyrifos 4E AG insecticide at the following rates by application in sufficient water to the soil surface and incorporate into the soil:

PESTS	Chlorpyrifos 4E AG
Cutworms	2-4 pints/acre

Use recommended rate in not less than 10 gallons of water per acre and apply as a broadcast spray to the soil surface using suitable power-operated ground spray equipment. On the same day of treatment, incorporate the insecticide into the top 2 to 4 inches of soil using a disc, field cultivator or equivalent equipment.

Postemergence Treatment

Use Chlorpyrifos 4E AG for control of the following pests at the dosage indicated by application in sufficient water to ensure thorough coverage of treated plants:

PESTS	Chlorpyrifos 4E AG
Cutworms	2-3 pints/acre
Sunflower beetle larvae and adults	
Stem weevil	
Sunflower moth	
Banded sunflower moth	
Woollybears	
Seed weevil	1- 1 ½ pints/acre
Grasshoppers	1 pint/acre

Apply as a broadcast spray using either aerial (fixed-wing or helicopter) or power-operated ground spray equipment when field counts indicate that pests are or may become a problem. For cutworm control, a second treatment may be made 7 to 10 days later, if needed. For stem weevil control, optimal treatment time is within 5 to 7 days after adult weevils begin to appear. For sunflower moth control, make first application during early 1 to 5 percent bloom stage. A second treatment may be made 7 days later, if needed. For seed weevil control, treat when field counts indicate there are 10 to 12 adults per plant for oil crops and 1 to 3 adults per plant on confectionery crops.

Additional treatments should be made at successive 7 to 10 days intervals if field counts indicate need to re-treat. For sunflower beetle larvae or adult control, treat when field counts indicate there are 10 larvae or 1 to 2 adults per seedling. Additional treatments may be made at successive 7 to 10 day intervals if field counts indicate need to re-treat.

RESTRICTIONS:

Do not apply more than 9 pints of Chlorpyrifos 4E AG per acre per season. Do not apply within 42 days before harvest. Do not allow livestock to graze in treated areas.

SUGAR BEETS

Apply Chlorpyrifos 4E AG as a broadcast foliar spray at a rate of ½ to 1 pint per acre to control grasshoppers, 1 ½ to 2 pints per acre to control beet armyworms and 2 pints per acre to control cutworms. Treat when field counts indicate that damaging insect populations are or may be a problem. Mix the specified dosage with 2 to 5 gallons of water per acre and apply using suitable aerial spray equipment or with 10 to 30 gallons of water per acre when using power-operated ground spray equipment. Re-treat as necessary to maintain control.

RESTRICTIONS: Do not apply within 30 days before harvest of beet roots and tops. Do not apply more than a total of 8 pints of Chlorpyrifos 4E AG per acre per season. Do not allow livestock to graze in treated areas nor harvest treated beet tops as feed for meat or dairy animals within 30 days after last treatment.

SWEET POTATOES

Use Chlorpyrifos 4E AG to reduce the feeding damage caused by populations of Conderus wireworm, Systena flea beetle and the sweet potato flea beetle. Apply at the rate of 4 pints per acre as a broadcast (overall) spray to the soil surface followed by incorporation. Mix the specified dosage with enough water to obtain uniform coverage and apply as a coarse spray using suitable ground spray equipment. Incorporate the insecticide to a depth of 4 to 6 inches as soon as possible after application by using a rotary hoe, disc cultivator, or other suitable incorporation equipment. Plant the crop in the usual manner no later than 14 days after treatment (any delay in planting will reduce the length of time that Chlorpyrifos 4E AG will protect against feeding damage). Chlorpyrifos 4E AG will not control false wireworms or white fringe beetle or other grubs that attack sweet potatoes.

RESTRICTIONS: Do not make more than one application per season. Do not harvest within 125 days of treatment.

TOBACCO *

Use Chlorpyrifos 4E AG for preplant treatment to control larvae of cutworms, flea beetles, mole crickets, root maggots, and wireworms. Apply 2 to 3 quarts of Chlorpyrifos 4E AG per acre in not less than 10 gallons of water as a broadcast (overall) spray to the soil surface one week before transplanting. Immediately following application, incorporate the insecticide into the soil to a depth of 2 to 4 inches using suitable equipment. The application of Chlorpyrifos 4E AG will also suppress the movement of imported fire ants into treated fields.

To control the above insects and low to moderate populations of rootknot nematodes in North Carolina, South Carolina, and Virginia, use Chlorpyrifos 4E AG at the rate of 5 quarts per acre. To control the above insects and moderate populations of rootknot nematodes in all tobacco growing regions, use Chlorpyrifos 4E AG in a tank mix with Nemacur 3 per acre. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for Nemacur

3 used in combination with Chlorpyrifos 4E AG. Apply the specified dosage in not less than 10 gallons of water as a broadcast (overall) spray to the soil surface 24 to 48 hours before bedding and transplanting. Immediately following application, incorporate into the soil surface 24 to 48 hours before bedding and transplanting. Immediately following application, incorporate into the soil to a depth of at least 4 inches using suitable equipment. Where the nematode species *Meloidogyne arenaria* or *M. Javanica* are present or high populations of *M. incognita*, apply Telone* II soil fumigant at the recommended label rate.

RESTRICTIONS: Do not make more than one application per season. *Not for use in California.

TREE FRUITS

Use Chlorpyrifos 4E AG as a dormant or delayed dormant spray at the rates indicated to control the following insects on the crops listed. While Chlorpyrifos 4E AG may be used without oil, oil is recommended to control additional pest such as European red mite.

CROP	INSECT	Chlorpyrifos 4E AG per 100 gallons of spray*
Apples	Rosy apple aphid San Jose scale Lygus Pandemis leafroller Climbing cutworms Oblique banded leafroller	1/2 - 1 pint
Pears	San Jose scale Climbing cutworms Pear psylla adults	(Use a minimum of 1.5 pints/acre)
Plums	San Jose scale	
Prunes	Mealy plum aphid Climbing cutworms Peach twig borer	
Almonds	San Jose scale	
Peaches	Peach twig borer	
Nectarines	Climbing cutworms	

* Based on 200 to 600 gallons per acre as a dilute spray

For dilute spray, tank mix the specified dosage with 1 to 2 gallons of a petroleum spray oil recommended for dormant use

in 100 gallons of water and spray the entire tree by application to runoff using suitable ground spray equipment. (See "additional Precautions Specific to California" for use in California).

For low volume (concentrate) sprays, less than 200 gallons of spray mixture per acre, use the same amount of Chlorpyrifos 4E AG as for a dilute spray and apply in a manner that will ensure thorough coverage of the trees. Use the higher dosage of Chlorpyrifos 4E AG for severe infestations. Use oil as recommended by your state agricultural experiment station or extension service specialist.

PRECAUTIONS: Because cold or dry conditions may cause Chlorpyrifos 4E AG plus oil sprays to infuse trees resulting in bud damage or drop, do not apply until winter rains or irrigation has replenished soil moisture such that bark and twigs are not desiccated. Do not use more than 4 pints of Chlorpyrifos 4E AG per acre.

Additional Precautions Specific to California: Use a minimum of 250 gallons of total spray volume per acre. Do not use more than 4 gallons of spray oil per acre on almonds, peaches, or nectarines. Do not use any adjuvants or surfactants in addition to or as a substitute for a petroleum spray oil in a tank mix with Chlorpyrifos 4E AG. Do not apply on almonds in the following counties in California: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo, and Yuba.

RESTRICIONS: Make only one application during the dormant season. Do not allow meat or dairy animals to graze in treated orchards.

TREE NUTS

Use Chlorpyrifos 4E AG at the dosage indicated by application as a foliar spray to control pests listed in the following table. Mix the required dosage in sufficient water to ensure thorough and complete coverage of the foliage and crop, and apply as a concentrate or dilute spray using conventional, power-operated spray equipment. For dilute sprays applied to tree nut crops, mix the required dosage in sufficient water to allow for spray to runoff. For concentrate sprays, apply an equivalent amount of Chlorpyrifos 4E AG per acre. Treat when pests appear or in accordance with local conditions. Insect control by aerial application may be less than control by ground application because of less coverage. Consult your state agricultural experiment station, certified pest control advisor, or extension service specialist for specific use information in your area.

ALMONDS, FILBERTS, WALNUTS

Use Chlorpyrifos 4E AG at the rates indicated to control the listed pests.

CROP	INSECTS CONTROLLED	DOSAGE Chlorpyrifos 4E AG	RESTRICTIONS
Almonds	Navel orangeworm Peach twig borer San Jose scale	4 pints/acre	Make no more than 3 foliar applications per season on almonds and filberts and no more than 2 applications per season in walnuts. Do not apply within 14 days of harvest. Do not allow livestock to graze in treated orchards.
Filberts	Eye-spotted bud moth Filbert aphid Filbert leafroller Filbert worm Obliquebanded leafroller Omnivorous leaf-tier Winter moth	3-4 pints/acre	
Walnuts	Codling moth Walnut scale	4 pints/acre	

Applies
to
walnuts
also

PECANS

Use Chlorpyrifos 4E AG at the rates indicated to control the listed pests.

INSECTS CONTROLLED	DOSAGE of Chlorpyrifos 4E AG (Dilute or Concentrate Pints/Acre)	REMARKS AND RESTRICTIONS
Pecan nut casebearer Fall webworm Phylloxera spp. ¹ Black pecan aphid Hickory shuckworm ² Pecan leaf scorch mite (suppression) ³	1 ½ - 4 * 2-4	Make no more than five applications per year. Do not apply within 28 day of harvest. Do not allow livestock to graze in treated orchards. Make no applications of tank mixtures closer to harvest than the longest preharvest interval shown for any of the products in the tank mixture.
Fire ants and other ants species ⁴		For dilute applications with ground equipment use at least the minimum rate of Chlorpyrifos 4E AG listed for the pest. Apply in 100-600 gallons of water per acre. For aerial applications use 5-15 gallons of water per acre.
Yellow pecan aphid Black margined aphid	1-4 pints of Chlorpyrifos 4E AG plus: 5.33 fl. oz. of Pydrin 2.4E, OR 1.70 fl. oz. Asana 1.9EC, OR 3.00 fl. oz. Of Ammo 2.5EC, OR 2.56 fl. oz. Of Cymbush 3E	Note: With aerial application control may be reduced due to poor coverage. Up to 20 pints of Chlorpyrifos 4E AG may be applied per acre.

¹ For best Phylloxera spp. control, make 2 applications at a 7 to 10 day interval using a minimum of 1.0 pint of Chlorpyrifos 4E AG per acre starting at bud swell.

² For best results make 2 applications, 10 - 14 days apart.

³ To suppress pecan leaf scorch mite, use a preventative program.

⁴ For ant control, apply as an orchard floor spray. Do not apply where weed growth or other obstructions prevent uniform coverage of the orchard floor.

ALMOND ORCHARD FLOORS

Use Chlorpyrifos 4E AG to control Southern fire ant and pavement ant by applying the specified dose with ground application equipment that will uniformly apply the spray to the orchard floor. Use when ant activity becomes evident within the orchard.

Since worker ants cease most of their foraging activity at temperatures above 90°F, best results will be achieved with applications made at temperatures below 90°F at the time of application. Dosage of Chlorpyrifos 4E AG and spray volume may vary depending on the irrigation method employed in the orchard as follows:

Ant Control in Sprinkler - or Drip-irrigated Orchards

Apply Chlorpyrifos 4E AG as a broadcast spray to the entire orchard floor using ground spray equipment at 4 to 8 pints per acre in 25 or more gallons of water. Use the high rate for heavy infestations and the low rate for light infestations. In orchards where ant activity is concentrated around the irrigation emitters, apply the high rate to a 6 to 8 foot band along the drip-irrigation line and the low rate to the rest of the orchard.

Ant Control in Flood-irrigated Orchards

Apply Chlorpyrifos 4E AG at 4 to 8 pints per acre in 25 or more gallons of water to the entire orchard floor using ground spray equipment. Apply the high rate to heavily infested areas and the low rate to lightly infested areas. Where ant colonies are abundant only in the berm areas, apply Chlorpyrifos 4E AG at 8 pints per treated acre in 50 or more gallons of water to a 6 to 10 foot band along the treeline (berm).

Do not apply where weed growth or other obstructions would impede uniform coverage of the orchard floor. Mow or chemically control weeds before the application of Chlorpyrifos 4E AG. Foliar applications of Chlorpyrifos 4E AG may be made in addition to the orchard floor treatment.

RESTRICTIONS: Do not apply more than 16 pints of Chlorpyrifos 4E AG per season to the orchard floor. Do not apply the last treatment within 14 days of harvest. Do not allow livestock to graze in treated orchards.

VEGETABLES

Use Chlorpyrifos 4E AG at the dosages indicated to control the pests listed in the following table. To avoid phytotoxicity in vegetables except Brussels sprouts, do not mix with other pesticide products or treat plants that are under extreme heat and drought stress.

CROP	INSECTS CONTROLLED	DOSAGE Chlorpyrifos 4E AG	USE DIRECTIONS	RESTRICTIONS
Cauliflower	Root maggot	1.6 - 2.4 fl. oz./1000 linear ft. or row	For direct seeded crops apply the specified dosage in a water-based spray as a 4-inch wide band over the row at planting time.	Do not apply more than 2 pints of Chlorpyrifos 4E AG to cauliflower planted in 40 inch rows. Use proportional amounts for other row
Broccoli	Root maggot	1.6 - 2.75 fl. oz./1000 linear ft. of row	Shallow incorporation is pints necessary. Placement behind the planter shoe and in front of the press wheel is recommended.	spacing not to exceed 4 pints of Chlorpyrifos 4E AG per acre. Do not apply more than 2.6 pints of Chlorpyrifos 4E AG per acre to broccoli, brussels sprouts, cabbage Chinese cabbage, collards, kale, kohlrabi, and turnips planted in 40-inch rows. Do not apply more than 4 ½ pints of Chlorpyrifos 4E AG per acre to these crops in 20-inch rows (or two rows per bed). Use proportional amounts of for other row spacings not to exceed 4 ½ pints of Chlorpyrifos 4E AG per acre.
Brussels sprouts			For transplanted crops, apply Chlorpyrifos 4E AG as a water-based spray directed to the base of the plants immediately after setting. Use a minimum of 40 gallons of total spray per acre. Do not Add any additional adjuvants, surfactants or spreader stickers. Do not apply as a foliage application.	
Cabbage				
Chinese cabbage				
Collards				
Kale				
Kohlrabi				
Turnips				

Continued)				
Broccoli Cabbage	Root aphid	1.2 fl. oz/1000 ft of row for single row plantings, and 2.4 fl. oz/1000 linear ft. of row for double row plantings.	Apply Chlorpyrifos 4E AG in a water emulsion or or with liquid fertilizer injected as a sidedress on each side of the row. After plants are established. Avoid mechanical damage to crop roots. Use a minimum of 15 gallons of total spray volume per acre.	Do not make more than one application per season or apply within 30 days before harvest.
Brussels sprouts	armyworms cabbage aphid cutworms imported cabbageworm striped flea beetle (adult)	1-2 pints/acre	Apply Chlorpyrifos 4E AG with conventional power- operated spray equipment in 20 to 150 gallons of water per acre. Apply when insects appear on foliage and at 7 to 14 day intervals thereafter as needed. Consult your state agricultural experiment station, extension service specialist, or integrated pest control advisor for proper time to treat your area.	Do not make more than 6 applications per season. Do not apply within 21 days before harvest.
Radishes	Root maggot	1.0 fl.oz/1000 linear ft. of row	Apply the specified dosage as a waterbased drench in the seed furrows with the seed at planting time. Use a minimum of 40 gallons of total drench per acre.	Do not make more than 5 ½ pints of Chlorpyrifos 4E AG per acre or make more than one application per season.
Rutabagas	Root maggot	1.6-3.3 fl. oz/1000 linear ft. of row	Apply the specified dosage in a waterbased spray as a 4 inch wide band over the row at planting time, behind the planter shoe and in front of the press wheel to achieve shallow incorporation. Use a minimum of 40 gallons of total spray volume per acre.	Do not make more than 4 ½ pints of Chlorpyrifos 4E AG per acre or make more than one application per season. Do not use rutabaga tops for food or feed purposes.

WARRANTY STATEMENT

Seller warrants that the product conforms to its chemical description and is reasonably fit for the purposes stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product contrary to label instruction or under abnormal conditions or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. Buyer assumes all risks of use, storage, or handling of this material not in strict accordance with directions given herewith.