1812-403 06/27/2000 1|18

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

Mr. Darryl E. Brock
Griffin L.L.C.
P. O. Box 1847
2509 Rocky Ford Road
Valdosta, GA 31603-1847

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Subject: Chlorfos 4E
EPA Reg. No. 1812-403
Submission dtd. July 26, 2000

JUN 27 2000

Dear Mr. Brock:

The revised labeling referred to above, submitted in connection with 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 two copies of your final, printed labeling prior to releasing the product for shipment. A stamped copy of the current label is enclosed.

1. The statement on page 3 of the label: "Not for sale in the States of California and Arizona" must be moved to just above the active ingredient section on page 1 of the label. The Agency does not want this restriction to appear in the "Direction for Use" section of the label, in that section it has enforcement implications.

2. The statement on page 16 of the label; "For distribution and use only in Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming." must be changed to read: "This product is registered for use on wheat only in Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming."

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). 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

ACCEPTED
with COMMENTS
In EPA Letter Dated:
Jun 27, 2000
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 1812-403

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RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicators certification.

CHLORFOS® 4E

INSECTICIDE

LOW ODOR FORMULA

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

Active Ingredient:	
Chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate	42.0%
Inert Ingredients:	58.0%
Total	100.0%

Contains 4 pounds of Chlorpyrifos per gallon.

KEEP OUT OF REACH OF CHILDREN

WARNING - AVISO

Si usted on entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

STATEMENT OF PRACTICAL TREATMENT

Organophosphate

If Swallowed: Call a physician or Poison Control Center immediately. Do not induce vomiting. Contains aromatic petroleum solvent. Do not give anything by mouth to an unconscious person.
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 symptoms of cholinesterase inhibition appear and get medical attention immediately.
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.

For medical emergencies involving this product, call toll free 1-800-237-1854.

See label for additional precautionary statements.

Mfg. For: Griffin L.L.C.
EPA Registration No.: 1812-403
EPA Establishment No.:
Net Contents:

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)

WARNING - AVISO

May Be Fatal If Swallowed. Harmful If Absorbed Through The Skin. Causes Moderate Eye And Skin Irritation. Prolonged Or Frequently Repeated Skin Contact May Cause Allergic Reactions In Some Individuals.

Avoid breathing vapor or spray mist. Do not get in eyes, on skin, or on clothing.

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 G on an EPA chemical resistance category selections chart.

Applicators and other handlers must wear:
- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves such as Barrier Laminate or Viton
- Chemical-resistant shoes plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment and mixing or loading

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

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

User Safety Recommendations

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

Environmental Hazards

This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. Do not apply directly to water, 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 when disposing of equipment washwaters. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds if bees are visiting the treatment area. Protective information may be obtained from your cooperative agricultural extension service.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

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Directions for Use

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

Read all Directions for Use carefully before applying.

Not for sale, distribution or use in the States of California and Arizona.

This product cannot be reformulated or repackaged into other end-use products.

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.

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) and restricted-entry interval. 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.

Exception: If the product is soil-injected or soil-incorporated, the Worker Protection Standard under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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-resistantgloves such as Barrier Laminate or Viton
- Shoes plus socks

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°F 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 of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wasted cannot be disposed of by use according to label instructions, contact your State Pesticide or Enviromental 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.

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

Chlorfos 4E 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.

Mixing Directions

To prepare the spray, add a portion of the required amount of water to the spray tank and with the spray tank agitator operating add the Chlorfos 4E. 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.

Chlorfos 4E 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 Chlorfos 4E alone. When tank mixtures of Chlorfos 4E 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 of the intended tank mixture before adding Chlorfos 4E to the spray or mix tank. 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 redispense indicates an incompatible mixture that should not be used.

Sprinkler Irrigation

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

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.

Special Use Directions

The following use directions are to be followed when Chlorfos 4E 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 Chlorfos 4E 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 Chlorfos 4E. 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 befort starting the injector. Start the injector and calibrate the injector system according to

"Special Use Precautions." The mixture containing Chlorfos 4E must be injected continuosly 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 mixtures containing Chlorfos 4E.

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.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

If you have questions about calibration, you should contact state extension service specialists, equipment manufacturers, or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system.

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.

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 back flow. Refer to the American Society of Agricultural Engineer's Engineering Practice 409 for more information.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operatedvalve 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.

The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.

The irrigation line or water pump must 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.

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.

To insure uniform mixing of the insecticide into the water line, inject the mixture through a nozzle placed 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. The steel tank holding the insecticide mixture should be large enough to allow the system to complete a revolution with 1 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.

In order to calibrate the irrigation system and injector to apply the mixture containing Chlorfos 4E, 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 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 operation.

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.

Do not allow irrigation water to collect or runoff and pose a hazard to livestock, wells, or adjoining crops.

Allow foliage to dry before reentering the field. (NOTE: See Agricultural Use Requirements Box)

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

Approved Crops

Alfalfa

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

Pests	Chlorfos 4E
corn rootworm adults (spotted cucumber beetle) grasshoppers leafhoppers	1/2 - 1 pt./acre
alfalfa blotch leaf miner alfalfa caterpillar alfalfa weevil larvae and adults armyworms blue alfalfa aphid cutworms pea aphid plant bugs spittlebugs spotted alfalfa aphid (suppression)	1 - 2 pt./acre

Note: Use higher rates to control spotted alfalfa aphid in 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.

Chlorfos 4E 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 Chlorfos 4E per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" for further information.

Chlorfos 4E 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 Chlorfos 4E. 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 1/2 pint of Chlorfos 4E per acre, within 14 days after application of 1 pint per acre, or within 21 days after application of rates above 1 pint per acre. Do not make more than 4 applications per year or apply more than once per crop cutting.

Asparagus

Use Chlorfos 4E 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 as a broadcast, foliar spray. For cutworms, it is preferable to apply Chlorfos 4E 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 1 preharvest application per season or apply within 1 day of harvest. Do not make more than 2 postharvest applications during the fern stage. Based on available residue data, the use of Chlorfos 4E on asparagus is limited to the Midwest and Pacific Northwest.

Cherry

Use Chlorfos 4E for the control of lesser peach tree borer, and American plum borer by application as a trunk spray. Mix 1 1/2 to 3 quarts of Chlorfos 4E with 100 gallons of water and apply as a course, low pressure spray to give uniform coverage of tree trunks and lower limbs. Make a second application 2 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, 1 of the 3 allowable applications per year may be applied as a dormant spray for San Jose scale, peach twig borer, and climbing cutworms. For control of these pests, tank mix 1/2 to 1 pint of Chlorfos 4E 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 Chlorfos 4E 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 Chlorfos 4E for severe infestations. Use oil as recommended by your State Agricultural Experiment Station or Extension Service Specialist.

Restrictions: Make only 3 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 Chlorfos 4E at the rate indicated to control the following insects on the tree varieties listed.

Do not allow livestock to graze in treated areas.

Tree Variety	Insects Controlled	Dosage Chlorfos 4E	Remarks
balsam fir blue spruce concolor fir Douglas fir eastern white pine Fraser fir grand fir noble fir Scotch pine white spruce	ants aphids adelgids (cooley) (eastern spruce gal) European pine sawfly European pine shoot moth grasshoppers gypsy moth mites[1] (European red spider) (two spotted spider) (except in WA or OR) pales weevil (adult) pine needle midge Douglas fir needle midge pine spittlebug plant bugs spittlebugs spruce budworm spruce needle-miner scale[2] (pine needle) (pine Tortoise) (spruce bud) (black pine) (striped pine)	1 qt./acre	Do not treat plants under extreme heat and drought stress. Apply to foliage in sufficient water to ensure adequate coverage. [1] For effective control of adult spider mites if large numbers of eggs are present, apply a second spray 7 to 10 days after initial treatment to control newly hatched nymphs. [2] For sacle control apply when scale crawlers are active.
	pales weevil	3 qt./100gl	Apply as a cut stump drench.

Citrus Fruit

Use Chlorfos 4E 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.

Chlorfos 4E may be used in tank mixtures with ethion, dicofol, Agri-Mek, or Vendex. See "Mixing Directions" for further instructions. Read and

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carefully follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with Chlorfos 4E.

Precautions: Observe local use directions for tank mix combinations especially in regard to applications of Chlorfos 4E 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.

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

Chlorfos 4E is highly toxic to bees exposed to direct treatment and should not be applied when bees are actively visiting the area.

Restrictions: Do not apply more than 2 applications or more than 15 pints of Chlorfos 4E 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 of up to 7 pints of Chlorfos 4E 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.

Crop	Geographic Location	Pest	Dosage of Chlorfos 4E (pt./acre)	Spray Volume (gal./acre)	Remarks
grapefruit lemons oranges and other citrus fruit	Florida	aphids brown citrus aphid grasshoppers* orange dogs mealybugs scale insects snow scale Florida red scale purple scale long scale chaff scale black scale brown soft scale	2 - 7	ground: 100 - 1400 aerial: min. of 20	Do not use a spray concentration of Chlorfos 4E of less than 1/2 pt./100 gal of water per acre.
		Citrus rust mites	4 - 7	100 - 700	Do not use a spray concentration of Chlorfos 4E of less than 1 pt./100 gal of water per acre.
		* Lubber grasshoppers must be controlled when they are small (less than 1 inch in length) by direct contact with spray.			
grapefruit lemons oranges and other citrus fruit	Texas	aphids brown citrus aphid cutworms katydids mealybugs scale insects brown soft scale California red scale chaff scale	4 - 7	200 - 700	Do not use less than 1/2 pt.of Chlorfos 4E per 100 gallons of water in dilute applications.
		citrus rust mites (suppression)	4 - 7	200 - 700	
small transplanted grapefruit, orange and other citrus trees	Texas	aphids brown citrus aphid cutworms katydids mealybugs scale insects brown soft scale California red scale chaff scale	max. of 7		Apply Chlorfos 4E at a rate of 1 fl. oz/1 gal. of water with a backpack sprayer. Apply to runoff.

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Citrus Orchard Floors

Imported Fire Ants and other Ant Species
Use Chlorfos 4E 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 Chlorfos 4E to the orchard floor at the rate of 3/4 to 1 quart per acre. Re-treat 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 Chlorfos 4E may be made in addition to the orchard floor treatments.

Chlorfos 4E 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 Chlorfos 4E per acre. See "Sprinkler Irrigation" for further information.

Application With Dry Bulk Fertilizer: For impregnating Chlorfos 4E on dry fertilizers, use a closed rotary drum mixer equipped with suitable spraying equipment. The spray nozzle should be positioned inside the mixer to provide uniform spray coverage of the tumbling fertilizer. Apply Chlorfos 4E at the rate of 1 1/2 to 2 pints per acre to control ants in citrus orchard floors. The maximum concentration of Chlorfos 4E to be added is 2 pints per 200 pounds of fertilizer. At the higher concentration of Chlorfos 4E, the fertilizer may not readily absorb all of the liquid. For a suitable free-floating mixture, an absorptive powder such as Micro-Cel E should be added separately and uniformly to the fertilizer blend following addition of Chlorfos 4E. Bulk fertilizers impregnated with Chlorfos 4E should be applied immediately, not stored. All bulk containers should be tightly covered while the products are being transported and applied to reduce the chance of loss of Chlorfos 4E via volatilization. Foliar applications of Chlorfos 4E may be made in addition to the orchard floor treatments.

Compliance with any and all federal and state laws and regulations relating to the Chlorfos 4E and fertilizer mixture is the responsibility of the person offering such mixture for sale of distribution.

Restrictions: Do not apply more than 10 quarts of Chlorfos 4E per acre per season. Do not apply last treatment within 28 days before harvest for seasonal rates of more than 3 quarts per acre of Chlorfos 4E or 14 days before harvest for seasonal rates of 3 quarts per acre or less of Chlorfos 4E. Do not allow livestock to graze in treated areas. In Florida, do not apply more than 3 quarts per season.

Cranberry

Use Chlorfos 4E 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 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 waters, make no applications while bogs are flooded.

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

Restrictions: Do not make more than 2 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 Chlorfos 4E at the following rates by application in sufficient water to the soil surface and incorporate into the soil:

Pests	Chlorfos 4E
cutworms symphylans	2- 4 pt./acre
wireworms billbugs flea beetle larvae grubs seed corn maggots seed corn beetle	4 pt./acre
lesser cornstalk borer corn rootworm larvae	6 pt./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.

Chlorfos 4E 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" for further information. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with Chlorfos 4E.

Preplant, At-Plant, or Preemergence Treatment in Conservation Tillage
Use Chlorfos 4E at the following rates by application in sufficient water to surface trash and exposed soil:

Pests	Chlorfos 4E
cutworms armyworms	1 - 2 pt./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. Chlorfos 4E may also be applied in tank mixtures with non-pressure fertilizer solutions and/or with paraquat and Roundup herbicide. See "Mixing Directions" for

further information. Read and carefully follow all applicable directions, restrictions, and precautions, on labeling for the other products used in combination with Chlorfos 4E.

Cultivation Time Treatment
Use Chlorfos 4E at the rate of 2 pints per acre to control corn rootworm larvae. Apply Chlorfos 4E 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 Chlorfos 4E may be made in addition to an at planting application of Chlorfos 15G insecticide.

Postemergence Treatment
Use Chlorfos 4E at the following rates by application in sufficient water to ensure thorough coverage of treated plants:

Pests	Chlorfos 4E
grasshoppers	1/2 - 1 pt./acre
armyworms chinch bugs aphids corn rootworm adults cutworms webworms western bean cutworm European corn borer (see note)	1 - 2 pt./acre
southwestern corn borer corn earworm	1 1/2 - 2 pt./acre
billbugs lesser cornstalk borer flea beetle adults common stalk borer	2 - 3 pt./acre

Note: The recommended dosage will control silk clipping by corn rootworm adults. For European corn borer control, use 1 1/2 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 information.

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 Chlorfos 4E may be needed.

For cutworm, webworm, western bean cutworm, armyworm, aphid, European and southwestern corn borer, grasshoooper, 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 Chlorfos 4E when soil is moist and worms are active on or near the soil surface. If ground is dry, cloddy, or crusty at time of treament, worms may be protected from the spray and effectiveness will be reduced. If such conditions exist, shallow incorporation using a rotary hoe or other suitable equipment immediately before or soon after treatment may improve control. Apply as needed to maintain control. Use higher rates for larger worms or when heavy cutworm infestations are expected or present. Fields should be monitored for cutworm presence or damage. A second application may be required if damage of density levels exceed ecomomic thresholds established for your area. 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% of the corn plants show pinhole feeding or leaf-feeding scars. For maximum control potential, ground applications of Chlorfos 4E 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 dependant 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 burndown with paraquat herbicide (3 to 5 days). Do not use Chlorfos 4E in combination with the burndown herbicide for control of common stalk borer.

Chlorfos 4E 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 Chlorfos 4E in a tank mix with 2 pints per acre of non-emulsifiable oil. Maintain vigorous tank agitation to assure uniformity of the Chlorfos 4E plus oil mixture throughout the injection period. Chlorfos 4E 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" for further information.

Restrictions: Do not apply within 35 days before harvest of grain. Do not apply more than a total of 15 pints of Chlorfos 4E per acre per season. Do not allow livestock to graze in treated areas nor harvest treated corn silage as feed for meat or 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.

T-Band At Plant Treatment: Chlorfos 4E insecticide may be applied as a liquid T-Band in fields with no more than 30 percent cover of crop residue remaining on the soil surface. Apply Chlorfos 4E as a liquid T-Band over an open seed furrow and incorporate into the top one inch of soil using tines, chains or other suitable equipment. Position a flat fan nozzle behind the planter shoe, in front of the press wheel adjusted to provide a 5 to 6 inch band width centered over the row. Apply Chlorfos 4E at a rate of 2.4 fluid ounces per 1,000 linear feet of row (2 pints per acre with 40 inch row spacing)in a minimum spray volume of 5 gallons per acre. The table below provides equivalent rates for various row spacings.

	Amount of Chlorfos 4E Required	
Pests	Row Spacing (inches)	Pints per Acre
corn rootworm	30	2.6
larvae	36	2.2
cutworms	38	2.1
grubs	40	2.0
seed corn beetle		
seed corn maggot		

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Sweet Corn Grown Only in Florida and Georgia

Use Chlorfos 4E 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 indicate damaging pest populations are developing or present. Re-treat as necessary to maintain control but do not apply more than 22 one-pint or 11 two-pint treatments per season.

Chlorfos 4E 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 Chlorfos 4E in a tank mix with 2 pints per acre of non-emulsifiable oil. Maintain vigorous tank agitation to assure uniformity of the Chlorfos 4E plus oil mixture throughout the injection period. See "Sprinkler Irrigation" for further information.

Restrictions: Do not apply more than 22 pints of Chlorfos 4E per acre per season. Do not harvest corn ears, allow livestock to graze in treated areas, or 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 Chlorfos 15G.

Cotton

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

Pests	Chlorfos 4E
cotton fleahopper plant bugs *(Lygus, Mirids)*	3/8 - 1 pt./acre
fall armyworm grasshoppers thrips yellowstripedarmyworm	1/2 - 1 pt./acre
cotton aphid	1/2 - 2 pt./acre
spider mites	1 pt./acre
beet armyworm cotton bollworm tobacco budworm cutworms pink bollworm salt marsh caterpillar	1 1/2 - 2 pt./acre

Note: The recommended dosage rate of 3/8 pint per acre will not achieve the high degree of control of the higher 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. Use a higher dosage within the indicated rate range.

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.

Chlorfos 4E 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 Chlorfos 4E per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" 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 fields 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)	Average 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" = ——
7/16" = ——
11/16" = ———

Graphics of worms at actual sizes, and of actual-sized dime, for visual ease.

(approximately the size of a dime)

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 Chlorfos 4E 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 to 60 psi with a droplet size of 100 to 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.

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Grape

Use Chlorfos 4E for control of grape root borer by application just before the pest emerges from the soil. Mix 4 1/2 pints of Chlorfos 4E 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 or each vine. Do not allow spray to contact fruit or foliage.

Restrictions: Do not make more than 1 application per season or apply within 35 days before harvest. Based upon available residue data, the use of Chlorfos 4E in grapes is restricted to states east of the Rocky Mountains.

Mint

Use Chlorfos 4E 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 3/4 inch in length, use the 2-pint rate. When larvae are 3/4 inch or more in length, use the higher rate. **Make only 1 application during the growing season. Do not apply within 90 days before harvest.** For mint root borer control, apply postharvest 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 1 postharvest application per season.**

Chlorfos 4E 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 Chlorfos 4E per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" for further information.

Nectarine, Peach

Use Chlorfos 4E for the control of peach tree borers by application as a trunk spray before newly hatched borers enter the trees. Mix 3 quarts of Chlorfos 4E with 100 gallons of water and apply as a course, 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.

Chlorfos 4E 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 1 application per season. Do not apply within 14 days before harvest. Do not allow meat or dairy animals to graze in treated orchards.

Onion (Dry Bulb)

Use Chlorfos 4E to control onion maggot by application as an in-furrow drench. Apply Chlorfos 4E at the rate of 1.1 fluid ounce per 1,000 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 1 application per year.

Peanut

For suppression of wireworms, apply Chlorfos 4E 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: The combined total of preplant and postplant applications of Chlorfos 4E and Chlorfos 15G must not exceed 4 pounds active ingredient per acre per season. 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 - Grain Sorghum (Milo)

Use Chlorfos 4E insecticide for control of the following pests at the dosages indicated:

Pests	Chlorfos 4E	Specific Directions
sorghum midge	1/2 pt./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	1/2 - 1 pt./acre	
greenbug	1/2 - 2 pt./acre	for in festations of greenbug that are difficult to control, use a higher dose within the indicated rate range.
chinch bugs lesser cornstalk borer	1 - 2 pt./acre	apply as a directed spray toward the base of the plant using power-operated spray equipment with sufficient water to ensure coverage of an 8 - 12 inch band centered in the row. On plants less than 6 inches high, apply a 8 - 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 pt./acre	
armyworms cutworms	1 - 2 pt./acre	
European and southwestern corn borer	1 1/2 - 2 pt./acre	
corn earworm	2 pt./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 Chlorfos 4E to drought stressed grain sorghum within 3 days following irrigation or rain except where the product is applied in irrigation water.

Chlorfos 4E may also be applied through sprinkler irrigation systems as a post emergence broadcast application to control the above listed foliar

pests. For best results, use the recommended rate of Chlorfos 4E per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" for further information.

Precaution: Be aware that sorghum lines used in seed production fields may be more sensitive to chemical injury. Susceptible inbred lines or hybrids are likely to be at greater risk of yield-reducing chemical injury when sprayed at the higher rates of application. Do not apply more than 1 pint per acre of Chlorfos 4E to seed sorghum if the additional risk of crop injury is unacceptable.

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 Chlorfos 4E 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 Chlorfos 4E per acre per season.

Soybean

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 Chlorfos 4E 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 Spacings				
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 Chlorfos 4E at the following rates by application in sufficient water to ensure thorough coverage of treated plants:

Pests	Chlorfos 4E
European corn borer southern green stink bug	2 pt./acre
bean leaf beetle cutworms corn earworm saltmarsh caterpillar other woollybears	1 - 2 pt./acre
Mexican bean beetle armyworms	1 - 1 1/2 pt./acre
velvetbean caterpillar grasshoppers green cloverworm spider mites	1/2 - 1 pt./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 1 application after pod set.

Chlorfos 4E 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 Chlorfos 4E per acre. Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See "Sprinkler Irrigation" for further information.

Restrictions: Do not apply more than 6 pints of Chlorfos 4E 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 2 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.

Strawberry

Use Chlorfos 4E 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. Chlorfos 4E 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 Chlorfos 4E is applied to strawberries experiencing high temperature and drought stress.

Restrictions: For pre-bloom use only. Do not make more than 2 applications per season or apply within 21 days before harvest.

Sunflower

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

Preplant Incorporation Treatment
Use Chlorfos 4E at the following rates by application in sufficient water to the soil surface and incorporate into the soil:

Pests	Chlorfos 4E
cutworms	2 - 4 pt./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 Chlorfos 4E for control of the following pests at the dosage indicated by application in sufficient water to ensure thorough coverage of treated plants:

Pests	Chlorfos 4E
cutworms	2 - 3 pt./acre
sunflower beetle larvae and adults stem weevil sunflower moth banded sunflower moth woollybears seed weevil	1 - 1 1/2 pt./acre
grasshoppers	1 pt./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% bloom stage. A second treatment may be made 7 days later, if needed. For seed weevil control, treat when field counts indicate need to retreat.

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

Sugar Beet

Soil Treatment (At Planting or Preplant Incorporated)
To reduce feeding damage from early season insects such as cutworms, use Chlorfos 4E at planting or as a preplant treatment and incorporate to a depth of 1 to 2 inches. Do not apply as an in-furrow treatment. Apply 1 pint of Chlorfos 4E per planted acre to a 10 inch wide band centered on the row for furrows 30 inches apart. (For rows 30 inches apart, this is equivalent to 9.2 fluid ounces of Chlorfos 4E per 10,000 feet of row). For other row widths, adjust the spray volume per planted acre in proportion to the area actually treated.

Postemergence Treatment
Apply Chlorfos 4E as a broadcast or banded foliar spray. Treat when field counts indicate that damaging insect populations are developing or present. Re-treat as necessary to maintain control of target insects.

Broadcast Application: Apply the specified dosage in water using 2 to 5 gallons of finished spray per acre when using aerial spray equipment or 10 to 30 gallons per acre when using ground spray equipment.

Band Application: Apply the specified dosage within the band using a minimum of 6 1/2 gallons of finished spray per acre. Apply the spray in a 5 to 7 inch wide band over the row. Do not reduce the dosage for band applications. Concentrate the full labeled dosage rate in the treated zone. For best results, band-applied treatments should be lightly incorporated either mechanically or with irrigation.

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

Pests	Chlorfos 4E		Timing per Special Directions
	Broadcast	Band	
grasshoppers	1/2 - 1 pt./acre	-	Low rate will control small nymphs (1st through 3rd instar)
spider mites	1 pt./acre	2/3 pt./acre	
fall armyworm yellowstriped armyworm webworms	1 - 2 pt./acre	2/3 - 1 1/3 pt.acre	
beet armyworm	1 1/2 - 2 pt./acre	1 - 1 1/3 pt./acre	
cutworms flea beetle adults	2 pt./acre	1 1/3 pt./acre	
sugar beet maggot adults[1]	1/2 - 1 pt./acre	-	To target adults present at the time of application based on local field trap monitoring, apply anytime from 7 days before until 3 days after peak adult emergence.
sugar beet root maggot larvae[1]	2 pt./acre	2/3 - 1 1/3 pt./acre	Use as supplemental treatment following an at-plant insecticide treatment for control of root maggot. Application timing should be based on local field trap monitoring. Apply anytime from 7 days before until 3 days after peak adult emergence.
sugar beet root maggot larvae[1]	-	1 1/3 - 2 pt./acre	Use as primary treatment to control root maggot. Application timing should be based on local field trap monitoring. Apply anytime from 7 days before until 3 days after peak adult emergence.

[1] To prevent potential development of insecticide resistance in sugar beet root maggot, producers are encouraged to take the following steps: (1) avoid applying more than 2 applications of Chlorfos 4E per season when adults are active; (2) if an organophosphate insecticide was applied at planting, make no more than 1 postemergence application of Chlorfos 4E when adults are active.

Restrictions: Do not apply within 30 days of harvest of beet roots and tops. Do not apply more than a total of 8 pints per acre of Chlorfos 4E on a broadcast basis, or make more than 4 applications per season. Do not allow livestock to graze in treated areas or harvest treated beet tops as feed for meat or dairy animals within 30 days of last treatment.

Sweet Potato

Use Chlorfos 4E 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 Chlorfos 4E will protect against feeding damage). Chlorfos 4E will not control false wireworms or white fringe beetle or other grubs that attack sweet potatoes.

Restrictions: Do not make more than 1 application per season. Do not harvest within 125 days of treatment.

Tobacco

Use Chlorfos 4E for preplant treatment to control larvae of cutworms, flea beetles, mole crickets, root maggots, and wireworms. Apply 2 to 3 quarts of Chlorfos 4E per acre in not less than 10 gallons of water as a broadcast (overall) spray to the soil surface 24 - 48 hours before bedding and transplanting. Immediately following application, incorporate the insecticide into the soil to a depth of 2 to 4 inches using suitable equipment. The application of Chlorfos 4E 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 Chlorfos 4E 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 Chlorfos 4E in a tank mix with Nemacur 3 at the rate of 2 quarts of Chlorfos 4E plus 4 quarts of Nemacur 3 nematicide per acre. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for Nemacur 3 used in combination with Chlorfos 4E. 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 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.

Before broadcast application of Chlorfos 4E onto existing beds, knock down beds to final shape for transplanting. Use of PTO-driven implements that will incorporate Chlorfos 4E to a depth of 4 inches is recommended.

Restrictions: Do not make more than 1 application per season.

Tree Fruit

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

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

Crop	Insect	Chlorfos 4E per 100 Gallons of Spray[1]
apples	rosy apple aphid San Jose scale *Lygus* pandemis leafroller climbing cutworms obliqua banded leafroller	1/2 - 1 pt (Use a minimum of 1 1/2 pt./acre)
pears	San Jose scale climbing cutworms pear psylla adults	1/2 - 1 pt (Use a minimum of 1 1/2 pt./acre)
plums prunes	San Jose scale mealy plum aphid climbing cutworms peach twig borer	1/2 - 1 pt (Use a minimum of 1 1/2 pt./acre)
peaches nectarines	San Jose scale peach twig borer climbing cutworms	1/2 - 1 pt (Use a minimum of 1 1/2 pt./acre)

[1]Based on 200 to 600 gallons per acre as a dilute spray.

For dilute sprays, 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.

For low volume (concentrate) sprays, less than 200 gallons of spray mixture per acre, use the same amount of Chlorfos 4E as for a dilute spray and apply in a manner that will ensure thorough coverage of the trees. Use the higher dosage of Chlorfos 4E 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 Chlorfos 4E 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 Chlorfos 4E per acre.

Restrictions: Make only 1 application during the dormant season. Do not allow meat or dairy animals to graze in treated orchards.

Tree Nut

Use Chlorfos 4E at the dosages 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 Chlorfos 4E 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.

Pecan
Use Chlorfos 4E at the rates indicated to control the listed pests.

Insects Controlled	Dosage of Chlorfos 4E (Dilute or Concentrate)	Remarks
Spittlebugs[1]	1 -4 pt./acre	[1] Use a dosage of 2 to 4 pints per acre for concentrate sprays.
pecan nut casebearer fall webworm	1 1/2 - 4 pt./acre	
Phylloxera spp.[2] black pecan aphid hickory shuckworm[3] pecan leaf scorch mite (suppression)[4] fire ants and other ant species[5]	2 - 4 pt./acre	[2] For best *Phylloxera* spp. control, make 2 applications at a 7 to 10 day interval using a minimum of 1.0 pint of Chlorfos 4E per acre starting at bud swell. [3] For best results make 2 applications 10 to 14 days apart. [4] To suppress pecan leaf scorch mite, use a preventative program. [5] For fire ant control, apply as an orchard floor spray. Do not apply where weed growth or other obstructions prevent uniform coverage of the orchard floor.
yellow pecan aphid black margined aphid	1 - 4 pints of Chlorfos 4E plus: 5.33 fl. oz. of pydrin 2.4E, or 1.70 fl. oz. of Asana 1.9EC, or 3.00 fl. oz. of Ammo 2.5EC, or 2.56 fl. oz. of Cymbush 3E	

Restrictions:

Make no more than 5 applications per year. Do not apply within 28 days of harvest. Do not allow livestock to graze in treated orchards.
Make no applications of tank mixtures closer to harvest than the longest postharvest interval shown for any of the products in the tank mixture.
For dilute applications with ground equipment use at least the minimum rate of Chlorfos 4E listed for the pest. Apply in 100 to 600 gallons of water per acre.
For aerial applications use 5 to 15 gallons of water per acre.
NOTE: With aerial application, control may be reduced due to poor coverage.
Up to 20 pints of Chlorfos 4E may be applied per acre per year.

Filberts
Use Chlorfos 4E at the rates indicated to control the listed pests.

Crop	Insects Controlled	Dosage Chlorfos 4E
filberts[1]	eye-spotted bud moth filbert aphid filbert leafroller filbert worm oblique banded leafroller omnivorous leaftier winter moth	3 - 4 pt./acre

Restrictions:
[1] Make no more than 3 foliar applications per season on filberts.
Do not apply within 14 days of harvest.
Do not allow livestock to graze in treated orchards.

Vegetables

Use Chlorfos 4E at the dosages indicted 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 Chlorfos 4E	Use Directions	Restrictions
cauliflower	root maggot	1.6 - 2.4 fl. oz./1,000 linear ft of 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. Shallow incorporation is necessary.	Do not apply more than 2 pints of Chlorfos 4E to cauliflower planted in 40 inch rows. Use proportional amounts for other row spacings not to exceed 4 pints of Chlorfos 4E per acre.
broccoli Brussels sprouts cabbage Chinese cabbage collards kale kohlrabi turnips	root maggot	1.6 - 2.75 fl. oz./1,000 linear ft of row	Placement behind the planter shoe and in front of the presswheel is recommended. For transplanted crops, apply Chlorfos 4E 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.	Do not apply more than 2.6 pints of Chlorfos 4E 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 1/2 pints of Chlorfos 4E per acre to these crops in 20 inch rows (or 2 rows per bed). Use proportional amounts for other row spacings not to exceed 4 1/2 pints of Chlorfos 4E per acre.
broccoli cabbage	root aphid	For single row spacings: 1.2 fl. oz./1,000 linear ft of row For double row spacings: 2.4 fl. oz./1,000 linear ft of row	Apply Chlorfos 4E in a water emulsion 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 1 application per season or apply within 30 days before harvest.
Brussels sprouts	armyworms cabbage aphid cutworms imported cabbage worm striped flea beetle (adult)	1 - 2 pt./acre	Apply Chlorfos 4E 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 in 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./1,000 linear ft of row	Apply the specified dosage as a water-based drench in the seed furrows with the seed at planting time. Use a minimum of 40 gallons of total drench per acre.	Do not apply more than 5 1/2 pints of Chlorfos 4E per acre or make more than 1 application per season.
rutabagas	root maggot	1.6 - 3.3 fl. oz./1,000 linear ft of row	Apply the specified dosage in a water-based 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 apply more than 4 1/2 pints of Chlorfos 4E per acre or make more than 1 application per season. Do not use rutabaga tops for food or feed purposes.

WHEAT

For distribution and use only in Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming

For control of aphids, including Russian wheat aphid, grasshoppers, wheat midge, brown wheat mite, and cutworms infesting wheat.

Use and Dosage recommendations

Apply Chlorfos 4E at the rate of 1/2 to 1 pint per acre (0.25 to 0.5 lb ai/acre) to control aphids (including Russian wheat aphid), brown wheat mite or grasshoppers.

For control of wheat midge, use 1 pint of Chlorfos 4E per acre. Treatment is recommended when 75% of the wheat heads have emerged from the boot and when midge adults are found in the crop (1 midge per 4-5 heads). Application timing is critical to ensure good control. If possible, apply in the late afternoon or early evening when temperatures exceed 50°F and wind speed is less than 7 mph.

For control of army cutworms and suppression of other cutworm species, use 1 pint of Chlorfos 4E per acre. Control may be reduced under high temperature conditions (greater than 80°F), under dry soil conditions, or if larvae are more than 1/2 inch long. Treat when field counts or crop injury indicates that damaging pest populations are developing or present. A second application of 1 pint/acre may be made for additional control.

Mix the required dosage with water and apply in a minimum of 2 gallons per acre finished spray volume. Apply using aerial (fixed wing or helicopter) or power-operated ground spray equipment. Chlorfos 4E may also be applied through sprinkler-irrigation systems. Report any bird or fish kills which may be associated with the use of chlorpyrifos by calling 1-(800)-237-1854.

Restrictions

- Do not make more than two applications per crop.
- Do not apply within 28 days of harvest.
- Do not allow livestock to graze or otherwise feed on treated forage within 14 days of application.
- Do not feed straw from treated wheat within 28 days of application.
- Do not apply directly to bodies of water.
- Do not apply product where runoff is likely to occur to aquatic habitats (including lakes, public reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or other natural waters).
- Do not apply when weather conditions favor drift or runoff from treated areas.

Ground Application

For ground applications, the distance from treated areas to aquatic habitats (including lakes, public reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or other natural waters) must be 30 feet or more.

- Do not make ground applications if wind speed is greater than 15 mph.
- Do not apply at spray boom pressures greater than 45 psi.

Aerial Application

- Do not apply by air within 300 feet of aquatic habitats (including lakes, public reservoirs, rivers, permanent streams, marshes, natural ponds, estuaries or other natural waters).
- Do not make aerial applications of Chlorfos 4E when wind speeds exceed 10 mph or when an atmospheric temperature inversion exists.
- Boom length should not exceed 75% of the wing span and release height for aerial applications should be no greater than 10 feet above the crop canopy.

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