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READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

USE ONLY IN ACCORDANCE WITH INSTRUCTIONS.

KEEP OUT OF REACH OF CHILDREN

## CUTTER 48 EC



### INGREDIENTS

Chlorpyrifos.....48%  
Other ingredients .....25%

CUTTER 48 EC is a broad-spectrum organophosphate insecticide. CUTTER 48 EC is effective in controlling cutworms, corn rootworms, cockroaches, grubs, flea beetles, flies, termites, fire ants, and lice. It is used as an insecticide on grain, cotton, field, fruit, nut and vegetable crops, and well as on lawns and ornamental plants.

It is also registered for direct use on sheep and turkeys, for horse site treatment, dog kennels, domestic dwellings, farm buildings, storage bins, and commercial establishments. CUTTER 48 EC acts on pests primarily as a contact poison, with some action as a stomach poison. It is available as granules, wettable powder, dustable powder and emulsifiable concentrate.

Trade Names Of Other Firms: Trade names for products containing Chlorpyrifos include Brodan, Detmol UA, Dowco 179, Dursban, Empire, Eradex, Lorsban, Paqeant, Piridane, Scout, and Stipend.

### What is CUTTER 48 EC and how does it work?

CUTTER 48 EC is a broad-spectrum organophosphate insecticide. Chlorpyrifos acts on pests primarily as a contact poison, with some action as a stomach poison.

### Key Benefits of CUTTER 48 EC:

1. Effective broad spectrum control
2. Available in other formulations for application flexibility

### PRECAUTIONS

Harmful if swallowed, inhaled or absorbed through skin. Causes eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing dust or vapor. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Keep children or pets away from treated area until dry.

### SYMPTOMS OF POISONING

Irritation on skin or eyes.

### MEDICAL TREATMENT

Treatment is symptomatic.

### FIRST AID

If skin contacts, remove all contaminated clothing at once; thoroughly wash affected areas with soap and water. If eyes contact, flush for 15 minutes with large amount of water. If inhaled, remove patient to fresh air. In all cases, notify a physician and present this label. Ingestion: Do not induce vomiting or administer liquids. Vomiting should be induced only under professional supervision. Keep patient prone and quiet. Get medical aid. ONLY A PHYSICIAN should induce vomiting as first aid for this slightly toxic substance due to increased risk of chemical pneumonia or pulmonary edema caused by aspiration of the hydrocarbon solvent.

### DIRECTIONS OF USE

#### MIXING DIRECTIONS

To prepare the spray, add a portion of the required amount of water to the spray tank and with agitation, add the CUTTER 48 EC. 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.

CUTTER 48 EC 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 CUTTER 48 EC alone. When tank mixtures of CUTTER 48 EC 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 CUTTER 48 EC 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**

CUTTER 48 EC 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 PRECAUTIONS**

The mixture containing CUTTER 48 EC 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 CUTTER 48 EC.

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 a

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, quickclosing 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.
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 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.
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 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.
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 CUTTER 48 EC, determine the following:

- a. Calculate the number of acres irrigated by the system;
- b. Set the irrigation rate and determine the number of minutes for the system to cover the intended treatment area;
- c. 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 that deliver a low coefficient of
19. uniformity such as certain water drive units.

#### APPROVED CROPS

##### ALFALFA

Use CUTTER 48 EC to control the following pests at the dosages indicated by application as a broadcast foliar spray:

Pest	
Aphids (suppression)	1/2 pint/acre
Corn rootworm adults (spotted cucumber beetle) Grasshoppers	1/2-1 pint/acre
Alfalfa blotch leafminer Alfalfa looper Alfalfa weevil larvae and adults Armyworms Cutworms Egyptian alfalfa weevil larvae and adults Plant bugs	1-2 pints/acre

Leafhoppers Spittlebugs	
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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.

CUTTER 48 EC 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 CUTTER 48 EC per acre.

Maintain vigorous tank agitation to assure uniformity of the application throughout the injection period. See **SPRINKLER IRRIGATION** section for further information.

CUTTER 48 EC 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 CUTTER 48 EC. 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 CUTTER 48 EC 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 CUTTER 48 EC 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 CUTTER 48 EC 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.

### CHERRIES

Use CUTTER 48 EC for the control of lesser peach tree borer, greater peach tree borer, and American plum borer by application as a trunk spray. Mix 1 1/2 to 3 quarts of CUTTER 48 EC 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 cutworm. For control of these pests, tank mix 1/2 to 1 pint of CUTTER 48 EC 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 CUTTER 48 EC 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 CUTTER 48 EC 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.

### CITRUS FRUITS

Use CUTTER 48 EC 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.

CUTTER 48 EC 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 CUTTER 48 EC.

**PRECAUTIONS:** Observe local use directions for tank-mix combinations especially in regard to applications of CUTTER 48 EC 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.

CUTTER 48 EC should not be tank mixed with Difolatan 80 Sprills as crop injury may occur. CUTTER 48 EC 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 16 pints of CUTTER 48 EC 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 CUTTER 48 EC per acre nor within 35 days for application of rates above 7 pints per acre. Do not allow livestock to graze in treated areas. Do not apply more than 8 pints (4 lbs. a.i.) per acre in a single application.

Pest	Dosage pt/acre	Spray volume gal/acre
Red scale	12	Ground: 100-2400
<b>REMARKS</b>		
Do not use a spray concentration of CUTTER 48 EC of less than 1/2 pt./100 gal. of total volume.		
Aphids, Katydid, Lepidopterous larvae, Avocado leafroller, Cutworms, Fruit-tree leafroller, Orange tortrix, Western tussock moth	<b>2-7</b>	Ground: 100-750 Aerial: min. 15

Scale insects (Black scale, Brown soft scale, California red scale)	<b>8</b>	100-2400
Thrips (suppression) Mealybugs	<b>6-8</b>	100-750
<b>REMARKS</b> Do not use a spray concentration of CUTTER 48 EC of less than 1/2 pt./100 gal. of total volume.		

### CITRUS ORCHARD FLOORS

Use CUTTER 48 EC 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 CUTTER 48 EC 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 CUTTER 48 EC may be made in addition to the orchard floor.

CUTTER 48 EC 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 CUTTER 48 EC per acre. See **SPRINKLER IRRIGATION** section for further information.

**RESTRICTIONS:** Do not apply more than 10 quarts of CUTTER 48 EC per acre per season. Do not apply last treatment within 28 days before harvest. Do not allow livestock to graze in treated areas.

### CRANBERRIES

Use CUTTER 48 EC by application as a broadcast, foliar spray to control brown spanworm, cranberry fruitworm, cranberry weevil, cutworms, fireworms, and *Sparganothis* fruitworm 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.

CUTTER 48 EC may also be applied through sprinkler irrigation systems to control the above listed pests. For best results, use the recommended rate of CUTTER 48 EC 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 more 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 CUTTER 48 EC at the following rates by application in sufficient water to the soil surface and incorporate into the soil:

PEST	CUTTER 48 EC
Cutworms, Symphylans	2 pints/acre
Wireworms, Billbugs, Flea beetle larvae, Grubs, Seedcorn, maggots, Seedcorn beetle	2 pints/acre
Lesser cornstalk borer, Corn rootworm larvae	2 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. CUTTER 48 EC 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 CUTTER 48 EC.

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

Use CUTTER 48 EC at the following rates by application in sufficient water to surface trash and exposed soil:

PEST	CUTTER 48 EC
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. CUTTER 48 EC 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 CUTTER 48 EC.

**Cultivation Time Treatment**

Use CUTTER 48 EC at the rate of 2 pints per acre to control corn rootworm larvae. Apply CUTTER 48 EC 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 CUTTER 48 EC may be made in addition to an at-planting application of Chlorpyrifos 15G granular insecticide.

**Postemergence Treatment**

Use CUTTER 48 EC at the following rate by application in sufficient water to ensure thorough coverage of treated plants:

PEST	CUTTER 48 EC
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
Southwestern corn borer, Corn earworm	1 1/2-2 pints/acre
Cutworms, Billbugs, Lesser cornstalk borer, Flea beetle adults, Common stalk borer	2 pints/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.

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 CUTTER 48 EC 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 CUTTER 48 EC 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 CUTTER 48 EC 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 CUTTER 48 EC in combination with the burn

down herbicide for control of common stalk borer. CUTTER 48 EC 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 CUTTER 48 EC in a tank mix with 2 pints per acre of non-emulsifiable oil. Maintain vigorous tank agitation to assure uniformity of the CUTTER 48 EC plus oil mixture throughout the injection period. CUTTER 48 EC may also be applied through sprinkler irrigation systems at the rate of 2 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 **SPRINKLE IRRIGATION** section for further information.

**RESTRICTIONS:** Do not apply within 35 days before harvest of grain. 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. Do not apply more than 2 pints (1 lb. a.i.) per acre per application. Do not make more than 3 applications per season. Do not apply more than 6 pints (3 lbs. a.i.) per acre per season.

#### COTTON

CUTTER 48 EC for control of the following pests in all states except Arizona and California at the dosages indicated:

PEST	CUTTER 48 EC
Cotton fleahopper, Plant bugs (Lygus, Mirids)	3/8-1 pint/acre
Fall armyworm, Grasshopper, Thrips, Yellowstriped 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

**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 are difficult to control, use a higher dosage within the indicated rate range.

PEST	CUTTER 48 EC
Armyworms, Cotton Aphid, Cotton fleahopper, Lygus, Salt marsh caterpillar, Thrips	1-2 pints/acre
Cotton bollworm, Tobacco budworm, Boll weevil, Cutworms,	Pink bollworm

**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. Retreat as necessary to maintain control.

CUTTER 48 EC 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 CUTTER 48 EC 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 fields be scouted twice per week and treatments made when worms are 1/4 inch or less in length.

#### DISPOSAL METHODS

Do not dispose of undiluted chemicals on site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush, or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt.

#### STORAGE CONDITION

Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Store in a locked room

or place away from children, animals, food, feedstuffs, seed and fertilizers. Triple or preferably pressure rinse containers before disposal. Add rinsing to spray tank.

For More Details including effects on environment email [contact@ivorychem.com](mailto:contact@ivorychem.com) with Subject "CUTTER 48 EC DETAILS"

More Details:

#### TOXICOLOGICAL EFFECTS

- Acute toxicity: Chlorpyrifos is moderately toxic to humans [43]. Poisoning from chlorpyrifos may affect the central nervous system, the cardiovascular system, and the respiratory system. It is also a skin and eye irritant [2]. While some organophosphates are readily absorbed through the skin, studies in humans suggest that skin absorption of chlorpyrifos is limited [2]. Symptoms of acute exposure to organophosphate or cholinesterase-inhibiting compounds may include the following: numbness, tingling sensations, incoordination, headache, dizziness, tremor, nausea, abdominal cramps, sweating, blurred vision, difficulty breathing or respiratory depression, and slow heartbeat. Very high doses may result in unconsciousness, incontinence, and convulsions or fatality. Persons with respiratory ailments, recent exposure to cholinesterase inhibitors, cholinesterase impairment, or liver malfunction are at increased risk from exposure to chlorpyrifos. Some organophosphates may cause delayed symptoms beginning 1 to 4 weeks after an acute exposure which may or may not have produced immediate symptoms [2]. In such cases, numbness, tingling, weakness, and cramping may appear in the lower limbs and progress to incoordination and paralysis. Improvement may occur over months or years, and in some cases residual impairment will remain [2]. Plasma cholinesterase levels activity have been shown to be inhibited when chlorpyrifos particles are inhaled [8]. The oral LD50 for chlorpyrifos in rats is 95 to 270 mg/kg [2,13]. The LD50 for chlorpyrifos is 60 mg/kg in mice, 1000 mg/kg in rabbits, 32 mg/kg in chickens, 500 to 504 mg/kg in guinea pigs, and 800 mg/kg in sheep [2,13,44]. The dermal LD50 is greater than 2000 mg/kg in rats, and 1000 to 2000 mg/kg in rabbits

[2,13,45]. The 4-hour inhalation LC50 for chlorpyrifos in rats is greater than 0.2 mg/L [46].

- Chronic toxicity: Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure including the delayed symptoms. Other effects reported in workers repeatedly exposed include impaired memory and concentration, disorientation, severe depressions, irritability, confusion, headache, speech difficulties, delayed reaction times, nightmares, sleepwalking, and drowsiness or insomnia. An influenza-like condition with headache, nausea, weakness, loss of appetite, and malaise has also been reported [8]. When technical chlorpyrifos was fed to dogs for 2 years, increased liver weight occurred at 3.0 mg/kg/day. Signs of cholinesterase inhibition occurred at 1 mg/kg/day. Rats and mice given technical chlorpyrifos in the diet for 104 weeks showed no adverse effects other than cholinesterase inhibition [43]. Two-year feeding studies using doses of 1 and 3 mg/kg/day of chlorpyrifos in rats showed moderate depression of cholinesterase. Cholinesterase levels recovered when the experimental feeding was discontinued [2]. Identical results occurred in a 2-year feeding study with dogs. No long term health effects were seen in either the dog or rat study [2,47]. A measurable change in plasma and red blood cell cholinesterase levels was seen in workers exposed to chlorpyrifos spray. Human volunteers who ingested 0.1 mg/kg/day of chlorpyrifos for 4 weeks showed significant plasma cholinesterase inhibition [47].
- Reproductive effects: Current evidence indicates that chlorpyrifos does not adversely affect reproduction. In two studies, no effects were seen in animals tested at dose levels up to 1.2 mg/kg/day [8]. No effects on reproduction occurred in a three-generation study with rats fed dietary doses as high as 1 mg/kg/day [43,47]. In another study in which rats were fed 1.0 mg/kg/day for two generations, the only effect observed was a slight increase in the number of deaths of newborn offspring [2].
- Teratogenic effects: Available evidence suggests that chlorpyrifos is not teratogenic. No teratogenic effects in offspring were found when pregnant rats were fed doses as high as 15 mg/kg/day

for 10 days. When pregnant mice were given doses of 25 mg/kg/day for 10 days, minor skeletal variations and a decrease in fetal length occurred [43,45]. No birth defects were seen in the offspring of male and female rats fed 1.0 mg/kg/day during a three-generation reproduction and fertility study [2,47].

- Mutagenic effects: There is no evidence that chlorpyrifos is mutagenic. No evidence of mutagenicity was found in any of four tests performed [43].
- Carcinogenic effects: There is no evidence that chlorpyrifos is carcinogenic. There was no increase in the incidence of tumors when rats were fed 10 mg/kg/day for 104 weeks, nor when mice were fed 2.25 mg/kg/day for 105 weeks [43].
- Organ toxicity: Chlorpyrifos primarily affects the nervous system through inhibition of cholinesterase, an enzyme required for proper nerve functioning.
- Fate in humans and animals: Chlorpyrifos is readily absorbed into the bloodstream through the gastrointestinal tract if it is ingested, through the lungs if it is inhaled, or through the skin if there is dermal exposure [8]. In humans, chlorpyrifos and its principal metabolites are eliminated rapidly [2]. After a single oral dose, the half-life of chlorpyrifos in the blood appears to be about 1 day [41]. Chlorpyrifos is eliminated primarily through the kidneys [8]. Following oral intake of chlorpyrifos by rats, 90% is removed in the urine and 10% is excreted in the feces [13]. It is detoxified quickly in rats, dogs, and other animals [8]. The major metabolite found in rat urine after a single oral dose is trichloropyridinol (TCP). TCP does not inhibit cholinesterase and it is not mutagenic [8]. Chlorpyrifos does not have a significant bioaccumulation potential [8]. Following intake, a portion is stored in fat tissues but it is eliminated in humans, with a half-life of about 62 hours [2]. When chlorpyrifos (Dursban) was fed to cows, unchanged pesticide was found in the feces, but not in the urine or milk [48]. However, it was detected in the milk of cows for 4 days following spray dipping with a 0.15% emulsion. The maximum concentration in the milk was 0.304 ppm [2]. In a rat study, chlorpyrifos did not accumulate in any tissue except fat [49].

#### ECOLOGICAL EFFECTS

- Effects on birds: Chlorpyrifos is moderately to very highly toxic to birds

[43]. Its oral LD50 is 8.41 mg/kg in pheasants, 112 mg/kg in mallard ducks, 21.0 mg/kg in house sparrows, and 32 mg/kg in chickens [8,13,43]. The LD50 for a granular product (15G) in bobwhite quail is 108 mg/kg [13,43]. At 125 ppm, mallards laid significantly fewer eggs [43]. There was no evidence of changes in weight gain, or in the number, weight, and quality of eggs produced by hens fed dietary levels of 50 ppm of chlorpyrifos [8].

- Effects on aquatic organisms: Chlorpyrifos is very highly toxic to freshwater fish, aquatic invertebrates and estuarine and marine organisms [43]. Cholinesterase inhibition was observed in acute toxicity tests of fish exposed to very low concentrations of this insecticide. Application of concentrations as low as 0.01 pounds of active ingredient per acre may cause fish and aquatic invertebrate deaths [43]. Chlorpyrifos toxicity to fish may be related to water temperature. The 96-hour LC50 for chlorpyrifos is 0.009 mg/L in mature rainbow trout, 0.098 mg/L in lake trout, 0.806 mg/L in goldfish, 0.01 mg/L in bluegill, and 0.331 mg/L in fathead minnow [50]. When fathead minnows were exposed to Dursban for a 200-day period during which they reproduced, the first generation of offspring had decreased survival and growth, as well as a significant number of deformities. This occurred at approximately 0.002 mg/L exposure for a 30-day period [8]. Chlorpyrifos accumulates in the tissues of aquatic organisms. Studies involving continuous exposure of fish during the embryonic through fry stages have shown bioconcentration values of 58 to 5100 [51]. Due to its high acute toxicity and its persistence in sediments, chlorpyrifos may represent a hazard to sea bottom dwellers [52]. Smaller organisms appear to be more sensitive than larger ones [50].
- Effects on other organisms: Aquatic and general agricultural uses of chlorpyrifos pose a serious hazard to wildlife and honeybees [13,48].

#### ENVIRONMENTAL FATE

- Breakdown in soil and groundwater: Chlorpyrifos is moderately persistent in soils. The half-life of chlorpyrifos in soil is usually between 60 and 120 days, but can range from 2 weeks to over 1 year, depending on the soil type, climate, and

- other conditions [12,19]. The soil half-life of chlorpyrifos was from 11 to 141 days in seven soils ranging in texture from loamy sand to clay and with soil pHs from 5.4 to 7.4. Chlorpyrifos was less persistent in the soils with a higher pH [51]. Soil half-life was not affected by soil texture or organic matter content. In anaerobic soils, the half-life was 15 days in loam and 58 days in clay soil [43]. Adsorbed chlorpyrifos is subject to degradation by UV light, chemical hydrolysis and by soil microbes. When applied to moist soils, the volatility half-life of chlorpyrifos was 45 to 163 hours, with 62 to 89% of the applied chlorpyrifos remaining on the soil after 36 hours [51]. In another study, 2.6 and 9.3% of the chlorpyrifos applied to sand or silt loam soil remained after 30 days [51]. Chlorpyrifos adsorbs strongly to soil particles and it is not readily soluble in water [19,51]. It is therefore immobile in soils and unlikely to leach or to contaminate groundwater [51]. TCP, the principal metabolite of chlorpyrifos, adsorbs weakly to soil particles and appears to be moderately mobile and persistent in soils [43].
- Breakdown in water: The concentration and persistence of chlorpyrifos in water will vary depending on the type of formulation. For example, a large increase in chlorpyrifos concentrations occurs when emulsifiable concentrations and wettable powders are released into water. As the pesticide adheres to sediments and suspended organic matter, concentrations rapidly decline. The increase in the concentration of insecticide is not as rapid for granules and controlled release formulations in the water, but the resulting concentration persists longer [50]. Volatilization is probably the primary route of loss of chlorpyrifos from water. Volatility half-lives of 3.5 and 20 days have been estimated for pond water [51]. The photolysis half-life of chlorpyrifos is 3 to 4 weeks during midsummer in the U.S. Its change into other natural forms is slow [52]. Research suggests that this insecticide is unstable in water, and the rate at which it is hydrolyzed increases with temperature, decreasing by 2.5- to 3-fold with each 10 C drop in temperature. The rate of hydrolysis is constant in acidic to neutral waters, but increases in alkaline waters. In water at pH 7.0 and 25 C, it had a half-life of 35 to 78 days [12].

- Breakdown in vegetation: Chlorpyrifos may be toxic to some plants, such as lettuce [36]. Residues remain on plant surfaces for approximately 10 to 14 days. Data indicate that this insecticide and its soil metabolites can accumulate in certain crops [8].
- PHYSICAL PROPERTIES
- Appearance: Technical chlorpyrifos is an amber to white crystalline solid with a mild sulfur odor [13].
- Chemical Name: O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate [13]
- CAS Number: 2921-88-2
- Molecular Weight: 350.62
- Water Solubility: 2 mg/L @ 25 C [13]
- Solubility in Other Solvents: benzene s.; acetone s.; chloroform s.; carbon disulfide s.; diethyl ether s.; xylene s.; methylene chloride s.; methanol s. [13]
- Melting Point: 41.5-44 C [13]
- Vapor Pressure: 2.5 mPa @ 25 C [13]
- Partition Coefficient: 4.6990 [13]
- Adsorption Coefficient: 6070 [19]
- Exposure Guidelines:
- ADI: 0.01 mg/kg/day [38]
- MCL: Not Available
- RfD: 0.003 mg/kg/day [53]
- PEL: 0.2 mg/m<sup>3</sup> (8-hour) (skin)
- HA: 0.02 mg/L (lifetime) [53]
- TLV: Not Available



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