

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



OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

December 13, 2000

Mr. Matt Talley
Micro Flo Company
P.O. Box 772099
Memphis, TN 38117-2099

Subject: Chlorpyrifos 4E Insecticide
EPA Reg. No. 51036-154
Submission dated 8/15/00

Dear Mr. Talley:

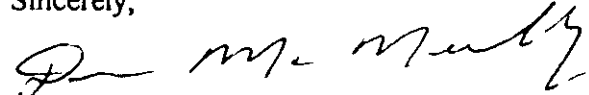
The revised product labeling referred to above, submitted in connection with the registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable provided you make the labeling change indicated below before you release the product for shipment bearing the amended labeling:

- 1) On pages 2 and 4, after "Protective eyewear" add the following " (goggles, face shield, or safety glasses with front, brow and temple protection)". This applies to both instances on page 2 where "Protective eyewear" is listed.
- 2) Correct the typo, at the top of page 10 (highlighted), "PALNT" to "PLANT".
- 3) On page 19, delete the use in wall voids or any indoor site under the heading "General Control of Wood Infesting Insects" according to the agreement EC formulations cannot be used indoors. The sentence: "Do not use in structures housing animals which are intended for or which produce products to be used for food purposes, i.e., poultry houses." must be deleted. That statement implies that other indoor uses are permitted. In addition, all indoor use directions under "Application methods" must also be deleted.

Failure to comply with any of the conditions of registration set forth in Paragraph 10 of the MOA shall be grounds for cancellation of the affected registration(s) under FIFRA section 6(e). Submit one

copy of the revised final printed label before releasing the product for shipment. If the conditions enumerated above are not complied with, the registration will be subject to cancellation in accordance with FIFRA Section 6(e).

Sincerely,

A handwritten signature in black ink, appearing to read "Dennis McNeilly", written in a cursive style.

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

RESTRICTED USE PESTICIDE

For retail sale and use by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.

**CHLORPYRIFOS 4E INSECTICIDE
ORGANOPHOSPHATE**

Controls numerous pests in the following areas: Commercial Nursery/ Commercial Greenhouse (Soils treatment, Dormant Spray of Tree Pests, Pre-Plant Incorporation of Field Grown Nursery Stock); Golf Course Turf, Turf and Ornamentals Around Industrial Buildings; Turf and Ornamentals in Road Medians.

ACTIVE INGREDIENT:

Chlorpyrifos (0,0-diethyl 0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate)..... 44.70%

INERT INGREDIENTS: 55.30%

TOTAL..... **100.00%**

ACCEPTED
with COMMENTS
In EPA Letter Dated:

DEC 13 2000

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No.

51036-154

This product contains petroleum distillates.
Contains 4 pounds of chlorpyrifos per gallon.

KEEP OUT OF REACH OF CHILDREN

WARNING AVISO

Si Usted no entiende la etiqueta, busque a alguien para que se la explique a Usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

FIRST AID

Organophosphate

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

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

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

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

NOTE TO PHYSICIAN: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. Atropine only by injection is an antidote.

This product is an organophosphorus ester that inhibits cholinesterase.

See Additional Precautionary Statements Inside

EPA Reg. No. 51036-154

EPA Est. No. 51036-GA-1

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

PRECAUTIONARY STATEMENTS
 Hazards To Humans And Domestic Animals

WARNING

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

EMERGENCY TELEPHONE NUMBERS: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact:

- (800) 424-9300 CHEMTREC (transportation and spills)
- (800) 900-4044 Poison Control Center (human health)
- (800) 345-4735 ASPCA (animal health)

PERSONAL PROTECTIVE EQUIPMENT

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

Applicators and other handlers must wear:

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

Exception: Applicators who submerge containerized or balled/burlapped plants in tanks must wear:

1. Long-sleeved shirt and long pants
2. Chemical-resistant gloves, such as barrier laminate or viton
3. Chemical-resistant footwear plus socks
4. Chemical-resistant apron
5. Protective eyewear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate.

Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

Users should:

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

ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to fish, birds, and other wildlife. For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Cover or incorporate spills. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.

PHYSICAL AND CHEMICAL HAZARDS

COMBUSTIBLE: Do not use or store near heat or open flame. Do not cut or weld container.

DIRECTIONS FOR USE

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

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 and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not 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.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil, or water, is:

1. Coveralls
2. Chemical-resistant gloves, such as barrier laminate or viton
3. Shoes plus socks
4. Protective eyewear

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides [40 CFR Part 170]. The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Keep children, pets and other unprotected persons out of treated area until sprays have dried.

CHEMIGATION PROHIBITION

Do not apply this product through any type of irrigation system.

STORAGE AND DISPOSAL

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

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

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

GENERAL INFORMATION

TURF AND OTHER NONRESIDENTIAL OUTDOOR USES

Chlorpyrifos 4E is an emulsifiable concentrate for control of pests located around industrial buildings (turf and ornamentals), road medians (turf and ornamentals), and golf course turf only. The pests controlled are listed in the accompanying tables. Chlorpyrifos 4E is compatible with insecticides, miticides and fungicides commonly recommended except for alkaline materials such as Bordeaux mixture and lime. It is always recommended that a small jar compatibility test using proper proportions of chemicals and water be run to check for physical compatibility prior to tank mixing.

Attention: Keep out of fish pools and other bodies of water. Do not treat vegetable gardens. Do not allow livestock to graze in treated areas. Do not feed treated grass cuttings (hay) or seed screenings to livestock or use hay for livestock bedding. Do not use in poultry houses.

ORNAMENTALS IN NURSERIES, AROUND INDUSTRIAL BUILDINGS AND ROAD MEDIANS

Use Chlorpyrifos 4E to treat flowers, shrubs, evergreens, vines, shade and flowering trees and non-bearing fruit, nut and citrus trees found in nurseries, around industrial buildings and road medians infested with pests listed in the following table. Dilute Chlorpyrifos 4E with water according to directions given in the table and apply using suitable hand- or power-operated spray equipment in a manner to provide complete and uniform coverage. For best results, apply a coarse spray to thoroughly wet both upper and lower leaf surfaces and infested limb and trunk areas. Attempt to penetrate dense foliage, but avoid overspraying to the point of excessive runoff. Treat when pests appear and repeat at 7 to 10 day intervals, if needed. Consult your State Agricultural Experiment Station or Extension Service Specialist for application timing and other specific use information. For nurseries, when using spray equipment delivering less than 200 gallons of finished spray per acre, use the rate recommended in the per acre column. Uniform coverage is critical for effective insect and mite control.

Note: Environmental factors have significant effects on phytotoxic expression. Chlorpyrifos 4E has been tested on numerous ornamental plants without causing serious phytotoxicity at recommended use rates. Some varieties of azaleas, camellias, poinsettias, rose bushes, or variegated ivy have shown varying degrees of phytotoxicity following treatment with Chlorpyrifos 4E.

Before treating large numbers of plants (especially those listed above), it is recommended that a small block of plants be treated and observed for 7 to 10 days to determine phytotoxic potential.

Note: The user assumes responsibility for determining if Chlorpyrifos 4E is safe to treated plants under commercial growing conditions.

Pest*	Amount of Chlorpyrifos 4E in Water to Make		Specific Directions
	Per Acre	100 gallons	
Adelgids (Cooley) (Eastern spruce galls) (Pine bark) Ants (including foraging fire ants) Aphids (Apple) (Chrysanthemum) (Cottonwood) (Elm leaf) (Peach) (Rose) (Spirea) (Woolly) Armyworms (Fall) (Yellowstriped) Bagworms ¹ Boxelder bugs Cankerworms Carpenter ants ² Catalpa sphinx Chiggers Citrus mealy bugs Cockroaches (American) (Brownbanded) (German) (Oriental) (Smokey brown) Elm spanworms Fall webworms ³ Grasshoppers Green fruitworms Hornworms Jackpine budworms Juniper webworms Katydid Lace bugs Leafhoppers Leafrollers Maple leafcutters ⁴ Mites ⁵ (Clover) (Red spider) (Southern red) (Spruce spider) (Twospotted spider) Oleander caterpillars Orange tortrix Periodical cicada Plant bugs Poplar tentmaker Psyllids Puss caterpillars Rose chafers Sawflies, exposed (Pin oak) (Pine) (Redheaded) Sowbugs	1 pt-1 qt	8-16 fl oz	1. For bagworms, treat when larvae are small and actively feeding. 2. For effective control of leafrollers, spray should be applied before leaves are tightly rolled. 3. For effective control of maple leafcutters on maple trees, apply spray to larvae as cases are being formed. Do not treat sugar maple trees intended for maple syrup production. 4. For effective control of spider mites when large numbers of eggs are present, apply a second spray 3-5 days in the South or 7-10 days in the North after initial treatment to control newly-hatched nymphs. 5. Locate carpenter ant nest, if possible, and drench thoroughly. 6. For control of fall webworms, directly spray into web and immediately adjacent foliage.

Pest*	Amount of Chlorpyrifos 4E in Water to Make		Specific Directions
	Per Acre	100 gallons	
Spittlebugs Spring elm caterpillars Springtails Spruce budworms (Eastern) (Western) Tent caterpillars (Eastern) (Forest) (Western) Thornbug Walnut caterpillars Whiteflies Yellownecked caterpillars	1 pt-1 qt	8-16 fl oz	
Armyworms (Beet) Beetles (Fuller rose) (Native elm bark) ¹ Browntail moth Outworms Leafhoppers Mahogany webworms Mealybugs Mimosa webworms Moths (Browntail) (Cypress tip) (Douglas fir tussock) (European pine shoot) (Gypsy) ² (Holly bud) (Nantucket pine tip) (Pandora) (Pitch pine tip) (Subtropical pine tip) (Tussock) Oakworms (California) (Orangestriped) (Redhumped) Redhumped caterpillars Thrips (exposed) Weevils (Blackvine) ³ (Pine reproduction) (Yellow poplar)	1 qt	1 pt	1. To reduce twig and branch feeding by bark beetles, applications should be made in the spring or early summer. 2. To kill migrating and invading gypsy moth larvae, treat trunks and foliage. 3. Blackvine weevils are night feeders. Late afternoon spraying will maximize control.
Foliar feeding Beetles (Blister leaf) (Cottonwood leaf) ¹ (Elm leaf) (Picea) (Fuller rose) (Japanese) (Junce) (Willow leaf)	1 qt	1 pt	1. For cottonwood leaf beetles, use Chlorpyrifos 4E in water to control larvae and adults infesting cottonwoods. Make the treatment when field counts indicate damaging beetle populations are developing or present.
Borers ¹ Clearwing moths (Ash) (Dogwood) (Lesser peachtree) (Lilac) (Oak) (Rhododendron) Metallic wood (Bronze birch) (Flatheaded apple tree) (Twolined chestnut) Longhorned beetles (Locust) (Red oak) Cranberry girdler	1 qt	1 qt	1. For borers, apply Chlorpyrifos 4E to the trunks and lower limbs of trees and shrubs when the adults begin to emerge. Consult your State Agricultural Experiment Station or Extension Service Specialist for proper time to treat. Apply uniformly as a coarse low-pressure spray. Pheromone traps may aid in detection of adult clearwing moths. 2. For cranberry girdler larvae, apply 1 quart of Chlorpyrifos 4E per acre. Direct spray at the base of tree using 50 gallons of water per acre. Irrigate immediately after application for soil penetration of 1-2 inches. Treat after egg laying during the summer. 3. Time applications for control of scale insects when crawlers or first two stages of settled nymphs are present.

Pest*	Amount of Chlorpyrifos 4E in Water to Make		Specific Directions
	Per Acre	100 gallons	
larvae ¹ Leafminers Needleminers (Jeffrey pine) (Lodgepole pine) (Spruce) Scale insects ¹ (Cottonycushion) (Cottony maple) (Euonymus) (Fletcher) (Florida wax) (Golden oak) (Hemispherical) (Lecanium) (Magnolia) (Oak kermes) (Oak lecanium) (Oystershell) (Pine needle) (San Jose) (Tea) (White birch) (White peach)			
Borers (Cottonwood) ¹ (Peachtree) ¹	1 qt	3 qt *	1. For peachtree borers, apply Chlorpyrifos 4E in water to flowering trees and shrubs of the genus <i>Prunus</i> as a trunk spray before newly-hatched larvae enter the trees. Apply as a coarse, low-pressure spray. Thoroughly wet all bark areas from ground level to scaffold limbs. * *When using the 3 quart per 100 gallon dilution, Do not exceed 1 qt. Of Chlorpyrifos 4E per acre.
Beetles ¹ (Includes Wood Infesting) (Ambrosia) (Anobiidae) (Black turpentine) (Cottonwood leaf) (Elm leaf) (European elm bark) (Flea) (Fuller rose) (Japanese) (June) (Native elm bark) ² (Southern pine) (Willow leaf)	1 qt.	2 gal*	1. For preventive treatment, apply the spray to the main trunk of trees in the early spring or when threat of attack exists from nearby infested trees. For remedial treatment, apply the spray to the main trunk of infested trees when damage occurs but before adult beetles begin to emerge. 2. To prevent native elm bark beetles from overwintering in uninfested trees, apply Chlorpyrifos 4E in water to the bottom 9 ft of the trunk. Wet the trunk thoroughly but do not spray to runoff. Care should be taken to apply the spray right to the base of the root flare. Application can be made with either a backpack mistblower or a hydraulic pressure sprayer from spring through to early fall.* when using the 2 gallon per 100 gallon dilution, Do not exceed 1 qt. Of Chlorpyrifos 4E per acre.

*Superscripts refer to Specific Directions.

ORNAMENTALS IN NURSERIES AND GREENHOUSES (SOIL TREATMENT)

Use Chlorpyrifos 4E to treat potted, containerized, or balled and burlapped nursery stock to control the insects in the soil attached to the roots of these plants. Completely submerge the container with drain holes or root ball stabilized by burlap in a tank containing diluted Chlorpyrifos 4E. Do not remove burlap wrap or plastic containers with drain holes prior to submerging. Keep the container or root ball submerged until complete soil saturation has occurred, normally about 30 seconds.

PRECAUTIONS: During all operations (submerging, drenching, injecting), wear chemical-resistant apron in addition to other PPE listed for applicators and other handlers. Application should be made in a well-ventilated area.

Note: Environmental factors significantly affect phytotoxicity. Chlorpyrifos 4E has been tested on numerous ornamental plants without causing serious phytotoxicity. However, because of the numerous varieties grown, it is recommended that a small group of plants be treated at the recommended rate under the anticipated growing conditions and observed for phytotoxic symptoms for at least 7 days, before a large number of plants are treated.

Note: The professional user assumes responsibility for determining if Chlorpyrifos 4E is safe to treated plants under commercial growing conditions.

Pest*	Amount of Chlorpyrifos 4E in Water to Make		Specific Directions
	1 gallon	100 gallons	
Fire Ants ¹	1/25 fl oz	4 fl oz	1. An alternative treatment to submerging potted plants is to dilute 4 oz. of Chlorpyrifos 4E in 100 gals. of water. This dilution should be applied to the point of runoff on a twice-daily schedule for three consecutive days. Do not remove burlap wrap or container from plants prior to treatment.
White Grubs ² Weevils ³ (Such as Blackvine)	2/3 fl oz	2 qt*	2. An alternative treatment to submerging containerized plants is to drench the container with the diluted insecticide solution applying approximately 10 to 12 fl. oz. of diluted insecticide solution per gallon of container size (4-5 fl. oz./100 cubic inches of container). The container media should be pre-moistened by irrigation or rainfall before drenching. Do not remove container from plants prior to treatment. 3. An alternate treatment to submerging balled and burlapped plants is to inject Chlorpyrifos 4E insecticide into the root ball. Equally distribute 1 to 3 quarts of the dilute Chlorpyrifos 4E solution per cubic foot of soil volume through an injection rod inserted into the soil ball surrounding the plant roots. Uniform distribution of the insecticide throughout the soil of the root ball is critical for effective control. It is recommended that the injection rod be inserted in at least four equally spaced locations around the stem of the plant at a 30-45 degree angle from the plant between the stem and the upper, outer perimeter of the ball. This technique has been shown to be most effective with small root balls (up to 1.5 ft. diameter). Larger root balls may require more injection points to ensure thorough soil distribution of the insecticide. The injection rod should be coupled to a flow meter to monitor the correct volume applied per root ball using an injection pressure of at least 30 psi. The application should be made such that splash-back and runoff are minimized. * Do not exceed more than 1 quart of Chlorpyrifos 4E per acre.
Coffee root mealybug ⁴	1/6 fl oz	1 pint	

* Superscripts refer to Specific Directions.

ORNAMENTALS IN NURSERIES, GREENHOUSES, INDUSTRIAL PLANT SITES AND ROAD MEDIANS (DORMANT SPRAY OF TREE PESTS)

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

For high volume (dilute) sprays (200 to 600 gallons of spray mixture per acre), tank mix the specified dosage with 1 to 2 gallons of a petroleum spray oil recommended for dormant use per 100 gallons of water. Spray the entire tree 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 Chlorpyrifos 4E as for a dilute spray and apply in a manner that will ensure thorough coverage of the tree. Use oil as recommended by your State Agricultural Experiment Station or Extension Service Specialist.

Precautions: Because cold dry conditions may cause Chlorpyrifos 4E plus oil to infuse trees resulting in bud damage or drop, do not apply until rain or irrigation has replenished soil moisture such that bark and twigs are not desiccated.

For nurseries: Do not use more than 2 pints of Chlorpyrifos 4E per acre.

Restrictions: Make only one application during the dormant season except for control of the apple ermine moth. Do not allow meat or dairy animals to graze in treated areas.

Pest	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
Aphids (Mealy plum) (Rosy apple) (Woolly apple) Borers (Peach twig) Cutworms (Climbing) Leafrollers (Pandemis) Pear psylla adults Plant bugs Scale (San Jose)	1/12-1/6 fl oz	1/4-1/2 fl oz	1/2-1 pt	Tank mix with 1-2 gallons of a petroleum spray oil recommended for dormant use in 100 gallons of water.
Apple ermine moth	1/12 fl oz	1/4 fl oz	1/2 pint	For control on Malus species, make 2 applications at a 7-14 day interval in combination with a petroleum spray oil at the rate of 2-4% (volume:volume) in a spray to wet application to ensure thorough coverage of all stems and

Pest	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
				branches. When using tank mixtures, also follow all label directions for the mixing partner (oil). Use appropriate application equipment and spray volumes to ensure complete coverage of the plant(s) or control will be compromised.

ORNAMENTALS IN NURSERIES AND GREENHOUSES (PRE-PLANT INCORPORATION TREATMENT OF FIELD GROWN NURSERY STOCK)

White Grubs and White Fringed Beetles:

Apply Chlorpyrifos 4E to soil and incorporate before transplanting or planting to control white grubs and white fringed beetles during transplant or seedling establishment. Apply to the soil surface as a broadcast spray at a rate of 1 quart per acre using sufficient water to obtain adequate coverage. Do not aerially apply. On the same day of the treatment, incorporate the insecticide into the top 2 to 4 inches of the soil using a tandem disc, field cultivator or equivalent incorporation equipment capable of thorough soil mixing.

Precaution: Environmental factors and varietal variation can significantly affect the potential for phytotoxicity from pesticide use. Chlorpyrifos 4E insecticide has been evaluated at the above indicated rate on loblolly pine without phytotoxic effects. Growers should prepare and observe a small test plot as above in order to determine the potential phytotoxicity in species or varieties other than loblolly pine. The following procedure should be used: 1) Treat a small test block as above; 2) Seed or transplant the test species or variety and observe for symptoms of phytotoxicity for a minimum of 14 days following emergence or transplanting.

Note: The professional user assumes responsibility for determining if Chlorpyrifos 4E is safe to treated plants under commercial growing conditions.

Garden Symphylans:

Apply Chlorpyrifos 4E as a preplant incorporated treatment to suppress garden symphylans on land to be planted to field grown ornamentals. Apply as a broadcast application to the soil surface at the maximum rate of 1 quart per acre in at least 10 gallons of water per acre. On the same day of treatment incorporate the

insecticide to a depth of up to 8 inches using a disc, rotovator or other suitable equipment. Use the higher rate range for longer residual or where deeper incorporation is necessary.

Precaution: Environmental factors significantly affect phytotoxicity. Chlorpyrifos 4E has been tested on numerous ornamental plants without causing serious phytotoxicity. However, because of the numerous varieties grown, it is recommended that a small group of plants be treated at the recommended rate under the anticipated growing conditions and observed for phytotoxic symptoms for at least 7 days, before a large number of plants are treated. Do not blend Chlorpyrifos 4E with dry bulk fertilizer materials.

Note: The professional user assumes responsibility for determining if Chlorpyrifos 4E is safe to treated plants under commercial growing conditions.

TREE PESTS IN NURSERIES AND GREENHOUSES

Use Chlorpyrifos 4E to treat shade and flowering trees, and evergreens found to be infested with pests listed in the following table. Dilute Chlorpyrifos 4E with water according to directions given in the table and apply using suitable hand- or power-operated spray equipment in a manner to provide complete and uniform coverage. For best results, apply a coarse spray to thoroughly wet both upper and lower leaf surfaces and to infested limb and trunk areas. Attempt to penetrate dense foliage, but avoid overspraying to the point of excessive runoff. Treat when pests appear and repeat at 7 to 10 day intervals, if needed.

Consult your State Agricultural Experiment Station or Extension Service Specialist for application timing and other specific use information.

Pest*	Amount of Chlorpyrifos 4E in Water to			Specific Directions
	1 gallon	3 gallons	100 gallons	
Adelgids (Cooley) (Eastern spruce gall) (Pine bark) Aphids (Apple) (Chrysanthemum) (Cottonwood) (Elm leaf) (Peach) (Rose) (Spirea) (Woolly) Bagworms Boxelder bugs Cankerworms Catalpa sphinx Citrus mealybugs	1/12 fl oz	1/4 fl oz	8 fl oz	1. For bagworms, treat when larvae are small and actively feeding. 2. For effective control of leafrollers, spray should be applied before leaves are tightly rolled. 3. For maple leafcutters on maple trees, apply spray to larvae as cases are being formed. Do not treat sugar maple trees intended for maple syrup production. 4. For effective control of spider mites, when large numbers of eggs are present, apply a second spray after 3-5 days in the South or 7-10 days in the North after initial treatment to control newly-hatched nymphs. 5. For effective control of fall webworms, direct spray into web and immediately surrounding foliage.

15/22

Pest*	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
Elm spanworms Fall webworms ¹ Greenstriped mapleworms Jackpine budworms Juniper webworms Katydid Lace bugs Leafhoppers Leafrollers ¹ Maple leafcutters ¹ Mites ¹ (Clover) (Red Spider) (Southern red) Oak skeletonizers Poplar tentmakers Puss caterpillars Sawflies, exposed (Pin oak) (Pine) Spring elm caterpillars Spruce budworms Tent caterpillars (Eastern) (Forest) (Western) Walnut caterpillars Western spruce budworms Yellownecked caterpillars				
Beetles (Fuller rose) (Native elm bark) ¹ Leafhoppers Mahogany webworms Mealybugs Mimosa webworms Moths (Browntail) (Cypress tip) (Douglas fir tussock) (European pine shoot) (Gypsy) ² (Holly bud) (Mantucket pine tip) (Pandora) (Pitch pine tip) (Subtropical pine tip) (Tussock) Oakworms (California) (Orangestriped) (Redhumped) Redhumped caterpillars Thrips (exposed) Weevils (Blackvine) ³ (Pine reproduction) (Yellow poplar)	1/6 fl oz	1/2 fl oz	1 pt	1. To reduce foliar feeding on twigs and branches by beetles, applications should be made in the spring or early summer. 2. To kill migrating and invading gypsy moth larvae, treat trunk and foliage. 3. Blackvine weevils are night feeders. Late afternoon spraying will maximize control.

Pest*	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
Beetles (Cottonwood leaf) (Elm leaf) (Flea) (Willow leaf)	1/6-1/3 fl oz	1/2-1 fl oz	1 pt-1 qt	1. For cottonwood leaf beetles, use Chlorpyrifos 4E in water to control larvae and adults infesting cottonwoods. Make the treatment when field counts indicate damaging beetle populations are developing or present. For seedlings, use 8-20 gal of spray volume per acre.
Borers ¹ Clearwing moths (Ash) (Dogwood) (Lesser peachtree) (Lilac) (Oak) (Rhododendron) Metallic wood (Bronze birch) (Flatheaded apple tree) (Twolined chestnut) Longhorned beetles (Locust) (Red oak) Cranberry girdler larvae ² Leafminers Needleminers (Jeffrey pine) (Lodgepole pine) (Spruce) Scale insects ³ (Cottonycushion) (Cottony maple) (Euonymus) (Fletcher) (Florida wax) (Golden oak) (Hemispherical) (Lecanium) (Magnolia) (Oak kermes) (Oystershell) (Pine needle) (San Jose) (Tea) (White birch)	1/3 fl oz	1 fl oz	1 qt	1. For borers, apply Chlorpyrifos 4E to the trunks and lower limbs of trees and shrubs when the adults begin to emerge. Consult your local State Agricultural Experimental Station or Extension Service Specialist for proper time to treat. Apply uniformly as a coarse low-pressure spray. Pheromone traps may aid in detection of adult clearwing moths. 2. For cranberry girdler larvae infesting Douglas fir seedlings, apply 1 quart of Chlorpyrifos 4E per acre. Direct spray at the lower crown and stems using 50 gal of water per acre. Irrigate immediately after application for soil penetration of 1-2 inches. Treat after egg laying during the summer. 3. Time applications for control of scale insects when crawlers or first two stages of settled nymphs are present.
Northern pine weevil Pales weevil	1 fl oz	3 fl oz	3 qt*	Apply as a cut stump spray or drench in winter or early spring. * Do not exceed 1 quart of Chlorpyrifos 4E per acre
Borers (Cottonwood) (Peachtree) ¹	1 fl oz	3 fl oz	3 qt*	1. For peachtree borers, apply Chlorpyrifos 4E in water to flowering trees and shrubs of the genus Prunus as a trunk spray before newly-hatched larvae enter the trees. Apply as a coarse low pressure spray. Thoroughly wet all bark areas from ground level to scaffold limbs. * Do not exceed more than 1 quart of Chlorpyrifos 4E per acre.
Beetles ¹ (Cottonwood)	1 1/3 fl oz	4 fl oz	1 gal*	1. For preventive treatment, apply the spray to the main trunk of trees in the

Pest*	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
leaf) (Elm leaf) (Plea) (Fuller rose) (Native elm bark) ² (Willow leaf)				early spring or when threat of attack exists from nearby infested trees. For remedial treatment, apply the spray to the main trunk of infested trees or logs when damage occurs but before adult beetles begin to emerge. 2. To prevent native elm bark beetles from overwintering in uninfested trees, apply a dilution of 1 gal. per 100 gals. of water (1 1/3 fl. oz. per gallon) as spray to the bottom 9 feet of the trunk. Wet the trunk thoroughly but do not spray to runoff. Care should be taken to apply the spray right to the base of the root flare. Applications can be made from spring to early fall. To reduce twig and branch feeding on trees deemed to be of high value, apply as a spray to the tree crown using a dilution of 1 gal. per 100 gals. of water (1 1/3 fl. oz. per gallon). Applications should be made in the spring or early summer using a sprayer that will give thorough coverage to the tree crown. * Do not exceed more than 1 quart of Chlorpyrifos 4E per acre.
Beetles ¹ (Ambrosia) (Anobiidae) (Bark) (Black turpentine) (Blister) (European elm bark) (Ips) (Japanese) (June) (Southern pine) (Spruce) Carpenter ants Termites	2 2/3 fl oz	8 fl oz	2 gal*	1. For preventive treatment, apply the spray to the main trunk of trees in the early spring or when threat of attack exists from nearby infested trees. For remedial treatment, apply the spray to the main trunk of infested trees or logs or before adult beetles begin to emerge. * Do not exceed more than 1 quart of Chlorpyrifos 4E per acre.
Weevils (Such as: Northern pine, Pitch eating, Twig)	5 1/3 fl oz	16 fl oz	4 gal*	For pine seedlings, treat immediately after transplanting. Treat each seedling with enough spray to thoroughly wet the foliage and stem to the point of runoff. For nurseries, do not use more than 6 gallons of spray dilution per acre. * Do not exceed more than 1 quart of Chlorpyrifos 4E per acre.

*Superscripts refer to Specific Directions.

TURF, INDUSTRIAL PLANT, AND ROAD MEDIAN OUTDOOR USES

Use Chlorpyrifos 4E to control the pests listed in the following table by applying at the recommended dosages and in accordance with the directions given below or as recommended by your local Agricultural Extension Service Specialist. Dilute Chlorpyrifos 4E in water and apply as a coarse, low-pressure spray using suitable application equipment. Thoroughly water immediately after treatment to wash the insecticide into the turf, except as noted.

For best results, the area to be treated should be moist at time of treatment. Spray when pests first appear; re-treat when needed.

Pest*	Amount of Chlorpyrifos 4E per		Specific Directions
	1000 sq ft	Acre	
Ticks ¹ (American dog) (Cattle fever) (Gulf coast) (Lone star)	1/4 fl oz	1 1/2 pt	1. For control of ticks infesting, treat soil and other areas likely to serve as harborage sites for ticks that have removed themselves from their host. Spray surfaces to be treated until wet, but do not create excessive runoff. Note: This application is intended as a pre-mix spray only. Do not use as a direct spray on livestock or any sites which may come in contact with livestock.
Ants (including foraging fire ants) Armyworms (Beet) (Fall) (Yellowstriped) Centipedes Chiggers ¹ Chinch bugs Clover mites Cutworms Crickets Deer Ticks ¹ Earwigs Fiery skipper Fire ants (mounds) ¹ Fleas Gnats Grasshoppers Greenbug aphids June beetles Leafhoppers Lucerne moths Millipedes Mites (Clover) (Bermudagrass stunt) (Foxtail grass) (Winter grain) Mosquitoes ¹ Pillbugs Sod webworms ¹ (lawn moths) Sowbugs Ticks ¹	3/4 fl oz	1 qt	1. Use Chlorpyrifos 4E for area control of ticks and chiggers infesting golf course turf, turf in road medians and industrial plant sites where these pests are present and create a nuisance or a possible public health problem. Do not allow public use of treated areas during application or until spray has dried. Apply Chlorpyrifos 4E in water at the rate of 1/2 pint/acre (equivalent to 1/6 fl oz per 1,000 sq. ft) using a hydraulic sprayer, misapplicator, knap sack sprayer, or other suitable hand- or power-operated spray equipment. Treat low underbrush, grassy areas, weeds, and ground surface and debris using enough spray volume to obtain thorough coverage, usually 40-100 gal/acre. 2. For individual fire ant mounds, apply Chlorpyrifos 4E as a drench, diluted at the rate of 1 fl oz per 4 gal of water. Gently sprinkle a total of 1 gal of the diluted emulsion over the surface of each mound using a gentle spray (such as a sprinkler can). Thoroughly wet mound and surrounding areas to a 4 ft. diameter (12 sq ft). For best results, apply in cool weather, 65-80°F, or in early morning or late evening hours. Treat new mounds as they appear. Pressurized sprays may disturb the ants and cause migration, reducing product effectiveness. 3. Mosquitoes coming to rest on areas treated for control of turf pests will be killed for varying periods of time after treatment, depending on exposure of treated areas to weathering conditions. 4. For sod webworms, watering or mowing of the treated area should be delayed for 24 hours after treatment. 5. For control of deer ticks, apply in water at the rate of 1 quart per acre or 3/4 fl. oz. per 1,000 sq.ft. Treat low underbrush, turf, grassy areas, weeds, and ground surface and debris, using enough spray volume to obtain thorough coverage.
European crane fly	1 fl oz	1 qt	
Turfgrass weevil (Hyperodes)	1 1/2 fl oz	1 qt	1. Spray suspected problem areas in mid-April and again in mid-May or as recommended by your local Agricultural Extension Service Specialist.
White grubs ¹ (Black turfgrass ateenius) (European chafer) (Japanese beetle larvae) (Southern and Northern masked	1 1/2-3 fl oz	1 qt.	1. For white grubs, spray when grubs are young and actively feeding near the soil surface, usually during late July and August or as recommended by your local Agricultural Extension Service Specialist. Immediately after spraying, irrigate the treated area with 1/2 to 1 inch of water to wash the insecticide deep into the thatch or into the underlying soil.

Pest*	Amount of Chlorpyrifos 4E per		Specific Directions
	1000 sq ft	Acre	
Chaffer)			
Billbug adults, such as (Bluegrass) (Denver) (Hunting)	3/4-3 fl oz	1 qt.	For billbugs, spray early in the season when adults first appear.
Mole Crickets	1 1/2 fl oz	1 qt.	For mole crickets in golf course turf, turf in road medians, and industrial plant site turfgrass, apply through high pressure injection or other suitable subsurface placement application equipment. Depending on the application equipment used, follow the manufacturer's recommendation for calibration and the volume of spray per acre needed to provide control or as recommended by your local Agricultural Extension Service Specialist. For best results, apply when young nymphs are active.
Imported Fire Ants in commercial sod		1 qt.	Apply Chlorpyrifos 4E as a spray to the area of sod to be cut. Immediately after application, irrigate treated area with at least 1/2 acre-inch of water or a sufficient volume to thoroughly soak below the cut line. Do not apply a volume or rate of water to cause runoff. Sod can be cut when vegetation has dried and when soil is moist, but not wet.

*Superscripts refer to Specific Directions.

OUTSIDE SURFACES AND AROUND INDUSTRIAL PLANT SITES (SUCH AS AROUND WAREHOUSES, FOOD PROCESSING AND FOOD MANUFACTURING SITES)

Chlorpyrifos 4E may be applied as a residual spray to and around outside surfaces of nonresidential buildings and structures. Permitted areas of use include but are not limited to: fences, pre-construction foundations, refuse dumps, outsides of walls, and other areas where pests congregate or have been seen. Adults, children or pets should not contact treated surfaces until spray has dried. Keep out of fish pools and other bodies of water. Do not treat vegetable gardens. Do not allow livestock to graze in treated areas. Do not feed treated grass cuttings (hay) or seed screenings to livestock, nor use treated hay for livestock bedding. Repeat treatment as needed to maintain effectiveness. Unless prohibited by a product's label, users, at their own discretion can tank mix pesticides currently labeled for similar use patterns. It is always recommended that a small jar compatibility test using proper proportions be run to check for physical compatibility prior to tank mixing. Do not tank mix this product with products containing dichlorvos (DDVP).

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Pest*	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	10 gallons	50 gallons	
	For Band Treatment ¹			
Ants Bees Beetles Boxelder bugs (or other true bugs) Carpenter ants Centipedes Clover mites Cockroaches** Crickets Earwigs Elm leaf beetles (adults) Firebrats Fleas Flies Hornets Millipedes Mosquitoes Pillbugs Scorpions ¹ Silverfish Sowbugs Spiders Springtails Ticks Wasps Yellowjackets	1/4 tsp	3/4 fl oz	4 fl oz	1. To help prevent infestation of non-residential buildings, treat a band of soil 6-10 ft wide around and adjacent to buildings, also the building foundation to a height of 2-3 ft. where pests are active and may find entrance. Use 4 fl oz of Chlorpyrifos 4E per 50 gal of water and apply as a coarse spray at the rate of about 10 gal. spray mixture per 1,000 sq. ft to thoroughly and uniformly wet the band area. 2. For scorpions, treat or remove accumulations of lumber, firewood, and other materials which serve as insect harborage sites. Make a thorough perimeter treatment around the structure using directions in (1.) above.
	For Outside Surfaces			
	1 1/3 fl oz	13 1/3 fl oz	2 qt *	* Do not exceed 1 quart of Chlorpyrifos 4E per acre

* Do not exceed 1 quart of Chlorpyrifos 4E per acre

*Superscripts refer to Specific Directions.

**Controls American, Asian, Brownbanded, German, Oriental and Smokey brown cockroaches.

ANTS, TERMITES AND MISCELLANEOUS PESTS

Pest*	Amount of Chlorpyrifos 4E in Water to Make			Specific Directions
	1 gallon	3 gallons	100 gallons	
Ants Cockroaches (Such as: American, Asian, Brownbanded, German, Oriental, Smokey brown, Wood) Fire ants (foraging workers) Fire ants (mounds) ¹ Sowbugs Springtails	1/6 fl oz	1/2 fl oz	1 pint	1. For mounds apply as a drench. Dilute 1 fl. oz. per 4 gallons of water. Gently sprinkle 1-2 gallons of the diluted insecticide over the surface of each mound and surrounding areas to a 2 foot diameter. For best results, apply in cool weather, 65-80°F or in early morning or late evening hours. Treat new mounds as they appear. Pressurized sprays may disturb the ants and cause migration, reducing product effectiveness.

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Carpenter Ants ² Termites	2 2/3 fl oz	8 fl oz	2 gallons*	2. Locate nests and drench thoroughly * Do not exceed 1 quart of Chlorpyrifos 4E per acre
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*Superscripts refer to Specific Directions.

GENERAL CONTROL OF WOOD-INFESTING INSECTS

Chlorpyrifos 4E is intended to be mixed with water and applied as a general surface or localized injection treatment with pressurized sprayers or other equipment suitable for applying insecticides to localized areas. Contact with treated surfaces should be avoided until spray has dried. Cover or remove exposed foods before treatment. Do not apply where electrical short circuits could occur. Do not use in structures housing animals which are intended for or which produce products to be used for food purposes, i.e., poultry houses. Permitted areas of use include, but are not limited to: wood surfaces, voids and channels in damaged wood, gaps between wooden members, wall voids and junctions between wood and foundation. Not for use in wood treatment in residential areas.

Mixing Directions: To make a 0.5% water based spray, mix 1 1/3 fl. oz. of Chlorpyrifos 4E per each gallon of spray mixture. A stable emulsion can be formed by first adding approximately one-half water to a spray tank followed by adding the proper amount of Chlorpyrifos 4E. Close the tank and shake vigorously for 5 to 10 minutes.

Tank Mixing: Unless prohibited by a product's label, users, at their own discretion can tank mix pesticides currently labeled for similar use patterns. It is always recommended that a small jar compatibility test using proper proportions be run to check for physical compatibility prior to tank mixing. Do not tank mix this product with products containing dichlorvos (DDVP).

Application Methods: This product may be applied either as a coarse spray or by brushing onto targeted surfaces. Equipment capable of delivering a coarse, low pressure (about 25 psi) spray is recommended for treatment of large or overhead areas. Inaccessible areas such as wall voids can be treated by injecting the spray mixture under low pressure (about 20 psi) through drilled openings. Use sufficient amount of spray dilution to cover the area to the point of wetness but avoid spraying to the point of runoff. It is recommended that, when spraying overhead interior areas of buildings, surfaces below areas being treated be covered with plastic sheeting or other material which could be

disposed of by placing in trash.

Beetles ¹ (Anobiidae) (Bostrichidae) (Cerambycidae) (Lyctidae) Carpenter ants ² (and other wood-infesting ants) Carpenter bees Termites ³	1. Beetles may be controlled by applying spray mixture to infested areas, or areas where infestations are likely to occur. This includes but is not limited to wood surfaces, voids, and channels in damaged wood, in spaces between wooden member of a structure, and junctions between wood and foundations. Use the following guidelines to determine appropriate rates of application: New wood (typically less than 10 years of age), apply at about 1 gallon of dilution per 150 square feet. Old wood (typically greater than 10 years of age), apply at about 1 gallon of dilution per 100 square feet. 2. Wood-infesting ants may be controlled by applying spray mixture around doors and windows, cracks or crevices, or other areas where ants may enter, crawl, or hide. Primary colonies are typically found outside through an exterior inspection. Correction of sanitation and structural deficiencies or landscape modifications may be necessary for effective control. 3. Termites can be treated by applying spray mixture to infested areas, or areas where infestations are likely to occur. This includes but is not limited to wood surfaces, voids and channels in damaged wood, in spaces between wooden members of a structure, and junctions between wood and foundations. This treatment is intended to kill localized infestations of workers and winged reproductive forms of termites and to prevent infestations for a temporary period. This application is not intended as a substitute for soil treatments.
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Superscripts refer to Specific Use Directions for Control of Wood-Infesting Insects.

* Do not apply this product on residential wood surfaces.

NOTICE

MICRO FLO WARRANTS THAT THIS PRODUCT CONFORMS TO THE CHEMICAL DESCRIPTION ON THE LABEL THEREOF AND IS REASONABLY FIT FOR THE PURPOSE STATED ON SUCH LABEL ONLY WHEN USED IN ACCORDANCE WITH THE DIRECTIONS FOR USE. IT IS IMPOSSIBLE TO ELIMINATE ALL RISKS INHERENTLY ASSOCIATED WITH THE USE OF THIS PRODUCT. CROP INJURY, INEFFECTIVENESS, OR OTHER UNINTENDED CONSEQUENCES MAY RESULT BECAUSE OF SUCH FACTORS AS WEATHER CONDITIONS, PRESENCE OF OTHER MATERIALS, OR THE MANNER OF USE OR APPLICATION, ALL OF WHICH ARE BEYOND THE CONTROL OF MICRO FLO. IN NO CASE SHALL MICRO FLO BE LIABLE FOR THE CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER.

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