

US ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES PROGRAMS
REGISTRATION DIVISION (75-767)
WASHINGTON, DC 20460

EPA REGISTRATION NO.

10163-158

DATE OF ISSUANCE

August 26, 1991

TERM OF ISSUANCE

Until Reregistration

NOTICE OF PESTICIDE:

REGISTRATION
 REREGISTRATION

(Under the Federal Insecticide, Fungicide,
and Rodenticide Act, as amended)

NAME OF PESTICIDE PRODUCT

Gowan Chlorpyrifos 41

NAME AND ADDRESS OF REGISTRANT (Include ZIP code)

Gowan Company
P.O. Box 5509
Yuma, AZ 85366

NOTE: Changes in labeling formula differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above U.S. EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby Registered/Reregistered under the Federal Insecticide, Fungicide, and Rodenticide Act.

A copy of the labeling accepted in connection with this Registration/Reregistration is returned herewith.

Registration is in no way to be construed as an indorsement or approval of this product by this Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is conditionally registered in accordance with section 3(c)(7)(A) provided that you:

1. Submit to the Agency all data or other information required for registration, reregistration or your product under FIFRA section 3(c)(5) or FIFRA section 3(c)(7)(A) and the Agency will refer you to registrants of similar products to submit their data.

2. Make the following changes listed below before you release the product for shipment:

- a. Add the phrase "EPA Registration No. 10163-158."
- b. In the ingredients statement, replace "contains petroleum distillates" with "contains cyclic aliphatic aromatic solvents." Indicate that this statement is a footnote to the inert ingredient by placing asterisks or similar symbols in the appropriate places.
- c. In the environmental hazards section, replace the phrase "... disposal of wastes" with "... disposal of equipment and wastes."

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ATTACHMENT IS APPLICABLE

SIGNATURE OF APPROVING OFFICIAL

Dennis H. Edwards, Jr.

DATE

8/26/91

4. Review the use directions for ground application to cotton by regarding the word "essential" with "obtained" (see page 11).
- a. Correct the spelling of "dairy" in the instructions for use on sugar beets.
3. A 1-year storage stability study will be due within 15 months of the date of this notice. The study should be conducted under warehouse conditions of temperature and humidity with the product contained in packages similar to what will be used in the marketplace.

4. Submit five (5) copies of your final printed labeling before you release the product for shipment. Refer to the 2-79 enclosure for a further description of final printed labeling.

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

A stamped copy of the label is enclosed for your records.

DKE

Dennis H. Edwards, Jr.
Product Manager (19)
Insecticide-Rodenticide Branch
Registration Division (B7505C)

Enclosures



GOWAN CHLORPYRIFOS 4E
Insecticide for Agricultural Use Only

Active ingredient:	
Chlorpyrifos [(0,0-diethyl 0-(3,5,6-trichloro-2-pyridinyl) phosphorothioate]	40.7%
Inert ingredients.	59.3%

Contains 4 pounds of chlorpyrifos per gallon.

Contains petroleum distillates.

KEEP OUT OF REACH OF CHILDREN

WARNING--AVISO

PRECAUCION AL USARIO: Si usted no lee ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente.

Statement of Practical Treatment

IF SWALLOWED: Do not induce vomiting. Call a physician or Poison Control Center. Do not give anything by mouth to an unconscious person.

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

IF ON SKIN: Wash with plenty of soap and water. Get medical attention.

IF IN EYES: Flush with plenty of water. Call a physician.

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

See side panels for additional precautions.

Net Contents _____ Gallons

Gowan Company

EPA Reg. No. 10163-
EPA Est. No. 10163-AZ-1

P.O. Box 5569
Yuma, Arizona 85366

AUG 26 1991

10163-158

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**PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals**

WARNING: May be fatal if swallowed. Harmful if absorbed through skin or inhaled. Causes substantial but temporary eye injury. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or smoking. Remove contaminated clothing and wash before reuse.

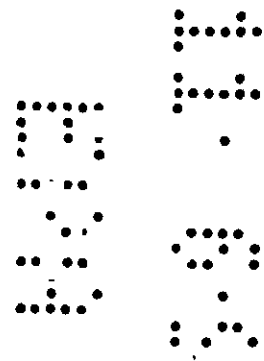
Physical or Chemical Hazards

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

Environmental Hazards

This pesticide is extremely toxic to fish, birds, and other wildlife. Do not apply directly to water. 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 wastes.

Bee Caution: This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Avoid use when bees are actively foraging. Protective information may be obtained from your Cooperative Agricultural Extension Service.



Recommendations for Application

Gowan Chlorpyrifos 4E is suitable for use in all conventional spray equipment. It may be used in tank mixtures with certain herbicides and/or non-pressure fertilizer solutions as recommended under specific crop use directions.

Caution: Fertilizer solutions containing sulfur may inactivate Gowan Chlorpyrifos 4E. For best results in tank mixing, fill the mix tank 1/3 full with water. Start agitation and add wettable powders first, flowables second, and emulsifiable concentrates last. Before actual mixing, test compatibility of the tank mix by mixing products and water proportional for the tank mix in a pint or quart jar. Shake the trial mix and observe whether the material precipitates. If precipitation occurs and will not redisperse, do not use that mix in the tank.

Dilution Directions

The rate required to provide thorough, uniform coverage varies with plant growth at the time of application. The following rates are therefore intended to cover a broad range of conditions.

Dilute Applications: Field and Row Crops: Apply specified rate in 20 to 75 gallons of water per acre. Fruits and Nuts: Apply specified rate in 100 to 800 gallons of water per acre. For citrus, use up to 2,000 gallons of water per acre.

Concentrate Applications: Field and Row Crops: Apply specified rate in not less than 5 gallons of water per acre. Fruits and Nuts: Apply specified rate in 20 to 100 gallons of water per acre. These applications require special concentrate equipment.

Air Application: Field and Row Crops: Apply specified rate in a minimum of 1 gallon of water per acre. Fruits and Nuts: Apply specified rate in a minimum of 5 gallons of water per acre.

Chemigation Directions

Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move irrigation systems. Do not apply this product through any other type of irrigation system. Crop injury, lack of effectiveness or illegal pesticide residues in the crop can result from nonuniform distribution of treated water. 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. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Chemigation systems

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connected to public water systems must contain a functional, reduced-pressure zone, backflow preventer (RPZ) or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe. For non-public water sprinkler chemigation systems, the system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-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. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected. For non-public water sprinkler chemigation systems, the irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock. Do not apply when wind speed favors drift beyond the area intended for treatment.

It is recommended that the pesticide supply tank be equipped with a means for continuous agitation either by recirculation or a mechanical agitator. Charge the supply tank with the appropriate amount of water and add the pesticide slowly followed by any sticker-spreaders, insecticides, nutrients, etc. Observe all cautions and limitations on the label of all products used in the mixtures. For fixed position irrigation systems such as center pivot, big gun, etc., the pesticide should be applied towards the end of the irrigation period. Exact timing will depend on the desired pesticide application rate and calibration of the system. For moving systems, the pesticide should be applied continuously. In all cases, thorough coverage of the crop should be achieved.

NOTICE ON CONDITIONS OF SALE

Our recommendations for use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility including injury or damage, resulting from its misuse as such, or in combination with other materials.

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CROP USE RECOMMENDATIONS

Unless a specified method is suggested, rates are given in pounds per acre per application and intended for concentrate, dilute, or aerial spray. Follow "Dilution Directions" to determine total amount of spray mixture. The preharvest interval is given in () days just after the crop name.

ALFALFA: (7 days after application of 1/2 pint per acre, 14 days after application of 1 pint per acre, 21 days after application of 1 to 2 pints per acre.) Aphids (suppression); Use 1/2 pint per acre. Corn rootworm adults (spotted cucumber beetle), grasshoppers; Use 1/2 to 1 pint per acre. Alfalfa blotch leafminer, alfalfa looper, alfalfa weevil larvae and adults, armyworms, cutworms, Egyptian alfalfa weevil larvae and adults, plant bugs, leafhoppers, spittlebugs; Use 1 to 2 pints per acre. In California and Nevada: Use higher rates to control spotted alfalfa aphid. Gowan Chlorpyrifos 4E may also be used in sprinkler irrigation systems as a postemergence broadcast application to control the pests listed above. Refer to the Chemigation Instructions on this label for further information. NOTE: Do not use Gowan Chlorpyrifos 4E with other pesticides, surfactants, or fertilizers unless prior use has shown the combination to be noninjurious under the current conditions of use. Do not graze livestock in treated alfalfa within 7 days of application of 1/2 pt. per acre, within 14 days of application of 1 pt. per acre, or within 21 days of application of 1 to 2 pts. per acre. Do not apply more than once per crop cutting and do not apply more than 4 times per season. This product is highly toxic to bees. Do not apply if bees are clustered outside of hives and bees are foraging.

ASPARAGUS: (1) (Except California) Asparagus aphids, asparagus beetles, cutworms; Use 2 pts. per acre. Apply as a broadcast, foliar spray. For cutworms, apply when the soil is moist and worms are active at or near the soil surface. Applications may be made during the fern stage for control of asparagus beetles and asparagus aphids. Do not make more than one preharvest application per season. Do not make more than 2 postharvest applications during the fern stage.

CHERRIES: (6) American plum borer, lesser peachtree borer, greater peachtree borer; Use 1 1/2 to 3 quarts per 100 gallons of water. Use as a low-pressure spray to give uniform coverage to tree trunks and lower limbs. Make a second application 2 weeks after the first and a third application after harvest. Note: Contact with foliage in sweet cherries may cause premature leaf drop.

For control of San Jose scale, peach twig borer, and climbing cutworms, one of the three allowable applications per year may be applied as a dormant or delayed dormant spray. Use 1/2 to 1 pint of Gowan Chlorpyrifos 4E per acre with a petroleum oil recommended for dormant use. Spray entire tree to runoff. Always follow oil manufacturer's recommendations. Use the higher dosage of Gowan Chlorpyrifos 4E for severe infestations. Make only three applications per year. Do not allow livestock to graze in treated orchards.

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CITRUS FRUITS. (21 days for applications of more than 7 pints per acre.) Use the lower rates below to control lighter infestations and the higher rates to control heavier infestations.

Gowan Chlorpyrifos

CROP	PEST	Coverage ^A Spray Coverage		Gallons of Spray Per Acre For Dilute Applications ²	Remarks
		Dilute (Pints/100 gal. water)	Dilute or Concentrate (Pints/Acre)		
Grapefruit Lemons Oranges and Other Citrus Fruits	Aphids, Katydid Lepidopterous larvae Cutworms Fruit tree leafroller Orange tortrix Western tussock moth	Outside Coverage Spray (OC) 1/2 to 1	2 to 7	200 to 700	Use directions apply in all states including California
	Citrus thrips ¹ , Mealy bugs ¹ Scale insects ² Black scale Brown soft scale California red scale Snow scale, Chaff scale	1/2 to 1	2 to 7	200 to 700	Use directions apply in all states except California (See footnotes 1 & 2)
	Citrus rust mite (suppression)		4 to 7	100 to 700	Use directions apply in Florida only

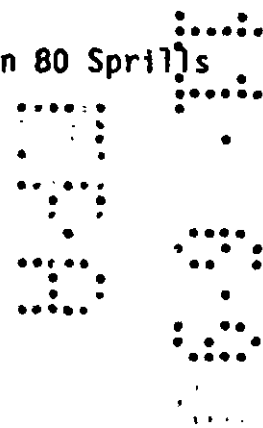
1
In California, apply as Outside Coverage using 6 to 12 pints of Gowan Chlorpyrifos 4E per acre in 100 to 300 gallons of finished spray per acre.

2
In California, apply as Thorough Coverage using 8 to 12 pints of Gowan Chlorpyrifos 4E per acre. For dilute sprays, apply 1200 to 2400 gallons of spray per acre but do not apply more than 12 pints of Gowan Chlorpyrifos 4E per acre or use less than 1/2 pint Gowan Chlorpyrifos 4E per 100 gallons of finished spray per acre.

3
Gallonage per acre is based on average size of mature trees. Adjust to tree size per acre.

Gowan Chlorpyrifos 4E may be applied in tank mixes with ethion, dicofol, or fenbutatin-oxide. See the Recommendations for Application for further instructions on tank mixing. Read and carefully follow all applicable directions, restrictions, and precautions on labeling for other products used in combination with Gowan Chlorpyrifos 4E

Gowan Chlorpyrifos 4E should not be tank mixed with Difolatan 80 Spril's (Captafol) as crop injury may occur.



^{why}
CALIFORNIA ONLY: For control of aphids, katydids, Lepidopterous larvae including avocado leafroller, cutworms, fruittree leafroller, orange tortrix, and Western tussock moth, use 2 to 7 pints per acre on grapefruit, lemons, oranges, and other citrus fruits. (Apply by aerial application (fixed-wing or helicopter) spray equipment. Use a total spray volume of 15 to 30 gallons per acre.)

A petroleum spray oil recommended for use on citrus 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. Note: Do not apply when temperature exceeds 95°F or trees are stressed by drought or high temperatures. Observe local use directions for tank mixes with spray oil.

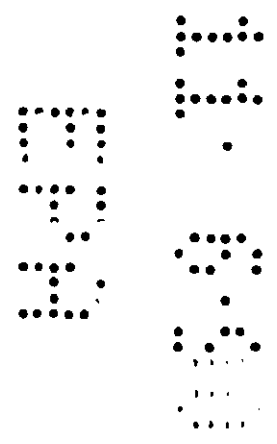
Do not apply more than 2 applications per fruit year or more than 15 pints of Gowan Chlorpyrifos 4E per acre per fruit year. Do not make 2nd application within 30 days of first application. Do not pick fruit or do other work involving contact with trees within 2 days of last treatment. Do not allow livestock to graze in treated areas.

CITRUS ORCHARD FLOORS: (28) Red imported fire ants, other ant species; Use 3/4 to 1 quart per acre in 25 or more gallons of water with ground application equipment that will uniformly spray the orchard floor. Repeat applications as needed. Do not apply in tank mixes with ametryn herbicides. Foliar applications of Gowan Chlorpyrifos 4E may be made in addition to the orchard floor treatments.

Gowan Chlorpyrifos 4E may also be applied to citrus orchard floors through sprinkler irrigation systems only if the system uniformly covers the soil surface at the base of the tree. Follow sprinkler irrigation directions found elsewhere on this label.

Do not apply more than 10 quarts per acre per season. Do not allow livestock to graze in treated areas. (In Florida, do not make more than 3 applications per season.)

CRANBERRIES: (60) Brown spanworm, cranberry fruitworm, cranberry weevil, cutworms, fireworms, Sparganothis fruitworms; Use 3 pints per acre. Use as a broadcast, foliar spray. For weevil control, apply once at flower bud development and again at 100% bloom if weevils are present. 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 100 gallons of spray per acre when using ground equipment. Do not make any applications if bogs are flooded. Do not make more than two applications per year.

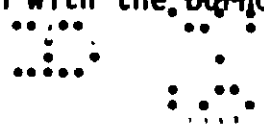


FIELD CORN, POPCORN, SWEET CORN: (35) Preplant Incorporation Treatment: Cutworms, symphylans; Use 2 to 4 pints per acre. Wireworms, billbugs, flea beetle larvae, grubs, seed corn maggots, seed corn beetle; Use 4 pints per acre. Lesser cornstalk borer, corn rootworm larvae; Use 6 pints per acre. North Carolina, South Carolina, Virginia: Nematodes; Use 4 to 6 pints per acre. Apply as a broadcast spray to the soil surface or band on bed top. On the same day of treatment, work the insecticide into the soil using a disc, field cultivator, or equivalent equipment. Gowan Chlorpyrifos 4E may also be applied in tank mixtures with non-pressure fertilizer solutions and/or cyanazine, EPTC, butylate, metolachlor, and atrazine herbicides. Read and follow all applicable directions on labeling for other products used in combination with chlorpyrifos.

Preplant, At-Plant, or Preemergence treatment in conservation tillage: Cutworms, armyworms; Use 1 to 2 pints per acre and apply as a broadcast spray. Use higher rates for residual control. Gowan Chlorpyrifos 4E may also be applied in tank mixes with non-pressure fertilizer solutions and/or with paraquat and glyphosate herbicides. Follow all applicable directions, restrictions, and precautions on labeling for the other products used in combination with chlorpyrifos.

Cultivation Time Treatment: Corn rootworm larvae; Use 2 pints per acre applied 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. A cultivation application of Gowan Chlorpyrifos 4E may be made in addition to an at planting application of granular chlorpyrifos insecticide.

Postemergence Treatment: Grasshoppers; Use 1/2 to 1 pint per acre. Armyworms, chinch bugs, aphids, corn rootworm adults, webworms, western bean cutworm; Use 1 to 2 pints per acre. European and southwestern corn borer, corn earworm; Use 1 1/2 to 2 pints per acre. For European corn borer control, use 1 1/2 to 2 pints per acre when application is made with ground or aerial equipment and 1 to 2 pints per acre when application is made through an overhead sprinkler irrigation system. Cutworms, billbugs, lesser cornstalk borer, flea beetle adults, common stalk borer; Use 2 to 3 pints per acre. For best billbug, chinch bug, and flea beetle control, on corn less than 6 inches tall, apply the insecticide spray in a 9 to 12 inch wide band over the row. On corn taller than 6 inches, apply using drop nozzles directed at the base of the plant. A second application may be needed when chinch bugs continue to immigrate to corn over prolonged periods or under extreme pressure. 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 or ground spray equipment. For first generation European corn borer control, treat when 25 to 50 percent of the corn plants show pinhole feeding or leaf-feeding scars. Direct ground applications at the corn whorls. For second generation European corn borer control, treat when field counts of egg masses indicate pests are or may become a problem. 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 glyphosate or after complete burndown by paraquat (3 to 5 days). DO NOT use Gowan Chlorpyrifos 4E in combination with the burndown herbicide for control of common stalk borer.



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Overhead sprinkler irrigation system: Use recommended amount of Gowan Chlorpyrifos 4E with 2 pints per acre of non-emulsifiable oil as a postemergence broadcast application. Follow directions for overhead sprinkler irrigation systems. In Nebraska, Gowan Chlorpyrifos 4E may be applied at the rate of 2 to 3 pints per acre in a minimum of 3/4 inch of water per acre as a rescue treatment for the control of corn rootworm larvae.

Do not apply more than 15 pints per acre per season. Do not allow livestock to graze in treated areas nor harvest treated corn silage as feed for meat or dairy animals within 14 days after last treatment. Do not feed treated corn fodder to meat or dairy animals within 35 days after last treatment.

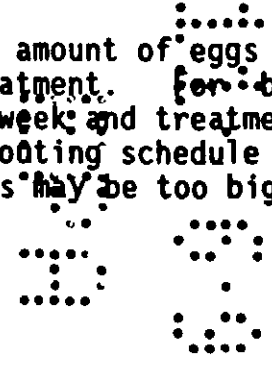
SWEET CORN (Florida and Georgia): (21) Beet armyworm, fall armyworm, corn earworm; Use 1 to 2 pints per acre. Apply as a broadcast foliar spray. Use the higher rate with overhead sprinkler irrigation systems. Retreat as necessary to maintain control but do not apply more than twenty-two 1 pint or eleven 2 pint treatments per season. Do not apply more than 22 pints per acre per season. Do not harvest corn ears, allow livestock to graze in treated areas, or feed treated silage, fodder, or grain to meat or dairy animals within 21 days of treatment. An overhead sprinkler irrigation system may be used as a postemergence broadcast application to control the above listed foliar insects. Use recommended rate of Gowan Chlorpyrifos 4E with 2 pints per acre of non-emulsifiable oil. Refer to overhead sprinkler irrigation system directions. Note: Do not use in conjunction with foliar applications of granular chlorpyrifos.

COTTON: (14) (Except California and Arizona) Cotton fleahopper, plant bugs (Lygus, Mirids); Use 3/8 to 1 pint per acre. Cotton aphid, fall armyworm, grasshoppers, thrips, yellow-striped armyworm; Use 1/2 to 1 pint per acre. Spider mites; Use 1 pint per acre. Beet armyworm, bollworms (Heliothis spp.), bollweevil, cutworms, pink bollworm, salt marsh caterpillar; Use 1 1/2 to 2 pints per acre. Note: The recommended dosage rate of 3/8 pint per acre will not achieve the high degree of control at the higher 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.

(Arizona and California): Armyworms, cotton aphid, cotton fleahopper, Lygus, salt marsh caterpillar, thrips; Use 1 to 2 pints per acre. Bollworms, (Heliothis spp.), boll weevil, cutworms, pink bollworm; Use 2 pints per acre. Note: The 2 pint rate will aid in the suppression of cotton leafperforator and spider mites. Re-treat as necessary to maintain control.

When used as a postemergence broadcast application to control the above listed pests, Gowan Chlorpyrifos 4E may be applied through an overhead sprinkler irrigation system. Follow directions for overhead sprinkler irrigation systems.

For most effective control of spider mites when a large amount of eggs are present, apply a second spray 3 to 5 days after first treatment. For best results on bollworms, fields should be scouted twice per week and treatments made when worms are 1/4 inch or less in length. Note: A scouting schedule of only once per week will not be satisfactory since the worms may be too big to control by the seventh or eighth day.



Aerial application: Shorten boom length to avoid spray entering the vortices at the wing tips. Swath width should be reduced when wind direction is the same as the direction of the spraying. Flying at a height of 5-15 feet above the target results in the best coverage. The proper nozzle arrangement and swath width can be checked by flying over paper tape using water with/without soluble dye. Nozzle orientation of the boom is important. Desired droplet size (100-200 microns) can be obtained by angling the nozzles somewhere between straight down and straight back.

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

Do not allow livestock to graze in treated areas. Do not feed gin trash or treated forage to livestock.

For control of armyworms, bollworms (*Heliothis* spp.), boll weevil, cotton fleahopper, plant bugs (*Lygus*, Mirids), and spider mites, Gowan Chlorpyrifos 4E can be mixed with the following:

TANK MIXTURE	RATE/ACRE
plus Ambush ² 2E	1 to 2 pints plus 1/5 to 2/5 pint
plus Pounce ³ 3 2E	1 to 2 pints plus 1/8 to 1/4 pint
plus Pydrin ² 2 4E	1 to 2 pints plus 1/6 to 1/3 pint
plus Bolstar ⁴ 6E	1/2 to 1 pint plus 2/3 to 1 1/3 pints
plus methyl parathion ⁵ Plus EPN ¹	1 pint plus 0.6 lb a.i. plus 0.6 lb a.i.

- ¹Trademark of ICI Americas Inc
- ²Trademark of FMC Corporation
- ³Trademark of Shell Chemical Company
- ⁴Trademark of Farbwerke Bayer GmbH Leverkusen
- ⁵Use only emulsifiable formulations containing these active ingredients (a.i.)

* Gowan Chlorpyrifos 4E

Mix the tank mixture components in sufficient water to ensure thorough coverage of plants (at least 1 gallon of spray per acre) and apply using aerial equipment. Re-treat as necessary to maintain control.

In California and Arizona: Armyworms, bollworms, cabbage looper, cotton aphids, cotton fleahopper, cutworms, grasshopper, omnivorous leafroller, pink bollworm, plant bugs (*Lygus*, Mirids), saltmarsh caterpillar, thrips, and whitefly (suppression); Use Gowan Chlorpyrifos 4E at 1 to 2 pints per acre plus methamidophos or acephate according to labeled rates for tank mixes. For tank mixes with methamidophos, apply before 65% of the bolls have opened. Re-treat as necessary to maintain control. Make no applications of the tank mixtures closer to harvest than the longest pre-harvest interval shown for any of the products in the tank mixture.

Do not allow livestock to graze in treated areas. Do not feed gin trash or treated forage to livestock. Workers entering the field within 48 hours of application should wear protective clothing.

FIGS: (7 months)(In California): Driedfruit beetle; Use 2 quarts per acre in sufficient water to the soil surface followed by incorporation into the top 3 inches of soil. Apply to fig orchard soil as a dormant application in the late winter prior to beetle emergence and prior to leaf formation. Make only one application per year.

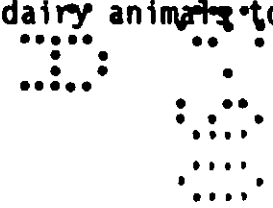
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GRAIN SORGHUM: (30 days for applications of 1 pint per acre or 60 days for applications of more than 1 pint) Sorghum midge; Use 1/2 pint per acre. Apply when 30 to 50 percent of the seed heads are in bloom and repeat at 3 day intervals if necessary. Greenbugs, grasshoppers, yellow sugar cane aphid, other aphids; Use 1/2 to 1 pint per acre. Chinch bugs, lesser cornstalk borer; Use 1 to 2 pints per acre. Apply as a directed spray toward the base of the plant using ground spray equipment with sufficient water to ensure coverage of an 8 to 12 inch band centered on the row. On plants less than 6 inches high, apply an 8 to 12 inch band over the row. Armyworms, corn earworm, cutworms; Use 1 to 2 pints per acre. European and southwestern corn borer; Use 1 1/2 to 2 pints per acre. Webworms; Use 1 pint per acre. Note: To minimize chemical injury, do not apply to drought stressed grain sorghum within 3 days following irrigation or rain except where the product is applied in irrigation water. When used as a postemergence broadcast application to control pests, overhead sprinkler irrigation systems can be used. Follow directions for overhead sprinkler irrigation systems. The treated crop is not to be used for forage, fodder, hay, or silage within 30 days of application of 1 pint per acre or within 60 days of application of rates over 1 pint per acre. Do not treat sweet varieties of sorghum. Do not apply more than 3 pints per acre per season.

GRAPES: (35) (Restricted to states east of the Rocky Mountains): Grape root borer; Use 4 1/2 pints per 100 gallons of water and apply 2 quarts of the diluted spray mixture to the soil surface on a 15 square foot area around the base of each vine. Do not allow spray to come in contact with fruit or foliage. Do not make more than one application per season.

MINT: (90) Cutworms; Use 2 to 4 pints per acre. Mint root borer; Use 4 pints per acre. Use as a broadcast foliar spray. When cutworm larvae are less than 3/4 inch long, use the 2 pint rate. When cutworm larvae are longer than 3/4 inch, use the higher rate. For mint root borer control, apply post-harvest when field counts indicate insect populations are present or developing. Follow treatment with approximately 1 acre inch of sprinkler irrigation immediately after application to incorporate the insecticide into the soil. Make only one post-harvest application per season and only one application during the growing season.

NECTARINES, PEACHES: (14) Peach tree borers; Use 3 quarts per 100 gallons of water and apply as a coarse, low-pressure spray to give uniform coverage of tree trunks before newly hatched borers enter the tree trunks. Thoroughly wet all bark areas from ground level to scaffold limbs. Do not allow spray to come in contact with fruit. Consult your State Agricultural Experiment Station or Extension Service specialist for proper time to treat in your area. ~~Gowan~~ Chlorpyrifos 4E may also be used as a preplant dip application for non-bearing peach trees at the equivalent application rate of 3 quarts per 100 gallons of water for control of peach tree borer. Dip trees several inches above the grafting bud scar and plant immediately or allow to dry before returning to storage. Do not allow peach trees to remain in contact with the dip solution. Make only one application per season. Do not allow meat or dairy animals to graze in treated orchards.



ONIONS (Dry bulb): Onion maggot; Use 1.1 fluid ounce per 1000 linear feet of row at an 18 inch row spacing. Use a minimum of 40 gallons of total drench per acre. Incorporate to a depth of 1 to 2 inches. Do not make more than one application per year.

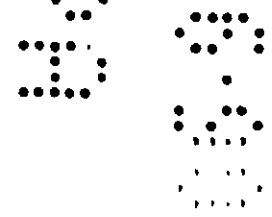
PEANUTS: (21) Lesser cornstalk borer; Use 2 to 4 pints per acre as a directed spray to the base of the plants in an 8 to 10 inch wide band. Do not apply as a foliage application. Do not make more than one application per season. Do not feed treated peanut forage or hay to meat or dairy animals.

SOYBEANS: (28) Soil treatment: Cutworms, lesser cornstalk borer; Use 1 to 2 pints per acre. Equivalent rates of insecticide spray required per 100 feet of row for various row spacing are given in the table below. For at-plant treatments, apply over the row in a 4 to 6 inch band in front of the planter shoe or press wheel or after the press wheel followed by a drag chain for light incorporation. Do not apply as an in-furrow treatment. For postemergence rescue treatments, apply as a directed spray in a 9 to 12 inch band at the base of the plant. For plants under 6 inches high, apply over the top in a 6 to 12 inch band. Treat when pests are or may become a problem.

Volume of Spray Per Acre	Fluid Ounces of Spray Required Per 100 Feet of Row for Various Row Spacing			
	36"	32"	28"	24"
10 Gallons	88	79	69	59
15 Gallons	132	118	103	88
20 Gallons	176	157	137	118

Foliar Treatment: European corn borer, southern green stink bug; Use 2 pints per acre. Bean leaf beetle, cutworms, corn earworm, saltmarsh caterpillar, other woolybears; Use 1 to 2 pints per acre. Mexican bean beetle, armyworms; Use 1 to 1 1/2 pints per acre. Velvetbean caterpillar, grasshoppers, green cloverworm, spider mites; Use 1/2 to 1 pint per acre. Apply as a broadcast spray using aerial or ground equipment. Apply a second spray 3 to 5 days after initial spray to control spider mites and their newly-hatched nymphs. Note: On determinate soybeans, do not apply more than one application after pod set. May be applied through overhead sprinkler irrigation systems as a postemergence broadcast application to control the above mentioned pests. Follow directions for overhead sprinkler irrigation systems. Do not apply more than 6 pints per acre per season. Do not apply last two treatments closer than 14 days apart. Do not allow livestock to graze in treated areas or feed treated soybean forage, hay, or straw to meat or dairy animals.

STRAWBERRIES: (21) Strawberry bud weevil; Use 1 quart per acre. Apply as a broadcast foliar spray. Apply when buds first appear and 10 to 14 days later. Do not apply after berries start to form or when berries are present. Note: Do not mix with other pesticides, surfactants, or fertilizers unless the prior combination has shown to be noninjurious under current conditions. Phytotoxicity may occur when applied to strawberries experiencing high temperature and drought stress. For pre-bloom use only. Do not make more than two applications per season.



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SUNFLOWERS: (42) Preplant Incorporation Treatment: Cutworms; Use 2 to 4 pints per acre. Apply as a broadcast spray to the soil surface. On the same day of treatment, incorporate into the top 2 to 4 inches of soil using a disc, field cultivator, or equivalent equipment.

Postemergence Treatment: Cutworms; Use 2 to 3 pints per acre. Sunflower beetle larvae and adults, stem weevil, sunflower moth, banded sunflower moth, woollybears, and seed weevil; Use 1 to 1 1/2 pints per acre. Grasshoppers; Use 1 pint per acre. Apply as a broadcast spray using aerial or ground spray equipment. For cutworm control, a second treatment may be made 7 to 10 days later if needed. For stem weevil control, optimal treatment time is within 5 to 7 days after adult weevils begin to appear. For sunflower moth control, make first application during early 1 to 5 percent bloom stage. A second treatment may be made 7 days later if needed. For seed weevil control, treat when field counts indicate there are 10 to 12 adults per plant for oil crops and 1 to 3 adults per plant on confectionary crops. Additional treatments should be made at successive 7 to 10 day intervals if field counts indicate need to re-treat. For sunflower beetle larvae or adult, treat when field counts indicate there are 10 larvae or 1 to 2 adults per seedling. Additional treatments may be made at successive 7 to 10 day intervals if needed. Do not apply more than 9 pints per acre per season. Do not allow livestock to graze in treated areas.

SUGAR BEETS: (30) Beet armyworms; Use 1 1/2 to 2 pints per acre. Cutworms; Use 2 pints per acre. Apply as a broadcast, foliar spray. Re-treat as necessary. Do not apply more than 8 pints per acre per season. Do not allow livestock to graze in treated areas or harvest treated beet tops as feed for meat or dairy animals within 30 days of application.

SWEET POTATOES: (125) Conderus wireworms, Systema flea beetles, sweet potato flea beetle; Use 4 pints per acre as a broadcast (overall) spray to the soil surface followed by incorporation to a depth of 4 to 6 inches using a rotary hoe, disc cultivator, or other incorporation equipment. Plant the crop in the usual manner as soon as possible after treatment but no more than 14 days after treatment. Do not make more than one application per season. Note: Gowan Chlorpyrifos 4E will not control false wireworms or whitefringed beetle or other grubs that attack sweet potatoes.

TOBACCO: Larvae of cutworms, flea beetles, mole crickets, root maggots, wireworms; Use 2 to 3 quarts per acre as a broadcast (overall) spray to the soil surface one week before transplanting. Immediately following application, incorporate into soil to a depth of 2 to 4 inches using suitable equipment. North Carolina, South Carolina, Virginia: Rootknot nematodes and above listed insects; Use 5 quarts per acre. In all tobacco growing regions: Rootknot nematodes; Use 2 quarts plus 4 quarts of fenamiphos per acre. Follow all applicable directions, restrictions, and precautions on labeling for fenamiphos used in conjunction with chlorpyrifos. Apply as a broadcast (overall) spray to the soil surface 24-48 hours before bedding and transplanting. Immediately following application, incorporate into the soil to a depth of at least 4 inches using suitable equipment. If the nematode species *Meloidogyne arenaria* or *M. javanica* are present, apply dichloropropene soil fumigant at the recommended label rate.

Do not make more than one application per season.

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TREE FRUITS: Use Gowan Chlorpyrifos 4E as a dormant or delayed dormant spray on the crops below. While Gowan Chlorpyrifos may be used without oil, oil is recommended for additional pest control.

APPLES: Rosy apple aphid, San Jose scale, Lygus, Pandemis leafroller, climbing cutworms; Use 1/2 to 1 pint per acre.

PEARS: San Jose scale, climbing cutworms, pear psylla adults; Use 1/2 to 1 pint per acre.

PLUMS, PRUNES: San Jose scale, mealy plum aphid, climbing cutworms, peach twig borer; Use 1/2 to 1 pint per acre.

PEACHES, NECTARINES: San Jose scale, peach twig borer, climbing cutworms; Use 1/2 to 1 pint per acre.

If oil is used for application, tank mix the specified dosage with a petroleum spray oil recommended for dormant use and spray the entire tree by application to runoff using suitable ground spray use equipment. Use the higher dosage for severe infestations. Always follow oil manufacturer's directions for use and as recommended by your State Agricultural Experiment Station or Extension Service Specialist. Note: Because cold or dry conditions may cause Gowan Chlorpyrifos 4E plus oil sprays to infuse trees resulting in bud damage or drop, do not apply until winter rains or irrigation has replenished soil moisture such that bark and twigs are not desiccated.

Precautions specific to California: Do not use more than 4 pints of Gowan Chlorpyrifos 4E per acre and follow the Dilution Directions found elsewhere on this label. Do not use more than 4 gallons of spray oil per acre on almonds, peaches, or nectarines. Do not use on almonds in the following California counties: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo, and Yuba. Make only one application during the dormant season. Do not allow meat or dairy animals to graze in treated orchards.

TREE NUTS:

ALMONDS: (14) Navel orangeworm, peach twig borer, San Jose scale; Use 4 pints per acre. Make no more than 3 applications per season. Do not allow livestock to graze in treated orchards.

FILBERTS: (14) Eyespotted bud moth, filbert aphid, filbert leafroller, filbertworm, obliquebanded leafroller, omniverous leaf-tier, winter moth; Use 3 to 4 pints per acre. Make no more than 3 applications per season. Do not allow livestock to graze in treated orchards.

PECANS: (28 days if only Gowan Chlorpyrifos 4E is used or the longest pre-harvest interval shown for any of the products in the tank mixture): Black pecan aphid, hickory shuckworm, pecan nut casebearer, Phylloxera spp., fall webworm, spittlebug; Use 2 pints per 100 gallons. Yellow pecan aphid complex; Use 1 pint plus 2-2/3 ounce of fenvalerate 2.4E per 100 gallons. Fire ants and other ant species; Use 2 pints per acre as a ground spray. Make no more than 5 applications per season. Do not allow livestock to graze in treated orchards. Mix the required dosage in sufficient water to ensure thorough coverage of the foliage and crop and apply as a concentrate or dilute spray using conventional, power-operated spray equipment. For dilute spray, apply 200 to 600 gallons per acre and allow for spray to runoff. For concentrate sprays, apply an equivalent amount of Gowan Chlorpyrifos 4E per acre.

WALNUTS: (14) Codling moth, walnut scale; Use 4 pints per acre. Make no more than 2 applications per season. Do not allow livestock to graze in treated orchards.

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VEGETABLES: For control of root maggots on the following crops, use the recommended dosage given below.

Cauliflower: (30) 1.6 to 2.4 fl. ounces per 1000 linear feet of row.

Broccoli, Brussels Sprouts, Cabbage, Chinese Cabbage, Collards, Kale, Kohlrabi, Turnips: (30) Use 1.6 to 2.75 fl. ounces per 1000 linear feet of row.

Note: For direct seeded crops, apply the specified dosage in a water-based spray as a 4 inch wide band over the row at planting time, behind the planter shoe and in front of the press wheel to achieve shallow incorporation. Apply in a minimum of 40 gallons of total spray per acre.

Note: For transplanted crops, apply as a water-based spray directed at the base of the plants immediately after setting. Use a minimum of 40 gallons of total spray per acre. Do not add any additional adjuvants, surfactants, or spreader stickers. Do not apply as a foliage application.

Restrictions: Do not apply more than 2 pints to cauliflower planted in 4 inch rows. Use proportional amounts for other row spacings not to exceed 4 pints per acre. Do not apply more than 2.6 pints per acre to broccoli, Brussels sprouts, cabbage, Chinese cabbage, collards, kale, kohlrabi, and turnips planted in 40 inch rows or more than 4 1/2 pints per acre to these crops in 20 inch rows (or 2 rows per bed). Use proportional amounts for other row spacings not to exceed 4 1/2 pints per acre. Do not make more than one application per season.

Radishes: Use 1 fl. ounce per 1000 linear feet of row. Apply in a water-based drench in the seed furrows with the seed at planting time. Use a minimum of 40 gallons of total drench per acre. Do not apply more than 5 1/2 pints per acre or make more than one application per season.

Rutabagas: Use 1.6 to 3.3 fl. ounces per 1000 linear feet of row. Apply in a water-based spray as a 4 inch wide band over the row at planting time, behind the planter shoe and in front of the press wheel to achieve shallow incorporation. Use a minimum of 40 gallons of total spray per acre. Do not apply more than 4 1/2 pints per acre or make more than one application per season. Do not use rutabaga tops for food or feed purposes.

Note for vegetable crops: To avoid phytotoxicity, do not mix with other pesticide products or treat plants that are under extreme heat and drought stress.

