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SEP 29 1987

Cindy I. Keller
Nor-Am Chemical Company
3509 Silverside Road
P.O. BOX 7495
Wilmington, DE 19803

Dear Ms. Keller:

Subject: Amendment/Registration Standard Label
Statements and Addition of Dosage Chart
Vorlex
EPA Registration No. 45639-90
Your Submissions dated November 10, 1986,
April 14 and May 19, 1987

The amendment referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable provided that you:

1. Make the labeling changes listed below before you release the product for shipment bearing the amended labeling:

a. Add the following statement to the precautionary text:

Field Reentry

Workers entering the treated area for 72 hours after application of 1,3-dichloropropene must wear protective clothing.

b. Under directions for use seedbeds, organic soil type, change the maximum gallons per acre from 70 to 60 gallons.

c. Under directions for use on vegetable crops, revise the statement "Cleared for use on All Vegetables" to read "Maybe used as a preplant soil treatment for soil that is to be planted to any vegetables" or similar wording.

d. We recommend you add a statement below the ingredient statement which indicates the product weight per gallon.

SYMBOL						
RNAME						
DATE						

BEST AVAILABLE COPY

2. Submit one copy of your final printed labeling before you release the product for shipment.

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

Sincerely yours,

Lois A. Rossi
Product Manager 21
Fungicide-Herbicide Branch
Registration Division

CONCURRENCES

SYMBOL	NAME	DATE					

SPECIMEN LABEL
ACCEPTED
OR AGRICULTURAL USE ONLY
EPA Letter Label

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

SEP 29 1987

Under the Federal Insecticide,
Fungicide, and Rodenticide Act
as amended, this pesticide
registered under EPA Reg. No.
45639-90

Worlex®

SOIL FUMIGANT

ACTIVE INGREDIENTS:	
1,3-dichloropropene and other related chlorinated C ₃ hydrocarbons	40.0%
Methyl isothiocyanate	20.0%
INERT INGREDIENTS	40.0%
TOTAL	100.00%

EPA Reg. No. 45639-90 EPA Est. No. 08800 IL-1

PRECAUCION AL USUARIO: Si usted no lee ingles, no use este producto hasta que el etiqueta haya sido explicado ampliamente.

KEEP OUT OF REACH OF CHILDREN

 **DANGER - POISON** 
PELIGRO - VENENO

STATEMENT OF PRACTICAL TREATMENT

- IF INHALED: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.
- IF ON SKIN: IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. IF WATER IS NOT IMMEDIATELY AVAILABLE, REMOVE EXCESS CHEMICAL FROM SKIN WITH ABSORBENT MATERIAL SUCH AS TOWEL OR DRY SOIL, THEN PROCEED AT ONCE TO LOCATION WHERE WATER IS AVAILABLE AND THOROUGHLY WASH CONTAMINATED SKIN WITH PLENTY OF WATER. CALL A PHYSICIAN.
- IF IN EYES: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER OR A 5% SOLUTION OF SODIUM BICARBONATE FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN. CONTINUE TREATMENT WITH OPHTHALMIC HYDROCORTISONE OINTMENT.
- IF SWALLOWED: IMMEDIATELY CALL A PHYSICIAN OR POISON CONTROL CENTER. DO NOT INDUCE VOMITING. NOTE TO PHYSICIAN: EMPTY STOMACH CONTENTS BY GASTRIC LAVAGE.

SEE LEFT PANEL FOR ADDITIONAL PRECAUTIONS
DO NOT REUSE ORIGINAL CONTAINERS UNLESS RECONDITIONED

 **NOR-AM**
NOR-AM CHEMICAL COMPANY
3509 Silverside Road, P. O. Box 7495
Wilmington, DE 19903

NET CONTENTS:
PROTECTED BY U.S. PAT. NOS. 3,205,129,
3,113,908, 3,240,666

STORAGE, SHIPMENT AND DISPOSAL

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS & DOMESTIC ANIMALS

DANGER. Causes severe eye damage. May be fatal if inhaled, absorbed through skin, or swallowed. Do not get in eyes, on skin or on clothing. Do not take internally. Do not breathe vapor. Use only with adequate ventilation.

Causes burns of skin and eyes. May produce kidney and liver damage upon prolonged exposure. Wear chemical worker goggles, face shield or safety glasses. Wash thoroughly with soap and water after handling, and before eating and smoking.

The use of this product may be hazardous to your health. This product contains 1,3-dichloropropene which has been determined to cause tumors in laboratory animals. Risks can be reduced by closely following the use directions and precautions, and by wearing protective clothing specified elsewhere on this label.

STORAGE: Store in tightly-closed original container cool place away from dwellings. Do not allow contamination of seeds, plants, fertilizers, or other pesticide chemicals. Do not contaminate food, feedstuffs, drugs, or domestic water supplies. In outside storage, store drums (make sure that bungs are tightly closed) on sides to avoid accumulation of rain water in top or bottom of recessed areas.

SHIPMENT: Do not ship or store with food, feeds, drugs, or clothing.

PESTICIDE DISPOSAL: Do not contaminate water, food or feed by storage or 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 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. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other approved state or local procedures.

DO NOT REUSE ORIGINAL CONTAINERS UNLESS RECONDITIONED.

GENERAL INFORMATION

Vortex Soil Fumigant is used as a preplanting treatment in both field and greenhouse soils.

In the soil, when used as directed, Vortex vaporizes and diffuses, helping to control plant parasitic nematodes and harmful fungi causing damping-off, root-rot and wilt. When used as directed, Vortex also helps to control wireworms and symphylans. When used as directed, Vortex helps control weeds such as pigweed, dandelion, lambsquarters, bermudagrass, purslane, crabgrass, quackgrass, spurge, fleabane, sedge, chickweed, ragweed, mustard, Poa spp., smartweed, wild radish, dodder, velvetleaf and shepherdspurse.

PHYSICAL OR CHEMICAL HAZARDS

FLAMMABLE

DO NOT USE, POUR, SPILL, OR STORE NEAR HEAT OR OPEN FLAME. DO NOT CUT OR WELD CONTAINER. FIRE OR EXPLOSION MAY RESULT EVEN IF CONTAINER IS EMPTY.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Do not spill or empty into streams, ponds or any other body of water. Do not contaminate water or wetlands by cleaning of equipment, disposal of wastes, or direct application. In case of spills, properly dispose of contaminated materials.

BEST AVAILABLE COPY:

HANDLING PRECAUTIONS

DO NOT GET ON SKIN -

index **REQUIRED CLOTHING AND EQUIPMENT DURING THE HANDLING AND APPLICATION OF VORLEX:**

One-piece coveralls which have long sleeves and long pants constructed of laminated fabric as specified in the USDA/EPA Guide for Commercial Applicators.

Liquid-proof hat such as a plastic hard hat with a plastic sweat band.

Heavy duty liquid-proof (neoprene/synthetic) work gloves and boots.

Any article worn while handling VORLEX must be washed before reusing.

Immediately remove all clothing which has been drenched or has otherwise absorbed VORLEX from any spill. Dispose of contaminated clothing in a sanitary landfill by incineration, or if allowed by state and local authorities by burning. If burned, stay out of smoke!!

Never wear protective gear having odor of VORLEX. Wash and aerate all protective gear thoroughly after use until all odor is gone.

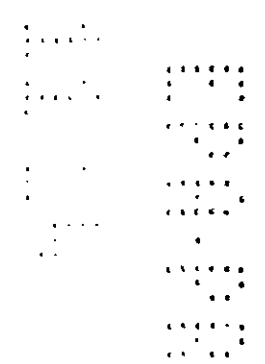
DO NOT INHALE VAPORS - NIOSH- or MSHA-approved respiratory protection should be worn when Vorlex liquid soil fumigant is exposed to the atmosphere or when conducting operations which vent to the atmosphere. A NIOSH- or MSHA-approved half-faced respirator with chemical worker's goggles or full-face respirators shall be used during small spills, repairs, calibrations, transfers, sampling and when working in poorly ventilated areas. When in use canisters or cartridges shall be replaced daily or sooner if specified by manufacturer or at first sign of odor breakthrough, whichever comes first. NIOSH-approved cartridges, such as a WILLSON-R21 will be adequate for short-term situations such as listed above.

Where very high concentrations of vapors might be expected (such as large spills in poorly ventilated areas) a self-contained or air-supplied respirator should be used.

DO NOT GET IN EYES - Wear eye protection such as chemical worker goggles, safety glasses or full face respirator when handling Vorlex.

DO NOT SWALLOW - Do not use the mouth to siphon Vorlex from containers or to blow out clogged lines, nozzles, etc.

For Chemical Emergency - Spill, Leak, Fire, Exposure or Accident Call 800-424-9300 Day or Night



DIRECTIONS FOR USE

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

USE PRECAUTIONS: As with most soil fumigants, application of Vorlex may temporarily raise the level of ammonia nitrogen and soluble salts in the soil which may result in plant injury. This is most likely to occur when heavy rates of fertilizer or fumigant are applied to soils that are either cold, wet, acid or high in organic matter.

Do not add fertilizers containing ammonia or ammonium salts or undecomposed manure to the soil at or near the time of fumigation. Use only fertilizers containing nitrates until the soil temperature is above 65°F and the crop is well established.

Do not allow liquid or vapors to come in contact with lawn and desirable plants; do not apply on areas beneath which roots of desirable plants extend.

Do not use in greenhouses which contain living plants.

Do not fumigate if the soil temperature at 3 inch depths is over 90°F.

Avoid reinfestation of treated soil. Do not contaminate treated soil with untreated soil. Do not use transplants or tools which could carry soil-borne pests from infested land. Clean equipment carefully before using.

Vorlex may be corrosive under certain conditions. Flush all applicators with fuel oil or kerosene immediately after use. **DO NOT USE WATER.** Do not use containers or equipment of aluminum, magnesium or their alloys. Close containers tightly.

TIME OF APPLICATION: Treatment can be made at any time the soil is workable; fall or winter application is desirable for crops which are planted early in the spring.

Soil temperature: Vorlex is active in soils as cold as 35°F except against soil insects.

PREPARATION OF SOIL: FOR OPTIMUM CONTROL WITH VORLEX FOLLOW THESE STEPS

CAREFULLY: (1) Work crop remains into the soil so that they are well decomposed before treatment. (2) In shrub and tree replant sites remove as much of the root system as possible. (3) Break up all clods and loosen soil thoroughly by cultivation one week before treatment. Deep tillage is recommended, particularly for deep-rooted crops. Always work soil deeper than intended application depth. (4) Keep soil moist from the surface down through the root zone and maintain in this condition for one week before fumigation. **DO NOT FUMIGATE DRY SOILS.**

APPLICATION: Use Injection type applicators.

Broadcast treatment: Set shanks 6" to 8" apart; for band treatment, set shanks 8" apart. Inject at a depth of 6" to 8".

Row treatment: Adjust injection chisels to same spacing as planter. Seal the treated strips by bedding or listing. Always inject the fumigant at least 6-8" below the final soil (planting) surface. Before

planting, remove the tops of the beds, being careful that none of this soil falls over on the fumigated band.

DOSAGE:

Pest	Soil Type	Overall (Broadcast) Application		Row or Band Application	
		Per Acre	Per 100 sq. ft.	Per Chisel	Per 100 Linear Ft.
Nematodes	Mineral	7-15 gal	2-4 1/2 fl. oz.	40-87 mi ⁶	1-4.3 C. fl. oz. ⁶
Nematodes	Organic ² Muck	10-25 gal	3-7 1/2 fl. oz.	58-146 mi ⁶	2.5 fl. oz. ⁶
Symphyta ³	—	10-15 gal	3-4 1/2 fl. oz.	—	—
Weeds ¹ , fungi, nematodes and soil insects (wire-worms)	Mineral	25-50 gal ⁴	7 1/2-15 fl. oz. ⁴	145-290 mi ^{4,5}	5-10 fl. oz. ^{4,5}
Weeds ¹ , fungi, nematodes and soil insects (wire-worms)	Organic ² Muck	40-80 gal	4-1 1/2 pint	232-346 mi ⁵	8-12 fl. oz. ⁵

1. For best weed control use the higher dosages indicated. Inject at 4 inch depth and cover with a tarp for 4 days.
2. If Vorlex is used in heavy clay soils, an extended aeration period may be required.
3. To obtain best symphytan control remove all residues prior to fumigation.
4. For citrus and other orchard trees where deep penetration is desirable, use 60-70 gallons of Vorlex per acre (1 1/2-1 3/4 pints per 100 sq. ft.).
5. Row or band treatment does not give effective soil insect control.
6. Row fumigation may not effectively control nematodes on root crops where infestation is severe.

IMMEDIATELY after application, drag the soil to remove chisel marks, then firm with a smooth roller. If additional water is required, apply only the amount necessary to wet the soil to a depth of one-half inch. If a tarp seal is used, lower dosages may be effective.

In soils 70°F or higher at 6" depth, special attention should be given to sealing the surface of the soil. Tarping gives the best seal.

FUMIGATION PERIOD: After application at soil temperatures of 60°F or above, keep soil moist and undisturbed for a minimum of 4 days; 7 days is preferable. Use a shorter fumigation period only if it has been shown effective.

Colder soils require a longer fumigation period. If these conditions occur, allow at least 1 to 3 weeks for the fumigation period depending upon the temperature.

In fall or winter application the fumigation period should extend until spring. The soil should be undisturbed during this period.

AERATION PERIOD: For soil temperatures above 60°F (at 6" depth), aerate the soil at the end of the fumigation period by cultivation, e.g., discing. Repeated cultivation will aid release of the fumigant and is especially desirable if heavy rains occur during the fumigation period. If soil crusting occurs, it retards aeration and must be broken up. Repeated cultivation may be necessary to prevent soil crusting.

Aerate until the fumigant has completely escaped from the soil. This is usually accomplished by allowing 1 week between cultivation (and of fumigation period) and planting for each 12 gallons per acre of Vorlex.

For soil temperatures below 60°F (at 6" depth), longer aeration periods than those mentioned above will be required. Repeated deep cultivation is especially important when heavy rains or very wet soil accompany low soil temperatures, since these conditions retard aeration.

DO NOT PLANT WHEN THE ODOR OF THE FUMIGANT IS STILL DETECTABLE.

TREATMENT OF ORCHARD TREE REPLACEMENT SITES:

Use Vorlex for control of fungi and nematodes in orchard tree replacement sites. For instructions regarding this use, contact NOR-AM for bulletin entitled "Fumigation of Orchard Tree Replacement Sites".

Vorlex³ Dosage Chart

Crop	Control Desired	Method of Application	Soil Type	Gals. Acre
VEGETABLE CROPS	Nematodes	Overall	Mineral	7-15
			Organic	10-25
Cleared for use on All Vegetables	Nematodes	Row (40")	Mineral	5-8
	Soil Diseases		Organic	8-12
	Soil Insects	Overall	Mineral	25-40
	Weeds		Organic	40-60
ONIONS	Nematodes	Bed	Mineral	12 1/2-20
	Soil Diseases* Soil Insects	Overall		25-40
ORCHARDS	Nematodes	Overall	Mineral	10-15
	Nematodes			30-60
	Soil Diseases Soil Insects -- Weeds			2 1/2-5
PEANUTS	Nematodes	Row (36")	Mineral	3-5
	Soil Diseases			7-15
POTATOES	Nematodes	Overall	Organic	10-25
	Soil Diseases		Mineral	25-40
	Soil Insects -- Weeds		Organic	40-60
			Bed	3 1/2-7 1/2
STRAWBERRIES	Nematodes	Overall	Mineral	7-15
	Nematodes	Bed		12 1/2-20
	Soil Diseases Soil Insects -- Weeds	Overall		25-40
	Nematodes	Overall		7-15
SUGARBEETS	Nematodes	Overall	Mineral	25-40
	Soil Diseases Soil Insects -- Weeds			7-15
SWEET POTATOES	Nematodes	Row (36")	Mineral	5-10
	Soil Diseases	Row (48")		3-5
TOBACCO	Nematodes	Overall	Mineral	7-15
	Nematodes	Row (48")		5-8
	Soil Diseases Soil Insects -- Weeds	Overall		25-40
	Nematodes	Overall		7-15
NURSERY and FLORAL CROPS	Nematodes	Overall	Mineral	25-40
	Soil Diseases Soil Insects -- Weeds			Mineral
SEEDBEDS	Nematodes	Overall	Mineral	35-50
	Soil Diseases Soil Insects -- Weeds		Organic	50-70

Note: 1 Row fumigation may not effectively control nematodes on root crops where infestation is severe.
 2 Row fumigation will not control soil insects.
 3 For best weed control, use the higher dosages indicated, inject at 4" depth and cover with a tarp for 3 days.
 4 For citrus and other orchard trees where deep penetration is desirable, use 60-70 gal of Vorlex per acre.
 *Onions -- Vorlex suppresses pine rots.

(The above recommendations may vary because of local conditions. Consult your local agricultural authority for regional recommendations.)

IMPORTANT: READ BEFORE USE

By using this product, user accepts the following conditions, warranty, disclaimer of warranties and limitations of liability.

CONDITIONS: The directions for use of this product are believed to be adequate and should be followed carefully. However, because of extreme weather and soil conditions, manner of use and other factors beyond NOR-AM Chemical Company's control, it is impossible for NOR-AM to eliminate all risks associated with the use of this product. As a result, crop injury or ineffectiveness is always possible.

DISCLAIMER OF WARRANTIES: THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, WHICH EXTEND BEYOND THE STATEMENTS MADE ON THIS LABEL. No agent of NOR-AM Chemical Company is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. UNDER NO CIRCUMSTANCES SHALL NOR-AM CHEMICAL COMPANY BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM FAILURE TO USE THIS PRODUCT IN ACCORDANCE WITH LABEL DIRECTIONS.

LIMITATIONS OF LIABILITY: In no event shall NOR-AM Chemical Company's liability for damages arising from the use of this product exceed the purchase price of the product used.

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