

Amvac Chemical Company
c/o Mr. H. R. McLane
7210 S.W. 57th Ave., Suite 212A
Miami, FL 33143

MAR 23 1988

Dear Mr. McLane:

SUBJECT: November 19, 1987 3(c)(2)(B) Data Call-In
Notice for lindane products permitting
greenhouse smoke fumigation use
Amendment - Delete greenhouse smoke fumigation uses
Technical lindane
EPA Reg. No. 5481-225
Your submission dated December 29, 1987

A FIFRA section 3(c)(2)(B) Data Call-In Notice requiring exposure studies to assess the potential respiratory and dermal exposure to workers upon re-entry into greenhouses which had been treated by smoke fumigation from lindane impregnated materials, was issued November 19, 1987. The Environmental Protection Agency has determined that you, as a registrant of a lindane manufacturing-use product which could be formulated into an end-use product for smoke fumigation of greenhouses, have complied with the requirements of that Notice by submitting the required FIFRA section 3(c)(2)(B) Summary Sheet and amended labeling specifying deletion of greenhouse smoke fumigation uses (both food use and non-food use) within the 90 day period allowed.

The amendment referred to above, submitted in connection with a registration under the Federal Insecticide, Fungicide, and Rodenticide Act, is acceptable provided the following revisions are made to both the label and the associated Technical Bulletin prior to release for shipment under the amended labeling:

1. Since a recent review of the Agency's records indicates that the only registered greenhouse food uses for lindane are smoke fumigation of the three crops indicated on your label, and you are excluding those uses, you must delete the site "Greenhouse Food Crops" and the associated crop listing from your label, rather than just adding the limitation "(Does Not Include Greenhouse Smoke Fumigation)".

- 2. Since the only lindane end-use product for use on foxes has been cancelled, delete the use pattern "fox" from your listing of acceptable "Livestock Uses".
- 3. The acceptable uses listed under "Terrestrial Food Uses On" should clearly indicate which of the listed crops pertains only to seed treatment. The listing should be revised as follows:

alfalfa (seed treatment only); apples; apricots; asparagus; barley (seed treatment only), beans, dry (seed treatment only); beans, succulent (seed treatment only); beets (seed treatment only); broccoli; Brussels sprouts; cabbage; carrots (seed treatment only); cauliflower; celery; cherries; clover (seed treatment only); collards; corn (seed treatment only); cotton (seed treatment only); cucumber; eggplant; flax (seed treatment only); grapes; kale; lentils (seed treatment only); lettuce; mangoes; melons, including canteloupes and watermelons; oats (seed treatment only); okra; onion, dry bulb; peaches; pears; peas, including cowpeas (seed treatment only); pecans; peppers; pineapples; plums, including prunes; pumpkins; radishes (seed treatment only); rye (seed treatment only); safflower (seed treatment only); sorghum (seed treatment only); soybeans (seed treatment only); spinach; squash, including winter and summer; strawberries; sudangrass (seed treatment only); sugar beets (seed treatment only); sunflower (seed treatment only); tomatoes; and wheat (seed treatment only).

This letter also responds to your submission dated June 19, 1986 (which superseded your response dated February 7, 1986) in response to the Lindane Registration Standard. Items number 2 and 3 of the above comments pertain to aspects of the label under lindane reregistration while item number 1 pertains to the Data-Call In for greenhouse smoke fumigation. It is understood that the current label submission which is hereby accepted with comments supersedes that submitted February 7 and June 19, 1986. The Technical Bulletin which the Agency is accepting with comments at this time is that which was submitted June 19, 1986, since a revised Technical Bulletin was not included with your December 22, 1987 submission. The use patterns appearing in the Technical Bulletin must be in agreement with those appearing on the revised amended label. A stamped copy of the labeling, including the associated Technical Bulletin, is enclosed for your records. Any product released for shipment 90 days after the date of this letter must bear the revised amended labeling. When available, please submit five copies of the revised amended label and associated Technical Bulletin for the Agency's files.

The Confidential Statement of Formula dated June 19, 1986 is acceptable and has been included in this product's registration file as the basic formula of record. It is understood that the product specific chemistry and toxicology data required in support of this product is identical to that submitted by your supplier, since this is merely a repackaging.

Sincerely yours,

George T. LaRocca
Product Manager (15)
Insecticide-Rodenticide Branch
Registration Division

DEC 29 1987

EPA/AMVAC/5481-225.AMD HD #31 EPA Reg. No. 5481-225

This Date:

This Label Revision, in Response to the 11-29-87 Lindane Data Call-In, Excludes All Product Use as "Smoke Fumigation Application" in Accepted Greenhouse uses.

DIRECTIONS FOR USE

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

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal. **STORAGE:** Store product in its original labeled container in a cool, dry, locked place designated as Technical Lindane, out of reach of children. **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 disposed of in a sanitary landfill, or by other approved State and local procedures.

TECHNICAL LINDANE

AN INSECTICIDE FOR FORMULATING USE ONLY

This Pesticide may Only Be Used in the Formulation of an Insecticide. Formulators Using This Product are Responsible for Obtaining EPA Registration for their Formulated Products which may be Labeled For the Use Patterns as Found Listed on this Label.

ACTIVE INGREDIENT:

Lindane (gamma isomer of benzene hexachloride). 99.5%

INERT INGREDIENTS:..... 0.5%

Total 100.0%

ACCEPTED
with COMMENTS
in EPA Letter Dated:

MAR 23 1988

KEEP OUT OF REACH OF CHILDREN

WARNING

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 5481-225

STATEMENT OF PRACTICAL TREATMENTS

IF SWALLOWED: Call a physician or Poison Control Center immediately. Have victim drink 1 cup of water and induce vomiting by touching back of throat with finger. Repeat until vomit fluid is clear. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

IF INHALED: Remove victim to fresh air. Apply artificial respiration if needed. Call a physician immediately.

IF ON SKIN: Remove contaminated clothing & wash affected areas with soap and water. Get medical attention if irritation persists.

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

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

WARNING: May be fatal if swallowed, inhaled or absorbed through the skin. Do not breathe vapors. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling and before eating or smoking. Do not contaminate feed or foodstuffs.

ENVIRONMENTAL HAZARDS

This product is toxic to fish, birds and other wildlife. Do not discharge effluent containing this active ingredient into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of wastes.

EPA REG. NO. 5481-225

EPA EST. NO. 5481-CA-1

TECHNICAL INFORMATION

Refer to Lindane Technical Bulletin for manufacturing data available on request from the AMVAC CHEMICAL CORPORATION.

Net Weight 50 Pounds

AMVAC CHEMICAL CORPORATION
4100 EAST WASHINGTON BLVD.
LOS ANGELES CA 90023

DIRECTIONS FOR USE (Cont.)

USE PATTERNS FOR LINDANE "END-USE PRODUCT"

This product may be used for formulations ONLY into End-Use Products for use in the following "USE PATTERNS".

TERRESTRIAL FOOD USES ON

ALFALFA (SEED TREATMENT), APPLE, APRICOT, ASPARAGUS, BARLEY, BEANS (DRY, SUCCULENT), BEETS, BROCCOLI, BRUSSELS SPROUTS, CABBAGE, CAULIFLOWER, CARROTS, CELERY, CHERRY, CLOVER, CORN, COLLARDS, COTTON, CUCUMBERS, EGGPLANTS, FLAX, GRAPES, KALE, LENTILS, LETTUCE, MELONS INCLUDING CANTALOUPE AND WATER-MELONS) OATS, OKRA, ONIONS(DRY), PEACHES, PEARS, PEAS (INCLUDING COWPEAS), PECANS, PEPPERS, PINEAPPLE, PLUM, PRUNE, PUMPKINS, RADISH, RYE, SAFFLOWER, SORGHUM, SOYBEAN, SPINACH, SQUASH (WINTER & SUMMER), STRAWBERRIES, SUDAN-GRASS, SUGAR BEETS, SUNFLOWER, TOMATOES, WHEAT,

TERRESTRIAL NON-FOOD CROP

TOBACCO

TERRESTRIAL NON-FOOD USES

ORNAMENTAL EVERGREENS (INCL. ARBORVITAE, DOUGLAS FIR, HEMLOCK, JUNIPER, PINES SPP. (AUSTRIAN-SCOTCH-SUGAR-WHITE-DIGGER-JAPANESE-BLACK-MONTEREY-PONDEROSA) NORWAY-WHITE SPRUCE; ORNAMENTAL DECIDUOUS TREES (INCL. ASH, ASPEN, BEECH, BIRCH, BOXELDER, CHESTNUT, COTTONWOOD, DOGWOOD, ELM, FLOWERING PLUM, FLOWERING ORNAMENTAL FRUIT TREES, HAWTHORN, HOLLY, LILAC, LINDEN, LOCUST, MAPLE, MOUNTAIN ASH, OAK, PYRACANTHA, RHODODENDRON, SYCAMORE, WILLOW; ORNAMENTAL HERBACEOUS PLANTS (INCLUDING AZALEA, CAMELLIA, CHRYSANTHEMUMS, DAFFODIL, DAHLIAS, GLADIOLUS, HYACINTH, IRIS, LILIES, NARCISSUS, TULIPS; ORNAMENTAL WOODY SHRUBS (INCL. AZALEAS, HIBISCUS, HOLLY, ROSES (INCL. NURSERY STOCK), ORNAMENTAL LAWNS,

GREENHOUSE FOOD CROPS (Does Not Include Greenhouse Smoke Fumigation)

CUCUMBER, LETTUCE, TOMATO

GREENHOUSE NON-FOOD CROP (Does Not Include Greenhouse Smoke Fumigation)

ORNAMENTAL PLANTS : AZALEAS, CAMELLIA, CARNATIONS, CHRYSANTHEMUMS, GERANIUMS, GERANIUMS, GLADIOLUS, PRIMROSE, RHODODENDRON, ROSE, AND SNAPDRAGONS.

LIVESTOCK USES

BEEF CATTLE, HORSES, HOGS, SHEEP, GOATS, MULES, FOX.

DOMESTIC OUTDOOR

LAWNS AND ORNAMENTAL PLANTS OUTDOOR TREATMENTS FOR ROACHES, FLEAS, CHIGGER MITES, & MOSQUITOES.

HUMAN USES

HUMAN SKIN/CLOTHING (MILITARY USE ONLY).

NOTICE: This product conforms to its chemical description and is reasonably fit for the purpose stated on the label, when used in accordance with directions under normal conditions of use. *Manufacturer is not responsible for the use of this product contrary to the label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to the manufacturer and/or seller and the buyer assumes the risk of any such use.*



Agricultural Chemicals Division

Technical Bulletin

TECHNICAL LINDANE

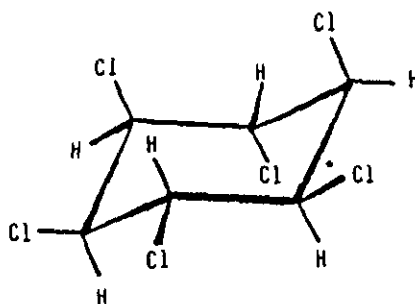
EPA REG. NO. 5481-225

ACCEPTED
with COMMENTS
in EPA Letter Dated:

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

5481-225



Hexachlorocyclohexane

Lindane is a high purity free flowing crystalline product, white in color and odorless; it readily passes through a 10 mesh screen. A powdered material can be supplied, upon special order, of which 90% passes through a 325 mesh screen (wet analysis).

Lindane, by virtue of its chemical structure and biological properties, holds a unique place among chlorinated organic insecticides. Lindane is the gamma isomer of benzene hexachloride and should not be confused with BHC which is a mixture of several stereoisomers including gamma. Lindane is a relatively persistent and broad spectrum insecticide.

SPECIFICATIONS

Active Ingredient	99.5% Minimum
Lindane (gamma isomer of hexachlorocyclohexane)	
Inert Ingredients	0.5% Maximum
Other hexachlorocyclohexane isomers	

SHIPPING CONTAINERS & WEIGHT

Shipments are made in drums with polyethylene liners. Content is 110 pounds (50 Kg) net weight.

MODE OF ACTION

Lindane controls insect and arachnid pests in three different ways. It acts as a contact poison, effective against ants, aphids, fleas, flies, lice, mosquitoes and ticks. It is a stomach poison to leaf feeding insects such as armyworms, caterpillars and grasshoppers. It is a vapor toxicant or soil fumigant against soil-borne insects such as cutworms, seed corn maggots, white grubworms and wireworms.

Technical Bulletin



6/8

TECHNICAL LINDANE

EPA REG. NO. 5481-225

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TERRESTRIAL NON-FOOD CROP

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~~GREENHOUSE FOOD CROPS~~ ← delete

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ORNAMENTAL PLANTS: AZALEAS, CAMELLIA, CARNATIONS, CHRYSANTHEMUMS, GARDENIAS, GERANIUMS, GLADIOLUS, PRIMROSE, RHODODENDRON, ROSE, AND SNAPDRAGONS. (Does Not include Greenhouse smoke fumigation)

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with COMMENTS
in EPA Letter Dated:

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

5481-225

Technical Bulletin



7/8

TECHNICAL LINDANE

EPA REG. NO. 5481-225

AN INSECTICIDE FOR FORMULATING USE ONLY

This Pesticide may Only Be Used in the Formulation of an Insecticide. Formulators Using This Product are Responsible for Obtaining EPA Registration for their Formulated Products which may be Labeled For the Use of ~~Formulators~~ ^{with Comments} as Found Listed on this Label. in EPA Letter Dated:

ACTIVE INGREDIENT:
Lindane (gamma isomer of benzene hexachloride).
INERT INGREDIENTS:
Total

MAR 23 1988

99.5% Under the Federal Insecticide, Fungicide, and Rodenticide Act as 100.0% for the pesticide registered under EPA Reg. No.

KEEP OUT OF REACH OF CHILDREN

5481-225

W A R N I N G

STATEMENT OF PRACTICAL TREATMENTS

IF SWALLOWED: Call a physician or Poison Control Center immediately. Have victim drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Repeat until vomit fluid is clear. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.
IF INHALED: Remove victim to fresh air. Apply artificial respiration if needed. Call a physician immediately.
IF ON SKIN: Remove contaminated clothing & wash affected areas with soap and water. Get medical attention if irritation persists.
IF IN EYES: Flush eyes with plenty of water. Call a physician immediately.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

WARNING: May be fatal if swallowed, inhaled or absorbed through the skin. Do not breathe vapors. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling and before eating or smoking. Do not contaminate feed or foodstuffs.

ENVIRONMENTAL HAZARDS

This product is toxic to fish, birds and other wildlife. Do not discharge effluent containing this active ingredient into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of wastes.

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Technical Bulletin



8/8

TECHNICAL LINDANE

EPA REG. NO. 5481-225

Technical lindane is a white crystalline solid with a melting point of 112°C. It is stable to light, heat, air and strong acids but decomposes to trichlorobenzenes and HCl in alkali. It is soluble in most organic solvents and is soluble in water at 10 parts per million (ppm) at 20°C. Other chemical and physical properties include vapor pressure of 9.4×10^{-6} mm Hg at 20°C, and specific gravity 1.85.

Extensive testing with laboratory animals has established the following values for lindane acute toxicity:

LD₅₀ ranges in experimental mammals.

Species	LD ₅₀ ranges for different routes of administration as mg/kg bodyweight						Presentation
	i.v.	i.m.	i.p.	s.c.	p.o.	dermal	
Rat			35-200	~350	88-225	50-400	Oil
						500	Acetone
			35		200		Paraffin
					170-300		Water
						900-1000	Xylene
						2000	Crystalline
House	15-30		16	90-150	72-200	~180	Oil
		152	97		245-480		Water or Carboxy-methylcellulose
					120		Starch paste
						300	Acetone
Guinea-pig				100	100-127		Oil
						400	Acetone
Rabbit					100		50% Paraffin
					91	4000	Crystalline
	4.2-4.5			75	40-75	75	Oil
					200		50% Paraffin
					300	Acetone	
					~180	Dimethylphthalate	
					50	Vanishing cream	

Reference

Ulman, E., Lindane: Monograph of an Insecticide (Germany: Verlag K. Schillinger, 1972), p. 37.

Toxicity : Acute Oral LD 50 Male Rats - 88 mg/kg
Female Rats - 91 mg/kg
Acute Dermal LD 50 Male Rats - 1000 mg/kg
Female Rats - 900 mg/kg

Formulations : Various Dusts, Wettable Powders, Emulsifiable Conc and Granules.

Packing : 110 lb. Metal Drums with Poly Inner Liners.

AMVAC CHEMICAL CORPORATION
4100 EAST WASHINGTON BLVD.
LOS ANGELES, CA 90023