



NUFARM AGRICULTURE INC.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUPPLIED BY:

Nufarm Agriculture Inc.
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Calgary, AB. T2H 1H9

MANUFACTURED BY:

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PRODUCT:**Desormone® Liquid Herbicide Emulsifiable Concentrate****PCP NUMBER:**

15027

DATE PREPARED:

December 5, 2011

PREPARER:

Nufarm Agriculture Inc.; Regulatory Affairs & Research Department

CHEMICAL FAMILY/USE:

Herbicide.

FORMULA:C₁₆H₂₂Cl₂O₃ and C₉H₈Cl₂O₃**CHEMICAL SYNONYMS:**

2,4-D 2EHE; 2,4-D IOE; 2,4-Dichlorophenoxyacetic acid, isooctyl (2-ethylhexyl) ester.
2,4-DP 2EHE; 2,4-DP IOE; (RS)-2-(2,4-Dichlorophenoxy) propanoic acid, isooctyl
(2-ethylhexyl) ester; dichlorprop, isooctyl (2-ethylhexyl) ester; dichlorprop 2EHE.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	Wt. %	CAS NO.
2,4-D 2EHE	40-46	1928-43-4
Dichlorprop 2EHE	42.5-48.5	79270-78-3
Complex hydrocarbon mixture	1-3	68921-07-3
Emulsifiers and other proprietary ingredients	8-11	NA

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: WARNING-POISON. Keep out of reach of children. Harmful if swallowed. Avoid contact with clothing, skin or eyes and do not inhale fumes or spray mist. May cause eye and skin irritation. May be harmful if absorbed through the skin or inhaled. Combustible.

EFFECTS OF ACUTE EXPOSURE:

INGESTION: Harmful if swallowed. May cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. Hydrocarbon component may cause dizziness, weakness, nausea, headache, unconsciousness, central nervous system effects, or in extreme cases, death.

SKIN CONTACT: Causes moderate skin irritation. Overexposure by skin absorption may cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms. May cause allergic reaction in sensitive individuals.

INHALATION: Contains materials that may be moderately toxic. Vapours could cause headache, dizziness, respiratory irritation and symptoms similar to those from ingestion. Hydrocarbon component may cause upper respiratory tract irritation, dizziness, weakness, nausea, headache, unconsciousness, central nervous system effects, or in extreme cases, death.

EYE CONTACT: Causes severe eye irritation.

MEDICAL CONDITIONS AGGRAVATED: Skin exposure may aggravate preexisting skin conditions. Inhalation of mist may aggravate preexisting respiratory conditions.

SUBCHRONIC (TARGET ORGAN) EFFECTS: (An adverse effect with symptoms that develop slowly over a long period of



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time): Repeated overexposure may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses of 2,4-D for prolonged periods.

CHRONIC EFFECTS/CARCINOGENICITY: The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current lifetime feeding studies in rodents did not show carcinogenic potential. The hydrocarbon component may contain polycyclic aromatic hydrocarbons that are listed by IARC and the U.S. National Toxicology Program as reasonably anticipated to be human carcinogens.

REPRODUCTIVE TOXICITY: No impairment of reproductive function attributable to 2,4-D or dichlorprop has been noted in laboratory animal studies.

DEVELOPMENTAL TOXICITY: Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring, but these findings were at doses toxic to mother animals. A rat study on dichlorprop resulted in fetal mortality, decreased fetal body weight, decreased body weight gain and developmental delays at the highest dose, which was also toxic to mother animals.

GENOTOXICITY: There have been some positive and some negative studies, but the weight of evidence is that 2,4-D is not mutagenic. Genotoxicity studies on dichlorprop have been inconclusive with some positive and some negative results.

PRINCIPLE ROUTES OF EXPOSURE: Eye contact. Skin absorption. Inhalation. Oral.

TOXICOLOGICALLY SYNERGISTIC MATERIALS: None known.

OTHER: None known.

4. FIRST AID MEASURES

If swallowed, call a poison control centre or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give **any** liquid to the person. Do not give anything by mouth to an unconscious person.

If on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.

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 centre 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 by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

Take container, label or product name and Pest Control Product Registration Number with you, when seeking medical attention.

NOTE TO PHYSICIAN: This product contains petroleum distillates. If large amounts have been ingested, empty the stomach by gastric intubation with the aid of a cuffed endotracheal tube to prevent aspiration and possible chemical pneumonia.

This product contains a phenoxy herbicidal chemical. No specific antidote. Treatment based on sound judgment of physician and individual reactions of patient. Overexposure to materials other than this product may have occurred.

5. FIRE FIGHTING MEASURES

FLASH POINT: > 94°C.

CONDITIONS OF FLAMMABILITY:..... Combustible mixture. When heated above the flash point, this material emits vapours which, when mixed with air, can burn or be explosive. Heavier than air vapours may travel to an ignition source.

FLAMMABLE LIMITS IN AIR - Upper (%):.....NA.

FLAMMABLE LIMITS IN AIR - Lower (%):.....NA.

AUTOIGNITION TEMPERATURE:NA.

SENSITIVITY TO MECHANICAL IMPACT (Y/N):NA. No sensitivity expected based on long handling history.

SENSITIVITY TO STATIC DISCHARGE:NA.

EXTINGUISHING MEDIA: Water fog, alcohol foam, carbon dioxide, dry chemical.



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SPECIAL FIREFIGHTING PROCEDURES: Firefighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. Minimize and contain water runoff.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Use safety equipment and procedures appropriate to the size of the spill. Keep potential ignition sources and unnecessary people away. Avoid runoff to natural waters and sewers. Contamination of water may kill fish. Do not allow to contact desirable vegetation. Surround and absorb spills with inert material such as perlite, clay granules, vermiculite, sand or dirt. Contain all affected material in a closed, labeled container for proper disposal. Isolate from other waste materials. Clean contaminated area such as hard surfaces with detergent and water, collecting cleaning solution for proper disposal. Large spills to soil or similar surfaces may necessitate removal of top soil.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: This product is not extremely combustible, but it is suggested to handle as a combustible liquid. Keep away from potential ignition sources. Keep away from food and feed products. Avoid storage in close proximity to insecticides, fungicides, fertilizers, plants and seeds. Avoid contact with eyes, skin and clothing. Keep container tightly closed when not in use. Shake well before using.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

Hazardous Ingredients	TWA*	ACGIH TLV®	STEL	Units
2,4-D EHE	10**	10**	N/E	mg/M ³
dichlorprop EHE	N/E	N/E	N/E	NAp

*8-hour TWA unless otherwise noted

**based on adopted limit for 2,4-D

ENGINEERING CONTROLS: Use in a well ventilated area. General ventilation with a good source of make-up air recommended as minimum for indoor situations. Ventilation should be adequate to maintain air concentrations below exposure limits and flammable limits.

RESPIRATORY PROTECTION EQUIPMENT: Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists or vapours is likely.

PROTECTIVE GLOVES: All types of chemical-resistant gloves for handling chemicals are acceptable, provided that they can be cleaned. Rinse gloves before removal. Gloves are not required for applicator in enclosed tractor or airplane cockpit.

EYE AND FACE PROTECTION: Goggles or face shield when handling concentrate.

OTHER PROTECTIVE EQUIPMENT: Long sleeved shirt, long pants, socks and shoes are minimum work clothing. Coveralls or a chemical-resistant apron should also be worn when open pouring from containers greater than 5L. Use other equipment appropriate to specific situation.

VENTILATION: Use only in well ventilated area.

9. PHYSICAL AND CHEMICAL PROPERTIES

NOTE: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

BOILING POINT:NA.

VAPOR PRESSURE:3.6 x 10⁻⁶ mm Hg @ 25°C (data on 2,4-D 2EHE)



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VAPOR DENSITY (air = 1):.....NA.
FREEZING POINT:.....NA.
MELTING POINT:NA.
PHYSICAL STATE:.....Liquid.
ODOUR:.....Characteristic phenolic and hydrocarbon.
COLOUR:.....Amber.
ODOR THRESHOLD (ppm):.....NA.
EVAPORATION RATE (butyl acetate = 1):.....NA.
SPECIFIC GRAVITY (water = 1):.....1.126
DENSITY @ 25°C:.....1.126
pH:.....NA
SOLUBILITY IN WATER (20°C):.....Product is emulsifiable in water.
COEFFICIENT OF WATER/OIL DISTRIBUTION:.....NA. Product is oil soluble.

10. STABILITY AND REACTIVITY

STABILITY: Stable.

HAZARDOUS POLYMERIZATION: Will not occur.

HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS: Hydrogen chloride, other chlorine compounds, carbon dioxide, carbon monoxide, oxides of nitrogen, oxides of sulfur and other potentially toxic combustion products may be present.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acidic, basic or oxidizing agents.

CONDITIONS TO AVOID: None known.

11. TOXICOLOGICAL INFORMATION

Data are from laboratory studies conducted on a similar, but not identical, formulation:

ACUTE ORAL LD₅₀ (mg/kg):.....> 1200 (Rat)

ACUTE DERMAL LD₅₀ (mg/kg):.....> 2000 (Rabbit)

ACUTE INHALATION LC₅₀ (mg/l):.....> 8.4 mg/l (Rat)

OTHER: Severely irritating to the eye and moderately irritating to skin (Rabbit).

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Data on 2,4-D 2EHE or EC formulation:

96-HOUR LC₅₀ (mg/L): 7.2 (Rainbow Trout)

96-HOUR LC₅₀ (mg/L): > 5 (Bluegill)

48-HOUR EC₅₀ (mg/L): > 5 (Daphnia)

DIETARY LC₅₀ (ppm): > 5620 (Bobwhite Quail)

DIETARY LC₅₀ (ppm): > 5620 (Mallard Duck)

Data on dichlorprop 2EHE:

96-HOUR LC₅₀ (mg/L): 7.9 (Rainbow Trout)

96-HOUR LC₅₀ (mg/L): 7.7 (Bluegill)

CHEMICAL FATE INFORMATION: In representative laboratory and field studies, 2,4-D 2EHE rapidly hydrolyzed to parent acid. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks. The average field half-life reported for dichlorprop is 10 days.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: For information on disposal of unused, unwanted product, contact the manufacturer or the provincial



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regulatory agency. Disposal should be made in accordance with federal, provincial and local regulations. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Do not reuse container for any unintended purpose. If applicable, return container in accordance with return program. If a recyclable container, dispose of at a container collection site. Contact local distributor, dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site, triple or pressure rinse the empty container adding rinsings to spray tank, and make container unsuitable for further use. If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

14. TRANSPORT INFORMATION

CANADIAN TDG DESCRIPTION (Road & Rail): Not regulated for transport by road/rail in Canada. Contact manufacturer for updates to transport information.

15. REGULATORY INFORMATION

WHMIS HAZARD CLASS: D2B Toxic Material.

WHMIS TRADE SECRET: Exempt. (This product is regulated under the Pest Control Products Act - WHMIS exempt.)

CANADIAN INVENTORY: This product is currently exempt from CEPA.

HAZARD RATING SYSTEMS:

HMIS: Not Available

National Fire Protection Association (NFPA®) Hazard Ratings:

Ratings for This Product		Key to Ratings	
2	Health Hazard	0	Minimal
2	Flammability	1	Slight
0	Instability	2	Moderate
		3	Serious
		4	Severe

16. OTHER INFORMATION

REVISIONS:

The following has been revised since the last issue of this MSDS: Section 1, 4 revisions.

ADDITIONAL INFORMATION:

Abbreviations used throughout the MSDS are:

- NA = Not available
- NAp = Not applicable
- N/E = None Established.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Company references utilized in preparation of the MSDS.

END OF MSDS