

Product Name: Lontrel* 360 Herbicide

Issue Date: 2010.09.14

Dow AgroSciences Canada Inc. encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

Lontrel* 360 Herbicide

COMPANY IDENTIFICATION

Dow AgroSciences Canada Inc.
A Subsidiary of The Dow Chemical Company
Suite 2100, 450 1st Street SW,
Calgary, AB T2P 5H1
Canada

For MSDS updates and Product Information: 800-667-3852

Prepared By: Prepared for use in Canada by EH&S, Hazard Communications.
Revision 2010.09.14

Customer Information Number: 800-667-3852

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 613-996-6666
Local Emergency Contact: 613-996-6666

2. Hazards Identification

Emergency Overview

Color: Red to brown

Physical State: Liquid.

Odor: Sweet

Hazards of product:

CAUTION! Combustible liquid and vapor. May cause eye irritation. May cause skin irritation. May cause respiratory tract irritation. Vapor explosion hazard. Vapors may travel a long distance; ignition and/or flash back may occur. Isolate area. Keep upwind of spill. Stay out of low areas. Eliminate ignition sources. Toxic fumes may be released in fire situations.

Potential Health Effects

Eye Contact: May cause mild eye discomfort. May cause eye irritation. May cause slight temporary corneal injury. Mist may cause eye irritation. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin Contact: Prolonged contact may cause skin irritation with local redness. Observations in animals include: Lethargy.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: Mist may cause irritation of upper respiratory tract (nose and throat) and lungs. Excessive exposure (400 ppm) to isopropanol may cause eye, nose and throat irritation. Incoordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest and death may follow a longer duration or higher levels. Observations in animals include middle ear lining damage upon exposure to vapors of isopropanol. However, the relevance of this to humans is unknown

Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. Observations in animals include: Lethargy.

Effects of Repeated Exposure: For similar active ingredient(s). Clopyralid. In animals, effects have been reported on the following organs: Liver. Kidney. Observations in animals include: Lethargy. For the major component(s): Isopropyl alcohol. In animals, effects have been reported on the following organs: Liver. Observations in animals include: Lethargy. Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans.

Birth Defects/Developmental Effects: For similar active ingredient(s). Clopyralid caused birth defects in test animals, but only at greatly exaggerated doses that were severely toxic to the mothers. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure. For the major component(s): Isopropanol has been toxic to the fetus in laboratory animals at doses toxic to the mother.

3. Composition/information on ingredients

Component	CAS #	Amount W/W
Clopyralid monoethanolamine salt	57754-85-5	40.9 %
Isopropanol	67-63-0	5.0 %
Ethylene oxide, propylene oxide and di-sec-butylphenol polymer	69029-39-6	1.0 %
Balance		53.1 %

Amounts are presented as percentages by weight.

4. First-aid measures

Eye Contact: Hold eyes 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 eyes. Call a poison control center or doctor for treatment advice.

Skin Contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

Notes to Physician: Maintain adequate ventilation and oxygenation of the patient. Hemodialysis may be of benefit if substantial amounts have been ingested and the patient is showing signs of intoxication. Consider hemodialysis for patients with persistent hypotension or coma unresponsive to standard therapy (isopropanol levels >400 - 500 mg/dl). (Goldfrank 1998, King et al, 1970). No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Eliminate ignition sources. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. May produce flash fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

See Section 9 for related Physical Properties

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Refer to Section 7, Handling, for additional precautionary measures. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Vapor explosion hazard. Keep out of sewers. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling. Keep container closed. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Keep away from heat, sparks and flame. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically ground and bond all equipment.

Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame. Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Isopropanol	CAD BC OEL	TWA	200 ppm
	CAD BC OEL	STEL	400 ppm
	CAD ON OEL	TWAEV	200 ppm
	CAD ON OEL	STEV	400 ppm
	ACGIH	TWA	200 ppm
	ACGIH	STEL	400 ppm
	OEL (QUE)	TWA	983 mg/m ³ 400 ppm
	OEL (QUE)	STEL	1,230 mg/m ³ 500 ppm
	OEL (QUE)	TWA	983 mg/m ³ 400 ppm
	OEL (QUE)	STEL	1,230 mg/m ³ 500 ppm
	CAD AB OEL	TWA	492 mg/m ³ 200 ppm
CAD AB OEL	STEL	984 mg/m ³ 400 ppm	
Ethylene oxide, propylene oxide and di-sec-butylphenol polymer	Dow IHG	TWA	2 mg/m ³

Consult local authorities for recommended exposure limits.

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or

"vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Red to brown
Odor	Sweet
Flash Point - Closed Cup	47.2 °C <i>Closed Cup</i>
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	23.5 mmHg @ 20 °C
Boiling Point (760 mmHg)	100 °C <i>Literature</i> .
Vapor Density (air = 1)	1.06 @ 20 °C
Specific Gravity (H2O = 1)	1.161
Liquid Density	1.161 g/cm ³ @ 20 °C <i>Calculated</i>
Freezing Point	No test data available
Melting Point	Not applicable
Solubility in water (by weight)	Miscible with water
pH	7.5 - 8.0
Decomposition Temperature	No test data available
Evaporation Rate (Butyl Acetate = 1)	No test data available
Dynamic Viscosity	7 cPs
Kinematic Viscosity	No test data available

10. Stability and Reactivity

Stability/Instability

Thermally stable at recommended temperatures and pressures.

Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Avoid direct sunlight.

Incompatible Materials: Avoid contact with: Acids. Halogenated organics. Oxidizers. Avoid contact with metals such as: Zinc. Brass. Aluminum. Copper.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Chlorinated pyridine. Carbon monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides.

11. Toxicological Information**Acute Toxicity****Ingestion**

|| LD50, Rat, male and female > 5,000 mg/kg

Dermal

|| LD50, Rabbit > 5,000 mg/kg

Inhalation

|| Maximum attainable concentration. LC50, 4 h, Aerosol, Rat, male and female > 3.0 mg/l

Eye damage/eye irritation

|| May cause mild eye discomfort. May cause eye irritation. May cause slight temporary corneal injury. Mist may cause eye irritation. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin corrosion/irritation

|| Prolonged contact may cause skin irritation with local redness. Observations in animals include: Lethargy.

Sensitization**Skin**

|| Did not cause allergic skin reactions when tested in guinea pigs.

Repeated Dose Toxicity

|| For similar active ingredient(s). Clopyralid. In animals, effects have been reported on the following organs: Liver. Kidney. Observations in animals include: Lethargy. For the major component(s): Isopropyl alcohol. In animals, effects have been reported on the following organs: Liver. Observations in animals include: Lethargy. Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans.

Chronic Toxicity and Carcinogenicity

|| For the component(s) tested: Did not cause cancer in laboratory animals.

Developmental Toxicity

|| For similar active ingredient(s). Clopyralid caused birth defects in test animals, but only at greatly exaggerated doses that were severely toxic to the mothers. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure. For the major component(s): Isopropanol has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive Toxicity

|| For the component(s) tested: In animal studies, did not interfere with reproduction.

Genetic Toxicology

|| For the component(s) tested: In vitro genetic toxicity studies were negative. For the component(s) tested: Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Data for Component: **Clopyralid monoethanolamine salt**

Movement & Partitioning

For similar active ingredient(s). Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability

For similar active ingredient(s). Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Data for Component: **Isopropanol**

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50).

Henry's Law Constant (H): 3.38E-06 - 8.07E-06 atm*m3/mole; 25 °C Estimated.

Partition coefficient, n-octanol/water (log Pow): 0.05 Measured

Partition coefficient, soil organic carbon/water (Koc): 1.1 Estimated.

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
7.26E-12 cm ³ /s	1.472 d	Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
95 %	21 d	OECD 301E Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
20 - 72 %		78 - 86 %	

Chemical Oxygen Demand: 2.09 mg/mg

Theoretical Oxygen Demand: 2.40 mg/mg

Data for Component: **Ethylene oxide, propylene oxide and di-sec-butylphenol polymer**

Movement & Partitioning

No bioconcentration is expected because of the relatively high water solubility. May foam in water.

Persistence and Degradability

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Chemical Oxygen Demand: 1.78 mg/mg

Theoretical Oxygen Demand: 2.35 mg/mg

ECOTOXICITY

Data for Component: **Clopyralid monoethanolamine salt**

Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L). Material is practically non-toxic to aquatic invertebrates on an acute basis (LC50/EC50 > 100 mg/L). Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested). Material is slightly toxic to birds on an acute basis (LD50 between 501 and 2000 mg/kg). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (*Pimephales promelas*), static, 96 h: > 2,900 mg/l

LC50, bluegill (*Lepomis macrochirus*), static, 96 h: 125 - 4,686 mg/l

LC50, rainbow trout (*Oncorhynchus mykiss*), static, 96 h: 1,968 - 2,900 mg/l

Aquatic Invertebrate Acute Toxicity

|| LC50, water flea Daphnia magna, static, 48 h, survival: 1,100 mg/l

|| EC50, water flea Daphnia magna, static, 48 h, immobilization: 225 - 1,133 mg/l

Aquatic Plant Toxicity

|| EbC50, green alga Pseudokirchneriella subcapitata (formerly known as Selenastrum capricornutum), static, 96 h: 6.9 mg/l

Toxicity to Above Ground Organisms

|| oral LD50, mallard (Anas platyrhynchos): 1465 - 2000 mg/kg bodyweight.

|| dietary LC50, bobwhite (Colinus virginianus): > 5620 mg/kg diet.

|| contact LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

|| oral LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

Data for Component: Isopropanol

|| Material is practically non-toxic to aquatic organisms on an acute basis

|| (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

|| LC50, fathead minnow (Pimephales promelas), flow-through test, 96 h: 9,640 mg/l

Aquatic Invertebrate Acute Toxicity

|| LC50, water flea Daphnia magna, static, 24 h, immobilization: 24 mg/l

Aquatic Plant Toxicity

|| EC50, alga Scenedesmus sp., Growth rate inhibition, 72 h: > 1,000 mg/l

Toxicity to Micro-organisms

|| EC50; activated sludge: > 1,000 mg/l

Data for Component: Ethylene oxide, propylene oxide and di-sec-butylphenol polymer

|| Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

|| LC50, fathead minnow (Pimephales promelas), 96 h: 13.3 mg/l

|| LC50, bluegill (Lepomis macrochirus), 96 h: 4.8 mg/l

|| LC50, rainbow trout (Oncorhynchus mykiss), 96 h: 3.7 mg/l

Aquatic Invertebrate Acute Toxicity

|| LC50, water flea Daphnia magna, 48 h: 10.5 mg/l

Toxicity to Above Ground Organisms

|| dietary LC50, Honey bee (Apis mellifera): > 105 micrograms/bee

|| contact LD50, Honey bee (Apis mellifera): > 100 micrograms/bee

13. Disposal Considerations

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. Transport Information

TDG Small container

NOT REGULATED

TDG Large container**Proper Shipping Name:** FLAMMABLE LIQUID, N.O.S.**Technical Name:** CONTAINS ISOPROPANOL**Hazard Class:** 3 **ID Number:** UN1993 **Packing Group:** PG III**IMDG****Proper Shipping Name:** FLAMMABLE LIQUID, N.O.S.**Technical Name:** CONTAINS ISOPROPANOL**Hazard Class:** 3 **ID Number:** UN1993 **Packing Group:** PG III**EMS Number:** F-E,S-E**ICAO/IATA****Proper Shipping Name:** FLAMMABLE LIQUID, N.O.S.**Technical Name:** CONTAINS ISOPROPANOL**Hazard Class:** 3 **ID Number:** UN1993 **Packing Group:** PG III**Cargo Packing Instruction:** 310**Passenger Packing Instruction:** 309**15. Regulatory Information****CEPA - Domestic Substances List (DSL)**

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Hazardous Products Act Information: CPR Compliance

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

Hazardous Products Act Information: WHMIS Classification

This product is exempt under WHMIS.

Pest Control Products Act Registration number: 23545**National Fire Code of Canada**

Class II

16. Other Information**Hazard Rating System**

NFPA	Health	Fire	Reactivity
	2	2	1

Recommended Uses and Restrictions

Product use: End use herbicide product

Revision

Identification Number: 50397 / 1023 / Issue Date 2010.09.14 / Version: 7.0

DAS Code: XRM-3972

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
VOL/VOL	Volume/Volume

Dow AgroSciences Canada Inc. urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.