

<p style="text-align: center;">MONSANTO COMPANY Safety Data Sheet Commercial Product</p>

1. PRODUCT AND COMPANY IDENTIFICATION

Product name

Warrant® Herbicide

EPA Reg. No.

524-591

Product use

Herbicide

Chemical name

Not applicable.

Synonyms

None.

Company

MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167

Telephone: 800-332-3111 **Fax:** 314-694-5557

E-mail: safety.datasheet@monsanto.com

Emergency numbers

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).

FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

2. HAZARDS IDENTIFICATION

Emergency overview

Appearance and odour (colour/form/odour): Whitish / Liquid, (emulsion) / Slight

CAUTION!

HARMFUL IF INHALED

HARMFUL IF ABSORBED THROUGH SKIN

MAY CAUSE ALLERGIC SKIN REACTION

Potential health effects

Likely routes of exposure

Skin contact, eye contact, inhalation

Eye contact, short term

Not expected to produce significant adverse effects when recommended use instructions are followed.

Skin contact, short term

May be harmful if absorbed through the skin.

May cause allergic skin reaction.

Inhalation, short term

Harmful if inhaled.

Refer to section 11 for toxicological and section 12 for environmental information.

OSHA Status

This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient

2-chloro-N-(ethoxymethyl)-N-(2-ethyl-6-methylphenyl) acetamide; {Acetochlor}

Composition

COMPONENT	CAS No.	% by weight (approximate)
Acetochlor	34256-82-1	33
Glycerin	56-81-5	<=10
Petroleum Distillates Hydrotreated Light	64742-47-8	<=2
Water and minor formulating ingredients		<=55

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

4. FIRST AID MEASURES

Use personal protection recommended in section 8.

Eye contact

If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. 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. Sensitized persons should avoid further contact and reuse of contaminated clothing.

Inhalation

If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

Ingestion

Call 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 center or doctor. Do not give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

Flash point

Does not flash.

Extinguishing media

Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

Unusual fire and explosion hazards

Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

Hazardous products of combustion

Carbon monoxide (CO), nitrogen oxides (NOx), hydrogen chloride (HCl)

Fire fighting equipment

Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions

Minimise spread.
Keep out of drains, sewers, ditches and water ways.

Methods for cleaning up

Contain spillage with sand bags or other means.
Absorb in earth, sand or absorbent material.
Dig up heavily contaminated soil.
Collect in containers for disposal.
Place leaking containers in oversize leakproof drums for transport.
Wash spill area with detergent and water.
Minimise use of water to prevent environmental contamination.
Refer to section 7 for types of containers.

Refer to section 13 for disposal of spilled material.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

Handling

Avoid prolonged or repeated contact with skin.
Avoid breathing vapour or mist.
Wash hands thoroughly after handling or contact.
When using do not eat, drink or smoke.
Wash outside of gloves before removing.
Wash contaminated clothing before re-use.
Thoroughly clean equipment after use.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Refer to section 13 of the safety data sheet for disposal of rinse water.
Emptied containers retain vapour and product residue.
FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

Storage

Minimum storage temperature: 0 °C
Maximum storage temperature: 40 °C
Compatible materials for storage: stainless steel, Heresite[™]-lined steel, high-density polyethylene (HDPE), polypropylene (PP), Teflon[™], polyvinylidene difluoride (PVDF)
Incompatible materials for storage: unlined mild steel, aluminium, polyvinyl chloride (PVC), Contact with mild steel may cause color change and reduce product's ability to emulsify with water.
Keep out of reach of children.
Keep away from food, drink and animal feed.
Keep only in the original container.
Use appropriate containment to avoid environmental contamination.
Partial crystallization may occur on prolonged storage below the minimum storage temperature.
Protect from freezing.
Minimum shelf life: 2 years.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

Components	Exposure Guidelines
Acetochlor	No specific occupational exposure limit has been established.

Glycerin	TLV (ACGIH): 10 ppm: The exposure limit is for mist only. PEL (OSHA): 15 mg/m ³ : total dust, The exposure limit is for mist only. PEL (OSHA): 5 mg/m ³ : respirable fraction, The exposure limit is for mist only.
Petroleum Distillates Hydrotreated Light	TLV (ACGIH): No specific occupational exposure limit has been established. PEL (OSHA): No specific occupational exposure limit has been established. Manufacturer suggested exposure limit: 1,200 mg/m ³ : 152 ppm: Measured as total hydrocarbon vapor
Water and minor formulating ingredients	No specific occupational exposure limit has been established.

Engineering controls

Provide local exhaust ventilation.

Eye protection

No special requirement when used as recommended.

Skin protection

Wear chemical resistant gloves.

Applicators and other handlers must wear:

Wear long sleeved shirt, long pants and shoes with socks.

Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment.

If no such instructions for washables, use detergent and hot water.

Keep and wash personal protective equipment separately from other laundry.

Respiratory protection

If airborne exposure is excessive:

Wear respirator.

Respiratory protection programs must comply with all local/regional/national regulations.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Whitish
Odour:	Slight
Form:	Liquid, (emulsion)
Physical form changes (melting, boiling, etc.):	
Melting point:	Not applicable.
Boiling point:	No data.
Flash point:	Does not flash.
Explosive properties:	No explosive properties
Auto ignition temperature:	No data.
Specific gravity:	1.098
Vapour pressure:	No significant volatility.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	0.13 Pa.s @ 10 °C; Method: Haake

Kinematic viscosity:	Not applicable.
Density:	1.0919 g/cm ³
Solubility:	Water: Soluble
pH:	9.3
Partition coefficient:	log Pow: 4.14 @ 20 °C (acetochlor)

10. STABILITY AND REACTIVITY

Stability

Stable under normal conditions of handling and storage.

Oxidizing properties

No data.

Materials to avoid/Reactivity

Corrosive to mild steel.
Corrosive to aluminium.

Hazardous decomposition

Thermal decomposition: When heated may give off irritant/corrosive fumes.
Hazardous products of combustion: see section 5.

Self-accelerating decomposition temperature (SADT)

No data.

Hazardous polymerization

Does not occur.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

|| Data obtained on product and components are summarized below.

Acute oral toxicity

|| **Rat, LD50:** > 5,000 mg/kg body weight

|| Practically non-toxic.
|| FIFRA category IV.

Acute dermal toxicity

|| **Rat, LD50:** > 5,000 mg/kg body weight

|| Practically non-toxic.
|| FIFRA category IV.

Acute inhalation toxicity

|| **Rat, LC50, 4 hours, aerosol:** > 5.11

|| Practically non-toxic.
|| FIFRA category IV.

Skin irritation

|| **Rabbit, 3 animals:**

|| Days to heal: 0
|| Primary Irritation Index (PII): 0/8.0
|| No skin irritation.
|| FIFRA category IV.

Eye irritation

|| **Rabbit, 3 animals:**

|| Days to heal: 2
|| FIFRA category IV.

Skin sensitization

|| Guinea pig, 3-induction Buehler test:

|| Positive incidence: 25 %
|| Positive.

Mutagenicity

|| In vitro and in vivo mutagenicity test(s):

|| Not mutagenic.

Acetochlor

Mutagenicity

In vivo mutagenicity test(s):

Not mutagenic.

In vitro mutagenicity test(s):

Mutagenic/Genotoxic in some assays.

Repeated dose toxicity

Rat, oral, 90 days:

NOAEL toxicity: 18 mg/kg body weight/day
Target organs/systems: none
Other effects: decrease of body weight gain, decrease of food consumption

Rabbit, dermal, 21 days:

NOAEL toxicity: 400 mg/kg body weight/day
Target organs/systems: none
Other effects: increased mortality, decrease of body weight gain

Chronic effects/carcinogenicity

Rat, oral, 2 years:

NOAEL toxicity: 10 mg/kg body weight/day
Target organs/systems: liver, kidneys
Other effects: decrease of body weight gain, organ weight change, blood biochemistry effects
NOEL tumour: 10 mg/kg body weight/day
Tumours: nose, thyroid; Tumours not relevant for man based on mechanistic data.
Tumours: liver; Tumours only above MTD.

Mouse, oral, 18 months:

NOAEL toxicity: 1.1 mg/kg body weight/day
Target organs/systems: kidneys, liver
Other effects: histopathologic effects, haematological effects, decrease of body weight gain
NOEL tumour: 1.1 mg/kg body weight/day
Tumours: lung, histiocytic sarcoma; Tumours probably not related to treatment.
Tumours: liver; Tumours only above MTD.

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 21 mg/kg body weight/day
NOAEL reproduction: 66 mg/kg body weight/day
Target organs/systems in parents: liver, kidneys, thyroid
Other effects in parents: decrease of body weight gain, organ weight change, histopathologic effects
Target organs/systems in pups: none
Other effects in pups: decrease of body weight gain, change in sexual maturation landmarks
Effects on offspring only observed with maternal toxicity.

Developmental toxicity/teratogenicity

Rat, oral, 6 - 18 days of gestation:

NOAEL toxicity: 200 mg/kg body weight
NOAEL development: 400 mg/kg body weight
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of body weight gain
No adverse treatment related effects in offspring.

Rabbit, oral, 7 - 19 days of gestation:

NOAEL toxicity: 100 mg/kg body weight/day

NOAEL development: 300 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of body weight gain
No adverse treatment related effects in offspring.

Acute neurotoxicity

Rat, oral, single dose, gavage:

NOAEL: 150 mg/kg body weight
Other effects: decreased activity

Repeated dose neurotoxicity

Rat, oral, 13 weeks, dietary:

NOAEL: 52 mg/kg body weight/day
Target organs/systems: none
Other effects: decrease of body weight gain, decrease of food consumption
Not neurotoxic.

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, short term, occupational:

Skin effects: sensitization in susceptible individuals

Glycerin

Mutagenicity

In vitro and in vivo mutagenicity test(s):

Not mutagenic on the basis of weight-of-evidence analysis.

Repeated dose toxicity

Rat, inhalation, 13 weeks:

NOAEL toxicity: 165 mg/m³
Target organs/systems: none
Other effects: local irritation

Chronic effects/carcinogenicity

Rat, oral, 2 years:

NOAEL toxicity: 10,000 mg/kg body weight/day
Target organs/systems: none
Other effects: none
No evidence of carcinogenicity.

Toxicity to reproduction/fertility

Rat, oral, 2 generations:

NOAEL toxicity: 2,000 mg/kg body weight/day
NOAEL reproduction: 2,000 mg/kg body weight/day
Target organs/systems in parents: none
Target organs/systems in pups: none

Developmental toxicity/teratogenicity

Rabbit, oral:

NOAEL toxicity: 1,180 mg/kg body weight/day
NOAEL development: 1,180 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: none
Developmental effects: none
Other effects in foetus: none

Hydrocarbon solvent (aliphatic)

EXPERIENCE WITH HUMAN EXPOSURE

Skin contact, repeated, non occupational, occupational:

Skin effects: irritation

Eye contact, , non occupational, occupational:

Eye effects: irritation

Inhalation, excessive, non occupational, occupational:

Gastro-intestinal effects: nausea/vomiting

General/systemic effects: fatigue

Neurological effects: headache, confusion, incoordination, drowsiness, vertigo/dizziness, disturbance of level of consciousness, convulsions

Ingestion, short term, intentional misuse, accidental misuse:

Respiratory effects: pneumonitis (aspiration)

Gastro-intestinal effects: abdominal pain, diarrhoea

Note: May cause effects similar to those described under Inhalation.

12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on active ingredient(s) are summarized below.

Acetochlor

Aquatic toxicity, fish

Bluegill sunfish (*Lepomis macrochirus*):

Acute toxicity, 96 hours, static, LC50: 1.3 mg/L

Moderately toxic.

Rainbow trout (*Oncorhynchus mykiss*):

Acute toxicity, 96 hours, static, LC50: 0.36 - 1.2 mg/L

Highly toxic.

Aquatic toxicity, invertebrates

Water flea (*Daphnia magna*):

Acute toxicity, 48 hours, static, EC50: 8.6 - 16 mg/L

Moderately toxic.

Aquatic toxicity, algae/aquatic plants

Green algae (*Selenastrum capricornutum*):

Acute toxicity, 96 hours, static, EC50: 0.27 - 1.49 µg/L

Very highly toxic.

Avian toxicity

Bobwhite quail (*Colinus virginianus*):

Acute oral toxicity, single dose, LD50: 928 - 1,560 mg/kg body weight

Mallard duck (*Anas platyrhynchos*):

Acute oral toxicity, single dose, LD50: > 2,000 mg/kg body weight

Practically non-toxic.

Mallard duck (*Anas platyrhynchos*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

Practically non-toxic.

Bobwhite quail (*Colinus virginianus*):

Dietary toxicity, 5 days, LC50: > 5,620 mg/kg diet

Practically non-toxic.

Arthropod toxicity

Honey bee (*Apis mellifera*):

Oral, 48 hours, LD50: > 100 µg/bee

Practically non-toxic.

Honey bee (*Apis mellifera*):

Contact, 48 hours, LD50: > 200 µg/bee

Practically non-toxic.

Soil organism toxicity, invertebrates

Earthworm (*Eisenia foetida*):

Acute toxicity, 14 days, LC50: 211 - 397 mg/kg dry soil

Slightly toxic.

Bioaccumulation

Bluegill sunfish (*Lepomis macrochirus*):

Whole fish: BCF: 20

Rapid depuration after end of exposure.

Dissipation

Water, aerobic, 20 °C:

Half life: 25.9 - 55.1 days

Soil, aerobic, 20 °C:

Half life: 3.4 - 29 days

Koc: 74 - 422

13. DISPOSAL CONSIDERATIONS

Product

Recycle if appropriate facilities/equipment available.

Keep out of drains, sewers, ditches and water ways.

Burn in special, controlled high temperature incinerator.

Follow all local/regional/national/international regulations.

Container

See the individual container label for disposal information.

Emptied containers retain vapour and product residue.

Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Empty packaging completely.

Triple or pressure rinse empty containers.

Do NOT contaminate water when disposing of rinse waters.

Ensure packaging cannot be reused.

Do NOT re-use containers.

Store for collection by approved waste disposal service.

Recycle if appropriate facilities/equipment available.

Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

US DOT basic description and technical name

Not regulated for domestic ground transportation.

Special provisions

This material meets the definition of a marine pollutant.

IMDG Code

Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

IATA/ICAO

Use description for ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

15. REGULATORY INFORMATION

TSCA Inventory

Exempt

OSHA Hazardous Components

Acetochlor
Glycerin
Petroleum Distillates Hydrotreated Light

SARA Title III Rules

Section 311/312 Hazard Categories
Immediate
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Not applicable.

CERCLA Reportable quantity Not applicable.

16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.
Follow all local/regional/national/international regulations.
Please consult supplier if further information is needed.
In this document the British spelling was applied.
|| Significant changes versus previous edition.

	Health	Flammability	Instability	Additional Markings
NFPA	2	1	1	

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

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