MONSANTO COMPANY

Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
Degree® Herbicide

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: TS-SAFETYDATASHEET@DOMINO.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 / Slight

CAUTION!
HARMFUL IF INHALED
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 cause allergic skin reaction.
Not expected to produce significant adverse effects when recommended use instructions are followed.
Inhalation, short term
May be 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	42
Other ingredients		58

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
Immediately flush with plenty of water.
If easy to do, remove contact lenses.

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.

Ingestion
Immediately offer water to drink.
Never give anything by mouth to an unconscious person.
Do NOT induce vomiting unless directed by medical personnel.

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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protection recommended in section 8.

Environmental precautions
Minimise spread.
Contain spillage with sand bags or other means.
Keep out of drains, sewers, ditches and water ways.
Do NOT contaminate water when disposing of rinse waters.

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 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.
Wash hands thoroughly after handling or contact.
When using do not eat, drink or smoke.
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: -15 °C
Maximum storage temperature: 40 °C
Compatible materials for storage: stainless steel, Heresite[TM]-lined steel, high-density polyethylene (HDPE), polypropylene (PP), Teflon[TM], 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.
If frozen, place in warm room and shake frequently to put back into solution.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

Components	Exposure Guidelines
Acetochlor	No specific occupational exposure limit has been established.
Other 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
If repeated or prolonged contact:
Wear chemical resistant gloves.

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
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:	1.1100
Vapour pressure:	No significant volatility.
Vapour density:	Not applicable.
Evaporation rate:	No data.
Dynamic viscosity:	No data.
Kinematic viscosity:	Not applicable.
Density:	1.1100 g/cm3
Solubility:	Water: Emulsifies.
pH:	6.0 - 9.0
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.
No mortality.

Acute dermal toxicity
Rat, LD50: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.

Acute inhalation toxicity
Rat, LC50, 4 hours, aerosol:
Slightly toxic.
FIFRA category III.
Maximum attainable concentration. No mortality.

Skin irritation
Rabbit, 6 animals, OECD 404 test:
Days to heal: 3
Primary Irritation Index (PII): 0.6/8.0
FIFRA category IV.
Slight irritation.

Eye irritation
Rabbit, 6 animals, OECD 405 test:
Days to heal: 1
FIFRA category IV.
Essentially non irritating.

Skin sensitization
Guinea pig, 3-induction Buehler test:
Positive incidence: 40 %
Positive.

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:
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

Furilazole (Safener)

Mutagenicity

In vitro and in vivo mutagenicity test(s):
Not mutagenic on the basis of weight-of-evidence analysis.

Repeated dose toxicity

Rat, oral, 3 months:
NOAEL toxicity: 7 mg/kg body weight/day
Target organs/systems: liver
Other effects: decrease of food consumption, decrease of body weight gain, organ weight change, haematological effects, histopathologic effects

Rat, dermal, 21 days:
NOEL toxicity: 250 mg/kg body weight/day
Target organs/systems: none
Other effects: blood biochemistry effects

Chronic effects/carcinogenicity

Rat, oral, 2 years:
NOAEL toxicity: 0.26 mg/kg body weight/day
Target organs/systems: liver, kidneys
Other effects: decrease of body weight gain, organ weight change, histopathologic effects, blood biochemistry effects
NOEL tumour: 6.03 mg/kg body weight/day
Tumours: liver, (adenoma), (carcinoma)

Mouse, oral, 18 months:
NOAEL toxicity: 5.9 mg/kg body weight/day
Target organs/systems: liver, lung
Other effects: increased mortality, blood biochemistry effects, organ weight change, histopathologic effects
NOEL tumour: 5.9 mg/kg body weight/day
Tumours: liver, (adenoma), (carcinoma)
Tumours: lung, (adenoma), (carcinoma)

Toxicity to reproduction/fertility

Rat, oral, 2 generations:
NOAEL toxicity: 10 mg/kg body weight/day
NOAEL reproduction: 99 mg/kg body weight/day
Target organs/systems in parents: kidneys, liver
Other effects in parents: decrease of body weight gain, histopathologic effects
Target organs/systems in pups: none
Other effects in pups: none

Developmental toxicity/teratogenicity

Rat, oral, 6 - 15 days of gestation:
NOAEL toxicity: 10 mg/kg body weight
NOAEL development: 10 mg/kg body weight
Target organs/systems in mother animal: liver
Other effects in mother animal: organ weight change
Developmental effects: post-implantation loss
Effects on offspring only observed with maternal toxicity.

Rabbit, oral, 7 - 19 days of gestation:
NOAEL toxicity: 10 mg/kg body weight/day
NOAEL development: >= 50 mg/kg body weight/day
Target organs/systems in mother animal: none
Other effects in mother animal: weight loss, decrease of body weight gain, decrease of food consumption
Developmental effects: none
Other effects in foetus: none

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: > 31 - 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: 12 days
Soil, aerobic, 20 °C:
Half life: 12.9 days
Koc: 204

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 labelled 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.

Not hazardous under the applicable DOT, ICAO/IATA, IMO, TDG and Mexican regulations.

15. REGULATORY INFORMATION

TSCA Inventory
Exempt

OSHA Hazardous Components
Acetochlor
Furilazole (Safener)
Surfactant(s)

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

	Health	Flammability	Instability	Additional Markings
NFPA	2	1	1	

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

Endnotes:
{a} EU label (manufacturer self-classification)

{b} EU label (Annex I)
{c} National classification

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)