SAFETY DATA SHEET

TRINEXAPAC-ETHYL 120 g/l ME

Revision: Sections containing a revision or new information are marked with a ♣.

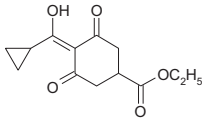
1. ♣ IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name	TRINEXAPAC-ETHYL 120 g/l ME
Intended use	Plant growth regulator
Supplier	Plant growth regulator CHEMINOVA A/S P.O. Box 9 DK-7620 Lemvig Denmark sds@cheminova.dk
Phone	(+45) 97 83 53 53 (24 h; for emergencies only)

2. ♣ HAZARDS IDENTIFICATION

2.1. EU classification according to Dir. 1999/45/EC as amended	R52/53; see 15.1.
CLP classification according to EU Reg. 1272/2008	Eye irritation: Category 2 Hazards to the aquatic environment: Category Chronic 3
WHO classification	None (unlikely to present acute hazard in normal use)
2.2. Health hazards (acute and chronic)	The product may cause eye irritation. Other severe adverse health effects are not expected, but it cannot be excluded that effects may occur in case of massive exposure.
2.3. Signs and symptoms of exposure	To our knowledge, adverse effects in humans have not been reported. In animal tests, reduced activity and shortness of breath were seen at high dosage.
2.4. Environmental hazards	The product is a plant growth regulator. It may have effects on many plant species. See section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Active ingredient	**Trinexapac-ethyl**
CAS name	Cyclohexanecarboxylic acid, 4-(cyclopropylhydroxymethylene)-3,5-dioxo-, ethyl ester
CAS no.	95266-40-3
IUPAC names	4-(Cyclopropylhydroxymethylene)-3,5-dioxocyclohexanecarboxylic acid ethyl ester Ethyl 4-cyclopropyl(hydroxy)methylene-3,5-dioxocyclohexanecarboxylate
ISO name/EU name	Trinexapac-ethyl
EC no. (EINECS no.)	–
EU index no.	–
EU classification of the ingredient	R52/53; see section 16.
Structural formula	

3.2. **Composition**

Active ingredient	Trinexapac-ethyl	11% by weight
Reportable ingredients	Tetrahydrofurfuryl alcohol	60-100% by weight

CAS no. 97-99-4, EC no. (EINECS no.): 202-726-8

EU classification: Xi;R36; see section 16.

Polyaryl ethoxylate 10-30% by weight

EU classification: Xi;R36 N;R51/53; see section 16.

4. ♣ FIRST AID MEASURES

4.1. Emergency and first aid procedures

Inhalation	If experiencing any discomfort, immediately remove from exposure. Get medical attention if discomfort does not disappear.
Ingestion	Inducing vomiting is not recommended. Rinse mouth and drink several glasses of water or milk. If vomiting occurs, rinse mouth and drink fluids again. Consult a physician.
Eye contact	Immediately flush eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and flush again. See physician if irritation persists.
Skin contact	Immediately flush skin with much water while removing contaminated clothing and footwear. Wash with water and soap. See physician if any symptom develops.
4.2. Note to physician	There is no specific antidote against this substance. After decontamination, treatment is supportive and symptomatic. Gastric lavage and/or administration of activated charcoal can be considered.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media and procedure

Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

5.2. Hazardous decomposition products in a fire

The essential breakdown products are carbon monoxide and carbon dioxide.

5.3. Unusual fire and explosion hazards –

6. ♣ ACCIDENTAL RELEASE MEASURES

6.1. Personal protection

Observe all protection and safety precautions when cleaning up spills. Depending on the magnitude of the spill this may mean wearing face mask, safety glasses, gloves and rubber boots. See section 8, Personal protection.

6.2. Steps to be taken in case of spill

It is recommended to have a predetermined plan for the handling of spills. Empty, closable vessels for the collection of spills should be available. Stop the source of the spill immediately if safe to do so. Contain the spill to prevent any further contamination of surface, soil or water. Spills on the floor or other impervious surface should be absorbed onto an absorptive material such as hydrated lime, universal binder, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Rinse area with much water and industrial detergent. Absorb wash liquid onto absorbent and transfer to suitable containers. Wash waters must be prevented from entering surface water drains. Large spills which soak into the ground should be dug up and placed in suitable containers. Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or

disposal. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body. The used containers should be properly closed and labelled. Refer to section 13 for disposal.

7. HANDLING AND STORAGE

7.1. Precautions to be taken in handling In an industrial environment it is recommended to avoid all personal contact with the product, if possible by using closed systems with remote system control. Otherwise adequate ventilation or local exhaust ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.For its use as a plant growth regulator, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8. The precautions of section 8 are primarily meant for handling of the undiluted product and for preparing the spray solution, but can be recommended for spraying as well.

7.2. Precautions to be taken in storing The product is stable under normal conditions of warehouse storage. Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorised persons or children. The room should only be used for storage of chemicals. Food, drink, feed and seed must be kept away. A hand wash station should be available.

7.3. Specific use	The product is a plant growth regulator which may only be used for officially allowed applications in accordance with a label approved by the regulatory authorities.
7.4. Fire and explosion precautions	–

8. ♣ EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limits	To our knowledge not established for trinexapac-ethyl. For tetrahydrofurfuryl alcohol, the AIHA (American Industrial Hygiene Association) has established a Workplace Environmental ExposureLevel (WEEL, TWA) of 2 ppm. However, other personal exposure limits defined by local regulations may exist and must be observed.
8.2. Personal protection	When used in a closed system, personal protection equipment will not be required. The following is meant for other situations, when the use of a closed system is not possible, or when it is necessary to open the system. Consider the need to render equipment or piping system non-hazardous before opening.

Respiratory protection	The product is not likely to present an airborne exposure concern during normal handling, but in the event of discharge of the material which produces a heavy vapour or mist, workers should put on an officially approved face mask or respiratory protection equipment with a universal filter type including particle filter.

Protective gloves	Wear natural rubber gloves if much manual labour with the substance is required. The breakthrough time of this material for the product is unknown, but it is expected that it will give adequate protection.

Eye protection	Wear goggles or safety glasses. It is recommended to have an eye wash fountain immediately available in the work area when there is a potential for eye contact.

Other protection	Wear appropriate chemical resistant clothing to prevent skin contact.
8.3. Work/hygienic practices	Avoid contact with eyes, skin or clothing. Avoid breathing vapour and spray mist. Wash thoroughly with water and soap after handling. Remove contaminated clothing immediately and wash before reuse.

8.4. Environmental exposure controls Do not discharge to the environment. See section 13 for disposal.

9. ♣ PHYSICAL AND CHEMICAL PROPERTIES

9.1. Physical state	Liquid
9.2. Colour	Red-brown
9.3. Odour	Glue-like
9.4. Melting point	Not available
9.5. Boiling point	**Tetrahydrofurfuryl alcohol** : 178°C **Trinexapac-ethyl** : Decomposes, starting at 310°C
9.6. Density	1.08 g/ml at 20°C
9.7. Vapour pressure	**Tetrahydrofurfuryl alcohol** : 1.5 x 10-3 Pa at 20°C **Trinexapac-ethyl** : 2.16 x 10-3 Pa at 25°C
9.8. Solubility in water	The product can be emulsified in water. Solubility of trinexapac-ethyl: 1.1 g/l at pH 3.5 and 25°C 2.8 g/l at pH 4.9 and 25°C 10.2 g/l at pH 5.5 and 25°C 21.1 g/l at pH 8.2 and 25°C
9.9. Solubility in organic solvents	Solubility of **trinexapac-ethyl** in: methanol > 500 g/l at 25°C acetone > 500 g/l at 25°C n-octanol 420 g/l at 25°C toluene > 500 g/l at 25°C dichloromethane > 500 g/l at 25°C ethyl acetate > 500 g/l at 25°C hexane 45 g/l at 25°C
9.10. Viscosity	18 cP at 20°C, 8 cP at 40°C
9.11. Surface tension	Undiluted: 42.0 mN/m at 25°C 1 g/l emulsion in water: 41.9 mN/m at 23°C
9.12. Partition coefficient n-octanol/water	**Trinexapac-ethyl** : log Kow = 1.5 at pH 5 and 25°C log Kow = -0.29 at pH 6.9 and 25°C log Kow = -2.1 at pH 8.9 and 25°C
9.13. pH	3.6 (1% emulsion in water) at 20°C
9.14. Flash point	72°C
9.15. Flammable limits	Tetrahydrofurfuryl alcohol : 1.5 - 9.7 vol%
9.16. Autoignition temperature	268°C
9.17. Explosive properties	Not explosive
9.18. Oxidising properties	Not oxidising

10. STABILITY AND REACTIVITY

10.1. Thermal decomposition	Stable at ambient temperatures.
10.2. Hazardous decomposition products	See 5.2.
10.3. Materials to avoid	–

11. ♣ TOXICOLOGICAL INFORMATION

11.1. Toxicokinetics, metabolism and distribution

After oral administration, trinexapac-ethyl is rapidly absorbed in the body and mostly distributed to kidneys, liver and plasma. It is only partially metabolised and rapidly excreted. There is no evidence of accumulation.

11.2. Acute toxicity — The product is not expected to be harmful by inhalation, in contact with skin or if swallowed. However, it should always be treated with the usual care of handling chemicals. The acute toxicity of the product is measured as:

Route(s) of entry	- ingestion	LD50, oral, rat: > 2000 mg/kg
	- skin	LD50, dermal, rat: > 2000 mg/kg
	- inhalation	LC50, inhalation, rat: > 5.33 mg/l/4 h
11.3. Irritancy		Mildly irritating to eyes, not irritating to skin.
11.4. Allergic sensitisation		Not causing hypersensitivity.
11.5. Carcinogenicity		No indications of carcinogenic effects are found for trinexapacethyl.
11.6. Effects on reproduction		No effects on fertility are found for trinexapac-ethyl.
11.7. Teratogenicity		No indications of teratogenic (birth defects causing) effects of trinexapac-ethyl are found.
11.8. Mutagenicity		Trinexapac-ethyl is not mutagenic.

12. ♠ ECOLOGICAL INFORMATION

12.1. Ecotoxicity — Trinexapac-ethyl has growth inhibiting effects on many plants. It is considered as non-toxic to fish, aquatic invertebrates, birds, mammals, insects and soil micro- and macro-organisms.

The toxicity of the product is measured as:

- Fish Rainbow trout (Oncorhynchus mykiss)	96-h LC50: 34.1 mg/l
- Invertebrates Daphnids (Daphnia magna)	48-h EC50: > 100 mg/l
- Algae Green algae (Pseudokirchneriella subcapitata)	72-h IC50: 21.1 mg/l
- Aquatic plants Duckweed (Lemna gibba)	7-day EC50: 14.9 mg/l
- Earthworms Eisenia fetida	14-day LC50: > 1000 mg/kg dry soil
- Insects Honey bees (Apis mellifera L.)	48-h LD50, contact: > 1800 µg/bee
	48-h LD50, oral: > 234 µg/bee
12.2. Mobility	Under normal conditions trinexapac-ethyl is moderately mobile in soil.
12.3. Persistence and degradability	Trinexapac-ethyl does not fulfil the criteria for being readily biodegradable, but it is degraded in the environment. Half-life times are usually less than 1 day in soil. Degradation products are further degraded, but slower. Degradation occurs mainly microbiologically.
12.4. Bioaccumulative potential	Due to its relatively high solubility in water and degradability, trinexapac-ethyl does not bioaccumulate.

13. ♠ DISPOSAL CONSIDERATIONS

13.1. Waste disposal method — Waste that cannot be reused or chemically reprocessed can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

13.2. Packaging/container disposal — Triple rinse (or equivalent) and offer for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials. Disposal of waste and packagings must always be in accordance with all applicable local regulations.

14. TRANSPORT INFORMATION

Not classified as hazardous material for transport

15. ♠ REGULATORY INFORMATION

15.1. **LABELLING IN THE EU**

According to Dir. 1999/45/EC as amended

Hazard symbols	None
Contains	Trinexapac-ethyl
R-phrases	R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-phrases	S61: Avoid release to the environment. Refer to special instructions/safety data sheets.
Other mentions	To avoid risks to man and the environment, comply with the instructions of use.

15.2. **GLOBALLY HARMONISED SYSTEM**

According to EU Reg. 1272/2008

CLP classification	Eye irritation: Category 2
	Hazards to the aquatic environment: Category Chronic 3

CLP labelling

Product identifier	Trinexapac-ethyl 120 g/l ME
Contains	Trinexapac-ethyl

Hazard symbols required on label

Signal word	Warning
Hazard statement	H319: Causes serious eye irritation P412: Harmful to aquatic life with long lasting effects
Supplementary hazard statement	EUH401: To avoid risks to human health and the environment, comply with the instructions of use.

Precautionary statements	
Prevention	P264: Wash hands thoroughly after handling. P280: Wear eye protection. P273: Avoid release to the environment.
Response	P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313: If eye irritation persists: Get medical advice/attention.
Storage	–
Disposal	P501: Dispose of contents/container in accordance with local regulations.
15.2. Regulatory status	All ingredients in this product are covered by EU chemical legislation.

16. OTHER INFORMATION

Used R-phrases	R36 Irritating to eyes. R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product may vary and situations unforeseen by Cheminova A/S may exist. The user of the material has to check the validity of the information under local circumstances.