

SAFETY PRECAUTIONS

1. Handle with care. Product is corrosive.
2. Wear protective clothing, boots, rubber gloves and face shield when handling the product.
3. KEEP OUT OF THE REACH OF CHILDREN.
4. KEEP APART FROM FOOD AND FOODSTUFFS.
5. KEEP UNDER LOCK AND KEY.
6. **DO NOT** inhale fumes or spray mist.
7. Avoid contact with skin and eyes.
8. Prevent spray drift onto other crops, grazing, rivers, dams or other areas not under treatment.
9. **DO NOT** eat, drink or smoke whilst mixing or applying or before washing hands and face and changing clothes.
10. Wash contaminated clothing daily.
11. Toxic to fish and birds.
12. Wash with soap and water after use and accidental skin contact.
13. Clean all equipment thoroughly after use. Dispose of wash water where it will not contaminate crops, grazing, rivers, dams and boreholes.
14. Triple rinse empty containers in the following manner: Rinse the container three times with a volume of water equal to a minimum of 10% of that of the container. Add the rinsings to the contents of the spray tank before destroying the container in the described manner.
15. Destroy the empty container by perforating and flattening and dispose of it in a safe manner.
16. **Never** re-use the empty container for any other purpose whatsoever.

SYMPTOMS OF HUMAN POISONING:

Local: burns on skin and mucosal tissues.

Systemic: gastro-intestinal irritation. This product causes reversible cholinesterase inhibition.

FIRST AID

- Ingestion** If swallowed, seek medical advice immediately and show this container or label to the physician. DO NOT induce vomiting.
- Eye Contact** Rinse immediately with plenty of clean water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.
- Skin Contact** Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.
- Inhalation** Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Keep patient warm and at rest. Call a physician or Poison Information Centre immediately.

NOTES TO PHYSICIAN

The product is an acid. It is corrosive - see product pH value.
Treat symptomatically.

Gastric lavage is not normally required. However, if a significant amount (more than a mouthful) has been ingested, administer activated charcoal and sodium sulphate.
Contraindication: atropine.

ANTIDOTE

There is no specific antidote.

WARNINGS

Excellent results should be achieved from the use of this product, provided the recommendations contained on this label are followed in full. However, as the application of this product and the conditions under which it is applied are beyond the control of the distributor, no warranties are given with regards to the use of this product. The distributor accepts no liability in delict for any injury to persons or damage to or loss of property, or profits, resulting from the handling, use or storage of this product.

Manufactured by:

NOVAAGRO (HK) LTD
6TH FLOOR, WYNDHAM PLACE,
44 WYNDHAM STREET,
CENTRAL HONG KONG

ETHEPHON 480SL

Reg. No. 19-G-7-19

1L



HARMFUL IF SWALLOWED



Composition:	mass/volume
Ethephon	480g/L
Inert ingredients	520g/L

Chemical Group: Phosponic acid

**A soluble concentrate plant growth regulator
for use on Sugarcane and other crops.**

**TO CAUSE A HAZARD IN THE USE, STORAGE OR DISPOSAL
OF THIS SUBSTANCE IS AN OFFENCE.**

KEEP OUT OF REACH OF CHILDREN

DIRECTIONS FOR USE: Use only as directed.

MIXING INSTRUCTIONS:

Half fill the spray tank with the required amount of water. If the spray water is alkaline, a buffer should be added before adding **ETHEPHON 480SL**. Add the required amount of **ETHEPHON 480SL** and the remaining amount of water. Prepare only the volume needed for one day of spraying. Do not allow spray solution to stand overnight.

COMPATIBILITY:

The range of physical compatibility of **ETHEPHON 480SL** with other pesticides and fertilizers is not known. Therefore, before preparing tank mixes, add a small amount of **ETHEPHON 480SL** to an equal amount of water and then the other pesticide. **DO NOT** use mixtures that precipitate, curdle or grease.

CROP/USE	DOSAGE	REMARKS
SUGARCANE -To increase sugar content	1.5L in 30L water/ha	Ensure thorough coverage by means of aerial application. To obtain maximum benefit, apply only to actively growing cane 6 to 12 weeks before harvest.
OTHER CROPS	60mL in a 15L knapsack 30mL in 50L of water every six hours.	Apply to butt end of leaf. For use in greenhouses and drying tunnels.

SAFETY PRECAUTIONS

Empty container disposal

Invert the empty container over the spray tank or mixing tank and allow to drain for at least 30 seconds after the flow has slowed down to a drip. Thereafter, rinse the container three times with a volume of water equal to a minimum of 10% of the container. Add the rinsings to the contents of the spray tank. Destroy the empty container by perforating and flattening. Return to supplier for recycling. **DO NOT** use for any other purpose. Dispose of the wash water at a site for the disposal of pesticides.

Decontamination of sprayer

Clean applicator thoroughly after use and ensure that all traces of **ETHEPHON 480SL** are removed. Make use of the following method;
(a) Drain and rinse tank, spray boom and hoses with clean water for at least 10 minutes
(b) Fill tank with clean water and add it to 1 litre household bleach (5%) or 1.5 Litres of household bleach (3.5%) per 200 Litres of water. Rinse hoses and spray boom and leave in tank for 15 minutes whilst agitating. Drain through nozzle outlets.
(c) Repeat step (b) and thereafter, rinse thoroughly with clean water and dispose of the wash water at a site designated for the disposal of pesticides.

Date of Manufacture: Mar. 2019

Batch No.: 20190321

Registration held by:

MAGCHEM (PVT) LIMITED
2274 TILBURY ROAD,
WORKINGTON, HARARE,
ZIMBABWE



1. Triple rinse clean container after use
2. Puncture holes in bottom
3. Return to Maguires Recycling Facilitator / Return to nearest recycling facility



MATERIAL SAFETY DATA SHEET

PRODUCT : ETHEPHON 480SL
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1. IDENTIFICATION OF SUBSTANCE AND COMPANY

PRODUCT NAME : ETHEPHON 480SL
COMMON NAME : Ethephon
CHEMICAL NAME : 2-chloroethylphosphonic acid
SUPPLIER : NOVA AGRO (HK) LTD
(Reg. No. 1023146)
6th Floor Wyndham Place
44 Wyndham Street
CENTRAL HONG KONG.

EMERGENCY TELEPHONE NUMBERS

SPILLAGES:

Emergency tel./ fax : (+27) 83-676 1998

POISONINGS:

National Poison Centre 021-9386084 (office hours
(South Africa) 021-9316129 (after hours).

2. COMPOSITION / INFORMATION ON INGREDIENTS

CAS No. 16672-87-0
Chemical Family Ethylene generator
Chemical Formula $C_2H_6ClO_3P$ (Mol. wt.: 144.5)
NIOSH/RTECS no. SZ 7100000
UN no. 3265
Use Plant growth regulator.
Hazchem class 8
Hazardous components Ethephon 480 g/l
SYMBOLS C (Corrosive).
RISK-PHRASE(S) R20/ 21, R34, R 52/R53

3. HAZARD IDENTIFICATION

Main hazard: Corrosive! Causes eye and skin damage.
Toxicity class: WHO Table 5; EPA III. A low toxicity plant growth regulator.
Flammability: Not flammable. Gives off irritating or toxic fumes (gases) in a fire.
Biological hazards: Skin contact, ingestion and inhalation.
Eye contact: Corrosive. May cause severe eye irritation. Irritation may develop after exposure to mists, aerosols or vapors. Splash contact may cause corneal erosions and permanent tissue damage.
Skin contact: Severe dermal burns may occur with dermal exposure. Complications seen with dermal burns include cellulitis, sepsis, contractures, osteomyelitis, and systemic toxicity from absorbed acid.

Ingestion: Oral ingestion may produce mild to moderately severe oral and esophageal burns with more severe burns occurring in the stomach. Perforations are rare but may occur. The pyloric end of the stomach is most severely affected and is the site of delayed stricture occurring generally at 3 weeks after the ingestion.

Inhalation: Minimally toxic by inhalation. Over-exposure may result in dyspnea, pleuritic chest pain, pulmonary edema, hypoxemia, bronchospasm, pneumonitis, trachea-bronchitis and persistent pulmonary function abnormalities.

Reproductive hazard: See section 11.

Carcinogenicity: See section 11.

Mutagenicity: See section 11.

Neurotoxicity: See section 11.

4. FIRST AID AND MEDICAL MEASURES AND PRECAUTIONS

Inhalation: Remove source of contamination or move victim to fresh air. Keep person warm and at rest. Treat symptomatically and supportively. Obtain medical advice if necessary.

Skin contact: Remove contaminated clothing, shoes and leather goods. Gently wipe off excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap. Seek medical advice if necessary.

Eye contact: Immediately flush the eyes with gently flowing water or saline solution for 20 minutes, holding the eyelid(s) open. Seek medical attention.

Ingestion: Have victim rinse mouth thoroughly with water, give glass of milk. **DO NOT INDUCE VOMITING.** Do not give bicarbonate to neutralize. Activated charcoal is of no value. Passing a nasogastric or orogastric tube into the stomach is controversial at this time.

Do not perform gastric lavage if victim is unconscious. Administration of gastric lavage and oxygen should be performed by qualified medical personnel. Seek medical advice immediately showing container and label.

Advice to physician: The product is an acid. It is Corrosive; See product pH value.

ORAL EXPOSURE:

A. **DILUTION:** Immediately dilute with 120 to 240ml of milk or water in adults and 60 to 120ml in children.

B. **STEROIDS:** Steroid use is controversial. There is no good data in the literature to assess the efficacy of steroids for preventing stricture formation.

C. Observe patients with ingestion carefully for the possible development of esophageal or gastrointestinal tract irritation or burns. If signs or symptoms of esophageal irritation or

burns are present, consider endoscopy to determine the extent of injury.

D. Consultation with gastroenterology and/or GI surgery should be obtained in patients with suspected mucosal burns.

EYE DAMAGE ASSESSMENT: It may take 48 to 72 hours after the burn to correctly assess the degree of ocular damage. The basis of such an evaluation is the degree of corneal opacification and perilimbal whitening.

EYE DAMAGE TREATMENT: If ocular damage is minor, topical mydriatics and antibiotics may be sufficient. If more extensive, one or more of the following may be tried, only with ophthalmologic consultation: acetazolamide, timolol, steroids, EDTA, cysteine, NAC, penicillamine, tetracycline, soft contact lenses, insertion of a methylmethacrylate ring, or saran wrap suturing.

DERMATOLOGIC:

ACUTE EXPOSURE

Chemical burns to the skin are often associated with concurrent thermal burns and trauma. Complications seen with thermal burns including cellulitis, sepsis, contractures, osteomyelitis, may occur as well as systemic toxicity from absorbed acid. Deep or extensive burns may require grafting.

CHRONIC EXPOSURE

Prolonged or repeated exposure can result in dermatitis. Ulcerations may also occur. Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

This product will not burn.

Extinguishing agents: Extinguish **small surrounding fires** with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for **larger fires** or cooling of unaffected stock, but avoid the accumulation of polluted runoff from the site.

Firefighting: Remove container from fire area if possible. Contain fire control water for later disposal. Use a recommended extinguishing agent for the type of surrounding fire. Keep material out of sewers and water sources. Avoid inhalation of hazardous vapours. Keep upwind.

Special Hazards: Product is stable up to 75°C. Ethylene gas is released with decomposition of Ethophon

Personal protective equipment: Fire-fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:

Do not inhale fumes. Ventilate area of spill or leak, especially confined areas. Avoid contact with skin, eyes or clothes. For personal protection see Section 8.

Environmental precautions:

Do not allow entering drains or watercourses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Occupational spill:

For **small spills**, soak up sand or suitable non-combustible absorbent material, place into containers for subsequent disposal. Thoroughly wash body areas, which come into contact with the product. Avoid runoff to sewer as it may cause fire/explosion. Do not allow the product to come in contact with water systems. For **large spills** contact the manufacturer. Contain liquid far ahead of spill. Contain spillage and contaminated water for subsequent disposal. Do not flush spilled material into drains. Keep spectators away and upwind.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Harmful by inhalation. Avoid contact with eyes and skin and inhalation of fumes. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Operators should change and wash clothing daily. Remove clothing immediately if the product gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination

Storage:

Store in its original container in isolated, dry, cool (avoid temperatures above 40°C) and well-ventilated area. Avoid cross contamination with other pesticides and fertilizers. Product is stable in aqueous solutions of a pH<5. At higher pH the product decompose to ethylene. This product is sensitive for UV irradiation. Keep under lock and key out of reach of unauthorized persons, children and animals. Store away from incompatible substances. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

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8. EXPOSURE CONTROL / PERSONAL PROTECTION

Occupational exposure limits:

No occupational limits established by OSHA, ACGIH or NIOSH

Engineering control measures:

It is essential to provide adequate ventilation. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal equipment including approved respiratory protection.

Respirator: An approved full-face respirator suitable for protection from mists of pesticides is required. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing: Employee must wear appropriate protective (impervious) clothing and equipment to prevent skin contact with the substance.

Gloves: Employee must wear appropriate chemical resistant protective gloves to prevent contact with this substance.

Eye protection: Employee must wear splash-proof safety goggles and face-shield to prevent contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, straw-coloured liquid with slight acrid odour.

Flammability: Non flammable

Explosive properties: No information currently available.

Flash point: Not applicable. The product contains water.

Oxidising properties: Corrosive to metal.

pH: pH (100%): 0.62 ± 0.05 ; pH (5% solution): 1.2 ± 0.1

Relative density: $1.245 \text{ g/ml} \pm 0.01 \text{ g/l}$ at 25°C

Storage stability: Stable for up to 2 years under normal warehouse and field conditions. Product is stable in aqueous solutions of a pH <5. At higher pH the product decompose to ethylene. This product is sensitive for UV irradiation. Will decompose at temperatures above 75°C

Solubility in water: Readily soluble in water.

Partition-coefficient in n-octanol / water:

(data for active substance) $K_{ow} (\log P_{ow}) < -2.20$ (25°C)

10. STABILITY AND REACTIVITY

Stability: Will decompose at temperatures above 75°C .

Stable for up to 2 years under normal warehouse and field conditions. Product is stable in aqueous solutions of a pH <5. At higher pH the product decompose to ethylene. This product is sensitive for UV irradiation.

Incompatibility: The product is compatible with alkaline materials and solutions containing metal ions, e.g. iron-, zinc-, copper-, and manganese-containing fungicides.

Do not physically mix concentrate directly with other pesticide concentrates; always dilute first.

Hazardous decomposition: Product undergoes decomposition at temperatures higher than 75°C . This product produces ethylene gas on decomposition.

11. TOXICOLOGICAL INFORMATION

Acute oral LD₅₀: 4250 mg/kg in rats.

Acute dermal LD₅₀: >5 000 mg/kg in rats.

Acute inhalation LC₅₀ (4 h): 13,11 mg/λ air for rats.

Acute skin irritation: The product is a severe skin irritant.

Acute eye irritation: Corrosive, causes irreversible eye damage (rabbit).

Dermal sensitisation: The product is considered to be a dermal sensitiser (guinea pig).

Carcinogenicity: Animal studies did not detect any carcinogenic effects. No human information available.

Teratogenicity: Animal studies did not detect any teratogenic effects. No human information available.

Mutagenicity: Animal studies did not detect any mutagenic effects. No human information available.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY:

Birds: Practically non-toxic to birds.

Acute oral LD₅₀: > 10 000 mg/kg (bobwhite quail).

Fish: May pose a hazard to fish.

LC₅₀ (96 hr): 215.21 mg/(*Brachydanio rerio*)

Bees: Non-toxic to bees.

Daphnia: EC₅₀ (48 h): 283.74 mg/(*Daphnia similis*)

Algae: *Selenastrum capricornutum* EC₅₀ (96 h): 505 mg/l.

Chlorella vulgaris: 32 mg/l

Earthworms: Not toxic to earthworms.

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LC₅₀ (14 d)::>2 388.89 mg/kg of soil.

Breakdown of Chemical in Soil and Groundwater

Ethephon was found to have low to moderate mobility in soils

ranging in texture from loamy sand to peat and silt loam based on soil thin layer chromatography tests. Therefore, the potential for contamination of groundwater appears to be low to moderate.

In soil, rapid degradation to phosphoric acid, ethylene, and chloride ions was reported.

Breakdown of Chemical in Surface Water

No information currently available.

Breakdown of Chemical in Vegetation

In plants, ethephon rapidly degrades to phosphate, ethylene, and chloride. Ethephon and the ethylene gas it produces are the major metabolites in plants.

Residues of monochloroacetic acid may be found in ethephon-treated commodities. Monochloroacetic acid is a potential degradation product of an impurity in ethephon, monochloroethyl ester of (2-chloroethyl)-phosphonic acid.

13. DISPOSAL CONSIDERATION

Pesticide disposal:

Waste resulting from the use of this product that cannot be reused or reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable local procedures. Hydrolysis under alkaline conditions is a suitable method to dispose of small quantities of the product. After hydrolysis, dilute and dispose of in pits or landfill. Comply with any local legislation applying to waste disposal.

Package product wastes:

Emptied containers retain vapour and product residues. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. Combustible containers should be disposed of in pesticide incinerators. Non-combustible containers must first be triple-rinsed with water, punctured and recycled or disposed of.

14. TRANSPORT INFORMATION

UN NUMBER: 3265
ADR/IRD:
 Substance name : Corrosive liquid, acidic, organic, n.o.s. (Ethephon 480 g/l).
 Hazard ID : 80
 Label : 8
 Item no : 40°(c)

IMDG/IMO:

Shipping name : Corrosive liquid, acidic, organic, n.o.s. (Ethephon 480 g/l).

Class : 8

Packaging Group : III

AIR/IATA:

Shipping name : Corrosive liquid, acidic, organic, n.o.s. (Ethephon 480 g/l).

Class : 8

Packaging Group : III

Y818 (1 l max.), 818 (5 l max.)
820 (60 l max.)

UK classification : Not available.

Tremcard number : 80GC3-II

15. REGULATORY INFORMATION

Symbol : C

Indication of danger: Corrosive

Risk phrases:

R 2021 Harmful by inhalation and in contact with skin.

R 34 Causes burns.

R 52/53 Harmful to aquatic organisms, may cause long-term effects in the aquatic environment.

Safety phrases:

S1/ 2 Keep locked up and out of reach children.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S61 Avoid release to the environment. Refer to MSDS or label.

National legislation: In accordance with 91/155/EEC Directive and with French standard T 01-102 and the South African Occupational Health and Safety Act, 1993 (Act. No. 85 of 1993).

16. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and



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believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons in receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces formulations(s) containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.

REFERENCES

- *The Pesticide Manual*; 13th Edition; Editor Clive Tomlin; Crop Protection Publications, 2004.
 - *Pestline*; Material Safety Data Sheets for Pesticides and Related Chemicals; Volume II; Occupational Health Services Inc., 1991.
 - *MICROMEDEX*, International Healthcare Series.
 - *ADR-Vol. II (Annex B)*, January 1997.
 - *Dangerous Goods Regulations, IATA, 41st Edition, Effective 1 January 2000.*
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