Section 1 - Identification of the Material and Supplier

Chemical nature: Aqueous concentrate containing ethephon

Trade Name: **Ethic 480 Plant Growth Regulator**

APVMA Code: 67921

Product Use: Plant growth regulator for use as described on the product label.

Issued By: **Amgrow Pty Ltd**
Unit B2a, Birnie Avenue
Lidcombe. NSW. 2141.
(02) 9395 1200.

This version issued: **May 2021** and is valid for 5 years from this date.

Poisons Information Centre: Phone 13 1126 from anywhere in Australia

Section 2 - Hazards Identification

Statement of Hazardous Nature

This product is classified as: Xn, Harmful. N, Dangerous to the environment. C, Corrosive. Hazardous according to the criteria of SWA.

Dangerous according to Australian Dangerous Goods (ADG) Code, IATA and IMDG/IMSBC criteria.

SUSMP Classification: S6
ADG Classification: Class 8: Corrosive Substances.
UN Number: 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.

GHS Signal word: DANGER

Acute Toxicity Oral Category 4
Acute Toxicity Dermal Category 3
Skin Corrosion /Irritation Category 1
Acute Toxicity Inhalation Category 4
Hazardous to aquatic environment Short term/Chronic Category 2

HAZARD STATEMENT:

H302: Harmful if swallowed.
H311: Toxic if contact with skin.
H314: Causes severe skin burns and eye damage.
H332: Harmful if inhaled.
H411: Toxic to aquatic life with long lasting effects.

PREVENTION

P234: Keep only in original container.
P260: Do not breathe fumes, mists, vapours or spray.
P262: Do not get in eyes, on skin, or on clothing.
P264: Wash contacted areas thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves, protective clothing and eye or face protection.

RESPONSE

P310: Immediately call a POISON CENTRE or doctor/physician.
P362: Take off contaminated clothing and wash before reuse.
P301+P312: IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water.
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313: If skin irritation occurs: Get medical advice.
P337+P313: If eye irritation persists: Get medical advice.
P390: Absorb spillage to prevent material damage.
P370+P378: In case of fire, use carbon dioxide, dry chemical, foam, water fog. Water fog or fine spray is the preferred medium for large fires.

STORAGE

P405: Store locked up.
P406: Store in corrosive resistant container with a resistant inner liner.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.

DISPOSAL

P501: Dispose of contents and containers as specified on the registered label.

Emergency Overview

Physical Description & Colour: Clear colourless to pale yellow liquid
Odour: Mild odour.
Major Health Hazards: causes burns, may cause serious damage to eyes, harmful by inhalation, in contact with skin, and if swallowed, skin irritant.

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc, g/L	TWA (mg/m^3)	STEL (mg/m^3)
Ethephon	16672-87-0	480	not set	not set
Water	7732-18-5	to 1L	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The SWA TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak "is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this SDS with you when you call.

Inhalation: If symptoms of poisoning become evident, contact a Poisons Information Centre, or call a doctor at once. Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure.
Skin Contact: Wash gently and thoroughly with water (use non-abrasive soap if necessary) for 20 minutes by the clock. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts) and completely decontaminate them before reuse or discard. If irritation persists, repeat flushing and seek medical advice. If patient feels unwell, seek medical advice.
Eye Contact: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 20-30 minutes, by the clock, while holding the eyelid(s) open. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. If necessary, keep emergency vehicle waiting (show paramedics this MSDS and take their advice). Take care not to rinse contaminated water into the unaffected eye or onto face. If irritation persists, repeat flushing. Call a Poisons Information Centre or a doctor urgently. Take special care if exposed person is wearing contact lenses.
Ingestion: If swallowed, do NOT induce vomiting; rinse mouth thoroughly with water and contact a Poisons Information Centre. Urgent hospital treatment is likely to be needed. Give activated charcoal if instructed.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: The major hazard in fires is usually inhalation of heated and toxic or oxygen deficient (or both), fire gases. There is little risk of an explosion from this product if commercial quantities are involved in a fire.

This product is likely to decompose only after heating to dryness, followed by further strong heating.
Fire decomposition products from this product are likely to be irritating if inhaled.

Extinguishing Media: In case of fire, use carbon dioxide, dry chemical, foam or water fog. Water fog or fine spray is the preferred medium for large fires. Try to contain spills, minimise spillage entering drains or water courses.

Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade. There is little danger of a violent reaction or explosion if significant quantities of this product are involved in a fire. Recommended personal protective equipment is liquid-tight chemical protective clothing and breathing apparatus. Cool closed, undamaged containers exposed to fire with water spray.

Flash point:	Not flammable.
Upper Flammability Limit:	Does not burn.
Lower Flammability Limit:	Does not burn.
Autoignition temperature:	Does not burn.
Flammability Class:	Does not burn.

Section 6 - Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Evacuate the spill area and deny entry to unnecessary and unprotected personnel. Wear full protective chemically resistant clothing including eye/face protection, gauntlets and self contained breathing apparatus. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include no specific manufacturer recommendations. Use impermeable gloves with care. Eye/face protective equipment should comprise, as a minimum, protective glasses and, preferably, goggles. If there is a significant chance that vapours or mists are likely to build up in the cleanup area, we recommend that you use a respirator. Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned below (section 8). Otherwise, not normally necessary.
Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. Because of the corrosiveness of this product, special personal care should be taken in any cleanup operation. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Recycle containers wherever possible after careful cleaning. Refer to product label for specific instructions. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this SDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this SDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

Storage: This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. Store in a cool, well ventilated area. Check containers periodically for corrosion and leaks. Containers should be kept closed in order to minimise contamination. Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10. If you keep more than 10000kg or L of Dangerous Goods of Packaging Group III, you may be required to license the premises or notify your Dangerous Goods authority. If you have any doubts, we suggest you contact your Dangerous Goods authority in order to clarify your obligations. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: AS/NZS 4501 set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**. Exposure limits have not been established by SWA for any of the significant ingredients in this product.

The ADI for Ethephon is set at 0.02mg/kg/day. The corresponding NOEL is set at 0.17mg/kg/day. ADI means Acceptable Daily Intake; NOEL means No-observable-effect-level. Data from Australian ADI List, June 2014.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.
Ventilation: This product should only be used where there is ventilation that is adequate to keep exposure below the TWA levels. If necessary, use a fan.
Eye Protection: Your eyes must be completely protected from this product by splash resistant goggles with face shield. All surrounding skin areas must be covered. Emergency eye wash facilities must also be available in an area close to where this product is being used.
Skin Protection: It is essential that all skin areas are adequately covered by impermeable gloves, overalls, hair covering, apron and face shield. See below for suitable material types.
Protective Material Types: There is no data that enables us to recommend any type except that it should be impermeable.
Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above. Otherwise, not normally necessary.
Safety deluge showers should, if practical, be provided near to where this product is being handled commercially.

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Clear colourless to pale yellow liquid
Odour:	Mild odour.
Boiling Point:	Not available.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	Water component.
Vapour Pressure:	2.37 kPa at 20°C (water vapour pressure). Vapour pressure of ethephon is negligible.
Vapour Density:	As for water.
Specific Gravity:	1.302 at 20°C
Water Solubility:	Completely soluble in water.
pH:	0.8
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	As for water.
Coeff Oil/water Distribution:	<-2.2 at 25°C (log P octanol/water)
Autoignition temp:	Does not burn.

Section 10 - Stability and Reactivity

Reactivity: Most strong acids react with inorganic and organic bases such as amines to form salts. They also react with many metals liberating hydrogen gas. These reactions are often rapid and sometimes liberate much heat. They can also decompose many organic materials such as esters, in a reaction called hydrolysis.
Conditions to Avoid: This product should be kept in a cool place, preferably below 30°C. Under no circumstances should the container be sealed. Keep isolated from combustible materials. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.
Incompatibilities: strong bases, strong oxidising agents, zinc, iron, copper, mild steel, aluminium, sodium chlorate.
Fire Decomposition: This product is likely to decompose only after heating to dryness, followed by further strong heating. Combustion forms carbon dioxide, and if incomplete, carbon monoxide and possibly smoke. May form oxides of phosphorus and other phosphorus compounds. May form hydrogen chloride gas, other compounds of chlorine. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.
Polymerisation: This product will not undergo polymerisation reactions.

Section 11 - Toxicological Information

Toxicity: An information profile for Ethephon is available at http://extoxnet.orst.edu/pips/ghindex.html
Acute Toxicity: Acute animal toxicity studies in a few species show that via the oral and dermal routes, Ethephon is relatively non-toxic except in hens. An acute study with rats showed an oral LD_{50} of 1.6 g/kg (EPA toxicity category III). An acute dermal study using rabbits showed a dermal LD_{50} of greater than 5 g/kg (EPA toxicity category III).
Chronic Toxicity: A chronic toxicity/oncogenicity study using Swiss albino mice included 85 mice fed diets containing 0, 4.5, 45, or 150 mg/kg/day of Ethephon for 78 weeks. Inhibition of plasma cholinesterase activity was significant at the 45 and 150 mg/kg/day dose levels in males and females. The No Observable Effect Level (NOEL) for plasma cholinesterase activity is 4.5 mg/kg/day for both sexes and the Lowest Effect Level for this effect was 45 mg/kg/day

for both sexes. There appeared to be a dose-related decrease in red blood cell cholinesterase activity in females. There was significant depression in RBC cholinesterase activity at the 45 and 150 mg/kg/day dose levels, while females in the 4.5 mg/kg/day dose groups exhibited depression in RBC cholinesterase activity at 52 weeks and 78 weeks, which was not considered statistically significant. The highest dose without adverse effects reported in rats was 375 mg/kg/day for 90 days.
Reproductive Effects: A developmental toxicity study was conducted on New Zealand white rabbits. The doses tested were 50, 100, or 150 mg/kg. The teratogenic NOEL was greater than 50 mg/kg/day (LDT or lowest dose tested). The number of litters at termination of the study was insufficient to determine teratogenic effects at the 100 and 150 mg/kg/day levels. The NOEL was reported to be greater than 1500 ppm (highest dose tested).
Teratogenic Effects: The NOEL for rat teratogenic effects is 600 mg/kg/day, while in the rabbit, the NOEL was reported to be 50 mg/kg/day based on foetal resorptions at higher dose levels tested.
Mutagenic Effects: Ethephon studies in Salmonella typhimurium indicated no mutagenic effect up to 1,000 micrograms/100 microlitres, without enzyme activation.
Carcinogenic Effects: No dose-related evidence of carcinogenicity/oncogenicity was reported.
Organ Toxicity: No information currently available.
Fate in Humans and Animals: No information currently available.
There is no data to hand indicating any particular target organs.

Classification of Hazardous Ingredients

Ingredient	Risk Phrases
Ethephon	Conc>=25%: C; R34; R20/21
Acute toxicity - category 4	
Skin corrosion - category 1B	
Hazardous to the aquatic environment (chronic) - category 3	

Potential Health Effects

Inhalation:
Short Term Exposure: Available data shows that this product is harmful, but symptoms are not available. In addition product may be mildly irritating, although unlikely to cause anything more than mild transient discomfort. If liquid enters nasal passages, it will cause pain and burn nasal membranes. Patients with inhalation burns may develop acute pulmonary oedema.
Long Term Exposure: No data for health effects associated with long term inhalation.

Skin Contact:
Short Term Exposure: Available data shows that this product is harmful, but symptoms are not available. In addition product is a severe skin irritant. Symptoms may include extreme itchiness and reddening of contacted skin. Other symptoms such as blisters may also become evident, and may last long after exposure has ceased.
Long Term Exposure: No data for health effects associated with long term skin exposure.

Eye Contact:
Short Term Exposure: This product is corrosive to eyes. It will cause severe pain, and corrosion of the eye and surrounding facial tissues. Unless exposure is quickly treated, permanent blindness and facial scarring is likely.
Long Term Exposure: No data for health effects associated with long term eye exposure.

Ingestion:
Short Term Exposure: Significant oral exposure is considered to be unlikely. Available data shows that this product is harmful, but symptoms are not available. However, this product is corrosive to the gastrointestinal tract. Capable of causing moderate to severe burns with ulceration. Can penetrate to deeper layers of skin, resulting in third degree burns. Corrosion will continue until product is removed or neutralised. Severity depends on concentration and duration of exposure.
Long Term Exposure: No data for health effects associated with long term ingestion.

Carcinogen Status:
SWA: No significant ingredient is classified as carcinogenic by SWA.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 12 - Ecological Information

Harmful to aquatic organisms, may cause long-term adverse effects to the aquatic environment. Until diluted or neutralised it will kill all aquatic organisms it contacts due to extreme pH. This product is unlikely to be mobile in soils. Ethephon is rapidly degraded in soil and is sensitive to UV radiation.

Effects on Birds: Data indicate that technical-grade Ethephon is slightly toxic on an acute oral basis to bobwhite quail, and slightly toxic on a subacute dietary basis to bobwhite quail and mallard ducks.
Effects on Aquatic Organisms: Laboratory and field studies indicate that Ethephon is slightly toxic to fish.
Effects on Other Animals (Nontarget species): Two studies using Ethephon were conducted in humans. In the first study, some symptoms characteristic of anticholinesterase activity were observed. Five humans of each sex were dosed with Ethephon at an average dose level of 1.8 mg/kg/day. Subjects receiving the test compound reported the following symptoms and/or signs; sudden onset of diarrhoea or an urgency of bowel movements, stomach cramps or gas and increased urgency or frequency of urination, and either an increase or decrease in appetite. None of the control subjects had complaints similar to the test group. In the second human study, 10 humans of each sex were administered Ethephon at 0.5 mg/kg/day for 16 days, followed by a 2-week recovery period. Dose related effects occurred in plasma cholinesterase activity, but not in red blood cell cholinesterase activity. The effect was reversible within 15 days. When the control group and test groups were compared, the decreased plasma cholinesterase activity was statistically significant.
ENVIRONMENTAL FATE
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.
Birds: LD_{50} bobwhite quail: 1072mg/kg
Fish: LC_{50} rainbow trout (*Oncorhynchus mykiss*): >100mg/L
Algae: EC_{50} *Scenedesmus subspicatus* 56mg/L LC_{50} *Chlorella vulgaris*: 29mg/L
Daphnia: EC_{50} >721mg/L

Section 13 - Disposal Considerations

Disposal: Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 http://www.chemclear.com.au/ and for help with the disposal of empty drums, contact DrumMuster http://www.drummuster.com.au/ where you will find contact details for your area.

Section 14 - Transport Information

Dangerous according to Australian Dangerous Goods (ADG) Code, IATA and IMDG/IMSBC criteria.

UN Number: 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Hazchem Code: 2X
Special Provisions: 223, 274
Limited quantities: ADG 7 specifies a Limited Quantity value of 5 L for this class of product.
Dangerous Goods Class: Class 8: Corrosive Substances.
Packing Group: III
Packing Instruction: P001, IBC03, LP01

Class 8 Corrosive Substances shall not be loaded in the same vehicle or packed in the same freight container with Classes 1 (Explosives), 4.3 (Dangerous When Wet Substances), 5.1 (Oxidising Agents), 5.2 (Organic Peroxides), 6 (Toxic Substances where the Toxic Substances are cyanides and the Corrosives are acids), 7 (Radioactive Substances), Foodstuffs and foodstuff empties. They may however be loaded in the same vehicle or packed in the same freight container with Classes 2.1 (Flammable Gases), 2.2 (Non-Flammable, Non-Toxic Gases), 2.3 (Poisonous Gases), 3 (Flammable liquids), 4.1 (Flammable Solids), 4.2 (Spontaneously Combustible Substances), 6 (Toxic Substances except where the Toxic Substances are cyanides and the Corrosives are acids) and 9 (Miscellaneous Dangerous Goods).

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this formulation are compliant with NICNAS regulations.
The following ingredient: Ethephon, is mentioned in the SUSMP.

Section 16 - Other Information

This SDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition)
AICS	Australian Inventory of Chemical Substances
SWA	Safe Work Australia, formerly ASCC and NOHSC
CAS number	Chemical Abstracts Service Registry Number
Hazchem Code	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSMP	Standard for the Uniform Scheduling of Medicines & Poisons
UN Number	United Nations Number

THIS SDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS SDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS

OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

This SDS is prepared in accord with the SWA document “Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice” (December 2011)