



VIVAX

Version 4 / GB
10200001954

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Revision Date: 13.09.2017
Print Date: 05.04.2018

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name VIVAX
Product code (UVP) 05927544

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use Growth regulator

1.3 Details of the supplier of the safety data sheet

Supplier Bayer CropScience Limited
230 Cambridge Science Park
Milton Road
Cambridge
Cambridgeshire CB4 0WB
United Kingdom

Telephone +44(0)1223 226500
Telefax +44(0)1223 426240
Responsible Department Email: ukcropsupport@bayer.com

1.4 Emergency telephone no.

Emergency telephone no. 00800 1020 3333 (24 hr)

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification in accordance with Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, as amended.

Corrosive to metals: Category 1

H290 May be corrosive to metals.

Acute toxicity: Category 3

H301 Toxic if swallowed.

Eye irritation: Category 2

H319 Causes serious eye irritation.

Chronic aquatic toxicity: Category 3

H412 Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling in accordance with Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, as amended.

Hazard label for supply/use required.

Hazardous components which must be listed on the label:

- Ethephon
- Chlormequat chloride



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Signal word: Danger

Hazard statements

- H290 May be corrosive to metals.
- H301 Toxic if swallowed.
- H319 Causes serious eye irritation.
- H412 Harmful to aquatic life with long lasting effects.
- EUH401 To avoid risks to human health and the environment, comply with the instructions for use.

Precautionary statements

- P234 Keep only in original container.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/ physician.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a POISON CENTER/doctor/ physician.
- P501 Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste.

2.3 Other hazards

No other hazards known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical nature

Soluble concentrate (SL)
Ethephon/Chlormequat chloride 150:300 g/l

Hazardous components

Hazard statements according to Regulation (EC) No. 1272/2008

Name	CAS-No. / EC-No. / REACH Reg. No.	Classification	Conc. [%]
		REGULATION (EC) No 1272/2008	
Ethephon	16672-87-0 240-718-3	Aquatic Chronic 2, H411 Skin Corr. 1C, H314 Acute Tox. 4, H332 Acute Tox. 4, H302 Acute Tox. 3, H311	13.40
Chlormequat chloride	999-81-5 213-666-4	Acute Tox. 3, H301 Acute Tox. 4, H312 Aquatic Chronic 3, H412	26.80

Further information



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For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice	Move out of dangerous area. Place and transport victim in stable position (lying sideways). Remove contaminated clothing immediately and dispose of safely.
Inhalation	Move to fresh air. Keep patient warm and at rest.
Skin contact	Wash off immediately with soap and plenty of water. Get medical attention if irritation develops and persists.
Eye contact	In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Ingestion	Do NOT induce vomiting. Keep at rest. Rinse mouth. Obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	Local:, Burns on skin and mucosal tissues Systemic:, Gastro-intestinal irritation, This product causes reversible cholinesterase inhibition without long term effects.
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4.3 Indication of any immediate medical attention and special treatment needed

Risks	Must NOT be confused with organophosphorus compounds!
Treatment	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. There is no specific antidote. Contraindication: atropine.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable	High volume water jet

5.2 Special hazards arising from the substance or mixture	In the event of fire the following may be released:, Carbon monoxide (CO), Hydrogen chloride (HCl), Nitrogen oxides (NOx)
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5.3 Advice for firefighters

Special protective equipment for firefighters	In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus.
Further information	Whenever possible, contain fire-fighting water by diking area with sand or earth. Do not allow run-off from fire fighting to enter drains or water courses.



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SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Precautions Keep people away from and upwind of spill/leak. Avoid contact with spilled product or contaminated surfaces. When dealing with a spillage do not eat, drink or smoke. Use personal protective equipment.

6.2 Environmental precautions Do not allow to get into surface water, drains and ground water. If spillage enters drains leading to sewage works inform local water company immediately. If spillage enters rivers or watercourses, inform the Environment Agency (emergency telephone number 0800 807060).

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. Clean contaminated floors and objects thoroughly, observing environmental regulations.

Additional advice Check also for any local site procedures.

6.4 Reference to other sections Information regarding safe handling, see section 7.
Information regarding personal protective equipment, see section 8.
Information regarding waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling No specific precautions required when handling unopened packs/containers; follow relevant manual handling advice. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion No special precautions required.

Hygiene measures When using, do not eat, drink or smoke. Avoid contact with skin, eyes and clothing. Remove soiled clothing immediately and clean thoroughly before using again. Keep working clothes separately. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers Store in original container. Store in a place accessible by authorized persons only. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from direct sunlight.

Advice on common storage Keep away from food, drink and animal feedingstuffs.

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Suitable materials HDPE (high density polyethylene)

7.3 Specific end use(s) Refer to the label and/or leaflet.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters**

Components	CAS-No.	Control parameters	Update	Basis
Ethephon	16672-87-0	1.4 mg/m ³ (TWA)		OES BCS*

*OES BCS: Internal Bayer AG, Crop Science Division "Occupational Exposure Standard"

8.2 Exposure controls

Refer to COSHH assessment (Control of Substances Hazardous to Health (Amendment) Regulations 2004). Engineering controls should be used in preference to personal protective equipment wherever practicable. Refer also to COSHH Essentials.

Personal protective equipment

In normal use and handling conditions please refer to the label and/or leaflet. In all other cases the following recommendations would apply.

Respiratory protection

Respiratory protection is not required under anticipated circumstances of exposure.

Respiratory protection should only be used to control residual risk of short duration activities, when all reasonably practicable steps have been taken to reduce exposure at source e.g. containment and/or local extract ventilation. Always follow respirator manufacturer's instructions regarding wearing and maintenance.

Hand protection

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Wash gloves when contaminated. Dispose of when contaminated inside, when perforated or when contamination on the outside cannot be removed. Wash hands frequently and always before eating, drinking, smoking or using the toilet.

Material Nitrile rubber

Rate of permeability > 480 min

Glove thickness > 0.4 mm

Protective index Class 6

Directive Protective gloves complying with EN 374.

Eye protection

Wear goggles (conforming to EN166, Field of Use = 5 or equivalent).

Skin and body protection

Wear standard coveralls and Category 3 Type 6 suit.

If there is a risk of significant exposure, consider a higher protective type suit.

Wear two layers of clothing wherever possible. Polyester/cotton or cotton overalls should be worn under chemical protection suit and should be professionally laundered frequently.

General protective measures

If product is handled while not enclosed, and if contact may occur:

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Complete suit protecting against chemicals

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**9.1 Information on basic physical and chemical properties**

Form	Liquid, clear to slightly turbid
Colour	colourless
pH	≤ 2 at 100 % (23 °C)
Flash point	> 104 °C
Ignition temperature	455 °C
Density	ca. 1.12 g/cm ³ at 20 °C
Water solubility	miscible
Partition coefficient: n-octanol/water	Ethephon: log Pow: -1.89 Chlormequat chloride: log Pow: -3.47
Viscosity, kinematic	1.709 mm ² /s at 40 °C
Surface tension	55.3 mN/m at 25 °C Determined in the undiluted form.
Oxidizing properties	No oxidizing properties
Explosivity	Not explosive
9.2 Other information	Further safety related physical-chemical data are not known.

SECTION 10: STABILITY AND REACTIVITY**10.1 Reactivity****Thermal decomposition** Stable under normal conditions.**10.2 Chemical stability** Stable under recommended storage conditions.**10.3 Possibility of hazardous reactions**No hazardous reactions when stored and handled according to prescribed instructions.
Corrodes aluminium.
Corrodes metals in the presence of water or moisture.
Risk of ethylene emission in case of increasing pH.



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- 10.4 Conditions to avoid** Extremes of temperature and direct sunlight.
- 10.5 Incompatible materials** Store only in the original container.
Aluminium, Mild steel, Copper, Zinc, Iron, Strong bases, Strong oxidizing agents
- 10.6 Hazardous decomposition products** No decomposition products expected under normal conditions of use.
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SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute oral toxicity LD50 (Rat) 1,000 mg/kg
LD50 (Human) 50 - 200 mg/kg
The value mentioned relates to the active ingredient chlormequat chloride.
Of high toxicity after single ingestion.

Acute inhalation toxicity Not relevant
During intended and foreseen applications, no respirable aerosol is formed.

Acute dermal toxicity LD50 (Rat) > 4,000 mg/kg
ATE (Mix) (Rabbit) > 2,000 mg/kg

Skin irritation No skin irritation (Rabbit)

Eye irritation Irritating to eyes. (Rabbit)

Sensitisation Non-sensitizing. (Mouse)
OECD Test Guideline 429, local lymph node assay (LLNA)

Assessment STOT Specific target organ toxicity – single exposure

Ethephon: Based on available data, the classification criteria are not met.

Chlormequat chloride: Based on available data, the classification criteria are not met.

Assessment STOT Specific target organ toxicity – repeated exposure

Ethephon did not cause specific target organ toxicity in experimental animal studies.

Chlormequat chloride did not cause specific target organ toxicity in experimental animal studies.

Assessment mutagenicity

Ethephon was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Chlormequat chloride was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

Assessment carcinogenicity

Ethephon was not carcinogenic in lifetime feeding studies in rats and mice.

Chlormequat chloride was not carcinogenic in lifetime feeding studies in rats and mice.

Assessment toxicity to reproduction

Ethephon did not cause reproductive toxicity in a two-generation study in rats.

Chlormequat chloride caused reproduction toxicity in generation studies in rats only at dose levels also toxic to the parent animals.

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Ethephon did not cause developmental toxicity in rats and rabbits.
Chlormequat chloride did not cause developmental toxicity in rats and rabbits.

Aspiration hazard

Based on available data, the classification criteria are not met.

SECTION 12: ECOLOGICAL INFORMATION**12.1 Toxicity**

Toxicity to fish	LC50 (Cyprinus carpio (Carp)) > 100 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient ethephon.
	LC50 (Cyprinus carpio (Carp)) > 100 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient chlormequat chloride.
Chronic toxicity to fish	Oncorhynchus mykiss (rainbow trout) NOEC: 43.1 mg/l Exposure time: 21 d The value mentioned relates to the active ingredient chlormequat chloride.
Toxicity to aquatic invertebrates	EC50 (Daphnia (water flea)) 55 mg/l Exposure time: 48 h
Chronic toxicity to aquatic invertebrates	NOEC (Daphnia magna (Water flea)): 2.44 mg/l Exposure time: 21 d The value mentioned relates to the active ingredient chlormequat chloride.
Toxicity to aquatic plants	EC50 (Raphidocelis subcapitata (freshwater green alga)) 13 mg/l Exposure time: 72 h The value mentioned relates to the active ingredient ethephon.
	EC50 (Desmodesmus subspicatus (green algae)) > 100 mg/l Exposure time: 96 h The value mentioned relates to the active ingredient chlormequat chloride.
	EC50 (Lemna gibba (gibbous duckweed)) > 1.6 mg/l Exposure time: 14 d The value mentioned relates to the active ingredient ethephon.
	EC10 (Lemna gibba (gibbous duckweed)) 0.21 mg/l The value mentioned relates to the active ingredient ethephon.

12.2 Persistence and degradability

Biodegradability	Ethephon: Not rapidly biodegradable
	Chlormequat chloride: rapidly biodegradable



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Koc Ethephon: Koc: 2540
Chlormequat chloride: Koc: 168

12.3 Bioaccumulative potential

Bioaccumulation Ethephon:
Does not bioaccumulate.
Chlormequat chloride: Bioconcentration factor (BCF) 0.01
Does not bioaccumulate.

12.4 Mobility in soil

Mobility in soil Ethephon: Slightly mobile in soils
Chlormequat chloride: Moderately mobile in soils

12.5 Results of PBT and vPvB assessment

PBT and vPvB assessment Ethephon: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Chlormequat chloride: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

12.6 Other adverse effects

Additional ecological information No other effects to be mentioned.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product In accordance with current regulations and, if necessary, after consultation with the site operator and/or with the responsible authority, the product may be taken to a waste disposal site or incineration plant. Advice may be obtained from the local waste regulation authority (part of the Environment Agency in the UK).

Contaminated packaging Small containers (< 10 l or < 10 kg) should be rinsed thoroughly using an integrated pressure rinsing device, or, by manually rinsing three times.
Add washings to sprayer at time of filling.
Dispose of empty and cleaned packaging safely.
Large containers (> 25 l or > 25 kg) should not be rinsed or re-used for any other purpose.
Return large containers to supplier.
Follow advice on product label and/or leaflet.

Waste key for the unused product **02 01 08*** agrochemical waste containing hazardous substances

SECTION 14: TRANSPORT INFORMATION

ADR/RID/ADN
14.1 UN number

2922



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14.2 Proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S. (ETHEPHON, CHLORMEQUAT CHLORIDE SOLUTION)
14.3 Transport hazard class(es)	8 (6.1)
14.4 Packing group	III
14.5 Environm. Hazardous Mark	NO
Hazard no.	86
Tunnel Code	E

This classification is in principle not valid for carriage by tank vessel on inland waterways. Please refer to the manufacturer for further information.

IMDG

14.1 UN number	2922
14.2 Proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S. (ETHEPHON, CHLORMEQUAT CHLORIDE SOLUTION)
14.3 Transport hazard class(es)	8 (6.1)
14.4 Packing group	III
14.5 Marine pollutant	NO
Segregation group according to 5.4.1.5.11.1	IMDG SEGREGATION GROUP 1 - ACIDS

IATA

14.1 UN number	2922
14.2 Proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S. (ETHEPHON, CHLORMEQUAT CHLORIDE SOLUTION)
14.3 Transport hazard class(es)	8 (6.1)
14.4 Packing group	III
14.5 Environm. Hazardous Mark	NO

UK 'Carriage' Regulations

14.1 UN number	2922
14.2 Proper shipping name	CORROSIVE LIQUID, TOXIC, N.O.S. (ETHEPHON, CHLORMEQUAT CHLORIDE SOLUTION)
14.3 Transport hazard class(es)	8 (6.1)
14.4 Packing group	III
14.5 Environm. Hazardous Mark	NO
Emergency action code	2X

14.6 Special precautions for user

See sections 6 to 8 of this Safety Data Sheet.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

No transport in bulk according to the IBC Code.

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

UK and Northern Ireland Regulatory References

This material may be subject to some or all of the following regulations (and any subsequent amendments). Users must ensure that any uses and restrictions as indicated on the label and/or leaflet



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are followed.

Transport

Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No 1348)
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 (SI 1997 No 2367)
Air Navigation Dangerous Goods Regulations 2002 (SI 2002 No 2786)

Supply and Use

Chemical (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No 716)
Chemical (Hazard Information and Packaging for Supply) (Northern Ireland) Regulations 2009
Control of Substances Hazardous to Health Regulations 2002 (SI 2002 No 2677)
EH40 Occupational Exposure Limits - Table 1 List of approved workplace exposure limits
Control of Pesticide Regulations 1986
Dangerous Substances and Explosive Atmospheres Regulations 2002

Waste Treatment

Environmental Protection Act 1990, Part II
Environmental Protection (Duty of Care) Regulations 1991
The Waste Management Licensing Regulations 1994 (as amended)
Hazardous Waste Regulations 2005 (Replacing Special Waste Regulations 1996 as amended)
Landfill Directive
Regulation on Substances That Deplete the Ozone Layer 1994 (EEC/3093/94)
Water Resources Act 1991
Anti-Pollution Works Regulations 1999

Further information

WHO-classification: II (Moderately hazardous)

15.2 Chemical safety assessment

A chemical safety assessment is not required.

SECTION 16: OTHER INFORMATION

Text of the hazard statements mentioned in Section 3

H301	Toxic if swallowed.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Abbreviations and acronyms

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute toxicity estimate
CAS-Nr.	Chemical Abstracts Service number
Conc.	Concentration

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EC-No.	European community number
ECx	Effective concentration to x %
EH40 WEL	Worker Exposure Limit
EINECS	European inventory of existing commercial substances
ELINCS	European list of notified chemical substances
EN	European Standard
EU	European Union
IATA	International Air Transport Association
IBC	International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)
ICx	Inhibition concentration to x %
IMDG	International Maritime Dangerous Goods
LCx	Lethal concentration to x %
LDx	Lethal dose to x %
LOEC/LOEL	Lowest observed effect concentration/level
MARPOL	MARPOL: International Convention for the prevention of marine pollution from ships
N.O.S.	Not otherwise specified
NOEC/NOEL	No observed effect concentration/level
OECD	Organization for Economic Co-operation and Development
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SI	Statutory Instrument
TWA	Time weighted average
UN	United Nations
WHO	World health organisation

The information contained within this Safety Data Sheet is in accordance with the guidelines established by Regulation (EU) 1907/2006 and Regulation (EU) 2015/830 amending Regulation (EU) No 1907/2006 and any subsequent amendments. This data sheet complements the user's instructions, but does not replace them. The information it contains is based on the knowledge available about the product concerned at the time it was compiled. Users are further reminded of the possible risks of using a product for purposes other than those for which it was intended. The required information complies with current EEC legislation. Addressees are requested to observe any additional national requirements.

The above information is intended to give general health and safety guidance on the storage and transport of the product.

It is not intended to apply to the use of the product for which purposes the product label and any appropriate technical usage literature available should be consulted and any relevant licenses, consents or approvals complied with.

The requirements or recommendations of any relevant site or working procedure, system or policy in force or arising from any risk assessment involving the substance or product should take precedence over any of the guidance contained in this safety data sheet where there is a difference in the information given.

The information provided in this safety data sheet is accurate at the date of publication and will be updated as and when appropriate.

No liability will be accepted for any injury, loss or damage resulting from any failure to take account of information or advice contained in this safety data sheet.

Reason for Revision: Section 2: Hazards Identification. Section 3: Composition / Information on Ingredients. Section 4: First Aid Measures. Section 11: Toxicological Information. Section 14: Transport Information.

Safety Data Sheet according to Regulation (EU) No. 2015/830. The following sections have been revised: Section 16: Other Information.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006



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Changes since the last version are highlighted in the margin. This version replaces all previous versions.