



## Safety Data Sheet (SDS) of Krop-Max™

### Section 1 – Chemical Product and Company Identification

Product name	Krop-Max™
Synonyms name	Cyanamide, Cyanoamine, Amidocyanogen, Hydrogen Cyanamide
Chemical Class	Organic chemical
Recommended Use	Plant growth regulator- for dormant spray
Company details Importer	Zhejiang Tide CropScience Co., Ltd. 21 Hubble, Irvine, CA 92618
EPA Reg. No.	80697-6
Emergency phone	CHEMTREC 1-800-424-9300 Zhejiang Tide CropScience Co., Ltd. 1-949-679-3535

### Section 2 – Hazard(s) Identification

**Classified as Hazardous according to criteria of the Hazard Communication Standard (HCS) or 29 CFR §1910.1200 (2012).**

**OSHA regulatory Status: This material is classified as hazardous under OSHA regulations.**

#### Classification of the substance or mixture:

Acute oral (Category 4)  
Acute Inhalation (Category 4)  
Acute dermal (Category 4)  
Eye irritation (Category 2A)  
Acute aquatic toxicity (Category 2)

#### Label elements

#### HCS labeling

#### Hazard pictograms (HCS)



**Signal Word:** WARNING

#### GHS Hazard Statements:

Harmful if swallowed  
Harmful in contact with skin  
Causes serious eye irritation



Harmful if inhaled  
Toxic to aquatic life

**Other hazard information:**

**NFPA Ratings:** Health-2 Flammability-0 Reactivity-1

**Signs and Symptoms of Systemic Effects:**

Causes substantial but temporary eye injury. Causes skin irritation. May be fatal if swallowed or if absorbed through skin. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

**Environmental hazards:**

Harmful to aquatic organisms.  
Toxic to terrestrial vertebrates.  
Toxic to bees.

**Section 3 - Composition /Information on Ingredients**

Active ingredient	CAS No.	Content (w/w,%)	ACIGH
Hydrogen Cyanamide	420-04-2	50%min.	2 mg/mP <sup>3</sup> (TWA)
Sodium phosphate	7558-80-7	2%max.	1 mg/m <sup>3</sup>
Other ingredient deemed not to be hazardous	Proprietary	Balance	-

**Section 4 – First-Aid Measures**

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact CHEMTREC at 1-800-424-9300 for emergency medical treatment information.

**If in eyes:**

Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye. If eye irritation persists: Get medical advice/attention.

**If on skin or Clothing:**

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Get medical advice/attention. Wash contaminated clothing before reuse.

**If inhaled:**

Remove person to fresh air and keep comfortable for breathing. If person is not breathing, call an ambulance, then give artificial respiration, preferably mouth –to-mouth, if possible. Call a POISON CENTER or doctor/physician if you feel unwell.

**If swallowed:**

Immediately call a POISON CENTER or doctor/physician if you fell unwell. Rinse mouth. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any thing by mouth to an unconscious person.

**Note to physician:**

Immediate lavage of stomach. Hydrogen cyanamide is not hydrogen cyanide and does not degrade to hydrogen cyanide. Do not induce vomiting or give anything by mouth to an unconscious person.

**Section 5 – Fire-Fighting Measures**



**Flashpoint:** No data applicable

**Combustible:** No

**OSHA Flammability Classification:** None

**Autoignition temperature:** Not determined

**Other flammable properties:** Burning will produce hazardous compounds including oxides of carbon, nitrogen, Burning/thermal decomposition will produce Hydrogen cyanide. Burning will produce fumes of ammonia.

**Extinguishing Media:** Solid stream of water may spread the fire. Do not use full jets of water. Use water spray of fog, foam, dry chemical or CO<sub>2</sub>.

**Firefighting Procedures:** Wear protective clothing and self-contained breathing apparatus.

## Section 6 - Accidental Release Measures

Steps to be taken in case of material is released or spilled: Ventilate area, Absorb spill with inert material and place in a chemical waste container. Obey relevant local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds ground water or sol.

**Personal protection:** Wear impervious gloves, eye protection and protective clothing.

**Containment and clean up:** Isolate spill area. Spills should be absorbed with sawdust, clay or sand, followed by disposal at a sanitary landfill. Rinse spill area with water.

## Section 7- Handling and Storage

### Handling:

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection. Remove contaminated clothing & wash before re-use.

Do not breathe vapor or mist. Do not get in eyes, on skin or clothing.

Avoid contact with acids, or bases.

Do not use when temperature is above 40°C.

Wash hands thoroughly after handling.

Avoid release to the environment.

Follow MSDS/Label precautions.

### Storage:

Store in cool and dry place not to exceed 68°F (20°C), away from alkaline, acidic and oxidizing materials.

Do not store near combustible materials and/or direct sunlight.

Keep container closed when not in use.

## Section 8 - Exposure Controls/Personal Protection

### Exposure limit values

Components.	CAS-No	Control parameters	Basis
Hydrogen Cyanamide	420-04-2	2 mg/m <sup>3</sup>	TWA, OSHA/ACGIH
Phosphoric acid	7558-80-7	1 mg/m <sup>3</sup>	TWA, OSHA/ACGIH

### Engineering controls:

**Closed Systems:** This product must be mixed, loaded, and transferred only in a closed system.



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**Closed Systems and Enclosed Cab Requirements (if applicable):** This product must be applied only with the applicator in an enclosed cab. When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**IMPORTANT:** When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment break-down.

The operating pressure of the spray rig shall be no more than 40 psi with the use of low pressure nozzles on dilute boom sprays and no more than 100 psi on air fan sprayers. Air fan sprayers should have the fan adjusted so that the spray mist does not greatly exceed the top of vines being sprayed.

**Personal protection:**

Some materials that are chemical-resistant to this product are barrier laminate, butyl rubber, nitrile rubber, and Viton. If you want more options, follow the instructions for category F on an EPA chemical-resistance category selection chart.

Follow OSHA recommended PPE standard (29CFR1910.132) be conducted before using this product. Follow Product label-personal protective equipment.

**Applicators, mixers, loaders and other handlers must wear:**

- Coveralls worn over short-sleeved shirt and short pants
- Chemical-resistant gloves made of any waterproof material such as barrier laminate, butyl rubber >14 mils, nitrile rubber > 14 mils, neoprene rubber > 14 mils, natural rubber > 14 mils, polyethylene, polyvinyl chloride (PVC) > 14 mils, or viton > 14 mils
- Chemical-resistant footwear plus socks
- Protective eyewear - persons who mix, load or transfer must wear goggles
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing, or loading

**User Safety Requirements:**

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Wash PPE after each day's use.

Do not consume alcoholic beverages prior to, during, or for 24 hours after handling this product.

**Respiratory protection:**

A NIOSH's respirator is required whenever work place conditions warrant respirator use.

**Eye Protection:**

Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent).



Tightly sealed goggle

**Skin Protection:** Use impermeable gloves and apron.



### Chemical resistant gloves

**Specific Hygiene Measures:** Handle in accordance with good industrial hygiene and safety practice. **Do not breathe vapor or mist.** Wearing of closed work clothing is recommended. Keep separated from food stuffs and feed stocks. Do not eat, drink or smoke when using this product. Hands and/or face should be washed before breaks and at the end of the shift. Store work clothing separately.

### Environmental controls

See Sections 6, 7, 12, 13.

## Section 9 - Physical and Chemical Properties

**Appearance:** Clear –light yellow liquid

**Odor:** Odorless

**Odor threshold:** No Data Available

**pH:** 4.0-6.0@ 20 °C

**Melting point/freezing point:** 45-46°C (Based on technical)

**Initial boiling point and boiling range:** 83°C (Based on technical)

**Flammability:** No flammable

**Explosibility:** Not have explosive characteristics.

**Evaporation rate:** No Data Available

**Vapor pressure:** 500mPa at 20°C (Based on technical)

**Vapor density:** No Data Available

**Density:** Kg/m<sup>3</sup> (g/ml) @ 20°C = 1.09 × 10<sup>3</sup> (1.09)

**Solubility:** Miscible in water

**Octanol/water partition coefficient:** K<sub>ow</sub>logP=-0.82 at 20°C (Based on technical)

**Auto-ignition temperature:** No Data Available

**Decomposition temperature:** No Data Available

**Viscosity:** 1.15 cSt/s at 20°C and 0.84 cSt/s at 40°C

**Specific heat:** J/Kg (Cal/g) @ 20°C = 3.77 × 10<sup>3</sup> (0.9)

These physical data are typical values based on material test but may vary from sample to sample. Typical values should not construed as a guaranteed analysis and any specific lot or as specification items.

## Section 10 - Stability and Reactivity

**Reactivity:** Product will not undergo polymerization

**Chemical Stability:** Store in cool and dry place not to exceed 68°F (20°C)

**Possibility of Hazardous reactions:** Will not occur under normal conditions.

**Conditions to avoid:** High temperature and direct sunlight

**Incompatibility materials:** Acids, basics, metals, alkalis, and combustible material.

**Hazardous decomposition products:** Ammonia

## Section 11 - Toxicological Information

**Exposure routes:** Eyes, skin, ingestion & inhalation.



### **Toxicity:**

**Acute oral, LD<sub>50</sub> (Rat):** 313 mg/Kg in females

May cause "Cyanamide Flush", a transitory intense redness in the face, headache, nausea, vertigo, tachycardia, hypotension, and respiratory distress. Corrosive and may cause severe and permanent damage to mouth, throat and stomach.

**Acute dermal, LD<sub>50</sub> (Rabbits):** 1,707 mg/Kg in males, >5,050 mg/Kg in females

**Acute dermal irritation (Rabbits):** Slightly irritating. Harmful if absorbed through the skin. Contact causes burning sensations, smarting, inflammation, burns and painful blisters.

**Acute eyes irritation (Rabbits):** Moderately irritating. May cause severe corneal damage or corrosion of eyes if not washed immediately and thoroughly.

**Inhalation, LC<sub>50</sub> (Rat):** Greater than 2.32mg/L in males and females.

Harmful if inhaled. If misted, causes irritation of mucous membranes, nose, eyes and throat. May cause coughing and difficulty in breathing. May cause excessive tear formation, coughing, wheezing short of breath, nausea and vomiting. Corrosive, may cause burns resulting in permanent damage.

**Skin sensitization (Guinea pigs):** Do not elicit sensitizing reaction in guinea pig

**Note:** Acute effects may be intensified by exposure to ethanol. Do not consume alcoholic beverages prior to, during and within 24 hours of handling the product.

### **Subchronic Toxicity (Based on technical):**

Hydrogen cyanamide by the oral route in rats caused hepatotoxicity (hydropic liver cell degeneration, individual liver cell degeneration, enlarged periportal hepatocytes with clumped cytoplasm, and bile duct proliferation), and thyroid toxicity (small follicular lumens without colloid, separated by proliferating epithelial cells and interfollicular cells). The lowest-observed-effect-level (LOEL) for hepatotoxicity (28 days) in rats was 4.6 mg/kg-day. The 28-day no-observed-effect-level (NOEL) for bile duct hyperplasia in rats dosed by gavage was 5 mg/kg-day. In the same 28-day gavage study, the LOEL for thyroid toxicity was 5 mg/kg-day. The 90 day NOEL for thyroid toxicity in rats exposed to hydrogen cyanamide in the diet was 0.8 mg/kg-day. Dogs also exhibited thyroid toxicity in response to hydrogen cyanamide by gavage. The NOEL (90 days) for thyroid toxicity (reduced plasma thyroxine levels) in dogs dosed with hydrogen cyanamide by gavage was 2 mg/kg-day. In the same study, the LOEL for testicular atrophy and oligospermia in the dog, was 0.6 mg/kg-day.

### **Chronic Toxicity (Based on technical):**

Hydrogen cyanamide was not oncogenic in the rat, but chronic exposure caused thyroid toxicity (reduced colloid and the formation of micro-follicles, reduced T3 and thyroxine levels in the plasma). The NOEL for thyroid toxicity in the rat was 1 mg/kg-day. Hydrogen cyanamide was oncogenic in the mouse, causing a significant, dose-related increase in granulosa-theca tumors in the ovary. In addition, hydrogen cyanamide caused nephrotoxicity (fibrosis and scarring, atrophic/basophilic tubules, and vacuolar degeneration and necrosis), chronic cystitis of the urinary bladder, hepatotoxicity (biliary proliferation and centrilobular hypertrophy) in the mouse. The NOEL for mouse hepatotoxicity was 29.5 mg/kg-day. The NOEL for mouse nephrotoxicity and chronic cystitis was 13.7 mg/kg-day. In dogs, hydrogen cyanamide caused thyroid toxicity (lower thyroxine levels), changed clinical chemistry indicating reduced over-all metabolism, testicular effects (neutrophil infiltration of testes, oligospermia), and clinical signs (tremors and excessive salivation). The NOEL for these effects in dogs was 0.2 mg/kg-day.

### **Genotoxicity (Based on technical):**

Hydrogen cyanamide was not mutagenic in the Ames test, and did not stimulate unscheduled DNA synthesis in vitro. It did induce chromosomal aberrations in Chinese hamster cells in vitro. However, it did not produce micronucleus formation in vivo. Thus, the genotoxic potential of hydrogen cyanamide is considered equivocal.

### **Reproductive Toxicity (Based on technical):**

Hydrogen cyanamide by gavage was not reported to cause any significant histomorphologic changes in parental rats or offspring associated with the treatments. No reproductive effects of hydrogen



cyanamide were reported in a study acceptable under FIFRA. The adult NOEL was 1.25 mg/kg-day for decrement in body weight. There was no NOEL for neonatal pup survival (days 0-4). The LOEL was 1.25 mg/kg-day. In an earlier, unacceptable study, dietary exposure to hydrogen cyanamide was reported to cause atrophic seminiferous tubules and interstitial cell proliferation in rats.

#### **Developmental Toxicity(Based on technical):**

In rabbits, the NOEL for maternal toxicity (significant decrement in weight gain) was 6 mg/kg-day. The NOEL for developmental toxicity (retinal folds) was 2 mg/kg-day. Hydrogen cyanamide by gavage caused an increased incidence of diaphragmatic hernias and depression of fetal body weights in rats. The NOEL for developmental effects in rats was 15 mg/kg-day. The maternal NOEL for clinical signs (hypoactivity, hunched posture, fecal and urine stains, protruding eyes, malocclusion, and chromodacryorrhea) in rats was 5 mg/kg-day.

## **Section 12 - Ecological Information**

### **Ecotoxicity:**

#### **Avian toxicity:**

Acute Oral LD<sub>50</sub>: 1,201 mg/Kg to northern bobwhite

#### **Aquatic organism toxicity:**

Acute EC<sub>50</sub>-96 hrs: 145.34 mg/L (*Oncorhynchus mykiss*)-Fish

Acute EC<sub>50</sub>-48 hrs: 6.24 mg/L (*Daphania*)

#### **Persistence and degradability:**

Not readily biodegradable. Cyanamide in water/sediment is moderately degradable. Evidence for inherent biodegradability. Biodegradable in the soil (sediment). Under acid conditions (pH < 4) BREAKER hydrolyses to urea, which is easily biodegradable

#### **Bioaccumulative potential:**

No bioaccumulation potential based on study results.

#### **Mobility in soil:**

Hydrogen cyanamide was only slightly mobile in soil.

## **Section 13 - Disposal Considerations**

Waste and empty container must be disposed of in accordance with local State, provincial Federal regulations and laws. Incineration is the preferred method.

Do not contaminate water, food or feed by disposal.

**Pesticide disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

#### **Container disposal:**

**5 gallon containers:** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Offer for recycling, if available. Dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**15 gallon containers:** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth



several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Offer for recycling, if available. Dispose of empty container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**55 gallon containers:** Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

## Section 14 - Transport Information

UN number;	2922
D.O.T. Shipping Name:	Corrosive liquid, Toxic, N.O.S.
Technical Shipping Name:	Hydrogen Cyanamide 50% solution
Packing Group:	III
D.O.T. Hazard Class:	8
Marine pollutant	No
Hazard subclasses	6.1

## Section 15 - Regulatory Information

### FIFRA –

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. The following is the hazard information as required on the pesticide label:

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### WARNING

Causes substantial but temporary eye injury. Causes skin irritation. May be fatal if swallowed or if absorbed through skin. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.

#### ENVIRONMENTAL HAZARDOUS

Do not apply this product to any area in which an endangered species has been identified or in such a manner that drift from applications of this product could result in destroying an endangered species. This limitation applies only to areas that have been identified by and are protected by State and Federal agencies. Do not apply closer than 300 yards to the mean high water mark for intertidal areas or closer than 300 yards to surface water. Do not apply to crops growing closer than 300 yards to rivers, streams, or their flowing tributaries. Do not contaminate water by the cleaning of equipment or disposal of equipment washwater or rinsate. Do not apply when weather conditions favor drift from treated areas or where runoff is likely to occur. Do not spray when bees are active in the field.

This chemical can contaminate surface water through ground spray applications. Under some conditions it may also have a high potential for runoff into surface water after application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters,





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frequently flooded areas, areas overlaying extremely shallow ground water, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters by vegetated filter strips, and areas overlaying tile drainage systems that drain to surface water. This pesticide is highly toxic to freshwater invertebrates and moderately toxic to birds and mammals. Drift and runoff may be hazardous to aquatic organisms in neighboring areas.

#### US Federal Regulations

**TSCA list** TSCA 8(b) inventory: Cyanamide

**SARA Title III - section 302 - notification and information** None

**SARA Title III - section 313 - toxic chemical release reporting** None

**SARA Title III - section 311/312 - hazard identification**

Acute health hazardous

This product contains none of the components listed as Extremely Hazardous substances.

#### OSHA Hazardous Components:

Phosphoric acid: 7558-80-7

#### US States Regulatory Reporting

##### CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

#### State information:

Illinois toxic substances disclosure to employee act: Cyanamide

Rhode Island RTK hazardous substances: Cyanamide

Pennsylvania RTK: Cyanamide

Florida: Cyanamide

Minnesota: Cyanamide

Massachusetts RTK: Cyanamide

New Jersey: Cyanamide

Other state regulations may apply. Check individual state requirements.

#### Canadian Regulations

CAS# 420-04-2 is listed on Canada's DSL List

#### Environmental

**CERCLA** None

**WGK (Water Danger/Protection)** CAS# 420-04-2: 2

**Safe Drinking Water Act Maximum Contaminant Levels** None

**RCRA CLASSIFICATION:** Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. None

#### Section 16 - Other Information

SDS# ZTCS-PGR806876

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Revised for:

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