1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **CottonQuik® Cotton Harvest Aid/Defoliant**
EPA Reg. No.: 228-607
Synonyms: Mixture of Urea Sulfate and Ethephon
Product Type: Harvest Aid/Defoliant

Company Name: Nufarm Americas Inc.
150 Harvester Drive, Suite 200
Burr Ridge, IL 60527

Telephone Numbers: **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, Call CHEMTREC Day or Night: 1-800-424-9300**
For Medical Emergencies Only, Call 1-877-325-1840

Date of Issue: March 22, 2010 **Supersedes:** March 16, 2010
Sections Revised: 11

2. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance and Odor: Clear, yellow-orange or pink colored liquid.
Warning Statements: Danger. Keep out of reach of children. Corrosive, causes irreversible eye damage. Harmful if swallowed, inhaled or absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin, eye or clothing. Avoid breathing spray mist.

Potential Health Effects:
Likely Routes of Exposure: Inhalation, eye and skin contact.
Eye Contact: Corrosive, causes irreversible eye damage. Vapors and mists can cause irritation, redness, tearing and possible swelling of the conjunctiva.
Skin Contact: Slightly toxic and moderately irritating to skin based on toxicity studies.
Ingestion: Harmful if swallowed. May cause severe irritation of the mouth, throat, esophagus and stomach with severe abdominal and chest pain.
Inhalation: Low inhalation toxicity based on toxicity studies. Sprays (mists) are irritating to the respiratory tract. Signs and symptoms may include choking, coughing, burning of the throat.
Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:
This product may be harmful to wildlife directly sprayed.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Urea Sulfate	21351-39-3	58.6
Ethephon	16672-87-0	18.3
Other Ingredients		23.1

4. FIRST AID MEASURES

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
If on Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.
If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
Note to Physician: There is no specific antidote. Treat symptomatically. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Acid ingestion may cause gastroesophageal perforation. Perforation may occur within 72 hours, but along with abscess formation, may occur weeks later. Due to the corrosive property of this material, amesis is contraindicated. Probable mucosal damage may contraindicate the use of gastric lavage. The use of alkaline substances to neutralize the acid is contraindicated. Victims of severe overexposure by inhalation should be kept under medical observation for up to 72 hours for delayed onset of pulmonary edema.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable – noncombustible
Autoignition Temperature: Not determined **Flammability Limits:** Not determined

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
Unusual Fire and Explosion Hazards: Containers will burst from internal pressure under extreme fire conditions. Dilute product in contact with common metals can generate hydrogen, which can form flammable mixtures with air. If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.
Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride, oxides of carbon and reactions with bases cause evolution of ethylene gas.

National Fire Protection Association (NFPA) Hazard Rating:
Rating for this product: Health: 3 **Flammability:** 1 **Reactivity:** 1
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

Handling:
Do not get in eyes or on clothing. Avoid contact with skin, eye or clothing. Avoid breathing spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Do not allow this product to be headed above 176°F, as the quality of the product may deteriorate. If this product is heated above 230°F, vigorous decomposition may occur. Do not weld equipment containing this product.

This product can attack cotton, nylon and leather clothing. If this product contacts clothing of this type, flush with plenty of water to minimize damage.

Do not mix with materials containing chlorates as this could result in the formation of hypochlorous acids which on heating will emit toxic chorine fumes.

Storage:
Material crystallizes below 32°F. Do not heat above 176°F. Materials recommended for use with this product include polyethylene, polypropylene, PVC, CPVC, fiberglass made with reinforced resins such as polyesters and epoxides, most rubbers and 316 stainless steel. Do not expose mild steel, leather, nylon or acid sensitive resins such as delrin and celcon to undiluted material. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear face shield, goggles or safety glasses with front, brow and temple protection. An emergency eyewash or water supply should be readily accessible to the work area.
Skin Protection: To avoid contact with skin wear long-sleeved shirt, long pants, shoes plus socks and chemical-resistant gloves. An emergency shower or water supply should be readily accessible to the work area.
Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	TWA	STEL	TWA	STEL	Unit
Urea Sulfate	NE	NE	NE	NE	
Ethephon	NE	NE	NE	NE	

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear, yellow-orange colored liquid.

Boiling Point:	Not determined	**Solubility in Water:**	Soluble
Density:	12.4 pounds/gallon	**Specific Gravity:**	1.49 @ 20°C
Evaporation Rate:	Not determined	**Vapor Density:**	Not determined
Freezing Point:	Not determined	**Vapor Pressure:**	Not determined
pH:	< 2 (1% solution)	**Viscosity:**	47.32 cPs @ 20°C

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Chemical Stability: This material is stable under normal handling and storage conditions.
Conditions to Avoid: Do not allow product to be heated above 176°F, as the quality of the product may deteriorate. If this product is heated above 230°F, vigorous decomposition may occur. Do not weld equipment containing this product.
Incompatible Materials: Concentrated oxidizing agents and alkaline materials. Corrosive to metals such as iron, aluminum and copper. Do not mix with materials containing chlorates as this could result in the formation of hypochlorous acids which on heating will emit toxic chlorine fumes.
Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride, oxides of carbon and reactions with bases cause evolution of ethylene gas.
Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:
Data from laboratory studies on this product are summarized below:

Oral: Rat LD_{50}: >500 and <5,000 mg/kg
Dermal: Rabbit LD_{50}: >2,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.05 mg/L
Eye Irritation: Rabbit: Corrosive/severely irritating
Skin Irritation: Rabbit: Moderately irritating
Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Subchronic (Target Organ) Effects: Repeated overexposure to ethephon may cause cholinesterase inhibition, red blood cell effects and/or kidney effects. Repeated overexposure to urea sulfate may affect the lungs.
Carcinogenicity / Chronic Health Effects: Prolonged overexposure to ethephon may cause cholinesterase inhibition, body weight decreases and organ effects (thyroid, kidney and liver). Ethephon did not cause cancer in laboratory animal studies. No known carcinogenicity risks associated with urea sulfate.
Reproductive Toxicity: Ethephon caused decreased pup body weights at the highest does in a two generation study in rats. No effects were observed on fertility, gestation, mating, organ weights or histopathology. No known risks associated with urea sulfate.
Developmental Toxicity: Ethephon did not cause developmental effects in animals No known risks associated with urea sulfate.
Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that ethephon is not genotoxic or mutagenic. No known risks associated with urea sulfate.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Urea Sulfate:

96-hour LC_{50} Threespine sickleback	62.8 mg/l	Bobwhite Quail 8-day Dietary LC_{50}:	>5,620 ppm
48-hour EC_{50} Daphnia:	35 mg/l	Mallard Duck 8-day Dietary LC_{50}:	>5,620 ppm
Honey Bee LD_{50}:	>100 ug/bee		

Data on Ethephon (75%):

96-hour LC_{50} Fathead Minnow:	88 mg/L	Bobwhite Quail Oral LD_{50}	596 mg/kg
48-hour EC_{50} Daphnia:	54 ppm	Mallard Duck 8-day Dietary LC_{50}:	>5,000 ppm

Environmental Fate:

Urea sulfate rapidly dissociates to urea and sulfuric acid and/or sulfate ions. Biodegradation is expected to be the major fate process for urea, producing ammonia and CO_2. Sulfuric acid can acidify soil or water ecosystems. Ethephon is stable to hydrolysis in acidic water, but does rapidly hydrolyze in neutral and alkaline environments with a half-life ranging from a few days to a few weeks. Ethephon is stable to photolysis in water with an estimated half-life of 139 days. Photodegradation on soil does not appear to be a significant route of dissipation. Ethephon degrades fairly rapidly in soil under aerobic and in water under anaerobic conditions with half-life ranging from 7 to 30 days. Ethephon is characterized as having moderate to low mobility in soil.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticide wastes may be acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions. Contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: 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 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment 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. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure 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 1/4 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. Turn the container over onto its other 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. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: 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 a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT
UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (UREA SULFATE AND ETHEPHON) 8, III

IMDG
UN 3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (UREA SULFATE AND ETHEPHON) 8, III

IATA
Non Regulated

15. REGULATORY INFORMATION

U.S. Federal Regulations:

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):
Immediate and Corrosive

Section 313 Toxic Chemical(s):
None

Reportable Quantity (RQ) under U.S. CERCLA:
None

RCRA Waste Code:
None

State Information:
Other state regulations may apply. Check individual state requirements.

California Proposition 65: Not Listed

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

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