1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: CutOut™ Cotton Defoliant
Synonyms: Mixture of Thidiazuron and Diuron SC
Product Type: Cotton Defoliant
EPA Reg No.: 228-678

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

Date of Issue: April 10, 2012
Supersedes: February 9, 2011
Sections Revised: 2, 3, 4, 5, 6, 7, 13

2. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance and Odor: Milky off-white liquid suspension concentrate with a faint amine-like odor.
Warning Statements: CAUTION. Keep out of reach of children. Harmful if swallowed, absorbed through the skin or if inhaled. Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist.

Potential Health Effects:
Likely Routes of Exposure: Ingestion, inhalation, eye and skin contact.
Eye Contact: Minimally irritating based on toxicity studies. Degree of injury will depend on the amount of material that gets into eye and the speed and thoroughness of first aid treatment.
Skin Contact: Minimally toxic and minimally irritating based on toxicity studies. Prolonged or repeated skin contact may cause irritation.
Ingestion: Low toxicity if swallowed based on toxicity studies.
Inhalation: Low inhalation toxicity based on toxicity studies. Inhalation of dust may irritate the respiratory tract. Prolonged vapor or spray mist inhalation can cause central nervous system effects.
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 chemical has properties and characteristics associated with chemicals detected in groundwater. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

See Section 12: ECOLOGICAL INFORMATION for more information.
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS NO.</th>
<th>% BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thidiazuron (N-phenyl-N’-1,2,3-thidiazol-5-y lurea)</td>
<td>51707-55-2</td>
<td>12.0</td>
</tr>
<tr>
<td>Diuron (3-(3,4-Dichlorophenyl)-1,1-dimethylurea)</td>
<td>330-54-1</td>
<td>6.0</td>
</tr>
<tr>
<td>Other Ingredients</td>
<td></td>
<td>82.0</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

If on Skin or Clothing: 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 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.
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 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.

5. FIRE FIGHTING MEASURES

Flash Point (TCC): > 107°C (>225°F)
Autoignition Temperature: Not applicable Flammability Limits: Not applicable

Extinguishing Media: Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Evacuate nonessential personnel to prevent exposure to fire, smoke, fumes or products of combustion and fight fire upwind from a safe distance to avoid hazardous vapors and decomposition products. Fire exposed containers can build up pressure and should be kept cool with water spray if possible. Explosive vapor could form from ruptured containers. Equipment and materials involved in fire may be contaminated. 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. Use water spray cautiously and do not use solid water stream as it may scatter and spread fire. Cool closed containers exposed to fire with water spray.
Unusual Fire and Explosion Hazards: If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.
Hazardous Decomposition Materials (Under Fire Conditions): May thermally decompose at high temperatures. Thermal decomposition may produce aldehydes and oxides of nitrogen, sulfur and carbon.

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

6. ACCIDENTAL RELEASE MEASURES

Clean up spills immediately observing the precautions in Section 8 of this MSDS.
Personal Precautions: Avoid breathing spray mist and avoid skin contact. Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
Environmental Precautions: Prevent material from entering soil, public sewer systems, waterways, low areas, or to contact vegetation. 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:** Control spill at the source and dike spill using absorbent or impervious materials such as earth, sand or clay. Cover entire spill with absorbing material and place into compatible disposal containers. Collect and contain contaminated absorbent and dike material for disposal. Once all material is cleaned up and placed in disposal containers, seal the containers and arrange for disposition.

**Methods for Cleanup and Disposal:** Scrub the area with strong detergent and water and dilute alkaline solutions of soda ash or lime. Pick up wash liquid with absorbent and place into disposal containers. 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:**
Harmful if swallowed, absorbed through skin or if inhaled. Avoid contact with skin, eyes, or clothing. Avoid breathing spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**Storage:**
Store product in original container only and keep closed. Store in a cool, dry place. Do not use or store near heat or open flame. 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 chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

**Skin Protection:** To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. A chemical-resistant apron should be worn when cleaning equipment, mixing or loading. 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:**

<table>
<thead>
<tr>
<th>Component</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>OSHA STEL</th>
<th>ACGIH STEL</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thidiazuron</td>
<td>10</td>
<td>NE</td>
<td>NE</td>
<td>NE</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Diuron</td>
<td>NE</td>
<td>NE</td>
<td>10</td>
<td>NE</td>
<td>mg/m³</td>
</tr>
</tbody>
</table>

NE = Not Established
9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance and Odor:** Milky off-white liquid suspension concentrate with a faint amine-like odor.

**Boiling Point:** Not applicable

**Density:** 1.073 g/mL

**Evaporation Rate:** Not applicable

**Freezing Point:** Not applicable

**Melting Point:** Not available

**pH:** 6 – 7 (1% solution)

**Solubility in Water:** Not available

**Specific Gravity:** 1.019

**Vapor Density:** Not applicable

**Vapor Pressure:** Not applicable

**Freezing Point:** Not applicable

**Vapor Pressure:** Not applicable

**Vapor Pressure:** Not applicable

**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:** Excessive heat. Do not store near heat or flame.

**Incompatible Materials:** Strong alkalis.

**Hazardous Decomposition Products:** Thermal decomposition may produce aldehydes and oxides of hydrogen, nitrogen, sulfur and carbon.

**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$_{50}$: >5,000 mg/kg (female) and 4,721 mg/kg (male)

**Dermal:** Rabbit LD$_{50}$: >2,000 mg/kg

**Inhalation:** Rat 4-hr LC$_{50}$: >2.40 mg/L

**Eye Irritation:** Rabbit: Moderately irritating

**Skin Irritation:** Rabbit: Slightly irritating.

**Skin Sensitization:** Not a contact sensitizer in guinea pigs following repeated skin exposure.

**Subchronic (Target Organ) Effects:** Repeated overexposure to thidiazuron may cause reduced body weight gains. Repeated overexposure to diuron may cause reduced body weight gain, enlarged spleen, increased liver and kidney weights, and effects to blood, bladder and kidney.

**Carcinogenicity / Chronic Health Effects:** Prolonged overexposure to thidiazuron may cause reduced body weight gains and transient hemolytic anemia. Studies in both rats and mice produced no treatment-related increases in tumor incidence. Chronic effects from diuron in blood, bladder and kidney. In animal studies with diuron, an increase in urinary bladder tumors in rats and an increase of mammary tumors in mice were observed at doses in excess of 600 mg/kg/day.

**Reproductive Toxicity:** In animal studies, either thidiazuron or diuron did not demonstrate or cause reproductive effects.

**Developmental Toxicity:** In rat and rabbit studies, thidiazuron did not cause development effects. Diuron did not cause developmental effects in rabbits. In rat studies, effects were observed only at maternally toxic dose levels.

**Genotoxicity:** Neither in vitro nor in vivo tests on thidiazuron demonstrated mutagenic or genotoxic effects. Studies indicate that diuron did not produce genetic damage in mammalian or bacterial cell cultures or in animal studies.

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

See Section 2: HAZARDS IDENTIFICATION for more information.
12. ECOLOGICAL INFORMATION

Ecotoxicity:
Data on Thidiazuron Technical:
- 96-hour LC₅₀ Bluegill: >32 mg/l
- 96-hour LC₅₀ Rainbow Trout: >19 mg/l
- 48-hour EC₅₀ Daphnia: 10 mg/l
- 96-hour LC₅₀ Mysid: 3.2 mg/l

Ecotoxicity:
Data on Diuron Technical:
- 96-hour LC₅₀ Bluegill: 2.8 mg/l
- 96-hour LC₅₀ Rainbow Trout: 1.95 mg/l
- 96-hour LC₅₀ Fathead Minnow: 14.2 mg/l
- 48-hour EC₅₀ Daphnia: 1.4 ppm

Environmental Fate:
Thidiazuron is persistent in soil with a typical half-life of one year. Adsorption of thidiazuron in soil is related to soil organic matter. Based on relatively low octanol/water portioning coefficient, thidiazuron is not expected to bioconcentrate. In water, photolysis is expected to be the major route of degradation. Diuron is mobile and very persistent in soils. Binding of diuron to soil is highly correlated with soil organic matter. The average half-life in soils ranges from months to a year. The major route of dissipation for diuron in the environment is microbial degradation. Diuron also degrades through photolysis in both water and soil, but at a slower rate.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:
Pesticide wastes are 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 ¼ 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. 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. Then offer for recycling if available, 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.

**Refillable 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 a mix tank. Fill the container about 10% full with 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**

< 119 gallons per completed package:

Non Regulated

≥119 gallons per completed package:

UN 3082, Environmentally hazardous substance, liquid, n.o.s., (Thidiazuron), 9, III, RQ,(Diuron), Marine Pollutant

**IMDG**

UN 3082, Environmentally hazardous substance, liquid, n.o.s., (Thidiazuron), 9, III, RQ,(Diuron), Marine Pollutant

**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, Delayed.

**Section 313 Toxic Chemical(s):**

Duron (CAS No. 330-54-1)

**Reportable Quantity (RQ) under U.S. CERCLA:**

Duron (CAS No. 330-54-1) 100 pounds

**RCRA Waste Code:**

None

**State Information:**

Other state regulations may apply. Check individual state requirements.

**California Proposition 65:** Listed. WARNING. This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

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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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