MATERIAL SAFETY DATA SHEET

Emergency Phone: Chemtrec 800-424-9300  
Effective Date: July 1, 2013

New

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Willowood Glufosinate 280SL
CHEMICAL NAME: Glufosinate Ammonium
CHEMICAL FAMILY: Phosphinic Acid Herbicide
IUPAC CHEMICAL NAME: 2-amino-4-(hydroxymethylphosphinyl)butyric acid–monoammonium salt

COMPANY IDENTIFICATION:
Willowood USA, LLC
1600 NW Garden Valley Blvd., Suite 120
Roseburg, Oregon, 97471
Telephone: 877-679-9963

EPA REGISTRATION NUMBER: 87290-41

Warning - May be fatal if absorbed through the skin. May cause substantial, but temporary, eye injury. Harmful if swallowed. Restricted to professional users.

2. HAZARDS IDENTIFICATION

HAZARDS TO HUMANS AND DOMESTIC ANIMALS: Avoid contact with skin or clothing. Can be fatal if absorbed through the skin. May cause skin or eye irritation. Harmful if swallowed.

ENVIRONMENTAL HAZARDS: This product is toxic to aquatic invertebrates and wildlife. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Components

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>EINECS No.</th>
<th>Average % By Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glufosinate Ammonium</td>
<td>77182-82-2</td>
<td>278-636-5</td>
<td>24.5%</td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td>75.5%</td>
</tr>
</tbody>
</table>

Total 100.0%

4. FIRST AID

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact the National Pesticides Information Center (NPIC) at 1-800-858-7378 seven days a week, 6:30 am to 4:30 pm Pacific Time or your poison control center at 1-800-222-1222.

IF ON SKIN OR CLOTHING: Call a poison control center or doctor for treatment advice. Take off contaminated clothing. Rinse skin immediately with water for 15-20 minutes.
IF IN THE EYES: Hold the eyelids open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, and then continue rinsing the eyes. Call a poison control center or doctor for treatment advice.

IF SWALLOWED: Call a poison control center or doctor immediately for treatment advice. Have the exposed person sip a glass of water if he or she is conscious and is able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

IF INHALED: Move the exposed person to fresh air. If the person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth. Call a poison control center or doctor for further treatment advice.

NOTE TO PHYSICIAN: Vomiting may cause suffocation. Treat symptomatically and give supportive therapy. There is no specific antidote.

5. FIRE-FIGHTING MEASURES

Flash Point: Ö200°F (93 °C)

Fire and Explosion Hazards: Thermal decomposition can produce oxides of nitrogen, sulfur, and carbon. Pesticide particulates may become airborne in a fire.

Means of Extinction: Use foam, dry chemical, carbon dioxide, or water spray.

Fire Fighting Instructions: Evacuate area and fight fire upwind a safe distance to avoid hazardous vapors and decomposition products. Use as little water as possible and use spray or fog and avoid heavy hose streams to prevent runoff. Dike and collect water used to fight fire to prevent environmental damage due to runoff. Foam or dry chemical extinguishing systems are preferred to prevent environmental damage due to runoff.

Firefighting Equipment: Wear a self-contained breathing apparatus with full face piece.

Hazardous Combustion Products: Oxides of nitrogen, sulfur, and carbon.

6. ACCIDENTAL RELEASE MEASURES

Clean up spills immediately observing the precautions in Section 8 of this MSDS. Isolate the hazard area and keep unnecessary and unprotected personnel from entering. Prevent material from contaminating soil or from entering sewage and drainage systems and bodies of water. Transfer liquids and solid diking materials to separate suitable containers for recovery or disposal.

7. HANDLING AND STORAGE

Do not get on skin, in the eyes, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

Keep from freezing. Store above 32°F (0 °C) and below 120 °F (49 °C.) Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, water, food, and feed. Store in original container and out of the reach of children, preferably in a locked storage area.

Avoid exposure to direct sunlight.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Facilities storing or utilizing this material should be equipped with an eyewash station and a safety shower.

PROTECTIVE CLOTHING: Wear chemically resistant gloves (e.g. nitrile, butyl, or neoprene.) Wear a long-sleeved shirt, long pants and socks and shoes. Wear goggles or a face shield.
GENERAL: Wash thoroughly with soap and water after handling. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing and PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Liquid
COLOR: red
ODOR: Slightly pungent odor
FLASH POINT: ≥200°F (93 °C)
pH: 6.5 - 7.5
DENSITY: 1.15 g/cm³
SOLUBILITY IN WATER: Solubility ≥1.0 g/L

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Freezing temperatures and contact with ignition sources. Temperatures above 120 °F (49 °C). Exposure to sunlight.
CHEMICAL STABILITY: Stable under normal use and storage conditions.
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may yield oxides of nitrogen, phosphorus, and carbon.
INCOMPATIBILITY WITH OTHER MATERIALS: Oxidizing agents.
POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY - Oral LD₅₀ (female rat): > 300 mg/kg
ACUTE DERMAL TOXICITY - Dermal LD₅₀ (male rat): > 1,400 mg/kg
ACUTE INHALATION TOXICITY - Inhalation LC₅₀ (rat): > 2.0 mg/L (4-hour)
EYE IRRITANT - Rabbit: Moderate to Severe irritation.
SKIN IRRITATION - Rabbit: Slight irritation
SENSITIZATION - Guinea Pig: Sensitizing
CARCINOGENICITY:
- ACGIH: Not listed
- IARC: Not listed
- NTP: Not listed
- OSHA: Not listed
- EPA: No evidence of carcinogenicity has been found in extensive rat and mice feeding studies
MUTAGENIC DATA: No evidence of mutagenic effects during in vivo and in vitro assays.
ADDITIONAL DATA: Not known to cause reproductive or birth defects in rats at normal exposure levels.

12. ECOLOGICAL INFORMATION

Glufosinate 280SL is highly toxic to aquatic plants and to some aquatic invertebrates but only slightly toxic to fish. It is relatively nontoxic to animals, birds, and honeybees. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wash water.
AQUATIC TOXICITY
Rainbow Trout (LC_{50}): \geq 700 \text{mg/L (96 hour)}
Water Flea (Daphnia magna (EC_{50}): \geq 500 \text{mg/L (48 hour)}
Desmodesmus (EC_{50}): \geq 35 \text{mg/L (72 hour)}
Glufosinate 280SL is slightly toxic to fish and moderately toxic to aquatic invertebrates.

AVIAN TOXICITY
Bobwhite Quail (LD_{50}): > 5,000 \text{mg/kg}
Mallard Duck (LC_{50}): > 5,620 \text{mg/kg}
Glufosinate 280SL is practically non-toxic to birds.

Glufosinate 280SL is practically non-toxic to mammals and insects

Avoid using in locations or under conditions where runoff or drift could expose water bodies to Glufosinate 280SL contamination.

13. DISPOSAL CONSIDERATIONS
Do not contaminate water, food, or feed by disposal.
PESTICIDE DISPOSAL: Pesticide wastes are toxic. 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 DISPOSAL: Non-refillable container. Do not reuse or refill Glufosinate 280SL containers. Triple rinse the container promptly after emptying it. Recycling of empty containers is recommended. Refer to the product label for specific instructions.

14. TRANSPORT INFORMATION
Under 49CFR, Glufosinate 280SL is not listed as a hazardous material.
US DOT (ground) SHIPPING NAME: Not regulated for ground transportation. UN Number 2902; DG Class 6.1; Packing Group III.
IATA (air) SHIPPING NAME: Not regulated for air transportation. UN Number 2902; DG Class 6.1; Packing Group III.
IMO (water) SHIPPING NAME: Not regulated for ocean transportation. UN Number 2902; DG Class 6.1; Packing Group III.

15. REGULATORY INFORMATION
FIFRA – All pesticides are governed under the Federal Insecticide, Fungicide, and Rodenticide Act. The regulatory information presented below is pertinent only when this product is handled outside of the normal use and application as a pesticide.
SARA Title III – Section 302 Extremely Hazardous Substances - None
SARA Title III – Section 311/312 Hazard Categories - None
SARA Title III – Section 312 Threshold Planning Quantity - None
SARA Title III – Section 313 Reportable Ingredients - None
CERCLA ñ None
CALIFORNIA PROP 65 STATUS ñ None
16. OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by CPR.

National Fire Protection Association (NFPA)
Hazardous Materials Identification System (HMIS)

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Least</td>
</tr>
<tr>
<td>1</td>
<td>Slight</td>
</tr>
<tr>
<td>2</td>
<td>Health</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>Severe</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Slight</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>H</td>
<td>PPE</td>
</tr>
<tr>
<td>0</td>
<td>Reactivity</td>
</tr>
</tbody>
</table>

RISK PHRASES: R20, Harmful by inhalation; R21, Harmful in contact with skin; R22, harmful if swallowed; R36, Irritating to eyes; R51, Toxic to aquatic organisms.

SAFETY PHRASES: S2, Keep out of reach of children; S9, Keep container in a well-ventilated place; S23, Do not breathe vapors; S24, Avoid contact with skin; S25, Avoid contact with eye; S36, Wear suitable protective clothing; S37, Wear suitable gloves; S38, In case of insufficient ventilation, wear suitable respiratory equipment; S39, Wear eye/face protection; and S62, If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

REASON FOR ISSUE: New
APPROVAL DATE: July 1, 2013
PREPARED BY: Jack Firkins

ABBREVIATIONS

ACGIH American Conference of Governmental Industrial Hygienists
AICS Australian Inventory of Chemical Substances
CAS# Chemical Abstract Service Number
CERCLA Comprehensive Environmental Response Compensation and Liability Act
°C Celsius temperature scale
CI China
DSL Canada Domestic Substances List
ECL Korean Existing Chemicals List
EEC European Economic Commission
ENCS Japanese existing Chemical List
EINECS # European Inventory of Existing Chemical Substance Number
EU European Union
FIFRA Federal Insecticide, Fungicide, and Rodenticide Act
(IIsrael) 2001 proposed list of chemical substances to be regulated under Israel Hazardous Substances Law and Regulations List of 1993
IARC International Agency for Research on Cancer
MAC Netherlands
MAK  Germany
MITI  Ministry of International Trade and Industry
NA   Not Applicable
ND   Not Determined
NE   Not Established
NIOSH National Institute of Occupational Safety and Health
NPIC National Pesticide Information Center
NTP  National Toxicology Program
OSHA Occupational Safety and Health Act
PICCS Philippines
PPE  Personal Protective Equipment
Prop Proprietary
SARA Superfund Amendments and Reauthorization Act
SWISS Giftliste 1 and Inventory of Notified New Substances
TSCA Toxic Substances Control Act
(Taiwan) List of Toxic Chemical Substances regulated under Taiwan Toxic Chemical Substances Control Act of November 26, 1986
UK   United Kingdom
USA  United States of America

Disclaimer
This information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Willowood, LLC be liable for any claims, losses or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if company has been advised of the possibility of such damages.