MATERIAL SAFETY DATA SHEET
Weed-Master™ Glyphosate Forestry Herbicide

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1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name: Weed-Master Glyphosate Forestry Herbicide

Telephone Number in Canada: (250) 924-8080
Fax Number in Canada: (855) 295-6600
Emergencies: CANUTEC (613) 996-6666
Other information in Canada: (250) 924-8080
Address: TeraGro Inc.
    P.O. Box 192
    Ladysmith, B.C. V9G 1A2
    www.teragro.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

2.1. ACTIVE INGREDIENT: 
Glyphosate, in the form of its isopropylamine salt

Common Name ....................... Glycine, N-(phosphonomethyl)-
CAS Name ....................... Glycine, N-(phosphonomethyl)-
ISO Name  ....................... Glyphosate
CAS No. ....................... 1071-83-6
EC No. (EINECS No.) ............ 213-997-4
Molecular Weight ............... 169.07
Empirical Formula ............... C₃H₈NO₅P
Structural Formula ............... CH₂-NH-CH₂-COO
HO P O CH₂-NH-CH₂-COO
HO P O
 CH₂-NH-CH₂-COO + NH₃CH(CH₃)₂

Glyphosate, isopropylamine salt
Glycine, N-(phosphonomethyl),
Compd. with 2-propanamine (1:1)
Not available
38641-94-0
254-056-8
228.18
C₆H₁₇N₃O₄P

2.2. TYPICAL CONTENT:
Active Ingredient ..................... Glyphosate, N-(phosphonomethyl)glycine*,
as its isopropylamine salt ......................... 30 – 60% by weight
*(Contains 450 g/l of the active ingredient glyphosate in the form of its isopropylamine salt, equivalent to about 356 g/l of the acid, glyphosate)

Inert Ingredients ..................... Tallow alkylamine ethoxylate (CAS 61791-26-2) 7 – 13% by weight

Material Safety Data Sheet meeting the requirements of the Hazardous Products Act and Controlled Products Regulation. The information presented herein is believed to be accurate and reliable, but is presented without guarantee or responsibility on the part of TeraGro Inc.
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3. **HAZARDS IDENTIFICATION**

3.1. Health Hazards (Acute and Chronic):

   Likely Routes of Exposure ...... Skin contact and inhalation
   Eye Contact..................... The product may cause pain, redness and tearing as shown by toxicity studies.
   Skin Contact ................... The product is only slightly toxic and only slightly irritating as shown by toxicity studies.
   Ingestion ........................ The product is only slightly toxic as shown by toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.
   Inhalation ...................... The product is only slightly toxic if inhaled as shown by toxicity studies.

3.2. Signs and Symptoms of Exposure See 3.1.
3.3. Environmental Hazards See 12.

4. **FIRST AID MEASURES**

4.1. Emergency and First Aid Procedures:
   If in Eyes .......................... Immediately hold eyelids open and flush with plenty of water. Get medical attention.
   If Swallowed ................. The product will cause gastrointestinal tract irritation. Immediately dilute by swallowing water or milk. Get medical attention.
   If Inhaled ....................... Remove individual to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.
   If in contact with skin Wash with plenty of soap and water. Get medical attention if irritation persists.

5. **FIRE-FIGHTING MEASURES**
5.1. Extinguishing Media and Procedure  
Water spray, foam, dry chemical, carbon dioxide or any class B extinguishing agent.

Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear a full facepiece self-contained breathing apparatus and protective clothing.

5.2. Hazardous Decomposition or Byproducts in a Fire  
The essential breakdown products are carbon monoxide, carbon dioxide, phosphorus pentoxide and nitrogen oxides.

5.3. Unusual Fire and Explosion Hazards  
None.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal Protection  
Observe all protection and safety precautions when cleaning up spills, see 8.

6.2. Steps to Be Taken in Case of Spill  
Small liquid spills on the floor or other impervious surface, should be soaked up with towels or other absorbent material and discarded in the trash. Clean the spill area with soap and water and rinse the area thoroughly.

Large liquid spills on the floor or other impervious surface should be contained or diked and then absorbed with attapulgite, bentonite or other absorbent clays. Collect the contaminated absorbent, place in a metal drum and dispose of in accordance with the instructions provided under Disposal (see 13). Thoroughly scrub floor or other impervious surface with a strong industrial detergent and rinse with water.

Large spills that soak into the ground should be dug up, placed in metal drums and disposed of in accordance with instructions provided under Disposal (see 13). Contact appropriate state agency when considering a land spreading disposal option.

Leaking containers should be separated from non-leakers and either the container or its contents transferred to a drum or other non-leaking container and disposed of in accordance with instructions provided under Disposal (see 13). Any recovered spill liquid should be similarly collected and disposed of.
7. HANDLING AND STORAGE

7.1 Precautions to Be Taken in Handling
Do not get in eyes or breathe mist or get in or on clothing. Avoid breathing vapor or spray mist. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing (see 8, Personal Protection).

Spray solutions of the product should be mixed, stored or applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined containers.

**Do not mix, store or apply this product or spray solutions of this product in galvanized or unlined steel (except stainless steel) containers or spray tanks.**

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.

Do not contaminate water when disposing of equipment washwaters.

7.2 Precautions to Be Taken in Storing
Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

7.3 Fire and Explosion Precautions
Not applicable.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Respiratory Protection
The undiluted product is not likely to present an airborne exposure concern during normal handling. In the event of an accidental discharge of the material during manufacture or handling which produces a heavy vapor or mist, workers should put on respiratory protection equipment approved by NIOSH/MSHA or by the local authorities.

For application of product diluted in accordance with label instructions: Respirators are not required for applications of use-dilutions of the product.

- **Protective gloves**: Wear heavy duty, natural rubber gloves.
- **Eye Protection**: Wear safety glasses with sideshields meeting CSA or ANSI standards or chemical splash goggles.
- **Skin Protection**: Wear appropriate protective clothing to prevent skin contact. Applicators and other handlers must wear long-sleeved shirt, long pants, shoes plus socks and protective eyewear.

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8.2. Work/Hygienic Practices

Do not get in eyes or get in on clothing. Avoid breathing vapor or spray mist. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Wash thoroughly with soap and water after handling. Remove contaminated clothing immediately and wash before reuse. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Clear, viscous solution</td>
</tr>
<tr>
<td>Color</td>
<td>Amber – Brown colored</td>
</tr>
<tr>
<td>Odor</td>
<td>Practically odorless to slight amine-like odor</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Occurs in 2 steps, 143-164°C and 189-223°C</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>113°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.16 g/cm³ at 20°C</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>For the active ingredient glyphosate (acid): 1.75 x 10⁻⁷ mm Hg (1.31 x 10⁻⁵ Pa) at 25°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>43 cS at 20°C, 18 cS at 40°C (kinematic viscosity)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>The product is fully miscible with water (solubility active ingredient glyphosate (acid): 10.5 g/l at 20°C)</td>
</tr>
<tr>
<td>Partition Coefficient n-Octanol/Water</td>
<td>P = 4.5 x 10⁻⁴; Log P = - 3.4 (active ingredient glyphosate (acid))</td>
</tr>
<tr>
<td>pH</td>
<td>4.5 (1% solution in water) at 20°C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Above 113°C</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

10.1. Chemical Stability

The product is stable at ambient temperature.

10.2. Hazardous Decomposition or Byproducts

None (however, see 5.2.).

10.3. Materials to Avoid

Do not mix, store or apply this product or spray solutions of this product in galvanized or unlined steel (except stainless steel) containers or spray tanks.

This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture with air. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welders torch, lighted cigarettes or other ignition source.
11. TOXICOLOGICAL INFORMATION

11.1. Health Hazards

See 3.

11.2. Toxicological Data:

- **Ingestion (oral)**
  - Practically non-toxic (LD$_{50}$, rat: > 5000 mg/kg)

- **Skin (dermal)**
  - Practically non-toxic (LD$_{50}$, rabbit: > 2000 mg/kg)

- **Inhalation**
  - LC$_{50}$, rat: > 4.86 mg/l/4 h

- **Eye Irritation**
  - May cause substantial but temporary eye injury

- **Skin Irritation**
  - Practically not irritant to rabbit skin

- **Allergy Sensitization**
  - No sensitizing properties towards guinea pigs in the Magnusson-Kligmann Maximization test

- **Carcinogenicity**
  - EPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans).

12. ECOLOGICAL INFORMATION

The active ingredient (glyphosate (acid)) is rapidly deactivated by adsorption to clay particles.

The acute toxicity of the product is:

- **Fish**
  - Rainbow Trout 96-hr LC$_{50}$: 18.6 mg/l (static)
  - Bluegill Sunfish 96-hr LC$_{50}$: 11.9 mg/l (static)

- **Invertebrates**
  - *Daphnia magna* 48-hr EC$_{50}$: 21.6 mg/l

- **Birds**
  - Bobwhite quail and mallard duck LD$_{50}$: > 2000 mg/kg (glyphosate (acid))

- **Algae**
  - Algae 72-hr EC$_{50}$: 17.4 mg/l

- **Bees**
  - Honey Bees, LD$_{50}$, oral: > 100 µg/bee

13. DISPOSAL CONSIDERATIONS

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable federal, state or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.**

Plastic Containers

Do not reuse container. Triple rinse container. Then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. However, procedures in accordance with state and local regulations must be observed.

14. TRANSPORT INFORMATION

**TDG CLASSIFICATION:** Not classified as hazardous material for transport.

15. REGULATORY INFORMATION

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15.1. Threshold Limit Value

<table>
<thead>
<tr>
<th></th>
<th>OSHA PEL (USA)</th>
<th>ACGIH TLV (USA)</th>
<th>MAK (Germany)</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

However, threshold limit values defined by local regulations must be observed.

16. OTHER INFORMATION

This MSDS is intended for worker and transport safety. It is not intended for users of the product who should refer to the product label for safety precautions applicable to them. Some safety equipment and procedure recommendations in this MSDS differ from the product label because they are intended for a different audience.

This material should only be handled by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.