MATERIAL SAFETY DATA SHEET

Syngenta Canada Inc.
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In Case of Emergency, Call
1-800-327-8633 (FAST MED)

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MSDS prepared by:
Department of Regulatory & Biological Assessment
Syngenta Canada Inc.

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SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: **TOUCHDOWN TOTAL® Herbicide** Formulation No.: A13013BR
Registration Number: 28072 (Pest Control Products Act)
Chemical Class: Phosphonic acid herbicide

Active Ingredient (%): Glyphosate (36.8 %) CAS No.: 70901-20-1
Chemical Name : N-(phosphonomethyl) glycine, as the potassium salt.
Product Use: TOUCHDOWN TOTAL is a water-soluble herbicide used for non-selective weed control. For further details please refer to product label.

SECTION – 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen	WHMIS†
Glyphosate (36.8%)	Not Established	Not Established	Not established	No	Not Established

*** Syngenta Occupational Exposure Limit (OEL)
† Material listed in Ingredient Disclosure List under Hazardous Products Act.

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

SECTION – 3: HAZARDS IDENTIFICATION

Symptoms of Acute Exposure

Causes mild eye and skin irritation.

Hazardous Decomposition Products

Flammable hydrogen gas may be formed on contact with incompatible metals. See "**Conditions to Avoid**", Section 10. Can decompose at high temperatures forming toxic gases.

Physical Properties

Appearance: Clear Brown liquid.
Odour: Sweet.

Unusual Fire, Explosion and Reactivity Hazards

This product will form flammable and explosive hydrogen gas on contact with incompatible metals (i.e. galvanized or unlined steel). See "**Conditions to Avoid**", Section 10. Can decompose at high temperatures and form toxic gases. This product mixes with water. Firefighting water can contaminate the environment.

Potential Health Effects

Relevant routes of exposure: Skin, eyes, mouth, lungs.

SECTION – 4: FIRST AID MEASURES

IF POISONING IS SUSPECTED, immediately contact the poison information centre, doctor or nearest hospital. Have the product container, label or Material Safety Data Sheet with you when calling Syngenta, a poison control center or doctor, or going for treatment. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given. Call the Syngenta Emergency Line [**1-800-327-8633** (**1-800-FASTMED**)], for further information.

EYE CONTACT: Flush eyes with clean water, holding eyelids apart for a minimum of 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta, a poison control center or doctor for treatment advice. Obtain medical attention immediately if irritation persists.

SKIN CONTACT: Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Flush skin with plenty of water for 15-20 minutes. Call Syngenta, a poison control centre or doctor for treatment advice.

INHALATION: Move victim to fresh air. If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call Syngenta, a poison control centre or doctor for treatment advice.

INGESTION: If swallowed, immediately contact Syngenta, a poison control centre, doctor or nearest hospital for treatment advice. Provided the patient is conscious, wash out mouth with water. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water.

NOTES TO PHYSICIAN:
There is no specific antidote. Treat symptomatically.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:
None known.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: > 105° C
Upper and lower flammable (explosive) limits in air: Not available.
Auto-ignition temperature: 490° C
Flammability: Not flammable.
Hazardous combustion products: During a fire, irritating and possible toxic gases may be generated by thermal decomposition or combustion. Thermal decomposition products may include carbon monoxide, carbon dioxide and oxides of nitrogen and phosphorus.
Conditions under which flammability could occur: This product may slowly form flammable and explosive hydrogen gas when in contact with galvanized or unlined steel. Keep fire exposed containers cool by spraying with water.
Extinguishing media: Use foam, carbon dioxide, dry powder, halon extinguishant or water fog or mist, (avoid use of water jet). Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. Contain run-off water with, for example, temporary earth barriers.
Sensitivity to explosion by mechanical impact: None known.
Sensitivity to explosion by static discharge: None known.

SECTION – 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Wear suitable protective clothing and equipment and clothing as described in Section 8 and/or the product label.
Procedures for dealing with release or spill: Control the spill at its source. Contain the spill to prevent material from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Sections 7 and 8, and "Conditions to Avoid" (Section 10). Pump or scoop

large amounts of liquid into a **compatible** disposable container. Absorb remaining liquid or smaller spills with clay, sand or vermiculite. Scoop or sweep up material and place into a disposal container. Wash area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, small amounts will naturally decompose. For large amounts, skim off the upper contaminated layer and collect for disposal. Once all material is cleaned up and placed in a disposal container, seal the container and arrange for disposal. Spillages or uncontrolled discharges into watercourses must be reported to the appropriate regulatory authority.

SECTION – 7: HANDLING AND STORAGE

Handling practices: KEEP OUT OF REACH OF CHILDREN. Spray solutions of this product should be mixed, stored and applied using only plastic, plastic-lined steel, stainless steel or fiberglass containers. **Concentrate and spray solutions should not be stored in galvanized steel, carbon steel, aluminum or unlined steel containers.** Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. After work, rinse gloves and remove protective equipment. Wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, applying cosmetics or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Keep product, wash or rinse water, and contaminated materials out of water and away from animals, birds and unauthorized people.
Appropriate storage practices/requirements: Store in original container only in a well-ventilated, cool, dry, secure area. Protect from heat, sparks and flame. Do not expose sealed containers to temperatures above 40 °C. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.
National Fire Code classification: Not applicable.

SECTION – 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable control measures, including engineering controls: This product is intended for use outdoors where engineering controls are not necessary. If necessary, ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels below the TLV. Warehouses, production area, parking lots and waste holding facilities must have adequate containment to prevent environmental contamination. Provide separate shower and eating facilities.

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

CONSULT THE PRODUCT LABEL FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS.

Personal protective equipment for each exposure route:
General: Avoid breathing dust, vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, applying cosmetics or handling tobacco.

INGESTION: Do not eat, drink, handle tobacco, or apply cosmetics in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

EYES: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

SKIN: Where contact is likely, wear chemical-resistant gloves (such as nitrile or butyl), coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

INHALATION: A respirator is not normally required when handling this substance. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P, R or HE class filter and an organic vapour cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits (e.g. emergency spills).

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear yellow liquid.
Formulation Type: Solution Concentrate.
Odour: Sweet.
pH: 4.6-5.3 (1% aqueous solution @ 25 ºC).
Vapour pressure and reference temperature: $< 1.8 \times 10^{-7}$ mmHg @ 25°C (Glyphosate Acid)
Vapour density: Not available.
Boiling point: Not available.

Melting point: Not available.
Freezing point: Not available.
Specific gravity or density: 1.34 g/mL @ 20 °C.
Evaporation Rate: Not available.
Water/oil partition coefficient: Not available.
Odour threshold: Not available.
Viscosity: ~ 30 cps (or mPas) @ 20 °C.
Solubility in Water: Miscible.

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.
Conditions to avoid: This product may form flammable and explosive hydrogen gas when in contact with galvanized or unlined steel. Concentrate **should not** be stored in galvanized steel, carbon steel, aluminum or unlined steel containers. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass.
Incompatibility with other materials: See "**Conditions to Avoid**", above.
Hazardous decomposition products: This product will form flammable and explosive hydrogen gas on contact with incompatible metals (i.e. galvanized or unlined steel). See "**Conditions to Avoid**", above. Can decompose at high temperatures and form toxic gases.
Hazardous polymerization: Will not occur.

SECTION – 11: TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

Ingestion:	Low AcuteToxicity Oral (LD50 Rat):	> 5,000 mg/kg body weight
Dermal:	Low AcuteToxicity Dermal (LD50 Rat):	> 5,050 mg/kg body weight
Inhalation:	Low AcuteToxicity Inhalation (LC50 Rat):	> 5.08 mg/L air - 4 hours
Eye Contact:	Mildly Irritating (Rabbit)	
Skin Contact:	Mildly Irritating (Rabbit)	
Skin Sensitization:	Not a Sensitizer (Guinea Pig)	

Neurotoxicity
Glyphosate Technical: No known neurotoxic effects based on animal studies.

Reproductive/Developmental Effects
Glyphosate Technical: No known reproductive or developmental effects, based on animal studies.

Chronic/Subchronic Toxicity Studies
Glyphosate Technical: Slight reduction in body weight gain in rodents at high doses.
Carcinogenicity
Glyphosate Technical: Not carcinogenic in animal studies.

Other Toxicity Information:
None.

Toxicity of Other Components
The acute toxicity test results reported in Section 11, above, for the finished product take into account any acute hazards related to the "other components" in the formulation.

Other materials that show synergistic toxic effects together with the product: None known.

Target Organs

Active Ingredient

Glyphosate Technical: Eye, skin.

Inert Ingredients

Not Applicable.

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

TOUCHDOWN TOTAL is an herbicide that is mixed with water and applied as a spray for the control of annual and perennial grasses and broadleaf weeds. The active ingredient, glyphosate, is highly toxic to plants, but since there are no uses involving direct application on water, the risk to aquatic non-target plants is low. Terrestrial non-target plants may be injured by spray drift, but there is no risk to plants when the product is applied following the label directions. The toxicity of glyphosate is low to moderate for fish, aquatic invertebrates (water flea), birds, and insects (bees).

Eco-Acute Toxicity

Glyphosate Technical (Glyphosate Acid):

Green Algae 96-hour E_bC_{50}	17 ppm
Bees LC_{50}/EC_{50} (Contact)	>103 µg/bee
Invertebrates (Water Flea) LC_{50}/EC_{50}	130 ppm
Fish (Trout) 96-hour LC_{50}/EC_{50}	130 ppm
Fish (Bluegill) 96-hour LC_{50}/EC_{50}	47 ppm
Birds (8-Day Dietary - Bobwhite Quail) LC_{50}/EC_{50}	> 5,200 ppm
Birds (8-Day Dietary - Mallard Duck) LC_{50}/EC_{50}	> 5,200 ppm

Eco-Chronic Toxicity

Glyphosate Technical (Glyphosate Acid):

Invertebrates (Water Flea) 21-Day NOEC	50.0 ppm
Fish (Trout) 95-Day NOEC	35.2 ppm

Environmental Fate

The active ingredient glyphosate has a low bioaccumulation potential, low mobility in soil, and low persistence in soil and water. The dissipation half-life in soil is 3 days. The main routes of degradation are by microbial degradation and formation of bound residues.

SECTION – 13: DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse empty containers unless they are specifically designed to be re-filled. Empty container retains product residue. Dispose of empty containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal. Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

SECTION – 14 : TRANSPORT INFORMATION

Shipping information such as shipping classification:

TRANSPORTATION OF DANGEROUS GOODS CLASSIFICATION - ROAD/RAIL.

Not Regulated.

SECTION – 15: REGULATORY INFORMATION

WHMIS classification for product: Exempt

This MSDS has been prepared in accordance with WHMIS requirements, but the data are presented under 16 headings.

Pest Control Products (PCP) Act Registration No.: 28072

SECTION – 16: OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Syngenta will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years. This product is under the jurisdiction of the Pest Control Products Act and is exempt from the requirements for a WHMIS compliant MSDS. Hazardous properties of all ingredients have been considered in the preparation of this MSDS. Read the entire MSDS for the complete hazard evaluation of this product.

Prepared by: Syngenta Canada Inc.
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