NUFARM AGRICULTURE INC.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUPPLIED BY:
Nufarm Agriculture Inc.
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Calgary, AB. T2H 1H9
Phone Number: (403)-253-8471
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MANUFACTURED BY:
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Calgary, AB T2H 1H9
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PRODUCT: **Credit® Liquid Herbicide**
PCP NUMBER: 25866
DATE PREPARED: January 6, 2012
PREPARER: Nufarm Agriculture Inc.; Regulatory Affairs & Research Department
CHEMICAL FAMILY/USE: Herbicide
FORMULA: $C_6H_{17}N_2O_5P$
CHEMICAL SYNONYMS: Glyphosate, isopropylamine salt; Glyphosate, IPA salt; N-(phosphonomethyl) glycine, isopropylamine salt

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	%	CAS NO.
Glyphosate, N-(phosphonomethyl) glycine, in the form of its isoproplyamine salt	40-42 w/w	38641-94-0 (as the salt) (1071-83-6 as the acid)
Surfactant	14-16 v/v	

Note: The other major ingredient in this product is water.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: CAUTION-IRRITANT. Keep out of reach of children. MAY CAUSE EYE IRRITATION HARMFUL IF SWALLOWED. Avoid contact with eyes or prolonged contact with skin.

EFFECTS OF ACUTE EXPOSURE:
INGESTION: This product is no more than slightly toxic based on 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.
SKIN CONTACT: This product is no more than slightly toxic and no more than slightly irritating based on toxicity studies. Prolonged contact may cause dermal irritation.
INHALATION: This product is no more than slightly toxic if inhaled based on toxicity studies.
EYE CONTACT: This product may cause eye irritation.

MEDICAL CONDITIONS AGGRAVATED: None Known.
TOXICOLOGICAL EFFECTS: See toxicological data in Section 11.
PRINCIPLE ROUTES OF EXPOSURE: Skin contact and inhalation.
TOXICOLOGICALLY SYNERGISTIC MATERIALS: None known.
OTHER: None known.

4. FIRST AID MEASURES

If swallowed: Call a poison control centre 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 a poison control centre 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 15–20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre 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 centre or doctor for further treatment advice.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.
Note to physician: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLASH POINT:.....NAp
CONDITIONS OF FLAMMABILITY: .....May burn under fire conditions.
FLAMMABLE LIMITS IN AIR - Upper (%):.....NAp
FLAMMABLE LIMITS IN AIR - Lower (%):. .....NAp
AUTOIGNITION TEMPERATURE: .....NAp
SENSITIVITY TO MECHANICAL IMPACT (Y/N): NA. No sensitivity expected based on long handling history.
SENSITIVITY TO STATIC DISCHARGE: .....NA. No sensitivity expected based on long handling history.
EXTINGUISHING MEDIA: Water fog, alcohol foam, carbon dioxide, dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use. Minimize and contain water runoff.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Use safety equipment and procedures appropriate to the size of the spill. Keep unnecessary people away. Avoid runoff to natural waters and sewers. Surround and absorb spills with inert material such as perlite, sawdust, clay granules, vermiculite, sand or dirt. (Soak up small amounts of spill with absorbent clays.) Contain all affected material in a closed, labeled container for proper disposal. Isolate from other waste materials. Clean contaminated area such as hard surfaces with detergent and water, collecting cleaning solution for proper disposal. Large spills to soil or similar surfaces may necessitate removal of top soil.

See Section 13 for disposal information.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Handling:
KEEP OUT OF REACH OF CHILDREN. MAY CAUSE EYE IRRITATION. HARMFUL IF SWALLOWED. Avoid contact with eyes or prolonged contact with skin. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Avoid direct applications to any body of water. Do not contaminate water by disposal of waste or cleaning of equipment. Spray solutions of this product should be mixed, stored and applied only in stainless steel, aluminum,

fibreglass, plastic and plastic lined steel containers. DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL 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. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Storage:
Avoid contamination of seed, feed, and foodstuffs. Product is stable under normal conditions of storage and handling for at least 5 years. Store in a cool, well-ventilated place away from seed, feed, foodstuffs, reducing agents and acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

Hazardous Ingredients	TWA*	ACGIH TLV®	STEL	Units
Glyphosate IPA salt	N/E	N/E	N/E	NAp
Surfactant	N/E	N/E	N/E	NAp

*8-hour TWA unless otherwise noted

ENGINEERING CONTROLS: Undiluted product should be used in a well ventilated area. General ventilation with a good source of make-up air recommended as minimum for indoor situations.
RESPIRATORY PROTECTION EQUIPMENT: For Handling of the Undiluted Product: Undiluted product is not likely to present an airborne exposure concern during normal handling. If there is an accidental discharge of the material during manufacture or handling that produces a heavy vapor or mist, workers should use NIOSH/MSHA approved equipment. Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists or vapours is likely. In work situations where an air purifying respirator is appropriate to be used, use of a full face respirator equipped with purifying elements for protection against organic vapor and dust/mist approved for pesticides is recommended. Use cartridges or canister with NIOSH/MSHA approval. Full facepiece replaces the need for chemical goggles. Observe respirator use limitations specified by the manufacturers and NIOSH/MSHA.
For Application of Product Diluted in accordance with label instructions: Respirators are not required for applications of use – dilutions of this product.
PROTECTIVE GLOVES: All types of impervious gloves for handling chemicals are acceptable, provided that they can be cleaned.
EYE AND FACE PROTECTION: Wear chemical splash goggles during mixing/pouring operations or other activities in which eye contact with undiluted product is likely to occur.
OTHER PROTECTIVE EQUIPMENT: Use other equipment appropriate to specific situation.
VENTILATION: Use in well ventilated area. No special requirements apply to normal outdoor use.
SKIN PROTECTION: Wear appropriate protective clothing to prevent skin contact. Long sleeved shirt, long pants, socks and shoes suggested as minimum work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

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.
BOILING POINT:..... NA. Expected to be similar to water: >100°C.
VAPOR PRESSURE:..... Glyphosate negligible. Product expected to be similar to water.
VAPOR DENSITY (air = 1): ..... NA.
FREEZING POINT:. ..... NA. Expected to be similar to water: 0°C.
MELTING POINT: ..... NA. Glyphosate 200°C with decomposition.
PHYSICAL STATE: ..... Liquid.

ODOUR:..... Practically odorless to slight amine-like odor.
COLOUR: ..... Clear amber.
ODOR THRESHOLD (ppm):. ..... NA
EVAPORATION RATE (butyl acetate = 1):. NA
SPECIFIC GRAVITY (water = 1):..... 1.17 @ 25 degrees C
DENSITY @ 25°C:..... 1.17
pH: ..... 4.4 to 4.9
SOLUBILITY IN WATER (20°C): ..... Soluble.
COEFFICIENT OF WATER/OIL DISTRIBUTION: NA. Product water soluble.

10. STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of storage and handling. Store in a cool, well-ventilated place away from foodstuffs, reducing agents and acids.
HAZARDOUS POLYMERIZATION: Will not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.
HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS: None.
INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids and bases. See Section 7.
CONDITIONS TO AVOID: None known.

11. TOXICOLOGICAL INFORMATION

Data are from laboratory studies conducted on this product:
ACUTE ORAL LD_{50} (mg/kg):.....> 5,000 (Rat)
ACUTE DERMAL LD_{50} (mg/kg):.. .....> 5000 (Rabbit)
ACUTE INHALATION LC_{50} (mg/l): .....> 3.18 mg/l (Rat 4-hr exp.)
OTHER:
Eye Irritation: Rabbits 24-hr exp.; Moderate to severe irritation.
Skin Irritation: Rabbits 4-hr exp.; Slightly irritating.
This product is not considered a dermal sensitizing agent in guinea pigs. At 5 times the intended use concentration of this product, 21-day dermal toxicity studies in rabbits resulted in severe dermal irritation and systemic toxicity (mortality, reduced feed consumption, body weight loss and testicular effects). When the test substance did not include surfactant and was at 3 or less times the intended use concentration, only slight to moderate local irritation was observed. Effects similar to those from the high concentration of this product were observed when the surfactant alone was tested. Effects in these studies are considered to be a secondary response to the stress of severe dermal irritation.

Components: Data from laboratory studies and from the scientific literature on components of this product:

ISOPROPYLAMINE SALT OF GLYPHOSATE:
Data from studies with formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:
In repeat dosing studies (6-month), dogs fed MON 0139 exhibited slight weight changes. Following repeated skin exposure (30 weeks) to MON 0139, skin irritation was the primary effect in rabbits.
Additional toxicity information is available on glyphosate, the active herbicidal ingredient of MON 0139. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed at the high-dose level in one long-term (2 year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce

tumors in any of these studies. Based on the results from the chronic studies, USEPA has classified glyphosate in category E (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

SURFACTANT:
The surfactant component of CREDIT Liquid Herbicide is reported to cause irritation to the eyes and skin and may contribute to the irritation potential reported for this herbicide. Ingestion may produce gastrointestinal irritation, nausea, vomiting and diarrhea.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: Data are from studies conducted on this product unless noted.

This product has been shown to be slightly to moderately toxic in aquatic studies:

96 HOUR LC_{50} (mg/L):	22 (Rainbow Trout - static)
96 HOUR LC_{50} (mg/L):	8.2 (Rainbow Trout - dynamic)
96 HOUR LC_{50} (mg/L):	14 (Bluegill Sunfish - static)
96 HOUR LC_{50} (mg/L):	5.8 (Bluegill Sunfish - dynamic)
96 HOUR LC_{50} (mg/L):	9.4 (Fathead minnow)
96 HOUR LC_{50} (mg/L):	16 (Channel Catfish)
96 HOUR LC_{50} (mg/L):	20 (Chinook Salmon)
96 HOUR LC_{50} (mg/L):	22 (Coho Salmon)
48 HOUR EC_{50} (mg/L):	37 (Daphnia magna - aeration)
48 HOUR EC_{50} (mg/L):	24 (Daphnia magna - without aeration)
48 HOUR EC_{50} (mg/L):	42 (Gammarus pseudolimnaeus)

This product has been shown to be practically non-toxic to avian species following subacute dietary exposure.

DIETARY LC_{50} (ppm):	> 6300 (Bobwhite Quail)
DIETARY LC_{50} (ppm):	> 6300 (Mallard Duck)

CHEMICAL FATE INFORMATION: Glyphosate is rapidly and strongly adsorbed to soil. It has a soil half-life of approximately 47 days, but the adsorptive characteristic negates herbicidal activity almost immediately.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Disposal should be made in accordance with federal, provincial and local regulations. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.
Do not reuse this container for any purpose. If applicable, return container in accordance with return program. If a recyclable container, dispose of at a container collection site. Contact local distributor, dealer or municipality for the location of the nearest collection site.

Before taking the container to the collection site, triple or pressure rinse the empty container adding rinsings to spray tank, and make container unsuitable for further use. If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

14. TRANSPORT INFORMATION

CANADIAN TDG DESCRIPTION (Road & Rail): None. Contact manufacturer for updates to transport information.

15. REGULATORY INFORMATION

WHMIS HAZARD CLASS: D2B Toxic Material
WHMIS TRADE SECRET: Exempt. (This product is regulated under the Pest Control Products Act - WHMIS exempt.)

CANADIAN INVENTORY: This product is currently exempt from CEPA.
HAZARD RATING SYSTEMS: **HMIS:** Not Available
NFPA: Not Available

16. OTHER INFORMATION

EMERGENCY TELEPHONE NUMBERS:
For spills or transportation accidents, Chemtrex, 1-800-424-9300.
For health or environmental emergencies, Prosar, 1-877-325-1840.
For product and use information, Nufarm Agriculture Inc., 1-800-868-5444.

REVISIONS:
The following has been revised since the last issue of this MSDS: Section 1, 4 & 16.

ADDITIONAL INFORMATION:
Abbreviations used throughout the MSDS are: NA = Not available
NAp = Not applicable
N/E = None Established.

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 the CPR.

Company references and data on substantially similar products utilized in preparation of the MSDS.

*****END OF MSDS*****