



## NUFARM AGRICULTURE INC.

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**SUPPLIED BY:**

Nufarm Agriculture Inc.  
5507 1st Street, SE  
Calgary, AB. T2H 1H9

**MANUFACTURED BY:**

Nufarm Agriculture Inc.  
5507 1st Street, SE  
Calgary, AB T2H 1H9

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**PRODUCT:****RIVAL Emulsifiable Concentrate Liquid Herbicide (RIVAL 500 EC)****PCP NUMBER:**

18612

**DATE PREPARED:**

April 22, 2014

**PREPARER:**

Nufarm Agriculture Inc.; Regulatory Affairs &amp; Research Department

**CHEMICAL FAMILY/USE:**

Herbicide

**FORMULA:** $C_{13}H_{16}F_3N_3O_4$ **CHEMICAL SYNONYMS:**Trifluralin;  $\alpha,\alpha,\alpha$ -trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine; 2,6-dinitro-*N,N*-dipropyl-4-(trifluoromethyl)-benzenamine.

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	Wt. %	CAS NO.
Trifluralin	47-49	1582-09-8
Aromatic hydrocarbon solvent	44-48	64742-94-5
Naphthalene	< 1	91-20-3
Emulsifiers and other proprietary ingredients	6-8	NA

### 3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW:** Product is a dark yellow / red liquid, with an aromatic (solvent) odour. May cause eye damage or skin irritation. Product is toxic to aquatic organisms.

**EFFECTS OF ACUTE EXPOSURE:**

**INGESTION:** Unlikely to cause injury if ingested in small amounts. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause mild to severe pulmonary injury and possibly death.

**SKIN CONTACT:** May cause slight skin irritation.

**INHALATION:** Vapours are unlikely to cause injury.

**EYE CONTACT:** May cause eye irritation.

**MEDICAL CONDITIONS AGGRAVATED:** None known.

**SUBCHRONIC (TARGET ORGAN) EFFECTS:** None specified.

**CHRONIC EFFECTS/CARCINOGENICITY:** Not considered to be a carcinogen. Formation of renal calculi has been noted in chronic feeding studies in rats. The effect was demonstrated as reversible in dogs. A minor ingredient in this product, naphthalene, has been reported by the U.S. National Toxicology Program to be associated with increased nose/lung tumors in laboratory animals via inhalation exposure.

**REPRODUCTIVE TOXICITY:** Not considered to interfere with reproduction.



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**DEVELOPMENTAL TOXICITY:** Not considered to interfere with fetal development.

**GENOTOXICITY:** Not considered to be mutagenic.

**PRINCIPLE ROUTES OF EXPOSURE:** Eye contact. Skin absorption. Inhalation. Oral ingestion.

**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. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give **any** liquid to the person. Do not give anything by mouth to an unconscious person.

**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 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 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:** This product contains petroleum distillates. If large amounts have been ingested, empty the stomach by gastric intubation with the aid of a cuffed endotracheal tube to prevent aspiration and possible chemical pneumonia. No specific antidote. Treat based on sound judgment of physician and individual reactions of patient. Overexposure to materials other than this product may have occurred.

### 5. FIRE FIGHTING MEASURES

**FLASH POINT:** ..... 102°C (± 5°C, closed cup)

**CONDITIONS OF FLAMMABILITY:**..... Combustible mixture. When heated above the flash point, this material emits vapours which, when mixed with air, can burn or be explosive. Heavier than air vapours may travel to an ignition source.

**FLAMMABLE LIMITS IN AIR - Upper (%):**.....NA. Approximately 11-13 for hydrocarbon component.

**FLAMMABLE LIMITS IN AIR - Lower (%):**.....NA. Approximately 1.5-2.1 for hydrocarbon component.

**AUTOIGNITION TEMPERATURE:** .....NA.

**SENSITIVITY TO MECHANICAL IMPACT (Y/N):** .....NA. No sensitivity expected based on similar products.

**SENSITIVITY TO STATIC DISCHARGE:** .....NA. Sensitivity possible based on solvent data.

**EXTINGUISHING MEDIA:** ..... Water, water mist, foam or dry chemical.

**SPECIAL FIREFIGHTING PROCEDURES:** Firefighters should wear self-contained breathing apparatus and full protective clothing when fighting chemical fires. 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. 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.



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### 7. HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep away from food and feed products. Avoid freezing. If product is frozen, bring the contents to 20°C for 24 hours and shake well before using. If stored for one year or longer, shake well before using.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### EXPOSURE LIMITS:

Hazardous Ingredients	TWA*	ACGIH TLV	STEL	Units
Naphthalene	10	N/E	15	ppm
Aromatic hydrocarbon solvent	15**	N/E	N/E	ppm

\*8-hour TWA unless otherwise noted

\*\*unofficial recommendation of solvent manufacturer

**ENGINEERING CONTROLS:** Use in a well ventilated area. General ventilation with a good source of make-up air recommended as minimum for indoor situations. Ventilation should be adequate to maintain air concentrations below flammable limits.

**RESPIRATORY PROTECTION EQUIPMENT:** Use an approved pesticide respirator if ventilation is not adequate or exposure to sprays, mists or concentrated vapours is likely.

**PROTECTIVE GLOVES:** Chemical-resistant gloves such as nitrile.

**EYE AND FACE PROTECTION:** Goggles or face shield when handling concentrate.

**OTHER PROTECTIVE EQUIPMENT:** Long sleeved shirt, long pants, socks and shoes suggested as minimum work clothing. Generally, a second layer such as coveralls suggested for handling concentrate. Use other equipment appropriate to specific situation.

**VENTILATION:** Use only in well ventilated area.

### 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:** .....>100°C. Hydrocarbon solvent 235-278°C.  
**VAPOR PRESSURE:** .....NA. Hydrocarbon solvent < 0.1 kPa @ 20°C.  
**VAPOR DENSITY (air = 1):**.....NA. Hydrocarbon solvent > 5.  
**FREEZING POINT:** .....NA.  
**MELTING POINT:** .....NAp.  
**PHYSICAL STATE:**.....Liquid.  
**ODOUR:** .....Hydrocarbon (aromatic).  
**COLOUR:**.....Dark yellow-red.  
**ODOR THRESHOLD (ppm):**.....NA.  
**EVAPORATION RATE (butyl acetate = 1):**.....NA.  
**SPECIFIC GRAVITY (water = 1):** .....1.12 ± 0.05 kg/l at 20°C.  
**DENSITY @ 25°C:** .....1.12 ± 0.05 kg/l at 20°C.  
**pH:**.....4.4 ± 1 (5% aqueous dilution)  
**SOLUBILITY IN WATER (20°C):**.....Emulsifiable  
**COEFFICIENT OF WATER/OIL DISTRIBUTION:**.....NA. Oil soluble.



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### 10. STABILITY AND REACTIVITY

**STABILITY:** Stable.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:** Toxic smoke, carbon dioxide, carbon monoxide, oxides of nitrogen, fluorinated hydrocarbons and other potentially toxic combustion products may be present.

**INCOMPATIBILITY (MATERIALS TO AVOID):** Avoid contact with strong acidic, basic or oxidizing agents.

**CONDITIONS TO AVOID:** None known.

### 11. TOXICOLOGICAL INFORMATION

**ACUTE ORAL LD<sub>50</sub> (mg/kg):** .....5600 (Rat)

**ACUTE DERMAL LD<sub>50</sub> (mg/kg):** .....>2000 (Rat)

**ACUTE INHALATION LC<sub>50</sub> (mg/l):** .....>2.0 (4-hour, Rat)

**OTHER:** May cause eye and skin irritation (rabbit).

### 12. ECOLOGICAL INFORMATION

#### ECOTOXICOLOGICAL INFORMATION:

Data on trifluralin technical.

**96-HOUR LC<sub>50</sub> (mg/L):** 0.01-0.04 (Rainbow Trout)

**96-HOUR LC<sub>50</sub> (mg/L):** 0.02-0.09 (Bluegill)

**48-HOUR EC<sub>50</sub> (mg/L):** 0.56 (Daphnia)

**ORAL LD<sub>50</sub> (mg/kg):** >2000 (Bobwhite Quail)

**DIETARY LC<sub>50</sub> (ppm):** >5000 (Mallard Duck)

**CHEMICAL FATE INFORMATION:** Metabolism involves dealkylation of the amino group, reduction of the nitro group to an amino group, partial oxidation of the trifluoromethyl group to a carboxy group, and subsequent degradation to smaller fragments.

DT<sub>50</sub> in soils ranges 57-126 days. Degradation is more rapid under anaerobic conditions. Trifluralin is absorbed by soil and resistant to leaching and lateral movement. In animals, trifluralin is eliminated in urine and faeces, thereafter, degradation is as in soils.

Degradation in plants is as for soils.

### 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.

Do not reuse 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.



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### 14. TRANSPORT INFORMATION

**CANADIAN TDG DESCRIPTION (Road & Rail):** Not regulated for transport by road/rail in Canada. Contact manufacturer for updates to transport information.

**DOT Shipping Description:** RQ ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, UN3082, III (TRIFLURALIN) ERG GUIDE 171

**U.S. Surface Freight Classification:** COMPOUND, TREE OR WEED KILLING, NOI (NMFC 50320, SUB 2: CLASS 60)

### 15. REGULATORY INFORMATION

**WHMIS HAZARD CLASS:** N/E.

**WHMIS TRADE SECRET:** Exempt. (This product is regulated under the Pest Control Products Act - WHMIS exempt.)

**CANADIAN INVENTORY:** Trifluralin is listed on the Domestic Substances List (DSL).

#### HAZARD RATING SYSTEMS

**HMIS:** Not Available

**National Fire Protection Association (NFPA®) Hazard Ratings:**

Ratings for This Product		Key to Ratings	
2	Health Hazard	0	Minimal
1	Flammability	1	Slight
1	Instability	2	Moderate
		3	Serious
		4	Severe

### 16. OTHER INFORMATION

#### REVISIONS:

The following has been revised since the last issue of this MSDS: Sections 1 revision.

#### 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 utilized in preparation of the MSDS.

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