

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	HMIS		PROTECTIVE CLOTHING
			Health	1	
			Flammability	0	
			Reactivity	0	
			PPE	A	

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME Rainbow Plant Food 6-9-22, Florence

SYNONYM This MSDS is applicable to all Agrium Rainbow Plant Foods containing Ammonium Phosphate (MAP or DAP), Potash, Ammonium Sulfate and depending on formulation, Ammonium Nitrate, with less than 1% by weight of compounds containing Iron, but with greater than 1% by weight of compounds containing Boron and Zinc.

MSDS NUMBER: 16027a

CHEMICAL NAME Not applicable. A homogenously granulated product.

REVISION NUMBER 1.6

CHEMICAL FAMILY Ammonium salt.

MSDS prepared by August 31, 2013
the Environment,
Health and Safety
Department on:

CHEMICAL FORMULA Not applicable.

24 HR EMERGENCY TELEPHONE NUMBER:

MATERIAL USES Agricultural industry: Fertilizer.

Transportation: 1-800-792-8311
Medical: 0-303-389-1653 Collect

MANUFACTURER

Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.
Suite 1700, 4582 South Ulster St.
Denver, Colorado, U.S.A., 80237

SUPPLIER

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Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m ³	TLV-TWA ppm	STEL mg/m ³	STEL ppm	CEIL mg/m ³	CEIL ppm	
Monoammonium phosphate	7722-76-1	----						0-70
Diammonium phosphate	7783-28-0	----						0-70
Ammonium nitrate	6484-52-2	----						0-10
Ammonium sulfate	7783-20-2	----						10-30
Potassium chloride	7447-40-7	----						0-30
Potassium magnesium sulfate	14977-37-8	----						0-30
Calcium sodium borate (ulexite)	1319-33-1	2 (I)		6 (I)				0-2
Iron oxide	1309-37-1	5 (R)						0-1
Sodium borate decahydrate (borax)	1303-96-4	2 (I)		6 (I)				0-1
Zinc oxide	1314-13-2	2 (R)		10 (R)				0-1

ACGIH TLV notations:

---- No assigned TLV

(C) - Ceiling - the concentration not to be exceeded at any time

(I) - measured as the Inhalable fraction of the aerosol

(R) - measured as the Respirable fraction of the aerosol

(T) - measured as the Thoracic fraction of the aerosol

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TOXICOLOGICAL DATA ON INGREDIENTS**Monoammonium Phosphate (MAP) TFI Product Testing Program:**

Acute oral LD₅₀, rat, OECD 425 protocol: >2,000 mg/kg. MAP is not acutely toxic by the oral route of exposure.

Acute dermal LD₅₀, rat, OECD 402 protocol: >5,000 mg/kg. MAP is not acutely toxic by the dermal route of exposure.

Dibasic Ammonium phosphate (DAP)

TFI Product Testing Results, OECD 402 acute dermal toxicity: LD₅₀: > 5,000 mg/kg rat, not acutely toxic

TFI Product Testing Results, OECD 425 acute oral toxicity: LD₅₀: > 2,000 mg/kg rat, not acutely toxic

TFI Product Testing Results, OECD 201 green algae acute toxicity testing, no toxicity observed at up to 97.1 mg/L (highest conc tested); growth stimulated at 6.4 mg/L and higher.

Ecotoxicity:

Acute fish toxicity, 96hr LC₅₀, rainbow trout, OECD 203 protocol: >85.9 mg/L. The acute toxicity of MAP to fish is low.

Ammonium Sulfate TFI Product Testing Program Results:

Acute oral LD₅₀: 640-4,250 mg/kg (rat, mouse)

Acute dermal LD₅₀: >2,000 mg/kg (rat, mouse)

Ecotoxicity:

Acute toxicity to fish, various species, 96 hr LC₅₀: >13.6-159.8 mg total NH₃/L

Acute toxicity to aquatic invertebrates, Daphnia, 96 hr LC₅₀: >27 mg total NH₃/L

Ammonium Nitrate:[^]

Rat oral LD50: 4500 mg/kg. [Peer Reviewed] [Environment Canada;Tech Info for Problem Spills: Ammonium Nitrate (Draft) p.59 (1981)]

Rat oral LD50: 2217 mg/kg (Rat) [Gigiena i Sanitariya. For English translation, see HYSAAV. (V/O Mezhdunarodnaya Kniga, 113095 Moscow, USSR) V.1- 1936- (52(8),25,1987)]

Huntingdon Research Center Testing Results (3 studies), OECD Guide 401: 2462- 2900 mg/kg (rat oral)

TFI Product Testing Results, OECD Guideline 402: > 5,000 mg/kg acute dermal LD₅₀, rat,

Bacterial reverse mutation assay: negative, with and without metabolic activation, (Salmonella)

Developmental teratogenicity: Not teratogenic to rats. NOAEL >57 mg/kg

Ecotoxicity Values:

Acute fish toxicity: Chinook salmon, rainbow trout, bluegill: 96hr LC₅₀ = 420-1360 mg NO₃/L

Acute toxicity to aquatic invertebrates: Daphnia magna EC₅₀ = 555mg/L

Acute toxicity to aquatic plants (algae): Scenedesmus quadricauda EC₅₀ = 83mg/L

LD50 Aspergillus niger (fungus) 15 mg/l/40 hr (36 deg C). [Peer Reviewed] [Environment Canada; Tech Info]

Potash TFI Product Testing Program Results:

Acute oral toxicity: 2,600 mg/kg rat; 1,500 mg/kg mouse

Ecotoxicity:

Acute toxicity to fish, species unspecified, LC₅₀, 96hr: 2,010 mg/L

Acute toxicity to invertebrates, Daphnia, 48hr TLM 337mg/L

Potassium magnesium sulfate:

Acute oral toxicity: no specific information available

Boron Compounds as Borax:

Rat Oral LD50, Acute: 2660 mg/kg, RTECS.

Algal toxicity: Green algae, Scenedesmus subspicatus 96-hr EC10 = 24 mg B/L

Invertebrate toxicity: Daphnids, Daphnia magna Straus 24-hr EC50 = 242 mg B/L

Fish toxicity, Seawater: Dab, Limanda limanda 96-hr LC50 = 74 mg B/L

Fish toxicity, Freshwater: Rainbow trout, S. gairdneri (embryo-larval stage) 24-day LC50 = 88 mg B/L; 32-day LC50 = 54 mg B/L

Goldfish, Carassius auratus(embryo-larval stage) 7-day LC50 = 65 mg B/L; 3-day LC50 = 71 mg B/L

Iron oxide:

Rat inhalation (TCLo): 0.5mg/m3 continuous, 61 days RTECS.

Zinc oxide

Mouse oral LD50, Acute: 7950 mg/kg, RTECS.

Section III. Hazards Identification.**POTENTIAL ACUTE HEALTH EFFECTS**

This product may irritate eyes and skin upon prolonged or repeated contact due to mechanical or desiccant action. Over-exposure by inhalation may cause respiratory tract irritation. Ingestion of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea.

For nitrate containing formulations only:

May interfere with the oxygen carrying capacity of the blood if ingested in large quantities or over a prolonged period of time. Persons with anemia, bowel diseases, or infants, are more likely to develop effects. Over-exposure by ingestion is unlikely under normal working conditions. Inhalation of dusts may cause respiratory irritation. This product may irritate eyes and skin upon contact but is unlikely to injure tissue. Symptoms of overexposure may include: Cardiovascular: methemoglobinemia, low blood pressure (hypotension), irregular heart beat (arrhythmia), shock (vasodilation)

CNS: headache, dizziness, generalized tingling sensation (parasthesia)

Gastrointestinal: nausea, vomiting, diarrhea, abdominal pain

Eye: redness and inflammation (conjunctivitis)

Skin: bluish discoloration (cyanosis) with profuse sweating following ingestion or irritation and flushed skin following contact with moist skin surfaces.

POTENTIAL CHRONIC HEALTH EFFECTS

CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.

MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.

TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.

For Borax containing formulations only:

Chronic borax inhalation overexposures may result in lung irritation and inflammation, as well as dermatitis.

For nitrate containing formulations only:

Repeated or prolonged overexposure by ingestion can reduce the oxygen carrying capacity of the blood producing anoxia in infants or individuals with preexisting bowel or blood diseases.

High levels of manganese in the blood may increase anemia by interfering with iron absorption. Iron deficiency may increase an individual's susceptibility to manganese. Studies suggest that populations at risk of adverse effects due to manganese exposure are infants and those with existing iron deficiency.

Section IV. First Aid Measures**EYE CONTACT**

May cause eye irritation. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.

MINOR SKIN CONTACT

May cause skin irritation. Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

EXTENSIVE SKIN CONTACT

No additional information.

MINOR INHALATION

Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the individual's neck and waist. Allow the person to rest in a well ventilated area. Obtain medical attention if irritation persists.

SEVERE INHALATION

In emergency situations use proper respiratory protection to evacuate affected individuals to a safe area as soon as possible. Loosen tight clothing around the person's neck and waist. Oxygen may be administered if breathing is difficult. If the person is not breathing, perform artificial respiration. Obtain immediate medical attention.

SLIGHT INGESTION

Do not induce vomiting. Quickly transport the person to an emergency care facility. Removal of the substance from the stomach must be done by medical personnel. If tolerated, give no more than 1 cup of milk or water (or 1/2 cup for children) to rinse the mouth and throat and dilute the stomach contents.

If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat. Rinse mouth with water.

EXTENSIVE INGESTION

No additional information.

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Section V. Fire and Explosion Data

THE PRODUCT IS	Non-flammable.
AUTO-IGNITION TEMPERATURE	Not applicable.
FLASH POINT	Not applicable.
FLAMMABILITY LIMITS	Not applicable.
PRODUCTS OF COMBUSTION	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases: ammonia, nitrogen oxides, sulfur oxides, phosphorous oxides.
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	This product is non-explosive.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic and combustible gases. Use extinguishing media suitable for surrounding materials. Fire fighters should wear self-contained breathing apparatus (SCBA) and full turnout gear.
SPECIAL REMARKS ON FIRE HAZARDS	Non combustible. Flammable/toxic gases will form at elevated temperatures (>190 °C) by thermal decomposition (ammonia, sulfur oxides, nitrogen oxides, phosphorus oxides). A self contained breathing apparatus should be used to avoid inhalation of toxic fumes.
SPECIAL REMARKS ON EXPLOSION HAZARDS	No additional remark.

Section VI. Accidental Release Measures

SMALL SPILL	Use appropriate tools to put the spilled solid in a suitable container for intended use or disposal.
LARGE SPILL	Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses, wells, etc. Product will promote algae growth and may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L. Will dissolve and disperse in water. Nitrate in potable drinking water should be maintained below 10 mg/L. Reclaiming material may not be viable. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal is in compliance with government requirements and local regulations.

Section VII. Handling and Storage

PRECAUTIONS	Avoid contact with skin and eyes. After handling, always wash hands thoroughly with soap and water. Do not breathe dust. Keep away from food, drink and animal feed. Avoid contact with incompatible substances. Keep out of reach of children.
STORAGE	Store in a dry, cool and well ventilated area.

Section VIII. Exposure Controls/Personal Protection

ENGINEERING CONTROLS	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.
PERSONAL PROTECTION	The selection of personal protective equipment varies, depending upon conditions of use. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is appropriate for most applications. A NIOSH approved full facepiece or half mask dust respirator with N-100 or P-100 filters should be used under conditions where airborne concentrations may exceed occupational exposure limits.

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PERSONAL PROTECTION IN CASE OF LARGE RELEASE	If the use of non-disposable half or full facepiece respirators is warranted, a respiratory protection program that meets OSHA 29 CFR 1910.134 requirements must be followed.
	No additional information.
EXPOSURE LIMITS	<p>Borate Compounds, Inorganic: ACGIH TLV-TWA 2 mg/m³ as inhalable dust; STEL 6 mg/m³ as inhalable dust.</p> <p>Iron oxide: ACGIH TLV-TWA 5 mg/m³ as respirable dust. Fed OSHA Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 10 mg/m³ as fume.</p> <p>Zinc oxide: ACGIH TLV-TWA 2 mg/m³; STEL 10 mg/m³ as respirable dust. Fed OSHA Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 15 mg/m³ as total dust. MI OSHA Permissible Exposure Limit: R325.51103 Table G-1-A, 8-hr Time Weighted Avg: 10 mg/m³ as total dust.</p> <p>OSHA PEL: 15 mg/m³ for Particulates Not Otherwise Regulated (nuisance particulates) as total dust.</p> <p>Federal, State, and Provincial exposure limits may vary. Consult local officials for acceptable exposure limits in your jurisdiction.</p>

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Solid granules.		
MOLECULAR WEIGHT	Not applicable.	COLOR	Grey.
pH (10% SOLN/WATER)	5-8	ODOR	Odorless.
BOILING POINT	Decomposes.	ODOR THRESHOLD	Not applicable
MELTING POINT	Not available	TASTE	Acrid and saline.
CRITICAL TEMPERATURE	Not available.	VOLATILITY	Not applicable.
SPECIFIC GRAVITY g/cc	<1 (Water = 1)	SOLUBILITY	Easily soluble in hot water. Soluble in cold water.
BULK DENSITY kg/m³ ; lbs/ft³	Variable depending on formulation	DISPERSION PROPERTIES	See solubility in water.
VAPOR PRESSURE	Not applicable.	WATER/OIL DIST. COEFF.	Not available.
VAPOR DENSITY	Not applicable.		

Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional remark.
INCOMPATIBILITY WITH VARIOUS SUBSTANCES	Slightly reactive with oxidizing agents, metals, alkalis, and moisture.
CORROSIVITY	Corrosive to aluminum, zinc, and copper. Slightly corrosive to steel, and 304 stainless steel. Non-corrosive to 316 stainless steel.
SPECIAL REMARKS ON REACTIVITY	Avoid contact with moisture. Hygroscopic. Material will absorb moisture impairing flowability. Hydrolysis will slowly produce acids corrosive to metals.

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SPECIAL REMARKS ON CORROSIVITY	Incompatible with copper alloys. Corrosive to brass. Corrosive to ferrous metals and alloys. Contact your sales representative or a metallurgical specialist to ensure compatability with your equipment.
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Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	See Section II.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs. The product itself and its products of degradation are not harmful under normal conditions of careful and responsible use. Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses.
OTHER EFFECTS ON HUMANS	Our data base contains no additional remark on the toxicity of this product
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional remark.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional information.


Section XII. Ecological Information

ECOTOXICITY	<p>Low toxicity for humans or animals under normal conditions of use. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal exposure.</p> <p>Aquatic/Marine Toxicity: Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses. Will disperse with current. Release to watercourses may cause effects down stream from the point of release. U.S. D.O.T.: This material NOT listed as a Marine pollutant.</p>
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Nitrogen oxides (NO,NO ₂ ...), sulfur oxides (SO ₂ , SO ₃ ...), phosphates, inorganic mineral salts and oxides.
TOXICITY OF THE PRODUCTS OF DEGRADATION	The products of biodegradation are not harmful under normal conditions.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L. Nitrate in potable drinking water should be maintained below 10mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable.

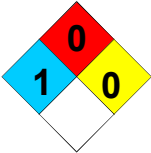

Section XIII. Disposal Considerations

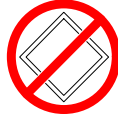
WASTE DISPOSAL OR RECYCLING	Recover and place material in a suitable container for intended use or disposal. Ensure disposal complies with government requirements and local regulations.
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Section XIV. Transport Information

DOT / TDG CLASSIFICATION	<p>Not controlled under TDG (Canada) or D.O.T. (U.S.A.) unless granulated with Ammonium Nitrate, and transported by air or water. Not subject to the requirements of the Hazardous Materials Regulation 49 CFR Parts 171-180 for rail or vehicular transport.</p> <p>For ammonium nitrate containing products transported by air or water:</p> <p>Class 9, UN2071, PGIII. Proper shipping name: "Ammonium nitrate fertilizer; uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, with not more than 70% ammonium nitrate and not more than 0.4 percent total added combustible material or with not more than 45% ammonium nitrate with unrestricted combustible material.</p>
PIN and Shipping Name	See above.
SPECIAL PROVISIONS FOR TRANSPORT	Not applicable, unless transported by air or water. If transported by air or water: 132, IB8.
DOT (U.S.A) (Pictograms)	

Section XV. Other Regulatory Information and Pictograms

OTHER REGULATIONS	<p>CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA. TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory. CERCLA/SUPERFUND, 40 CFR 117,302: This product contains no Reportable Quantity (RQ) Substances. This product is not considered as a priority pollutant as regulated under the Clean Water Act.</p> <p>This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372: Aqueous ammonia from water dissociable ammonium ions, 10% of which is reportable as CAS#7783-20-2 and as CAS#7722-76-1 and/or 7783-28-0. Ammonium nitrate CAS# 6484-52-2 may be present in your formulation. Refer to EPA documents 745-R-00-005 and 745-R-00-006, and the specific product analysis for your product to determine your reporting requirements under this regulation.</p> <p>This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products</p>		
OTHER CLASSIFICATIONS	HCS (U.S.A.)	HCS CLASS: Irritating substance.	
	DSCL (EEC)	Not available.	
National Fire Protection Association (U.S.A.)	Hazards presented under acute emergency conditions only:		<p>Fire Hazard</p> <p>Reactivity</p> <p>Specific Hazard</p>
TDG (Pictograms - Canada)			
DSCL (Europe) (Pictograms)	<p>Not Available No Disponible Pas Disponible</p>		

ADR (Europe)
(Pictograms)**Section XVI. Other Information****REFERENCES**

- Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
- Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
- Domestic Substances List, Canadian Environmental Protection Act.
- 29 CFR Part 1910
- 33 CFR Parts 151, 153, 154, 156
- 40 CFR Parts 1-799
- 46 CFR Part 153
- 49 CFR Parts 1-199
- American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2012.
- NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
- Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
- ERG2008 Emergency Response Guidebook
- CHRIS Hazardous Chemical Data: U.S. Coast Guard, Washington, D.C.
- HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland
- IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C.
- NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio
- OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System U.S. Environmental Protection Agency, Washington, D.C.
- RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio
- The Fertilizer Institute Product Testing Program Results, March 2003

OTHER SPECIAL CONSIDERATIONS

Three year review. Sections 2, 8 and 16 updated.

FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT

AGRIUM
Wholesale Environment, Health and Safety
Telephone (780) 998-6906 or Fax (780) 998-6677

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