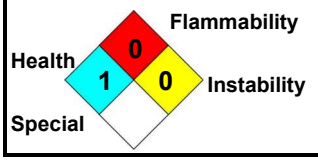
Agrium Advanced Technologies

Material Safety Data Sheet

NFPA	HMIS	WHMIS	TDG	DOT
	Health 1 Flammability 0 Physical hazards 0 Suggested PPE E		 See Section 14	 See Section 14

1 . Product and Company Identification

Product name **MAN-GRO DF**

Synonym	Manganese Sulphate (Monohydrate)	**MSDS prepared by the Environment, Health & Safety Department on:**	**2/8/2012.**
Material uses	Fertilizer.	**Version**	1.01
		In Case of Emergency	
MSDS Number	50415	**Transportation: 1-800-792-8311** **Medical: 1-888-615-0015**	

Manufacturer

Agrium Advanced Technologies
Fairbury Micronutrients
71025 569th Avenue
Fairbury, Nebraska

For more information on Agrium AT or our products, please go to:
http://www.agriumat.com
or contact us at Toll-Free:800-461-6471

2 . Hazards Identification

Physical state Solid.

Odor Odorless.

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Routes of entry Inhalation.
Ingestion.
Dermal

Potential acute health effects

Inhalation May irritate the respiratory tract if inhaled.

Ingestion May be harmful if swallowed.

Skin May cause skin irritation.

Eyes No known significant effects or critical hazards.

Potential chronic health effects

Chronic effects Contains material that may cause target organ damage, based on animal data.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

2 . Hazards Identification

Target organs Contains material which may cause damage to the following organs: blood, kidneys, upper respiratory tract, central nervous system (CNS).

Over-exposure signs/symptoms

Inhalation No specific data.

Ingestion No specific data.

Skin No specific data.

Eyes No specific data.

Medical conditions aggravated by over-exposure Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3 . Composition / Information on Ingredients

United States

Name	CAS number	%
Manganese, monosulfate, monohydrate	10034-96-5	>90

Canada

Name	CAS number	%
Manganese, monosulfate, monohydrate	10034-96-5	>90

Mexico

Name	CAS number	UN number	%	IDLH	Classification H	F	R	Special
Manganese, monosulfate, monohydrate	10034-96-5	Not available.	>90	500 mg/m³	0	0	0	

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First Aid Measures

Eye contact Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, ocassionally lifting the upper and lower eyelids. Seek medical attention if irritation or symptoms occur. Seek additional medical adice if symptoms or conditions persist.

Skin contact In case of contact, flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Seek medical advice if irritation or symptoms persist.

Inhalation If inhalation occurs, remove individual(s) to fresh air. Loosen restrictive clothing items if necessary. If individual has irregular or difficulty breathing or is under respiratory arrest seek medical attention immediately. If other conditions or symptoms develop contact a physician.

Ingestion If ingestion occurs, rinse mouth with copious amounts of water. Do Not induce vomiting unless directed to do so by trained medical personnel. Do Not give anything by mouth to unconcious individuals. Seek immediate medical attention.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4 . First Aid Measures

Notes to physician	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting Measures

Flammability of the product	No specific fire or explosion hazard.
Extinguishing media	
Suitable	Use an extinguishing agent suitable for the surrounding fire.
Not suitable	None known.
Special exposure hazards	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Hazardous thermal decomposition products	Decomposition products may include the following materials: sulfur oxides metal oxide/oxides
Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Special remarks on fire hazards	No additional remark.
Special remarks on explosion hazards	No additional remark.

6 . Accidental Release Measures

Personal precautions	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
Environmental precautions	Avoid dispersal of spilled material and runoff into waterways, drains, and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers or waterways).
Methods for cleaning up	
Small spill	Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
Large spill	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and Storage

Handling

Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Keep out of reach of children.

8 . Exposure Controls / Personal Protection

United States

Ingredient	Exposure limits
Manganese, monosulfate, monohydrate	**ACGIH TLV (United States, 2/2010).** TWA: 0.2 mg/m³, (as Mn) 8 hour(s). **OSHA PEL (United States, 6/2010).** CEIL: 5 mg/m³, (as Mn)

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Manganese, monosulfate, monohydrate, as Mn	US ACGIH 2/2010	-	-	0.2	-	-	-	-	-	-	
	~~AB 4/2009~~	-	-	0.2	-	-	-	-	-	-	
	BC 9/2010	-	-	0.2	-	-	-	-	-	-	
	ON 7/2010	-	-	0.2	-	-	-	-	-	-	
	QC 6/2008	-	-	5	-	-	-	-	-	-	[a]

Form: [a]Total dust.

Mexico

Ingredient	Exposure limits
Manganese, monosulfate, monohydrate	**NOM-010-STPS (Mexico, 9/2000).** LMPE-PPT: 0.2 mg/m³, (as Mn) 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8 . Exposure Controls / Personal Protection

Personal protection

Respiratory	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eyes	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to dusts.
Skin	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Personal protective equipment (Pictograms)	
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and Chemical Properties

Physical state	Solid.
Flash point	Non-flammable.
Color	White. [Light]
Odor	Odorless.
Molecular weight	169.02 g/mol
Boiling/condensation point	~ 850 C
Melting/freezing point	~ 700 C
Relative density	2.95 g/cm3
VOC	0 % (w/w)
Solubility	Soluble in cold water, hot water

10 . Stability and Reactivity

Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	No specific data.
Materials to avoid	No specific data.

10 . Stability and Reactivity

Hazardous decomposition products Decomposition products may include the following materials:
sulfur oxides
metal oxide/oxides

Conditions of reactivity Incompatible with: STRONG ACIDS

No additional remarks.

11 . Toxicological Information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate	TDLo Intravenous	Rat	4.5 mg/kg	-

Conclusion/Summary Potentially harmful to humans and animals.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Potentially may cause manganese poisoning over an extended period of use without proper personal protective equipment.

Irritation/Corrosion

Conclusion/Summary Not available.

Skin Possible skin irritant

Eyes Slightly irritating to the eyes.

Respiratory Possible respiratory irritant.

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
None identified.			

Conclusion/Summary Not available.

Skin Not considered a sensitizer

Respiratory Not considered a sensitizer

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Manganese, monosulfate, monohydrate			

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Teratogenicity

11 . Toxicological Information

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
None identified.						

Conclusion/Summary Not considered to be toxic to the reproductive system.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate	TDLo Intravenous	Rat	4.5 mg/kg	-

Conclusion/Summary Potentially harmful to humans and animals.

Chronic toxicity

Conclusion/Summary Potentially may cause manganese poisoning over an extended period of use without proper personal protective equipment.

Irritation/Corrosion

Conclusion/Summary Not available.

Skin Possible skin irritant

Eyes Slightly irritating to the eyes.

Respiratory Possible respiratory irritant.

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
None identified.			

Conclusion/Summary Not available.

Skin Not considered a sensitizer

Respiratory Not considered a sensitizer

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Manganese, monosulfate, monohydrate			

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

11 . Toxicological Information

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
None identified.						

Conclusion/Summary Not considered to be toxic to the reproductive system.

Mexico

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate	TDLo Intravenous	Rat	4.5 mg/kg	-

Conclusion/Summary Potentially harmful to humans and animals.

Chronic toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Potentially may cause manganese poisoning over an extended period of use without proper personal protective equipment.

Irritation/Corrosion

Conclusion/Summary Not available.

Skin Possible skin irritant

Eyes Slightly irritating to the eyes.

Respiratory Possible respiratory irritant.

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
None identified.			

Conclusion/Summary Not available.

Skin Not considered a sensitizer

Respiratory Not considered a sensitizer

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Manganese, monosulfate, monohydrate			

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Manganese, monosulfate, monohydrate				

11 . Toxicological Information

Conclusion/Summary Not classified as carcinogenic, teratogenic and mutagenic

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure

None identified.

Conclusion/Summary Not considered to be toxic to the reproductive system.

12 . Ecological Information

Environmental effects No known significant effects or critical hazards.

United States

Conclusion/Summary Very low toxicity to humans or animals.

Canada

Conclusion/Summary Very low toxicity to humans or animals.

Mexico

Conclusion/Summary Very low toxicity to humans or animals.

13 . Disposal Considerations

Waste disposal The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport Information

Regulatory information	UN number	Shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-

14 . Transport Information

TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-
				PG* : Packing group		

15 . Regulatory Information

United States

HCS Classification Target organ effects

U.S. Federal regulations

TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) Listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

DEA List I Chemicals (Precursor Chemicals) Not listed

DEA List II Chemicals (Essential Chemicals) Not listed

State regulations

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: None of the components are listed.
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed:
MANGANESE compounds, n.o.s.
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: None of the components are listed.

15 . Regulatory Information

New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: MANGANESE COMPOUNDS
Rhode Island Hazardous Substances: None of the components are listed.

United States inventory (TSCA 8b) All components are listed or exempted.

Canada

WHMIS (Canada) Class D-2B: Material causing other toxic effects (Toxic).

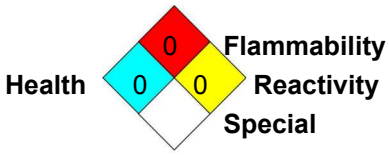
Canadian lists
CEPA Toxic substances: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Manganese
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

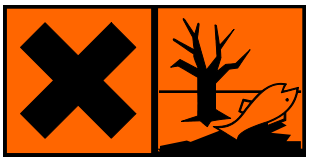
Mexico

Classification



EU regulations

Hazard symbol or symbols



Risk phrases
R48/20/22- Also harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases
S2- Keep out of the reach of children.
S29- Do not empty into drains.
S46- If swallowed, seek medical advice immediately and show this container or label.
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

International regulations

International lists
Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

Chemical Weapons Convention List Schedule I Chemicals Not listed

15 . Regulatory Information

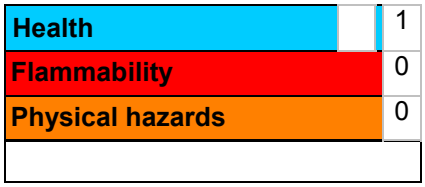
Chemical Weapons Convention List Schedule II Chemicals Not listed

Chemical Weapons Convention List Schedule III Chemicals Not listed

16 . Other information

Label requirements CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

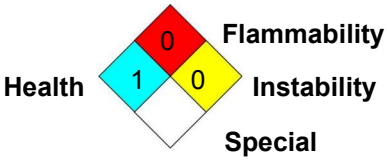
Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

National Fire Protection Association (U.S.A.)



Other special considerations No additional remarks.

Date of issue 2/8/2012.

Version 1.01

Indicates information that has changed from previously issued version.

Notice to Reader:

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