

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

## Section I. Chemical Product and Company Identification

**PRODUCT NAME/ TRADE NAME** Ultra Yield Manganese Broadman 20

**SYNONYM** Fertilizer with added manganese and iron micronutrients.

**MSDS NUMBER:** 14112

**CHEMICAL NAME** Not applicable.

**REVISION NUMBER** 1.2

**CHEMICAL FAMILY** Ammonium salt.

**MSDS prepared by the Environment, Health and Safety Department on:** January 25, 2007

**CHEMICAL FORMULA** Not applicable.

### 24 HR EMERGENCY TELEPHONE NUMBER:

**MATERIAL USES** Agricultural use.: Fertilizer. Industrial applications: Manufacture of specialty fertilizers.

**Transportation: 1-800-792-8311  
Medical: 1-888-670-8123**

#### 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

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

## Section II. Hazardous Ingredients

NAME	CAS #	Exposure Limits (ACGIH)						% by Weight
		TLV-TWA mg/m <sup>3</sup>	TLV-TWA ppm	STEL mg/m <sup>3</sup>	STEL ppm	CEIL mg/m <sup>3</sup>	CEIL ppm	
Manganese compounds, n.o.s.	-----	0.2						5-10
Manganese sulfate	7785-87-7	0.2						3-7
Iron salts, soluble, n.o.s. as Fe	-----	1 as Fe						1-5

#### 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

#### TOXICOLOGICAL DATA ON INGREDIENTS

##### Manganese sulfate:

Rat: LD50 - ROUTE: Oral; DOSE: 2150 mg/kg - RTECS

Mouse: LD50 - ROUTE: Oral; DOSE: 2330 mg/kg - RTECS

##### Ferrous sulfate:

Rat: LD50 - ROUTE: Oral; DOSE: 319 mg/kg - RTECS

**Section III. Hazards Identification.**

<b>POTENTIAL ACUTE HEALTH EFFECTS</b>	This product may irritate eyes and skin upon prolonged or repeated contact due to salt effects and/or mechanical 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.
<b>POTENTIAL CHRONIC HEALTH EFFECTS</b>	<p>Chronic manganese poisoning may occur as a result of prolonged and repeated overexposure to manganese. Early symptoms include languor, sleepiness, tremors and weakness in legs. A mask like appearance of the face, slurred speech, emotional disturbances such as anorexia, apathy, and inability to concentrate, uncontrollable laughter, and loss of balance with a spastic gait and a tendency to fall while walking are findings in more advanced cases.</p> <p>While high levels of manganese may increase anemia by interfering with iron absorption, iron deficiency may increase an individual's susceptibility to manganese. Experimental studies suggest that populations at greatest risk of adverse effects due to manganese exposure are the very young and those with iron deficiency. Effects have been reported in the scientific literature at or below the U.S. OSHA Permissible Exposure Limit of 5 mg/m<sup>3</sup> as a ceiling value. Although permanently disabled unless treated; chronic manganese poisoning is not a fatal disease. Not classifiable as a human or animal carcinogen, teratogen or mutagen.</p> <p>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.</p>

**Section IV. First Aid Measures**

<b>EYE CONTACT</b>	May cause eye irritation by mechanical action. 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.
<b>MINOR SKIN CONTACT</b>	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.
<b>EXTENSIVE SKIN CONTACT</b>	No additional information.
<b>MINOR INHALATION</b>	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.
<b>SEVERE INHALATION</b>	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.
<b>SLIGHT INGESTION</b>	<p>Do not induce vomiting. May cause digestive tract irritation, with accompanying nausea, vomiting and diarrhea. If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat.</p> <p>If tolerated, give no more than 1 cup of milk or water for adults or 1/2 cup for children to rinse the mouth and throat, dilute the stomach contents, and minimize irritation. Obtain medical attention.</p>
<b>EXTENSIVE INGESTION</b>	No additional information.

**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 and nitrogen 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 and melts at elevated temperatures to release toxic and combustible gases (ammonia, carbon dioxide, and oxides of nitrogen). Fires involving this material may be extinguished by any means consistent with surrounding materials. As in any fire, wear MSHA/NIOSH approved pressure-demand self-contained breathing apparatus, or equivalent and full protective gear.
SPECIAL REMARKS ON FIRE HAZARDS	Non combustible. Flammable and toxic gases may form at upon prolonged exposure to elevated temperatures (>190 °C) by thermal decomposition (ammonia, phosphorus oxides, nitrogen 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 which may degrade water quality and taste. Notify downstream water users. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal complies with government requirements and local regulations.

**Section VII. Handling and Storage**

PRECAUTIONS	After handling, always wash hands thoroughly with soap and water. Avoid contact with skin and eyes. 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, leather gloves, and safety glasses with side shields.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	

Continued on Next Page

Wear a NIOSH approved dust respirator if engineering, work practise or other control measures are not adequate to prevent overexposure. Where skin and eye contact may occur as a result of prolonged or repeated exposures, wear long sleeved clothing, coveralls, leather gloves, and safety glasses with side shields. For U.S. work sites where respiratory protection is required, ensure that a respiratory protection meeting 29 CFR 1910.134 is in place.

**EXPOSURE LIMITS**

ACGIH TLV-TWA for Particulates (Insoluble) Not Otherwise Specified: 10 mg/m<sup>3</sup>  
 OSHA PEL for Particulates Not Otherwise Regulated: 15 mg/m<sup>3</sup>  
 ACGIH TLV-TWA for Manganese and Inorganic compounds, as Mn: 0.2 mg/m<sup>3</sup>  
 OSHA PEL for Manganese and Inorganic compounds, as Mn: 5 mg/m<sup>3</sup> (ceiling)  
 ACGIH TLV-TWA for Iron salts, soluble, as Fe: 1 mg/m<sup>3</sup>  
 MI OSHA PEL for Iron salts, soluble, as Fe: 1 mg/m<sup>3</sup>

Federal, State or Provincial exposure limits may vary by jurisdiction. Consult local authorities for acceptable exposure limits in your area.

**Section IX. Physical and Chemical Properties**

<b>PHYSICAL STATE AND APPEARANCE</b>	A grey granular solid.		
<b>MOLECULAR WEIGHT</b>	Not applicable	<b>COLOR</b>	Grey.
<b>pH (10% SOLN/WATER)</b>	Not available	<b>ODOR</b>	Odorless.
<b>BOILING POINT</b>	Decomposes.	<b>ODOR THRESHOLD</b>	Not available
<b>MELTING POINT</b>	Not applicable	<b>TASTE</b>	Acid. Saline.
<b>CRITICAL TEMPERATURE</b>	Not applicable	<b>VOLATILITY</b>	Not applicable.
<b>SPECIFIC GRAVITY g/cc</b>	Not applicable	<b>SOLUBILITY</b>	Easily soluble in hot water. Slightly soluble in cold water.
<b>BULK DENSITY kg/m<sup>3</sup> ; lbs/ft<sup>3</sup></b>	Not available	<b>DISPERSION PROPERTIES</b>	See solubility in water.
<b>VAPOR PRESSURE</b>	Not applicable	<b>WATER/OIL DIST. COEFF.</b>	Not available.
<b>VAPOR DENSITY</b>	Not applicable		

**Section X. Stability and Reactivity Data**

<b>STABILITY</b>	The product is stable.
<b>INSTABILITY TEMPERATURE</b>	Not available.
<b>CONDITIONS OF INSTABILITY</b>	No additional remark.
<b>INCOMPATIBILITY WITH VARIOUS SUBSTANCES</b>	Slightly reactive with oxidizing agents, reducing agents, metals, alkalis, moisture. Non-reactive with combustible materials, organic materials, acids.
<b>CORROSIVITY</b>	Mineral salts. Slightly corrosive to steel, aluminum, zinc and copper. Non-corrosive to stainless steel (304 or 316).
<b>SPECIAL REMARKS ON REACTIVITY</b>	Avoid contact with moisture. Slow hydrolysis will produce corrosive acids.
<b>SPECIAL REMARKS ON CORROSIVITY</b>	Incompatible with copper alloys. Corrosive to brass. Contact your sales representative or a metallurgical specialist to ensure compatibility with system equipment.

**Section XI. Toxicological Information**

<b>SIGNIFICANT ROUTES OF EXPOSURE</b>	Ingestion. Inhalation.
<b>TOXICITY TO ANIMALS</b>	See Section II.
<b>SPECIAL REMARKS ON TOXICITY TO ANIMALS</b>	Very low toxicity for humans or animals. The product itself and its products of degradation are not toxic under normal conditions of use. Will release ammonium ions. Ammonia is a toxic hazard to fish. 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.
<b>OTHER EFFECTS ON HUMANS</b>	Our data base contains no additional remark on the toxicity of this product.
<b>SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS</b>	No additional remark.
<b>SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS</b>	No additional remark.

**Section XII. Ecological Information**

<b>ECOTOXICITY</b>	<p>Non-persistent. Non-cumulative when applied using normal agricultural practises. The product itself and its products of degradation are not harmful under normal conditions of careful and responsible use.</p> <p>Aquatic/Marine Toxicity: Low toxicity to fish and other water organisms. Slightly soluble. Slow release to watercourses may cause effects down stream from the point of release. These effects may be limited by recovery of spilled material if recovery is conducted immediately. Will release ammonium ions. Ammonia is a toxic hazard to fish. Will release phosphate. Phosphates will result in algae growth which may increase turbidity and deplete oxygen resulting in a hazard to fish. Avoid spills or release to watercourses.</p>
<b>BOD and COD</b>	Not available.
<b>PRODUCTS OF DEGRADATION</b>	Ammonium salts, iron sulfate salts, manganese salts, and carbon dioxide.
<b>TOXICITY OF THE PRODUCTS OF DEGRADATION</b>	The product itself and its products of degradation are not harmful under normal conditions of use. Avoid spills or releases to watercourses.
<b>SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION</b>	Product will promote algae growth which may degrade water quality and taste. Notify downstream water users. Will dissolve and disperse in water. Reclaiming material may not be viable.

**Section XIII. Disposal Considerations**

<b>WASTE DISPOSAL OR RECYCLING</b>	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**

<b>DOT / TDG CLASSIFICATION</b>	Not controlled under TDG (Canada) or D.O.T. (U.S.A.)
<b>PIN and Shipping Name</b>	Not applicable.
<b>SPECIAL PROVISIONS FOR TRANSPORT</b>	Not applicable.

Continued on Next Page

DOT (U.S.A) (Pictograms)



### Section XV. Other Regulatory Information and Pictograms

#### OTHER REGULATIONS

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.

This product contains the following chemicals subject to the reporting requirements of SARA Section 313 and 40 CFR 372:

a) Manganese compounds, chemical category N450, 20% of total product weight is Mn.

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 Regulations.

#### OTHER CLASSIFICATIONS

HCS (U.S.A.)

HCS CLASS: Irritating substance.

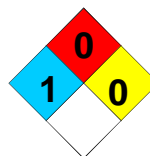
DSCL (EEC)

Not controlled under DSCL (Europe).

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

Hazards presented under acute emergency conditions only:

Health



Fire Hazard  
Reactivity

Specific Hazard

TDG (Pictograms - Canada)



DSCL (Europe) (Pictograms)



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, 2006.
- 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

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-TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: <http://csi.micromedex.com> (2007). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2007); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2007); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2007); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2007); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2007); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2007).

-The Fertilizer Institute Product Testing Program Results, March 2003  
-Michigan Office of Regulatory Reform R325.51108

**OTHER SPECIAL  
CONSIDERATIONS**

HMIS information added in this revision.

**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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