MATERIAL SAFETY DATA SHEET

Syngenta Canada Inc.
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In Case of Emergency, Call 1-800-327-8633 (FAST MED)

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MSDS prepared by:
Department of Regulatory & Biological Assessment
Syngenta Canada Inc.

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SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: VIBRANCE™ XL® Seed Treatment Formulation No.: A16874F
Registration Number: 30437 (Pest Control Products Act)
Chemical Class: Fungicidal Blend

Active Ingredient (%): Difenoconazole (5.9%) CAS No.: 119446-68-3
Chemical Name: 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole
Chemical Class: Triazole Fungicide

Active Ingredient (%): Metalaxyl-M and S-isomer (1.5%) CAS No.: 70630-17-0
Chemical Name: (methyl N-(2,6-dimethylphenyl)-N-(methoxyacetyl)-D-alaninate
Chemical Class: Phenylamide Fungicide

Active Ingredient (%): Sedaxane (1.2%) CAS No.: 874967-67-6
Chemical Name: N-[2-[1,1′-bicyclopropyl]-2-ylphenyl]-3-(difluoromethyl)-1-methyl-1H-pyrazole-4-carboxamide
Chemical Class: Pyrazole-carboxamide Fungicide

Product Use: A fungicidal blend for use on crops registered under the Pest Control Products Act. Please refer to product label for further details.

SECTION – 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen	WHMIS†
Clay Granules	15 mg/m³ TWA (total); 5 mg/m³ TWA (respirable)	10 mg/m³ TWA (total); mg/m³ TWA (respirable)	Not Established	No	Not Established
Glycerin CAS No. 56-81-5	15 mg/m³ TWA (total); 5 mg/m³ TWA (respirable)	10 mg/m³ TWA (total)	Not Established	No	Not Established
Difenoconazole	Not Established	Not Established	8 mg/m³ TWA ***	No	Not Established
Metalaxyl-M and S-isomer	Not Established	Not Established	10 mg/m³ TWA ***	No	Not Established
Sedaxane	Not Established	Not Established	Not Established	No	Not Established

*** Syngenta Occupational Exposure Limit (OEL)
† Material listed in Ingredient Disclosure List under Hazardous Products Act.
Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

SECTION – 3: HAZARDS IDENTIFICATION

Symptoms of Acute Exposure
May cause eye irritation.

Hazardous Decomposition Products
None known.

Physical Properties

Appearance:	Red opaque liquid.
Odour:	Weak odour.

Unusual Fire, Explosion and Reactivity Hazards
During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

Potential Health Effects
Relevant routes of exposure: Skin, eyes, mouth, lungs.

SECTION – 4: FIRST AID MEASURES

IF POISONING IS SUSPECTED, immediately contact the poison information centre, doctor or nearest hospital. Have the product container, label or Material Safety Data Sheet with you when calling Syngenta, a poison control center or doctor, or going for treatment. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given. Call the Syngenta Emergency Line [**1-800-327-8633** (**1-800-FASTMED**)], for further information.

EYE CONTACT:	Flush eyes with clean water, holding eyelids apart for a minimum of 15 - 20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta, a poison control center or doctor for treatment advice. Obtain medical attention immediately if irritation persists.
SKIN CONTACT:	Immediately remove contaminated clothing and wash skin, hair and fingernails thoroughly with soap and water. Flush skin with plenty of water for 15-20 minutes. Call Syngenta, a poison control centre or doctor for treatment advice.
INHALATION:	Move victim to fresh air. If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call Syngenta, a poison control centre or doctor for treatment advice.
INGESTION:	If swallowed, immediately contact Syngenta, a poison control centre, doctor or nearest hospital for treatment advice. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless directed by a physician or a poison control center. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer water.

NOTES TO PHYSICIAN:
There is no specific antidote. Treat symptomatically.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:
None known.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: > 101°C (Pensky-Martens CC)
Upper and lower flammable (explosive) limits in air: Not Applicable
Auto-ignition temperature: 415°C
Flammability: Not flammable

Hazardous combustion products: During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.
Conditions under which flammability could occur: Keep fire exposed containers cool by spraying with water. **Extinguishing media:** Use foam, carbon dioxide, dry powder, halon extinguishant. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. Contain run-off water with, for example, temporary earth barriers.
Sensitivity to explosion by mechanical impact: None known.
Sensitivity to explosion by static discharge: None known.

SECTION – 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. A small spill can be handled routinely. Use adequate ventilation and wear equipment and clothing as described in Section 8 and/or the product label.
Procedures for dealing with release or spill: Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Sections 7 and 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with detergent and water. Pick up wash liquid with additional absorbent and place into compatible disposal container. On soils, small amounts will naturally decompose. For large amounts, skim off the upper contaminated layer and collect for disposal. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposal. Spillages or uncontrolled discharges into watercourses must be reported to the appropriate regulatory authority.

SECTION – 7: HANDLING AND STORAGE

Handling practices: KEEP OUT OF REACH OF CHILDREN. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Avoid breathing vapours or spray mist. Wear full protective clothing and equipment (see Section 8). After work, rinse gloves and remove protective equipment, and wash hands thoroughly with soap and water after handling, and before eating, tobacco use, drinking, applying cosmetics or using the toilet. Wash contaminated clothing before re-use and separate from household laundry. Keep containers closed when not in use. Protect product, wash or rinse water, and contaminated materials from uncontrolled release into the environment, or from access by animals, birds or unauthorized people.
Appropriate storage practices/requirements: Store in original container only in a well-ventilated, cool, dry, secure area. Protect from heat, sparks and flame. Do not expose containers to temperatures below -10 °C or above 40 °C (i.e. prevent product from freezing). Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.
National Fire Code classification: Not specified.

SECTION – 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Applicable control measures, including engineering controls: Ensure work areas have ventilation, containment, and procedures sufficient to maintain airborne levels below the TLV. Warehouses, production area, parking lots and waste holding facilities must have adequate containment to prevent environmental contamination. Provide separate shower and eating facilities.

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION, PACKAGING AND USE OF THIS PRODUCT.

CONSULT THE PRODUCT LABEL FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS.

Personal protective equipment for each exposure route:
General: Avoid breathing vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, applying cosmetics or using tobacco.

INGESTION: Do not eat, drink, handle tobacco, or apply cosmetics in areas where there is a potential for exposure to this material. Always wash thoroughly after handling.

EYES: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

SKIN: Where contact is likely, wear chemical-resistant (such as nitrile or butyl) gloves, coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

INHALATION: A respirator is not normally required when handling this substance. A combination particulate/organic vapour respirator should be used until effective engineering controls are installed to comply with occupational exposure limits, or until exposure limits are established. Use a NIOSH certified respirator with a combination acid gas/organic vapour cartridge or canister and any N, P or R filter. Use a self-contained breathing apparatus in cases of emergency spills, when exposure levels are unknown, or under any circumstances where air-purifying respirators may not provide adequate protection.

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Opaque red liquid.
Formulation Type: Flowable suspension.
Odour: Faint odour
pH: 6.7 (1% aquelous solution @ 25°C).
Vapour pressure and reference temperature: 2.5×10^{-10} mmHg @ 25°C (Difenoconazole)
2.5×10^{-5} mmHg @ 25°C (Metalaxyl-M and S-isomer)
1.3×10^{-9} mmHg @ 20 °C (Sedaxane)
Vapour density: Not applicable.
Boiling point: Not Available
Melting point: Not Applicable
Freezing point: -18°C
Specific gravity or density: 1.12 g/cm^3 @ 20 ºC.
Evaporation Rate: Not available.
Water/oil partition coefficient: Not available.
Odour threshold: Not available.
Viscosity: 150-400 cps (or mPas) @ 20°C
Solubility in Water: 15 mg/L @ 25 °C (Difenoconazole)
26 g/L @ 25 °C (Metalaxyl-M and S-isomer)
14 mg/L @ 25 °C (Sedaxane)

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.
Conditions to avoid: Excessive heat.
Incompatibility with other materials: None known.
Hazardous decomposition products: Can decompose at high temperatures forming toxic gases.
Hazardous polymerization: Will not occur.

SECTION – 11: TOXICOLOGICAL INFORMATION

Acute toxicity/Irritation Studies (Finished Product):

Ingestion:	Low Acute Toxicity	
	Oral (LD50 Female Rat):	5,000 mg/kg body weight
Dermal:	Low Acute Toxicity	
	Dermal (LD50 Rabbit):	> 5,050 mg/kg body weight
Inhalation:	Low Acute Toxicity	
	Inhalation (LC50 Rat):	> 2.63 mg/L air - 4 hours

Eye Contact:	Minimally Irritating (Rabbit)
Skin Contact:	Non-Irritating (Rabbit)
Skin Sensitization:	Not a Sensitizer (Mouse)

Reproductive/Developmental Effects

Difenoconazole:	None observed.
Metalaxyl-M and S-isomer:	None observed.
Sedaxane:	None observed.

Chronic/Subchronic Toxicity Studies

Difenoconazole:	Kidney and liver effects at high doses (>5000 ppm; rats); Eye effects in dogs at high dose levels.
Metalaxyl-M and S-isomer:	Liver effects at high dose animal tests.
Sedaxane:	Increased liver weight and thyroid hypertrophy in rats

Carcinogenicity

Difenoconazole:	2/70 male rats in the highest dose group (20000 ppm) were found to have squamous cell carcinoma in the non-glandular stomach. Effect did not occur in female rats or in mice and not considered relevant to humans. Increase in brain tumors (mice) at doses exceeding the Maximum Tolerated Dose (MTD) (>2500 ppm).
Metalaxyl-M and S-isomer:	None observed
Sedaxane:	At extremely high doses, numerically higher incidences of uterine, thyroid and liver tumors (male and/or female rats) and liver tumors (male mice) were within the range of normal background variation and thus considered unrelated to treatment. Canadian PMRA and United States EPA have taken a more conservative position that these high-dose findings are treatment-related in rats and mice. The dose levels where these findings occur are not relevant to human exposure levels.

Other Toxicity Information:

None.

Toxicity of Other Components

Clay Granules

Prolonged inhalation of excessive concentrations of dust may lead to lung injury.

Glycerin

Repeated or prolonged exposure to concentrated solutions may result in dermatitis.

Other materials that show synergistic toxic effects together with the product: None known.

Target Organs

Active Ingredient

Difenoconazole:	Brain, liver, kidney, gastrointestinal tract.
Metalaxyl-M and S-isomer:	Liver.
Sedaxane:	Liver

Inert Ingredients

Clay Granules:	Respiratory tract
Glycerin:	Skin.

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

VIBRANCE XL Seed Treatment is applied as a seed treatment for the control of various diseases in registered crops. The formulation is comprised of three active ingredients; difenoconazole, metalaxyl-M and sedaxane, which are considered toxic to aquatic wildlife.

Ecotoxicity Effects:

Difenoconazole:

Green Algae 5-Day EC_{50}	0.31 ppm
Invertebrate (Water Flea) 48-hour EC_{50}	0.77 ppm
Fish (Rainbow Trout) 96-hr LC_{50}	1.06 ppm
Birds (Mallard Duck) 5-Day Dietary LD_{50}	>5,000 ppm

Metalaxyl-M:

Green Algae 5-Day EC_{50}	140 mg/L
Invertebrate (Water Flea) 48-hour EC_{50}	28 mg/L
Fish (Rainbow Trout) 96-hour LC_{50}	130 mg/L
Birds (Bobwhite Quail) 5-Day Dietary LD_{50}	>5,000 mg/kg

Sedaxane Technical:

Green Algae 5-day EC_{50}	1.9 ppm
Invertebrate (Water Flea) 48-hour EC_{50}	6.1 ppm
Fish (Rainbow Trout) 96-hour LC_{50}	1.1 ppm
Birds (Bobwhite Quail) 8-day Dietary LC_{50}	>2,000 mg/kg

Environmental Fate

Difenoconazole is stable in water, persistent in soil, and has low mobility in soil.

Metalaxyl-M has a low bioaccumulation potential, a low to high mobility in soil (depending on soil type), and is not persistent in the environment.

Sedaxane is not readily biodegradable, is moderately persistent in soil, and has a moderate to low mobility in soil.

SECTION – 13: DISPOSAL CONSIDERATIONS

Waste disposal information: Do not reuse empty containers unless they are specifically designed to be re-filled. Empty container retains product residue. Dispose of empty containers in accordance with local regulations. Consult provincial environment ministry for advice on waste disposal. Industrial/commercial waste may be handled at licensed facilities only. Waste shipments must be securely packaged and properly labelled. Only licensed carriers may be used, and proper documents must accompany the shipment.

SECTION – 14 : TRANSPORT INFORMATION

Shipping information such as shipping classification:

TRANSPORTATION OF DANGEROUS GOODS CLASSIFICATION - ROAD/RAIL

Not Regulated.

SECTION – 15: REGULATORY INFORMATION

WHMIS classification for product: Exempt

A statement that the MSDS has been prepared to meet WHMIS requirements, except for use of the 16 headings.

This MSDS has been prepared in accordance with WHMIS requirements, but the data are presented under 16 headings.

Other regulations; restrictions and prohibitions

Pest Control Products (PCP) Act Registration No.: 30437

SECTION – 16: OTHER INFORMATION

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Syngenta will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years. This product is under the jurisdiction of the Pest Control Products Act and is exempt from the requirements for a WHMIS compliant MSDS. Hazardous properties of all ingredients have been considered in the preparation of this MSDS. Read the entire MSDS for the complete hazard evaluation of this product.

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