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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 & Biology Assessment
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SECTION – 1: PRODUCT IDENTIFICATION

Product Identifier: TARGET[®] LIQUID SYSTEMIC Herbicide Formulation No.: A14357A
Registration Number: 28028 (Pest Control Products Act)
Chemical Classes: Phenoxy and benzoic derivative herbicide mixture.

Active Ingredient (%): MCPA (23.3%) and Mecoprop-P [CMPP-P] (5.3%) and Dicamba (5.3%)
CAS No.'s: 94-74-6 and 16484-77-8 and 1918-00-9.
Chemical Name: A mixture of 4-chloro-2-methylphenoxyacetic acid, (2*R*)-2-(4-chloro-2-methylphenoxy)propanoic acid, and 3,6-dichloro-2-methoxybenzoic acid. All acids are present as amine salt.
Product Use: Liquid herbicide for agricultural weed control. It is diluted with water prior to use. 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†
MCPA Technical (23.3%)	Not Established	10 mg/m ³	Not Established	No	Not Established
Mecoprop-P Technical [CMPP-P] (5.3%)	Not Established	Not Established	Not Established	No	Not Established
Dicamba Technical (5.3%)	Not Established	Not Established	10 mg/m ³ TWA***	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

Harmful if swallowed. May cause severe irritation to the eyes. May also cause irritation to the skin and mucous membranes.

Hazardous Decomposition Products

Can decompose at high temperatures and form toxic gases.

Physical Properties

Appearance: Clear dark brown liquid.
Odour: Mild, aromatic.

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 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 running water for a minimum of 20 minutes. Obtain medical attention if irritation occurs.

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. Provided the patient is conscious, wash out mouth with water. 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:

Target contains phenoxy and benzoic derivative herbicides. There is no specific antidote. Treat symptomatically. Symptoms of over exposure could include slurred speech, twitching, jerking and muscle spasms, drooling, low blood pressure, dizziness, muscle weakness, loss of appetite, weight loss, vomiting, decreased heart rate, shortness of breath, excitement, tenseness, depression, incontinence, cyanosis, exhaustion, unconsciousness, and loss of voice.

Persons suffering a temporary allergic reaction may respond to treatment with antihistamines or steroid creams and/or systemic steroids.

MEDICAL CONDITIONS KNOWN TO BE AGGRAVATED:

Persons with known allergy to dicamba or with a history of allergic sensitivity should use extra care in handling this product.

SECTION – 5: FIRE FIGHTING MEASURES

Flash point and method: > 105°C (Pensky-Martens CC)

Upper and lower flammable (explosive) limits in air: Not applicable.

Auto-ignition temperature: 410°C.

Flammability: Not flammable.

Hazardous combustion products: Can decompose at high temperatures and form toxic gases.

Conditions under which flammability could occur: None known

Extinguishing media: Use foam, carbon dioxide, dry powder, halon extinguishant or water fog or mist, (avoid use of water jet). 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.

Sensitivity to explosion by static discharge: None.

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. Wear suitable protective 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. Pump or scoop large amounts of liquid into a disposable container. Absorb remaining liquid or smaller spills with clay, sand or vermiculite. Scoop or sweep up material and place into a disposal container. Wash 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 disposition. Spillages or uncontrolled discharges into watercourses must be reported to the appropriate regulatory body.

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 sealed containers to temperatures above 40 °C. Keep separate from other products to prevent cross contamination. Rotate stock. Clean up spilled material immediately.

National Fire Code classification: Not required.

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 dust, vapours or aerosols. Avoid contact with eye, skin and clothing. Wash thoroughly after handling and before eating, drinking, applying cosmetics or handling 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 gloves (such as nitrile or butyl), coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.

INHALATION: A respirator is not normally required when handling this substance. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P, R or HE class filter and an organic vapour cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits (e.g. emergency spills).

SECTION – 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear dark brown liquid.

Formulation Type: Water-based solution concentrate.

Odour: Mild, aromatic.

pH: 8.2 @ 25 °C..

Vapour pressure and reference temperature:

Dicamba acid:	1.25 x 10 ⁻⁵ mmHg @ 25°C
MCPA Technical Acid:	1.5 x 10 ⁻⁶ mmHg @ 20°C
Mecoprop-P Technical (CMPP- P):	< 7.5 x 10 ⁻⁸ mmHg @ 20°C

Vapour density: Not available.

Boiling point: Not available.

Melting point: Not applicable.

Freezing point: -5 °C.

Specific gravity or density: 1.18 g/mL @ 20 °C.

Evaporation Rate: Not available.

Water/oil partition coefficient: Not available.

Odour threshold: Not available.

Viscosity: 43 mPas @ 25 °C (spindle #2 @ 30 rpm).

Solubility in Water:	Dicamba acid:	>250 g/mL
	MCPA Technical Acid:	>25 mg/L
	Mecoprop-P Technical (CMPP- P):	860 mg/L

SECTION – 10: STABILITY AND REACTIVITY

Chemical stability: Stable under normal use and storage conditions.

Conditions to avoid: None known.

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:	<u>Slightly Acutely Toxic</u> Oral (LD50 Female Rat):	1,750 mg/kg body weight
Dermal:	<u>Low Acute Toxicity</u> Dermal (LD50 Rat):	> 5,000 mg/kg body weight
Inhalation:	<u>Low Acute Toxicity</u> Inhalation (LC50 Rat):	> 2.57 mg/L air - 4 hours
Eye Contact:	<u>Moderately Irritating (Rabbit)</u>	
Skin Contact:	<u>Slightly Irritating (Rabbit)</u>	
Skin Sensitization:	<u>Sensitizing (Guinea Pig)</u>	

Reproductive/Developmental Effects

Technical Active Ingredients:

While MCPA does not have adverse effects on the reproductive capability of the rat, exposure to unacceptably high levels (i.e. considerably above the TLV) has been reported to cause birth defects in newborn rats. Dicamba is not teratogenic in animal studies, and does not affect the reproductive capability of rats. Information on the reproductive effects of CMPP-P is not available.

MCPA does not cause changes in hereditary material of microorganisms or cultured human cells in standard test procedures, but has been shown to cause weak effects in one insect species and either weak or no effects in other whole animal studies. CMPP-p also has weak effects in animals. Dicamba does not cause changes in the hereditary material of animals.

Chronic/Subchronic Toxicity Studies

Technical Active Ingredients: None known.

Carcinogenicity

Technical Active Ingredients: Although some reports have suggested that phenoxy herbicides cause cancer, MCPA was determined not to cause cancer in rats in a study involving lifetime exposure of rats to high doses of this compound. Exposure to CMPP-P or dicamba also did not cause cancer in animal studies.

Other Toxicity Information:

None.

Toxicity of Other Components

The acute toxicity test results reported in Section 11, above, for the finished product take into account any acute hazards related to the "other components" in the formulation.

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

Target Organs

Active Ingredients

MCPA: Liver, kidneys, spleen, thymus.
Mecoprop-P: Kidneys.
Dicamba: Eyes, skin.

Inert Ingredients

Not Applicable.

SECTION – 12: ECOLOGICAL INFORMATION

Summary of Effects

The three active ingredients in Target Herbicide are active against broadleaved (dicot) weeds. If sufficient exposure occurs, broadleaved plants outside the intended area may be harmed, but the toxicity to other organisms is low. Based on the effects of the active ingredients, the product is expected to be practically nontoxic to bees, aquatic invertebrates, and fish, and only moderately toxic to birds.

Eco-Acute Toxicity

MCPA Technical:

Green Algae 5-Day EC ₅₀	46 ppm
Bees LC ₅₀ /EC ₅₀ (Contact)	104 µg/bee
Invertebrates (Water Flea) LC ₅₀ /EC ₅₀	> 100 ppm
Fish (Trout) 96-hr LC ₅₀ /EC ₅₀	117 ppm
Fish (Bluegill) 96-hr LC ₅₀ /EC ₅₀	97 ppm
Birds (8-day Dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀	377 ppm
Birds (8-day Dietary - Mallard Duck) LC ₅₀ /EC ₅₀	>2000 ppm

CMPP-P (Mecoprop-P) Technical:

Bees LC ₅₀ /EC ₅₀ (contact)	> 10 µg/bee
Invertebrates (Water Flea) LC ₅₀ /EC ₅₀ 48 hr	> 100 ppm
Fish (Trout) LC ₅₀ /EC ₅₀ (96 hr)	100 ppm
Fish (Bluegill) LC ₅₀ /EC ₅₀ (96 hr)	> 100 ppm
Birds (8-day dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀	> 5,000 ppm
Birds (8-day dietary - Mallard Duck) LC ₅₀ /EC ₅₀	> 5,620 ppm

Dicamba Technical:		
Green Algae 5-Day EC ₅₀		> 3.7 ppm
Bees LC ₅₀ /EC ₅₀ (Contact)		> 100 µg/bee
Invertebrates (Water Flea) LC ₅₀ /EC ₅₀		110 ppm
Fish (Trout) 96-hr LC ₅₀ /EC ₅₀		135 ppm
Fish (Bluegill) 96-hr LC ₅₀ /EC ₅₀		135 ppm
Bird (8-day Dietary - Bobwhite Quail) LC ₅₀ /EC ₅₀		> 10,000 ppm
Bird (8-day Dietary - Mallard Duck) LC ₅₀ /EC ₅₀		> 10,000 ppm

Eco-Chronic Toxicity

Dicamba Technical:		
Invertebrates (Water Flea) 21-Day NOEC		Not available
Fish (Trout) 21-Day NOEC		Not available

MCPA Technical:		
Invertebrates (Water Flea) 21-Day NOEC		Not available
Fish (Trout) 21-Day NOEC		Not available

CMPP-P (Mecoprop-P) Technical:		
Invertebrates (<i>Daphnia magna</i>) 21-Day Reproduction EC ₅₀		22.7 mg/L
Fish (Rainbow Trout) 21-Day NOEC		Not Available

Environmental Fate

Target Herbicide is active when sprayed on foliage but has little or no residual activity after it has been in contact with soil. The ingredients are degraded in plants or by micro-organisms in soil and water. None of the active ingredients in Target Herbicide has a potential to bioaccumulate. The ingredients are highly mobile in soil, but actual movement is limited by rapid degradation. Bulk material sinks in water (after 24 h test) and mixes with water (water based).

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.: 28028

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.

Prepared by: Syngenta Canada Inc.
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