DUPONT HYVAR®X HERBICIDE

1. PRODUCT AND COMPANY IDENTIFICATION

Material Identification	**HYVAR®X**
Product description	Herbicide
Recommended use	Herbicide for non-selective weed control and selective weed control in citrus and asparagus.
Company details	**DuPont (New Zealand) Limited** Central Park Corporate Centre Level 2, Building 5 666 Great South Road Greenlane, Auckland 1051
Telephone	(09) 526 2501
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24-hour Emergency phone	**0800 658 080**
Date of issue	May 2013

2. HAZARDS IDENTIFICATION

HSNO Classification	6.1E (acute oral toxicant), 6.3B (skin irritant), 6.4A (eye irritant), 6.7B (suspected carcinogen), 6.8B (reproductive/development toxin), 6.9B (target organ toxicant), 9.1A (aquatic toxicant), 9.2A (soil toxicant)
Hazards	Harmful-may be harmful if swallowed, inhaled or absorbed through the skin. May cause skin and eye irritation. May cause development/ reproductive damage from repeated oral exposure. Suspected of causing cancer. May cause organ damage from repeated oral exposure at high doses. Very toxic to aquatic organisms. Very toxic to the soil environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	**CAS No.**	**Proportion**
Bromacil	314-40-9	80 %
Inert Ingredients	not allocated	20 %

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from exposure and have patient lie down and keep quiet. If patient is not breathing, start artificial respiration immediately. Never give anything by mouth to an unconscious person. Call a physician if necessary.
Skin contact	If spilt on the skin, remove contaminated clothing and wash affected areas of skin immediately.
Eye contact	If concentrate is splashed in eyes, flush with running water for at least 15 minutes. Take to hospital without delay. For advice contact the

	National Poisons Centre 0800 POISON (0800 764766)
Ingestion	If swallowed, DO NOT induce vomiting. For advice, contact the National Poisons Centre 0800 POISON (0800 764766) or call a doctor immediately.

5. FIRE FIGHTING MEASURES

Flammable properties	Flammable Limit in Air, % by volume: LEL 0.11 g/L. May be ignited by heat or open flame.
Fire/Explosion Hazard	Like most organic powders or crystals, under dusting conditions, this material may form explosive mixtures in air.
Extinguishing media	Water spray, foam, dry, chemical, or C02. Use media appropriate for surrounding material.
Fire fighting instructions	Evacuate personnel to a safe area. Wear self-contained breathing apparatus. Cool tank/container with water spray. Runoff from fire control may be a pollution hazard. If area is heavily exposed to fire and if conditions permit, let fire burn itself out, since water may increase the contamination hazard.
Hazchem code	2Z

6. ACCIDENTAL RELEASE MEASURES

Spill precautions	Use appropriate Personal Protective Equipment during clean up. (See Section 8)
Spill containment	Dyke spill. Prevent liquid from entering the sewers, waterways, or low areas.
Spill clean-up	Shovel or sweep up. DO NOT flush with water. Place material in a clean, dry container and cover for disposal. Wash contaminated areas with water and detergent. Prevent liquid from entering sewers, waterways or low areas. Soak up with sawdust, sand or other absorbent material. Shovel or sweep up. Never return to container for reuse. (See section 13 for disposal instructions.)

7. HANDLING AND STORAGE

Handling	Avoid skin and eye contact. Avoid inhaling the vapour, or spray mist. Wash thoroughly after handling. Wash clothing after use.
Storage	Store in the closed, original container in a dry, well ventilated area, as cool as possible out of direct sunlight and under lock and key. Keep from contact with fertilisers, fungicides and seeds. Do not store with Classes 1, 2, 3.2, 4 or 5 substances. Stores containing more than 100kg of this product, either alone or in aggregate with other hazardous substances are subject to requirement of an emergency management response plan, secondary containment and signage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls	Avoid confined spaces where dust may disperse in air.
Exposure Standards	None established for formulated product.
Bromacil	AEL (DU PONT) 10 mg/m^3 (8 and 12 hr TWA)
	TLV (ACGIH): 1 ppm, 11 mg/m^3
Personal protection	Avoid breathing spray, mist or dust. Use respiratory equipment suitable for herbicide dust if exposure may exceed AEL. Avoid contact with eyes and skin. Wear protective goggles, rubber gloves, boots and overall during handling and mixing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Solid
Colour	Beige
Odour	Odourless
pH	8.5 – 9.5
Density	0.53 g/cc
Corrosivity	Non-corrosive
Oxidisation	Not an oxidiser
(Also, see sections 5 &10)	

10. STABILITY AND REACTIVITY

Stability	Stable at normal temperatures and storage conditions.
Incompatible materials	Incompatible with amines.
Decomposition	Decomposes with heat to form highly toxic fumes, including oxides of nitrogen and bromine compounds. Decomposes with reaction with amines, particularly primary amines.
Polymerisation	Polymerisation will not occur.

11. TOXICOLIGICAL INFORMATION

Acute Effects	
Eye	Mild to moderate eye irritant.
Skin	Slightly toxic by contact. The compound is a moderate skin irritant, and is not a skin sensitiser.
Inhaled	Slightly toxic by inhalation.
Swallowed	Slightly toxic by ingestion.
Chronic Effects	None established for formulated product.
Bromacil	The compound is a moderate skin irritant, is a mild to moderate eye irritant, and is not a skin sensitiser. Rabbits acutely exposed via dermal route demonstrated no clinical signs of toxicity, and no gross tissue changes were observed at the highest practical dose, 5,000 mg/kg.

Acute inhalation exposure of rats resulted in only general signs of distress, rapid and deep respiration, at the highest dose tested, 4.8 g/L. Toxicity described in animals repeatedly exposed to the compound for two weeks include slightly increased platelet counts, and lower serum cholesterol in the group exposed to 2.0 mg/L. Slightly increased liver weights were noted in the groups exposed to 0.5 or 2.0 mg/L. All remaining animals were normal after a 14-day recovery period. When a massive dose was administered (ingested) to the dog (5,000 mg/kg), incoordination, salivation, vomiting, weakness, lacrimation and dilated pupils were observed. Toxicity described in animals repeatedly exposed to near lethal doses included liver changes, increased liver, adrenal and heart weights, and decreased brain, kidney and spleen weights. In another study, body weights were lower and changes were noted in the liver, kidneys and thyroids in rats repeatedly fed 2,500 ppm in the diet for 90 days. Dogs fed the compound for two years had no evidence of toxicity in any exposure group. Rats fed the same doses of the compound for two years had lower weight gain, and there were suggestions of slight thyroid effects, focal hyperplasia, in the high dose group. Mice that were administered 250, 1,250 or 5,000 ppm in the diet for 18 months demonstrated reduced growth rates at 1,250 ppm in females and at 5,000 ppm in males. Higher mortality was noted among female mice in the high dose group. Increased incidences of naturally occurring changes in ageing mice, including testicular tubule atrophy and liver effects, were observed at the higher doses. An increase in total liver tumours that was above the normal background incidence was observed in high-dose male mice. This response in male mice is considered only as limited evidence of a carcinogenic response in the species. The weight of the scientific data for bromacil suggests that this is not indicative of a similar response in female mice, other laboratory animals or in man. Additional animal testing indicated that this compound was not teratogenic and was not uniquely toxic to the conceptus. No reproductive effects were observed in rats exposed to 250 ppm in the diet for three generations. The compound does not produce heritable genetic damage in animals. Most studies for genetic damage in mammalian and bacterial cells in culture were also negative.

Toxicity Data
Bromacil

Acute Oral LD50 (rat) Male 2,000 mg/kg, Female 1,300 mg/kg
Acute Percutaneous LD50 (rabbit): > 5,000 mg/kg
Inhalation LC50 (4-hr rat): > 4.8 mg/L air

12. ECOLOGICAL DATA

Bromacil	Fish LC_{50} rainbow trout (48hr) 75, bluegill sunfish 71, carp 164 mg/L Daphnia LC_{50} (48hr) 119 mg/L. Algae EC_{50} (72hr) 0.097 mg/L (9.1A) Very toxic to aquatic organisms. Avoid contamination of any water supply with chemical or empty container. Seedling plants EC_{50} 0.0078 mg/kg soil-herbicidal. DT $_{50}$ soil 106 days. Log kow 2.11 (9.2A) Birds acute oral LD_{50} bobwhite quail 2,250 mg/kg, dietary LC_{50} (8days) mallard ducks, bobwhite quail > 10,000 mg/kg.

13. DISPOSAL CONSIDERATIONS

Ensure bag is completely empty and dispose of at an approved landfill. If local regulations and wind direction permit, burn. Dispose of this product only by using in accordance with label directions. Dispose of solid contaminated material/or contaminated soil in an approved landfill. Disposal must be in accordance with applicable local regulations.

14. TRANSPORT INFORMATION

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (Bromacil)
DG Class	9
UN Number	3077
Hazchem	2Z
Pack Group	III
Trade Name	Hyvar®X

15. REGULATORY INFORMATION

HSNO Approval Code	HSR000428
HSNO Controls (inc. Tracking and Record Keeping):	See www.epa.govt.nz/ for controls.
Approved handler	This product must be under the control of an approved handler during use.
ACVM Registration:	Hyvar®X is registered pursuant to the ACVM Act 1997 No. P.678
ACVM Controls:	See www.foodsafety.govt.nz/ for registration conditions.

16. OTHER INFORMATION

Glossary

ACGIH	American Conference of Governmental Industrial Hygienists.
DT_{50}	Time (days) for 50%loss.
EC_{50}	Median effective concentration.
EEL	Environmental Exposure Limit.
ERMA	Environmental Risk Management Authority
HSNO	Hazardous Substances and New Organisms.
IARC	International Agency for Research on Cancer.
K_{oc}	Organic carbon partition coefficient (ml soil water/g organic carbon)
LC_{50}	Lethal concentration that will kill 50% of the test organisms inhaling or ingesting it.
LD_{50}	Lethal dose to kill 50% of test animals/organisms.
NOEL	No observable effect level.
OSHA	American Occupational Safety and Health Administration.
P_{ow}	The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium at a specified temperature.
TEL	Tolerable Exposure Limit.
TLV	Threshold Limit Value-an exposure limit set by responsible authority.
WES	Workplace Exposure Limit

Miscellaneous The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process

Responsibility for MSDS DuPont (New Zealand) Limited
For further information phone (09) 268 5500