

**BETAMIX® HERBICIDE**

MSDS Version 2.1

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Name	BETAMIX® HERBICIDE
Chemical Name	3-methoxycarbonylamino phenyl 3-methylcarbanilate; 3-ethoxycarbonylamino phenyl carbanilate (active ingredients)
Synonym	
MSDS Number	20
Chemical Family	
Chemical Formulation	Mixture (active ingredients: C16H16N2O4; C16H16N2O4)
EPA Registration No.	264-621
Canadian Registrat. No.	19652

Bayer CropScience
 2 T.W. Alexander Drive
 Research Triangle PK, NC 27709
 USA

For Product Use Information: (866)-992-2937 Monday through Friday(CRLF) 8:00AM-4:30PM(CRLF) For Medical Emergency contact DART: (800) 334-7577 24 Hours/Day(CRLF) For Transportation Emergency CHEMTREC: (800) 424-9300 24 Hours/Day

Product Use Description BETAMIX is a Sugar Beet herbicide.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component Name</u>	<u>CAS No.</u>	<u>Concentration % by Weight</u>	
		<u>Minimum</u>	<u>Maximum</u>
Phenmedipham	13684-63-4	8.0000	
Desmedipham	13684-56-5	8.0000	
Inert ingredients,including:		84.0000	
Isophorone	78-59-1		
Trimethylbenzene	25551-13-7		
Isobutyl alcohol	78-83-1		
AROMATIC HYDROCARBONS	64742-95-6		
Xylene	1330-20-7		< 1.0000

INERT INGREDIENTS (84%): Only the regulated ingredients are listed above. For additional information, refer to Section 15 (Regulatory Information).

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SECTION 3. HAZARDS IDENTIFICATION

NOTE: Please refer to Section 11 for detailed toxicological information.

Emergency Overview	Warning! Combustible liquid. Harmful if swallowed. Prolonged contact can cause moderate to severe eye and skin irritation.
Physical State	liquid
Odor	Faint organic solvent
Appearance	amber
Routes of Exposure	Vapor/mist inhalation. Skin contact.
Immediate Effects	
Eye	May produce severe eye irritation, especially under conditions of prolonged contact. The liquid is a moderate eye irritant. The vapor is a mild to moderate eye irritant. Not know to be corrosive to eyes.
Skin	Can cause moderate skin irritation. The liquid is a mild skin irritant. The vapor is a mild to moderate skin irritant. Not known to be a skin sensitizer in animal study.
Ingestion	Harmful if swallowed. Ingestion of significant amounts of liquid may cause increased salivation, general ataxia (confusion and lack of muscular coordination), weakness and tremors.
Inhalation	Prolonged inhalation of solvent vapor may cause respiratory tract irritation, narcosis (a state of feeling drunken), headache, and nausea.
Chronic or Delayed Long-Term	Isophorone has shown some evidence of carcinogenicity in male rats and equivocal evidence of carcinogenicity in male mice in NTP studies. No other components of Betamix are listed as carcinogenic by NTP, IARC or OSHA. Results from 90-day animal studies suggest no target organ effects under conditions of normal handling and use.
Medical Conditions Aggravated by Exposure	Prolonged exposure and inhalation may aggravate pre-existing conditions of the respiratory system.
Signs and Symptoms	Solvent vapor may cause respiratory tract irritation, narcosis, headache and nausea. Ingestion and prolonged inhalation may cause increased salivation, general ataxia (confusion and lack of muscular coordination), weakness and tremors.

SECTION 4. FIRST AID MEASURES

Eye	Flush eyes with plenty of water for at least 15 minutes. Get medical attention.
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Skin	Take off contaminated clothing. Wash with soap and water.
Ingestion	Call a physician or Poison Control Center. Do not induce vomiting.
Inhalation	Remove victim to fresh air. Support respiration if necessary. Seek medical advice.
Note to Physician	Empty stomach contents by gastric lavage. Avoid aspiration.

SECTION 5. FIRE FIGHTING MEASURES

Flash Point	144 °F / 62 °C Method: Tagliabue Closed Cup Flammability Class: IIIA * *NOTE: Classified by NFPA/OSHA criteria. Combustible.
Fire and Explosion Hazards	Evolution of toxic fumes including nitrogen oxides.
Suitable Extinguishing Media	foam, dry chemical, carbon dioxide (CO2), water
Fire Fighting Instructions	Fire fighters should wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

General and Disposal	Use proper protective equipment to minimize personal exposure (see Section 8). Take all necessary action to prevent and to remedy the effects of the spill. Ensure that the disposal is in compliance with Federal or local disposal regulations. Notify the appropriate authorities immediately. See Section 13 for any applicable Reportable Quantity (RQ) and other federal regulatory information.
Land Spill or Leaks	Keep people away. Contain and absorb spillage with absorbent material. Wash area with water containing detergent and ammonia. Inform authorities immediately if material enter watercourses.

SECTION 7. HANDLING AND STORAGE

Handling Procedures	Warning! Harmful if swallowed. May produce severe irritation of eyes and irritation of the skin. Avoid breathing spray mist. Avoid contact with skin and eyes.
Storing Procedures	Store in original container. Keep tightly closed in a dry and cool place. Do not

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use or store near heat or open flame.

If exposed to subzero temperatures, BETAMIX gradually thickens. The liquid returns to its original consistency when placed in a room (over 50°F) for several days.

Work/Hygienic Procedures

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this products concentrate. Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment (PPE). If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Do not apply when weather conditions favor drift from treated areas. Do not apply this product through any type of irrigation system.

Only protected handlers may be in the area during application.

For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Control airborne concentrations below the exposure guidelines. Use with adequate ventilation. Local exhaust ventilation may be necessary, when used in a confined area.
Eye/Face Protection	splash goggles face-shield
Body Protection	Nitrile protective gloves.
Respiratory Protection	Ensure good ventilation. WEAR organic VAPOR respirator for maximum protection.

NOTE TO APPLICATORS AND HANDLERS OF AGRICULTURAL PRODUCTS:
For agricultural products which are within the scope of the EPA Worker Protection Standards (WPS) (40 CFR Part 170), all users must refer to the statement below or the Product Label for WPS-specified Personal Protective Equipment (PPE), Restricted Entry Interval (REI), and other Precautionary Statements.

PERSONAL PROTECTIVE EQUIPMENT FOR APPLICATORS AND HANDLERS:

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category F on an EPA chemical resistance category selection chart. Applicators and handlers must wear:

Coveralls over short-sleeved shirt and short pants

Chemical-resistant gloves, such as barrier laminate or butyl rubber or nitrile

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rubber or viton

Chemical-resistant footwear plus socks

Chemical-resistant headgear for overhead exposure

Chemical-resistant apron when cleaning equipment, mixing, or loading

PERSONAL PROTECTIVE EQUIPMENT REQUIRED FOR EARLY ENTRY INTO TREATED AREAS:

For entry into treated area during the restricted entry anything that has been treated such as plants, soil, or water, the PPE required is:

Coveralls over short-sleeved shirt and short pants

Chemical-resistant gloves such as barrier laminate or butyl rubber or nitrile rubber or viton

Chemical-resistant footwear plus socks

Chemical-resistant headgear for overhead exposure

Exposure Limits

Isophorone	78-59-1	ACGIH	Ceiling		5 ppm
		NIOSH	REL	4 ppm	23 mg/m3
		OSHA Z1	PEL	25 ppm	140 mg/m3
		OSHA Z1A	TWA	4 ppm	23 mg/m3
		US CA OEL	TWA PEL	4 ppm	23 mg/m3
Trimethylbenzene	25551-13-7	OSHA Z1A	TWA	25 ppm	125 mg/m3
		US CA OEL	TWA PEL	25 ppm	125 mg/m3
		ACGIH	TWA		25 ppm
Isobutyl alcohol	78-83-1	ACGIH	TWA		50 ppm
		NIOSH	REL	50 ppm	150 mg/m3
		OSHA Z1	PEL	100 ppm	300 mg/m3
		OSHA Z1A	TWA	50 ppm	150 mg/m3
		US CA OEL	TWA PEL	50 ppm	150 mg/m3
Xylene	1330-20-7	OSHA Z1	PEL	100 ppm	435 mg/m3
		OSHA Z1A	TWA	100 ppm	435 mg/m3
		OSHA Z1A	STEL	150 ppm	655 mg/m3
		US CA OEL	TWA PEL	100 ppm	435 mg/m3
		US CA OEL	Ceiling		300 ppm
		US CA OEL	STEL	150 ppm	655 mg/m3
		NIOSH	REL	100 ppm	435 mg/m3
		NIOSH	STEL	150 ppm	655 mg/m3
		NIOSH	REL	100 ppm	435 mg/m3
		NIOSH	STEL	150 ppm	655 mg/m3
		NIOSH	REL	100 ppm	435 mg/m3
		NIOSH	STEL	150 ppm	655 mg/m3
		ACGIH	TWA		100 ppm
ACGIH	STEL		150 ppm		

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	amber
Physical State	liquid
Odor	Faint organic solvent
Vapor Pressure	Pure Isophorone < 1.0 mmHg at 20 °C
Density	0.99 g/cm ³
Boiling Point	Not available
Solubility (in water)	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Hazardous Polymerization (Conditions to avoid)	Will not occur

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity	Rat: 4,059 mg/kg Low toxicity. Harmful if swallowed.
Acute Dermal Toxicity	Rabbit: 1,980 mg/kg Low toxicity.
Acute Inhalation Toxicity	Not available for Betamix. However, data from a formulation with similar ingredients suggest low toxicity for Betamix. The calculated LC50 is: > 10 mg/l (estimated from the known LC50 values for the inert solvents).
Skin Irritation	Product is a moderate skin irritant.
Eye Irritation	Can cause severe eye irritation under conditions of prolonged contact.
Sensitization	Not known to be a skin sensitizer in animal study.

The toxicity studies reported below were carried out with the active ingredients: Phenmedipham and

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Desmedipham technical (>96%). In comparison, Betamix contains only 8% each of DMP and PMP. Also reported is the data for isophorone (the inert ingredient) from the chronic feeding studies in animals.

Sub-Chronic Toxicity Results from 90-day animal studies suggest no target organ effects under the conditions of normal handling and use.

Chronic Toxicity Phenmedipham: In two-year feeding studies with phenmedipham 1.10 (10/14) in rats, mice and dogs, no organotoxic effects were observed; the only effects noted at the high experimental doses (500-1000 ppm) were reduced weight gain (rats) and increased kidney weight (mice).

Desmedipham: In two-year feeding studies with desmedipham in mice and rats, adverse effects were observed only in animals receiving high doses (750-1,500 ppm). The effects include increased spleen weight, toxic hemolytic anemia (both species) and elevated methemoglobin levels (rats only, 300-1,500 ppm). However, there were no significant increases in mortality rate in both species even at high dose levels. In a similar one-year study with dogs (up to 5,000 ppm), toxic hemolytic anemia associated with compensatory erythropoiesis (generation of red blood cells) was the main effect noted, with a threshold level of 300 ppm. The approximate no-effect level for desmedipham in the tested animals is: 25 mg/kg/day in mice; 3 mg/kg/day in rats; and 10 mg/kg/day in dogs.

Isophorone: When administered to mice or rats, by stomach tube in corn oil, at dosage levels of 250 or 500 mg/kg of body weight, isophorone was found to be associated with a slightly increased incidence of renal and preputial tumors in male rats and of liver tumors in male mice. However, isophorone did not exhibit similar potential in either female rats or female mice. Thus, under the conditions of this bioassay, isophorone appeared to exhibit weak carcinogenic activity in these animal studies. The significance of this data is uncertain with regard to potential human health hazard under the realistic exposure conditions, i.e., exposure by inhalation or dermal contact during normal product handling and use. Isophorone is also listed as a NTP Testing Program Substance.

Assessment Carcinogenicity

ACGIH

Isophorone	78-59-1	Group A3
Xylene	1330-20-7	Group A4

NTP

None

IARC

Xylene	1330-20-7	3
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OSHA

None

Reproductive & Developmental Toxicity Both phenmedipham and desmedipham were shown to have no adverse effects on fertility or reproduction in multi-generation rat reproduction studies at dose levels up to 1,250 mg/kg/day.

Teratogenicity Phenmedipham showed no embryotoxic or teratogenic effects in a rat or a rabbit

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teratology study.

No teratogenic effects of desmedipham were observed in fetuses of rabbits given up to 450 mg/kg/day during gestation. In rats, desmedipham induced methemoglobin formation in dams at all doses tested (10-1,000 ppm). However, no teratogenic or embryotoxic effects were observed in the offspring from dams administered a low dose of 10 mg/kg/day. At the higher doses (100-1,000 mg/kg/day), the dose-dependent, elevated methemoglobin levels were found to be maternally toxic, leading to an increased frequency of malformation.

Mutagenicity

Phenmedipham was not mutagenic or genotoxic when tested in numerous (eight) mutagenesis systems. Desmedipham was not mutagenic or genotoxic when tested in Ames mutation test and chromosomal aberration tests using human lymphocytes or mouse micronucleus. It was mutagenic only in mouse lymphoma cells when tested at high doses which extended into the toxic range (50-100 mg/ml).

SECTION 12. ECOLOGICAL INFORMATION

Environmental Precautions

This pesticide is toxic to fish and aquatic organisms. For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to fish and aquatic organisms in adjacent aquatic sites. Do not contaminate water through disposal of equipment washwaters.

SECTION 13. DISPOSAL CONSIDERATIONS

General Disposal Guidance

Pesticide Disposal: Do not contaminate water, food, or feed by storage or disposal. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal

Please refer to the product label for other specific disposal instructions (e.g., CONTAINER DISPOSAL).

RCRA Classification

78-83-1 Isobutyl alcohol

US. EPA Resource Conservation and Recovery Act (RCRA) U List of Hazardous Wastes (40 CFR 261.33(f) and 40 CFR 302 [CERCLA]): U140

1330-20-7 Xylene

US. EPA Resource Conservation and Recovery Act (RCRA) U List of Hazardous Wastes (40 CFR 261.33(f) and 40 CFR 302 [CERCLA]): U239

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SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME: None

DOT SHIPPING LABEL: None

SECTION 15. REGULATORY INFORMATION

US Federal

EPA Registration No. 264-621

TSCA list

Isophorone	78-59-1
Trimethylbenzene	25551-13-7
Isobutyl alcohol	78-83-1
AROMATIC HYDROCARBONS	64742-95-6
Xylene	1330-20-7

TSCA 12b export notification

None

SARA Title III - section 302 - notification and information

None

SARA Title III - section 313 - toxic chemical release reporting

Desmedipham	13684-56-5	1.0%
Xylene	1330-20-7	1.0%

US States Regulatory

CA Prop65

This product does not contain any substances known to the State of California to cause cancer.

This product does not contain any substances known to the State of California to cause reproductive harm.

US State right-to-know ingredients

Desmedipham	13684-56-5	NJ
Isophorone	78-59-1	CA, CT, IL, MN, NJ, PA, RI
Trimethylbenzene	25551-13-7	CA, IL, MN, PA, RI
Isobutyl alcohol	78-83-1	CA, CT, IL, MN, NJ, PA, RI
Xylene	1330-20-7	CA, CT, IL, MI, MN, NJ, PA, RI

Canadian Regulations

Canadian Registrat. No. 19652

Canadian Domestic Substance List

Isophorone	78-59-1
Trimethylbenzene	25551-13-7
Isobutyl alcohol	78-83-1
AROMATIC HYDROCARBONS	64742-95-6

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Xylene 1330-20-7

Environmental

CERCLA

Isophorone	78-59-1	5,000 lbs
Isobutyl alcohol	78-83-1	5,000 lbs
Xylene	1330-20-7	100 lbs

Clean Water Section 307 Priority Pollutants

Isophorone 78-59-1

Safe Drinking Water Act Maximum Contaminant Levels

Xylene 1330-20-7

International Regulations

EU Classification

Xylene	1330-20-7	Harmful
R Phrases	Flammable. Harmful by inhalation and in contact with skin. Irritating to skin.	
S Phrases	Keep out of the reach of children. Avoid contact with the eyes.	

European Inventory of Existing Commercial Substances (EINECS)

Phenmedipham	13684-63-4
Desmedipham	13684-56-5
Isophorone	78-59-1
Trimethylbenzene	25551-13-7
Isobutyl alcohol	78-83-1
AROMATIC HYDROCARBONS	64742-95-6
Xylene	1330-20-7

SECTION 16. OTHER INFORMATION

	Health	Flammability	Reactivity	Others
HMS	2	2	0	H
NFPA	2	2	0	none

REVISED SECTIONS:

MSDS REVISION INDICATOR: Company name change.

Print Date: 12/16/2002

Supersedes MSDS, which is older than: 12/12/2002

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