

Product Code: 15448 MSDS Number: C2937

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Material Safety Data Sheet

Print date -- August 17th, 2000 9:06 a.m. (E) PS PSA PSFHV -- 1.1 (1/14)

------ 1. CHEMICAL PRODUCT and COMPANY IDENTIFICATION -------

Product Name: BETAMIX® HERBICIDE

Product Code: 15448
MSDS Number : C2937

Chemical Name: 3-methoxycarbonylaminophenyl

3-methylcarbanilate; 3-ethoxycarbonylaminophenyl carbanilate

(active ingredients)

Chemical Formula: Mixture (active ingredients: C16H16N2O4;

C16H16N2O4)

EPA Registry Number: 264-621

Canadian Reg. No.: 19652 P.C.P ACT

AVENTIS CROP SCIENCE USA LP

2 T.W. ALEXANDER DRIVE RESEARCH TRIANGLE PK, NC 27709

UNITED STATES

PRODUCT USE:

END-USE PRODUCT DESCRIPTION: BETAMIX is a Sugar Beet

herbicide.

------ 2. COMPOSITION / INFORMATION on INGREDIENTS -------

Component	Cas number	%
Phenmedipham	13684-63-4	8%
Desmedipham	13684-56-5	8%
Inert ingredients, including:		84%
Isophorone	78-59-1	
Aromatic petroleum solvent	25551-13-7	
Isobutanol	78-83-1	
Aromatic Hydrocarbon	64742-95-6	
Mixed Xylene	1330-20-7	< 1%

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



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------ 3. HAZARDS IDENTIFICATION ------- 3.

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. PRODUCT IS AN AMBER LIQUID WITH A FAINT AROMATIC ODOR.

POTENTIAL HEALTH EFFECTS

ROUTES OF EXPOSURE:

Skin contact, vapor or mist inhalation.

SIGNS AND SYMPTOMS OF EXPOSURE:

EFFECTS OF OVEREXPOSURE: Solvent vapor may cause respiratory tract irritation, narcosis, headache, nausea. Ingestion and prolonged inhalation may cause increased salivation, general ataxia (confusion and lack of muscular coordination), weakness and tremors.

IMMEDIATE EFFECTS

SKIN:

Can cause moderate skin irritation. The liquid is a mild skin irritant and the vapor is a mild to moderate skin irritant. Not known to be a skin sensitizer in animal studies.

EYES:

May produce severe eye irritation, especially under conditions of prolonged eye contact. The liquid is a moderate eye irritant and the vapor is a mild to moderate eye irritant. Not known to be corrosive to eyes.

INHALATION:

Prolonged inhalation of solvent vapor may cause respiratory tract irritation, narcosis (a state of feeling drunken), headache, and nausea.



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------ 3. HAZARDS IDENTIFICATION (Continued)

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.

DELAYED/LONG TERM EFFECTS

CARCINOGENIC:

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.

TARGET ORGAN EFFECTS:

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.

After contact with skin:

Remove contaminated clothing and wash with soap and water.

After contact with eyes:

Flush with plenty of water for 15 minutes. Get medical attention.

After inhalation:

Remove to fresh air, support respiration, and seek medical advice.

After ingestion:

Call a PHYSICIAN or poison control center. DO NOT induce vomiting. (See "Hints for the physician" below).



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------ 4. FIRST AID MEASURES (Continued)

Hints for the physician:

EMPTY STOMACH CONTENTS BY GASTRIC LAVAGE. AVOID ASPIRATION.

FLAMMABLE PROPERTIES

Flash point: 144°F (Combustible) T.C.C.

Flammability Class: IIIA *

*NOTE: Classified by NFPA/OSHA criteria.

Advice on protection against fire and explosion:

FIRE AND EXPLOSION HAZARDS: Evolution of toxic fumes

including nitrogen oxides.

FIRE FIGHTING INSTRUCTIONS: Persons fighting fire should

wear self-contained breathing apparatus.

Suitable extinguishing media:

Foam, dry chemical, carbon dioxide, or water.

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 15 for applicable Reportable Quantity (RQ) and other federal regulatory information).

LAND SPILL OR LEAK: Keep people away. Contain and absorb spillage with absorbant material. Wash area with water containing detergent and ammonia. Inform authorities immediately if material enter watercourses.



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Handling:

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.

USERS SHOULD:

- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's 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.
- Do not apply through any type of irrigation system.
- lacktriangle 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.

Storage:

Store in original container and keep closed. Store in a cool, dry place. Do not 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 $50^{\circ}F$) for several days.



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------ 8. EXPOSURE CONTROLS / PERSONAL PROTECTION ------

Additional advice on system design:

ENGINEERING CONTROLS: Control airborne concentrations below the exposure guideline (see below for any OSHA/ACGIH exposure limits). Use with adequate ventilation. Local exhaust ventilation may be necessary, especially when used in a confined area.

Personal protective equipment

FOR APPLICATORS AND HANDLERS (AGRICULTURAL USES): The personal protective equipment (PPE) for agricultural uses are specified under the Subtitile: "Note to Applicators and Handlers of Agricultural Products."

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 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 interval (REI) of 24 hours that involves contact with anything that has been treated such as plants, soil, or water, the PPE required is:



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Personal protective equipment (Continued)

■ 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

FOR MANUFACTURING AND PACKAGING EMPLOYEES: The personal protective equipment (PPE) in accordance with OSHA standards are recommended immediately below.

Body protection:

Nitrile protective gloves.

Eye protection:

Splash goggles, face shield.

Respiratory protection:

Ensure good ventilation. WEAR organic VAPOR respirator for maximum protection.

EXPOSURE GUIDELINES:

Isophorone (78-59-1)

OSHA PEL ACGIH TLV HCC WEL

140 mg/m 3 (PEL)28 mg/m 3 (CEIL)None 25 ml/m 3 (PEL) 5 ml/m 3 (CEIL) None

Isobutanol (78-83-1)

OSHA PEL ACGIH TLV HCC WEL

300 mg/m³ (PEL)152 mg/m³ (TWA)None 100 ml/m³ (PEL)50 ml/m³ (TWA) None

Aromatic petroleum solvent (25551-13-7)

OSHA PEL ACGIH TLV HCC WEL

None $123 \text{ mg/m}^3 \text{ (TWA)} \text{None}$ None $25 \text{ ml/m}^3 \text{ (TWA)}$ None

Mixed Xylene (1330-20-7)

OSHA PEL ACGIH TLV HCC WEL

435 mg/m³ (PEL)651 mg/m³ (STELNone 100 ml/m³ (PEL)150 ml/m³ (STELNone None 434 mg/m³ (TWA)None

For Product Use Information: Medic./Trans. Emergency:	(888) Aventis	24 Hours/Day
(DART)	(800) 334-7577	24 Hours/Day
(CHEMTREC)	(800) 424-9300	24 Hours/Day



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EXPOSURE GUIDELINES: (Continued)

None 100 ml/m³ (TWA)None

Phenmedipham (13684-63-4)

Manufacturer's Recommended Limit: TWA = 5 mg/m3

Desmedipham (13684-56-5)

Manufacturer's Recommended Limit: TWA = 2 mg/m3

Aromatic hydrocarbon (64742-95-6)

Manufacturer's Recommended Limit: TLV (TWA) = 50 ppm

Although general guidance has been provided, the degree of protection required in a particular situation depends on factors such as concentration and duration. More detailed advice on protective devices is available from Aventis.

------ 9. PHYSICAL and CHEMICAL PROPERTIES -------

APPEARANCE: Amber liquid

ODOR: Faint organic solvent

BASIC PHYSICAL PROPERTIES PHYSICAL STATE: Liquid

BOILING POINT: Not available

VAPOR PRESSURE: < 1.0 mmHg (20°C)* SOLUBILITY (H2O): Not applicable

DENSITY: 0.99 g/cm3

*NOTE: The Vapor Pressure value (above) is that for pure Isophorone.



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------ 10. STABILITY and REACTIVITY -------

CHEMICAL STABILITY:

Stable

HAZARDOUS POLYMERIZATION:

Will not occur

------ 11. TOXICOLOGICAL INFORMATION ------

EYE EFFECTS

Can cause severe eye irritation under conditions of prolonged contact.

SKIN EFFECTS

Dermal LD50 (rabbit): > 1,980 mg/kg (low toxicity).

Product is a moderate skin irritant.

Not known to be a skin sensitizer in animal study.

ACUTE ORAL EFFECTS

Oral LD50 (rat): 4,059 mg/kg (low toxicity).

Harmful if swallowed.

ACUTE INHALATION EFFECTS

Inhalation LC50 (rat-4hrs): 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).

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

SUBCHRONIC (TARGET ORGAN EFFECTS)

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

CHRONIC (CANCER INFORMATION)

Phenmedipham: In two-year feeding studies with phenmedipham

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------ 11. TOXICOLOGICAL INFORMATION (Continued) -------

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 prepuitial 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 bioassy, 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.

CARCINOGENICITY: NTP: No IARC: No OSHA: No

TERATOGENICITY (BIRTH DEFECTS)

Phenmedipham showed no embryotoxic or teratogenic effects in a rat or a rabbit teratology study.

No teratogenic effects of desmedipham were observed in fetuses of rabbits given up to 450 mg/kg/day during



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------ 11. TOXICOLOGICAL INFORMATION (Continued) ------

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.

REPRODUCTIVE EFFECTS

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.

MUTAGENICITY (GENETIC EFFECTS)

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).

----- 12. ECOLOGICAL INFORMATION -----

ENVIRONMENTAL HAZARDS: 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.



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------ 13. DISPOSAL CONSIDERATIONS ------ 13. DISPOSAL CONSIDERATIONS

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.

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

RCRA CLASSIFICATION:

RCRA hazardous waste ingredients: Isobutanol (< 6.0%): U140

PROPER SHIPPING NAME: None
DOT SHIPPING LABEL: None

STATE REGULATIONS

The following chemicals associated with the product are subject to the right-to-know regulations in these states: 1-Desmedipham (3-ethoxycarbonylamino-phenyl carbanilate) (13684-56-5): NJ
Isophorone (78-59-1): CT, FL, IL, MA, NJ, NY, PA, RI
Isobutanol (78-83-1): CT, FL, IL, MA, NJ, NY, PA, RI
Aromatic petroleum solvent (25551-13-7): FL, MA, NJ, PA, RI

Mixed Xylene (1330-20-7): CT, FL, MA, MI, NJ, NY, PA, RI

U.S. FEDERAL REGULATIONS

SARA TITLE III NOTIFICATION AND INFORMATION: Section 302 (EHS) Ingredients: Not listed Reportable Quantity (Pounds): 8929

SARA TITLE III - HAZARD CLASSES
Acute Health Hazard - Yes

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U.S. FEDERAL REGULATIONS (Continued)

Chronic Health Hazard - No

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Fire Hazard - Yes
Sudden Release of Pressure Hazard - No
Reactivity Hazard - No

TSCA 12B
The following are listed:
Isobutanol 5.999% (78-83-1)

SARA 313
:
1-Desmedipham (3-ethoxycarbonylamino-phenyl carbanilate)
8% (13684-56-5)
Mixed Xylene .999% (1330-20-7)
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ENVIRONMENTAL:

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CERCLA HAZARDOUS SUBSTANCE:

Isophorone 59.999% (78-59-1)

Isobutanol 5.999% (78-83-1)

Mixed Xylene .999% (1330-20-7)

CLEAN WATER ACT SECTION 307 PRIORITY POLLUTANTS:

Isophorone 59.999% (78-59-1)

SARA EHS 304 REPORTABLE QUANTITY:

Isophorone 59.999% (78-59-1)

Isobutanol 5.999% (78-83-1)

Mixed Xylene .999% (1330-20-7)

SAFE DRINKING WATER ACT MAXIMUM CONTAMINANT LEVELS:

Mixed Xylene .999% (1330-20-7)
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INTERNATIONAL REGULATIONS

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Die folgende(n) Chemikalie(n), die mit dem Produkt verbunden sind, sind auch auf folgenden internationalen Listen aufgefährt:

1-Desmedipham (3-ethoxycarbonylamino-phenyl carbanilate) (13684-56-5): EINECS
Isophorone (78-59-1): CANADIAN DSL, EINECS
Isobutanol (78-83-1): CANADIAN DSL, EINECS
Aromatic Hydrocarbon (64742-95-6): CANADIAN DSL, EINECS
Aromatic petroleum solvent (25551-13-7): CANADIAN DSL, EINECS
Mixed Xylene (1330-20-7): CANADIAN DSL, EINECS
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------- 15. REGULATORY INFORMATION (Continued)

WHMIS INGREDIENT DISCLOSURE LISTED COMPONENTS:

CANADIAN WHMIS CLASSIFICATION FOR CONTROLLED PRODUCTS: Betamix is a registered pesticide under US FIFRA regulations and is therefore exempted from WHMIS classifications. It is identified as "Pest" for Canadian inventory reporting purposes. For hazard communication purposes, the toxicity data indicate an equivalency of: Class B/Division 3 - Combustible Liquid; BETAMIX (liquid/vapor) is a Skin and Eye irritant.

------- 16. OTHER INFORMATION ------------------- 16. OTHER INFORMATION

HAZARD RATINGS

REVISED SECTIONS:

MSDS REVISION INDICATOR: Newformat, Company Name and EPA Number

PREPARED BY: Dept. of Regulatory Affairs

PHONE: 800-438-5837

SUPERCEDES MSDS DATED: 10/07/96

DISCLAIMER:

THIS INFORMATION IS PROVIDED IN GOOD FAITH BUT WITHOUT EXPRESS OR IMPLIED WARRANTY.