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Material Safety Data Sheet

Print date -- August 7th, 2000 8:33 a.m. (E) PS PSA PSFHV -- 1.1 (1/14)

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

Product Name: BETANEX[®] HERBICIDE
Product Code: 15452
MSDS Number : C2930
Chemical Name: 3-ethoxycarbonylaminophenyl carbanilate
(active ingredient)
Chemical Formula: Mixture (active ingredient: C16H16N2O4)
EPA Registry Number: 264-620
Canadian Reg. No.: 11570 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: BETANEX is a sugar beet herbicide.

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

Component	Cas number	8
Desmedipham	13684-56-5	16%
Inert ingredients, including:		84%
Isobutanol	78-83-1	< 10%
Isophorone	78-59-1	< 50%
Aromatic petroleum solvent	25551-13-7	
Aromatic Hydrocarbon	64742-95-6	
Mixed Xylene	1330-20-7	< 1%
INERT INGREDIENTS (84%): Only	the regulated i	ingredients are

listed above. For additional information, refer to Section 15 (Regulatory Information).

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

EMERGENCY OVERVIEW:

WARNING. COMBUSTIBLE LIQUID. HARMFUL IF SWALLOWED. MAY PRODUCE SEVERE IRRITATION OF EYES AND IRRITATION OF SKIN. 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 study.

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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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 Betanex 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.

------ 4. FIRST AID MEASURES ------

After contact with skin:

Wash immediately with plenty of 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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Hints for the physician: EMPTY STOMACH CONTENTS BY GASTRIC LAVAGE. AVOID ASPIRATION.

FLAMMABLE PROPERTIES

Flash point: 147ºF (Combustible) T.C.C.
Flammability Class: III*

*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.

------ 6. ACCIDENTAL RELEASE MEASURES --------6.

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 absorptive material. Wash area with water containing detergent and ammonia. Inform authorities immediately if material enter watercourses.



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------ 7. HANDLING and STORAGE -------

Handling:

WARNING. Combustible liquid. Harmful if swallowed. May produce severe irritation of eyes and irritation of the skin. Avoid breathing spray mist. Avoid contact with skin and eyes. Avoid contamination of feed and foodstuffs.

USERS SHOULD:

• Discard clothing and other absorbent materials that have drenched or heavily contaminated with this product's concentrate. Do not reuse them.

• Follow manufacturer's instructions for cleaning/maintaining 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.

• 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, BETANEX 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:

Long-sleeved shirt and long pants
Chemical-resistant gloves, such as barrier laminate or butyl rubber or nitrile rubber or viton

- Shoes plus socks
- Protective eyewear

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:

Coveralls

Chemical-resistant gloves such as barrier laminate

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Personal protective equipment (Continued)

- or butyl rubber or nitrile rubber or viton
- Shoes plus socks
- Protective eyewear

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

Body protection:

Nitrile or other chemical-resistant gloves.

Eye protection:

Splash goggles, face shield.

Respiratory protection:

Ensure good ventilation. If not adequate, wear organic vapor respirator for protection.

EXPOSURE GUIDELINES:

Isophorone (78-59-1)

OSHA PELACGIH TLVHCC WEL140 mg/m³ (PEL)28 mg/m³ (CEIL)None25 ml/m³ (PEL) 5 ml/m³ (CEIL) None

Isobutanol (78-83-1)

OSHA PELACGIH TLVHCC WEL300 mg/m³ (PEL)152 mg/m³ (TWA)None100 ml/m³ (PEL)50 ml/m³ (TWA) None

Aromatic petroleum solvent (25551-13-7)

OSHA PEL	ACGIH TLV	HCC WEL
None	123 mg/m ³ (TW	A)None
None	25 ml/m ³ (TWA) None

Mixed Xylene (1330-20-7)

OSHA PEL	ACGIH TLV	HCC WEL
435 mg/m ³	(PEL)651 mg/m ³ (STELNone	
100 ml/m ³	(PEL)150 ml/m ³ (STELNone	
None	$434 \text{ mg/m}^3 (\text{TWA})$ N	Ione
None	100 ml/m ³ (TWA)N	Ione

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EXPOSURE GUIDELINES: (Continued)

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

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

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: 0.98 g/cm3

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

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

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

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

EYE EFFECTS May produce severe irritation of the eye.

SKIN EFFECTS
Dermal LD50 (rabbit): > 9,900 mg/kg (low toxicity)
Dermal LD50 (rat): > 19,800 mg/kg (low toxicity)
Betanex is a moderate skin irritant.
Not known to be a skin sensitizer.



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

ACUTE ORAL EFFECTS Oral LD50 (rat): 3,960 mg/kg (low toxicity) Harmful if swallowed.

ACUTE INHALATION EFFECTS

Inhalation LC50 (rat-4hrs): Greater than 2.6 mg/l, the highest attainable aerosol concentration in air. No mortality was observed when rats were exposed to this maximum dose. In addition, an estimated LC50 value for this Betanex product can be calculated from the known LC50 data for the several organic solvents. The calculated LC50 (mixture)is: > 10 mg/l.

The toxicity studies reported below were carried out with the active ingredients: Desmedipham technical (>96%). In comparison, Betanex contains only 16% of DMP. 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)

Desmedipham: In two-year feeding studies with desmedipham in mice and rats, adverse effects were observed only in animals receiving high doses (750-1500 ppm). These include increased spleen weight, toxic hemolytic anemia (both species) and elevated methemoglobin levels (rats only, 300-1500 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 5000 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 is 25 mg/kg per 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 associated with a slightly increased incidence of renal and prepuitial tumors in male rats and of liver tumors in male mice. However,

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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.

CARCINOGENICITY: NTP: No IARC: No OSHA: No

TERATOGENICITY (BIRTH DEFECTS)

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 (10-1000 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 (100-1000 mg/kg/day), the dose-dependent, elevated methemoglobin levels were found to be maternally toxic, leading to an increased frequency of malformation.

REPRODUCTIVE EFFECTS

Desmedipham showed no adverse effects on fertility or reproduction in a two-generation rat reproduction studies at dose levels up to 1250 mg/kg/day.

MUTAGENICITY (GENETIC EFFECTS)

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



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

ENVIRONMENTAL HAZARDS: Betanex is toxic to fish. 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. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water through disposal of equipment washwaters.

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

PROPER 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 product labeling for specific instructions.

RCRA CLASSIFICATION:

RCRA hazardous waste ingredients: Isobutanol (<10.0%): U140

PROPER SHIPPING NAME: WHEN SHIPPED IN BULK CONTAINERS -PROPER SHIPPING NAME IS: Combustible liquid, n.o.s., (Isophorone), NA1993, PG III, *

* Insert net volume

EXCEPTED FROM DOT REGULATIONS WHEN SHIPPED IN NON-BULK PACKAGED PRODUCT VIA DOMESTIC GROUND TRANSPORT ONLY. (NON-BULK = EACH CONTAINER CONTAINING EQUAL OR LESS THAN 119 GALLONS. PLACARD REQUIRED: NONE



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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): 10000 SARA TITLE III - HAZARD CLASSES: Acute Health Hazard - Yes Chronic Health Hazard - No Fire Hazard - Yes Sudden Release of Pressure Hazard - No Reactivity Hazard - No TSCA 12B The following are listed: Isobutanol 9.999% (78-83-1) SARA 313 1-Desmedipham (3-ethoxycarbonylamino-phenyl carbanilate) 16% (13684-56-5) Mixed Xylene .999% (1330-20-7) ENVIRONMENTAL: CERCLA HAZARDOUS SUBSTANCE : Isophorone 49.999% (78-59-1) Isobutanol 9.999% (78-83-1) Mixed Xylene .999% (1330-20-7) CLEAN WATER ACT SECTION 307 PRIORITY POLLUTANTS : Isophorone 49.999% (78-59-1) SARA EHS 304 REPORTABLE QUANTITY : Isophorone 49.999% (78-59-1)

Isobutanol 9.999% (78-83-1) Mixed Xylene .999% (1330-20-7)

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ENVIRONMENTAL: (Continued)

SAFE DRINKING WATER ACT MAXIMUM CONTAMINANT LEVELS : Mixed Xylene .999% (1330-20-7)

INTERNATIONAL REGULATIONS

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

WHMIS INGREDIENT DISCLOSURE LISTED COMPONENTS:

CANADIAN WHMIS CLASSIFICATION FOR CONTROLLED PRODUCTS: Betanex 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; BETANEX (liquid/vapor) is a Skin and Eye irritant.

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

HAZARD RATINGS

	HEALTH	FLAMM	REACT	OTHER
NFPA	2	2	0	None
HMIS	2	2	0	Н

REVISED SECTIONS:

MSDS REVISION INDICATOR: New format, Company Name and EPA number.

PREPARED BY: Dept. of Regulatory Affairs PHONE: 800-438-5837 SUPERCEDES MSDS DATED: 10/01/96



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------ 16. OTHER INFORMATION (Continued) ------- 16.

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