Material Safety Data Sheet
SUGARBEET MIX HERBICIDE

SECTION 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>SUGARBEET MIX HERBICIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSDS Number</td>
<td>102000003064</td>
</tr>
<tr>
<td>EPA Registration No.</td>
<td>264-621</td>
</tr>
</tbody>
</table>

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

For MEDICAL, TRANSPORTATION or other EMERGENCY call: 1-800-334-7577 (24 hours/day)
For Product Information call: 1-866-99BAYER (1-866-992-2937)

SECTION 2. HAZARDS IDENTIFICATION

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

**Emergency Overview**
Warning! Causes substantial but temporary eye injury. Harmful if swallowed or absorbed through skin. Do not get in eyes or on clothing. Avoid contact with skin.

**Physical State**
clear liquid

**Odor**
sweet

**Appearance**
yellow to amber

**Exposure routes**
Eye contact, Skin Absorption, Inhalation, Ingestion

**Immediate Effects**

Eye: Causes substantial but temporary eye injury. May cause eye irritation. Do not get in eyes.

Skin: Harmful if absorbed through skin. May cause irritation. Avoid contact with skin and clothing.

**Ingestion**
Harmful if swallowed. Do not take internally.

**Inhalation**
Avoid breathing spray mist.

**Chronic or Delayed Long-Term**
This material has been classified as a possible carcinogen (see Section 11).

**Medical Conditions Aggravated by Exposure**
Prolonged exposure and inhalation may aggravate pre-existing conditions of the respiratory system.
Material Safety Data Sheet
SUGARBEET MIX HERBICIDE

Potential Environmental Effect
Toxic to fish and aquatic organisms.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Component Name</th>
<th>CAS-No.</th>
<th>Average % by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenmedipham</td>
<td>13684-63-4</td>
<td>8.00</td>
</tr>
<tr>
<td>Desmedipham</td>
<td>13684-56-5</td>
<td>8.00</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>1.82</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>0.17</td>
</tr>
<tr>
<td>Cumene</td>
<td>98-82-8</td>
<td>0.09</td>
</tr>
<tr>
<td>Isophorone</td>
<td>78-59-1</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

General
When possible, have the product container or label with you when calling a poison control center or doctor or going for treatment.

Eye
Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a physician or poison control center immediately.

Skin
Take off contaminated clothing and shoes immediately. Wash off immediately with plenty of water for at least 15 minutes. Call a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse out mouth and give water in small sips to drink. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Do not leave victim unattended.

Inhalation
Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Notes to physician
Signs and Symptoms
The following symptoms may occur:
Salivation
weakness
Skin, eye and mucous membrane irritation

Hazards
Risk of respiratory disorders. This product, although being a carbamate, is NOT a cholinesterase inhibitor. Risk of pneumonia.

Treatment
There is no specific antidote. Appropriate supportive and symptomatic treatment as indicated by the patient's condition is recommended.
SECTION 5. FIRE FIGHTING MEASURES

Flash point 144 °F / 62 °C
Autoignition temperature ca. 460 °C / 860 °F
Lower Flammability Limit 0.8 %(V)
Upper Flammability Limit 3.8 %(V)
Explosiveness Not explosive
Fire and Explosion Hazards Carbon dioxide (CO2)
nitrogen oxides (NOx)
In the event of fire the following may be released:
Carbon monoxide (CO)

Suitable extinguishing media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Fire Fighting Instructions Keep out of smoke. Fight fire from upwind position. Evacuate personnel to safe areas. Do not allow run-off from fire fighting to enter drains or water courses.
Firefighters should wear NIOSH approved self-contained breathing apparatus and full protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions Keep unauthorized people away. Isolate hazard area. Remove all sources of ignition. Avoid contact with spilled product or contaminated surfaces.

Methods for cleaning up Clean contaminated floors and objects thoroughly, observing environmental regulations. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Collect and transfer the product into a properly labelled and tightly closed container. Contaminated soil may have to be removed and disposed.

Additional advice Information regarding personal protective equipment, see section 8. Information regarding waste disposal, see section 13.

SECTION 7. HANDLING AND STORAGE

Handling procedures Handle and open container in a manner as to prevent spillage. Use only in area provided with appropriate exhaust ventilation.
Keep away from heat and sources of ignition. Take measures to prevent the build up of electrostatic charge.

**Storing Procedures**

Store in original container. Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Protect from freezing.

**Work/Hygienic Procedures**

Handle in accordance with good industrial hygiene and safety practice. Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, using the toilet or applying cosmetics.

Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean clothing.

**Min/Max Storage Temperatures**

Recommended minimum transport/storage temperature: -20 °C / -4 °F

### SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**General Protection**

Follow all label instructions. Train employees in safe use of the product.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water. Keep and wash PPE separately from other laundry.

**Eye/Face Protection**

Tightly fitting safety goggles

**Hand protection**

Chemical-resistant gloves (barrier laminate, butyl rubber, nitrile rubber or Viton)

**Body Protection**

Wear long-sleeved shirt and long pants and shoes plus socks. Chemical resistant apron when cleaning equipment, mixing or loading.

**Respiratory protection**

When respirators are required, select NIOSH approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industry recommendations.

**Exposure Limits**

<table>
<thead>
<tr>
<th>Compound</th>
<th>CAS Number</th>
<th>Agency</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenmedipham</td>
<td>13684-63-4</td>
<td>OES BCS*</td>
<td>TWA</td>
<td>3.8 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5 mg/m³</td>
</tr>
<tr>
<td>Desmedipham</td>
<td>13684-56-5</td>
<td>OES BCS*</td>
<td>TWA</td>
<td>1.2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 mg/m³</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>NIOSH</td>
<td>REL</td>
<td>25 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TX ESL</td>
<td>ST ESL</td>
<td>250 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TX ESL</td>
<td>AN ESL</td>
<td>25 ppm</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACGIH</td>
<td>STEL</td>
<td>150 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA Z1</td>
<td>PEL</td>
<td>100 ppm</td>
</tr>
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</table>
## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>yellow to amber</td>
</tr>
<tr>
<td><strong>Physical State</strong></td>
<td>clear liquid</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>sweet</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>3.0 - 4.0 (10 %) at 20 °C</td>
</tr>
<tr>
<td><strong>Vapor Pressure</strong></td>
<td>&lt; 1.33 hPa / 0.9975 mm Hg at 20 °C</td>
</tr>
<tr>
<td></td>
<td>The data refer to the solvent.</td>
</tr>
</tbody>
</table>

*OES BCS: Internal Bayer CropScience "Occupational Exposure Standard"*
Vapor Density (Air = 1)  no data available
Density  ca. 0.99 g/cm³ at 20 °C
Evaporation rate  no data available
Boiling Point  no data available
Water solubility  emulsifiable
Minimum Ignition Energy  no data available
Decomposition temperature  no data available
Partition coefficient: n-octanol/water

- log Pow: 3.59 at 22 °C
  The value mentioned relates to the active ingredient phenmedipham.
- log Pow: 3.39 at 22 °C
  The value mentioned relates to the active ingredient desmedipham.

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid
Heat, flames and sparks.
freezing

Incompatibility
Oxidizing agents

Hazardous Decomposition Products  no data available

Hazardous reactions
No hazardous reactions when stored and handled according to prescribed instructions.

Chemical Stability
Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

The non-acute information pertains to the technical-grade active ingredients, phenmedipham and desmedipham, as well as, the inert ingredient, isophorone.

Acute oral toxicity  rat: LD50: 3,300 mg/kg
Acute dermal toxicity  rabbit: 1,980 mg/kg
Acute inhalation toxicity

LC50: > 10.0 mg/l
Estimated from the known LC50 values for the inert solvents.

Not available for Betamix. However, data from a formulation with similar ingredients suggest low toxicity for Betamix.

Skin irritation

rabbit: Moderate skin irritation.

Eye irritation

rabbit: Irritating to eyes.

Sensitisation

guinea pig: Non-sensitizing.

Chronic toxicity

Phenmedipham caused a decrease in red blood cell counts in subchronic (rat, mouse, dog) and chronic (rat) studies.

Desmedipham caused hemolytic anemia, hemosiderin deposition and/or elevated methemoglobin levels in chronic studies in rats, mice and dogs.

Isophorone caused kidney and/or liver effects in chronic studies in rats and mice.

Assessment Carcinogenicity

Phenmedipham was not carcinogenic in lifetime feeding studies in rats and mice.

Desmedipham was not carcinogenic in lifetime feeding studies in rats and mice. EPA has classified desmedipham as "Not likely to be Carcinogenic to Humans."

Isophorone has been classified by EPA as a Category C (probable human carcinogen) based on its oncogenic potential in male rats (preputial gland tumors) and male mice (liver tumors). There was no evidence of carcinogenicity in female rats and female mice.

ACGIH

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

NTP

None.

IARC

Xylene 1330-20-7 Overall evaluation: 3

OSHA

None.

Reproductive toxicity

REPRODUCTION

Phenmedipham was not a reproductive toxicant in a two-generation study in rats. Toxicity in the offspring occurred at doses producing systemic toxicity in parental animals.

Desmedipham was not a reproductive toxicant in a two-generation study in rats. Toxicity in the offspring occurred at doses producing systemic toxicity in parental animals.

Isophorone does not affect fertility based on limited studies in rats and mice.
DEVELOPMENTAL TOXICITY
Phenmedipham was not a developmental toxicant in rats and rabbits.

Desmedipham was not a primary developmental toxicant in rats and rabbits. Developmental effects were observed but were considered secondary to maternal toxicity.

Isophorone was not a developmental toxicant in mice and rats.

Neurotoxicity
Phenmedipham did not demonstrate the potential to cause neurotoxicity in standard toxicity studies using laboratory animals.

Desmedipham did not demonstrate the potential to cause neurotoxicity in standard toxicity studies using mice, rats, rabbits and dogs.

Isophorone did not cause neuropathological changes in standard oral subchronic and chronic toxicity studies using laboratory animals, however, high exposure levels in inhalation, oral and dermal studies have produced some indications of central nervous system depression.

Mutagenicity
Phenmedipham was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.

Desmedipham was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.

Isophorone was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish
Rainbow trout (Oncorhynchus mykiss)
LC50: ca. 3 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient phenmedipham.

Rainbow trout (Oncorhynchus mykiss)
semi-static test
LC50: 0.26 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient desmedipham.

Toxicity to aquatic plants
Scenedesmus subspicatus
IC50: 0.13 mg/l
Exposure time: 96 h
The value mentioned relates to the active ingredient phenmedipham.

Selenastrum capricornutum
IC50: 0.056 mg/l  
Exposure time: 96 h  
The value mentioned relates to the active ingredient desmedipham.

**Acute Toxicity to Aquatic Invertebrates**  
Water flea (Daphnia magna)  
EC50: 6 mg/l  
Exposure time: 48 h  
The value mentioned relates to the active ingredient phenmedipham.

Water flea (Daphnia magna)  
semi-static test  
EC50: 0.45 mg/l  
Exposure time: 48 h  
The value mentioned relates to the active ingredient desmedipham.

**Bioaccumulation**  
Lepomis macrochirus (Bluegill sunfish) BCF: 165  
The value mentioned relates to the active ingredient phenmedipham.

Lepomis macrochirus (Bluegill sunfish) BCF: 148 - 157  
The value mentioned relates to the active ingredient desmedipham.

**Environmental precautions**  
Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate surface or ground water by cleaning equipment or disposal of wastes, including equipment wash water. Do not allow to get into surface water, drains and ground water. Do not apply when weather conditions favor runoff or drift.

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**SECTION 13. DISPOSAL CONSIDERATIONS**

**General Disposal Guidance**  
Do not contaminate water, food, or feed by disposal. Dispose in accordance with all local, state/provincial and federal regulations. Follow container label instructions for disposal of wastes generated during use in compliance with the product label. It is best to use all of the product in accordance with label directions. If it is necessary to dispose of unused product, please follow container label instructions and applicable local guidelines.

**Container Disposal**  
Triple rinse containers. Do not re-use empty containers. Puncture container to avoid re-use. Consult state and local regulations regarding the proper disposal of container.

**RCRA Information**  
Characterization and proper disposal of this material as a special or hazardous waste is dependent upon Federal, State and local laws and are the user's responsibility. RCRA classification may apply.
SECTION 14. TRANSPORT INFORMATION

49CFR
NA-Number 1993
Packaging group III
Description of the goods COMBUSTIBLE LIQUID, N.O.S.
(ISOPHORONE SOLUTION)
RQ Reportable Quantity is reached with 9,090 lb of product.

IMDG
UN-Number 3082
Class 9
Packaging group III
Marine pollutant Marine Pollutant
Description of the goods ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(PHENMEDIPHAM, DESMEDIPHAM SOLUTION)

IATA
UN-Number 3082
Class 9
Packaging group III
Description of the goods ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(PHENMEDIPHAM, DESMEDIPHAM SOLUTION)

This transportation information is not intended to convey all specific regulatory information relating to this product. It does not address regulatory variations due to package size or special transportation requirements.

SECTION 15. REGULATORY INFORMATION

EPA Registration No. 264-621

US Federal Regulations
TSCA list
1,2,4-Trimethylbenzene 95-63-6
Xylene 1330-20-7
Cumene 98-82-8
Isophorone 78-59-1

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
Isophorone 78-59-1

SARA Title III - Section 302 - Notification and Information
None.

SARA Title III - Section 313 - Toxic Chemical Release Reporting
Desmedipham 13684-56-5 1.0%
1,2,4-Trimethylbenzene 95-63-6 1.0%
Xylene 1330-20-7 1.0%
Cumene 98-82-8 1.0%

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US States Regulatory Reporting

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

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>State(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desmedipham</td>
<td>13684-56-5</td>
<td>NJ</td>
</tr>
<tr>
<td>1,2,4-Trimethylbenzene</td>
<td>95-63-6</td>
<td>NJ, PA</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>CA, CT, IL, MI, NJ, RI</td>
</tr>
<tr>
<td>Cumene</td>
<td>98-82-8</td>
<td>CA, CT, IL, MN, NJ, PA, RI</td>
</tr>
<tr>
<td>Isophorone</td>
<td>78-59-1</td>
<td>CA, CT, IL, MN, RI</td>
</tr>
</tbody>
</table>

Canadian Regulations

Canadian Domestic Substance List

- 1,2,4-Trimethylbenzene: 95-63-6
- Xylene: 1330-20-7
- Cumene: 98-82-8
- Isophorone: 78-59-1

Environmental

CERCLA

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>100 lbs</td>
</tr>
<tr>
<td>Cumene</td>
<td>98-82-8</td>
<td>5,000 lbs</td>
</tr>
<tr>
<td>Isophorone</td>
<td>78-59-1</td>
<td>5,000 lbs</td>
</tr>
</tbody>
</table>

Clean Water Section 307 Priority Pollutants

None.

Safe Drinking Water Act Maximum Contaminant Levels

None.

International Regulations

European Inventory of Existing Commercial Substances (EINECS)

- Phenmedipham: 13684-63-4
- Desmedipham: 13684-56-5
- 1,2,4-Trimethylbenzene: 95-63-6
- Xylene: 1330-20-7
- Cumene: 98-82-8
- Isophorone: 78-59-1

SECTION 16. OTHER INFORMATION

NFPA 704 (National Fire Protection Association):

Health - 2 Flammability - 2 Reactivity - 1 Others - none

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard

Reason for Revision: Updated due to new system and numbering scheme.
This information is provided in good faith but without express or implied warranty. The customer assumes all responsibility for safety and use not in accordance with label instructions. The product names are registered trademarks of Bayer.