

L1060279 IREL/02Y PPE 4117869



syngenta®

Product registration number: PCS 05154

A suspension concentrate containing 250 g/l (23.4% w/w) mandipropamid.

For the control of Foliar blight (*Phytophthora infestans*) and protection against tuber blight in potatoes and the control of downy mildew on protected and outdoor lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, red mustard, baby leaf crops, spinach, land cress, cress, purslane, spinach beet leaves (chard) and herbs. For the control of *Peronospora brassicae* and *Peronospora parasitica* in Brussels sprouts, cauliflower, broccoli/calabrese, radish and for the control of *Peronospora vicae* in vining peas.



**FOR PROFESSIONAL USE ONLY**

**To avoid risks to human health and the environment comply with the instructions for use.**

REVUS® is a suspension concentrate containing 250 g/l (23.4% w/w) mandipropamid.

**Toxic to aquatic life with long lasting effects.**

Keep out of reach of children.

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

Collect spillage.

Dispose of contents/container to a licensed hazardous waste disposal contractor or collection site except for triple rinsed clean containers which can be disposed of as non-hazardous waste.

Contains 1,2-benzisothiazol-3(2H)-one. May produce an allergic reaction.



PCS 05154

**Authorisation Holder**

Syngenta UK Limited  
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Tel: +44 (0) 1223 833621

**Marketing Company**

Syngenta Ireland Ltd  
Block 6, Cleaboy Business Park,  
Old Kilmeaden Road, Waterford  
Tel: (051) 377203

**IN CASE OF TOXIC OR TRANSPORT EMERGENCY RING +44 (0) 1484 538444 ANYTIME**

**PROTECT FROM FROST. SHAKE WELL BEFORE USE.**

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**5 litres**

Product names marked ® or ™, the ALLIANCE FRAME  
the SYNGENTA Logo and the PURPOSE ICON  
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**REVUS®****IMPORTANT INFORMATION**

FOR USE ONLY AS A FUNGICIDE

Crop	Maximum Individual Dose	Maximum Number of Treatments	Latest Time of Application
Potatoes	0.6 litres product per hectare	Four per crop	3 days before harvest
Protected lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, red mustard, baby leaf crops*, spinach, land cress, cress, purslane, spinach beet leaves (chard) and herbs#	0.6 litres product per hectare	One per crop	7 days before harvest
Outdoor lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, red mustard, baby leaf crops*, spinach, land cress, cress, purslane, spinach beet leaves (chard) and herbs#	0.6 litres product per hectare	Two per crop	7 days before harvest
Brussels sprouts, cauliflower, Broccoli/calabrese	0.6 litres product per hectare	Two per crop	14 days before harvest
Outdoor radish	0.6 litres product per hectare	Two per crop	7 days before harvest
Vining peas	0.6 litres product per hectare	Two per crop	14 days before harvest

\*crops harvested no later than the 8 true leaf stage.

# please refer to the full list of herbs included at the back of the label

For outdoor crops and protected crops that are grown under a temporary cover, the maximum total dose must not exceed 1.2 L product/ha per year on any single area of land.

**READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS**

**SAFETY PRECAUTIONS****(a) Operator protection**

WASH HANDS AND EXPOSED SKIN before eating, drinking and after work.

IF YOU FEEL UNWELL, seek medical advice (show label where possible).

**(b) Environmental protection**

Do not contaminate water with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

**(c) Storage and disposal**

KEEP IN ORIGINAL CONTAINER, tightly closed, in a safe place.

DO NOT RE-USE CONTAINER for any purpose.

RINSE CONTAINER THOROUGHLY by using an integrated pressure rinsing device or manually, rinsing three times. Add washings to sprayer at time of filling and dispose of safely.

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## DIRECTIONS FOR USE

IMPORTANT: This information is approved as part of the Product Label. All instructions within this section must be carefully read in order to obtain safe and successful use of this product.

## FULL LIST OF HERBS

Scientific Name	Common Name
<i>Agastache rugosa</i>	Korean Mint
<i>Agastache spp</i>	
<i>Allium schoenoprasum</i>	Chives
<i>Anethum graveolens</i>	Dill leaves
<i>Angelica archangelica</i>	Angelica
<i>Anthriscus cerefolium</i>	Chervil
<i>Artemisia dracunculus</i>	Tarragon
<i>Calendula officinalis</i>	Marigold
<i>Coriandrum sativum</i>	Coriander leaves
<i>Foeniculum vulgare</i>	Fennel leaves
<i>Helichrysum angust/italicum</i>	Curry Plant
<i>Hyssopus officinalis</i>	Hyssop
<i>Laurus nobilis</i>	Bay
<i>Levisticum officinalis</i>	Lovage leaves
<i>Melissa officinalis</i>	Lemon Balm
<i>Mentha gentilis</i>	Gingermint
<i>Mentha suaveolens</i>	Applemint
<i>Mentha suaveolens variegata</i>	Pineapplemint
<i>Mentha spicata</i>	Spearmint
<i>Mentha x piperita</i>	Peppermint
<i>Mentha x piperita citrata</i>	Lemon Peppermint
<i>Ocimum basilicum</i>	Basil
<i>Origanum heracleoticum</i>	
<i>Origanum majorana</i>	Marjoram
<i>Origanum vulgare</i>	Oregano
<i>Petroselinum crispum</i>	Parsley
<i>Poterium sanguisorba</i>	Burnet (salad)
<i>Rosmarinus officinalis</i>	Rosemary
<i>Rumex acetosa</i>	Sorrel
<i>Ruta graveolens</i>	Rue
<i>Salvia officinalis</i>	Sage
<i>Satureja spp.</i>	Savory
<i>Tanacetum parthenium</i>	Feverfew
<i>Thymus camphoratus</i>	
<i>Thymus citriodora</i>	Lemon Thyme
<i>Thymus serpyllum</i>	Mother Of Thyme
<i>Thymus vulgaris</i>	Thyme

Scientific Name	Common Name
<i>Trigonella foenum-graecum</i>	Fenugreek
<i>Tropaeolum majar</i>	Nasturtium
<i>Urtica dioica</i>	Nettle
<i>Viola odorata</i>	Violet

#### PROPERTIES OF REVUS®

REVUS is a foliar fungicide for the preventative control of late blight (*Phytophthora infestans*) in potatoes and downy mildew in lettuce, herbs and other salad crops, named brassica, radish and vining peas and is highly active against spore germination. Uptake into the leaf tissue assures good translaminar activity and inhibits mycelial growth during the incubation period.

#### DISEASE CONTROLLED

##### Lettuce, herbs and other salad crops

For the control of downy mildew on protected and outdoor lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, purslane and herbs.

REVUS may be applied to the following crops– red mustard, baby leaf crops, spinach, land cress, cress and spinach beet leaves (chard): MODERATE CONTROL.

##### Potatoes

For the control of Foliar blight (*Phytophthora infestans*) and protection against tuber blight.

##### Brussels sprouts, cauliflower, broccoli/calabrese and radish

Downy mildew (*Peronospora brassicae*, *Peronospora parasitica*): MODERATE CONTROL

#### POTATOES

REVUS can be used on all varieties of potatoes including seed potatoes.

#### BACKGROUND TO POTATO BLIGHT CONTROL

Late blight (*Phytophthora infestans*) is potentially a devastating disease of potatoes. In commercial production, a season long **disease prevention** policy is essential. First of all ensure that other control methods are being satisfactorily applied:

1. Prevent re-growth on potato dumps.
2. Destroy all groundkeepers.
3. Plant disease free seed.
4. Use generous soil ridges to protect tubers.

Integrate this approach with a fungicide programme:

#### Early Crops

In first and second early potato crops, particularly those grown in the same locality as main crop potatoes, an adequate and full blight protection programme should be applied right up to harvesting or haulm desiccation. This will protect the early crop while helping to reduce disease risk to later crops.

## Maincrops

Disease prevention programmes require regular and season long fungicide use to limit foliar blight development. However, as an effective fungicide programme will preserve leaf area there may be more risk of infecting tubers at harvest, particularly during "heavy" blight years. Completion of the control programme should therefore include a complete haulm desiccant. Lifting of the crop should not take place for at least 10 days after **COMPLETE KILL** of the haulm. Crops intended for storage should not be lifted while there is any green tissue **AT ALL** on the leaves or stem bases.

## Blight Risk Assessment

The risk of disease is affected by **weather conditions** (during the crop life) and **crop location**:

**Weather Conditions** - Spread of disease occurs under warm, humid conditions. Preferably use a reliable decision support system to determine what frequency of fungicide treatment is appropriate and fungicide type required.

Note: Blight forecasting has often been based on the occurrence of "Smith periods". A "Smith period" is a 48 hour period in which the minimum temperature is 10°C or more and the relative humidity exceeds 90% for at least 11 hours during the first 24 hours and for at least 11 hours again during the final 24 hours. However, any period of warm, humid weather increases blight risk.

**Crop Location** - Locations with the highest probability of blight problems are:

1. Areas of the country where extensive main crop or early production takes place e.g. East Anglia, the south west or the west.
2. Areas where climatic conditions that encourage disease development occur on a frequent basis e.g. The south west, the west and the Fens.

## TIMING

REVUS is a protectant fungicide and therefore the spray programme must start **BEFORE** blight enters the crop. Commence spraying at the first blight warning or when local weather conditions are favourable for the disease.

Intervals between applications of REVUS should be reduced as blight risk increases, so that **protection** of the crop can be maintained.

Applications of REVUS should be made at 7-10 day intervals depending on disease pressure. As disease pressure and the risk of late blight infection increase, the interval should be shortened.

## Rates of Use

Apply REVUS at 0.6 litres product per hectare. Up to four applications may be made per crop.

Applications of REVUS can be made up to 3 days before harvest.

## RESISTANCE MANAGEMENT

Revus contains a CAA fungicide (FRAC code no. 40). It does not contain a formulated partner mixture, e.g. mancozeb, for resistant management purposes. To minimise the risk of resistance development in the pathogen population the following guidelines for CAA fungicides (based on an average number of 12 fungicide applications/season for potato blight control) should be followed:-

1. Where possible, use formulated/tank mixtures or an alternating strategy using fungicides from different mode of action groups.
2. Where CAA fungicides are applied as a mixture (co-formulated or as a tank mix) a maximum of 50% of the total number of applications may be made per crop or season. In potatoes up to six applications may be made.
3. Where CAA fungicides are applied alone (without a co-formulant or tank mix partner) a maximum of 33% of the total number of applications may be made per crop or season. In potatoes a maximum of four applications may be made.
4. No more than 3 applications of any CAA fungicide should be made consecutively
5. Further information on fungicide mode of action groups and resistance management strategies is available on the FRAC and FRAG-UK websites.
6. For information on suitable tank mix partner products contact Syngenta.

**LETTUCE, ENDIVES (INCLUDING FRISEE, ESCAROLE AND RADICCHIO), ROCKET, RED MUSTARD, BABY LEAF CROPS, SPINACH, LAMB'S LETTUCE, CRESS, LAND CRESS, PURSLANE, SPINACH BEET LEAVES (CHARD) AND HERBS**

**TIMING**

Before applying REVUS, ensure the crop is free from any stress caused by environmental or agronomic effects. Always inspect crops to assess disease development immediately before spraying. Best results will be achieved from applications made in the earliest stage of disease development or as a protectant treatment following a disease risk assessment or the use of appropriate decision support systems.

Protected crops - Only one application of REVUS should be made per crop.

Outdoor crops - Two applications of REVUS can be made per crop. Allow a minimum interval of 7 days between applications

96 X 130 mm

Applications of REVUS can be made up to 7 days before harvest.

**Rates of Use**

Apply REVUS at 0.6 litres product per hectare.

**RESISTANCE MANAGEMENT**

To minimise the risk of resistance developing REVUS may be applied in tank mixture or alternating using a fungicide with a different mode of action at a rate that is effective against downy mildew. Further information on suitable tank mix products and resistance management strategies is available on the FRAG website.

Use in alternation with fungicides with another mode of action.

**OUTDOOR RADISH**

**TIMING**

A second treatment may be required per crop if disease pressure remains high. A minimum interval of 7 days must be observed between applications to radish.

Do not exceed 2 applications per crop or 6 applications per year for multi-crop areas.

**Rates of Use**

Apply REVUS at 0.6 litres product per hectare.

Applications of REVUS can be made up to 7 days before harvest.

## **RESISTANCE MANAGEMENT**

To minimise the risk of resistance developing REVUS may be applied in tank mixture or alternating using a fungicide with a different mode of action at a rate that is effective against downy mildew. Further information on suitable tank mix products and resistance management strategies is available on the FRAG website.

Use in alternation with fungicides with another mode of action.

## **BRESSELS SPROUTS, CAULIFLOWER AND BROCCOLI/CALABRESE**

### **TIMING**

A second treatment may be required if disease pressure remains high. A minimum interval of 10 days must be observed between applications to brassicae.

### **Rates of Use**

Apply REVUS at 0.6 litres product per hectare.

Applications of REVUS can be made up to 14 days before harvest.

### **PROCESSING**

Where a crop is destined for processing, consult your processor before treating with REVUS.

## **RESISTANCE MANAGEMENT**

To minimise the risk of resistance developing CAA fungicides may be applied in formulated/tank mixture or alternating strategy using fungicides from different mode of action groups which are effective against downy mildew.

Use in alternation with fungicides with another mode of action is recommended.

CAA fungicides should make up no more than 50% of the total number of fungicide applications per crop or season.

For information on suitable tank mix partner products contact Syngenta.

## **VINING PEAS**

### **TIMING**

A second treatment may be required if disease pressure remains high. A minimum interval of 14 days must be observed between applications to fresh peas.

### **Rates of Use**

Apply REVUS at 0.6 litres product per hectare.

Applications of REVUS can be made up to 14 days before harvest.

## **MIXING AND SPRAYING**

Apply through a conventional hydraulic sprayer calibrated to give an even application at the correct volume.

Application to outdoor crops of potatoes, lettuce and associated crops should be made via a tractor mounted, trailed or self-propelled sprayer or alternatively through a knapsack sprayer.

The application to indoor lettuce and associated crops should be made via a hydraulic nozzle applicator e.g. motorised sprayer with hand or boom lance or via a knapsack sprayer.

### **Spray Volume**

**Potatoes:** Apply REVUS in at least 200 litres of water per hectare

**Lettuce and similar:** Apply REVUS in 200-600 litres of water per hectare

**Broccoli/Calebrase:** Apply REVUS in 200-600 litres of water per hectare

**Radish:** Apply REVUS in 200-600 litres of water per hectare

### **Spray Nozzles**

A medium quality spray\* is preferred for application of REVUS (\* as defined by The British Crop Protection Council). A spray pressure of 2 - 3 bar is recommended.

### **Mixing**

Make sure the sprayer is clean and set to give an even application at the correct volume

Fill the spray tank with half the required volume of clean water and start agitation. Add the required amount of REVUS and continue agitation whilst adding the rest of the water.

Agitate the mixture thoroughly before use and continue agitation during spraying and any stoppages

Thoroughly wash all spray equipment with water immediately after use

Do not leave the spray liquid in the sprayer for long periods (such as during meal breaks or overnight).

### **COMPANY ADVISORY INFORMATION**

As part of our Product Stewardship policy, Syngenta recommends the following precautions should also be observed:

Wear appropriate clothing – cotton overall and rubber gloves, when handling the concentrate.

Since the occurrence of resistance cannot be forecast, neither Syngenta UK Limited nor its distributors can accept responsibility for any loss or damage to crops caused by the failure of REVUS to control resistant strains.

**This product is to be used only in accordance with the recommendations and instructions given on the label provided with this pack**

#### **Section 6 of the Health and Safety at Work Act** **Additional Product Safety Information**

(This section does not form part of the product label under the Plant Protection Products Regulations 1995.)

The product label provides information on a specific pesticidal use of the product; do not use otherwise, unless you have assessed any potential hazard involved, the safety measures required and that the particular use has 'Extension of Use' approval or is otherwise permitted under the Plant Protection Products Regulations.

The information on this label is based on the best available information including data from test results.

## SAFETY DATA SHEET - V7.3

THESE PAGES CAN BE ADDED OR REMOVED AS NECESSARY  
TO CREATE A 20, 24, 28, OR 32 PAGE BOOKLET  
(INCLUDING GLUE PAGE)

### 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY/ UNDERTAKING

#### 1.1 Product Identifier

Product Name: REVUS  
Design Code: A12946B  
Product Registration Number: PCS 05154

#### 1.2 Relevant Identified Uses of the substance or mixture and uses advised against

Use of the Substance/Mixture: Fungicide

#### 1.3 Details of the supplier of the safety data sheet

Company: Syngenta Ireland Limited  
Block 6 Cleaboy Business Park, Old Kilmeaden Road,  
Waterford  
Ireland  
Telephone: (051) 377203  
Telefax: (051) 354748  
E-mail address of person responsible for the SDS: cropsales.ie@syngenta.com

#### 1.4 Emergency telephone number

Emergency phone No.: +44 (0) 1484 538444

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Long-term (chronic) aquatic hazard, Category 2 H411: Toxic to aquatic life with long lasting effects.

### 2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

#### Hazard Pictograms



Hazard Statements	H411	Toxic to aquatic life with long lasting effects
Supplemental Hazard Statements	EUH401	To avoid risks to human health and the environment comply with the instructions for use.
Precautionary Statements	EUH208	Contains 1,2-benzisothiazol-3-One. May produce an allergic reaction.
	P102	Keep out of reach of children.
	P270	Do not eat, drink or smoke when using this product.
	P273	Avoid release to the environment
	P391	Collect spillage
	P501	Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty triple rinsed clean containers which can be disposed of as non-hazardous waste.

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

### 3.2 Mixtures

Components

Chemical Name	CAS No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
mandipropamid (ISO)	374726-62-2 616-213-00-2	Aquatic Acute 1; H400 Aquatic Chronic 1; H410	$\geq 20$ - $< 25$
naphthalenesulfonic acid, dimethyl-, polymer with formaldehyde and methylnaphthalenesulfonic acid, sodium salt	9084-06-4	Skin Irrit. 2; H315 Eye Irrit. 2; H319	$\geq 1$ - $< 10$
1,2-benzisothiazol-3(2H)-one	2634-33-5 220-120-9 613-088-00-6	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Acute 1; H400	$\geq 0.0025$ - $< 0.025$

For explanation of abbreviations see section 16.

## 4. FIRST-AID MEASURES

### 4.1 Description of first aid measures

**General advice:** Have the product container, label or Safety Data Sheet with you when calling the emergency number, a poison control center or physician, or going for treatment.

**If inhaled:** Move the victim to fresh air. If breathing is irregular or stopped, administer artificial respiration. Keep patient warm and at rest. Call a physician or poison control centre immediately.

**In case of skin contact:** Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.

**In case of eye contact:** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

**If swallowed:** If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting.

### 4.2 Most important symptoms and effects, both acute and delayed

Symptoms: Nonspecific

No symptoms known or expected.

### 4.3 Indication of any immediate medical attention and special treatment needed

Treatment: There is no specific antidote available. Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

### 5.1 Extinguishing media

Extinguishing media - small fires

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

Extinguishing media - large fires

Use alcohol-resistant foam or water spray.

Unsuitable extinguishing media: Do not use a solid water stream as it may scatter and spread fire.

### 5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting: As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10).

Exposure to decomposition products may be a hazard to health.

### 5.3 Advice for fire-fighters:

Special protective equipment for firefighters: Wear full protective clothing and self-contained breathing apparatus.

Further information: Do not allow run-off from fire fighting to enter drains or water courses. Cool closed containers exposed to fire with water spray.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to protective measures listed in sections 7 and 8.

### 6.2 Environmental precautions

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities.

### 6.3 Methods and materials for containment and cleaning up

Methods for cleaning up: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Clean with detergents. Avoid solvents. Retain and dispose of contaminated wash water.

### 6.4 Reference to other sections

For disposal considerations see section 13., Refer to protective measures listed in sections 7 and 8.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Advice on safe handling: No special protective measures against fire required. Avoid contact with skin and eyes. When using do not eat, drink or smoke. For personal protection see section 8.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: No special storage conditions required. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep away from food, drink and animal feedingstuffs.

### 7.3 Specific end use(s)

Specific use(s): For proper and safe use of this product, please refer to the approval conditions laid down on the product label.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

#### Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
mandipropamid (ISO)	374726-62-2	TWA	5 mg/m <sup>3</sup>	SYNGENTA
propane-1,2-diol	57-55-6	TWA (particles)	10 mg/m <sup>3</sup>	GB EH40
Further information	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used			
	57-55-6	TWA (Total vapour and particles)	150 ppm 474 mg/m <sup>3</sup>	GB EH40
Further information	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used			

#### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
propane-1,2-diol	Workers	Inhalation	Long-term systemic effects	168 mg/m <sup>3</sup>
	Consumers	Inhalation	Long-term local effects	10 mg/m <sup>3</sup>
	Consumers	Inhalation	Long-term systemic effects	30 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	10 mg/m <sup>3</sup>

#### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
propane-1,2-diol	Fresh water	260 mg/l
	Marine water	26 mg/l
	Intermittent use/release	183 mg/l
	Sewage treatment plant	20000 mg/l
	Marine sediment	57.2 mg/kg
	Fresh water sediment	57.2 mg/kg
	Soil	50 mg/kg

### 8.2 Exposure controls

**Engineering Measures:** Containment and/or segregation is the most reliable technical protection measure if exposure cannot be eliminated. The extent of these protection measures depends on the actual risks in use. If airborne mist or vapours are generated, use local exhaust ventilation controls. Assess exposure and use any additional measures to keep airborne levels below any relevant exposure limit. Where necessary, seek additional occupational hygiene advice.

#### Personal protective equipment

**Eye protection:** No special protective equipment required.

#### Hand protection

**Remarks:** No special protective equipment required.

**Skin and body protection:** No special protective equipment required. Select skin and body protection based on the physical job requirements.

**Respiratory protection:** No personal respiratory protective equipment normally required. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

**Protective measures:** The use of technical measures should always have priority over the use of personal protective equipment. When selecting personal protective equipment, seek appropriate professional advice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Appearance:	suspension
Colour:	off-white to brownish
Odour:	characteristic
Odour Threshold:	No data available
pH:	5 - 9
	Concentration: 1 % w/v
Melting point/range:	No data available
Boiling point/boiling range:	No data available
Flash point:	Method: Pensky-Martens closed cup does not flash
Evaporation rate:	No data available
Flammability (solid, gas):	No data available
Upper explosion limit / Upper flammability limit:	No data available
Lower explosion limit / Lower flammability limit:	No data available
Vapour pressure:	No data available
Relative vapour density:	No data available
Density:	1.072 g/cm <sup>3</sup>
Solubility(ies)	
Solubility in other solvents:	No data available
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	480 °C
Decomposition temperature:	No data available
Viscosity	
Viscosity, dynamic:	45.0 - 338 mPa.s (40 °C) 56.2 - 424 mPa.s (20 °C)
Explosive properties:	Not explosive
Oxidizing properties:	The substance or mixture is not classified as oxidizing.

### 9.2 Other Information

Surface tension: 36.4 mN/m, 20 °C

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

None reasonably foreseeable.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions: No dangerous reaction known under conditions of normal use.

### 10.4 Conditions to avoid

Conditions to avoid: No decomposition if used as directed.

## 10.5 Incompatible materials

Materials to avoid: None known.

## 10.6 Hazardous decomposition products

Hazardous decomposition products: No hazardous decomposition products are known

# 11. TOXICOLOGICAL INFORMATION

## 11.1 Information on toxicological effects

Information on likely routes of exposure: Ingestion, Inhalation, Skin contact, Eye contact

### Acute toxicity

#### Product:

Acute oral toxicity: LD50 (Rat, female): > 5,000 mg/kg

Acute inhalation toxicity: LC50 (Rat, male and female): > 4.89 mg/l

Exposure time: 4 h

Test atmosphere: dust/mist

Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity: LD50 (Rat, male and female): > 5,000 mg/kg

#### Components:

##### **mandipropamid (ISO):**

Acute oral toxicity: LD50 (Rat, female): > 5,000 mg/kg

Acute inhalation toxicity: LC50 (Rat, male and female): > 5.19 mg/l

Exposure time: 4 h

Test atmosphere: dust/mist

Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity: LD50 (Rat, male and female): > 5,050 mg/kg

##### **1,2-benzisothiazol-3(2H)-one:**

Acute oral toxicity: LD50 (Rat): 1,020 mg/kg

### Skin corrosion/irritation

#### Product:

Species: Rabbit

Result: No skin irritation

#### Components:

##### **mandipropamid (ISO):**

Species: Rabbit

Result: No skin irritation

##### **naphthalenesulfonic acid, dimethyl-, polymer with formaldehyde and methyl naphthalenesulfonic acid, sodium salt:**

Species: Rabbit

Result: Irritating to skin.

##### **1,2-benzisothiazol-3(2H)-one:**

Result: Irritating to skin.

### Serious eye damage/eye irritation

#### Product:

Species: Rabbit

Result: No eye irritation

#### Components:

##### **mandipropamid (ISO):**

Species: Rabbit

Result: No eye irritation

**naphthalenesulfonic acid, dimethyl-, polymer with formaldehyde and methylnaphthalenesulfonic acid, sodium salt:**

Species: Rabbit

Result: Irritation to eyes, reversing within 21 days

#### **Respiratory or skin sensitisation**

##### **Product:**

Test Type: Buehler Test

Species: Guinea pig

Result: Did not cause sensitisation on laboratory animals.

##### **Components:**

##### **mandipropamid (ISO):**

Species: Guinea pig

Result: Did not cause sensitisation on laboratory animals.

##### **1,2-benzisothiazol-3(2H)-one:**

Result: Probability or evidence of skin sensitisation in humans

#### **Germ cell mutagenicity**

##### **Components:**

##### **mandipropamid (ISO):**

Germ cell mutagenicity- Assessment: Animal testing did not show any mutagenic effects.

#### **Carcinogenicity**

##### **Components:**

##### **mandipropamid (ISO):**

Carcinogenicity - Assessment: No evidence of carcinogenicity in animal studies.

#### **Reproductive toxicity**

##### **Components:**

##### **mandipropamid (ISO):**

Reproductive toxicity - Assessment : No toxicity to reproduction

#### **Repeated dose toxicity**

##### **Components:**

##### **mandipropamid (ISO):**

Remarks: No adverse effect has been observed in chronic toxicity tests.

## **12. ECOLOGICAL INFORMATION**

### **12.1 Toxicity**

#### **Product:**

Toxicity to fish:

LC50 (*Oncorhynchus mykiss* (rainbow trout)): > 100 mg/l

Exposure time: 96 h

LC50 (*Cyprinus carpio* (Carp)): > 100 mg/l

Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates:

EC50 (*Daphnia magna* (Water flea)): > 100 mg/l

Exposure time: 48 h

Toxicity to algae:

ErC50 (*Pseudokirchneriella subcapitata* (green algae)): > 100 mg/l

Exposure time: 72 h

EbC50 (*Pseudokirchneriella subcapitata* (green algae)): 15.3 mg/l

Exposure time: 72 h

#### **Ecotoxicology Assessment**

Chronic aquatic toxicity:

Toxic to aquatic life with long lasting effects.

### **Components:**

#### **mandipropamid (ISO):**

Toxicity to fish:	LC50 ( <i>Oncorhynchus mykiss</i> (rainbow trout)): 4.4 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates:	EC50 ( <i>Crassostrea virginica</i> (eastern oyster)): 0.97 mg/l Exposure time: 96 h
Toxicity to algae:	ErC50 ( <i>Pseudokirchneriella subcapitata</i> (green algae)): > 2.5 mg/l Exposure time: 72 h NOEC ( <i>Pseudokirchneriella subcapitata</i> (green algae)): 1.3 mg/l End point: Growth rate Exposure time: 72 h
M-Factor (Acute aquatic toxicity):	1
Toxicity to microorganisms:	EC50 (activated sludge): > 100 mg/l Exposure time: 3 h
Toxicity to fish (Chronic toxicity):	NOEC: 0.5 mg/l Exposure time: 32 d Species: <i>Pimephales promelas</i> (fathead minnow)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	NOEC: 0.076 mg/l Exposure time: 21 d Species: <i>Daphnia magna</i> (Water flea)
M-Factor (Chronic aquatic toxicity):	1

#### **Ecotoxicology Assessment**

Acute aquatic toxicity: Very toxic to aquatic life.

#### **1,2-benzisothiazol-3(2H)-one:**

#### **Ecotoxicology Assessment**

Acute aquatic toxicity: Very toxic to aquatic life.

### **12.2 Persistence and degradability**

#### **Components:**

#### **mandipropamid (ISO):**

Biodegradability: Result: Not readily biodegradable.

Stability in water: Degradation half life: 4.5 - 26 d

Remarks: Product is not persistent.

### **12.3 Bioaccumulative potential**

#### **Components:**

#### **mandipropamid (ISO):**

Bioaccumulation: Remarks: Low bioaccumulation potential.

Partition coefficient: n-octanol/water: log Pow: 3.2 (25 °C)

### **12.4 Mobility in soil**

#### **Components:**

#### **mandipropamid (ISO):**

Distribution among environmental compartments: Remarks: Low mobility in soil.

Stability in soil: Dissipation time: 26 - 178 d

Percentage dissipation: 50 % (DT50)

Remarks: Product is not persistent.

## 12.5 Results of PBT and vPvB assessment

### **Product:**

Assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### **Components:**

#### **mandipropamid (ISO):**

Assessment: This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

## 12.6 Other adverse effects

### **Product:**

Additional ecological information: Classification of the product is based on the summation of the concentrations of classified components.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Product:** Do not contaminate ponds, waterways or ditches with chemical or used container. Do not dispose of waste into sewer. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.

**Contaminated packaging:** Empty remaining contents. Triple rinse containers. Empty containers should be taken for local recycling or waste disposal. Do not re-use empty containers.

**Waste Code:** 150110, packaging containing residues of or contaminated by dangerous substances

## 14. TRANSPORT INFORMATION

### Land transport (ADR/RID)

#### 14.1 UN number

**ADN:** UN 3082  
**ADR:** UN 3082  
**RID:** UN 3082  
**IMDG:** UN 3082  
**IATA:** UN 3082

#### 14.2 UN proper shipping name

**ADN:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
(MANDIPROPAMID)  
**ADR:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
(MANDIPROPAMID)  
**RID:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
(MANDIPROPAMID)  
**IMDG:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
(MANDIPROPAMID)  
**IATA:** Environmentally hazardous substance, liquid, n.o.s.  
(MANDIPROPAMID)

#### 14.3 Transport hazard class(es)

**ADN:** 9  
**ADR:** 9  
**RID:** 9  
**IMDG:** 9  
**IATA:** 9

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#### 14.4 Packing group

##### ADN

Packing group: III

Classification Code: M6

Hazard Identification Number: 90

Labels: 9

##### ADR

Packing group: III

Classification Code: M6

Hazard Identification Number: 90

Labels: 9

Tunnel restriction code: (-)

##### RID

Packing group: III

Classification Code: M6

Hazard Identification Number: 90

Labels: 9

##### IMDG

Packing group: III

Labels: 9

EmS Code: F-A, S-F

##### IATA (Cargo)

Packing instruction (cargo aircraft): 964

Packing instruction (LQ): Y964

Packing group: III

Labels: Miscellaneous

##### IATA (Passenger)

Packing instruction (passenger aircraft): 964

Packing instruction (LQ): Y964

Packing group: III

Labels: Miscellaneous

#### 14.5 Environmental hazards

##### ADN

Environmentally hazardous: yes

##### ADR

Environmentally hazardous: yes

##### RID

Environmentally hazardous: yes

##### IMDG

Marine pollutant: yes

##### IATA (Passenger)

Environmentally hazardous: yes

##### IATA (Cargo)

Environmentally hazardous: yes

#### 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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#### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

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#### 15. REGULATORY INFORMATION

##### 15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals: Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59): Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer: Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants: Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

	Quantity 1	Quantity 2
E2 ENVIRONMENTAL HAZARDS	200 t	500 t

##### Other regulations:

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Use plant protection products safely. Always read the label and product information before use.

##### 15.2 Chemical Safety Assessment

A Chemical Safety Assessment is not required for this substance when it is used in the specified applications.

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#### 16. OTHER INFORMATION

##### Full text of H-Statements

H302:	Harmful if swallowed.
H315:	Causes skin irritation.
H317:	May cause an allergic skin reaction.
H318:	Causes serious eye damage.
H319:	Causes serious eye irritation.
H400:	Very toxic to aquatic life.
H410:	Very toxic to aquatic life with long lasting effects.

##### Full text of other abbreviations

Acute Tox.:	Acute toxicity
Aquatic Acute:	Short-term (acute) aquatic hazard
Aquatic Chronic:	Long-term (chronic) aquatic hazard
Eye Dam.:	Serious eye damage
Eye Irrit.:	Eye irritation
Skin Irrit.:	Skin irritation
Skin Sens.:	Skin sensitisation
IE OEL:	Ireland. List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
IE OEL / OELV - 8 hrs (TWA):	Occupational exposure limit value (8-hour reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European

Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECl - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

#### Further information

##### Classification of the mixture:

Aquatic Chronic 2 H411

##### Classification procedure:

On basis of test data.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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Crop	Maximum Individual Dose	Maximum Number of Treatments	Latest Time of Application
Potatoes	0.6 litres product per hectare	Four per crop	3 days before harvest
Protected lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, red mustard, baby leaf crops*, spinach, land cress, cress, purslane, spinach beet leaves (chard) and herbs#	0.6 litres product per hectare	One per crop	7 days before harvest
Outdoor lettuce, lamb's lettuce, endives (including frisee, escarole and radicchio), rocket, red mustard, baby leaf crops*, spinach, land cress, cress, purslane, spinach beet leaves (chard) and herbs#	0.6 litres product per hectare	Two per crop	7 days before harvest
Brussels sprouts, cauliflower, Broccoli/ calabrese	0.6 litres product per hectare	Two per crop	14 days before harvest
Outdoor radish	0.6 litres product per hectare	Two per crop	7 days before harvest
Vining peas	0.6 litres product per hectare	Two per crop	14 days before harvest

\*crops harvested no later than the 8 true leaf stage.

# please refer to the full list of herbs included at the back of the label

For outdoor crops and protected crops that are grown under a temporary cover, the maximum total dose must not exceed 1.2 L product/ha per year on any single area of land.

**READ THE LABEL BEFORE USE. USING THIS PRODUCT IN A MANNER THAT IS INCONSISTENT WITH THE LABEL MAY BE AN OFFENCE. FOLLOW THE CODE OF PRACTICE FOR USING PLANT PROTECTION PRODUCTS**

**SAFETY PRECAUTIONS**

**(a) Operator protection**

WASH HANDS AND EXPOSED SKIN before eating, drinking and after work.

IF YOU FEEL UNWELL, seek medical advice (show label where possible).

**(b) Environmental protection**

Do not contaminate water with the product or its container. Do not clean application equipment near surface water. Avoid contamination via drains from farmyards and roads.

**(c) Storage and disposal**

KEEP IN ORIGINAL CONTAINER, tightly closed, in a safe place.

DO NOT RE-USE CONTAINER for any purpose.

RINSE CONTAINER THOROUGHLY by using an integrated pressure rinsing device or manually, rinsing three times. Add washings to sprayer at time of filling and dispose of safely.



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