Sugar Beet Portfolio

Providing the foundations for Sugar Beet success

January 2019

Information in this portfolio booklet does not constitute a recommendation; it is for guidance only. Up-to-date information can be found on our website uk.uplonline.com.

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

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Made in Britain
Sugar Beet Weeds

Introduction

The growing of sugar beet has been revolutionised in recent decades from a high cost labour intensive crop to the efficient profitable one we know today. Efficient modern herbicides have been one of the major innovations that have made this possible.

Sugar Beet is a slow growing crop that suffers greatly from the competition of weeds which compete for light, space, nutrients and water. It is a very uneven battle, which without intervention would dramatically reduce crop yields. Certain weeds can seriously hamper harvesting and processing slowing down these all-important operations and increasing costs. Others can act as hosts to pests and diseases such as beet cyst nematodes, and violet root rot as well as contributing to the build up of weed seeds in the soil if left unchecked.

The choice of products whether used alone, in mixtures, or in a programme is critical to the success of controlling weeds. It is necessary to understand which weeds are controlled by which products, what size of weeds are controlled, and because beet is a very sensitive plant, at what crop stage the various herbicides may be applied.

Adapting to the changing face of sugar beet production in Europe, UPL Europe Ltd, formerly known as United Phosphorus Limited, has used their expertise to develop an unequalled range of cost effective products to support farmers.
UPL Europe Ltd. (UPL) is a leading global producer of crop protection products, speciality chemicals and other industrial chemicals. We operate in every continent around the world with offices in 30 countries, making us one of the leading producers of post-patent products in the world. We are lean, fit and responsive and our efficient formulation and manufacturing processes enable us to offer cost-effective solutions to farmer’s crop protection problems.

How We Do It
We aim to successfully meet the needs of our markets through the development and introduction of both new and existing products, both novel and post-patent. These products are developed to not only meet, but exceed our customer’s quality and performance expectations.

Our Areas of Expertise Include:

Product Development
As a major player in the crop protection market, we are constantly striving to acquire new products that will benefit our customers, whilst at the same time seeking to develop and improve our existing product portfolio.

Registration
We have a dedicated registration team based at our European headquarters in Warrington, UK. We are supporting the re-registration of major molecules with data generation to provide long term security for product registrations.

Manufacture and Formulation
In order for our manufacturing to be as efficient and competitive as possible, we manufacture most products at our own production facilities located in Europe and Asia. Each one operates to the strictest international quality standards.

Supporting UK Sugar Beet Growers
UPL are continuing to develop and acquire new and exciting products for the beet grower.

A market leader in herbicides including metamitron, desmedipham, phenmedipham, ethofumesate and triflusulfuron-methyl.
Investing in the future by developing novel fungicides for the beet crops.

UPL Sugar Beet Portfolio

Herbicides

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Name</th>
<th>Active Ingredients</th>
<th>Formulations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p7 BEETUP COMPACT SC</td>
<td>SC</td>
<td>desmedipham</td>
<td>SC</td>
<td>Sugar beet and fodder beet</td>
</tr>
<tr>
<td>p10 BETASANA SC</td>
<td>SC</td>
<td>phenmedipham</td>
<td>SC</td>
<td>Sugar beet, fodder beet, red beet and mangels</td>
</tr>
<tr>
<td>p12 BETASANA TRIO</td>
<td>SC</td>
<td>desmedipham, ethofumesate, phenmedipham</td>
<td>SC</td>
<td>Sugar beet, fodder beet and mangels</td>
</tr>
<tr>
<td>p15 BETTIX FLO SC</td>
<td>SC</td>
<td>metamitron</td>
<td>SC</td>
<td>Sugar beet, fodder beet, red beet and mangels</td>
</tr>
<tr>
<td>p20 EFECKT</td>
<td>SC</td>
<td>ethofumesate</td>
<td>SC</td>
<td>Sugar beet, fodder beet, red beet and mangels</td>
</tr>
<tr>
<td>p23 MISSION 200SL</td>
<td>SL</td>
<td>diquat</td>
<td>SL</td>
<td>Sugar beet</td>
</tr>
<tr>
<td>p23 SHIRO</td>
<td>WDG</td>
<td>triflusulfuron-methyl</td>
<td>WDG</td>
<td>Sugar beet and fodder beet</td>
</tr>
<tr>
<td>p26 VIVENDI 200</td>
<td>SL</td>
<td>clopyralid</td>
<td>SL</td>
<td>Sugar beet, fodder beet, red beet and mangels</td>
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</tbody>
</table>

Fungicides

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Name</th>
<th>Active Ingredients</th>
<th>Formulations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p28 MICROTHIOL SPECIAL</td>
<td>WDG</td>
<td>sulphur</td>
<td>WDG</td>
<td>Sugar beet</td>
</tr>
</tbody>
</table>

Note
Some products may have approvals for use in crops other than those listed above. For further information, please see product labels, also available to view and download at uk.uplonline.com.

Changes Since the Last Edition

1. Useful information: updated with changes since last edition highlighted in red.
Best Use Advice

The application of BEETUP COMPACT SC to crops suffering from stress may lead to a check. If substantial day-to-night fluctuations in temperature occur shortly before or after the application, growth may be checked.

Under poor growing conditions, growth is best controlled at the seedling stage when growing actively in warm, moist, sunny conditions. Under poor growing conditions, growth may be reduced.

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Fodder beet must not be grazed by livestock or harvested for animal consumption until at least 35 days after last application.

Useful Information

BEETUP COMPACT SC is a selective post-emergent herbicide for the control of annual weeds. It contains an 80:80 ratio of phenmedipham combined with desmedipham. The active ingredient of BEETUP COMPACT SC is more stable and therefore less reliant on temperature and light than phenmedipham alone.

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**Product Profile**

**Brand**: BEETUP COMPACT SC

**Active Ingredient**: phenmedipham

**Inclusion rate**: 80:80 ratio of phenmedipham combined with desmedipham

**Formulation**: Suspension Concentrate (SC)

**Volume**

- **Volume by Volume**
  - **Volume by Weight**
  - **Volume by Weight (f/k:1ha)**

**Brand & Formulation**

- **Brand & Formulation**
  - **Brand & Formulation**
  - **Brand & Formulation**

**Volume**

- **Volume by Volume**
  - **Volume by Weight**
  - **Volume by Weight (f/k:1ha)**

**Best Use Advice**

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**Useful Information**

- **Useful Information**
  - **Useful Information**
  - **Useful Information**
  - **Useful Information**

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  - **Useful Information**
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Fodder beet must not be grazed by livestock or harvested for animal consumption until at least 35 days after last application.
Crop Tolerance
All commercial varieties of Sugar Beet can be sprayed if healthy. Timing should be determined by the stage of growth of the weeds present.

As the beet plants are small and grow rapidly they can be affected by changes in conditions and become stressed.

The safety of BEETUP COMPACT SC to the crop will vary with conditions around the time of application.

If the plants are sprayed when they are stressed, this may lead to a check in growth from which they may not recover.

Causes of stress include:
• Temperatures above 21°C
• Wind or hail
• Nutrient deficiency
• Pests and diseases
• Use of other herbicides

Weeds Controlled
(see centre pages)

BEETUP COMPACT SC should be used as a repeat low dose treatment when weeds are at the cotyledon stage. If sprayed at later growth stages weed control may be reduced.

BEETUP COMPACT SC is a contact herbicide that is dependant for action on light and temperature.

Product Performance – Broom’s Barn 2012 UPL Trial

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Weeds/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>83</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Rothamsted Research, Broom’s Barn 2012
LSD = 25 (Comparison between treatments)
LSD = 18.4 (Comparison between untreated and treatments)

Trials Summary

Trials Summary
BEETUP COMPACT SC compares favorably with similar desmedipham:phenmedipham products to give reliable weed control and is an important tank mix partner.

Tank Mixes
Please note that the following tank mixes have been tested for physical compatibility with BEETUP COMPACT SC at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

BEETUP COMPACT SC is physically compatible with any one of the following tank mix partners:
- Bettix Flo
- Bettix Flo SC
- Debuit
- Defiant
- Defiant SC
- Dow Shield 400
- Efleck
- Ethofol
- Ethofol 500SC
- Ethofol 500
- Goltix 70SC
- Goltix 70
- Oblix 500SC
- Oblix 500
- Oblix MT
- Oblix MT/Volcano
- Shiro
- Safari Lite WSB
- Target SC
- Torero
- Venzar Flowable
- Venzar 500 SC
- Vivendi 200

For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

A Best Use Guide is available for BEETUP COMPACT SC

Summary
• Improved activity and speed of contact compared to solo products
• Safe at all stages of crop growth
• Proven reliability
• Flexible application timings
• Aids ethofumesate to penetrate weeds
• More stable, less reliant on temperature and light than phenmedipham solo
BETASANA SC

BETASANA SC is one of the building blocks integral to the UPL portfolio of quality sugar beet herbicides.

BETASANA SC is a contact herbicide for the control of a selection of broadleaved weeds in sugar beet, fodder beet, red beet and mangels.

**Product Profile**

<table>
<thead>
<tr>
<th>Brand</th>
<th>BETASANA SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>phenmedipham</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>160g/L</td>
</tr>
<tr>
<td>Formulation</td>
<td>Suspension Concentrate (SC)</td>
</tr>
<tr>
<td>Crops</td>
<td>Sugar beet, fodder beet, red beet and mangels</td>
</tr>
<tr>
<td>Maximum individual dose</td>
<td>3L/ha</td>
</tr>
<tr>
<td>Maximum total dose</td>
<td>6L/ha</td>
</tr>
<tr>
<td>Latest timing of application</td>
<td>Before crop leaves meet between the rows (BBCH 39)</td>
</tr>
<tr>
<td>Pack size</td>
<td>5L</td>
</tr>
<tr>
<td>LERAP</td>
<td>B</td>
</tr>
<tr>
<td>Water volume</td>
<td>80 – 100L/ha</td>
</tr>
</tbody>
</table>

**Weeds Controlled**

(see centre pages)

BETASANA SC should be used as a repeat low dose treatment when weeds are still small. Best control is achieved at the cotyledon stage. It is normal for a repeat low dose treatment to be applied as an overall spray.

BETASANA SC is a contact herbicide that is dependent for action on light and temperature. This affects both weed control and crop safety. This is particularly important for application under hot conditions to crops under stress and for tank mixtures.

BETASANA SC is absorbed through the leaves of the weeds and effects should be seen within 5–6 days of spraying. Weed response will vary according to conditions at spraying and the stage of growth of individual weeds.

Weeds are best controlled at the seedling stage when growing actively in warm, moist, sunny conditions. Under poor growing conditions control may be reduced. Susceptible weeds quickly die and in warm weather will be dead in 3-4 days. More tolerant weeds may take longer to die.

Under cool conditions results may not be complete for as long as 7-10 days.

BETASANA SC will not prevent germination of weed seed after treatment, and where this occurs further applications may be made provided the crop is in a healthy state and the other conditions for safe use are complied with.

As BETASANA SC has only contact action it is not affected by soil type and can be used on organic and peaty soils as well as mineral soils.

**Tank Mixes**

Please note that the following tank mixes have been tested for physical compatibility with BETASANA SC at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

BETASANA SC is physically compatible with any one of the following tank mix partners:

- Bettix Flo
- Bettix Flo SC
- Defiant
- Ethofol
- Ethofol 500SC
- Ethosat 500
- Dow Shield 400
- Defiant SC
- Efectk
- Goltix 70 SC
- Goltix 70
- Oblix 500SC
- Oblis MT/Volcano
- Oblix MT
- Safari Lite WSB
- Shiro
- Target SC
- Venzar Flowable
- Venzar 500 SC
- Vivendi 200

For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

**Summary**

- Effective contact action
- Safe at all stages of crop growth
- Proven reliability
- Flexible tank mixes and dose rates
**BETASANA TRIO** is a selective post-emergent herbicide for the control of annual weeds in sugar beet, fodder beet and mangels.

**BETASANA TRIO** combines three complementary active ingredients:

- **Ethofumesate** for:
  - Long lasting weed control
  - Good activity against weeds, including black-grass
  - Mode of action different to other sugar beet actives
  - Enhancing the contact activity of other herbicides

- **Phenmedipham** for:
  - Effective contact action
  - Safe at all stages of growth
  - Proven reliability

- **Desmedipham** for:
  - Rapid contact action
  - Improved activity under difficult/cool conditions
  - Improved efficacy against key weeds
  - Aids ethofumesate to penetrate weeds

Beet crops are extremely sensitive and can easily be damaged by herbicides. This can result in reduced yields and lower returns. **BETASANA TRIO** is proven to significantly reduce the threat of crop damage.

Using a specially formulated mixture of the three active ingredients above, **BETASANA TRIO** provides the highest level of weed control with unparalleled crop safety.

### Product Profile

**Brand**

**BETASANA TRIO**

**Active ingredient**

- Ethofumesate
- Phenmedipham
- Desmedipham

**Inclusion rate**

- 115g/L + 75g/L + 15g/L

**Formulation**

Suspension Concentrate (SC)

**Crops**

Sugar beet, fodder beet and mangels

**Maximum individual dose**

2.5L/ha

**Maximum total dose**

7.0L/ha

**Latest timing of application**

BBCH18 (eight leaves unfolded)

**Pack size**

5L

**LERAP**

- 

**Water volume**

100 – 300L/ha

### Other Specific Restrictions

The maximum total dose must not exceed 1.0kg of ethofumesate per hectare in any three year period.

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**Post-emergence broad-leaved weed control in Sugar Beet**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Minimum Gap Stage</th>
<th>Recommended Dose</th>
<th>Max Individual Dose</th>
<th>Max Total Dose</th>
<th>Latest Timing</th>
<th>Crop Emergence</th>
<th>Final Fully Developed Leaves</th>
<th>From Two True Leaves Unfolded</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETASANA TRIO</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Bettix Flo SC/Defiant</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Debut/Shiro + Bettix Flo SC/Defiant</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Ethofol/Oblix 500SC/Efekkt</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Fiesta T</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Oblix MT/Volcano</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
<tr>
<td>BETASANA TRIO + Safari Lite WSB</td>
<td>2.5 + 0.1</td>
<td>0.75 + 0.2</td>
<td>1.5 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
<td>15 + 0.2</td>
<td>2.0 + 0.4</td>
<td>2.5 + 0.4</td>
</tr>
</tbody>
</table>

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**Best Use Advice**

Post-emergence broad-leaved weed control in Sugar Beet
Product Performance
2012 Rothamsted Research, Broom’s Barn research trials have shown that as it is kinder to the crop BETASANA TRIO can improve yields by as much as 7 tonnes per hectare compared with the standard 4 ingredient herbicide.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Betanas Trio 1.5 + Bettx Flo 0.75 + Oi</td>
<td>Betanas Trio 2.0 + Venzar Flowable 0.4 + Oi</td>
</tr>
<tr>
<td>2</td>
<td>Standard 4 way 1.0 + Bettx Flo 0.75</td>
<td>Standard 4 way 1.0 + Venzar Flowable 0.4</td>
</tr>
</tbody>
</table>

BBRO Systems Trials – Weed Control, 2012 Results

Trials Summary
BETASANA TRIO performed consistently across all 4 trials sites. A full report is given in the British Sugar Beet Review Winter 2012 Volume 80 No 4.

A Best Use Guide is available for BETASANA TRIO

Summary
- Excellent crop safety
- Outstanding protection against a full range of annual weeds
- Easy to use

BETTIX FLO SC

BETTIX FLO SC is one of the building blocks integral to the UPL portfolio of quality sugar beet herbicides.

BETTIX FLO SC is a contact and residual acting selective herbicide for the control of annual weeds in sugar beet, red beet, fodder beet and mangels.

Product Profile
- Brand: BETTIX FLO SC
- Active ingredient: metamitron
- Inclusion rate: 700g/L
- Formulation: Suspension Concentrate (SC)
- Crops: Sugar beet, fodder beet, red beet and mangels
- Maximum individual dose: 3.0L/ha
- Maximum total dose: 10.2L/ha per crop
- Pack size: 5L
- LERAP: –
- Water volume: 100 – 200L/ha

Weeds Controlled
(see centre pages)
## Weed Control Chart

<table>
<thead>
<tr>
<th>Common Name</th>
<th>BEETUP COMPACT SC</th>
<th>BETASANA SC</th>
<th>BETASANA TRIO</th>
<th>BETTIX FLO SC</th>
<th>EFEKT</th>
<th>SHIRO + BETASANA SC</th>
<th>VIVENDI 200</th>
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</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>Contact</td>
<td>Contact</td>
<td>Contact-residual</td>
<td>Contact-residual</td>
<td>Contact-residual</td>
<td>Contact-residual</td>
<td>Foliar</td>
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<tr>
<td>Phenmedipham + desmedipham</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Phenmedipham</td>
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<tr>
<td>Ethofumate, Phenmedipham + desmedipham</td>
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<td>Ethofumate</td>
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<tr>
<td>Triflusulfuron-methyl + Phenmedipham</td>
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<tr>
<td>Clopoyralid</td>
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<tr>
<td><strong>Annual bugloss</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Lycopus arvensis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annual meadow-grass</strong></td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
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<tr>
<td>Poa annua</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Annual small nettle</strong></td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>MS</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Urticularis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Black bind-weed</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>MS</td>
<td>R</td>
<td>MS</td>
<td>S</td>
</tr>
<tr>
<td>Fallopia convolvulus</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Black nightshade</strong></td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>Solarium nigrum</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Black-grass</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Alpecurus mucronates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Charlock</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Stenospermum arvenssis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Clovers</strong></td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Galium aparine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Common chickweed</strong></td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Stellaria media</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Common field speedwell</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
</tr>
<tr>
<td>Veronica spicata</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common poppy</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>Papaver rhoeas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Com marigold</strong></td>
<td>S</td>
<td>MS</td>
<td>S</td>
<td>MS</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Chrysanthemum segetum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Com spurrey</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Spergula arvenssis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Creeping thistle</strong></td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td>Cirsium arvenssis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cut leaf Crane's-bill</strong></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Gemenium dissectum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dock, seeding</strong></td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Rumex app</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Additional Common Names

- Fat-hen: Chenopodium spp
- Fieldspurge: Viola arvensis
- Field penny cross: Thlaspi arvenssis
- Foul’s pansy: Aethusa cynapium
- Forget-me-not: Myosotis arvenssis
- Fumitory: Fumaria officinalis
- Groundsel: Senecio vulgaris
- Hemp nettle: Galeopsis tetrahit
- Knotgrass: Polygonum aviculare
- Mayweeds: Matricaria spp
- Orache: Atriplex p-veneris
- Pale persicaria: Polygonum lapathifolium
- Parsley sprat: Aphanes arvenssis
- Prickly sowthistle: Sonchus asper
- Red dead nettle: Lamium purpureum
- Redshank: Polygonum persicaria
- Ruch: Raphanus raphanistrum
- Scarlet pimpernel: Anagallis arvenssis
- Shepherd’s needle: Scandix p-veneris
- Shepherd’s-purse: Capsella b-pastoris
- Sun spurge: Euphorba helioscopia
- Volunteer oilseed rape: Brassica napus
- Volunteer potatoes: Solanum tuberosum
- Wild oat: Avena fatua

Sugar Beet Portfolio
**Bettix Flo SC**

**Best Use Advice for Bettix Flo SC in Different Programmes, A Flexible Tank Mix Partner**

<table>
<thead>
<tr>
<th>Bettyx FLO SC Options in a FAR Programme Crop Growth Stage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betasana SC 0.5 + Efect 0.2 + Bettix Flo SC 0.5 + Oil 0.5</td>
<td>Very safe and broad spectrum, better weed kill in dry conditions.</td>
</tr>
<tr>
<td>Betasana SC 0.5 + Efect 0.2 + Bettix Flo SC 0.5 + Venvedio 200 0.25</td>
<td>Good choice for brassica weeds and weeds on heavy soils.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bettyx FLO SC Options in a Broadacre Programme Crop Growth Stage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betasana SC 2.5 + Efect 0.4 + Debut/Shiro 20g + Venzar Flowable/Venzar 500 SC 0.4</td>
<td>No restriction, very safe and broad spectrum.</td>
</tr>
<tr>
<td>Betasana SC 2.5 + Efect 0.4 to 0.8 + Debut/Shiro 20g to 30g + Venzar Flowable/Venzar 500 SC 0.4 + Bettix SC 0.5</td>
<td>Good choice for broadleaf weeds on heavy soils.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bettyx FLO SC in a Typical Betasana Trio Programme Crop Growth Stage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betasana Trio 1.5 + Bettix Flo SC 0.75</td>
<td>Expanded cotyledon, before 8-10 true leaves. Oil according to temperature.</td>
</tr>
<tr>
<td>Betasana Trio 2.0 + Venzar Flowable/Venzar 500 SC 0.4</td>
<td>Second flush of weeds, 10-14 days after T1.</td>
</tr>
<tr>
<td>Betasana Trio 2.5 + Bettix Flo SC 1.0</td>
<td>Before 8-10 true leaves, oil according to the temperature and dependent on weed germination.</td>
</tr>
</tbody>
</table>

**Tank Mixes**

Please note that the following tank mixes have been tested for physical compatibility with Bettix Flo SC at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

**Bettix Flo SC** is physically compatible with any one of the following tank mix partners:

- **Herbicides**
  - Beetup Flo
  - Beetup Compact SC
  - Betanal maxxPro
  - Betanal Maxxim
  - Betanal Turbo
  - Betasana SC
  - Betasana Trio
  - Debut
  - Dow Shield 400
  - Efect 0.2
  - Ethofol
  - Ethofol 500 SC
  - Ethosat 500
  - Oblix 500SC
  - Rifle
  - Shiro
  - Sniper
  - Venzar Flowable
  - Venzar 500 SC
  - Vivendi 200

- **Adjuvants and Nutrients**
  - Cropspray 11E
  - Librel Mn
  - Manganese Sulphate

For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

**Notes**

Before using any tank mixture, consult and comply with the recommendations of the partner product.

Mixing instructions: One third fill the sprayer with clean water, start agitation and then add the **Bettix Flo SC** and allow it to thoroughly disperse. Add the partner product and fill to mark. Use immediately. Continuous and effective agitation is essential, even during stoppages, until the tank is empty.

A Best Use Guide is available for **Bettix Flo SC**

**Summary**

- Pre-emergent and post-emergent weed control
- Contact and residual action
- Excellent crop safety
- Flexibility of timing, rates and tank mixes
**EFECKT**

EFECKT is one of the building blocks integral to the UPL portfolio of quality sugar beet herbicides.

EFECKT is a contact and long lasting residual herbicide for pre and post-emergence use to control annual grasses and broadleaved weeds in sugar beet, red beet, fodder beet and mangels.

### Product Profile

<table>
<thead>
<tr>
<th>Brand</th>
<th>EFECKT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>ethofumesate</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>500g/L</td>
</tr>
<tr>
<td>Formulation</td>
<td>Suspension Concentrate (SC)</td>
</tr>
<tr>
<td>Crops</td>
<td>Sugar beet, red beet, fodder beet and mangels</td>
</tr>
</tbody>
</table>

- **Maximum individual dose**: either 2.0L/ha or 0.6L/ha
- **Maximum total dose**: either 2.0L/ha or 1.2L/ha
- **Latest timing of application**: Before crop emergence or before crop leaves meet between the rows.

<table>
<thead>
<tr>
<th>Pack size</th>
<th>5L</th>
</tr>
</thead>
<tbody>
<tr>
<td>LERAP</td>
<td>-</td>
</tr>
<tr>
<td>Water volume</td>
<td>80 – 240L/ha*</td>
</tr>
</tbody>
</table>

* Water volume has been reduced according to guidelines given in the Code of Practice for Using Plant Protection Products.

Other Specific Restrictions

To protect groundwater the maximum total dose must not exceed 1.0kg ethofumesate per hectare in any three year period.

### Weeds Controlled

(see centre pages)

### Mode of Action Comparison

<table>
<thead>
<tr>
<th>Group</th>
<th>Mode of action</th>
<th>Chemical family</th>
<th>Active</th>
<th>Product (examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Inhibition of acetyl CoA carboxylase (ACCase)</td>
<td>aryloxypenoxo-propionates (fops)</td>
<td>e.g. fluazifop-P-butyl</td>
<td>Fusilade Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cyclohexanedione (dims)</td>
<td>e.g. cycloxydim clethodim</td>
<td>Laser Centunon Max</td>
</tr>
<tr>
<td>C1</td>
<td>Inhibition of photosynthesis at photosystem II</td>
<td>triazines</td>
<td>metamitron</td>
<td>Bettix Flo SC Defiant Target SC</td>
</tr>
<tr>
<td>N</td>
<td>Inhibition of lipid synthesis</td>
<td>benzofturan</td>
<td>ethofumesate</td>
<td>Efeckt</td>
</tr>
</tbody>
</table>

**EFECKT** can be used as part of a black-grass control strategy due to MOA being different to graminicides where resistance may be an issue.

**Tank Mixes**

Please note that the following tank mixes have been tested for physical compatibility with EFECKT at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

**EFECKT** is physically compatible with **any one** of the following tank mix partners:

- Beetup Compact SC
- Beetup Flo
- Betanal Maxxim
- Betasana Trio
- Betanal Turbo
- Bettix Flo
- Bettix Flo SC
- Corzal
- Debut
- Defiant
- Defiant SC
- Dow Shield 400
- Golfix Flo 70 SC
- Pyramin DF (pre-em only)
- Rifle
- Shiro
- Takron (pre-em only)
- Target SC
- Venzar Flowable
- Venzar 500 SC
- Vivendi 200
- Trilogy

For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

**Summary**

- Contact and long lasting residual weed control
- Enhances contact activity of other herbicides to control larger weeds
- Ideal partner product for other actives
- Activity against grass weeds
MISSION 200SL

MISSION 200SL is a soluble concentrate formulation containing diquat for pre-emergence weed control in sugar beet.

Can be used at any time inter-row to control small weeds. Can form part of an integrated black-grass control program when used as a band spray. The use of crop guards is essential to prevent contact of the spray with the crop.

MISSION 200SL is a non-selective contact herbicide.

Product Profile

<table>
<thead>
<tr>
<th>Brand</th>
<th>MISSION 200SL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>diquat</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>200g/L</td>
</tr>
<tr>
<td>Formulation</td>
<td>Soluble Concentrate (SL)</td>
</tr>
<tr>
<td>Crops</td>
<td>Sugar beet</td>
</tr>
<tr>
<td>Maximum individual dose</td>
<td>2.0L/ha</td>
</tr>
<tr>
<td>Maximum number of treatments</td>
<td>One per crop</td>
</tr>
<tr>
<td>Latest timing of application</td>
<td>3 days in advance of crop emergence**</td>
</tr>
<tr>
<td>Pack size</td>
<td>5L</td>
</tr>
<tr>
<td>LERAP</td>
<td>B</td>
</tr>
<tr>
<td>Water volume</td>
<td>200 – 500L/ha</td>
</tr>
</tbody>
</table>

*MISSION 200SL (diquat) is withdrawn from the market on 4 May 2019 with a use-up period for growers ending on February 2020.

**See comment above about using inter-row.

Add a non-ionic surfactant adjuvant, which is not an organo-silicone, in accordance with the manufacturer’s instructions.

Summary

- Contact, non-selective weed control
- Pre-emergence use only as an overall spray

SHIRO

SHIRO is a water-dispersible granule formulation containing 50% w/w triflusulfuron-methyl, a sulfonylurea for the control of broad-leaved weeds in sugar beet and fodder beet.

SHIRO works mainly by foliar action, and in tank mix with other herbicide actives it will control a wide range of broad-leaved weeds. It is most effective if applied when the weeds are small and actively growing. SHIRO should always be applied in conjunction with a recommended adjuvant or suitable herbicide tank mix partner(s).

Product Profile

<table>
<thead>
<tr>
<th>Brand</th>
<th>SHIRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>triflusulfuron-methyl</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>500g/kg</td>
</tr>
<tr>
<td>Formulation</td>
<td>Water dispersible granule (WDG)</td>
</tr>
<tr>
<td>Crops</td>
<td>Sugar beet and fodder beet</td>
</tr>
<tr>
<td>Maximum individual dose</td>
<td>0.03kg/ha</td>
</tr>
<tr>
<td>Maximum number of treatments</td>
<td>4 per crop</td>
</tr>
<tr>
<td>Latest time of application</td>
<td>BBCH 39 (before the first leaves of the crop meets between the rows)</td>
</tr>
<tr>
<td>Pack size</td>
<td>120g</td>
</tr>
<tr>
<td>LERAP</td>
<td>B</td>
</tr>
<tr>
<td>Water volume</td>
<td>80 – 150L/ha</td>
</tr>
</tbody>
</table>

Mode of Action

SHIRO contains triflusulfuron-methyl, a sulfonylurea which is an ALS inhibitor that causes the inhibition of acetolactate synthase (ALS), it belongs to Group B (HRAC).
**Tank Mixes**

Please note that the following tank mixes have been tested for physical compatibility with SHIRO at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

**SHIRO** is physically compatible with any one of the following tank mix partners:

- Beetup Compact SC
- Beetup Flo
- Beetup Flo SC
- Beta-Team
- Beta-Team SC
- Betanal Maxxim
- Betasana SC
- Betasana Trio
- Bettix Flo
- Bettix Flo SC
- Betasana Trio
- Dow Shield 400
- Ethofol
- Ethofol 500 SC
- Ethosat
- Oblix 500 SC
- Oblix MT
- Phemo
- Rifle
- Shield 400
- Teamforce
- Trilogy
- Venzar Flowable

UPL will support SHIRO in a ‘Broadacre Programme’ from the beet at first true leaves each 1cm long where beet are growing actively and are not under any stress.

**BETASANA TRIO**

**Herbicides**

**SHIRO**

**Product Performance**

In trials carried out by Dewar Crop Protection for UPL Europe Ltd, SHIRO has proven to be comparable to other triflusulfuron-methyl products, see Graph 1 ‘Cleaver Control in Sugar Beet 2015’. The addition of SHIRO to a BETASANA TRIO programme has given excellent cleaver control.

Follow the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

Following Crops and Crop Failure

In the event of crop failure, sow only spring barley, linseed or beet within four months of application of SHIRO, provided this agrees with the recommendations of any partner product. Only winter cereals should be sown in the same calendar year after applying SHIRO, any crop may be sown or planted in the following spring (next calendar year).

Spray Tank Clean-out

To avoid damage to crops other than sugar beet, immediately after spraying SHIRO clean all spray equipment with a product such as All Clear® Extra. See SHIRO label for full details.

A Best Use Guide is available for SHIRO.

Summary

- Proven efficacy in trials
- Strong on Cleavers and Volunteer OSR
- + BETASANA TRIO = excellent weed control
- Comprehensive
VIVENDI 200

VIVENDI 200 is a post-emergence foliar acting herbicide. It is fully translocated throughout the plant and affects all parts of susceptible weeds. VIVENDI 200 is used for the control of some annual broad-leaved weeds, but especially for the control of thistles and volunteer potatoes.

Product Profile

<table>
<thead>
<tr>
<th>Brand</th>
<th>VIVENDI 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active ingredient</td>
<td>clopyralid</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>200g/L</td>
</tr>
<tr>
<td>Formulation</td>
<td>Soluble Concentrate (SL)</td>
</tr>
<tr>
<td>Crops</td>
<td>Sugar beet, red beet, fodder beet and mangels</td>
</tr>
<tr>
<td>Maximum individual dose</td>
<td>1.0L/ha</td>
</tr>
<tr>
<td>Maximum total dose</td>
<td>1.5L/ha</td>
</tr>
<tr>
<td>Earliest timing of application</td>
<td>1 March in the year of harvest</td>
</tr>
<tr>
<td>Latest timing of application</td>
<td>When the crops meet between the rows (BBCH39)</td>
</tr>
<tr>
<td>Pack size</td>
<td>1L</td>
</tr>
<tr>
<td>LERAP</td>
<td>–</td>
</tr>
<tr>
<td>Water volume</td>
<td>80 – 300L/ha</td>
</tr>
</tbody>
</table>

Creeping Thistle Control

For optimum control of creeping thistles a sequence of VIVENDI 200 applications is the most appropriate approach. The first application should be made when the weeds are at the rosette growth stage, followed by a second application 3–4 weeks later. It is likely that applications of VIVENDI 200 will be part of a sequential low dose programme in 80–100L of water with tank mix partners. It is worth noting one creeping thistle stem per square metre can reduce the yield of sugar beet by one tonne per hectare.

Volunteer Potato Control

A total of 1.0L/ha of VIVENDI 200 is required for control and ideally this should be applied as two doses of 0.5L/ha. Where emergence is protracted this can be split over 3 or 4 applications. The first application should be made when the volunteer potato shoots are 5–10cm tall. The second application should be made when untreated volunteer potatoes are 10–20cm tall. For an accurate guide to when this stage is reached, it is advisable to leave a small area of untreated volunteer potatoes in the field. Typically the second application is made 7–14 days after the first.

VIVENDI 200 is applied in tank mixture with ethofumesate as in EFECKT is the best treatment against volunteer potatoes in sugar beet.

The effect on progeny tubers is carried through to succeeding generations, thus reducing the threat from volunteers in the second year after treatment.

Tank Mixes

Please note that the following tank mixes have been tested for physical compatibility with VIVENDI 200 at recommended rates of use and will mix in the sprayer tank. Physical compatibilities may not be approved tank mixes. These tests have not been undertaken to check for any adverse crop phytotoxicity or for the biological efficacy of the individual products when applied as a tank mix. UPL accepts no liability for physical compatibilities; therefore use is at grower’s own risk.

VIVENDI 200 is physically compatible with any one of the following tank mix partners:

- Beetup Compact SC
- Beetup Flo
- Betanal Maximm
- Betanal Turbo
- Betasana SC
- Betasana Trio
- Bettix Flo
- Bettix Flo SC
- Corzal
- Corzal SC
- Debut
- Defiant
- Defiant SC
- Ethofol
- Ethofol 500SC
- Ethosat 500 SC
- Ethosat 500SC
- Ethosat MT
- Goltix Flowable
- Goltix 500SC
- Glufosinate
- Glufosinate 360 SC
- Oblix 500SC
- Oblix MT
- Rifle
- Safari WSG
- Shiro
- Sniper
- Target SC
- Trilogy
- Venzar Flowable
- Venzar 500 SC
- Volcano

For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

Summary

- Excellent control of thistles
- Additional control of some broad-leaved weeds, particularly mayweeds
- Aids volunteer potato control in conjunction with cultural control methods
MICROTHIOL SPECIAL

MICROTHIOL SPECIAL is a water dispersible granule containing sulphur for use against powdery mildew or as a foliar feed in sugar beet.

<table>
<thead>
<tr>
<th>Product Profile</th>
<th>MICROTHIOL SPECIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand</td>
<td>sulphur</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>80%</td>
</tr>
<tr>
<td>Inclusion rate</td>
<td>Water Dispersible Granule (WG)</td>
</tr>
<tr>
<td>Formulation</td>
<td>Sugar beet</td>
</tr>
<tr>
<td>Rate of application</td>
<td>10kg/ha</td>
</tr>
<tr>
<td>Crops</td>
<td>2 per crop</td>
</tr>
<tr>
<td>Rate of application</td>
<td>2 – 3 weeks later</td>
</tr>
<tr>
<td>Maximum number of treatments</td>
<td>2 per crop</td>
</tr>
<tr>
<td>Timing</td>
<td>Minimum of 400L/ha</td>
</tr>
</tbody>
</table>

**Tank Mixes**
For the latest information on tank mix recommendations, please visit our website at uk.uplonline.com.

**Summary**
- Excellent rainfastness
- Preventative, curative and eradicant activity
- Naturally occurring compound
- Multisite mode of action
Common poppy
(Papaver rhoeas)

Cut-leaved crane’s bill
(Geranium dissectum)

Fat hen
(Chenopodium album)

Field pansy
(Viola arvensis)

Forget-me-not
(Myosotis arvensis)

Fumitory
(Fumaria officinalis)

Knotgrass
(Polygonum aviculare)

Pale persicaria
(Polygonum lapathifolium)

Redshank
(Polygonum persicaria)

Red dead-nettle
(Lamium purpureum)

Scentless mayweed
(Matricaria perforata)

Shepherd’s-purse
(Capsella bursa-pastoris)