



## **Grower Summary**

The Bedding and Pot Plant Centre – new product opportunities for bedding and pot plant growers.

***Objective 1. Management of conventional chemistry***

**PO 19d**

**Project title:** The Bedding and Pot Plant Centre – new product opportunities for bedding and pot plant growers.

***Objective 1. Management of conventional chemistry***

**Project number:** PO 019d

**Project leader:** Dr Jill England, ADAS Boxworth

**Report:** Annual report, 31 March 2021

**Previous report:** None

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**Location of project:** RSK ADAS Ltd, Battlegate Road, Boxworth, Cambridgeshire, CB23 4NN

**Industry Representative:** Chris Need

**Date project commenced:** 1 April 2020

**Date project completed** 31 March 2023

**(or expected completion date):**

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## AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

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# Grower Summary

## Headline

- Frupica SC, Karma, Reflect, Sercadis and Topas were found to be crop safe on *Cosmos* 'Xanthos Lemon Sherbet', *Dahlia* 'Figaro Violet Shades', Pansy 'Matrix Beaconsfield', *Petunia* 'Express Blue' and *Verbena* 'Quartz XP Red Eye'.
- Fungicides with three different FRAC mode of action codes that are safe to use on selected bedding and pot plants were identified.

## Background

The Bedding and Pot Plant Centre (BPPC) was established to address the needs of the industry via a work programme to trial and demonstrate new product opportunities and practical solutions to problems encountered on nurseries.

*This is the Bedding and Pot Plant Centre report for:*

### **Objective 1. Management of conventional chemistry.**

## Summary

Several key active ingredients with activity against powdery mildew that are known to be crop safe in bedding and pot plant production have recently been withdrawn. The fungicides included within this trial were selected as they have activity against powdery mildew and have recently obtained Extensions of Authorisations for Minor Use (EAMUs) in the production of ornamentals. However, limited crop safety data relating to the use of these products is available for bedding and pot plant growers. Plant species were selected based on their susceptibility to powdery mildew. This trial expands the fungicide options available for the prevention and control of powdery mildew within the bedding and pot plant sector.

Five seed-raised bedding plant species (*Cosmos* 'Xanthos Lemon Sherbet', *Dahlia* 'Figaro Violet Shades', Pansy 'Matrix Beaconsfield', *Petunia* 'Express Blue' and *Verbena* 'Quartz XP Red Eye') were used for this trial. Plugs were transplanted into standard 6-packs (Pansy, *Petunia* and *Verbena*) and 1 L pots (*Cosmos* and *Dahlia*) at ADAS Boxworth on 25<sup>th</sup> June 2020 (week 26). All species were transplanted into Levington M2 Pot and Bedding Compost. Treatments (**Table 1**) were applied as a foliar spray in 500 L/ha water two and four weeks post-transplant (weeks 28 and 30). Treatment effects were compared with two control treatments, water only. If PGRs were required on the trial, the second control treatments would also be treated with PGR, to confirm that any treatment effects were attributable to the fungicide application and not the PGR. Plants were not irrigated for 24 hours following treatment.

**Table 1.** Treatment list. Treatments were applied at 2- and 4-weeks post-transplant (weeks 28 and 30)

Trt	Product	No. of applications	Active	Rate (L/ha, kg/ha)	Rate (ml/L, g/L)
1	Water control	2	N/A	N/A	N/A
2*	Water control (+ Bonzi if required)	2	N/A	N/A	N/A
3*	Frupica SC	2	Mepanipyrim	0.9 L/ha	1.8 ml/L
4*	Karma	2	Potassium hydrogen carbonate	3.0 kg/ha	6.0 g/L
5*	Reflect	2	Isopyrazam	1.0 L/ha	2.0 ml/L
6*	Sercadis	2	Fluxapyroxad	0.3 L/ha	0.6 ml/L
7*	Topas	2	Penconazole	0.5 L/ha	1.0 ml/L

\*If PGR was required, this was applied to all plants within treatments 2-7. Treatments applied in 500 L/ha water.

None of the fungicides (Frupica SC, Karma, Reflect, Sercadis or Topas) assessed in this crop safety trial resulted in any detrimental effects on the five plant species (*Cosmos*, *Dahlia*, Pansy, *Petunia* or *Verbena*). No major symptoms of phytotoxicity were observed, and there was no effect on plant quality or height by the final assessment. No delays in flowering were associated with the use of any of the fungicides assessed on the five species tested, therefore it can be concluded that Frupica SC, Karma, Reflect, Sercadis or Topas are crop safe on *Cosmos* 'Xanthos Lemon Sherbet', *Dahlia* 'Figaro Violet Shades', Pansy 'Matrix Beaconsfield', *Petunia* 'Express Blue' and *Verbena* 'Quartz XP Red Eye'.

Fungicide modes of action (MOA) are classified by the Fungicide Resistance Action Committee (FRAC), who use different numbers and letter combinations to distinguish fungicide MOA groups. Using fungicides with different FRAC codes prevents the development of fungicide resistance. These trials have identified fungicides with three different FRAC codes (**Table 2**) that are safe to use in the prevention and control of powdery mildew by bedding and pot plant growers as part of a planned fungicide resistance prevention strategy; Karma is not classified (nc) by FRAC.

## Financial benefits

Fungicides are an essential crop protection input in the production of bedding and pot plants. Without access to fungicides for the prevention and control of powdery mildew, losses caused by this pathogen are conservatively estimated at 1% of production value resulting in a potential loss of £4.3 million to the sector.

This evaluation of fungicides approved in the UK under EAMUs for use on bedding and pot plants will expand the range of active ingredients available to growers' for controlling powdery mildew. While growers do use cultural methods (e.g. fans, ventilation and controlling the timing of irrigation) to aid in the prevention of foliar disease where possible, a lack of cost-effective fungicides approved for use on protected ornamentals would reduce the range of plants that can be produced profitably within customer specifications. The cost per litre of spray solution per product included in this trial at the specified rates ranges from 0.008p to 0.261p (**Table 2**) and provides greater opportunity to increase profit through reduced input costs.

**Table 2.** Fungicide costs (non-discounted, excluding VAT and labour costs for application) and FRAC codes

Product	Application rate	FRAC code	Cost of active (p)	Cost / L of spray (p)
Frupica SC	0.9 L/ha	9	0.145 / ml	0.261
Karma	3 kg/ha	NC	0.0138 / g	0.08
Reflect*	1 L/ha	7	0.0488 / ml	0.0976
Sercadis*	0.3 L/ha	7	0.1410 / ml	0.0084
Topas	0.5 L/ha	3	0.0616 / ml	0.0616

\*Reflect and Sercadis have the same FRAC code. NC = not classified. At the time of writing Reflect was available in 10 L units only.

## Action points

- Frupica SC, Reflect and Sercadis are protectant fungicides, and will be most effective when used in fungicide programmes early on to prevent powdery mildew. Reflect and Sercadis have the same FRAC code so only one of these products should be used in fungicide programmes to minimise the risk of fungicide resistance developing.
- Topas is largely a protectant fungicide although it does have some anti-sporulant activity. It is best used preventatively or in the earliest stages of disease development.
- Karma has eradicant properties so is most effective when powdery mildew is present within crops.

- A limited number of species have been tested within this trial and growers are advised to test spray new or unfamiliar fungicides on a small number of plants prior to large scale use on commercial crops.
- Alternate fungicides with different modes of action to prevent fungicide resistance developing.
- Growers should familiarise themselves with and adhere to product labels, approvals, and Extensions of Approval for Minor Use (EAMUs) prior to use.

Growers should note that the water volume used in these trials (500 litres water per hectare) may be lower than the rate they currently use and as such application rates or volumes may need to be adjusted to maintain the same application rate of active ingredient.