



# **Grower Summary**

**Bedding and Pot Plant Centre. Management  
of conventional chemistry on bedding  
and pot plants**

**PO 19d**

Annual report 2022

**Project title:** Bedding and Pot Plant Centre. Management of conventional chemistry on bedding and pot plants

**Project number:** PO 019d

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

**Report:** Annual report, 31 March 2022

**Previous report:** The Bedding and Pot Plant Centre – new product opportunities for bedding and pot plant growers (31 March 2021).

**Key staff:** Dr Jill England (ADAS), Senior Horticulture Consultant  
David Talbot (ADAS), Senior Horticulture Consultant  
Thomas James (ADAS), Horticulture Research Officer

**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.

David Talbot

Senior Horticulture Consultant


ADAS

Signature  Date 06.04.2022

Thomas James

Horticulture Research Officer

ADAS

Signature  Date 23.11.2021

### Report authorised by:

Dr Jill England

Technical Director, Head of Horticulture

ADAS

Signature  Date 6.04.22

## Grower Summary

### Headline

- Frupica SC, Karma, Sonata, Sercadis and Luna Privilege are crop safe on '*Begonia*' *semperflorens* Heaven Red, '*Nemesia*' Lady Lisa, '*Geranium*' Horizon Red, '*Fuchsia*' *brutus*, and '*Calibrachoa*' Cabaret Cherry Rose and offer potential new options for *Botrytis* control in these crops.
- The products trialled contain fungicides with three different FRAC mode of action codes that can be alternated in programmes to minimise the risk of fungicide resistance developing.

### Background

- The Bedding and Pot Plant Centre (BPPC) addresses the needs of the industry via a programme of work to trial and demonstrate new product opportunities and practical solutions to problems encountered on nurseries.
- The trial being reported here focussed on the diminishing number of key active ingredients by testing fungicides with activity against *Botrytis* and which have recently obtained extensions of authorisations for minor use (EAMUs) for use in the production of ornamentals. These products were tested on bedding plant species that are susceptible to *Botrytis*.

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

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

### Summary

Several key active ingredients with activity against *Botrytis* that are known to be crop safe in bedding and pot plant production have recently been withdrawn. The fungicides included within this trial have been selected because they have activity against *Botrytis* and have recently obtained extensions of authorisations for minor use (EAMUs) for use in the production of ornamentals. However, no crop safety data relating to the use of these products was widely available for bedding and pot plant growers. The plant species were selected as they are susceptible to *Botrytis*. This trial expands the fungicide options available for the prevention and control of *Botrytis* within the bedding and pot plant sector.

Three cutting-raised ('*Nemesia*' Lady Lisa, '*Fuchsia*' *brutus*, and '*Calibrachoa*' Cabaret Cherry Rose) and two seed-raised bedding plant species ('*Begonia*' *semperflorens* Heaven Red, and '*Geranium*' Horizon Red) were used for this trial. Plugs were transplanted into standard 6-packs (*Begonia* and *Geranium*) and 1 L pots (*Nemesia*, *Calibrachoa* and *Fuchsia*) at ADAS

Boxworth on 19<sup>th</sup> May 2021 (week 20). All species were transplanted into Levington M2 Pot and Bedding Compost. Treatments (**Table 1**) were applied as a foliar spray in either 500 L/ha water (Frupica SC, Karma, Sercadis and Luna Privilege) or 1500 L/ha water (Sonata), two- and four-weeks post-transplant (weeks 22 and 24). Treatment effects were compared with two control treatments. The first control was water only. Then, 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 39).

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 (+ PGR 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*	Sonata**	2	<i>Bacillus pumilus</i> QST2808	10.0 L/ha	6.67 ml/L
6*	Sercadis	2	fluxapyroxad	0.3 L/ha	0.6 ml/L
7*	Luna Privilege	2	fluopyram	0.225 L/ha	0.45 ml/L

\*If PGR was required, this was applied to all plants within treatments 2-7. \*\*Sonata applied in 1500 L/ha water; all other treatments applied in 500 L/ha water

None of the fungicides (Frupica SC, Karma, Sonata, Sercadis or Luna Privilege) assessed in this crop safety trial resulted in any detrimental effects on the five plant species (*Begonia* 'semperflorens' Heaven Red, *Nemesia* 'Lady Lisa', *Geranium* 'Horizon Red', *Fuchsia* 'brutus', and *Calibrachoa* 'Cabaret Cherry Rose'). 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, Sonata, Sercadis or Luna Privilege are crop safe on *Begonia*, *Nemesia*, *Geranium*, *Fuchsia* and *Calibrachoa*.

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 *Botrytis* by bedding and pot plant

growers as part of a planned fungicide resistance prevention strategy; Karma is not classified (nc) by FRAC. Previous trial work carried out in this project highlighted that many of the fungicides included within this trial also have activity against powdery mildew. The crop safety of four of these fungicides on a range of species prone to powdery mildew has previously been demonstrated within this programme of work.

## 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 *Botrytis*, 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 *Botrytis*. Whilst growers do use cultural methods (e.g., fans, ventilation and controlling the timing of irrigation) to aid the prevention of foliar disease where possible, however a lack of cost-effective fungicides approved for use on protected ornamentals would reduce the range of plants that can be produced profitably within client specifications. The cost per litre of spray solution to apply the products included in this trial at the specified rates ranges from 0.08p to 5.55p (**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	0.26
Karma	3.0 Kg/ha	NC	0.0138 / g	0.08
Sonata*	10.0 L/ha	BM02	0.83 / ml	5.55
Sercadis*	0.3 L/ha	7	0.1410 / ml	0.08
Luna Privilege	0.225 L/ha	7	0.215 / ml	0.10

\* Sercadis and Luna Privilege have the same FRAC code. NC = not classified.

## Action points

- Sonata, Sercadis and Frupica SC are protectant fungicides and will be most effective when used in fungicide programmes to prevent *Botrytis*.
- Karma has eradicant properties so is most effective when *Botrytis* 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 untested plant varieties or cultivars prior to large scale use on commercial crops.
- Growers should familiarise themselves with and adhere to product labels, approvals, and Extensions of Approval for Minor Use (EAMUs) prior to use.
- EAMUs recommend the alternation of fungicides with different modes of action to prevent fungicide resistance becoming a problem.
- These trials have shown the potential of fungicides with three different FRAC codes which can be utilised for use in the control and prevention of *Botrytis* in spray programmes as part of an anti-fungicide resistance strategy. The mode of action of Karma is 'not classified'.
- Luna Privilege 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.
- Growers should note that the water volume used for Sercadis, Frupica SC, Karma and Luna Privilege 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.