



# **Grower Summary**

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

**PO 019d**

Final report

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

**Project number:** PO 019d

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

**Report:** Annual report, 31 March 2023

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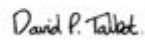
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## AUTHENTICATION

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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Senior Horticulture Consultant  
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Signature



Date 31.03.2023

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Date 31.03.2023

### **Report authorised by:**

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Date 31.03.2023

## Grower Summary

### Headline

- Serenade ASO, Fytosave, Signum, Amylo-X WG and Romeo were crop safe on *Cosmos* 'Xanthos' lemon sherbet, *Dahlia* 'Figaro' violet shades, Pansy 'Matrix' spring select mix, *Petunia* 'Express' blue and *Verbena* 'Quartz XP' mix and offer potential new options for disease control in these crops.
- Products tested with activity against powdery mildew were Serenade ASO, Signum, Fytosave, Amylo-X and Romeo
- Products tested with activity against downy mildew were Amylo-X and Romeo
- 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 powdery and / or downy mildew 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 powdery / downy mildew.

*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 and / or downy mildew 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 powdery and / or downy mildew 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 powdery / downy mildew. This

trial expands the fungicide options available for the prevention and control of powdery and / or downy mildew within the bedding and pot plant sector.

*Cosmos* ‘Xanthos’ lemon sherbet, *Dahlia* ‘Figaro’ mix, Pansy ‘Matrix’ spring select mix, *Petunia* ‘Frenzy’ mix and *Verbena* ‘Quartz XP’ mix 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 30<sup>th</sup> May 2022 (week 22). All species were transplanted into Levington M2 Pot and Bedding Compost. Treatments (**Table 1**) were applied as a foliar spray in 1000 L/ha water two- and four-weeks post-transplant (weeks 24 and 26). Treatment effects were compared with two control treatments. The first control was water only. The second control was included to account for the potential effects of PGRs on disease control but in practise acted as a second control because no PGR sprays were necessary in this trial.

**Table 1.** List of treatments used in the phytotoxicity trials. Treatments were applied to all five species at 2- and 4-weeks post-transplant.

Tr t	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	Serenade ASO	2	<i>Bacillus subtilis</i> QST 713	10 L/ha	10
4	Fytosave	2	COS-OGA	3.0 L/ha	3.0
5	Signum	2	<i>Bupirimate</i>	1.35 kg/ha	1.35
6	Amylo-X WG	2	<i>Bacillus</i> <i>amyloliquefaciens</i> D747	2.5 kg/ha	2.5
7	Romeo	2	cerevisane	0.75 kg/ha	0.75

None of the fungicides (*Serenade ASO*, *Fytosave*, *Signum*, *Amylo-X WG* or *Romeo*) assessed in this crop safety trial resulted in any detrimental effects on the five plant species (*Cosmos* ‘Xanthos’ lemon sherbet, *Dahlia* ‘Figaro’ violet shades, *Pansy* ‘Matrix’ spring select mix, *Petunia* ‘Express’ blue and *Verbena* ‘Quartz XP’ mix). 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 *Serenade ASO*,

Fytosave, Signum, Amylo-X WG and Romeo are crop safe on these varieties of *Pansy*, *Petunia*, *Verbena*, *Dahlia* and *Cosmos*.

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 and / or downy mildew by bedding and pot plant growers as part of a planned fungicide resistance prevention strategy; Fytosave is not classified (nc) by FRAC.

### Financial benefits

Fungicides are an essential crop protection input in the production of bedding and pot plants. Without effective methods for the prevention and control of *Powdery / Downy 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 / downy mildew. 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, a lack of cost-effective fungicides approved for use on protected ornamentals would reduce the range of plants that can currently 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 0.06p to 0.23p (**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)
Serenade ASO	10 L/ha	BM02	0.02 / ml	0.20
Fytosave	3.0 L/ha	NC	3.50 / ml	0.11
Signum	1.35 kg/ha	7 + 11	0.11 / ml	0.12
Amylo-X WG	2.5 kg/ha	BM02	0.08 / g	0.19
Romeo	0.75 kg/ha	P	0.08 / g	0.05

\* Serenade ASO and Amylo-X WG have the same FRAC code. NC = not classified.

## Action points

- Growers should note that Serenade ASO, Fytosave, Amylo-X WG and Romeo are protectant fungicides and will be most effective when used in spray programmes to prevent powdery / downy mildew. Signum has both preventative and systemic activity.
- 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 used in the control and prevention of powdery and / or downy mildew in spray programmes as part of an anti-fungicide resistance strategy. The mode of action of Fytosave is 'not classified'.
- Serenade ASO and Amylo-X WG 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.
- Speak to your BASIS qualified nursery adviser for confirmation of which products may be suitable for your target disease(s).