

Grower Summary

PO 019a

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

Objective 1. To extend the range of plants in flower available to growers for early spring marketing to include herbaceous perennials using minimal energy input

Annual Report 2019

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AHDB Horticulture is a Division of the Agriculture and Horticulture Development Board.

Project title: The Bedding and Pot Plant Centre – new product opportunities for bedding and pot plant growers.
Objective 1. To extend the range of plants in flower available to growers for early spring marketing to include herbaceous perennials using minimal energy input.

Project number: PO 019a

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Report: Annual report, 31 March 2019

Previous report: None

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Location of project: Baginton Nurseries, Coventry, Warwickshire
W D Smith and Sons, Battlesbridge, Essex

Industry Representative: Caroline Shove, Bryants Nurseries Ltd, Water Lane,
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Date project commenced: 1 April 2017

Date project completed (or expected completion date): 31 March 2019

Grower Summary

Headline

- To achieve flowering by week 14 and 16:
 - Apply heat from as late as mid-March for all of the species examined, except *Campanula persicifolia* 'Takion Blue' and *Gaura lindheimeri* 'Sparkle White'.
 - Apply heat from mid-January or mid-February to achieve flowering in week 14 in *C. persicifolia* 'Takion Blue'; from mid-February to achieve flowering in week 16.
 - *G. lindheimeri* 'Sparkle White' did not produce flowers by week 16.

Background

The Bedding and Pot Plant Centre (BPPC) has been established to address 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. Knowledge transfer events including trial open days and study tours are also included in the programme.

The work programme is guided by a grower-led Management Group that includes members of the BPOA Technical Committee, and representatives from Baginton Nurseries, Coventry the host nursery for the BPPC, and growers representing both the bedding and pot plant sectors.

This is the Bedding and Pot Plant Centre report for:

Objective 1: *To extend the range of plants in flower available to growers for early spring marketing to include herbaceous perennials using minimal energy input.*

Summary

Research over a number of years has confirmed that high early spring light levels in some areas of the US and continental Europe allow the successful forcing of a range of perennials and these can then be marketed as seasonal colour in a similar manner to traditional bedding and pot plants. Under UK conditions, however, many species do not produce a marketable product without additional supplementary light, and unless there are special circumstances potential improved returns don't compensate for the installation and running costs of lighting. However, a limited range of species may be suitable for low energy forcing under UK conditions and these have investigated in these trials.

There is an increasing trend, and interest among growers, to extend the herbaceous perennial season and product range so as to provide more flowering plants by early spring,

ready for impulse sales. The objective of this trial was to identify perennials that may be produced successfully under protection with minimal energy inputs, aiming to advance the natural marketing window. Six species were examined, applying heat from mid-January (Batch 1), mid-February (Batch 2) or mid-March (Batch 3), or maintaining frost protection only (Batch 4).

Seeds of six perennial species (*Campanula persicifolia* 'Takion Blue', *Gaura lindheimeri* 'Sparkle White', *Scabiosa japonica* var. *alpina* 'Ritz Blue', *Silene alpestris* 'Starry Dreams', *Arenaria montana* and *Geum coccineum* 'Koi') were sown into 104-cell trays in week 29 (21 July 2017) at Baginton Nurseries, Coventry and germinated at a minimum temperature of 15°C. Plants were transplanted (week 40) into black jumbo 6-packs and 1 L pots (Bulrush growing media, 15 mm peat, 25% Forest Gold, 2.5% clay + base fertiliser; Osmocote Exact High K, 5-6 m @ 2.5 g/L) and maintained under glass within the propagation area for two weeks to enable the plants to bulk up, and then moved into a polytunnel with frost protection (2°C, vent 4°C) in week 42 to provide a cold period. Plants were transferred to W.D. Smith & Sons (Battlesbridge, Essex) in week 50, where they were maintained under unheated glass with frost protection until treatments were applied. Plants were moved into heated glass (12°C, vent 15°C) in three batches (Batches 1-3), in weeks 2, 6 and 10, 2018, with Batch 4 remaining in unheated glass with frost protection only (2°C, vent 4°C) throughout the trial. Each plant species was represented within each batch, and half of each were available for plant growth regulator treatments; PGRs were applied as required to control stretch (**Table 1**).

Plants were monitored throughout the winter and assessed for number in flower, quality and height in weeks 14 and 16.

Table 1. Plant growth regulator application dates and dose rates

Treatment	Species	PGR	22/01/2018	20/02/2018
1	<i>Campanula persicifolia</i> 'Takion Blue'	Yes	Daminozide* 5 g/L	Daminozide* 5 g/L
2		No	-	-
3	<i>Gaura lindheimeri</i> 'Sparkle White'	Yes	Daminozide* 5 g/L	-
4		No	-	-
5	<i>Scabiosa japonica</i> var. <i>alpina</i> 'Ritz Blue'	Yes	Daminozide* 5 g/L	-
6		No	-	-
7	<i>Silene alpestris</i> 'Starry Dreams'	Yes	-	-
8		No	-	-
9	<i>Arenaria montana</i>	Yes	Paclobutrazol** 3 ml/L	Paclobutrazol** 3 ml/L
10		No	-	-
11	<i>Geum coccineum</i> 'Koi'	Yes	Daminozide* 5 g/L	-
12		No	-	-

* Daminozide as Dazide Enhance. **Paclobutrazol as Bonzi.

Batches of the species included in this trial that achieved flowering by weeks 14 and 16, with and without PGR application are summarised in **Table 2**.

Table 2. Summary effect of four heat treatments* (batches 1 to 4) with fully open flowers, with and without PGR application at the interim (week 14, 03/04/18) and final assessments (week 16, 18/04/2018)

Species	Week 14		Week 16	
	+ PGR	- PGR	+ PGR	- PGR
<i>Campanula persicifolia</i> 'Takion Blue'	0	1	1-2	1-2
<i>Gaura lindheimeri</i> 'Sparkle White'	0	0	0	0
<i>Scabiosa japonica</i> var. <i>alpina</i> 'Ritz Blue'	1-3	1-3	1-4	1-4
<i>Silene alpestris</i> 'Starry Dreams'	1-4	1-4	1-4	1-4
<i>Arenaria montana</i>	1-3	1-3	1-4	1-4
<i>Geum coccineum</i> 'Koi'	1-4	1-4	1-4	1-4

*Treatments: heating applied from week 2 (batch 1), week 6 (batch 2), week 10 (batch 3) or not at all (batch 4).

Campanula persicifolia 'Takion Blue' did produce flowers by week 14. PGR application was required to control plant height and prevent stretch, but caused some delay to flowering.

Gaura lindheimeri 'Sparkle White' did not achieve flowering by week 16 using the early heating regimes. However, buds were present in all batches, and there was potential to market the plants early although 'green'.

Scabiosa japonica var. *alpina* 'Ritz Blue' started to produce flowers as early as week 10, and flowers were present in all batches by week 14. However, plants would benefit from earlier sowing or provision of more warmth post-transplant to achieve bulkier plants.

Silene alpestris 'Starry Dreams' did produce flowers by weeks 14 and 16, with the first flowers present from week 2, in Batches 1-3, and with adjustments to scheduling such as earlier sowing or more heat prior to the cold period, bulkier plants could be produced that would be marketable earlier. However, tip burn developed in all treatments and whilst attractive, the plants were not considered to have the necessary impact to capture the attention of consumers.

Arenaria montana was in flower from week 10. However, it proved to be a very vigorous species, and growth was not sufficiently controlled with two applications of paclobutrazol (3 ml/L). Marketable plants may be produced for week 14 through adjustments to scheduling, for example lower temperature combined with earlier PGR application.

Geum coccineum 'Koi' produced flowers by week 10, and would have been marketable at this time had they bulked up sufficiently to achieve pot cover by this time. This variety flowers on relatively short stems, and did not require PGR application. However, the *Geum* did appear to attract aphids, therefore growers will need to monitor crops closely.

Conclusions

The premise of this work was to produce plants in flower with minimal energy input such as heat and light. Many plants have critical vernalisation and photoperiod requirements to induce flowering, and such information is available for some but not all perennial species. Long day plants requiring >12 hour days are more likely to require supplementary, photoperiodic or night break lighting to induce flowering under short day conditions. Of the species examined here, it is known that *Campanula persicifolia* 'Takion Blue' and *Geum coccineum* 'Koi' are day neutral (will flower under any day length); all other species have been determined to require long days to initiate flowering. Careful selection of species in consideration of their requirements will enhance the prospects of achieving early spring flowering with minimal energy input.

The *Silene alpestris* 'Starry Dreams', *Scabiosa japonica* var. *alpina* 'Ritz Blue' and *Geum coccineum* 'Koi' require some attention to scheduling to bulk up plants for early marketing; for *Geum* in particular it would be possible to produce good quality plants for marketing earlier than week 14. This could include, for example, earlier seed sowing or allowing a longer period under heat prior to the cold period. Conversely, *Arenaria montana* was too vigorous for production under the parameters of this trial, and growth would need to be reduced through a combination of adjustments to scheduling and production temperature. *Gaura lindheimeri* 'Sparkle White' did not produce flowers by week 16, however plants would have been marketable 'green' prior to week 14. *Campanula persicifolia* 'Takion Blue' produced plants suitable for marketing by week 14 and 16, although PGRs were required to control growth and produce a consistent plant height.

- In summary, to achieve flowering by week 14 and 16:
 - Apply heat from as late as mid-March for all other species examined except *Campanula persicifolia* 'Takion Blue' and *Gaura lindheimeri* 'Sparkle White'.
 - Apply heat to 12°C from mid-January or mid-February to achieve flowering in week 14 in *C. persicifolia* 'Takion Blue'; from mid-February to achieve flowering in week 16.
 - *G. lindheimeri* 'Sparkle White' did not produce flowers by week 16, but was marketable 'in the green'.

Action points

- If there are opportunities for early impulse sales of flowering plant material, five of the six species examined may be brought into flower by weeks 14 and 16 with additional heat.
- The scheduling used in this trial may be amended to improve marketability:

- Earlier sowing and a longer period of heat applied prior to the cold period would encourage bulking up in less vigorous species e.g. *Scabiosa japonica* var. *alpina* 'Ritz Blue', *Geum coccineum* 'Koi' and *Silene alpestris* 'Starry Dreams'.
- Trials should be carried out on different species and varieties on growers' own holdings prior to any large scale production.

Financial benefits

The objective of this trial was to advance flowering in a range of perennials to stimulate impulse purchases in early spring. This would increase sales opportunities during a marketing window traditionally filled with plants such as *Primula*, polyanthus, and *Viola*, and more recently with 'Senetti'. First marketed in Europe in 2001, 'Senetti' is a prime example of a new crop that has been brought to market that flowers at a time of year when there are fewer products available in flower and that now commands strong consumer demand each year. Whilst the overall value of UK 'Senetti' sales is not known, sales of 100,000 plants, with a trade price of around £2.00 - £2.50 per 2 L pot would generate a turnover of £250,000 – £300,000 where one did not previously exist.

It is estimated that for sales of perennials in flower in early spring, the trade price could be in the region of £1.00 - £1.25 (1 L pot), with sales of 100,000 plants generating £100,000 to £125,000. For comparison, perennials sold without flower may command £0.85 each, but demand would be less because of a lack of impact.