

Floral bedding trials at Wellington Botanic Garden ki Paekākā

Clare Shearman¹

Introduction

Wellington Botanic Garden isn't just a pretty place. We also conduct horticultural experiments to learn how plants grow under a variety of conditions.

We are in our third year of floral bedding trials and have been assessing plants for flower, foliage and pest and disease characteristics, along with their overall appearance, to establish a list of high performing plants for future bedding displays.

Our aim in the bedding trials at Wellington Botanic Garden is to identify plants with flowers that hold their colour, are long-lasting, do not require dead-heading, have good foliage coverage to assist with a low maintenance garden, and have pest and disease resistance to suit our chemical-free programme.

Methods

For these trials, we are using one of our large bedding display areas located in the main gardens. The trials border is 164 square metres in area and can hold up to 5,740 plants.

The trials area was selected as it is adjacent to the main display gardens, therefore has the same growing conditions as the bedding gardens that we use for our regular displays (Fig. 1).

These spaces were creatively designed to look similar to each other, so visitors seeing them together will not be able to distinguish between the trial bed and the regular display borders. We can create interesting displays for this 'front-of-house' space, along with creating awareness that not all plants behave themselves in Wellington's unique climate.

Plants were ranked on a scale of 1–5, following descriptions at each level for guidance (1 = looking terrible, 2 = looking poor, 3 = some imperfections, 4 = minor imperfections, 5 = looking perfect) and using four categories (flowers, foliage, pests and diseases, overall vigour).

For flowers we are seeking long lasting displays with no need for deadheading; for foliage we are looking for good colour, health and well-developed foliage; for pests and diseases we are seeking robust, healthy plants to fit in with our no-spray programme. The overall vigour and display of each plant selection was also appraised. Data were collected every two weeks and graphed at the end of the trials.

The trials reported in this article were conducted during the 2019–20 and 2020–21 summer seasons.

2019–20 summer bedding trials

For the summer of 2019–20 our design was to plant in circles (Fig. 2), using 17 different selections:

- *Ageratum houstonianum* (flossflower)
- *Begonia cucullata* (syn. *B. semperflorens*): pink, red and white flowered seed mixes
- *Cosmos bipinnatus* (garden cosmos): burgundy flowers
- *Dianthus barbatus* (sweet William)
- *Heliotropium arborescens* (cherry pie)
- *Lobularia maritima* (sweet alyssum)
- *Pelargonium* (geranium): pink and red flowered seed mixes
- *Pericallis* × *hybrida* 'Cineraria Satellite Mixed' seed mix
- *Petroselinum crispum* (leaf parsley; Fig. 3)
- *Petunia* × *hybrida* (*P.* × *atkinsiana*) Multiflora Dreams Midnight Blue F1 Hybrid
- *Petunia* × *hybrida* (*P.* × *atkinsiana*) Multiflora Dreams Red F1 Hybrid
- *Petunia* × *hybrida* (*P.* × *atkinsiana*) Multiflora Evening Scentsation F1 Hybrid
- *Salvia farinacea* 'Cirrus White'
- *Salvia farinacea* 'Victoria Blue' (Fig. 4).

Eight assessments were made in the first season of these trials due to COVID-19 restrictions.

2020–21 summer bedding trials

For summer 2020–21, our planting design changed to create a random display inspired by Piet Oudolf², using equal square meterage therefore allowing the same number of plants of each selection across the trials bed (Fig. 5). Seven plant selections were used for these trials:



Fig. 1 Floral display gardens at Wellington Botanic Garden. Trials border and display borders are indicated by arrows. Photo: Wellington Botanic Garden.

¹ Wellington Botanic Garden ki Paekākā, 101 Glenmore St, Kelburn, Wellington 6012, New Zealand; clare.shearman@wcc.govt.nz

² Piet Oudolf is a Dutch garden designer and leading figure of the "New Perennial" movement. His designs and plant compositions use bold drifts of herbaceous perennials and grasses.



Fig. 2 2019–20 trials bed, showing selections planted in circles. This bed was photographed mid-January, the peak time for floral displays at Wellington Botanic Garden.

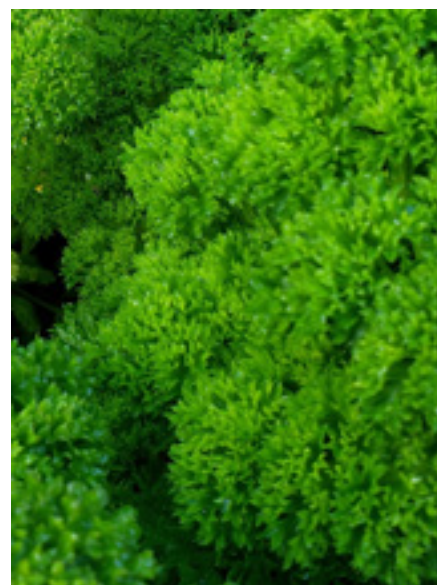


Fig. 3 *Petroselinum crispum* (leaf parsley).



Fig. 4 *Salvia farinacea* 'Victoria Blue'.



Fig. 5 2020–21 trials bed, showing selections planted following an equal square meterage. This bed was photographed mid-January, the peak time for floral displays at Wellington Botanic Garden.

- *Cosmos bipinnatus* 'Sonata White' (Fig. 6)
- *Oenothera lindheimeri* (syn. *Gaura lindheimeri*) (Fig. 7)
- *Petroselinum crispum* (leaf parsley)
- *Pyrethrum* 'Golden Moss' (Fig. 8)
- *Salvia splendens* 'Sizzler Purple' (Fig. 9)
- *Tagetes patula* 'Bonanza Bright Yellow' (Fig. 10)
- *Tagetes patula* 'Durango Flame' (Fig. 11).

17 assessments were made during summer 2020–21.

Petroselinum crispum (leaf parsley)³, and a different selection of *Cosmos bipinnatus* (garden cosmos) were trialled for each season; otherwise, different species were chosen for each trial.

Results

The results from the 2019–20 and 2020–21 trials are presented as individual bar graphs (Fig. 12–13). Results from both seasons are summarised in Table 1.

In the 2019–20 trials (Fig. 12), top ratings for flowers and foliage were the *Begonia cucullata* seed mixes (pink, red and white), and top rating for pest and disease resistance was *Petroselinum crispum*. *Pericallis × hybrida* 'Cineraria Satellite Mixed' scored lowest for all parameters (flowers, foliage, pest and disease resistance, and overall vigour).

In the 2020–21 trials (Fig. 13), the top rating for flowers and foliage was *Oenothera lindheimeri*, and six of the seven selections received high ratings for pest and disease resistance. *Salvia splendens* 'Sizzler Purple' scored lowest for foliage, pest and disease resistance, and overall vigour.

When considering the summary results (Table 1), percent scores of related selections grouped closely together (i.e., three selections of *Begonia cucullata*, two of *Salvia farinacea* and *Tagetes*, and three of *Petunia*), except for *Petroselinum crispum* and the two selections of *Cosmos* (the cultivar *C. bipinnatus* 'Sonata White' with a 75% score compared to burgundy flowered *C. bipinnatus* with 42%).

³ Leaf parsley has dark foliage that contrasts well with other species in flower. Because leaf parsley is not grown for its flowers, it was not scored for this feature during the trials.



Fig. 6 *Cosmos bipinnatus* 'Sonata White'.



Fig. 9 *Salvia splendens* 'Sizzler Purple'.



Fig. 7 *Oenothera lindheimeri* (Lindheimer's beeblossom).



Fig. 10 *Tagetes patula* 'Bonanza Bright Yellow'.



Fig. 8 *Pyrethrum* 'Golden Moss'.



Fig. 11 *Tagetes patula* 'Durango Flame'.

Table 1 Summary of results for all 24 selections grown in the Wellington Botanic Garden summer bedding trials, 2019–20 and 2020–21.

Plant Name	% score
<i>Begonia cucullata</i> Pink	99%
<i>Begonia cucullata</i> Red	99%
<i>Begonia cucullata</i> White	99%
<i>Petroselinum crispum</i> (2019–20)	94%
<i>Salvia farinacea</i> 'Cirrus White'	94%
<i>Salvia farinacea</i> 'Victoria Blue'	92%
<i>Heliotropium arborescens</i>	91%
<i>Oenothera lindheimeri</i>	91%
<i>Pelargonium</i> Pink	86%
<i>Petroselinum crispum</i> (2020–21)	84%
<i>Dianthus barbatus</i>	83%
<i>Pelargonium</i> Red	83%
<i>Tagetes patula</i> 'Bonanza Bright Yellow'	81%
<i>Tagetes patula</i> 'Durango Flame'	81%
<i>Cosmos bipinnatus</i> 'Sonata White'	75%
<i>Lobularia maritima</i>	72%
<i>Pyrethrum</i> 'Golden Moss'	70%
<i>Petunia</i> 'Dreams Midnight Blue'	69%
<i>Petunia</i> 'Dreams Red F1 Hybrid'	66%
<i>Petunia</i> 'Evening Scentsation'	65%
<i>Salvia splendens</i> 'Sizzler Purple'	63%
<i>Ageratum houstonianum</i>	59%
<i>Cosmos bipinnatus</i> burgundy flowers	42%
<i>Pericallis</i> 'Cineraria Satellite Mixed'	10%

Conclusions

Star performers of the 2019–20 trials were *Petroselinum crispum* and selections of *Begonia cucullata* and *Salvia farinacea*. Overall star performer of the 2020–21 trial was *Oenothera lindheimeri*. The overall worst performer, by a considerable margin, was *Pericallis × hybrida* 'Cineraria Satellite Mixed'.

When taking into consideration what we require in the gardens, it isn't all about flowers. Some bedding plants do not flower and are great performers for a foliage backdrop to show off the displays well (such as leaf parsley), and we take this into account when we examine the results.

We have produced useful data from these trials which will enable us to create long-lasting, healthy displays in the future.

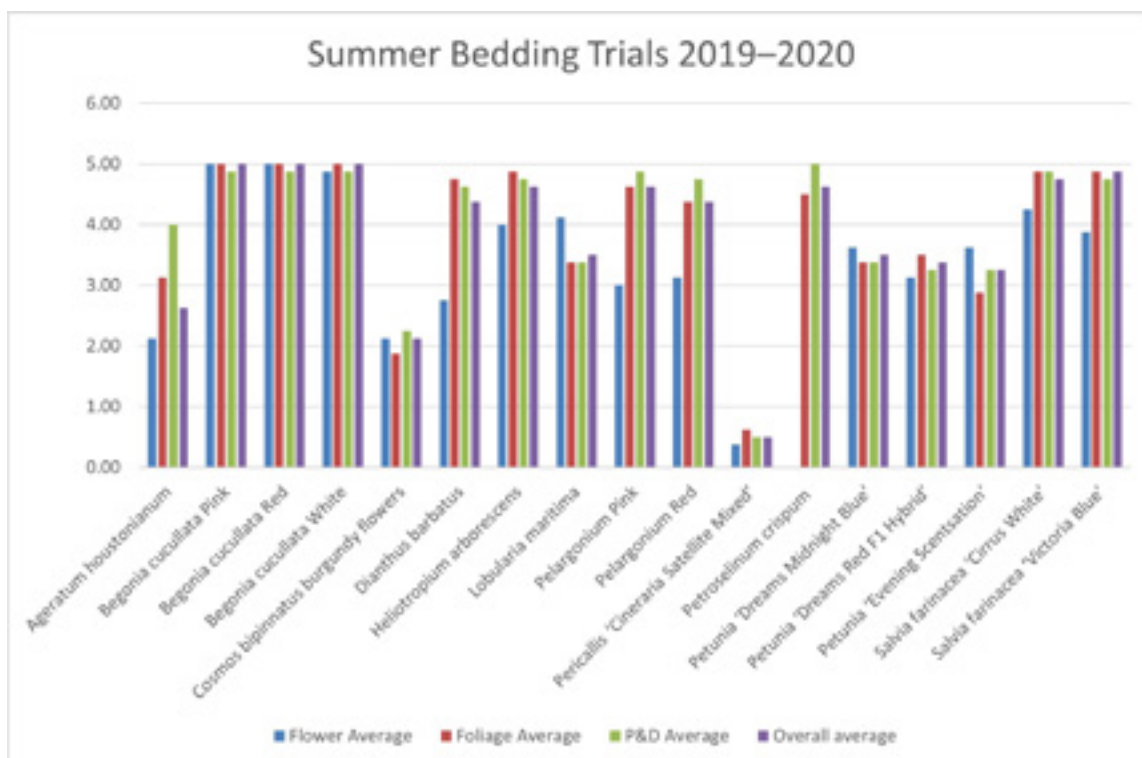


Fig. 12 Bar graph showing the results of the 2019–20 Wellington Botanic Garden bedding trials.

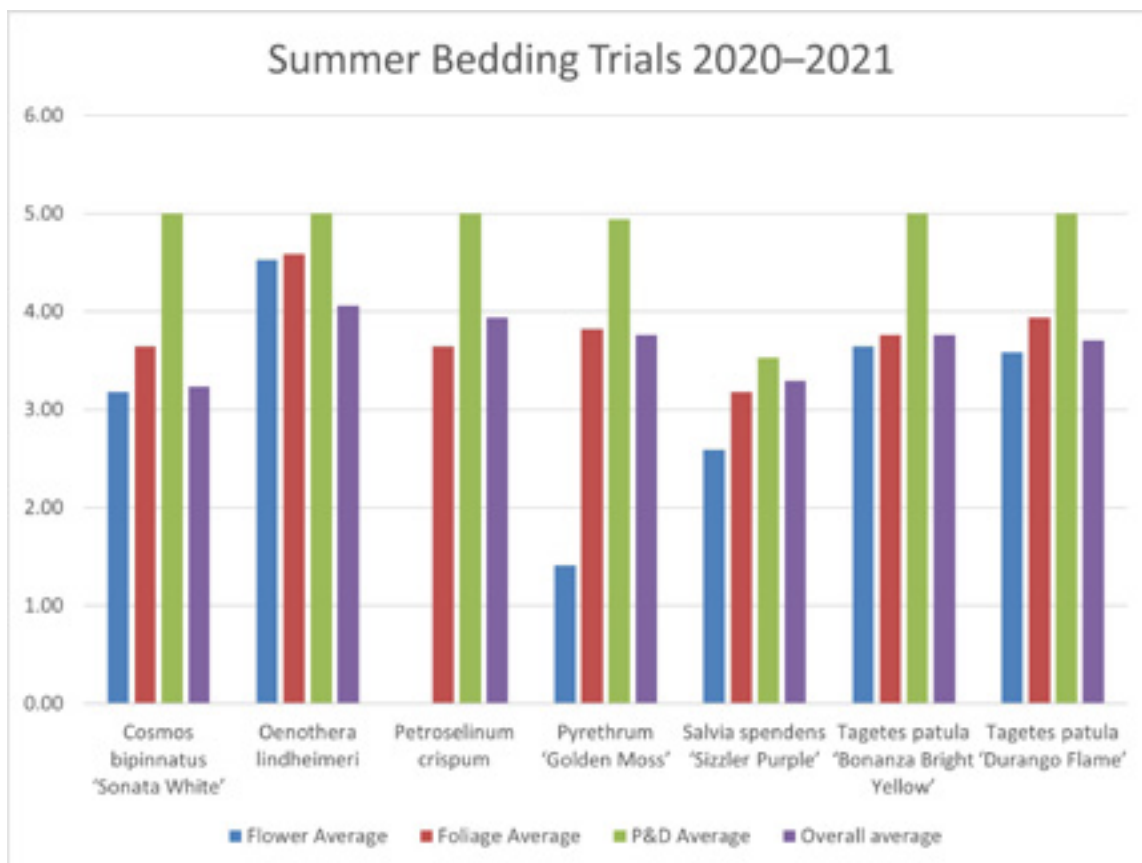


Fig. 13 Bar graph showing the results of the 2020–21 Wellington Botanic Garden bedding trials.

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