

Canna breeding at Auckland Botanic Gardens

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Background

Canna is the only genus in the family Cannaceae and comprises 11 or more species. Ornamental cultivars have been selected for their foliage and flowers. Although they have the common name 'canna lily', they are not true lilies. One species, *Canna indica* L. (Indian shot), is listed as an environmental weed in New Zealand.

Auckland Botanic Gardens cultivar collection

A large collection of *Canna* cultivars was collected and trialled at Auckland Botanic Gardens (ABG) in the early 1980s, with most selections sourced from a former canna lily nursery sited at Podgora garden in Waipu, Northland. Many became unhealthy with vein clearing and stunted growth. These symptoms were diagnosed by the late Joan Dingley (of the then Department of Scientific and Industrial Research) as primary signs of virus infection. Some cultivars also showed signs of bacterial soft rot (*Pectobacterium carotovorum*) which Dingley considered likely to be secondary to the virus infection. The eight most seriously affected cultivars were culled from the trial.

The remaining *Canna* collection was assessed by the ABG Perennial Evaluation Panel over several years, and the best performers were included in our display gardens and recommended in our Plant Advisory Leaflets.

Breeding programme

The primary objective of the *Canna* breeding programme at ABG was to produce virus-free cultivars. They also needed to meet the aesthetic and performance criteria applied by our evaluation panel if we were to display and ultimately release any cultivars into the marketplace. Criteria included flower and foliage quality, duration of flowering period, plant health and overall garden performance.

A selection of high-performing healthy cultivars from the original collection was initially chosen as seed parents. These exhibited a range of flower and foliage colours and plant sizes, with the expectation this would result in offspring showing a similar diversity of attributes.

On 6th April 1987 seed from the following cultivars was collected and sown on 4th May 1987 in a heated greenhouse with timed lighting providing 16 hours light per day. The resulting seedlings were planted in trial beds in the ABG open ground nursery in early October 1987 (Table 1).

The following year, on 24th April 1988 Jack Hobbs collected 44 seeds of *Canna* 'Cupid'. These were chipped and sown on 17th May, with first germination on 23th May. A total of 11 seedlings germinated and these were planted in the trial ground on 13th October 1988.

In early 1988 pairs of cultivars with similar flower colour were selected to act as parent blocks with the objective of producing new virus free cultivars in the main colour range groups. On 16th June 1988, the following pairs of cultivars were planted in the Camellia Garden with sufficient distance allowed between each pair to minimise unwanted pollination:

- red flowered pair: *C.* 'America' and *C.* 'Assault'
- pink flowered pair: *C.* 'Cupid' and *C.* 'La Boheme'
- yellow flowered pair: *C.* 'Banner' and *C.* 'Felix Ragout'.

All cultivars produced seed except for *C.* 'America'.

Seed was collected on 8th May 1988 and sown on 26th May 1989, and the resultant seedlings planted out on 10th October 1989 (Table 2).

ABG cultivars

Seedlings that demonstrated desirable characteristics and high performance were initially given a code. Seedlings that did not reach the required standards were culled.

The Perennial Evaluation Panel recommended that volcanic cones of Auckland be applied as cultivar names to outstanding selections from the breeding programme. Table 3 shows the *Canna* that have been given cultivar names and made available to the market.

From 2017–2020, ABG trialled a number of new *Canna* cultivars bred elsewhere and available on the market, alongside the ABG bred selections as a comparison. Each *Canna* was given an overall rating according to ABG star performer criteria (1 = poor performer to 10 = excellent performer). Cultivars that scored 8 or more were considered top performers and are recommended for Auckland based on the results of this trial. Overall rating took into consideration flowering period, quality of flowers, absence of pests and diseases, habit, and vigour. The ratings for ABG bred cultivars are included in Table 3. Two cultivars bred at ABG (*Canna* 'Albert' and *C.* 'Cecilia') were not given ratings because they were not in the trial or other plant collections at the time of the trial.

Divisions of all the above cultivars except *C.* 'Hampton' were originally given to Bruce Haggio of Dawn Rothay Nurseries on 4th April 1990. Dawn Rothay was a wholesale nursery in Whenuapai who made these cultivars available to landscapers and retailers.

Canna 'Hampton' was named in 2019. Emma Bodley chose the name and plants have recently been made available to the market.

Canna 'Gabriel' has been awarded the highest rating in trials at ABG (Table 3) and is promoted as a Star Performer.

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Table 1 Summary information of *Canna* seedlings from cultivars planted in 1987.

Name of seed parent	Flower colour of seed parent	Foliage colour of seed parent	Number of seedlings planted
C. 'Assault'	Red	Bronze	1
C. 'Banner'	Yellow	Green	37
C. 'Cupid'	Pink	Green	0 (no germination)
C. 'Madame Butterfly'	Pink	Green	10
C. 'Orange King'	Orange	Green	22
C. 'Perkeo'	Rose	Green	56
C. 'Professor Went'	Red	Bronze	7

Table 2 Summary of *Canna* seedlings planted in 1989.

Name of seed parent	Flower colour of seed parent	Foliage colour of seed parent	Number of seedlings planted
C. 'Assault'	Red	Bronze	12
C. 'Banner'	Yellow	Green	29
C. 'Cupid'	Pink	Green	11
C. 'Felix Ragout'	Yellow	Green	24
C. 'La Boheme'	Coral pink	Green	17
C. "number 8"	Salmon rose	Bronze	1

Note: *Canna* "number 8" was a coded selection from the sowing made in 1987.

Table 3 Named *Canna* cultivars with their original code in parenthesis from Auckland Botanic Gardens and overall rating.

Name of <i>Canna</i> cultivar	Flower colour	Foliage colour	Height (m)	Overall rating
C. 'Albert' (7) (Fig. 1)	Yellow	Green	1.4	n/a
C. 'Cecilia' (18)	Pink	Green	0.5	n/a
C. 'Gabriel' (28) (Fig. 2)	Coral pink	Green	1.4	8
C. 'Hampton' (26) (Fig. 3)	Lemon	Green	1.2	7
C. 'Rangitoto' (10) (Fig. 4)	Red	Green	1.5	7
C. 'Richmond' (8)	Salmon	Bronze	1.4	7
C. 'Victoria' (3) (Fig. 5)	Rose	Bronze	1.8	6



Fig. 1 *Canna* 'Albert'. Photo: Jack Hobbs.



Fig. 2 *Canna* 'Gabriel'. Photo: Jack Hobbs.



Fig. 3 *Canna* 'Hampton'. Photo: Jack Hobbs.



Fig. 4 *Canna* 'Rangitoto'. Photo: Emma Bodley.



Fig. 5 *Canna* 'Victoria'. Photo: Emma Bodley.