

Auckland Botanic Gardens

Hemerocallis rust trial

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Introduction

Hemerocallis, or daylilies, are an early to late summer flowering perennial. They are a popular garden plant that used to be considered relatively pest and disease free in New Zealand but now suffers from severe rust.

Hemerocallis rust (Fig. 1) is a relatively new disease to New Zealand which is caused by a fungus, *Puccinia hemerocallidis*, that spreads rapidly and causes yellow pustules on the underside of the leaves which spreads over the entire leaves (Mueller et al., 2003). Daylily rust is spread through spores and these require relatively warm temperatures and high humidity – which are typical of Auckland conditions.



Fig. 1 Pustules (uredinia) of *Puccinia hemerocallidis* on daylily foliage.
Photo: James Buck.

Puccinia hemerocallidis was first reported in New Zealand, from Auckland, in November 2011 and was collected in the Bay of Plenty in 2013 (PDD fungal collection records). Among other countries, it was recorded in Australia in 2002, the USA in 2000 (by 2002 *Hemerocallis* rust was found in more than 24 American states) and Brazil in 2001 (Mueller et al., 2003; Smith, 2009; Inokuti et al., 2012).

We aimed to identify top performing *Hemerocallis* in Auckland which are rust resistant in order to recommend

the best cultivars for Auckland gardens. Results of this trial may be applicable to other regions of New Zealand and will also help inform future breeding programmes by identifying those cultivars that are most rust resistant.

Methods

Three plants of each of 55 cultivars (Table 1) were planted in December 2009 in Auckland Botanic Gardens (ABG) trial beds. Plants were evaluated for five years in the trial then removed in early 2015. Over this time, plants were regularly assessed on their flowering period, flower colour, habit/form, plant vigour, amount of rust present on foliage, and overall performance. Each cultivar was given an overall rating based on both pest and disease observations, including insect and rust damage at ABG. The overall rating (1 = poor performer and 10 = excellent performer) was used to determine the list of top performers. Cultivars that scored 8 or more were considered top performers and would be recommended based on the results of these trials (Table 2).

Soils in Auckland are mostly clay, therefore the trial beds had compost and mulch applied to improve soil conditions. Fertiliser was applied at the time of planting. Plants were pruned to ground level once a year in autumn. Plants were watered infrequently and only when required in summer.

Results and conclusions

Table 2 shows the list of cultivars that are considered top performers in Auckland conditions, are relatively rust resistant and include both evergreen and deciduous cultivars. It is important to note that depending on local environments some cultivars will vary on their deciduous or evergreen characteristics. All cultivars listed as top performers (Table 2) scored an 8 or higher in our evaluations.

Hemerocallis 'Chicago Apache' is rust resistant compared to other cultivars in the trial scoring lower than 8, which agrees with laboratory experiments conducted in the USA by Mueller et al. (2003).

Table 1 List of all 55 *Hemerocallis* cultivars in rust trial.

<i>H.</i> 'Baby Betsy'	<i>H.</i> 'Kent's Favourite'	<i>H.</i> 'Pandora's Box'
<i>H.</i> 'Bashful Belle'	<i>H.</i> 'King Lamoni'	<i>H.</i> 'Pixie Parasol'
<i>H.</i> 'Betty Woods'	<i>H.</i> 'Lady Mischief'	<i>H.</i> 'Pony Ride'
<i>H.</i> 'Blythe Belle'	<i>H.</i> 'Little Fat Dazzler'	<i>H.</i> 'Prairie Blue Eyes'
<i>H.</i> 'Cade Stewart'	<i>H.</i> 'Little Favourite'	<i>H.</i> 'Rose Cherub'
<i>H.</i> 'Cane Fire'	<i>H.</i> 'Little Grapette'	<i>H.</i> 'Rose Emily'
<i>H.</i> 'Cherry Smoke'	<i>H.</i> 'Little Gypsy Vagabond'	<i>H.</i> 'Seeing Red'
<i>H.</i> 'Chicago Apache'	<i>H.</i> 'Little Monica'	<i>H.</i> 'Sir Galahad'
<i>H.</i> 'Crimson Icon'	<i>H.</i> 'Little Mutt'	<i>H.</i> 'Slade Brown'
<i>H.</i> 'Dancing Dwarf'	<i>H.</i> 'Little Showoff'	<i>H.</i> 'Sorcerer's Song'
<i>H.</i> 'Daring Deception'	<i>H.</i> 'Little Topsy'	<i>H.</i> 'Squeaky'
<i>H.</i> 'Dark Elf'	<i>H.</i> 'Little Zinger'	<i>H.</i> 'Stella Bella'
<i>H.</i> 'Double Cameo'	<i>H.</i> 'Littlest Angel'	<i>H.</i> 'Stella d'Oro'
<i>H.</i> 'Double Cutie'	<i>H.</i> 'Lullaby Baby'	<i>H.</i> 'Streaker'
<i>H.</i> 'Elsie Spalding'	<i>H.</i> 'Mellow Yellow'	<i>H.</i> 'Tiny Pumpkin'
<i>H.</i> 'Elves' Wine'	<i>H.</i> 'Mini Pearl'	<i>H.</i> 'Velvet Shadows'
<i>H.</i> 'In Excess'	<i>H.</i> 'Moon Goddess'	<i>H.</i> 'Wild Enchantress'
<i>H.</i> 'Jeune Rose'	<i>H.</i> 'Moonlight Mist'	<i>H.</i> 'Wildflower Tango'
<i>H.</i> 'Jeune Tom'		

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Table 2 The top 12 performers in ABG rust trial, having an overall score of 8 or more.

<i>Hemerocallis</i> cultivar	Flower colour	Habit/form	Pests	Disease	Overall rating
<i>H.</i> 'Baby Betsy'	Pink with yellow eye	Miniature Deciduous	Clean	Clean	8
<i>H.</i> 'Cade Stewart' (Fig. 2)	Red	Large Evergreen	Clean	Rust on older foliage	8
<i>H.</i> 'Chicago Apache' (Fig. 3)	Red/pink	Tidy Evergreen	Clean	Clean	9
<i>H.</i> 'Dancing Dwarf' (Fig. 4)	Red	Miniature Deciduous	Very clean	Very clean	8
<i>H.</i> 'Little Grapette' (Fig. 5)	Red-purple	Tidy Deciduous	Clean	Clean	9
<i>H.</i> 'Lullaby Baby'	Pale peach	Large clump Deciduous	Clean	Clean	8
<i>H.</i> 'Mini Pearl' (Fig. 6)	Peach	Dwarf Deciduous	Clean	Clean	10
<i>H.</i> 'Moon Goddess' (Fig. 7)	Yellow	Deciduous	Clean	Clean	8
<i>H.</i> 'Pandora's Box' (Fig. 8)	Peach with red eye	Tidy foliage Deciduous	Clean	Clean	8
<i>H.</i> 'Rose Emily' (Fig. 9)	Grey-red	Uniform Deciduous	Clean	Clean	9
<i>H.</i> 'Squeaky' (Fig. 10)	Yellow-orange	Dwarf Semi-evergreen	Clean	Clean	10
<i>H.</i> 'Stella d'Oro' (Fig. 11)	Yellow	Compact Deciduous	Clean	Clean	8



Fig. 6 *Hemerocallis* 'Mini Pearl'. Photo: Jack Hobbs.



Fig. 7 *Hemerocallis* 'Moon Goddess'. Photo: Jack Hobbs.



Fig. 2 *Hemerocallis* 'Cade Stewart'. Photo: Jack Hobbs.



Fig. 4 *Hemerocallis* 'Dancing Dwarf'. Photo: Jack Hobbs.



Fig. 3 *Hemerocallis* 'Chicago Apache'. Photo: Jack Hobbs.



Fig. 5 *Hemerocallis* 'Little Grapette'. Photo: Jack Hobbs.



Fig. 8 *Hemerocallis* 'Pandora's Box'. Photo: Jack Hobbs.



Fig. 9 *Hemerocallis* 'Rose Emily'.
Photo: Jack Hobbs.

Hemerocallis 'Mini Pearl' was one of the top performers in the ABG trial; however Mueller et al. (2003) only found it moderately resistant in the laboratory.

We found *Hemerocallis* 'Little Grapette' to be a good performer in Auckland conditions, unlike in the United States where it showed susceptibility to rust (Mueller et al., 2003).

Hemerocallis 'Cade Stewart' was also a top performer, however, it should be noted that its old foliage is susceptible to rust and therefore should be removed.

We recommend an annual cut back to ground level in autumn of the top performers (Table 2) to keep them looking their best. All cultivars have numerous flowers and many have good repeat flowering. *Hemerocallis* 'Mini Pearl' has fragrant flowers.

Although we tested 55 commercially available *Hemerocallis* cultivars, at least 1000 more selections have been cultivated in New Zealand (e.g., Gaddum, 2001), demonstrating the



Fig. 10 *Hemerocallis* 'Squeaky'.
Photo: Jack Hobbs.

popularity of this plant. Our trials should help ensure that some daylily selections can continue to be grown by gardeners with relative ease.

The results of this trial have informed our daylily parent selections in a breeding programme at ABG. Our breeding is aimed at producing an evergreen, rust resistant daylily.

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Fig. 11 *Hemerocallis* 'Stella d'Oro'.
Photo: Jack Hobbs.

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