

The potential effect of flower shape on pollination success in blueberry

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Could the shape or morphology of a flower be important to the attraction of a bee to that flower? To dig a little deeper, we are investigating some floral traits that may affect the attraction of European honey bees (*Apis mellifera*) to blueberry flowers. under controlled environmental conditions by Staphyt Ltd in Queensland.

Previous research suggests that blueberry flowers with a large opening, or throat area, can provide greater access to the nectar found at the base of the flower. However, this trait and its 'attractiveness' has not been examined among the varieties used in Australia. And, if influential in pollination, varieties with more 'attractive' flowers could be developed for utilising under high tunnels where honey bees are less inclined to visit and where poor pollination is a problem.

The first step in our investigation, reported here, examined the floral morphology of seven blueberry varieties with a view to selecting two varieties with contrasting flowers to test in the field for their attractiveness to honey bees.

The flowers of the seven blueberry varieties Dazzle, 11-11, Eureka, Eureka Sunrise, First Blush, Masena and Splash, were obtained from plants growing in the same location on the North Coast of NSW. They were picked fresh and preserved in alcohol until they were examined.

We observed the variability of flower shape using methods in microscopy including photographs of the magnified flowers and imaging software to measure the corolla (the group of petals) width and length and the corolla throat area (Figure 1).

Taking a close look at the corolla length and corolla throat area shows that Eureka has the longest flower with the largest opening, and therefore the greatest contrast in floral morphology compared with all the other varieties (Figure 2). However, the corolla width was relatively similar among these varieties.

As the varieties Eureka and Masena contrast greatly in their flower shape, and since they are co-planted in the field for cross-pollination purposes, these varieties will be compared in their ability to attract bees in a commercial crop. This next stage of our research will commence soon with data to be collected over several days in late winter, when these varieties are flowering at their peak.

Observations of honey bee visits will be made alongside the measurements of other traits including the sugar concentration of flower nectar, important to honey bees, and also fruit set, an index of pollination success.

We look forward to reporting on these observations in the next instalment of our work.

Figure 1. Images of flower racemes (column 2), corolla width and length (column 3), corolla throat area (column 4). Magnification is 30 – 35x. Figure credit: Leanne Davis, NSW DPI

Variety	Flower Racemes	Corolla Width/Length	Corolla Throat Area
DAZZLE			
11-11			
EUREKA			
EUREKA SUNRISE			
FIRST BLUSH			
MASENA			
SPLASH			

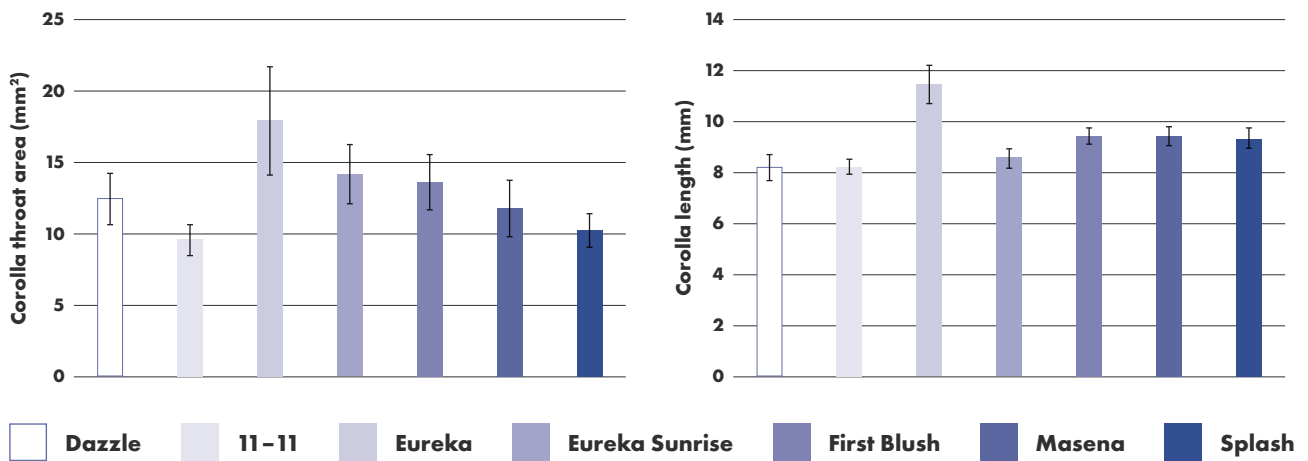


Figure 2. Corolla throat area (left) and corolla length (right) for seven blueberry varieties.
 The columns represent the average of the measurements of between 21-71 flowers and the bars are standard deviation.
 Chart Credit: Sophie Parks, NSW DPI

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