

Supplemental Material: The impact of floral diversity on bumble bee colony development, pollination efficacy, and fruit production in tomatoes

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Wax production across Year 1 & Year 2

METHODS – Year 1

In Year 1, we removed all of the excess wax covering the nest (brood and honey pots) before introducing it to the nest boxes. Though we checked the colony regularly to mark new workers, we did not remove the excess wax that bumble bees were using to cover the nest (brood and honey pots). Instead, we monitored excess wax production by photographing the nest from directly above the nest. In this way, we could compare the area of the nest covered in wax across treatments (Crall et al. 2018). However, leaving the wax on the nest also meant that we could not always see bees in the nest. As there were no clear effects of treatment on wax production from the images (Figure S1), we opted for a different method in Year 2 that would allow us to record bees in the nest more easily.

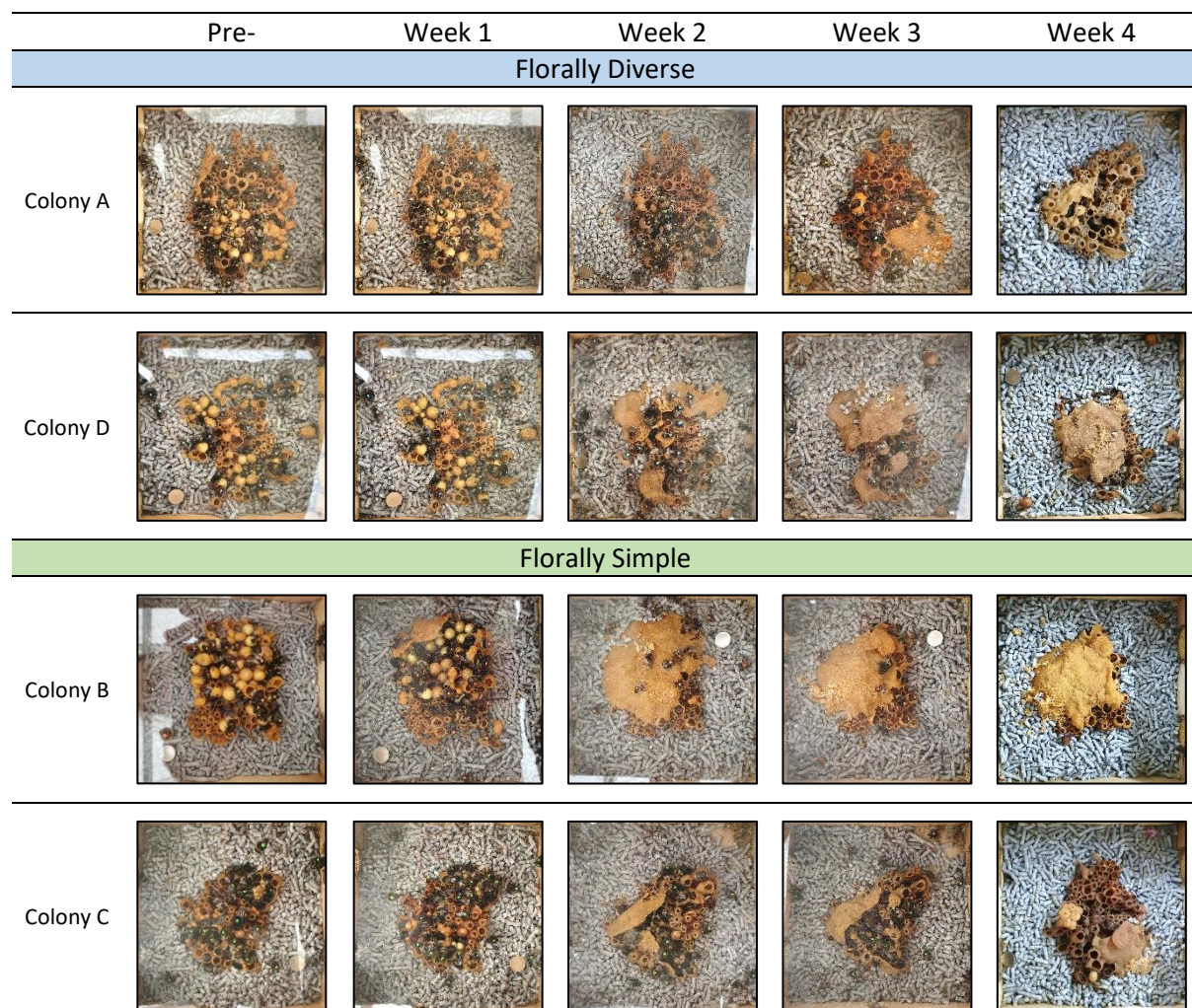


Figure S1. Images of each nest in Year 1 was taken above the nest. The first column shows the colony immediately after it was placed inside the glasshouse (23 Jan 2020). Subsequent images show the progression of nest development for the next four weeks. A clear solid piece of plexiglass was placed above the images for Pre- through Week 3. For Week 4, we took the photograph after all of the bees had been removed from the nest. All images are oriented so that the nest entrance would be located on the bottom of the picture.

METHODS – Year 2

In Year 2, we again removed all of the excess wax covering the nest (brood and honey pots) before introducing it to the nest boxes. Each week following this, we continued to remove excess wax that the colony had produced (Figure S2). This improved our ability to locate wasps inside the nest. The excess wax was weighed each week.



Figure S2. Example of nest before excess wax removal and after wax removal. Care was taken to minimize damage to brood and honey pot structures. Excess wax was removed once a week for all colonies.

RESULTS – Year 2

We found no evidence that bumble bees raised in diverse or simple environments produced a different amount of excess wax (GLMM: Trt $F_{1,5} = 0.05$; $P = 0.84$; Figure S3).

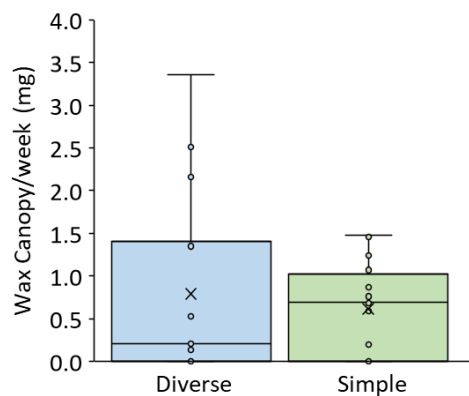


Figure S3. There was no difference in the amount of excess wax produced by bumble bees raised in florally diverse or florally simple colonies. Boxes represent medians (solid line) $\pm$ 25th percentile range, $\times$ represents the mean. Open circles represent individual data points.