



Environmental Effects on Nectar and Pollinators in Canola

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Flowers produce nectar as an attractant for pollinators. Typically, bees are attracted to flowers with higher nectar volume, or higher sugar concentration. Nectar provides the primary source of energy in the form of carbohydrates to adult bees, and for honey and bumble bees, is also the primary ingredient in honey. Canola doesn't require insect pollination but can see a nearly 40% increase in yield when insect pollinators are present. Seasonal climate shifts and drought conditions may reduce overall water availability to plants. Nectar is made mostly of water, so we were curious if reduced water availability would change the quantity or quality of nectar. We expected that plants in a drought scenario would produce a lower volume of nectar, and that the sugar concentration of the nectar available would be higher. We were also interested in bee communities at farms dependent on nectar traits. We conducted a greenhouse experiment where canola plants were grown with either full availability to water, or half availability to water. We then measured the amount and sugar concentration of nectar produced. We found that when plants had full access to water, plants produced significantly more flowers and the volume of nectar produced was significantly higher than the volume produced by plants with less water access. We found no significant differences in the sugar concentration, but we found that some plants did not produce a measurable volume of nectar when they were part of the reduced water scheme. We tested this in three different canola varieties and found that NCC 101S (variety B) produced more nectar overall than HyClass930 or Invigor L233P. In a field observation, we found variable communities of bees at canola fields producing differing quantities of nectar suggesting that nectar traits are not the sole attractor for pollinators.



Var A: HyClass 930

Var B: NCC 101S

Var C: Invigor L233P

In the 2019 field season, we plan to resample the pollinator communities, and we will also assess how landscape traits might affect pollinator populations using GIS methods.

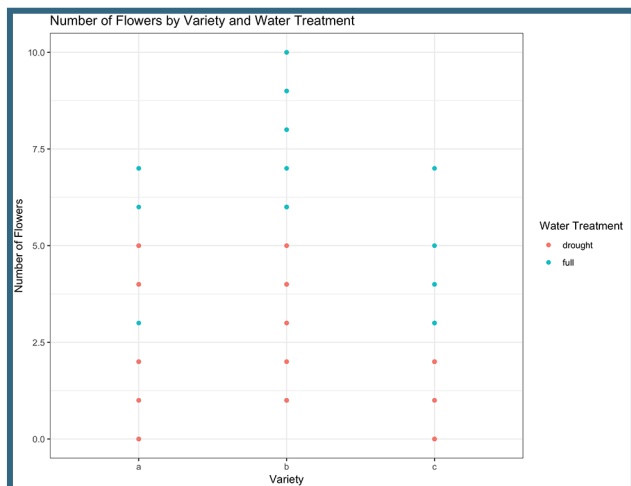


Figure 1. Number of flowers by variety and water treatment.

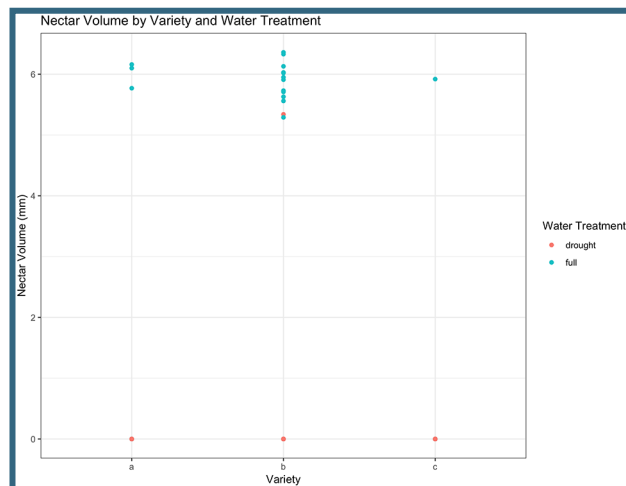


Figure 2. Nectar volume by variety and water treatment.