

(Please refer to Project Reporting Guidelines when completing this report)

Section 2: REPORT ON PROGRESS

SUMMARY OF PROJECT PROGRESS:

(Please provide a summary of the project activities and progress below)

Research activities so far

We have successfully completed two field seasons of data collection on this project. In 2019, 2e measured pollination deficits in the cranberry cultivars Stevens, Demoranville, Mullica at two sites: the cranberry research farm in Delta and a farm in Richmond. In 2020, we added farms in Chilliwack as a third study site, and included the cultivar Haines as an additional cultivar. During 2019, we measured pollen limitation by selecting 50 pairs of cranberry uprights per varietal per farm, but reduced this to 40 in 2020 based on our data from 2019, and to allow for the addition of more sites and cultivars. In both years, one of each pair was assigned to receive supplemental pollen by hand, while the other only received ambient pollination. The difference between treatment and control represents the pollination deficit - or the increase in yield that would be possible with maximum pollination service. We also measured pollinator visit rates and pollinator diversity in each cultivar during peak bloom by netting wild bees and counting honeybees.

Fieldwork was successfully completed by October in both years, when all treatment and control fruits were harvested. Fruit number, fruit weight and seed number data were collected during October and November of 2019. Fruit data collection and bumblebee ID is ongoing in 2020 due to delays in starting lab work due to COVID19. Because of this, data analysis of the fruit data is ongoing. However, a summary of the fruit data from 2019 is included below.

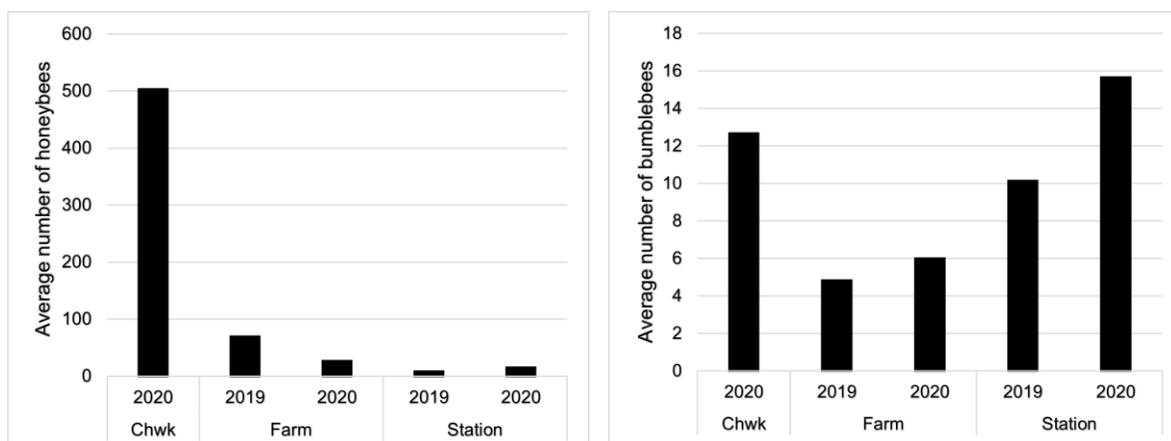
Preliminary results

1.0. pollinator visit patterns – 2019 and 2020

We documented substantial differences in the abundance of wild bumblebees vs honeybees at the research station, and the two farm locations, with variation occurring across years. Honeybees were much more abundant at both farms, particularly in Chilliwack in 2020, where the honeybee hives were

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very close to our sampling area. Bumblebees were slightly more common at the research station and in Chilliwack (Figure 2). This difference allows for interesting comparisons between sites as we continue analyzing the data.



2.0. Varietal variation in flower production and fruit set

Because collection of the 2020 fruit data has only just been completed, we can currently only present results from 2019. Cultivars varied significantly in the number of flowers produced and the number of fruits produced. This further varied between our study sites. All varieties produced between 3 and 5 flowers per stem, with Mullica producing on average the most, and Demoranville on average producing the least (Figure 2A). Both Mullica and Stevens produced more flowers at the farm site than the station, while Demoranville was the reverse (Figure 2B). Despite this difference in flower production, all varieties produced on average about 2 fruits per stem, with the exception of Stevens at the research station, which produced on average 1.5 fruits per upright (Figure 2C). Fruits per stem does not appear to be affected by our pollination treatments.

2.0. Varietal variation in fruit weight and seed number

Again, we can only present 2019 data. Seed number and fruit weight varied between varieties, and were impacted by our pollination treatments. Both treatment Stevens and Demoranville produced more seeds per fruit than control plants, while treatment Stevens had higher fruit weight than unpollinated control fruits (Figure 3). Both of these results suggest some degree of pollen limitation that may affect fruit quality, but not fruit number.

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Ongoing work

Counting and weighing of the 2020 fruit is complete – all that remains is to enter the data, complete the final analysis of the results. This will be complete by April of 2021.