

Blueberry Pollination: 2021

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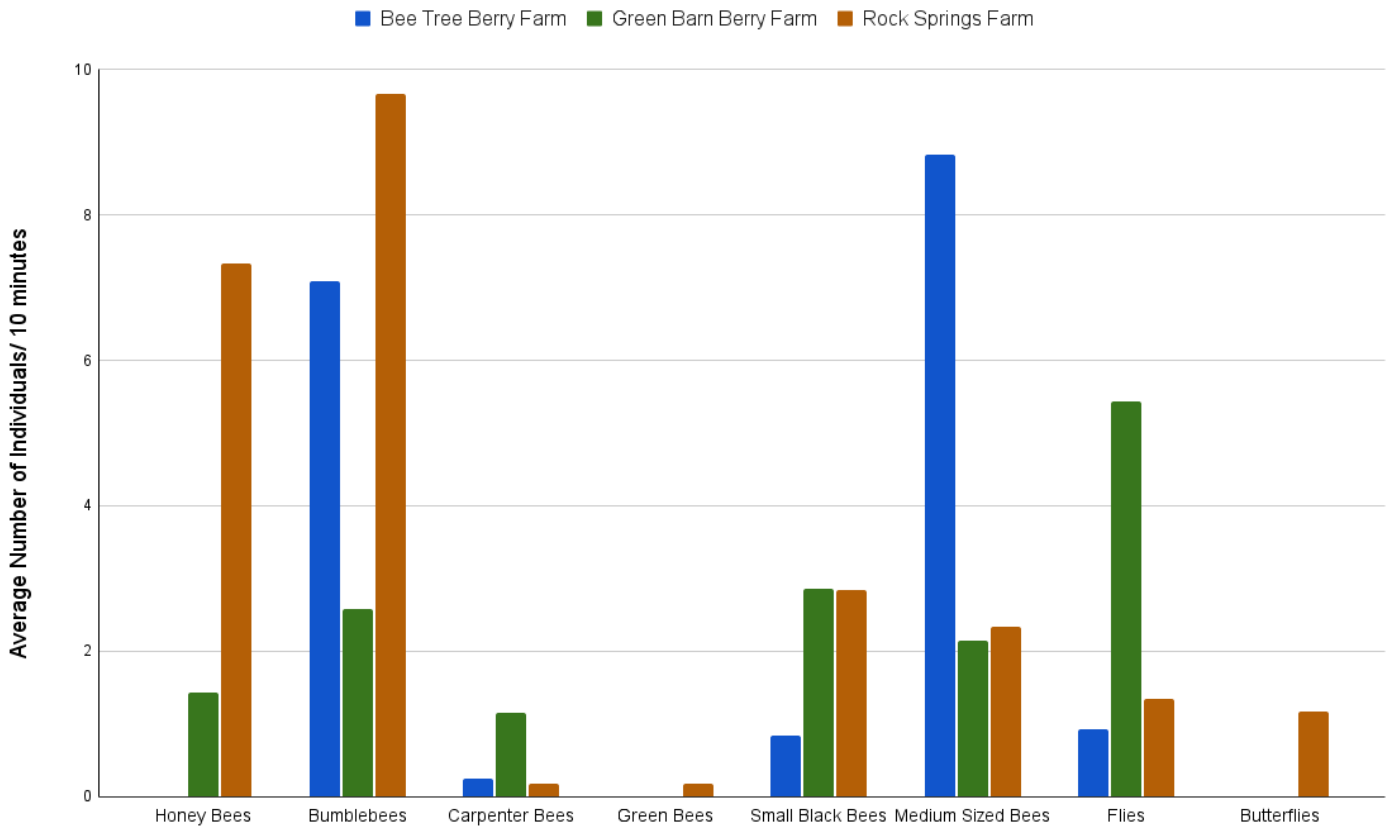
POLLINATOR DIVERSITY AND SERVICES

Blueberries depend on bee pollination to maximize yields. While different blueberry cultivars vary in their dependence for crop pollination, lack of or suboptimal bee visitation can decrease fruit set and fruit weight. As part of our NE-SARE funded project, we are working on characterizing the pollinator community and the benefits of pollination for the blueberry crops on your farm. In 2021, we visited your farms to characterize the pollinator community and set up experiments to quantify pollination limitation. This report provides a summary of the findings. Specifically, you will find information about the pollinator diversity and abundance in your farm, and to what degree your crop yields might be limited by insufficient pollination.



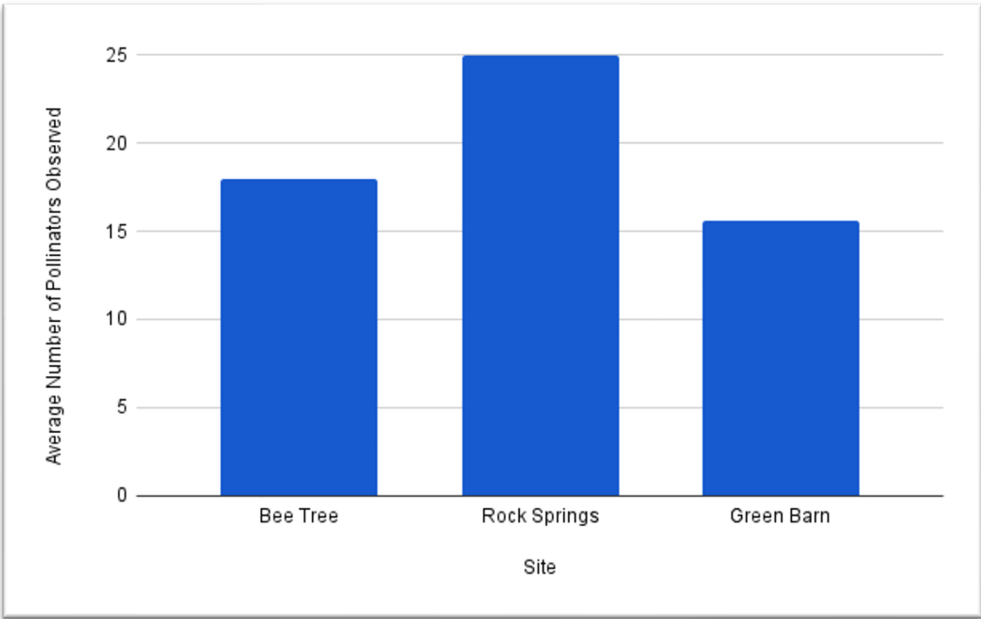
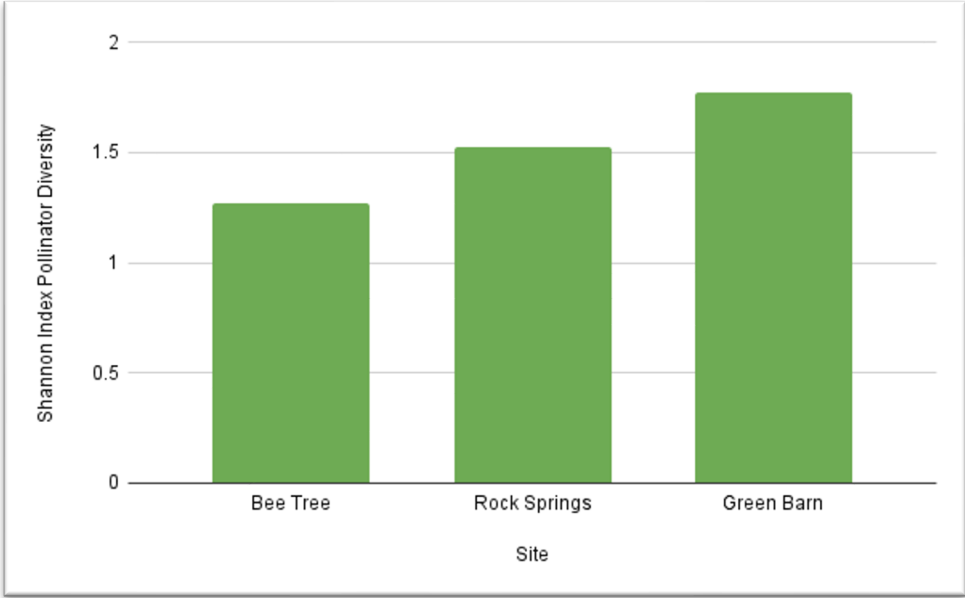
1. POLLINATOR ABUNDANCE

The number of pollinators observed visiting flowers varied across sites in 2019. The most common visitors across all farms included bumblebees, honeybees, and medium sized bees.





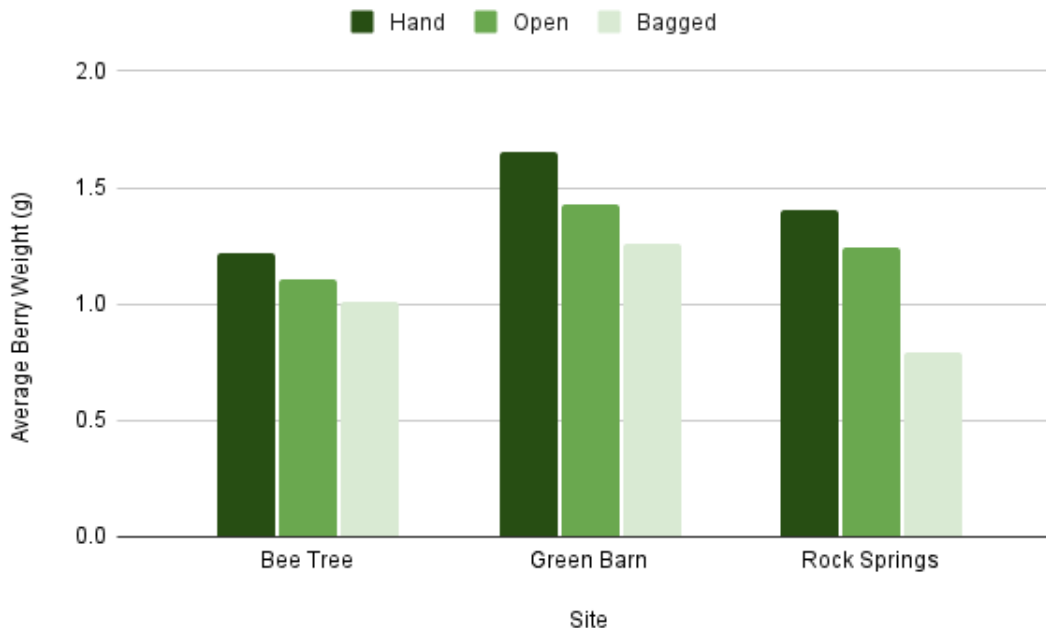
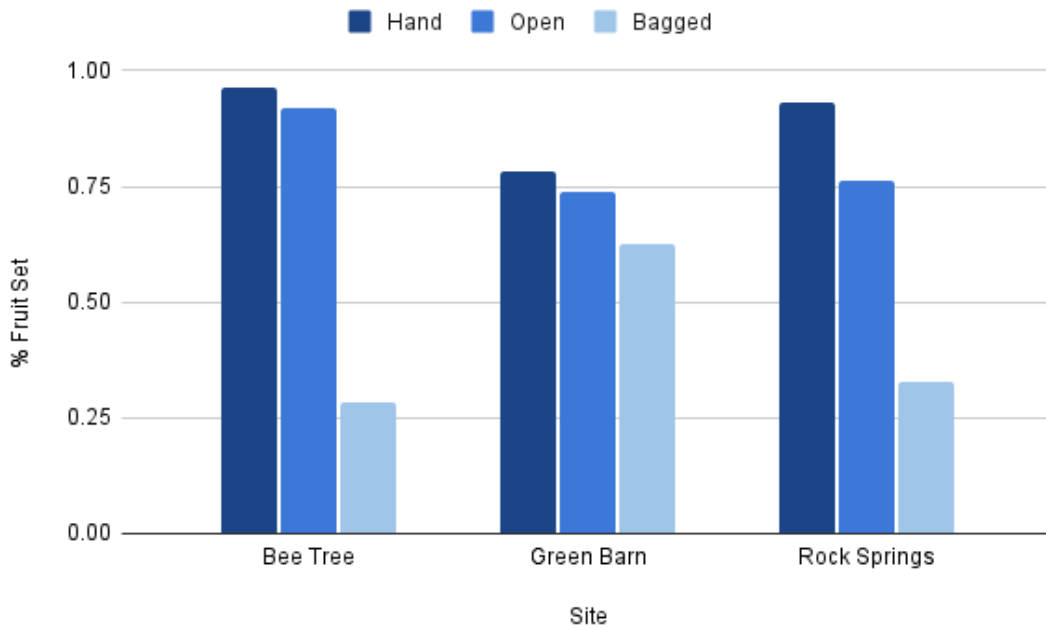
2. POLLINATOR DIVERSITY





3. POLLEN LIMITATION

One way of capturing the benefits that your crop receives from pollination is by mimicking a system where the flowers do not interact with pollinating insects by placing a mesh bag over the branches to prevent pollination. On the other hand, we can also mimic a “best case scenario” of pollination by hand pollinating to ensure that each flower bud has sufficient pollen to form fruit. We can then compare hand pollinated branches to the bagged and naturally pollinated open branches. If the berries from the open pollinated branches are more like those from the hand pollinated branches, this indicates that your natural pollinators are plentiful and efficient. In general, we found that hand pollinating resulted in small increases in both fruit set and berry weight. This may indicate that there are too few or inefficient pollinators to achieve maximum yield from your blueberry crop. However, overall, these decreases were very slight, so we believe that the status of pollination at all these sites is good.





4. LIST OF ALL BEE SPECIES VISITING BLUEBERRY FLOWERS

In addition to quantifying the abundance of bees visiting blueberry flowers at your farms, we also collected bees at each site to identify individuals to species. So far, we have found 25 bee species across three sites and two years!

Composite Species List (all species from 2019 and 2021)

Bee Family	Species Name	Common name	Green Barn	Rock Springs	Bee Tree Farm
Apidae	<i>Apis mellifera</i>	Honeybees	X	X	X
	<i>Bombus bimaculatus</i>	Bumblebees	X	X	X
	<i>Bombus griseocollis</i>				X
	<i>Ceratina mikmaqi</i>	Carpenter bees		X	
	<i>Ceratina dupla</i>			X	
	<i>Xylocopa virginica</i>				X
Andrenidae	<i>Andrena frigida</i>	Mining bees		X	
	<i>Andrena tridens</i>			X	X
	<i>Andrena cressonii</i>			X	
	<i>Andrena miserabilis</i>			X	
	<i>Andrena carlini</i>		X	X	X
	<i>Andrena dunningi</i>		X	X	
	<i>Andrena vicina</i>		X	X	X
	<i>Andrena imitatrix</i>			X	
	<i>Andrena nasonii</i>			X	
	<i>Andrena forbesii</i>			X	
	<i>Andrena perplexa</i>			X	
	<i>Andrena pruni</i>				X
	<i>Andrena rugosa</i>		X		
	<i>Andrena carolina</i>				X
Colletidae	<i>Colletes inaequalis</i>	Cellophane bees	X		X
	<i>Colletes thoracicus</i>				X
Halictidae	<i>Augochlorella aurata</i>	Sweat bees		X	
	<i>Lasioglossum pilosum</i>			X	X
Megachilidae	<i>Osmia lignaria</i>	Mason bees		X	

5. OTHER RESOURCES

For more information about wild bees of Pennsylvania or pollinating species of blueberries in our region, check out these additional resources.

Kilpatrick SK, López-Uribe MM. (2020). Checklist of the Bees of Pennsylvania. <https://lopezuribelab.com/checklist-bees-pennsylvania/>

López-Uribe MM, Amon N, Watrous K, Fleischer S. (2018). Who Pollinates Pennsylvania Blueberry Plants? Penn State Extension Fruit Times. <https://extension.psu.edu/who-pollinates-pennsylvania-blueberry-plants>



PennState Extension



López-Uribe Lab

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For questions, please reach out to Margarita López-Uribe, Department of Entomology, Pennsylvania State University.