



# Designing a Conservatory Garden

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## Introduction

Bees are an integral part of numerous ecosystems around the globe. However, they have been facing many issues in recent years. The numbers of bees have been declining for a number of reasons, making conservation of this vital species quite difficult. That is why the conservatory garden was designed, to potentially improve the populations of bee species in the Alpharetta area.

## Research Question

How can designing a conservatory garden help to improve the native bee populations of the city of Alpharetta?

## Methodology

The garden design was sketched out, and then the final measurements and components were decided in a final sketch. Then, the wooden frame was created with the help of an engineering student and placed outside near the retention pond. Soil and seeds were then added, and watered the next day. Then, the plants were observed daily to observe their growth and if they had attracted any bees. The seeds used were white Dutch clover seeds and black-eyed Susan seeds.

Materials: 2 pieces of plywood, drill, screws, soil, plant seeds, some form of water gathering.

## Background

There is much currently known about my topic, as the topic of bee conservation has been present within the scientific community ever since it first became a problem. Many studies have been done and solutions have been proposed, although there has not been a single definitive solution, which makes sense, since this problem as a whole is an innately complex one, and it is likely that it will require a number of solutions rather than just one. As said by Utah State University, "Factors that contribute to bee decline include habitat loss, improper apiary management, pesticides, climate change, pests and pathogens, competition among introduced and native bee species, and poor nutrition." (Mull et al., 2022). With all these factors, it takes almost every scientific field working together to truly fix this problem. However, the impact of my findings could be beneficial to this overall dilemma we are facing, as it gives the scientific community at least one solution to aid in the declining bee populations. In the grand scheme of things, my design could be a gamechanger in bee conservation, as it would give a simple and effective design than can be implemented in both rural and urban spaces to aid bee populations. Balancing both nature and urbanization is incredibly important, but also incredibly difficult. "There is a growing realization that focusing only on relatively "pristine" environments will not be sufficient to the magnitude of the task." (Cox & Perry, 2022). However, there are gaps that need to be filled within the field I am currently working in. The bee species of Georgia are severely understudied, as stated in an article by Athena Anderson, "Long-term Bombus research across the United States is urgently needed for conservation of this ecologically critical genus." (Anderson, 2024). Plus, much more needs to be recorded and analyzed of these native species to see how they have been impacted by the numerous problems bees are currently facing, and how conservation can benefit them. Therefore, my product could also be a way to further study the native bee species of Georgia and acquire that missing data that the scientific field may need for later research and problem solving. Overall, my product could be very useful in the scientific field I am focusing on, and the research needed for this particular area of expertise.

## Observations

Over the period of testing, there were numerous changes that were observed within the garden itself and the surrounding area. Namely, the rapid growth of plant life. The garden quickly began sprouting plants a few days after all the seeds had been planted and watered, which attracted some smaller insects to the garden. Said insects continued to be present throughout the rest of the testing period. Bee activity varied, and was more impacted by outside weather conditions than the growth of the garden. As sunny, low-wind days saw more activity than windy or rainy days. Honeybees were the most present bee species for the majority of the testing period, as the garden is located close to the school's beehives. However, there were brief appearances of another bee species, that being the bumblebee. These appearances were not long, but they were still present. More insects began to visit the garden as the testing period continued, yet few bees visited the garden. The garden itself remained lush with greenery, and several taller plants began to show up later on in the testing period. The growth of the garden was successful, but there was no notable increase in other bee species presence.

## Conclusion

In all, the conservatory garden did not help to improve native bee species in the city of Alpharetta. No significant increase in native bee species presence was observed, and it was rare to see another species of bee other than the honeybees already present in the retention pond. If I were to replicate this experiment at a later date, I would place the garden in an area that is not so close to honeybee hives, as honeybees tend to push out native bees out of the area they're in.

## Future Research

If I were to continue this project, I would likely create two gardens and have each impacted by different factors to see what is most helpful to bee populations. If not, I will most likely continue to tend to the garden throughout the rest of my time at Innovation Academy, to see if any results are yielded from a longer research period.

## References

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