



Nectar Availability for Honey Bees at Walkers Reserve

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Introduction

Walkers Reserve is being transformed from a sand quarry to a permaculture research and agro-tourism facility. It is located on the east coast of Barbados in St. Andrew's parish. Mining activities will end in three years due to the depletion of silica sand. Along with permaculture initiatives, the Walkers Reserve Apiary Program (WRAP) has been established. Multiple apiaries exist at the Reserve, while many employees maintain their own at home with the support of the Reserve. The apiaries support honey bees (*Apis mellifera*), which are major pollinators. Pollinators are keystone species as they transport pollen from flower to flower, helping maintain and increase biodiversity in ecosystems [1]. Additionally, honey bees are known for producing honey. Once enough research and development has occurred, honey will provide a revenue stream for Walkers Reserve.



Objective

Our objective was to develop a methodology for cataloguing and assessing plant species in terms of abundance and nectar availability. We added to the Walkers Reserve catalogue of plant species, created a nectar flow calendar for the most observed species, and designed a beta beekeeping calendar for Walkers Reserve to use.

Methodology

We started in the field identifying wild plant species in 18 transects (30 m by 1.5 m). Using Google Earth Pro the area of each region surveyed was estimated in order to extrapolate the abundance of each species from the number observed in each transect. Using those abundances and that of the permaculture species, we developed a scale of factors (table 1). For nectar flow we established a scale based on flowering characteristics as detailed by local experts (table 2). Multiplying the abundance and nectar flow factors for each species indicated its significance as a nectar producer at the Reserve.

Table 1. Abundance of species

Abundance Factor	Abundance
0	0 to 5
1	6 to 10
2	11 to 20
3	21 to 1000
4	1001 to 5000
5	5001 to 15000
6	15001 <



Table 2. Nectar flow of species

Nectar Flow	Nectar Factor	Number of blooms per stem	Number of flowers per plant
None	0	0	0
Minor	1	1 to 5	1 to 10
Moderate	2	5 to 10	30 to 40
Major	3	15 to 20	1000<



Results

Figure 1 shows the nectar flow calendar for the 9 most data rich species at Walkers Reserve. Valleys indicate periods of dearth (low nectar flow), which is important to know for the use of feeding hives sugar water and the collection of honey. This is detailed in the beekeeping calendar framework which can be adjusted as more data is collected. The Walkers Reserve plant catalogue was updated with much of the information coming from Dr. Sean Carrington's book, 'Wild Plants of Barbados' [2].

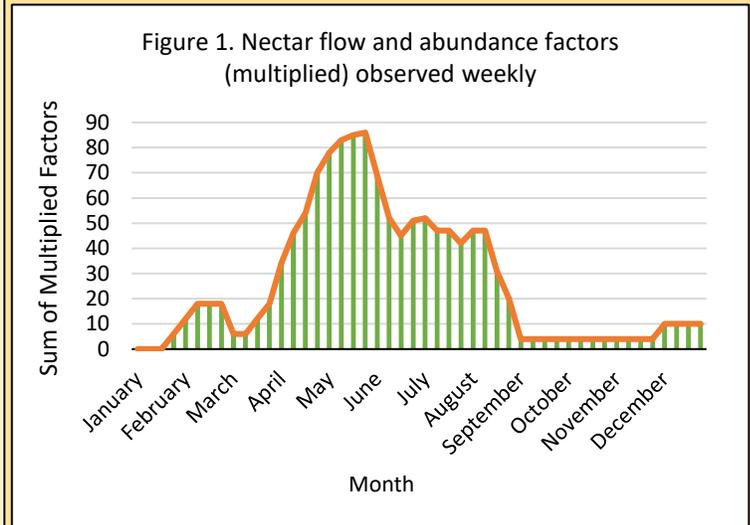


Table 3. Abundance and Nectar Production of the Selected Species

Common Name	Scientific Name	Abundance	Abundance Factor	Nectar Factor	Multiplied Factor
Black Willow	<i>Capparis cynophallophora</i>	38422	6	2	12
Cashew	<i>Anacardium occidentale</i>	17119	6	3	18
Clammy Cherry	<i>Cordia obliqua</i>	21698	6	3	18
Fat Pork	<i>Chrysobalanus icaco</i>	18041	6	2	12
Guarana relative	<i>Paullinia cururu</i>	59324	6	3	18
Scratch Wiss	<i>Cissus verticillata</i>	11296	5	3	15
Sea Grape	<i>Coccoloba uvifera</i>	65838	6	3	18
Sweet Tamarind	<i>Tamarindus indica</i>	24884	6	3	18
Wild Cucumber	<i>Coccoloba uvifera</i>	10854	5	3	15

Conclusion

As the project progressed, our objective shifted from providing a complete analysis to a framework for analysis of nectar availability and beekeeping at Walkers Reserve. The importance of our results is the replicability of the methodology to enrich data resources for Walkers Reserve and Barbados alike. The 9 selected species can become 100 species overtime giving a detailed report of the nectar availability for both the nectar flow and beekeeping calendars. The plant catalogue will continuously be updated as research intensifies at Walkers Reserve. Barbados, and perhaps the entire Caribbean, can look to the Walkers Reserve Apiary Program for data and guidance in observing, analyzing, and maintaining honey bees and nectar availability, due in part to our contributions.



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References

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- [2] Carrington, S. 2007. *Wild Plants of Barbados*. Macmillan Caribbean, Barbados (2nd Edition).