

GROWERTALKS

Under an Acre

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Advocates for Biodiversity in Agriculture

Anne-Marie Hardie

On the slope of the Mauna Loa Volcano, at 3,000 -ft. elevation, is the home of Kilinoe Forest, an entire eco system in which thousands of *Camellia sinensis* shrubs reside among native plants. The founders of this unique venture are Dr. Cam Muir and Eliah Halpenny—who are passionate about not only tea, but advocating for biodiversity.



With a background in academia, Cam moved to Hawaii from Vancouver, not as an agriculturist, but to work as a Post-Doctoral Research

Associate studying the evolution and population genetics of a collection of endangered Hawaiian *Drosophila* (fruit flies). Over time, the job extended to teaching and studying a variety of Hawaiian animals, including fish, tiny shrimp and Nene goose.

It wasn't until his wife Eliah joined him that they began to research working in agriculture, so that Eliah could carve her own career in something that she loved.

"Eliah is one of those gardeners that instinctively understands plants," said Cam. "We had one of those gardens in Vancouver that strangers used to stop by to visit. Each item planted was beautifully timed so that there were blooms throughout the year."

The couple dabbled with the idea of growing orchids, but discovered that this would require heavy use of pesticides, something that neither wanted to pursue.

"It was at that time that the USDA had just completed some research on growing tea in Hawaii as a specialty product," said Cam. Tea had been grown in Hawaii in the past, but it was commodity tea and it couldn't be competitive due to the high cost of labor.

Curious, the couple researched *Camellia sinensis* and discovered that it had few natural pests. However,

they knew that if the tea was to be a successful venture, it would need to be based on its quality, not the quantity processed.

“We thought, why not shoot high?” said Cam. “We were seeing success with high-end coffee, vanilla bean and cacao; why not high-end tea?”

And so, they contacted the number at the bottom of the paper from the USDA to request *Camellia sinensis* seeds as a potential Hawaii tea grower. When they opened the package, there were only eight seeds, which unfortunately, was not enough to fully understand the crop's potential.

“We needed a lot of genetic diversity; eight seeds would not support this need,” said Cam.

After several months of research, Eliah connected with a tea producer in the northern part of India, near the Darjeeling area, that would supply the seeds. The couple started growing seeds in pots, beginning with 1,500 seedlings in a greenhouse that was supported with shade cloth and tarps.

With the seeds planted, the next challenge would be finding a plot of land to transplant them. The two toured farms trying to find a spot that would have adequate precipitation and rich soil to support the growth of tea. Eventually, they discovered the plot on the Mauna Loa Volcano, a farm that was originally used for growing lettuce.

The farm consisted of nine commercial greenhouses on one half and the other half was full of 7-ft. high grass. Wanting to grow the tea in the ground, the couple began to tear down the greenhouses, replacing them with trees and other vegetation that naturally resided in the area.

Instead of planting the teas in rows, they interspersed their seedlings among the vegetation. The result has been extremely positive; in fact, pests are extremely minimal—a fact that Cam attributes to the biodiversity that they've fostered in their farm.

“Gradually, we started to see a lot more wildlife—birds, insectivores, geckos and chameleons—which was awesome, as they did the pesticide work for us,” said Cam.

However, this new agriculture venture didn't come without its challenges. In fact, one of their most frightening experiences occurred in 2009 (approximately eight years after the initial planting) when the first seedlings looked like they were about to die. The couple quickly realized that the problem was linked to the health of the soil from the 65-year-old farm, which although rich in appearance, had become dependent on fertilizers for nourishment.

“When we dug into the soil and brought it back to the lab, we discovered that there was not much microbial or worm activity, so we started thinking, how do we naturally bring that activity back?” said Cam.

Fortunately, Cam had recently been one of the faculty that was chosen to understand more about Hawaiian culture so that they could integrate it in their teaching. Part of this study involved learning about sacred sites in their environment and how they maintained their own agriculture, including nourishing the soil prior to

increased access of imports.

Cam discovered that historically Hawaiians had used bananas to enrich the soil, using it as a mulch. Taking their cue from history, the couple created their own “mulch lasagna” using shredded papers, layer of chopped up banana trunks, banana leaves and leaves from the giant tree fern, hapu’u, which they place underneath each individual tea tree.

This transformation of the soil was verified not only through the healthy plant growth, but through soil samples where Cam extracted the DNA in the soil and looked at the microbial activity.

“It is so important to have this soil diversity for the tea plant; there are lots of different little workers in the soil getting jobs done,” said Cam. “Farmers get trapped in compensating for things that don’t grow well. The more you can get an ecosystem to do its own job, the healthier the plants will be.”

Growing the *Camellia sinensis* plant is only a part of the process to produce orthodox teas; Eliah and Cam needed to also become experts in tea processing.

“It really took us the better part of 2008-09 to get the processing right,” said Cam. During that time, Eliah travelled, bringing their tea to a tea master in India, who tasted the tea, informed them of what their challenges were and provided the secret to rectify it. They appointed the name Big Island Tea to describe the orthodox product that was being grown in their Kilinoe Forest in Hawaii.

The tea drew the attention of London tea curator Jameel Lalani, founder of Lalani and Co., who brought it back to London and presented it to a few buyers. One of those buyers was luxury retailer Harrods, who added the exclusive product to their portfolio, putting Big Island Tea on the map as producers of high-end orthodox tea. Today, Cam and Eliah continue to produce green and black tea from their seedlings.

Biodiversity continues to be their vision for the future of Kilinoe Forest, with coffee plants being one of the more recent introductions. Passionate about education, Cam and Eliah have also begun to develop both farm tours and green tea workshops, where consumers can both pick and process their own green tea. And soon, there will be an opportunity for tea tourists and farmers alike to stay at the forest in a newly upgraded 24-ft. yurt to both enjoy the environment and see first-hand the benefits of biodiversity.

“We want to share with all farmers that biodiversity is possible for everyone,” said Cam. “Start by simply adding a few trees and native plants—these will naturally attract the microbial community that is best adapted for your area.” **GT**

Anne-Marie Hardie is a freelance writer/speaker from Barrie, Ontario, and part of the third generation of the family-owned garden center/wholesale business Bradford Greenhouses in Barrie/Bradford, Ontario.