Agriculture for the Tropics
How novel methods in bio-technology and agriculture can self-sustain an island.
Service-Learning Experience in Puerto Rico, Spring 2024

Agriculture in the Tropics
Growing up on an island makes you perceive agriculture differently. The costs of high-quality, fresh food were so expensive that most people opted for cans of processed meat to save costs. Conventional, modern agriculture is not sustainable because of the island’s small size, highly weathered soil, and limited resources. Most small community ranches often lay abandoned as tropical agriculture and traditional ecological knowledge vanish with each generation.

Puerto Rico faces similar conditions. Being an island nation comes with limited resources, and the constant threat of seasonal hurricanes often affects the people on the island, and imported goods cost more because of the Jones Act. The immigration of the island’s population and the loss of farms heavily affect the island.

My visit to Puerto Rico came with one objective in mind: How are the people of Puerto Rico resilient through Tropical Agriculture? What methods are used to progress and improve food security and provide resources for farmers through advancements in horticultural research?

Progress to Self-Sustainability
There were a couple of locations, projects, and experiences that contributed towards my thoughts on tropical agriculture:

- Hydroponics - Campo Canibe LLC
  Collaborate with local restaurant and further expand to grow fresh leafy greens on the island. They trialed different cultivars of lettuce in hydroponics to be able to provide fresh leafy greens to restaurants in Puerto Rico, rather than relying on imported lettuces.

- Tissue culture - Inter-American University of Puerto Rico in Barranquitas
  Somatic embryogenesis creates new whole plants through the use of somatic cells, or vegetative cells, which creates numerous clones. This is beneficial to Puerto Rico specifically, as plantains, a major food crop, can produce more plants per tissue culture rather than obtaining a singular plant from one sucker, a form of vegetative seed.

The Impacts We Make
Campo Canibe LLC is a hydroponics farm we visited. They discussed how they trialed different cultivars of lettuce in hydroponics to provide fresh leafy greens to restaurants in Puerto Rico, rather than relying on imported lettuces. They were planning to expand their operations to further support the surrounding community with fresh produce while continuing trials and growing crops hydroponically.

The biotechnology and agricultural research at the Inter-American University of Puerto Rico in Barranquitas focused on using tissue culture to generate reliable plantain suckers to support farmers as it was more cost-effective and efficient than traditional methods of propagating plantains. In 2017, Hurricane Maria affected their research by shutting down power and access to water, but they could salvage and continue their research as local farmers supported them by providing plantain material for them in exchange for the seeds produced from somatic embryogenesis.

Questions
My questions relate to my reflections of my own background and interests:

- Will there be an increase of self-sustainable farming with the current conventions of creating seed for local farms? Will it be able to reduce costs of importing seeds from outside sources?
- Potential to integrate plant genetics to support both algae research or food crops, such as plantains, for efficient yield based on the climate of Puerto Rico.
- Challenges of food security incentive via the government

Reflections
I did not know what to expect from Puerto Rico, besides it also being an island territory of the United States. I had expectations of comparing it to Guam. What I did not expect was the diversity in flora, the people, and the rich culture from city to city.

With my Spanish fluency diminished since moving to the United States and my reserved nature, I was hesitant to engage with people. However, their warm welcome and hospitality enchanted me.

I particularly remember a conversation with the university’s student counselor, who often told me about wishing to move over to the United States. Nostalgic for the tropics, I would often reminisce about the beauty of the flora, the hot tropical showers, the warm oceans perfect for swimming, and the sound of roosters waking me up as the sun rose. I had taken it all for granted.

During our conversation, the counselor told me about their renewed love for Puerto Rico, their Puerto Rican upbringing, and their newfound admiration for the island’s nature and its potential for resilience and self-sustainability. Remembering your roots and love for your hometown drives you to learn, return, and share knowledge to help your community. The projects we have visited exemplify how understanding the community’s needs and giving back can have local impacts.

I have made more connections during our brief trip to Puerto Rico than I could have ever imagined. The connections made with Puerto Ricans and even Oregon State University students and faculties are ones I will cherish.