

2015 Hawaii Public Seed Initiative Grant Report

1. Name: Ken Lindsey and Paul Massey

2. Project: Multiple Species Seed Production on Kaua`i

Project Locations: Regenerations Seed & Soil Center, Kalihiwai, Kaua`i
and Kauai Island Organics, Moloa`a, Kaua`i

3. Goals and Outcomes

The most tangible of the goals achieved is the seed we grew. We produced seed from summer squash, cucumbers, tomatoes, sweet peppers, bush beans, edamame, eggplant, okra, and lettuce, as well as vegetative propagules of taro and sugarcane. We anticipate harvesting arugula and cilantro in the next month. We achieved our field design, soil test, tillage, nut sedge removal, soil amendment, and bed shaping. We planted our sorghum border at the Kalihiwai site. We achieved acceptable crop isolation at the Moloa`a site, by growing indoors. We successfully harvested, processed, and stored our seed harvest. We engaged volunteer assistance in the project, who enjoyed an abundance of food grown from the project. We were able to begin distribution of the seed via a Kaua`i seed & plant exchange held on December 13th. We have shared news about the various stages of the project via the In the Garden on the Farm radio program on Kaua`i Community Radio. Ongoing activities include germination testing, grow outs to confirm seed purity, seed harvest, processing, and storage, and informing the public.

Despite our many accomplishments, we did not achieve all our intended goals. We were overambitious as to our ability to develop standard operating procedures in a single growing season and with so many crops. Due to a lengthy delay in the delivery of insect screening ordered well in advance of its need, we were not able to isolate our field grown crops to our satisfaction. We began our project without clear goals or strategy as to the collection of data, so our information on crop growth is not as comprehensive as desired. Since we now realize that we are only at the beginning of this investigation into best standard operating practices, we are not ready to publish an information kit.

4. Community Participation

A total of 22 people were involved in achieving the outcomes of the project. Their names and roles are as follows:

Ken Lindsey -project leader
Paul Massey - project support/ seed bank management
Sun Hadley- agronomic advisor
Joan Porter- land provider (Kalihiwai)
Brian Armstrong - land provider (Moloa`a)
Krista Ruchaber - field volunteer, seed processor
Grace Danielle - field volunteer
Jared Leightner- field volunteer
Sean Potter- field volunteer
Sean Hartman- field volunteer
Tripp McCalister - heavy equipment, tractor
Michael Esona - heavy equipment, tractor
Dev Brown - field volunteer
Ray Harris - truckage
Dylan Strong - agricultural advisor
Felicia Cowden - seed processor
Whitney Caywood - seed processor
Sequoia - seed processor
Larry Magnussen- seed processor
Connie Clune - Germination tester
Ellie Snyder - seed exchange volunteer
Perle Menashe - seed exchange volunteer

5. Regular Volunteers

Five regular volunteers assisted this project: Ken Lindsey, Paul Massey, Krista Ruchaber, Sean Hartman, and Jared Leightner.

6. Project Results

a. Production comprised of vegetable seed and vegetative propagules of subtropical food plants, as well as marketable produce.

b. 1) Amount of seed produced, by weight

Provider Bush Bean 2.5 lbs.

Stupice Tomato 20g.

Carolina Wonder Pepper 15.2g.

Success PM Straightneck Summer Squash 8oz.

Burmese Okra 4.5lbs.
Butterbean Edamame 3.5 lbs.
Diamond Eggplant 6.6oz.
Boothby Blonde Cucumber 10oz.
Poona Kheera Cucumber 11oz.
Canasta Lettuce 500 seeds (harvest is ongoing)

b. 2) 100 lbs. of summer squash was marketed. An unmeasured volume of tomatoes, peppers, squash, eggplant, and okra were consumed by project volunteers.

b. 3) Approximately 1200 plants were put into production. The amount of plants to be used was determined by the minimum amount of individuals of a given variety needed in a population to retain genetic integrity.

b. 4& 5) Varieties & Sources used for this project:

Vegetables:

Provider Bush Bean *Johnny's Selected Seeds*
Stupice Tomato *Turtle Tree Seed*
Carolina Wonder Pepper *Southern Exposure Seed Exchange*
Success PM Straightneck Summer Squash *High Mowing Organic Seeds*
Burmese Okra *High Mowing Organic Seeds*
Butterbean Edamame *Johnny's Selected Seeds*
Diamond Eggplant *High Mowing Organic Seeds*
Boothby Blonde Cucumber *High Mowing Organic Seeds*
Poona Kheera Cucumber *High Mowing Organic Seeds*
Canasta Lettuce *Turtle Tree Seed*
* Kai Choy *One Song Farm*
* Marketmore '76 Cucumber *High Mowing Organic Seeds*
* St. Valery Carrot *One Song Farm*
* New Kuroda Carrot *Regenerations Botanical Garden*
* Santo Cilantro *High Mowing Organic Seeds*
* Caribe Cilantro *Johnny's Selected Seeds*
* Astro Arugula *High Mowing Organic Seeds*
* Sora Radish *Turtle Tree Seed*
* De Cicco Broccoli *High Mowing Organic Seeds*
* Cherokee Purple Tomato *Johnny's Selected Seeds*

(*varieties marked with an asterisk either experienced crop failure or were not able to produce harvestable seed during the project period.)

Border:

Big Kahuna Sudex (*Sudan x Sorghum*) Koolau Seed & Supply

Taro:

Faifa`ausi *Regenerations Botanical Garden*

Piko `ula`ula *Regenerations Botanical Garden*

Piko sv. 1 *Regenerations Botanical Garden*

Piko sv. 2 *Regenerations Botanical Garden*

3 1/2 Mile Na Pali *Regenerations Botanical Garden*

Manini `owali *Regenerations Botanical Garden*

Banana Creek *Regenerations Botanical Garden*

Unknown #1 (Kuoho?) *Regenerations Botanical Garden*

Mana Uliuli *One Song Farm*

Unknown #3 *One Song Farm*

Unknown #4 *One Song Farm*

Mana `ulu *Regenerations Botanical Garden*

Mana `uli`uli *One Song Farm*

Haokea/Kalalau *Regenerations Botanical Garden*

Moi *One Song Farm*

Akado *One Song Farm*

`Uahiapele *UH CTAHR*

Piko Kea *UH CTAHR*

Lauloa palakea-elelele *UH CTAHR*

Lauloa palakea-papamu *UH CTAHR*

Lauloa ke`oke`o *UH CTAHR*

Talo Manu`a *UH CTAHR*

Lauloa Eleele-omao *UH CTAHR*

Sugarcane:

`Ie`ie *Regenerations Botanical Garden*

HC 52 *Regenerations Botanical Garden*

Hapai *Regenerations Botanical Garden*

"Purple Power" *One Song Farm*

"Centipede" *One Song Farm*

"Green Stripe" *One Song Farm*

"Purple Stripe" *One Song Farm*

Total # of varieties planted: 51

b. 6) All seed varieties were open pollinated, except for the sudex border, which is a hybrid.

b. 7) Organic farming methods were practiced at both locations

8. Influence on the Community

The influence of the project so far on our community is difficult to measure and probably not significant at this early stage. Farmers as well as lay people are pleased to hear that we have been conducting this work, and people generally understand the value and importance of locally adapted seed when the concept is explained to them. As we continue the work on developing standard operating procedures for producing seed, we anticipate an appreciable positive influence on the community that will lead to an increased production and use of Kauaʻi grown seed.

9. Hawaiʻi Public Seed Initiative Assistance

HPSI has greatly assisted in the development of our project. It has allowed over 10,000 sq. ft. of soil to be cultivated, amended and irrigated. One of the biggest constraints of new farming projects is lack of access to capital to make depleted, undeveloped land farmable. It has given us the ability to trial new varieties and discover more about what it takes to grow quality seed on Kauaʻi. The funding received from HPSI for this project has helped identify the areas on the island that are more suitable to grow seed and available methods to help overcome challenges in less desirable seed growing areas. Overall, it has allowed us to improve and expand the lifelong process of growing, adapting, and saving seed on our island.

10. Greatest Challenges Encountered

The challenges we faced were varied and numerous. The first was learning what it takes to produce acceptable seed from each crop. We needed to learn the adequate population sizes, isolation distances, isolation strategies, timing of seed harvest, seed harvesting techniques, and pest, disease, and weed management for growing a vegetable crop to seed. We also faced the challenge of extremely high rainfall at the outdoor Kalihiwai site—50 inches during the cropping cycle. This is a major limitation to growing seeds, especially those of the dry dehiscent type. The plants can perform wonderfully vegetatively but struggle in the flower to seed phase. High temperatures and humidity at both sites caused problems with seed germination, flowering, and fruit set. Another challenge was opening two new sites at different locations from scratch. Both sites needed the ground to be cultivated, amended, irrigated, and planted for the first time. The amount of time needed for this project was greatly underestimated. It was difficult to attend to the many management details of this project and keep up with regular farm responsibilities. Finding enough volunteer labor was a challenge as well. Growing in a greenhouse made pollinating, pest control, and overall working environment difficult. Weed and pest control was more difficult due to the increased amount of time the plants were in the ground. We lacked a clear and thorough data collection strategy at the onset of the project, which lead to data that was neither complete nor as informative as we had hoped. Due to poor germination during this very difficult growing period, there was a confusing mix of direct seeded, double seeded, and transplanted plants in the same row, as we attempted to have good plant stands for each crop. The isolation netting did not arrive on time to be utilized at the

Kalihiwai site. Pollinators like carpenter bees and honey bees visited our plants despite the dense sudex border that we established. Our choice of an indeterminate tomato variety was not ideal due to our limited labor force and the demanding management needs of that specific crop. Despite all of the challenges, we feel as though this project was a great success and paves the way for more seed production in the future.

11. Greatest Success

The project's greatest successes were as monumental as the challenges. We clearly identified what it takes to grow seed for ten crops and what it will take to be successful growing the remaining five that were more difficult. We now have cultivated, amended, and irrigated land to produce seed on. We learned how to set up the field for each crop and what it takes at each stage of production to be successful. Seed was produced from crops that most farmers find difficult to produce commercially (sweet peppers and summer squash). To be able to produce seed from difficult crops with limited resources demonstrates what would be possible under more ideal conditions. We also produced quality seed from ten crops that can be shared with other growers, added to the Kaua'i Community Seed Bank and Hawai'i Public Seed Initiative collections, and used for future trials and trait selection. We can now grow other varieties much easier on a more regular basis than ever before.

12. Project Needs

We are hopeful to continue this project in 2016 and for the foreseeable future. We intend to grow new varieties for trials and seed production and continue generational adaptation of the varieties we grew in this round. The greatest need for the project is people. We now have the infrastructure to produce seed, but more volunteer help or paid positions are what is absolutely necessary to allow the project to flourish. Growing seed is a lot of work and it seems that the economic viability of seed production will be the next most important barrier to cross. Developing procedures that allow a farmer to harvest both produce and seeds from the same planting would make the results of our research more useful to the average grower. A way to sell seeds to generate income will allow us to attract and retain the human resources needed to sustain and expand our seed production. Another need is to enhance the isolation structures for seed grown in an outdoor field setting. During the project we visited a local tomato farm, and the farmer has designed excellent crop isolation tunnels that inspire us to replicate his design with modifications to address our high rainfall and humidity at the Kalihiwai site.

13. Additional Comments

The success of our project going forward will be greatly supported by initiating our next cropping cycle in the spring to allow for better growing conditions; therefore, releasing funding for the next round early in 2016, and extending the project period, would be very helpful. We would like to thank the Ceres Trust for providing the funding for this important project, all of the volunteers for making the project possible, and Lyn Howe for her excellent leadership of the

Hawai`i Public Seed Initiative. Attending the 2015 HPSI gathering on Moloka`i was also very valuable to our professional development.

14. Supporting Documents

Click the links below to view the online content:

[Photos of the project on Flickr](#)

[Crop Data Sheet](#)

Our signatures below indicates that HPSI & The Kohala Center have permission to use this information and any media for program purposes.

Name of Preparers: Kenneth Lindsey and Paul Massey

Signature of Preparers: _____

The image shows two handwritten signatures in black ink. The first signature, on the left, is 'Kenneth J. Lindsey' written in a cursive style. The second signature, on the right, is 'Paul Massey' also in a cursive style. Both signatures are written over a horizontal line.

Date Submitted: December 16, 2015