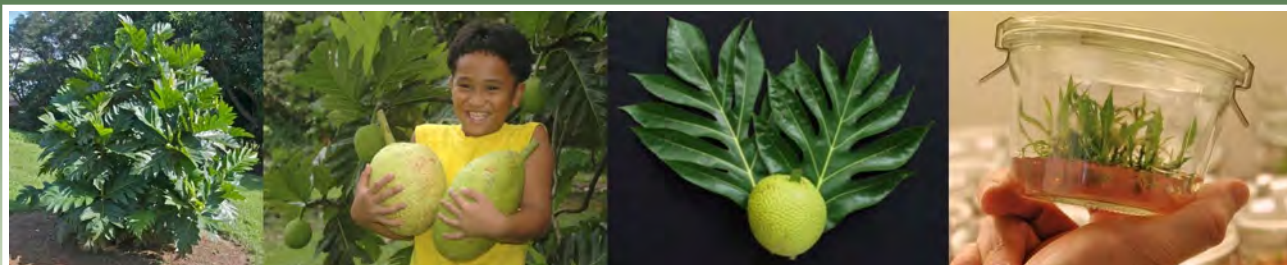


# BREADFRUIT INSTITUTE

## SPRING PROGRESS REPORT | 2016



**The National Tropical Botanical Garden (NTBG)** is a Hawai'i-based not-for-profit institution dedicated to tropical plant research, conservation, and education. NTBG's Breadfruit Institute ([www.breadfruit.org](http://www.breadfruit.org)), established in 2003, is the global leader in efforts to use breadfruit diversity to support food security, sustainable agriculture, and income generation for smallholder farmers in the tropics. The Breadfruit Institute manages the world's largest collection of breadfruit, vital to research, conservation and education. More than 300 trees of 120 varieties make up a living germplasm repository, providing material that has resulted in the micropropagation of thousands of breadfruit trees planted in the tropics to alleviate hunger.



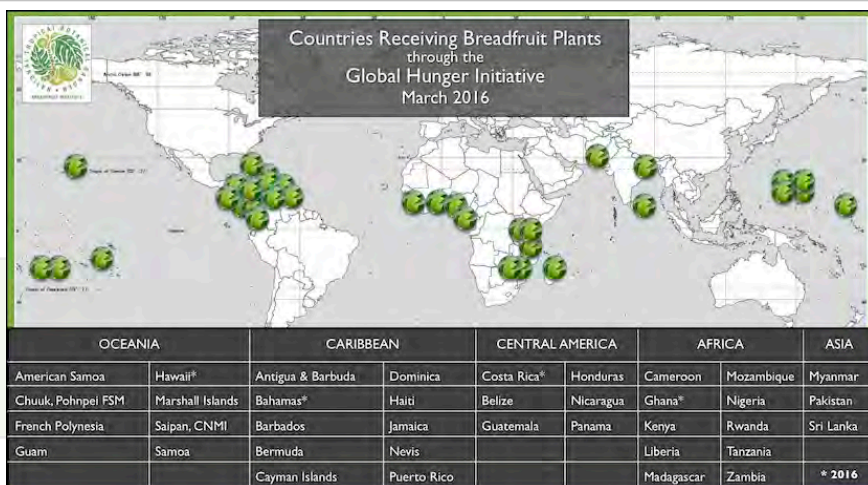
### Newly Planted Trees

Three Otea and three Mei trees, were planted in February in the McBryde Garden Breadfruit Research Orchard further expanding our collection. These trees will contribute to ongoing research and outreach projects, and are the first micropropagated trees of these cultivars to be planted at one of our Kaua'i locations.

### Global Hunger Initiative: Battling Storm Devastation & Economic Disparity with Breadfruit

The Breadfruit Institute and partners worldwide are engaged in an initiative to respond to critical global food security and reforestation issues by expanding plantings of good quality breadfruit varieties in tropical regions.

*Since the launch of the  
Global Hunger Initiative,  
**73,135 breadfruit trees**  
have been sent to **37 countries**.*



### Costa Rica

In March, Tropico Agroforstal received 1,500 breadfruit trees to be distributed in the Huertar Caribbean Region of Costa Rica. This area has the highest rate of poverty in the country and the most ideal conditions for growing breadfruit. As the nutritional value and economic benefits of growing breadfruit become increasingly recognized throughout the country, the demand for trees is expanding.



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## Bahamas

Hurricane Joaquin struck the Bahamas and caused substantial damage and deforestation in October, especially to Long Island. After the storm, one resident described the island as a "brown carpet." In January, in conjunction with the local Ministry of Agriculture and a small-farmers co-operative, 1,000 breadfruit trees from Global Breadfruit were transported by barge to Nassau, where they were then distributed to Long Island. A small mail-delivery plane carried the trees that were distributed to local schools in Exuma, a district in the Bahamas consisting of 365 small islands or cays. At Black Point Settlement and Farmers Cay schools, students are already learning about their trees under the theme of "Sharing is Caring."



## Ghana

Global Breadfruit delivered 4,000 breadfruit trees to Ghana in March to increase awareness for this crop as a solution to malnutrition and hunger in this equatorial country. The trees were shipped to the Biotechnology and Nuclear Agriculture Research Institute (BNARI) nursery. Dr. Jeff Marck ([www.jeffmarck.net/breadfruitrevolution.htm](http://www.jeffmarck.net/breadfruitrevolution.htm)) says, "It seems to me that this new BNARI cooperation could be a very significant development for the future of new variety breadfruit in Ghana. The Director, Dr. K.E. Danso, seems simply beloved and there is apparently a substantial financial backbone. Their receipt of their own trees and their facilitation of the safe landing of all the others was flawless."

## Nicaragua

Nicaragua was one of the first countries to receive micropropagated Ma'afala and Ulu fiti breadfruit plants from the Global Hunger Initiative in 2012. In a recent update, French agronomist Jean-Francois Julia of FADCANIC says, "They perfectly grew, they are magnificent. We found each of the two varieties delicious. Ma'afala is particularly interesting to make flour and to prepare a local creamy drink called "criminal". Ulu fiti is particularly appreciated to make French chips and "tostones". The trees were distributed to small holder farmers in eight different coastal regions, producing their first harvest after just over two years.



## Ulupono Breadfruit Value Chain Meeting



A successful breadfruit meeting was held on Hawaii Island at the Kohala Center facilitated by the Ulupono Initiative, a Hawaii-focused sustainability investment firm. Dr. Diane Ragone, Director of the Breadfruit Institute, Roger Still, Director of Global Initiatives, and Michael Besancon, Advisor to the Breadfruit Institute, collaborated with other participants in the discussion of commercializing breadfruit through value-added products, product distribution, farming and production, research, education and public outreach. With the help of the Ulupono Initiative, the next phase of increasing the Breadfruit Institute's capacity to serve as the leading information resource for breadfruit is anticipated.



## The Science of Breadfruit: Copenhagen Collaboration

Marin Lysák, a PhD Fellow at the University of Copenhagen, spent February at the Breadfruit Institute. She is collaborating with Dr. Ragone on her research to investigate options for adapting to the negative effects of climate change on food and nutrition security by increasing crop diversity through revitalizing breadfruit. She analyzed three years of data collected from our Plant a Tree of Life project, and initiated a program to follow up with more than 1,200 breadfruit tree recipients in Hawai'i. Since the project's first year in 2012, we have distributed 10,480 trees in Hawai'i and 6,179 internationally. Marin's follow up will assess the project's impact on sustainability and future food security throughout the Aloha State.



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# BREADFRUIT INSTITUTE

## SUMMER PROGRESS REPORT | 2016



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### Dr. Diane Ragone Receives a Medal of Honor from the Garden Club of America

A Medal of Honor was awarded to Dr. Diane Ragone by the Garden Club of America in Minneapolis on May 22, 2016, for her outstanding service to horticulture and breadfruit. "Her work is in every sense the epitome of the best in horticulture: quest for knowledge, preservation, conservation, research, creative experimentation, sharing, mentoring and fulfilling a humanitarian mission," said the GCA in honoring Dr. Ragone.



### Global Hunger Initiative: Breadfruit Trees in 40 Countries!

The Breadfruit Institute and partners worldwide are engaged in an initiative to respond to critical global food security and reforestation issues by expanding plantings of good quality breadfruit varieties in tropical regions.

Since the launch of the Global Hunger Initiative, **82,667 breadfruit trees have been sent to 40 countries.**



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Antigua  
& Barbuda



Cuba



Cuba



Guyana



Zambia

**Antigua & Barbuda** - 1,944 breadfruit trees were sent to Pamella Thomas of the Caribbean Farmers Network (CaFAN) and were distributed to farmers in Antigua and Barbuda. CaFAN offers local farmers training, workshops, study tours, planning sessions and networking opportunities in agriculture.

**Cuba** - A delivery of 1,000 Ma'afala breadfruit trees were given to a research institute in Cuba. Global Breadfruit was there to evaluate the best way to incorporate Ma'afala into local agriculture systems. This compact variety is easier to grow in home gardens than any other breadfruit variety and holds enormous potential to help make Cuba more food secure.

**Hawaii** - 648 breadfruit trees were distributed throughout Hawaii. 72 Ma'afala, 72 Otea, and 72 Ulu fiti trees went to the University of Hawaii for field trials at UH Research Stations led by Dr. Alyssa Cho.

**Jamaica** - Jamaica received 324 breadfruit trees through the Global Hunger Initiative. The trees went to a single farmer with land outside of Montego Bay.

**Puerto Rico** - 500 breadfruit trees were sent to El Duque, Naguabo, in southern Puerto Rico. The farmer plans to ship fresh fruit to New York for sale to Puerto Rican markets.

**Suriname & Guyana** - 2,448 trees were delivered to Suriname and 1,584 trees to Guyana. Reinier Taus of Suriname's Caribbean Agriculture Network was the on-the-ground coordinator.

**Zambia** - The founder of Planting a Future for Zambia, Llyod Lukama Kasela, received 288 breadfruit trees. When the trees are ready to leave the nursery, they will be distributed throughout the village and in new areas in northern Zambia where winter temperatures are warmer and there is more rain to assess the viability of breadfruit.

## BREADFRUIT DELIGHTS ENJOYED AT SPRING BOARD OF TRUSTEES MEETING

The Breadfruit Session held prior to the Board of Trustees meetings provided an overview of Breadfruit Institute programs, a discussion on the development of breadfruit as a value-added product, and the role of NTBG in commercialization in alignment with our mission and values. The meeting was facilitated by Dr. Ragone and the BFI Director of Global Initiatives, Roger Still. Tom Pickett's delicious breadfruit pastries, bagels and lavosh were presented at the meeting as an end-product example of the breadfruit value chain.



## BREADFRUIT INSTITUTE IN THE NEWS

Dr. Ragone and the influence of breadfruit was featured in *Saveur's* Summer 2016 magazine "Can Breadfruit Save the World?" Ragone's GCA Award recognition was highlighted in Kauai's local newspaper, *The Garden Island*, and in Virginia's *The Roanoke Times*.



## NEW BREADFRUIT INSTITUTE COLLECTION MANAGER : DAN RUDOLY

We are pleased to have Dan Rudoly join our staff as Collection Manager of the Breadfruit Institute based at Kahanu Garden. Dan joins the BFI with a wealth of experience and expertise in farming systems, permaculture, regenerative agriculture, education & outreach in Hawaii.



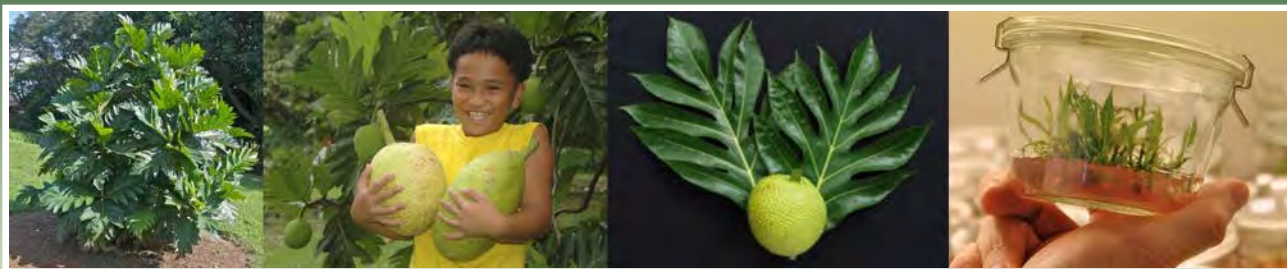
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# BREADFRUIT INSTITUTE

## FALL PROGRESS REPORT | 2016



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### Global Hunger Initiative: Breadfruit Trees in 43 Countries!



Grenada

The Breadfruit Institute and partners worldwide are engaged in an initiative to respond to critical global food security and reforestation issues by expanding plantings of good quality breadfruit varieties in tropical regions.

**Liberia** - **4,000** breadfruit trees were sent to recipients associated with Cuttington University and Central Agricultural Research Institute. Students will study the trees and learn business skills in developing and selling breadfruit byproducts.

**Grenada** - received **2,448** breadfruit trees in August. Most of Grenada's breadfruit production is consumed locally as a cooked vegetable in the preparation of the country's national dish called "oil-down." This one-pot dish includes breadfruit, dumplings, salted meat, callaloo, vegetables, coconut milk, and spices.

**Bermuda** - received **100** Ma'afala trees from Global Breadfruit's German facility.

**Madagascar** - **288** breadfruit trees were sent to the Fruits, Vegetables, and Environmental Education Project with the Church of Jesus Christ in Madagascar.

**Vietnam** - **72** trees were delivered to Mr. Hien Pham, an avid breadfruit farmer who grows breadfruit for food and economic security.

Since the launch of the Global Hunger Initiative, **91,735 breadfruit trees have been sent to 43 countries.**



Cuba



Suriname

### The Breadfruit Conservation Collection

Compost tea is an organic liquid fertilizer that provides essential biological and mineral amendments for healthy plant growth. The Breadfruit Institute at Kahanu Garden uses a brewer setup, a very low cost system running off a solar pump and recycled rain water. The cost is about 20 cents a gallon for final products. Compost tea applications are applied to the trees on a weekly basis.



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## Educational Outreach with the Horticultural Interns

We are excited to have NTBG's Horticultural Interns work with the Breadfruit Institute. They helped with six baby breadfruit trees in the McBryde Garden by weeding, clearing space, and applying fertilizer and mulch. At Kahanu Garden, the interns helped with a buffer zone project near the breadfruit collection and maintained the surrounding areas of the native forest species plantings. The interns were also able to harvest their own breadfruit to prepare meals.



## Breadfruit & Global Events

### Breadfruit Summit - Oahu

The 2016 Breadfruit Summit on Oahu was informative and inspiring, bringing together farmers, scientists, cultural practitioners, food entrepreneurs, students, government officials, NGOs, and others from Oceania and the Caribbean to talk about the myriad benefits and potential of breadfruit for culture, communities, ecologies, and economies.



### Indigenous Crop Biodiversity Festival (ICBF) - Maui

Providing outreach to the community and networking with other indigenous crop and conservation groups is important to the institute's mission to promote the conservation and use of breadfruit. The Breadfruit Institute and Kahanu Garden had displays at the festival. Dan Rudoy, BFI's Collection Manager, gave a talk on breadfruit history in the Pacific, varieties of breadfruit, cooking practices, and general information about the Institute at the ICBF Lecture Series at the UH Maui Campus.



### World Conservation Congress - Oahu & Kaua'i

The Breadfruit Institute participated in the International Union for Conservation of Nature (IUCN) / World Conservation Congress (WCC) which addressed key environmental and conservation issues through various programs and discussion panels led by acclaimed members of non-governmental agencies, global businesses and governments, UN departments, and the public.

The institute's booth at Kauai's Conservation Expo was a success! More than 20 organizations participated in the event to promote conservation, science and research. The event provided outreach to local schools, residents, business, conservation organizations, and IUCN participants.

## Breadfruit Institute in the News

- *National Public Radio* featured breadfruit and food security in an online piece: "Productive, Protein-Rich Breadfruit Could Help The World's Hungry Tropics" by Liza Gross, who participated in the 2016 Environmental Journalism Course at NTBG.
- *Honolulu Civil Beat* published an article on "Breadfruit Can Feed A Hungry World" and *The University of Hawaii News* and *For Kauai* had articles about Dr. Ragone being honored at Breadfruit Summit on Oahu.
- An on-line foodie newsource, *Eater*, featured the Institute and identified the exciting food trend in "Why It's Time to Embrace Breadfruit; How Hawaii chefs and scientists are introducing the superfood to the world."



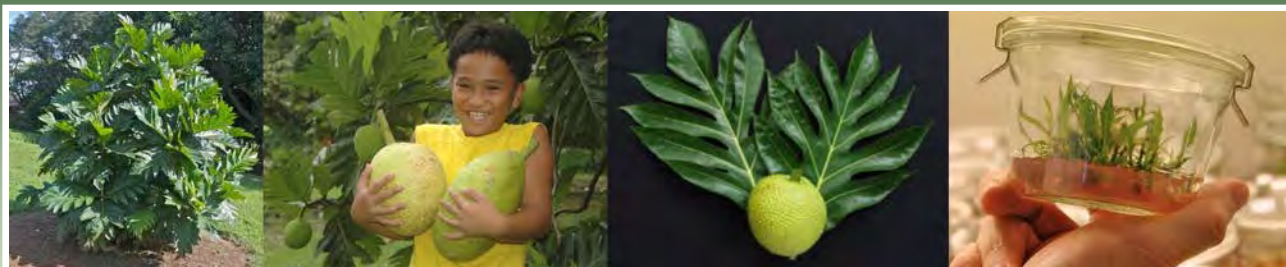
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# BREADFRUIT INSTITUTE

## WINTER PROGRESS REPORT | 2016



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### Global Hunger Initiative

The Breadfruit Institute and partners worldwide are engaged in an initiative to respond to critical global food security and reforestation issues by expanding plantings of good quality breadfruit varieties in tropical regions.

**Since the launch of the Global Hunger Initiative, 97,242 breadfruit trees have been sent to 43 countries.**

**19 countries received 29,000 breadfruit trees in 2016!**



### Kenya Receives 5,000 Trees!

The University of Nairobi in Kenya, received 5,000 breadfruit trees in December, 2016. The team at Global Breadfruit was responsible for successfully coordinating and shipping the trees. These trees will be used for agricultural studies and local outreach in farming methods and uses of breadfruit.

### Ghana Planting Success

Enock Katere, a farmer in New Longoro, Ghana, planted 40 breadfruit, mango, and cashew trees on his land for food security and economic gains. The trees were provided by the Poverty Reduction Empowerment Center and distributed by the Breadfruit Institute's distribution partner Global Breadfruit.



### The Breadfruit Conservation Collection

Professional arborists recently pruned 38 breadfruit trees at Kahanu Garden to improve their overall health and reduce risk to staff and visitors. Through proper pruning, tree structure is improved. This allows more sunlight to reach lower branches and underlying landscape as well as increasing air flow throughout and beneath the tree.



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## The Breadfruit Conservation Collection (cont.)

NTBG's Plant Records Manager, Kava Vale, mapped newly planted the breadfruit trees at Kahanu Garden. This process is essential in providing useful information and reference to our computerized database through an accession tag on each tree.



## Global Breadfruit Projects: Taumako and Puerto Rico



The Breadfruit Institute and the Vaka Taumako Project, led by Dr. Simon Salopuka, in the Solomon Islands is in the first phase of documenting breadfruit variety diversity, conservation status, and associated knowledge about breadfruit varieties on remote Taumako through interviews with island residents and photographs.



Ms. Veronica Anadon is working with the Breadfruit Institute to assess Puerto Rico's breadfruit agroforestry systems in private land areas with the goal of supporting local biodiversity and food security. She is networking with public and private sector organizations, identifying funding resources, collaborating with agroforestry specialists, and evaluating the local breadfruit industry.



## Volunteer Power

We had a wonderful year of volunteers helping the institute and contributing to our local community. Dave Hubbard, our Lead Volunteer, helped harvest and donate over 500 pounds of breadfruit to the Kauai Independent Food Bank, a non-profit that feeds hungry families throughout the island. We continue our harvest and donations weekly.

## Breadfruit Institute in the News

- Dr. Ragone and the positive influence of breadfruit were featured in the Green Goodness Going Global article of the Philippine Airlines *Mabuhay* magazine.
- The Breadfruit Institute was featured in *For Kauai* magazine in a six-page layout and article called Ho'oulu ka 'Ulu o Hawai'i Nei.



## Research Publications for 2016

- Gardner, EM, MG Johnson, D Ragone, NJ Wickett & NJC Zerega, 2016. Low-coverage, whole-genome sequencing of *Artocarpus camansi* for phylogenetic marker development and gene discovery. *Applications in Plant Sciences*.
- Nochera, CL & D Ragone, 2016. Preparation of a breadfruit flour bar. *Foods*.
- Ragone, D, 2016. Breadfruit for food and nutrition security in the 21st century. *Tropical Agriculture (Trinidad)*.
- Ragone, D, C Elevitch & A Dean. 2016. Revitalizing breadfruit in Hawaii - A model for encouraging the cultivation and use of breadfruit in the tropics. *Tropical Agriculture (Trinidad)*.
- Zerega, NJC & D Ragone, 2016. Toward a global view of breadfruit diversity. *Tropical Agriculture (Trinidad)*.



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