BREADFRUIT INSTITUTE

PROGRESS REPORT - November 2006

The Breadfruit Institute achieved several key goals in recent months. We now have seven varieties in tissue culture, are sending 3,000 plantlets to farmers in Honduras, and have equipped the Field Station to support research on breadfruit.

Breadfruit Distribution First Project Underway

The Breadfruit Institute signed an agreement with Sustainable Harvest International (SHI) to ship 3,000 plantlets of five breadfruit varieties to small farmers in Honduras. An initial shipment of 200 plantlets will be sent in November, with the remainder to ship in early 2007. SHI is a not-for-profit organization specializing in introducing new plants and agricultural practices in Central America, with projects in Honduras, Belize, Nicaragua, and Panama. We are excited about this first partnership as SHI has worked with over 750 families, implementing alternatives to slash-and-burn farming, planting more than 1.9 million trees, and converting 5,000 acres to sustainable uses.

Meanwhile, a test shipment of plantlets was FedExed to NTBG from the University of Guelph (UOG) tissue culture laboratory. Four plastic growth boxes (5-6 plantlets each) came snugly packed in a small Styrofoam box. They arrived in two days after easily clearing customs and agricultural inspection. By comparison, root cuttings must be quarantined in a nursery in Hawaii for two years after delivery. Following Dr. Murch's written guidelines, the plantlets were transferred into the greenhouse to familiarize Institute staff with the process involved in shipping, handling, and growing breadfruit plantlets. Each step of the process was photographed for a planting guide that will be translated into Spanish for the Honduran project. Informational materials about growing and using breadfruit are also being prepared.

New Publications About Breadfruit

Ragone, D. and C. G. Cavaletto. 2006. Sensory evaluation and nutritional composition of 20 breadfruit (*Artocarpus*, Moraceae) cultivars. *Economic Botany* 60: 335-346.

Ragone, D. 2006. *Artocarpus altilis*. In: Elevitch, C.R. (ed.). pp. 85-100. *Traditional Trees of Pacific Islands: Their Culture, Environment, and Use*. Permanent Agriculture Resources (PAR), Holualoa, Hawaii.

Ragone, D. 2006. *Artocarpus camansi*. pp. 101-126. *Traditional Trees of Pacific Islands.*

Ragone, D. and H. Manner. 2006. *Artocarpus mariannensis*. pp. 127-138. *Traditional Trees of Pacific Islands.*

Vital Work Begins at Field Station

Research activities commenced at the recently equipped laboratory of the Breadfruit Institute Field Station. The facility was the base for a 2-week project headed by a Ian Cole, a graduate student from Dr. Murch's program, and a former NTBG intern. Close to 300 specimens were shipped to the labs at the University of British Columbia and UOG, where they will be re-cultured and multiplied for research, conservation, and distribution. Shoot tips and leaves from 20 selected varieties were collected, cleaned, and placed in tubes of specialized media. Samples were also collected from other trees (ones in poor health, varieties rare in their home countries, or varieties with the potential for salinity tolerance), furthering our long-term goal to have the entire collection conserved *in vitro*. Finally, trees were pruned and sprayed with liquid fertilizer to initiate bud growth for future collection. This work is critical to the long-term survival of the collection.

Global Conservation Strategy to Preserve Breadfruit

Dr. Ragone is working closely with the Secretariat of the Pacific Community (SPC) to develop a global conservation strategy for breadfruit, one of 35 crops judged important for food security by the international community (International Treaty on Plant Genetic Resources for Food and Agriculture). An extensive questionnaire has been sent to breadfruit collection curators worldwide. Plans for developing this conservation strategy will also include discussions between managers of plant genetic resources and other experts from developing and developed countries. The Global Crop Diversity Trust (www.croptrust.org) is as an essential element of the funding strategy of the Treaty and it has commissioned SPC to coordinate the breadfruit strategy. Conservation strategies for 20 crops are in varying stages of progress; when completed they will be used to guide funding decisions of the Trust.

Breadfruit Promoted at Maui Fair

The Breadfruit Institute took breadfruit on the road by participating in the 84th Maui County Fair held September 28-30 and October 1. The fair is one of the most popular events on Maui and organizers expected more than 92,000 people to attend. The Maui County Farm Bureau helped coordinate the extensive horticultural displays and exhibits that included orchids, tropical fruits and vegetables, flower arrangements, and more.

The Institute's booth included several distinctive varieties of live trees as well as samples of fruits and leaves. Displays and printed materials illustrating BFI activities and resources were presented. Cooking demonstrations were held daily.

Seeing and tasting breadfruit was a first-time experience for many of the hundreds of visitors to the booth, including those from the U.S. mainland. Some island residents were unfamiliar with how to grow and use this versatile fruit and indicated they would like to eat more breadfruit. They were interested in the many recipes compiled from our Breadfruit Cookoffs. They also expressed great interest in learning how to grow the trees. The Breadfruit Institute will continue participating in local fairs and other events to improve local understanding and appreciation of breadfruit.

BREADFRUIT INSTITUTE

PROGRESS REPORT - JANUARY 2006

The Breadfruit Institute achieved several key goals in recent months. We completed 10 years of research on seasonality, constructed a Field Station, and began global networking with countries most likely to benefit from our research and experience.

Tissue Culture Project

Kahanu Garden was a hub of activity for visiting scientists who are working to develop effective, simple methods to propagate breadfruit plants using tissue culture. This international program involves the Breadfruit Institute, the University of British Columbia and the University of Guelph in Canada, and the Regional Germplasm Centre in Fiji. The goal is to conserve plants in tissue culture and mass produce varieties for distribution to tropical countries that need a sustainable food supply. Our collaborators, Valerie Tuia, Dr. Susan Murch, Dr. Praveen Saxena, and Wendy Lei Shi diligently collected hundreds of buds from 20 varieties to establish shoot cultures in their respective facilities. Our collaborators enjoyed getting out of their labs and working amongst the breadfruit trees. They were very excited about the Field Station—just a framed structure at that point—and using it to advance this important research work.

Distribution Network

To complement the tissue culture initiative, the Institute is working to establish a network for distributing breadfruit varieties and to provide technical support needed to grow and use breadfruit. In October, Dr. Ragone and General Counsel Michael Shea met with staff at the USDA Agricultural Research Service, the World Bank, the U.S. Agency for International Development, the Partnership to End Hunger and Poverty in Africa, and the embassies for both Madagascar and Ghana, to introduce the work of the Breadfruit Institute. An enquiry letter and the case statement were mailed to ambassadors from 70 nations in Africa, Asia, Central and South America, and the Caribbean, where breadfruit currently grows or could be grown. We are requesting their advice and assistance in collaborative partnerships with the Ministry of Agriculture, research organizations, NGOs, and communities in their countries to establish plantings where selected breadfruit varieties can be tested under local conditions to develop more sustainable agriculture, increase crop diversity, and enhance food security.

Field Station Completed

The Field Station will be used to support research and education activities related to the Breadfruit Collection, providing office, laboratory, and work space for research staff, interns, visiting scientists, and others interested in studying breadfruit. It will allow us to expand the scope of research on the Collection and provide a convenient venue for workshops. Most importantly, it provides the Institute with a visible and attractive physical presence at the site and establishes Kahanu Garden as the world's center for breadfruit conservation and research.

The station is a 24' x 24' structure with half of the space designed as a secure, enclosed building, housing a field laboratory and office. The other half is more open with extensive screened windows to take advantage of natural light and air circulation and to exclude mosquitoes. It will contain ample work counters and other items needed to handle fresh fruit and other plant materials. Construction of the station commenced in August with the pouring of the foundation. We are excited that the building is now completed and research activities can relocate from the equipment shed. After final inspection the Field Station will be ready for use in February 2006.

Ten Years of Seasonality Research Finished

Knowing the bearing season of different breadfruit varieties is key to selecting and planting the right trees to have an extended, or even year-round, availability of fruit. This long-term research project ended in mid-January. Data collection involved carefully examining 200 breadfruit trees every two weeks; recording the presence or absence of male flowers and five stages of fruit development. Estimates of total yield and number of mature, harvestable fruit were also recorded. All data were recorded using a field data sheet and have been entered into a computer. The next step is analysis and interpretation of a massive data set. This work certainly involved patience and perseverance. Some of the trees are more than 60 feet tall, and binoculars were needed to look at the upper branches. Regular and careful examination of the Breadfruit Collection allowed the Research Technician to become familiar with each and every tree, following the rhythms of production, and being aware of any problems with the trees, such as broken branches or need for fertilizer. An important use of this information is to put together a fruiting calendar for each variety which will help people choose varieties that have the best potential for their growing conditions.

Other News

Speaking of calendars, the theme of the International Plant Genetic Resources Institute's (IPGRI) 2006 calendar is 'Diversity for Nutrition: Making the most of Neglected Species.' Breadfruit is featured in June, with a smiling Leimana Naihe, the brother of Keala Ahuna, manager of the visitors program at Kahanu Garden.

Christy Taylor-Parsil joined the staff of the Breadfruit Institute as Assistant to the Director. Christy moved to Kaua`i from Arizona in 2001 and she and her husband Bruce have been active volunteers at NTBG, helping out in the Horticulture Center, Library, and Development Department. With her extensive background in library, legal, medical, and academic settings, she brings a wealth of organizational skills to the Institute.