

NATIONAL TROPICAL BOTANICAL GARDEN

Breadfruit Institute

GLOBAL HUNGER INITIATIVE

EXECUTIVE SUMMARY

The Breadfruit Institute at the National Tropical Botanical Garden, Hawai'i, is engaged in an initiative to expanding plantings of good quality breadfruit varieties in tropical regions. The institute's founder and director is Diane Ragone, PhD. The institute manages the world's largest collection of breadfruit, conserving over 120 varieties. The Breadfruit Institute has developed effective methods to propagate and distribute millions of plants of productive nutrient-rich varieties. This initiative aims to disseminate breadfruit plants to alleviate hunger and support sustainable agriculture, agroforestry, and reforestation in the tropics. The Breadfruit Institute is seeking partners to help fund this work and help distribute trees to farmers.

Imagine a 'tree of bread' so prolific: *"If a man plant ten breadfruit trees in his life, which he can do in about an hour, he would completely fulfil his duty to his own as well as future generations."* Joseph Banks, 1769

PROBLEM/NEED

There is a global demand for breadfruit. The global food crisis and access to sustainable, nutritious food are major 21st century issues. More than 80% of the world's hungry live in tropical and subtropical regions, including 180 million people in Sub-Saharan Africa and 53 million in Latin America and the Caribbean. Facing soaring food, fuel, and fertilizer costs, farmers in the tropics need sustainable, low input, nutritious crops. Many countries, with a total population of over 2 billion people, have ecological conditions suitable for cultivating breadfruit. Lack of access to planting material of good quality breadfruit varieties has been a major impediment to cultivation and use of this crop. Agriculture Departments, NGOs, tree planting groups, farmers and others in close to 50 countries have requested breadfruit varieties from the Breadfruit Institute.

WHY BREADFRUIT?

This 'tree of bread' has the potential to play a significant role in alleviating hunger in the tropics. The nutritious starchy fruit is a good source of carbohydrates and fiber, and rich in iron, calcium, potassium and fiber. Some varieties are good sources of anti-oxidants, carotenoids, thiamine, and niacin. The fruit is prepared and eaten at all stages of development. It is roasted, baked, boiled, fried, pickled, fermented, frozen, mashed into a puree for infants, and dried and ground into meal or flour. Breadfruit flour is gluten free and can contain up to 7.6% protein. The ripe fruit can be eaten raw and used in desserts. 'Breadnut' is grown for its nutritious seeds which contain 13-20% protein, 6-29% fat, and are a good source of potassium, calcium, and niacin. Seeds are roasted, boiled, or ground into flour.

The trees require little attention or care, producing an abundance of fruit with minimal inputs of labor or materials. Crop yields are superior to other starchy staples. An average-sized tree will readily produce 100-200 fruit (100-200 kg) per year. Yields of 400-600 fruit have been recorded for larger trees. A similar sized plot of land planted in plantains, root and tuber crops will produce less food with greater inputs. Conservative estimates predict that a 1 hectare orchard with 100 breadfruit trees would produce 20 tonnes of fruit, approximately 6 t/ha of dry matter. This is higher than the global average yields for corn (4 t), rice, (4.1 t) or wheat (2.6 t).

Breadfruit contributes to sustainable agriculture and agroforestry, improves soil conditions and watersheds, and provides food security. The trees are easy to grow in a wide range of ecological conditions and offer bountiful yields. They begin bearing in three to five years and are productive for many decades. Breadfruit tree planting projects will provide valuable environmental benefits and afford an excellent opportunity for carbon credits or offsets, reducing CO₂.

THE BREADFRUIT INSTITUTE

The National Tropical Botanical Garden, a private, not-for-profit organization established the Breadfruit Institute (www.breadfruit.org) in 2003 to promote the conservation and use of breadfruit for food and reforestation. The institute is headed by Diane Ragone PhD, who has engaged in collecting, conserving, and studying breadfruit varieties for 27 years. The institute manages the world's largest collection of breadfruit, conserving over 120 varieties from 34 Pacific islands, the Philippines, the Seychelles, and Indonesia including some varieties that have disappeared in their native lands. Pioneering research on this unique global resource has shown that year-round production of breadfruit is possible. We have studied yields and nutrient composition, and identified nutrient-rich highly productive varieties. A searchable web-based database of the collection, with photographs and detailed information for over 100 varieties, is available at www.ntbg.org/breadfruit/collection.

Under the co-direction of Dr. Diane Ragone, Director, the Breadfruit Institute, and Dr. Susan J. Murch, Canada Research Chair in Natural Products Chemistry, University of British Columbia Okanagan, we have successfully developed innovative methods to propagate breadfruit. Breadfruit is clonally propagated using root shoots or root cuttings. This method is inefficient and impractical for worldwide distribution of trees. Using micropropagation technology we can now produce healthy, vigorous, disease-free plants. This ground-breaking research makes large-scale production of breadfruit plants possible. Breadfruit-based agriculture and agroforestry can now be viable in ways previously beyond reach.

GLOBAL DISTRIBUTION PARTNERSHIPS

Strategic partnerships are key to realizing breadfruit's global potential. The Breadfruit Institute is working with NGOs on pilot projects to plant new breadfruit varieties in Honduras, Jamaica, and Haiti. The institute is a member of the Alliance to End Hunger, a coalition of 90 corporations, non-profit organizations, universities, individuals, and religious groups, working together to create real change for hungry people. In August 2008, NTBG and the Government of Samoa entered into a Memorandum of Understanding (MOU) allowing NTBG to distribute three Samoan breadfruit varieties globally through a horticultural partner, Cultivaris LLC. This agreement is a model for MOU with the countries of origin for breadfruit varieties at NTBG. These benefit-sharing arrangements will support agricultural development and capacity building in the Pacific, helping perpetuate traditional crop varieties and cultural knowledge.

Cultivaris (www.globalbreadfruit.com) is an innovative horticultural company with extensive experience in marketing, producing, and distributing plants globally. They have developed a commercial system that allows global distribution of breadfruit plants in a way that substantially improves the success rate of past efforts. Methods are now in place to grow and ship healthy, vigorous young breadfruit plants that will mature quickly and easily into productive trees. It is now possible to produce and distribute millions of breadfruit plants, as needed.

At this critical time of global food security issues, this exciting partnership between researchers, government, and the private sector now makes widespread cultivation and use of breadfruit for food and reforestation feasible. This initiative can alleviate hunger, provide long-term food security, and enhance the livelihoods of farmers in the tropics.

For information on how to support or become involved in this important initiative:

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