Tropical HTIRC: A collaborative research, development and extension/education center for tropical hardwood stewardship.

Vision Statement: We are the internationally recognized leader in sustainable production, protection, and utilization of tropical hardwoods.

Mission: The mission of the Tropical HTIRC is to advance the science of tropical hardwood tree improvement, utilization, conservation genetics and genomics, protection, and regeneration by:
- Developing and disseminating knowledge on improved and elite tropical hardwood tree species and germplasm for sustainable production of forest products;
- Improving tropical hardwood tree lines for restoration, maintenance of genetically diverse ecosystems, and the goods and services that they provide;
- Increasing knowledge and developing systems for nursery production and plantation establishment;
- Increasing knowledge and developing strategies for conservation, restoration, utilization and marketing of tropical hardwood resources.

Tropical HTIRC Strategic Directions for 2011-2016
1. Improve the genetic quality and regeneration techniques of tropical hardwoods, especially Acacia koa, through application of classical breeding and selection, genomics, molecular markers, advanced propagation and seed production technologies, and silviculture.
2. Develop a highly credible tropical hardwood research center that will be an internationally recognized tropical tree improvement and regeneration leader and, thereby, become a leading graduate education and training facility for future scientific leaders in tropical hardwood research throughout the Pacific.
3. Hire and nurture pre-eminent scientists who will build the credibility of the research program, be highly competitive for federal research grants, and become future leaders of the Tropical HTIRC.
4. Establish important, next generation native species trials and nursery production systems (e.g., on the Hawai‘i Experimental Tropical Forest) for education and training of consultant and industrial foresters, nursery practitioners, conservation biologists, and public and private landowners.
5. Communicate, convey, and market the work of the Tropical HTIRC as the international leader in hardwood research, development and extension.

Partners
USDA Forest Service:
Northern Research Station
Pacific Southwest Research Station
Region 5
Region 6
Purdue University
University of Hawai‘i at Mānoa
University of Hawai‘i at Hilo
American Forest Management
State of Hawai‘i Department of Hawaiian Home Lands
Forest Solutions
Forestry Management Consultants
Future Forests Nursery, LLC
State of Hawai‘i Division of Forestry and Wildlife
Hawai‘i Agricultural Research Center
Hawai‘i Forest Industry Association
Natural Resources Conservation Service
The Nature Conservancy

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Our focus is to serve the needs of Hawai‘i, the U.S. affiliated Pacific Islands, and Tropical Pacific nations utilizing research and application.
Problem

Tropical tree improvement and regeneration lags behind that of temperate regions, despite the global importance of tropical biodiversity, tropical timber production, and the growing need for large-scale approaches to restoration.

Need

There is a growing need for an expanded capacity in tropical hardwood tree improvement and regeneration to serve the needs of Hawai‘i, the U.S. Affiliated Pacific Islands, and Tropical Pacific nations. Beginning in Hawai‘i, a program would address the following needs:

(i) the restoration or rehabilitation of currently degraded sites with improved Acacia koa material, and material from a select group of tree species native to Hawai‘i; (ii) expanded reintroduction of improved koa into fire prone and/or invaded areas; (iii) expanded supplies of improved koa materials for restoration planting with improved disease resistance, growth rates, and canopy attributes; (iv) provision of technical assistance to private sector efforts for developing improved koa materials; (v) the building of partnerships and or cooperatives dedicated to this species; (vi) development of new sources of koa for planting at low elevations, and improved materials for mid and high elevation sources; and (vii) creation of new regeneration techniques to enhance nursery practices and the deployment of new materials across Hawai‘i.

In the future, we also will address improvement needs for a broader suite of species to meet the tree improvement needs of the Pacific Region, including the U.S. Affiliated Pacific Islands and southeast Asia. There are tremendous opportunities for a Hawai‘i-based tree improvement and regeneration program—for conservation and restoration but also commercial forestry applications.

Background

A workshop, “Emerging silvicultural technologies for Acacia koa restoration” was conducted in Hilo, Hawai‘i, March 3-4, 2010. The workshop identified key land-use issues contributing to the need for hardwood tree improvement and regeneration: (i) conversion of low elevation forests for crops and higher elevation forests for livestock grazing; (ii) overharvesting of koa timber with little sustainable management; and (iii) forest degradation by exotic plants and animals. Despite current conditions, opportunities to restore koa forests and the ecosystem services that those forests would provide exist because of decreased economic viability of cattle production; marginal economic viability of low value forestry operations in low elevations; and high ecological, cultural and economic value of restored native forests. In October of 2010, a second workshop in Hilo was held to formally establish the Tropical HTIRC and identify major goals for the first years of activity.

Regeneration Objectives

Broad regeneration needs exist for nearly all native tree species of Hawai‘i and the U.S. affiliated Pacific Islands. The Tropical HTIRC seeks to identify those species with maximum potential impacts on restoration, conservation and/or commercial objectives. Government incentives, both federal and state, will be sought to encourage conservation plantings while plantings for timber have the ability to be profitable on their own if planted and managed appropriately.

Recommendations

1. Develop stable funding for cost-share programs and possibly work with Non-Governmental Organizations (NGOs) to increase public support.
2. Enhance current tree improvement efforts through the formation of a regional koa hardwood cooperative to expand nursery and tree improvement research and development.
3. Facilitate information exchange by convening the same workshop participants and other interested parties for workshops and field tours.
4. Develop regional advocacy for hardwood regeneration and management.

Research, Development and Extension Needs

Genetics and Tree Improvement

1. Expand investigations of the genetic diversity of koa populations and koa progeny trials, as well as for other native species using both traditional and molecular tools
2. Develop seed zones to guide utilization of native seed and seedlings for restoration and forestry applications
3. Develop seed certification standards
4. Use molecular tools to identify economically and ecologically important traits
5. Breed koa and other native species for genetic improvement traits such as form, growth, yield, branch angle, wood quality, disease resistance and crown architecture
6. Develop vegetative propagation techniques for elite clones of koa and other species
7. Provide koa research on stresses such as cold hardiness and wilt resistance

Nursery Production

1. Increase native species seed availability, especially for koa, through expanded seed orchards across Hawai‘i
2. Develop seedling quality standards and improved nursery production methodologies
3. Transfer information and technical expertise on nursery management among users

Field Establishment and Silviculture

1. Develop site selection guidelines
2. Link nursery practices with field performance
3. Expand understanding of site preparation requirements, especially for degraded sites
4. Expand understanding of control measures for vegetation competition
5. Expand understanding of nutrition requirements