

International Forestry Working Group Newsletter

Working Group B3

March – 2020

Volume: 8

Issue: 1



Society of American Foresters

International Society of Tropical Foresters

Pacific Island Tree Nursery Workshop Held in Guam

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The USDA Forest Service State and Private Forestry (S&PF) Program provides support to forestry programs in the American-affiliated Pacific Islands. Within S&PF, the Reforestation, Nurseries, and Genetics (RNGR) Team provides technical expertise to forestry and conservation nurseries throughout the United States and its affiliated islands. This includes consultation and assistance via onsite visits, phone, and email; production of online and printed resources; and organization of technical workshops, conferences, and meetings.

In 2019, Diane Haase (RNGR's Western Nursery Specialist), J.B. Friday (Extension Forester, University of Hawaii), and Katie Friday (SPF's Forest Stewardship Program Manager for Forest Service Region 5) organized a workshop for Pacific Island foresters and nursery managers. The workshop was held July 31 through August 2 at the University of Guam. Participants attended from eight Pacific islands: Guam, Palau, Yap, Chuuk, Pohnpei, Rota, Saipan, and the Marshalls.

The nursery workshop was designed to help nurseries produce healthy seedlings for watershed protection, native forest restoration, agroforestry, riparian/coastal land stabilization, and urban beautification. Topics covered in the workshop were aimed toward assisting nurseries with meeting short- and long-term goals for environmental, economic, and social benefits. Each attendee received a copy of *Tropical Nursery Manual: A Guide to Starting and Operating a Nursery for Native and Traditional Plants* (Wilkinson KM, Landis TD, Haase DL, Daley BF, Dumroese RK, eds. 2014. Agriculture Handbook 732. Washington, DC: U.S. Department of Agriculture, Forest Service. 376 p.; available online at <https://rngr.net/publications/tropical-nursery-manual>).

The group discussed nursery mission and needs and developed a sample matrix that can be used as a tool for determining the appropriate plant species to grow in a given nursery based on its intended use (e.g., shade, erosion control, cultural products, etc.) and the conditions of the designated out planting site (e.g., savanna, forest, urban, coastal, etc.). This exercise helps nursery growers and land managers to make decisions based on the Target

Plant Concept. Determining the target plant is based on project objectives, limiting site factors, nursery stocktype, genetic source, and planting window. The quality of the seedling depends on how well it performs at the planting site. Thus, it is important to select the right plant (size, species, genetics) for the specific site conditions.

Over the three days, the workshop included a comprehensive overview of nursery operations. Specific topics covered included nursery design and environment; seed collection, processing, and storage; containers; growing media; plant propagation and culturing techniques; seedling quality and outplanting; planting in degraded soils; integrated pest management (IPM) – invasive species, pests, and diseases; and record keeping and project evaluation. In addition, local experts were brought in to give presentations. Jim McConnell (University of Guam) and his staff spoke on the Guam Plant Extinction Prevention Program (GPEPP); Christine Fejeran from Guam Forestry spoke on protecting trees from wildfires, and Roland Quitugua from the University of Guam spoke on the coconut rhinoceros beetle and little fire ant.

In addition to classroom presentations and discussion, participants visited the GPEPP rare plant nursery and the Guam Forestry nursery. These visits gave an opportunity for onsite discussions about nursery design (ventilation, irrigation system, resistance to hurricane damage, shading, etc.) and daily operations (selection of growing medium, fertilization, containers, pest management, etc.). The group also visited restoration, agroforestry, and urban planting sites on island where they reviewed results of research projects and discussed various strategies to optimize field growth and survival given challenges at each planting site (erosion, poor soil nutrition, fire, etc.)

At the conclusion of the workshop, participants generated goals for their respective islands based on material learned in the workshop and the specific needs for their nursery and outplanting programs. More information about RNGR and many resources for tropical nursery production are available at: <https://rngr.net/>.

Workshop Photos



Figure 1. The nursery workshop was held at the University of Guam and included classroom presentations and discussions on a wide range of topics.



Figure 2. The workshop included a visit to Guam Forestry's nursery for hands-on evaluation of nursery operations.



Figure 3. Dr. J. B. Friday discusses container types and seedling root development with workshop participants.



Figure 4. Nursery workshop participants visited an urban park where seedlings from the Guam Forestry nursery had been planted.