

Fellowship report

Developing a tree breeding program for Cameroon

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TIMBER EXPLOITATION in Cameroon takes place exclusively in the natural forest. Logging is selective and concentrated on a few species. The timber species *Triplochiton scleroxylon* (ayous), *Entandrophragma cylindricum* (sapelli) and *Lophira alata* (azobe) account for about 60% of current wood exports, leading to forest degradation and loss of genetic resources. The uncertainty of seed production and the slow process of natural regeneration of these species make it necessary to develop techniques for their mass propagation while maintaining desired quality timber. Such techniques can help to preserve genetic resources and meet local and international timber demand.

As tree improvement techniques are not well developed in Cameroon, ITTO support was sought through the Fellowship Program to undertake a customized short training course on tree improvement organized by the Forest Tree Breeding Center (FTBC), Japan. The training was aimed at acquiring skills for the development and mass production of improved planting stock for plantations, to ensure better quality forest products and to conserve genetic resources.

Tree breeding and propagation

In conventional tree breeding, trees with desirable phenotypic qualities are selected and tested to ensure that the qualities they exhibit are genetically determined. These elite trees are then used for mass production of seeds or vegetative propagules. When seed production is uncertain, vegetative propagation has been used in forestry as an alternative to ensure sufficient planting stock and the multiplication of desired genotypes for special uses such as in seed or breeding orchards.

The objectives of tree breeding focus on enhancing desirable qualities such as bole straightness; fast growth for characteristics like height, diameter and volume; high wood specific gravity and resistance to pests and unfavorable weather. Practical lessons on vegetative propagation techniques such as grafting, budding, cuttings and layering were carried out at the Iriomote Tropical Tree Breeding Center using tropical species like *Acacia auriculiformis*, *Paraserianthes falcataria*, *Tectona grandis* and *Eucalyptus urophylla*.

Grafting

Grafting is largely used to multiply desired genotypes. It has been used widely in forestry for clone preservation and seed orchard

establishment. Training focused on different techniques of treating and handling the root stock and scion stock plants before, during and after grafting, and also on how to set and protect the graft union to ensure success.

Cuttings

Cuttings are used to produce large quantities of planting materials of identical genotype. Training illustrated the various stages of setting cuttings from the establishment of a scion garden with improved material, to the process of hedging to ensure the availability of juvenile material.

Air layering

Layering leads to the generation of roots on intact branches by girdling. It is used to produce propagules for the establishment of seed orchards, thus avoiding graft incompatibility. It is sometimes used as an intermediate method to obtain roots for species with marginal success of producing rooted cuttings. Training on the process of setting air layers involved the identification of the appropriate branch, girdling, placement of rooting medium and the elimination of competitive branches.

Conclusion

The training received under this ITTO Fellowship award has helped to develop knowledge and skills to develop tree varieties with desired quality timber through selection. The various vegetative propagation methods will be of great importance in the mass production of improved planting material of tropical timber species for plantation establishment, and for the multiplication and preservation of desired clones. Current work in Cameroon is focusing on development of pest resistant varieties of vulnerable species like iroko and African mahogany for plantations as well as better conservation of tree genetic resources. Contacts are being maintained with the staff of FTBC who are providing on-going advice as a tree improvement program for Cameroon is developed and implemented.



Grafted: the author sets and ties a graft union in *Paraserianthes falcataria*. Photo: C.Osamu—FTBC Iriomote Tropical Tree Breeding Center