

BETTER TREES THROUGH BIOTECHNOLOGY:
A Modern Approach To Agroforestry

by

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ABSTRACT

The genetic improvement of woody species may greatly enhance the applicability of agroforestry, the ancient land use practice which addresses sustainable usage of land. "Biotechnology" as this modern science is broadly called, involves the genetic manipulation and/or clonal propagation of desired genes to rapidly produce superior clones of identical genetic constitution.

Application of biotechnology research to multi-purpose tree species is an especially appropriate means of addressing the needs of resource-poor farmers most dependent upon land of a marginal quality to meet their subsistence needs. To this end, biotechnology can rapidly propagate and generate tissue containing genes which code for desirable traits such as fast growth, nitrogen fixation, insect and disease resistance, and increased tolerance to adverse growth conditions such as frost, extreme pH levels, drought and flooding.

This paper explores the benefits of agroforestry itself as well as offers insights into the increased benefits that can be obtained from application of biotechnology. Among the issues that need to be explored to enable appropriate application of biotechnology is the improvement of basic knowledge regarding the genetic constitution and mechanism of multi-purpose tree species, increased exchange of information between private, public, and international research institutions, preservation of germplasm, and extension of agroforestry innovations to resource-poor farmers.

In order for such changes to occur, the direction of biotechnology research goals must first be redefined to include environmental sustainability as a guide to future research along with the currently prevailing profit-based motive. The first step in this direction requires international research institutions, funded by multilateral development institutions and foundations, to intensify their efforts. The implementation of this approach serves to not only expand the recent boom in agricultural, animal, and food biotechnology capabilities to the forestry sector, but more importantly provides an innovative response to the urgent need for marginal-land farmers to nourish the land as well as themselves.