

# THE ROLE OF ARBUSCULAR MYCORRHIZAL FUNGI (AMF) FOR ENHANCING TREES ESTABLISHMENT IN DEGRADED REFORESTATION SITES IN INDONESIA

Yadi Setiadi

Forest Biotechnology, Inter University Center for Biotechnology Bogor Agricultural University, Po. Box 01. Bogor 16001. INDONESIA

Drastic anthropic alternation of forest and soil cover due to deforestation activities has become a global environmental issue. Reforestation program to rehabilitate the degraded sites, therefore has become a major attention of the government and forest companies. This activities, however is not an easy task. Adverse edaphic and climatic condition and low soil microbial activities are the major constraints which limit the success rate of this activities. Re-planting of trees has been especially difficult and often results in low survival and poor growth.

To ensure trees establishment in such conditions, inoculation with effective and selective arbuscular mycorrhizal fungi on seeding of leguminous tree species in the nursery as well as in the field conditions has been attempted. The result shown that the growth performance and the survival percentage of mycorrhizal plants were consistently better than non-mycorrhizal plants. Inoculation with mixed AMF inoculum gave a greater responses than inoculation with a single fungus. Among plants tested, (i.e. *Paraserianthes falcataria*, *Acacia mangium*, *Pterocarpus sp*, *Prosopis sp*, *Enterolobium cyclocarpum* and *Sesbania grandiflora*) were highly responsive to inoculation with AMF. This implies that these trees may not grow well in reforestation sites unless inoculated with appropriate AMF.

The practical procedure for bulking up of mycorrhizal inoculum and method of raising colonized tree seeding in the nursery has been developed. The beneficial effect of mycorrhizal inoculation on promoting seedlings growth and increasing survival, enhancing tree establishment after transplanting in the field, reducing addition of fertilizer, and lowering the operation cost of reforestation management are discussed.