

Cocoa (*Theobroma Cacao* L.) And *Gliricidia Sepium* Root System For Water Availability On Agroforestry

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Abstract

Indonesia is the third largest producer of cocoa in the world. In generally, cocoa is cultivated using three different cropping systems Le (i) traditionally under the shade of selectively thinned forest, (ii) under planted shade trees such as *Gliricidia*, *Cocos nucifera* and (iii) unshaded trees conditions.

The objective of the research is to analyze the conductivity and root distribution of 6-year-old cocoa trees and *G.sepium*. Observations were done to learn about root conductivity and distribution. The reseach was conducted in O'o Village, South Kulawi District, Donggala Regency, which was around Lore Lindu National Park area, Central Sulawesi province, at 585 metres above sea level, and with a coordinate of 1.5524° North latitude and 120.0206° East longitude. The research was conducted from June 2006 to May 2008.

The result showed that cocoa root had low capacity in distributing water than that of *G. sepium*. Cocoa root were present to a depth of 150-160 cm, and the roots of *G. sepium* penetrated much deeper than those of cocoa, being present to a depth 275 cm. The different on root distribution and conductivity could be reducing competition for water and help to available water both cocoa and *G. sepium* tree.

Keywords: *Theobroma cacao*, *Gliricidia sepium*, root distribution, root conductivity

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INTRODUCTION

Cocoa is one of the commodities that its role is important enough for the national economy, especially as a provider of employment, sources of income and foreign exchange. In addition, cocoa is also a role in stimulating regional development and agro-industry development. In Indonesia, more cocoa trees planted by small farmers (87%), involving approximately 1,098,488 head of family farmers, the rest by the private sector (5%) and by BUMN (3%) (Damarjati 2005).

Starting in 2009 the government will undertake the Movement of Production and Quality Improvement at the National Cocoa nine provinces and in 40 districts. Movement is made until the year 2011 aims to accelerate the improvement of productivity and quality by

empowering national cocoa / involve optimally all potential stakeholders (*stakeholders*) of cocoa. Indonesia is the country's second largest cocoa producer in the world after the Ivory Coast, with a total area of 1,563,423 ha and produce 795 581 tons. Even though Indonesia is known as the country's largest cocoa producer in the world, but the productivity and quality is still very low. Average productivity is only 660 kg / ha, while the Ivory Coast productivity has reached 1.5 tons/ ha. Current level of productivity 660 kg / ha or decrease by approximately 40% of productivity has been achieved that is equal to 1100 kg / ha / yr. This means no loss of yield was 198 000 tons / year or equivalent to Rp 3.96 trillion. The main cause of low productivity and quality are due to pest and Cocoa Pod Borer (EAPs) and disease Vascular Streak Dieback (VSD) (<http://www.indonesia.go.id/id>).