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“Resilience of agricultural systems against crises”

Potential of *Crotalaria* spp. in the Agroecological Restoration of Fruit Orchards in the Soconusco, Chiapas, Mexico

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Abstract

Rambutan (*Nephelium lappaceum*) is a fruit tree from the Malaysian and Indonesian regions. It was introduced in the Soconusco, Chiapas, in the 1950's. The present cultivated area amounts to more than 1500 hectare. With increasing importance of this crop, the cultivation system is now facing increasing plant sanitary problems, substantial soil erosion and productivity issues, which are due to worsen in future by a lack of agro-ecological responsibility. From August 2006 until March 2007, the effects of different intercropping systems with rambutan and leguminous crops were compared. More particularly, the effects of *Crotalaria longirostrata* (Chipilin), *Crotalaria spectabilis* and *Vigna unguiculata* were evaluated in so far related to soil fertility, insects dynamics, leguminous biomass and rambutan fruit production within a typical rambutan orchard of the Soconusco, located at 15° 21' North latitude, 92° 33' West longitude and at 335 m asl. The results demonstrate that the legume enriched intercrops have a positive effect on the soil fertility and biomass production. By the same token, the *Crotalaria* spp. flowering time concurs with that of *Nephelium*, offering an additional attractive effect for insect pollinators and predators. The agro-ecological change in the fruit system was reflected by a superior rambutan fruit production of 5 719 kg ha⁻¹ in the intercropped *Crotalaria spectabilis* as compared to only 2 840 kg ha⁻¹ in the traditional rambutan cultivation (without legume). Finally, rambutan monoculture offers an extraordinary economic income of € 2 266 per hectare whereas € 5 840 per hectare were recorded for the different leguminous variants.

Keywords: Agro-ecology, intercrops, legumes, productivity, rambutan