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Labour Demand in Five Different Cocoa Production Systems in Bolivia

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Abstract

Cocoa cropping systems vary from full-sun monocrops to highly diversified agroforestry systems, which combine the cocoa production with by-crop such as bananas or plantains and trees with different functions. Additionally, these systems can be organically or conventionally managed. Although labour demand is one of the main activities contributing to the total production costs of the plantations and it may highly differ between production systems, there are still scarce data and information available.

In this study we present the labour demands of five different production systems in a newly established cocoa plantation in Alto Beni, Bolivia. The trial was established in 2008 within the framework of the SysCom programme (www.systems-comparison.fibl.org) and comprises monoculture and agroforestry systems under organic and conventional management and one successional agroforestry system with organic management, each one replicated four times. From 2009 to 2013, the establishment phase of the plantation, the time spent in all the farming activities, mainly weeding, pruning, harvesting and fertilising was recorded separately for each plot.

Overall, total labour demand was higher in the successional and agroforestry systems compared with the monocultures, mainly due to the time devoted to the management of the multifunctional trees and by crops. However, no significant differences were found between organic and conventional management under both agroforestry and monoculture systems. On the contrary, the time needed for pruning the cocoa trees was higher in the monocultures. Similarly, the time spent in cocoa harvesting was also higher in the monocultures, especially under conventional management, which well correspond to the yield obtained. Weeding was high time demanding the first years of the plantation but decreased with the time. However, no differences between the monoculture and agroforestry systems and between the organic and conventional management were found.

An economic analysis of the gross margins for each system at plot level, including the input costs (herbicides, fertilisers, etc.) and the associated cost for their preparation (e.g. compost preparation), and the income generated from the harvested produces (cocoa, banana, plantain and other by-crops out of the highly diversified system) is under evaluation.

Keywords: Agroforestry, monoculture, organic farming, profitability, working time