



Tropentag, September 15-17, 2021, hybrid conference

“Towards shifting paradigms in agriculture
for a healthy and sustainable future”

The Role of Shade Tree Pruning in Cocoa Agroforestry Systems: Agronomic and Economic Benefits

LAURA ESCHE¹, MONIKA SCHNEIDER¹, JOHANNA RÜEGG¹, JOACHIM MILZ², ULF
SCHNEIDEWIND², LAURA ARMENGOT¹

¹Research Institute of Organic Agriculture (FiBL), International Cooperation, Switzerland

²ECOTOP, Bolivia

Abstract

Cocoa (*Theobroma cacao*) is commonly produced in full-sun monoculture cropping systems to increase yields in the short term. Nevertheless, cocoa is a suitable crop for production under shaded conditions and is traditionally cultivated in agroforestry systems in Latin America. To ensure productivity and profitability, however, the development of best practices for shade management is crucial, but shade tree pruning is not commonly practised.

This study investigates the influence of pruning shade trees in cocoa-based organic agroforestry systems in Bolivia on agronomic and economic performance. Four organic agroforestry farms were selected, where shade trees were not pruned for at least 10 years. At each site, half of the plot was kept unpruned and the other half was pruned, while all other management practices were kept equal. Data on yield formation were collected subsequently for two harvesting seasons.

The trial results show a significant increase in cocoa yield under pruning conditions ranging from 28 % to 82 % compared to unpruned plots. This is attributed to an increase in flowering and fruit set in pruned plots. No differences in the incidence of pests and diseases in the pods were found between both treatments.

To evaluate, whether pruning shows an economic benefit for farmers, different scenarios of yield increase based on the minimum, average, and maximum yield of local cocoa producers were used. Other sources of income, such as by-crops, were not considered in the calculations. For the average yield level of 287.4 kg ha⁻¹ (dry), an increase of 51 % in two consecutive years will cover the pruning costs.

Despite the promising results and indication, that the yield increase will last for more than two years, the initial costs for pruning might still discourage farmers. Therefore, financing programs for farmers that support agroforestry tree pruning are necessary to increase both cocoa production and farmer's income.

More information on the project can be found here: <https://systems-comparison.fibl.org>

Keywords: Agroforestry, Bolivia, cocoa, Pruning