



Tropentag, September 15-17, 2021, hybrid conference

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

## Economic Performance of Five Different Cacao Production Systems

JOHANNA RÜEGG<sup>1</sup>, LAURA ARMENGOT<sup>1</sup>, JOACHIM MILZ<sup>2</sup>, ULF SCHNEIDEWIND<sup>2</sup>, MONIKA SCHNEIDER<sup>1</sup>

<sup>1</sup>Research Institute of Organic Agriculture (FiBL), International Cooperation, Switzerland

<sup>2</sup>Ecotop, Bolivia

### Abstract

Agroforestry systems for cocoa production are commonly promoted for biodiversity conservation, climate change mitigation and adaptation as well as for food security and risk mitigation. Generally, these systems include timber, legume or fruit trees, and sometimes additional crops. Knowledge gaps exist about the economic performance of cocoa based agroforestry systems, including the by-crops.

Here we present the economic performance of 5 cocoa production systems from planting to entering the mature stage (11 years). In a long-term trial in Bolivia, a gradient of complexity from monocultures, agroforestry systems to successional agroforestry systems (SAFS) is studied. Additionally, for monocultures and agroforestry, conventional and organic management are compared, while SAFS are managed organically. Income was calculated taking into account yields of cocoa, fruit trees and by-crops with farm gate prices. Only for cocoa organic premium prices were reached and taken into account. Labour time was registered for management, input preparation and post-harvest.

Cocoa yields were lower in the agroforestry systems compared with monocultures, and lowest in SAFS. For monocultures, they were higher under conventional management, while in agroforestry systems management had no influence. Total system yields in agroforestry systems (dry matter) were 3–4 times higher than in monocultures. This was mainly due to banana production in agroforestry systems and from a diversity of by-crops in SAFS.

Income over all years was comparable among all systems. In agroforestry systems, cocoa was responsible for more than 50 % of the income, while in SAFS the share of cocoa was smaller, as some crops like pineapples or peach palm had good markets in the region. The income generated per workday invested during the whole period did not differ between the systems.

Income analysis shows the importance of cocoa as a cash crop, but also the potential of by-crops depending on the development of their markets. On the other hand, agroforestry systems contribute to food security and mitigate risks of price or yield fluctuations in the cash crop. In conclusion, the data show that with different strategies and plantation design, the same level of income and income per work day invested can be reached.

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

**Keywords:** Agroforestry, cocoa, diversification, economic, income, organic, systems comparison, *Theobroma cacao*

---

**Contact Address:** Johanna Rüegg, Research Institute of Organic Agriculture (FiBL), International Cooperation, Ackerstrasse 113, 5070 Frick, Switzerland, e-mail: [johanna.rueegg@fibl.org](mailto:johanna.rueegg@fibl.org)