

# Economic profitability of organic vs. conventional cotton-based production systems in a long-term field trial in India

## Background

- Developing sustainable farming systems on large scale is very important for sustainable development of global agriculture (IAASTD, 2009).
- Scientific results about organic vs. conventional agriculture in the tropics are sparse.

## Objective

- To assess productivity and profitability of cotton-based production systems under organic and conventional management in central India.

## Material and methods

- Semi-arid climate zone
- Vertisol soil, Madhya Pradesh, India (Fig. 1)
- Time: 2007-2010 (conversion phase)
- Agronomic and economic data (plot level)
- Crop rotation (2 years): Cotton-soybean-wheat under biodynamic, organic and conventional (with/without Bt cotton) management (Fig. 2)



Figure 1: View of the farming systems comparison trial.

## Results

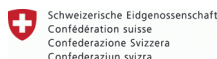
- 7 %–15 % lower yield for all organically produced crops compared to conventional systems (Fig. 3).
- Lower production costs in organic systems, therefore similar gross margins in all systems (Fig. 4).

## Conclusions

- Organic cotton production systems can produce high yields at low inputs of fertilizer and capital.
- Crucial factors for the economic profitability have to be considered such as access to knowledge and organic inputs (fertilizers, pesticides, non-GM seeds), existing market demand and certification system have to be considered.

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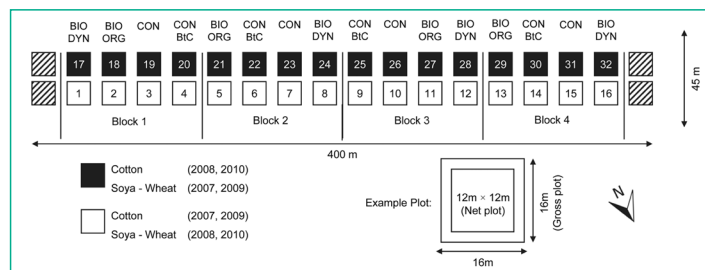


Figure 2: Experimental design of the farming systems comparison trial. Farming systems: biodynamic (BIODYN), organic (BIOORG), conventional (CON), conventional with Bt cotton (CONBTc).

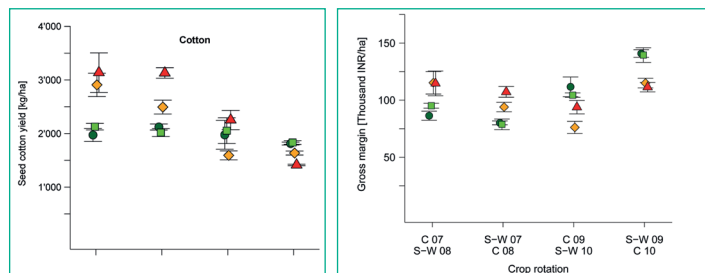
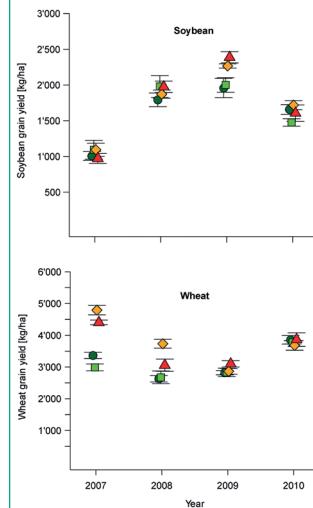


Figure 4: Gross margins of four crop rotations. C = cotton, S-W = soybean-wheat.



Farming systems:  
● biodynamic (BIODYN),  
■ organic (BIOORG),  
◆ conventional (CON),  
▲ conventional with Bt cotton (CONBTc).

Figure 3: Yield 2007-2010 in cotton, soybean and wheat.

## Literature

IAASTD (2009) International assessment of agricultural knowledge, science and technology for development (IAASTD): Executive summary of the synthesis report. Washington, DC: Island Press. 606 p.  
Forster D, Andres C, Verma R, Zundel C, Messmer MM, Mäder P (2013) Yield and Economic Performance of Organic and Conventional Cotton-based Farming Systems – Results from a Field Trial in India. PLoS One (submitted).

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