



Media release

Long-term trial in India shows: Organic Cotton is competitive with GM crops

Organic cotton shows lower yields than genetically modified (GM) *Bt* cotton. Nevertheless, the lower production costs render the production of organic cotton feasible. The result, however, strongly depends on the environmental conditions, mainly the weather. These conclusions emerge from a long-term experiment in India, carried out by a team of experts of the Research Institute of Organic Agriculture (FiBL) in collaboration with bioRe Association, the local farmers' umbrella organization. The results of this study have now been published in the online journal PLOS ONE.

(Frick, December 5, 2013) Cotton, the most important fiber plant for the production of textiles, is one of the most intensive crops worldwide in terms of pesticide use and irrigation. Against this backdrop, the genetically modified *Bt* cotton was developed. *Bt* cotton is supposed to give protection against cotton bollworm, the most important pest of cotton. In India, *Bt* cotton is mostly grown by smallholders on a total of more than 99 percent of the cotton growing area. Compared to this, the production of organic cotton is vanishingly small; according to FiBL-statistics the volume is 0.6 percent of the whole cotton production in India. But how productive and profitable is organic cotton production in India really? Since 2007, FiBL researchers are addressing this question in a unique research program: the long-term systems comparison in the tropics (see below).

Yields 14 percent lower, production costs 38 percent lower

The long-term trial in India has shown that organic cotton production can be profitable despite lower yields. In the observation period 2007-2010, organic cotton yields were on average 14 percent lower compared to conventional cotton. However, in economic terms organic systems were on par with conventional ones: after deduction of the 38 percent lower production costs, the organic farmer has as much in his pocket as his conventional counterpart. Thus organic cotton can be produced with less capital input which may reduce the dependence on loans and the risk of debt. Conventional cotton is more expensive to produce due to higher costs for chemical fertilizers, pesticides and GM seeds.

EXCELLENCE FOR SUSTAINABILITY

Das FiBL hat Standorte in der Schweiz, Deutschland und Österreich
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In order to produce cotton sustainably, the crop is not cultivated every year on the same land, but is followed by soybean and wheat in a two-year crop rotation. The results show, that the yields of soybean and wheat were 7 and 15 percent lower in the organic production systems. In turn, the production costs were lower by 66 and 49 percent, which led to comparable (wheat) or even slightly higher (soybean) profitability per unit area in the organic systems.

Study underlines importance of farmers' umbrella organization

FiBL Agronomist Christian Andres thinks the findings of the study are a positive contribution to the development of organic cotton farming in India. "Since cotton production is very input-intensive, the slightly lower yields in organic systems were no surprise to us. However, there are but few data on the profitability of organic cotton production. Our study underlines the importance of institutions such as bioRe, which acts as an umbrella organization of farmers. bioRe organizes certification and trainings with farmers, buys their cotton with a premium price of 15 percent on the conventional market price and takes care of the processing and exporting", Andres says.

The team of authors stresses the fact that more research is needed; firstly, the data presented in this study was collected during the transition to organic farming. Data from further years will provide more detailed insights into the long-term productivity and profitability of the different systems. Furthermore, one needs to elucidate the effects of the different production systems on the soil and the environment, as well as the quality of the products. These findings are necessary to optimize and promote organic cotton production systems with regard to their sustainability. Another interesting question relates to whether organic systems will become more productive due to enhanced soil fertility. Such effects have been shown in temperate zones in Europe and the USA. Whether these results hold true also in tropical climates with very different soil characteristics will arise within the next five years.

Project Systems Comparison in the Tropics (SysCom)

This study was conducted in the framework of the project "system comparison in the tropics" (SysCom), which is funded by the Swiss Agency for Development and Cooperation (SDC), the Liechtenstein Development Service (LED), the Coop Sustainability Fund and the Biovision Foundation for ecological development. Besides India, other project sites are located in Bolivia and Kenya. SysCom not only aims to provide solid data concerning the potential benefits and limitations of organic farming in the tropics, but also wants to put the often ideologically guided discourse about organic agriculture in the South on a rational basis with the help of science.



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The study

Forster D, Andres C, Verma R, Zundel C, Messmer MM, et al. (2013) Yield and Economic Performance of Organic and Conventional Cotton-Based Farming Systems – Results from a Field Trial in India. PLoS ONE 8(12): e81039. doi:10.1371/journal.pone.0081039

The study can be downloaded for free at the following link:

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0081039>

(Online article)

<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0081039&representation=PDF>

(PDF)

Website

<http://www.systems-comparison.fibl.org/>

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