

Knowing the impact of organic cotton production

System comparison study and on-farm trials on organic cotton in India



Dionys Forster

World Congress on Organic Cotton, Sept. 24, 2009

Background: DOK Long-term trial Therwil (BL)



Since 1978, DOK Trial, Therwil (BL), Switzerland

- » 8 treatments
- » 5 crops in a 7 years' rotation
- » 4 replications
- » 96 plots à 100m²
- » 30 year-trial

Selected results of the DOK trial

	Organic		Conventional
» Winter wheat yield	4.7 t/ha	- 15% ←	5.6 t/ha
» Fertilisation (NH ₄ NO ₃ Equivalent)	122 kg/ha	- 60% ←	360 kg/ha
» Energy (Diesel Equivalent)	340 l/ha	- 30% ←	570 l/ha
» Plant protection (Active Ingredients)	0-200 g/ha	- 97% ←	6.0 kg/ha
» Soil fertility (Microbial Biomass)	40 t/ha	+ 60% ←	24 t/ha

Objectives of the long-term system comparison trial

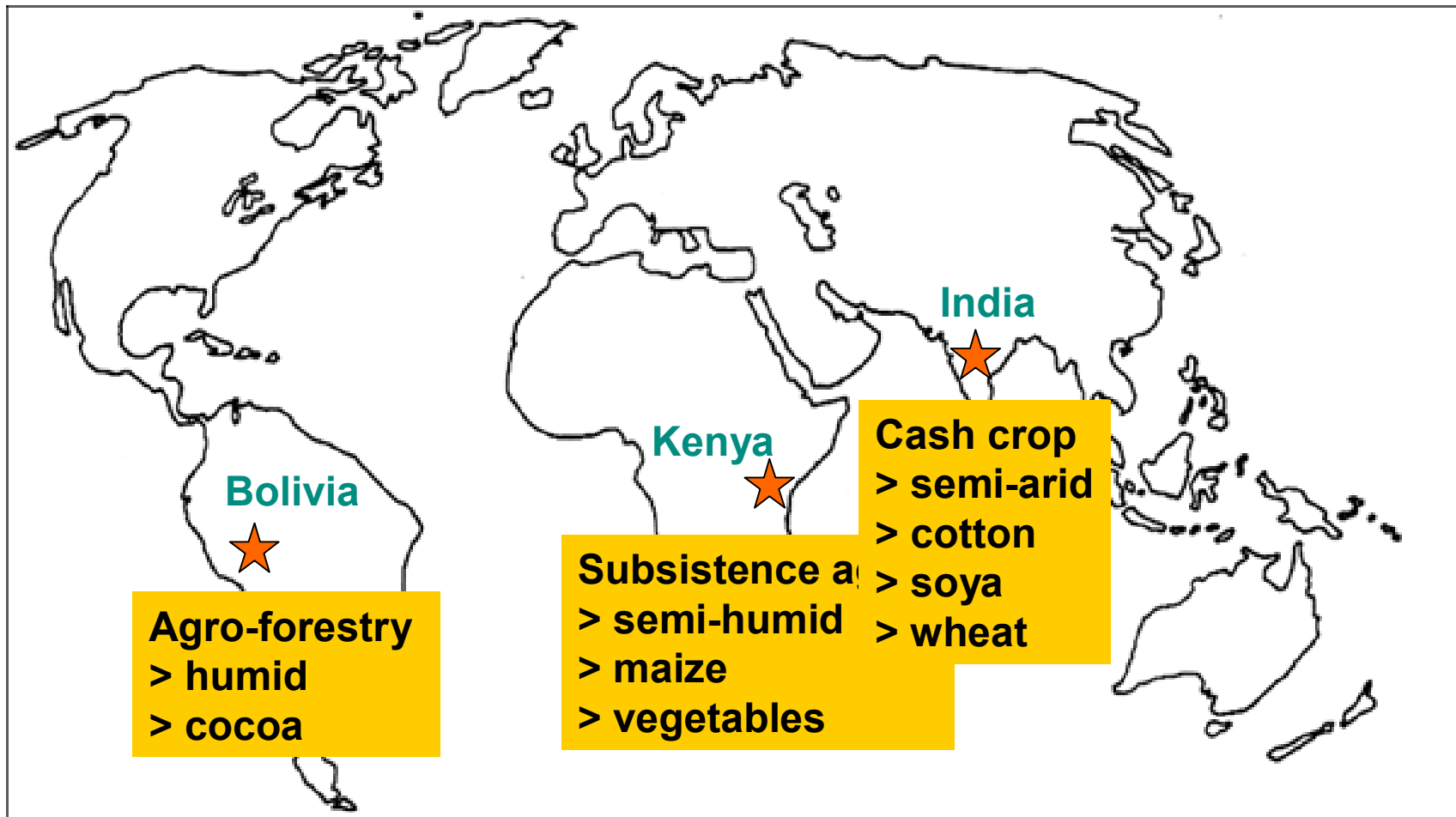
The objective is to quantify:

- » How organic agriculture (OA) influences
 - » yield and yield stability
 - » product quality
 - » product storability

- » How OA influences the agro-ecological system
 - » soil fertility
 - » beneficial organisms
 - » biodiversity

- » How OA influences natural and economic resource effectiveness (output/input relationships)

FiBL long-term system comparison trial



Location and trial setup

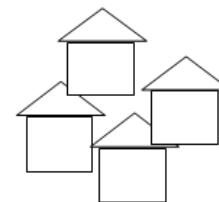
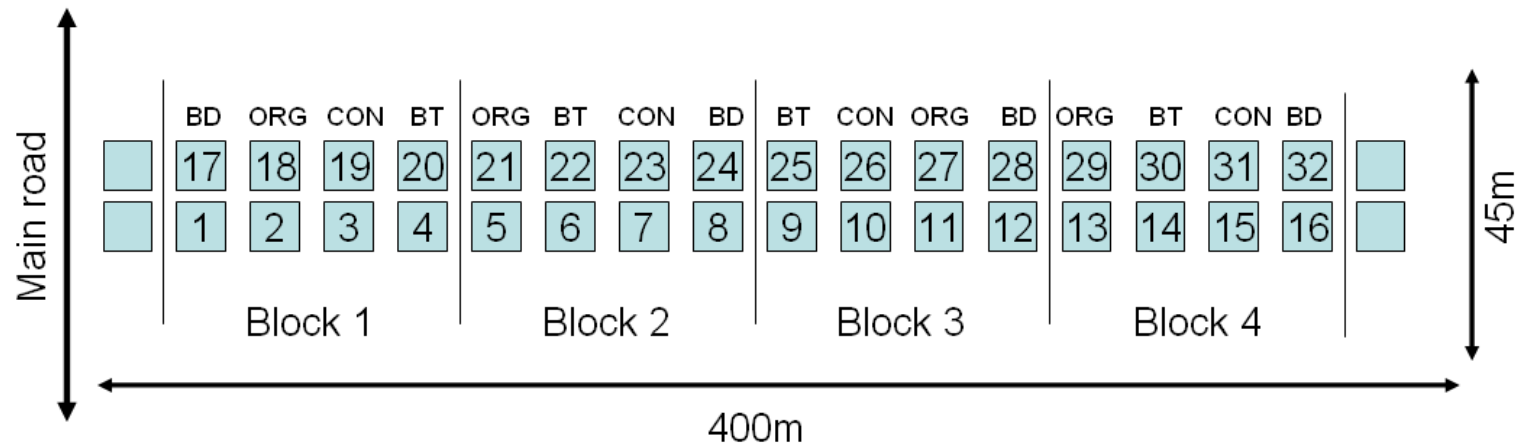
- » Location: Central Indian cotton belt (Madhya Pradesh)
- » Eco-zone: Semi-arid tropics
- » Agricultural system: Annual fibre and food crops (cash crops)
- » Crop rotation:

Year 1	Year 2	
Cotton	Soya	Wheat



- » Treatments: (1) Biodynamic, (2) organic, (3) conventional and (4) GM-cotton
- » Trial start: May 2007
- » Partners: bioRe India Association

Trial setup and plot allocation



bioRe Association India
Training Centre

Treatments and fertiliser

- » Nutrient input to conventional and GM-cotton treatment:
 - » Based on Indian Council of Agricultural Research (ICAR)
 - » Adjusted to conventional farmers practice
 - » 80% chem. fertiliser and 20% organic fertiliser
 - » GM-cotton: + 20% chem. fertiliser compared to conv. cotton

- » Nutrient input to biodynamic and organic treatment:
 - » N + P supply is about 50% of the conventional practice
 - » Corresponds to organic farmer's practice
 - » 100% organic fertiliser

- » Experience of the last two years
 - » Cotton – soya – wheat is an intensive rotation
 - » Nitrogen is limiting factor

On-farm validation trials

Based on first experiences of the long-term systems comparison trial:

- » Validate and complement the results of the long-term field trial under on-farm conditions
- » Support conventional farmers in the conversion from conv. to organic

Participatory technology development activities

- » On-farm / on-station trials on green manuring (precrop, undersowing)
 - » Leguminous crops (gliricidia, sesbania, crotalaria, mung bean)
 - » Brassicaceae
- » On-farm / on-station trial on phosphate rock solubility on high pH soils
 - » Compost and different additives are tested for phosphate rock solubilisation

Outlook

Issues during the first 4-5 year (conversion period):

- » Improve nutrient status through green manures and mulches
- » Develop efficient phosphorus sources (e.g. phosphate rock)
- » Further adjustment of the trial systems to farmers practices
- » First indications on soil fertility are expected after 4-5 years
- » Agronomic and economic analysis after first 4-5 years

Partners and donors:



bioRe India
Association

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Thank you for your attention!

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