

System Comparisons between Organic, Biodynamic, Conventional and Gmo's in cotton production & Organic, Biodynamic, Conventional systems in Soya and Wheat in Central India.

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Abstract

Over the past 05 years the organic cotton production in India has grown many folds. In the conventional cotton arena the genetically modified cotton is growing at an unprecedented rate. Considering the above factors it was considered necessary to carry out a 'System' comparisons in which the four systems can be compared. Further the research hopes to answer the larger questions

- *Put the discussion regarding the benefits and drawbacks of organic agriculture on a rational footing;*
- *Help to identify challenges for organic agriculture that can then be addressed systematically;*
- *Provide physical reference points for stakeholders in agricultural research and development and thus support decision-making and agricultural policy dialogue at different levels.*

At the farmers level the following outcomes are expected:

What happens to yields of the crops when you stop using fertilizers and pesticides ?

What happens to the pests when you don't use fertilizers and pesticides?

How do the crops grow when only FYM or compost is used?

Can we effectively control pests in the organic and biodynamic systems using a range of botanical sprays ?

Are the biodynamic preparations like BD 500, 501 and Cow Pat Pit (CPP) effective?

What are the costs of cultivation of the different systems that we are comparing?

What are impacts on the quality of the produce in the different systems ?

What are impacts on the soils of the different systems?

Introduction

BioRe works in the Central Indian State of 'Madhya Pradesh' the farmers associated are located in the Nimar valley (200 – 300 mts above sea level) which spreads along the Narmada river, bordered by the Vindhya in the North and the Satpura Range to the south. The valley is part of the central Indian cotton belt.

Farming systems in the region are cotton based, cotton is grown in rotation with cereals (wheat, maize, and sorghum), pulses (soybean, pigeon pea, chickpea, moong bean and other food crops such as chilli, onions.)

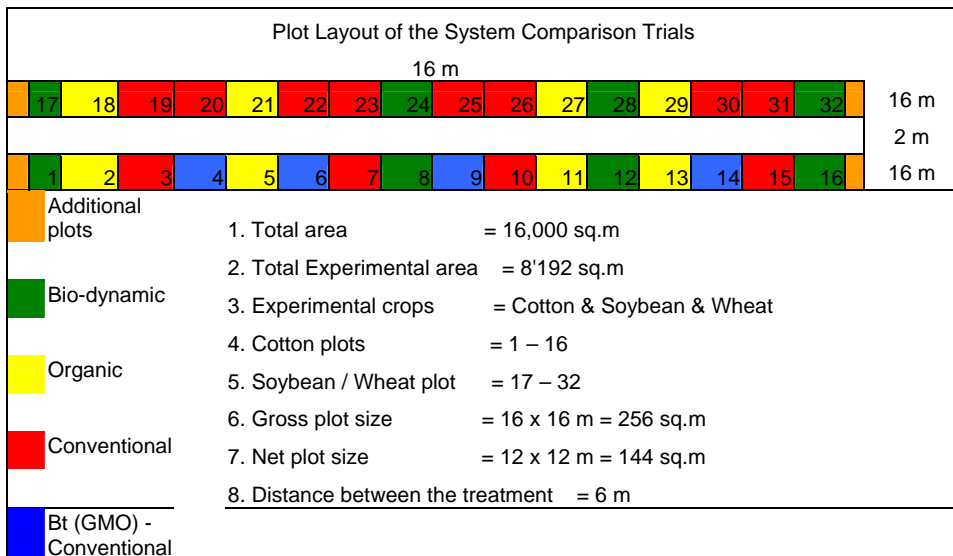
A pilot project was initiated in 1991 with a few farmers on 15 acres. Remei AG – a Swiss Company developed partnerships with manufacturers to produce a whole range of quality, fashionable, ecological-social garments made of bioRe's organic cotton. In the year 2007 bioRe is working with 7890 farmers spread over 460 villages.

Background

BioRe has been very keen to understand the impacts of organic farming, and with this intention a two year study was carried out with the active collaboration with FIBL where showed the organic cotton system managed to achieve similar or marginally higher yields than the conventional cotton and a 10 to 20% reduction in production costs. This study was an agronomic data monitoring of 60 conventional and 60 organic farmers. As a logical step to the study it was felt that a Long Term system comparisons trials would be extremely useful. This study plugs in very well with FIBL's intention of establishing a network of long-term comparisons of farming systems to investigate the contribution of organic farming to 'enhancing food security, combating poverty and conserving tropical ecosystem'.

Materials and methods

One of the first things that had to be done to put the above aims into reality was to purchase a plot of land, which would be suitable for the purpose, and what was critical in the selection was the question of homogeneity of the plot. Here is the layout of the plot where the trial is being conducted:



The crop rotation of all the systems has been based on the most common rotation in the area, i.e., cotton – wheat – soybean – wheat. Cultural practises reflect the local practices of the area where the trials are based. Detailed protocols of crop observation, soil sampling, monitoring of pest and diseases etc have been established with the active collaboration of FIBL.

The trials commenced in the year 2007 in the months of May and June and the current status is that the harvesting of cotton has started. However the following observations of the crops taken during the growing period are worth sharing.

Agronomic Observations Cotton:

Treatments	Observations				As on 1.10.07			
	53 days		80 days		Average Yield (kg/ha)	Input Cost (Rs/ha)	Labour Cost (Rs/ha)	Total Cost (Rs/ha)
	Plant Ht.cm	Dia. of main stem	Pin-head squares	No. of branches				
Dynamic	48.43	1.27	41	20	449	7492	5334	12826
Organic	47.00	1.38	46	21	474	8689	4872	13561
Conv.	50.35	1.39	50	20	677	14516	3294	17810
BT (GMO)	54.23	1.55	67	21	808	16307	3369	19676

Conclusions

The trials are in their first year and the first harvests of cotton are still ongoing and the costs are not frozen yet. However from the above data one can infer that the BT cotton has given 80% more yield as compared to the biodynamic treatment, on the cost front the BT cotton is costing (in comparison to the biodynamic treatment) costing 54% higher.

Agronomic Observations Soya

Observations at 60 days of 10 sample plants					
Treatment	Plant population per mt. row length	Fresh wt. of plants without nodules & soil	Air dry wt. of plants without nodules & soil	Number of nodules	Fresh wt. of nodules.
Bio-dynamic	19.30	237.25	169.25	313.25	3.00
Conventional	17.10	211.63	115.75	282.63	2.63
Organic	19.40	210.00	106.00	249.75	3.00

Conclusions.

The results of the soya are really interesting in that the bio dynamic and the treatment stand outs, especially in the nodule count, the harvests are to start shortly and then we shall have the full results.

Acknowledgments

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