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“Solidarity in a competing world —
fair use of resources”

Influence of Conventional and Organic Agricultural Management Practices on Soil Microbiological and Biochemical Parameters—Evidence from Semi-Arid Tropics

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Abstract

Provisions for sufficient quantities of food and fiber at affordable prices to the ever-increasing global population is one of the greatest challenges facing mankind. Ongoing environmental changes and diminishing natural resources together with lessons learnt from the unwanted effects of the ‘green revolution’ technologies are evidence that continuing with the conventional farming practices is not a sustainable option, so the agricultural production needs to be increased in a sustainable manner without compromising the ecological balance of the planet. Therefore, it is imperative to identify and develop alternative production systems, which are highly productive, system efficient, ecologically compatible and sustainable in long run yet economically viable too. Organic farming systems seem to offer a suitable alternative. Growing evidence show that organic agriculture is economically viable and competes with modern conventional agricultural systems. Moreover, organic practices envisages improved soil health, nutrient recycling, higher microbial biodiversity and ecosystem. However particularly in semi-arid tropics, these evidences are scarce. Hence it is evitable to obtain plausible information and reliable evidence. To substantiate this, the Research Institute of Organic Agriculture (FiBL) Switzerland is running a long-term farming systems comparison (Sys-Com) programme in Kenya, India and Bolivia, which provide a unique opportunity to verify the above claims/hypothesis. Within the framework of this program, a field site in Vertisols was set up in Madhya Pradesh, central India, consisting two year crop rotation with Cotton-Soybean-Wheat. Field plots continuously receiving organic and conventional treatments on a fixed-plot basis since 2007, provide a unique opportunity to verify the above claims. Studies were carried out during 2014–15 to determine the differences in soil biological properties and processes among different management practices taking place over time. From the analysis, the preliminary results indicates that soil microbiological and biochemical properties influenced due to soil management practices. By and large, organic practices showing encouraging evidence of improvement of soil quality parameters. The detailed results of the study will be presented. The results are expected to enhance our understanding of the relationships of soil biological properties with agricultural management and crop production.

Keywords: Organic agriculture, semi-arid tropics, soil biological properties, soil quality