



Short-term effects of fertility management under organic farming in Mediterranean region on soil properties and tomato production

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In organic farming, plant production depends almost exclusively on nutrient deriving from the decomposition of exogenous organic matter in soil which is able to provide significant quantities of several important nutrients for the plant growth. However, in the soil the timing and amount of mineralization often does not coincide with crop nutritional need, making in-season fertilization necessary. The Regulation (EC) No 889/2008 on organic farming standards recognizes these needs and allows the use of a limited range fertilizers and soil conditioners (inputs) in order to meet nutritional needs of the plants and to achieve short term economically viable yield. Short-term open field experiment was conducted at the Mediterranean Agronomic Institute of Bari (MAIB) located in Apulia region (Southern Italy) in order study the effects of different fertilization scenarios based on equilibrated nutritional requirement on tomato (*Lycopersicon esculentum* Mill, cv. San Marzano) production efficiency and soil chemical properties. In soil dressing phase, three months before planting, biochar (BCH), organic fertilizers (OF), combined treatment (BCH+OF), cattle manure and vineyard wood compost (MVC), dairy wastes industry and vineyard wood compost (DVC) and unamended soil as control (CON) were established. In the pre-crop phase, organic and/or mineral fertilizers were incorporated into the previous treatments except CON and BCH in order to achieve balanced N, P and K application rates for tomato plants. Different fertilization scenarios significantly increased the yields over CON and BCH treatments, maintaining fruits quality. In short period of time, most of the soil parameters remained invariable, only available phosphorus significantly increased in the treatments which received organic fertilizers maybe due to the slight reduction in soil pH. However, such results are not surprising, if we consider the quantity of amendments and fertilizers applied in the experiment, as well as a short term study. Future research needs to address the scope for increasing nutrient use efficiency and monitoring of soil nutrient pools in long term studies.

Keywords: organic farming, fertility management, tomato crop, Biochar