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Influence of organic and integrated crop management systems on crop productivity and soil fertility

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Abstract

Organic agriculture is one of the fastest growing sectors of agricultural production, and is reported to have both climate change adaptation and mitigation potential particularly in rainfed agriculture. A field experiment was conducted during 2010-2012 at research farm of the institute to evaluate the performance of sunflower, sesame and pigeonpea under organic and integrated crop management systems. During a two-year conversion period, conventional management gave higher yield of all the three crops compared to organic management. In 2010, the yield reduction in plots under organic production was 13.2% in sunflower, 24.7% in pigeonpea and 18.9% in sesame. Similarly in 2011, the yields of organically grown crops were reduced by 11.4% in sunflower, 5.8% in pigeonpea and 14.5% in sesame. In general, the yield of all crops was less during 2011 due to scanty and uneven distribution of rainfall. During third year, the yield reduction in plots under organic production was 11.1% in sunflower and 9.5% in green gram (grown in place of sesame). However, pigeonpea produced similar seed yield (1520-1537 kg/ha) under both organic and integrated management. Among different production systems, plots under organic management had slightly lower bulk density (1.44 Mg/m^3) than other treatments. However, soil pH and organic C were similar under both organic and integrated production systems. The latter treatment had higher content of available N, P and K compared to other treatments. The soil moisture content was 2-3% higher in the plots under organic management. Similarly, the soil temperature was lower under organic management by 0.2^0C compared to other treatments.

Biography

K.A. Gopinath holds a PhD in Agronomy from Indian Agricultural Research Institute, New Delhi, India. His main research interests include organic farming, integrated farming systems and weed management particularly in rainfed production systems. His research contributions have been recognized at the national level and he is the recipient of Indian Council of Agricultural Research (ICAR) Team Award for Outstanding Multidisciplinary Research (2005-06), Lal Bahadur Shastri Young Scientist Award (2007-08) of ICAR and Young Agronomist Award (2007) of Indian Society of Agronomy. He has published 35 papers in reputed journals and is serving as an editorial board member of 'Indian Journal of Dryland Agricultural Research and Development' and 'International Journal of Bio-resource and Stress Management'.