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Influence of Organic, Chemical, and Integrated Management Practices on Soil Organic Carbon and Soil Nutrient Status under Semi-arid Tropical Conditions in Central India

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Abstract

Soil organic carbon (SOC), macro- and micronutrient status, and nitrogen (N) mineralization were studied in a soil profile managed with organic (OMP), chemical (CMP), and integrated (IMP) management practices for 3 years (2004–7) under a soybean–durum wheat cropping sequence. The most significant buildup of SOC and nutrients was in OMP, followed by IMP and then CMP. The OMP had 15.8 and 7.3% more SOC content than the CMP and IMP, respectively. The concentration of nitrate N was significantly greater in the OMP and IMP than in the CMP. The amount of ammonium N

was less than nitrate N in OMP and IMP, indicating the high nitrification ability of the soil. A buildup of the micronutrient cation content was also noticed in the surface layer in the OMP and IMP plots. The OMP and IMP had a significantly greater mineralization rate of N than did CMP, and it was greatest in the top 0- to 15-cm soil layer.

Keywords:

Durum wheat | macronutrients | micronutrients | nitrogen mineralization | soybean | Vertisol

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