

Integrated nutrient management for castor (*Ricinus communis* L.)-sorghum (*Sorghum bicolor* L. Moench) crop rotation in relation to tillage under rainfed Alfisol. Indian J. Dryland Agric. Res. Developmen

ABSTRACT:

A fixed plot experiment was conducted in Alfisols for three years from 2010 to 2012 at Narkhoda farm of Directorate of Oilseeds Research, Hyderabad. The main objective of the study was to know the effect of conservation agriculture (minimum tillage, crop residue and cover crop) and nutrient management practices (recommended dose of fertilizers, integrated nutrient management, organic nutrient management, fertilizers based on soil test crop response and customized fertilizers) on the productivity, nutrient uptake and soil chemical and biological fertility in castor – sorghum cropping system under rainfed conditions. Conservation agriculture was found to be on par with conventional agriculture with reference to system productivity, system nutrient uptake and soil chemical and biological fertility. Among nutrient management practices, fertilizer application based on soil test crop response (STCR) significantly improved the system productivity (2717 kg/ha), system nutrient uptake (188-62-198 N:P2 O5 :K2 O kg/ha) and soil nutrient availability (224-30-430 N:P2 O5 :K2 O kg/ha) which was on par with customized fertilizer. The productivity improvement with these set of treatments was 15% higher compared to that of recommended dose of fertilizer (RDF). Soil respiration (290 mg kg/d), microbial biomass C (320 mg/kg) and N (48.5 mg/kg) were significantly increased with organic nutrient management followed by integrated nutrient management.

Key words: castor, conservation agricultural practices, STCR, nutrient management, soil biological activity, sorghum