Assessment of Sustainability of Groundnut Yield using Rainfall, Soil Moisture and Soil Fertility Variables under Arid Alfisols

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Abstract

Permanent manurial trials have been conducted in a fixed site for 22 years during *kharif* 1985 to 2006 (July to November) to study the effects of rainfall, soil moisture and soil fertility on groundnut pod yield in a shallow arid alfisol at Anantapur. Nine fertilizer treatments with combinations of organic N through groundnut shells (GS) and farm yard manure (FYM) and inorganic N, P and K were applied every year. The treatments differed significantly from each other in all years except 1992, 1996, 2000, 2002 and 2006. Observations were recorded on rainfall received from sowing to harvest; soil moisture at 30, 60 and 90 days after sowing (DAS); and soil test values of organic carbon, P and K and used for modeling of yield over years. The treatments had a better sustainability in the range of 33.4 to 45.9% based on regression model of yield through soil fertility compared to 27.6 to 35.3% through rainfall; and 24.8 to 32.9% through soil moisture variables. 100% N (GS ~ 20 kg N/ha) + 50% NPK (10–20–20 kg/ha), 100% N (GS ~ 20 kg N/ha) and 50% N (FYM ~ 10 kg N/ha) were efficient based on mean, coefficient of variation and sustainability yield index. 100% N (GS ~ 20 kg N/ha) and 100% N (GS ~ 20 kg N/ha) + 50% NPK (10–20–20 kg/ha) were equally efficient, while 50% N (FYM ~ 10 kg N/ha) was the next best treatment for attaining sustainable groundnut yield under shallow arid alfisols.

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Key Words

Crop seasonal rainfall, soil moisture, soil fertility, Sustainability yield index.

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