

Research
Paper

Studies on nutrient management in groundnut–field pea–summer groundnut cropping system under SAT of U.P.

R.A. SINGH, RAJESH RAI, I.P. SINGH AND H.K. SINGH

See end of the article for authors' affiliations

Correspondence to :

R.A. SINGH

Directorate of Extension,
C.S.A. University of
Agriculture and Technology,
KANPUR (U.P.) INDIA
Email : rasingh_csau@
yahoo.co.in

ABSTRACT

A field experiment was carried out on nutrients denuded sandy loam soil during 2000-2001 and 2001-2002 at Regional Research Station, Mainpuri, C.S.Azad University of Agriculture and Technology, Kanpur. The main objective was to enhance the productivity of crops in draught prone area with organic farming under groundnut-field pea-summer groundnut cropping system. Results displayed that the application of 15 kg N+ 30 kg P₂O₅ + 45 kg K₂O ha⁻¹ in association of 100 q FYM ha⁻¹, inoculated with vermicompost + vermiculture @ 5 q/100 q FYM gave significantly higher pod yield of rainy season groundnut by 28.14 q ha⁻¹ over control and conventional system of RDF. The residual effect of inoculated 100 q FYM ha⁻¹ in the integration of 25 kg N+50 kg P₂O₅ ha⁻¹ registered significantly higher grain yield of field pea as 35.27 q ha⁻¹ over control and conventional system of RDF. Likewise, application of 15 kg N + 30 kg P₂O₅+45 kg K₂O ha⁻¹ with remaining residual effect of 100 q FYM ha⁻¹ also, significantly increased pod yield of summer groundnut by 22.42 q ha⁻¹ over control and conventional system of RDF. The growth and yield contributing characters noted in groundnut and field pea was concordant to the yield of both crops. The uptake of NPK was increased under different crops of cropping system, when fertilized with RDF in association of FYM. Analysis of soil after harvesting of different crops of the sequence showed a significant build up of NPK with the application of FYM. The demography of earthworms was higher in the soil receiving plenty of FYM, inoculated with vermicast and vermicast eggs.

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Key words : Draught prone, Cropping system, Vermicompost, Vermiculture, Vermicast eggs

INTRODUCTION

The indiscriminate use of fertilizers, pesticides, fungicides and plant growth-regulators has resulted into many fold increase in yield potential of almost all the crops on one hand, creating several health hazards and environmental problems to fauna and flora on the other. The quantum of chemicals using has deteriorated our agro-eco-system very badly. Moreover, our soils too have become addicted to be fed with heavy dose of fertilizers to provide maximum returns to the farmers. Thus, residual toxicity is on the increasing trend in our foodstuffs beyond the prescribed limit.

Organic farming provides eco-technological stability, sustainable agriculture and pest management and is an alternative to inorganic fertilizers. Vermiculture is also an effective segment of organic farming especially in denuded

and sodic soils. Soil microbes act as bio-indicator of soil health, friend of environment, negative catalyst of nitrogen loss during denitrification, volatilization etc. Bio-fertilizers also increase nitrogen fixation and nutrient availability.

An integrated approach to plant nutrient management gained momentum and importance in recent years. The objectives of this approach are efficient, judicious and economic use of all the major sources of plant nutrients viz., soil, mineral, organic and biological in an integrated so as to get maximum economic yield from a cropping system.

With the view to enhance the productivity of field pea on sandy soils of semi-arid eco-system under groundnut-field pea-summer groundnut cropping system and enrich the soil in microbes, the present experiment was planned and executed under location specific condition.