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Research Paper

Effects of N, P and K on productivity and soil fertility in Soybean (*Glycine max* L. Merril)-Wheat (*Triticum aestivum*) cropping system

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ABSTRACT

A field experiment was conducted on cultivators' field during *Kharif* and *Rabi* seasons of 2008-09 on medium black soils in the scarcity zone of Ahmednagar district in Maharashtra in order to study the effect of fertilizer levels on yield and uptake of nutrients in soybean (*Glycine max* L. Merril) + wheat (*Triticum aestivum*) cropping sequence. The field experiment was laid out on permanent site in Randomized Block Design with six replications and five treatments. The fertility level increased the yield and up take of nutrients by soybean-wheat cropping Sequence. The grain yield of soybean and wheat were high with combined use of fertilizers. The maximum productivity, improvement in fertility status and chemical properties of soil could be possible from soybean-wheat cropping with application of 100 % RDF in the respective crops. A significant increase in the grain and straw yield of soybean-wheat cropping sequence was observed with balanced fertilizer application as per RDF in soybean-wheat yield. The highest productivity was recorded in the treatment consisting recommended dose of fertilizers with adequate supply of irrigation water in soybean-wheat cropping sequence.

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Key words : Cropping system, Soybean-wheat, Soil fertility, Productivity, Levels of NPK

INTRODUCTION

Soybean-wheat cropping sequence has gained popularity in scarcity zone of Maharashtra with high yielding and fertilizer responsive cultivators of these two staple food crops. There has been growing interest in cropping sequence as a potential tool in improving and sustaining soil health as well as productivity. Cropping sequence is traditionally a low cost input agriculture system. Information on nutrient management on individual crops is available, while cropping system, it is lacking. Moreover, the single nutrient approach has been replaced by multinutrient to proved balanced nutrients to boost up crop productivity and nutrient use efficiency. Beside nutrient management in cropping system is more efficient and judicious than individual crop, as following crop take care of the residual effects of nutrients N, P and to some extent K. Keeping these considerations in view, the present field investigation was undertaken.

MATERIALS AND METHODS

A field experiment was conducted for two consecutive seasons (2008-2009) on medium black soil in scarcity zone of Maharashtra. The soils were moderate in organic carbon (0.60 per cent), low in available nitrogen (176 kg ha^{-1}) and available phosphorus (14 kg ha^{-1}) and very high in available potassium (475 kg ha^{-1}). The field experiment was laid out on permanent site in Randomized Block Design with six replications and five treatments. The treatments were comparised of recommended dose of N, recommended dose of NP, recommended dose of NK, recommended dose of NPK and absolute control. The soybean (cv. *Phule Kalyani*) in *Kharif* and Wheat (cv. *Tyambak*) were the experimental crops. The recommended dose for soybean and wheat were 50:75:25 and 120.60.40 kg N: P: K ha^{-1} applied, respectively as per the treatments. Biofertilizers *viz., Rhizobium, Azotobactor* and PSB were used for seed treatment with respect of crops. Initial and after harvest soil samples