



Productivity and quality of maize and wheat under integrated potassium management in maize - wheat cropping system

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Abstract : A field experiment was conducted during 2010-11 and 2011-12 at Indian Agriculture Research Institute, New Delhi to study the productivity and profitability of application of different source of potassium in maize – wheat cropping system. The experiment was laid out in Randomized Block Design consists of ten treatments and replicated thrice. Results revealed that potassium application irrespective of sources was superior over control. Application of 60 kg K through muriate of potash + 30 kg K through farmyard manure in both maize and wheat resulted into higher yield attributes, grain yield and nutrient concentration. This treatment was closely followed by 30 kg K through muriate of potash + 30 kg K through farmyard manure in both maize and wheat which was found significantly superior over 60 kg K through muriate of potash alone and treatment without potassium application.

Key Words : Farmyard manure, Maize, Wheat, Quality, Integrated potassium management

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INTRODUCTION

Potassium is the only essential plant nutrient that is not a constituent of any plant part and plays a key role in adaptation to both abiotic and biotic stresses such as cold/heat, drought and pest problems. The maize - wheat cropping system is very important cropping system for meeting local food needs and ensuring food security. There is a growing evidence of increasing deficiency of potassium (K) as a result of imbalanced use of nitrogen (N) and phosphorus (P). Even with optimum rates of NPK application in long term experiments, the K balance under most of the soil and cropping systems was negative. Unfortunately, K application did not receive due attention, as most of Indian soils were believed to be 'adequate' in native K supply. The neglect of K application in India is evident from the highly imbalanced fertilizer consumption ratio in respect of K. Keeping in view the above facts the present study was very much needed to see the effect of applied potassium on the yield and quality of the maize and wheat in maize - wheat cropping system.

MATERIALS AND METHODS

A field experiment was carried at Indian Agricultural Research Institute, New Delhi during 2010-2011. The sandy loam soil had pH 8.0, organic carbon 0.4 per cent and available N, P and K 173.2 kg ha⁻¹, 13.8 kg ha⁻¹ and 261 kg ha⁻¹ respectively. The experiment was laid out in Randomized Block Design with three replication and ten treatment combination under different sets of treatment for both maize in *Kharif* and wheat in *Rabi* season crops at fixed site. Recommended dose of 150 kg N ha⁻¹ and 26 kg P ha⁻¹ were applied to maize through urea and DAP, respectively. The full dose of P, K and 50 kg N ha⁻¹ were given as basal and remaining 100 kg N ha⁻¹ was applied in split dose as top dressing at 30 and 50 60 DAS. Muriate of potash (MOP) and farmyard manure (FYM) were used as sources of potassium and applied as per the treatments. The nitrogen and phosphorus content of DAP and FYM were compensated in all the treatments by adjusting amount of urea and DAP. Wheat was given recommended dose of 120 kg N ha⁻¹ and 26 kg P ha⁻¹ through urea and DAP. Similarly, potassium was applied as

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