



Fertilizer value of rock phosphate as influenced by incubating with FYM and P-solubilizers

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ABSTRACT

Mussorie rock phosphate in an incubation study for 60 days was evaluated for extractable (Olsen's) P release on sandy loam soil with a slightly alkaline reaction using different PSM's with and without FYM. Treated soil was incubated at a temperature of $28 \pm 2^\circ$ C maintaining water holding capacity at 50%. Soil samples were drawn at 15, 30, 45 and 60 days. Olsen's P increased substantially up to 45 days and at 60 days of incubation there was a decrease in the extractable P and this decrease in the FYM treated soil was low. Among the different PSM's the *A. awamori* irrespective of the application of FYM maintained higher extractable P during the whole incubation period than *P. straina* or *B. polymyxa*.

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Key words : Mussorie rock phosphate, PSM, FYM, Olsen's P

INTRODUCTION

Phosphorus is the second essential nutrient after nitrogen for the plants. Majority of Indian soils have supply of phosphorus to crops and, therefore, require regular application of P- use efficiency of applied phosphate seldom exceeds 15-20 % due to its fixation characteristics in soil. The important source of phosphorus due to crops till date is single super phosphate which incurs a large cost of production due to use of imported raw materials in its production. There has been a considerable interest in studying the direct utilization of low grade phosphate to soils with neutral or alkaline pH but owing to its low solubility in these soils its use is limited to soils with acidic reaction. However, increasing its solubilisation with phosphorus solubilising micro-organisms along with organic amendments appears more appealing because of low cost of rock phosphate and locally available organic amendments and PSM's phosphorus solubilising ability is possessed by approximately 60% fungi and 40% bacteria. Positive effect of PSM's on solubilisation of rock

phosphate has been earlier reported by Dubey (2000) and Tomar *et al.* (1996). The capacity of different micro-organisms to solubilise rock phosphate is variable. Since the use of rock phosphate in the soils of low pH has been important subject of investigation, therefore, in present investigation incubation study was carried out to evaluate the use of efficient P- solubilizers along with FYM on the basis of extractable P released from the Mussorie rock phosphate.

MATERIALS AND METHODS

Incubation study was carried out by using the top soil (0-15cm depth) from the research field of AAIDU, Allahabad having sandy loam texture with pH 7.8, EC 0.29 dSm⁻¹, organic carbon 0.26%, available N 220 kg ha⁻¹, available P 20.0 kg P₂O₅ ha⁻¹ and available K 268 kg ha⁻¹. Mussorie rock phosphate (20.5% total P₂O₅) was used to supply 50 mg P kg⁻¹ soil on the basis of total P content. An amount of 250g soil passed through 2mm sieve was taken in plastic bottles and the required quantity

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