International Journal of Agricultural Sciences
Volume 8 |Issue 2| June, 2012 | 329-334

RESEARCH PAPER

Effect of an introduced beneficial inocula of native and exotic bioagents on microbial and dominant fungal population in pigeonpea rhizosphere of calciorthent soil

VIBHA*, P.K. JHA AND NIDHI[1]
Department of Plant Pathology, Rajendra Agricultural University, Pusa, SAMASTIPUR (BIHAR) INDIA
(Email : vibhapandey93@gmail.com)

Abstract : The study was carried out to identify the impact of native and exotic bioagents on microbial and dominant fungal population under pigeonpea cropping system of calciorthent soil. The effect of *Rhizobium* alongwith native and exotic strains of PSB and PGPR during the harvest season 2008-2009 was observed. The response of biological treatment on microbial and dominant fungal populations was compared in a field experiment. The soil samples were collected from the rhizosphere of pigeonpea crop at monthly intervals throughout the growth period, microbes and dominant fungi were enumerated through dilution plate technique on their respective media. The result indicates that the change in fungal population was not following any definite trend. Variation in total bacterial population was much wider in treatments where exotic beneficial agents were used in comparison to native bioagents. The total PGPR population was much stabilized under different treatments in comparison to total fungal and bacterial populations. Higher combinations of biological agents had suppressed the *Penicillium* and *Cladosporium* population than those of individual combinations. Though, the population of *Aspergillus* remained higher in all the treatments but was suppressive in different bioagent's combinations to control. Exotically, incorporated biogents did not influence much the population of *Trichoderma* as their distributions was at par with control. Effect of native bioagents on *Geotrichum* population was negligible as their values were almost identical to those of untreated soil whereas it was differential in treatments with exotic bioagents.

Key Words : Bioagents, Dominant fungi, Pigeonpea, Rhizosphere

View Point Article : Vibha, Jha, P.K. and Nidhi (2012). Effect of an introduced beneficial inocula of native and exotic bioagents on microbial and dominant fungal population in pigeonpea rhizosphere of calciorthent soil. *Internat. J. agric. Sci.*, **8**(2): 329-334.

Article History : Received : 16.11.2011**; Revised :** 10.02.2012**; Accepted :** 25.03.2012

INTRODUCTION

In the agriculture production system, the need of the hour is to maximise the efficiency of each external inputs by using the judicious combination of biological entities for sustainable agricultural production. Beneficial plant-microbes interactions in the rhizosphere are the determinants of plant health and soil fertility (Jefferies *et al*., 2003). In the calciorthent soil, the pH is above 8.0, and most of the mineral P is in the form of poorly soluble calcium mineral phosphate (CaP) due to their buffering capacity (Ae *et al*., 1991).

Pigeonpea [*Cajans cajan* (L.) Millspaugh] is a deep rooted and drought tolerant crop (Troedson *et al.*, 1990), can fix atmospheric nitrogen up to 40 kg^{-1}, and its root helps in releasing soil bound phosphorus to make it available for plant growth. Soil micro-organisms that mobilize phosphorus (P) are important in providing this nutrient to plants (Patel *et al*., 2008). Micro-organisms that dissolve poorly soluble CaPs are termed as mineral phosphate solublizer (MPS) (Dobbelaere *et al*., 2003 and Goldstein *et al*., 2003). A number of species of bacteria are able to solublize phosphorus *in-vitro* and some of them can moblize P in plants (Antoun *et al*., 1998 and Piex *et al*., 2000). Phosphate solublizing microorganisms (PSM) convert these insoluble phosphates into soluble forms through the process of acidification, chelation, exchange reactions and production of gluconic acid (Rodriguez *et al*.,

*** Author for correspondence.**
[1]Department of Statistics, Math and Computer Applications, Rajendra Agricultural University, Pusa, SAMASTIPUR (BIHAR) INDIA