AN AJSS

An Asian Journal of Soil Science

Volume 7 | Issue 1 | June, 2012 | 76-79

Research Article

Soil fertility status as influenced by incorporation of black gram (*Vigna mungo*) residues

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Received : *28.03.2012;* **Revised :** *26.05.2012;* **Accepted :** *01.06.2012*

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Summary

A study was undertaken during the period 2009 - 2010 and 2010 - 2011 to monitor the changes of soil pH, organic carbon and available NPK status after harvest of black gram followed by incorporation of residues into the respective treatment for a period of 45 days under field condition. Results have shown that soil pH slightly increased than initial after 45 days of incorporation irrespective of treatments. Moreover, bulk density decreased to 1.24 g/cc than initial. Organic carbon and available NPK content in soil increased progressively after each year. The treatment comprised of stale bed practice, 75 per cent of recommended NPK fertilizer along with biofertilizers in presence of FYM increased the mean organic carbon content, available N, P and K by 0.26%, 22.3 kg/ha, 2.7 kg/ha and 37.9 kg/ha, respectively, over initial.

Key words : Available NPK, Bulk density, Incorporation, Organic carbon, Soil pH

How to cite this article : Sarma, U.J. and Chakravarty, M. (2012). Soil fertility status as influenced by incorporation of black gram (*Vigna mungo*) residues. *Asian J. Soil Sci.*, **7**(1): 76-79.

Introduction

Black gram (*Vigna mungo*) is an important pulse crop grown particularly in summer and rainy seasons under rain fed condition in Assam. This crop grows best in soil with good soil health. Because of impoverished inherent capacity of soil, lowest use of production inputs and poor crop management practices including imbalance and inadequate supply of nutrients, productivity remains low. Assam soils are acidic in nature and are generally very poor in soil organic carbon content and deficient in N and P nutrients. Intensive agriculture exhausts the strength of soil in terms of soil fertility as involves heavy removal of plant nutrients by growing more than one crop. The long-term continuous and indiscriminate use of inorganic fertilizers adversely affect on deterioration of soil structure, soil health and environmental pollution (Singh, 2000). Application of organic materials along with inorganic fertilizers leads to increased productivity of the system and sustained soil health for longer period (Gawai and Pawar, 2006). Hence, there is need to judiciously manage for an efficient use of fertilizers integrated with organic manures, bio-fertilizers and recycling of crop residues for enhancing the farm productivity. However, information on integrated use of nutrients on black gram a traditionally grown an important popular pulse crop, in light textured soils under Assam condition is still lacking. The present study was, therefore, conducted to find out the residual soil organic carbon and available NPK status as affected by incorporation of black gram residues grown under different sources of nutrient combinations *viz.*, chemical fertilizers, native grasses biomass and bio –fertilizers.

Resources and Research Methods

A field experiment was conducted at Regional Agricultural Research Station, Assam Agricultural University, Gossaigaon, Assam for the year, 2009 and 2010, in the *Kharif* season to study the influence of black gram (variety, T-9) on residual soil fertility status as affected by incorporation of black gram stover grown under integrated nutrient management practices. The soil of the experimental site was sandy loam in texture with soil pH of 5.51 having low organic