Research Note

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Effect of application of post biomethanated spentwash on the population of phosphate solubilizing bacteria in sodic soil

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SUMMARY

An investigation was conducted to find out the effect of application of post biomethanated spentwash on population of phosphate solubilizing bacteria in sodic. The application of post biomethanated spentwash was done three months prior to sowing which improved the population of phosphate solubilizing bacteria. The increase in the rate of phosphate solubilizing bacteria population is directly proportional with increase in application dose of post biomethanated spentwash from 30 m^3 ha^{-1} to 180 m^3 ha^{-1}. The population of phosphate solubilizing bacteria increases upto flowering stage and thereafter it decreases.

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KEY WORDS : Biomethanated, Spentwash, Phosphate solubilizing bacteria, Sodic soil

The salt affected soils occur in the arid and semiarid regions where evapotranspiration greatly exceeds precipitation. Salt affected soils occur in all the major physiographic regions of India. Salts released by weathering of silicate minerals are important original source and are responsible for formation of such soils in India. In India, according to current estimates, an area of about 6.73 M ha suffers from the problem of salt accumulation which is equivalent to 2.1 per cent of total geographical area of the country, out of which 3.77 M ha is a sodic, while 2.96 M ha is saline soils (Sharma *et al.*, 2004).

Sodic soils due to its high ESP, posses poor physical properties. The soil salinity and sodicity adversely affect many micro-organisms as is the case with plant growth. It is evident that soils do not become productive immediately after the removal of salts, but gradually as the favourable micro-organisms were given time to multiply. Recently some soil biologists studied the role and interactions of some microbes in the reclamation of salt affected soils (Shinde *et al.*, 2004).

Some of the soil biologists have undertaken experiments to evaluate the impact of distillery spentwash on microbial dynamics. The pH of untreated spentwash was acidic whereas the treated spentwash was alkaline in nature. Spentwash application showed significant increase with respect to microbial population in soil. It also showed significant increase in enzyme activity (Mallika *et al.*, 2003).

In order to study the effect of post biomethanated spentwash on the population of phosphate solubilizing bacteria in sodic soil, a field experiment was conducted during *Rabi* 2008-09. The initial population of phosphate solubilizing bacteria was 4.0 x10^4 CFU g^{-1}. A three months prior to sowing of crop spentwash was applied @ 30,000, 60,000, 90,000, 120,000, 150,000, 180,000 l ha^{-1} and gypsum @ 50 per cent gypsum requirement and F.Y.M. @ 5 T ha^{-1}. Soil samples were analysed by adopting standard method of serial dilution plating technique (Halvorson and Zeagler, 1993) using Jensen's media.

The PSB population increased upto flowering stage. The phosphate solubilizing bacteria also increased with the levels of spentwash application (Table 1).

The highest population of phosphate solubilizing bacteria was 3.33 x 10^4 CFU g^{-1} at the treatment FYM @ 5 T ha^{-1} + 50 per cent gypsum + REF (AST) at flowering stage.Phosphate solubilizing bacteria was 1.22 x 10^4 CFU g^{-1} under control one month after the application

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