RELEASE OF MINERALISED NITROGEN FROM SOILS AFTER INCORPORATION OF DIFFERENT ORGANIC MANURES

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Use of organic manures as a nutrient source for crops is common practice in agriculture. Added advantages of using organic manures against synthetic fertilisers are the positive influence on physico-chemical and biological characteristics of soils. Release of mineral nitrogen from organic manures could be used as an index to check the quality of organic manures in relation to nutrient supply to the crops. Therefore, the objective of the present laboratory leaching study was to monitor the nitrogen release from soils after addition of selected organic manures.

Two surface soils, Reddish Brown Earths and Non Calcic Brown (0-30cm) collected from MahaIlluppallama and Aralaganwila areas respectively, were used in this study. Soils were mixed with three organic manures; Poultry manure (PM), Glyricidia leaves (GM) and Rice straw (RS) at the rate of 20 and 40 tons/ha. There were four treatments; 1). Soil only - control, 2). Soil+PM. 3). Soil +GM and 4). Soil + RS. Each soil-organic manure mixture was placed in leaching columns and incubated in dark at room temperature. Mineralised nitrogen (NH^+_4 - N and NO_3 -N) was extracted with 0.01M $CaCl_2$ solution at 7, 14, 21, 35 and 49 days after incubation using the method described by Stanford and Smith (1972). The NH^+_4 -N and NO_3 - N contents were determined by using standard Kjeldhal method. The physico-chemical and nutritive characteristics of soils and organic manures were determined bv using standard laboratory methods. Results of the study revealed that the application of organic manures has pronounced effect on the release of nitrogen. In both soils, 40 tons/ha level showed higher release of nitrogen compared to 20 tons/ha level. Out of three organic manures, PM treated soils showed a higher release of nitrogen followed by GM treated soils. The RS treatment showed a very low release of nitrogen which is caused by the immobiolisation in two soils during the incubation. It was very clear that the release and immobilisation of nitrogen are controlled by the C/N ratios of organic manure. Up to 7^{th} day the nitrogen release from PM and GM treated soils was high against the control as well as RS treated soils. After 7^{th} to 21^{th} day, the mineralisation and release of nitrogen was decreased and subsequently it was increased up to 35^{th} day and then again decreased at the end of incubation with few exceptions. In general, the proportion of NH^+_4 -N to NO_3 - N was high at the early stage of the incubation compared to the latter stage of incubation. This may be attributed to the transformation of more NH^+_4 - N to NO_3 -N by the nitrification process operating at the higher rate at the latter stage of incubation. The release of NH -N and NO -N from organic manures was significantly higher than the control at certain sampling times. However, according to this study, the use of organic manures such as PM and GM with C/N ratios will enhance the mineral nitrogen content in soils during the first week of incorporation.