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AS > Vol.2 No.3, August 2011



Effects of different levels of compost application on amounts and distribution of organic nitrogen forms in soil particle size fractions subjected mainly to double cropping

PDF (Size: 500KB) PP. 213-219 DOI : 10.4236/as.2011.23030

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ABSTRACT

Effects of different levels of compost application on the amounts and percentage distribution of organic N forms in whole soils and particle size fractions were investigated. Soil samples were collected from three plots: (a) F, only chemical fertilizers; (b) F+LC, chemical fertilizers plus low level of compost; (c) F+HC, chemical fertilizers plus high level of compost. Each soil sample was divided into five fractions: coarse sand-sized aggregate (CSA), medium sand-sized aggregate (MSA), fine sand-sized aggregate (FSA), silt-sized aggregate (SIA) and clay-sized aggregate (CLA) fractions. The sand fractions were subdivided into decayed plants (DP) and mineral particles (MP). The amounts of total N and different organic N forms in the whole soils as well as size fractions generally increased with increasing the amount of compost. In the whole soils, percentage distribution of non-hydrolysable-N and amino sugar-N increased by compost application while the distribution values of the hydrolysable ammonium-N and unidentified-N decreased. The application did not affect the distribution degree of amino acid-N. In the size fractions, the distribution values of most organic N forms increased in the CSA-DP, MSA-DP and FSA-DP fractions by compost application. In the CLA fractions, the amounts and percentage distribution of organic N forms were the highest, although the application caused decreases in their distribution values. These findings indicate that the CLA fraction merit close attention as an important reservoir of various organic N.

KEYWORDS

Compost Application; Upland and Paddy Fields; Soil Organic N Forms; Size Fractions

Cite this paper

Nguyen, T. and Shindo, H. (2011) Effects of different levels of compost application on amounts and distribution of organic nitrogen forms in soil particle size fractions subjected mainly to double cropping. *Agricultural Sciences*, 2, 213-219. doi: 10.4236/as.2011.23030.

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