

NS.AGR.4

## NUTRIENT RELEASE FROM SOIL AS AFFECTED BY THE COMPOSITION OF ORGANIC AMENDMENT

**A. A. Mariaselvam<sup>1</sup>, W. S. Dandeniya<sup>2</sup>, S. P. Indrarathne<sup>2</sup>**

<sup>1</sup>*Postgraduate Institute of Agriculture, University of Peradeniya*

<sup>2</sup>*Department of Soil Science, Faculty of Agriculture, University of Peradeniya*

Organic materials contribute to soil fertility by influencing nutrient availability. Composition of the organic amendments affects soil microbial activity and nutrient dynamics. Therefore, nutrient release from soil may differ with different organic amendments. The objective of this study was to determine the effect of different types of organic materials on soil nutrient release.

Soil was collected from an Ultisol in an agricultural field in Wagolla (Low Country Wet Zone of Sri Lanka). Organic amendments used were cattle manure (C), cattle manure-rice straw (CR) (2:1) cattle manure-wood shaving (CW) (2:1) cattle manure-rice straw-wood shaving (CRW) (4:1:1) as fresh material or material incubated for two months. 50 g soil was mixed with organic amendment (1% w/w) in triplicate and was used to set up leaching columns arranged in a complete randomized design. At the 1<sup>st</sup>, 2<sup>nd</sup>, and 8<sup>th</sup> week of incubation soil was leached with 150 ml distilled water. Leachates were analyzed for available NO<sub>3</sub><sup>-</sup>-N, P and K. Soil microbial respiration was measured in an incubation experiment using the same treatments up to 8 weeks.

Nutrient release declined over time and the trends were significantly affected by the treatment. Release of K during the first two weeks was higher in soils amended with fresh C followed by incubated CR, C and CRW treatments. Incubated C and CRW supplied more P than other treatments. N release in the first week was highest in soil only treatment as compared to soils incubated with organic amendments indicating immobilisation. Except for CW, N immobilisation was less when using incubated material. Soil microbial activity as reflected by the respiration rate was enhanced by organic amendments. Higher respiration rates in first and second week of incubation were noticed when soil was amended with an organic material (175-370 µg/g/day and 273-448µg/g/day respectively) compared to soil only treatment (117 and 136 µg/g/day respectively).

The complexity of the organic amendment differently affects the release of different nutrients. This is partly due to the nutrient content of the amendment and partly due to microbiologically mediated processes like mineralization-immobilisation. In general, incubation of organic amendments prior to application resulted in high P and K release in soil.

*Funding: HETC-QIG-W3 grant.*