

**Impact of Urea Integration with Different Organic Manures  
and Enrichment of Paddy Straw on C:N Ratio, N  
Availability and Microbial Activity in Sandy Regosol**



**BY**

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## ABSTRACT

A laboratory incubation study was conducted at Soil science laboratory, Eastern University, Sri Lanka during January to March, 2011 to study the impact of urea integration with organic manures and enrichment of paddy straw on C: N ratio, N availability and microbial activity in sandy regosol.

There were ten treatments and replicated three times in completely randomized design. They include organic sources (FYM, compost and paddy straw) solely to maintain equal amount of N to equivalent to 10tons/ha of FYM: and were combined with urea to maintain C: N ratio at 15:1. To supply equivalent amount of N as FYM: paddy straw was enriched with Effective microorganisms: paddy straw enriched with gliricidia to supply 50% N from paddy straw and 50% N from gliricidia: and then to maintain C: N ratio at 15:1, urea was added. These all treatments were tested with control (no nitrogen fertilizer) at 2 weeks interval and were evaluated among themselves also.

In sole organic manure application and its combination with urea, highest available nitrogen was recorded in compost and FYM treatments at 2<sup>nd</sup> and 10<sup>th</sup> weeks of incubation respectively. Among them, the organic carbon content and CO<sub>2</sub> evolution were high in sole paddy straw and its combination with urea at all stages of incubation. But compost recorded highest microbial population at initial stage while paddy straw recorded highest value at final stage of incubation. In organic manure urea combination N availability, evolved CO<sub>2</sub>, C and microbial populations were higher than their sole application whereas C: N ratio and organic carbon content were higher in sole applications of them.

Lower C: N ratio was recorded in enriched paddy straw applications than sole application of paddy straw. Among different enrichments, paddy straw enriched with urea recorded as

highest available N and paddy straw enriched with EM recorded highest microbial population, but paddy straw with gliricidia recorded lowest C: N ratio. Highest organic carbon content was observed in sole paddy straw applications than its enrichments.

Thus the addition of organic materials along with urea combinations and enriched material combinations resulted in decrease the C: N ratio and thereby increase the amount of available N and microbial population in sandy regosol. However, the changes in the available N were related to the C: N ratio,  $\text{CO}_2$ -C evolution, organic carbon content and microbial population processes of each material in soil.

**Key words:** Effective Microorganisms, microbial population, organic carbon, organic materials, sandy regosol and total N.

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