

NITROGEN RELEASE PATTERN OF NEEM COATED UREA PRODUCTS IN FLOOD WATER

S. SUGANYA, K. APPAVU AND A. VADIVEL

See end of article for authors' affiliations

Correspondence to :

S. SUGANYA

Department of Soil Science and Agricultural Chemistry,
Tamil Nadu Agricultural Univ.,
COIMBATORE (T.N.) INDIA

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ABSTRACT

Urea is the widely used nitrogenous fertilizer. To make this primary source of fertilizer more efficient, various modifications like manipulation of granular size and coating with materials have been effected. Development of controlled release N carriers / formulations is one of the strategies used to increase nitrogen use efficiency. The N of slow release nitrogenous fertilizers is hard to be lost because of its slow release characteristics. Therefore, the utilization of this coated fertilizer has a significant role in establishing fertilization technique preservative to the environment. Recently, in Tamil Nadu, Southern Petrochemical Corporations Ltd. (SPIC) has evolved such a strategy by bringing slow release N fertilizers, which are new formulations containing N source as neem coated urea products with neem oil and neem gold. The dynamics of release of nitrogen from these fertilizers is likely to be influenced by soil characteristics as well as moisture condition. Hence, the present investigation was designed to know the mineralization pattern of neem coated urea products in flood waters. An incubation experiment was conducted with two soil series viz., Noyyal series (Heavy textured) and Madukkur series (Light textured). The soil was incubated for 10 days with 200 ppm of nitrogen using different N carriers (9 Treatments viz., control, 0.1, 0.2 and 0.3% neem oil and neem gold coated urea, indigenously prepared neem coated urea and prilled urea). Flood water samples were collected and analysed for urea, ammoniacal and nitrate nitrogen. The results indicated that flood water samples of Madukkur series recorded the highest urea, ammoniacal and nitrate nitrogen content than Noyyal series. Among the sources, 0.1% and 0.2% neem gold coated urea recorded the higher content of urea N at all stages of incubation. Neem coated urea products had lower amounts of nitrate N in flood water compared to prilled urea and indigenously prepared neem coated urea. Thus, use of neem coated urea products increased the nitrogen availability for the crop growth and increased the efficiency of nitrogen.

Key words : Neem, Coated urea, Flood water, Nitrogen release.

Urea is the widely used nitrogenous fertilizer. Indian fertilizer industry is the urea based and may remain as the main source of N for many years to come. Urea hydrolysis is a biochemical reaction mediated by urease enzyme yielding ammonium carbonate which dissociates into NH_3 and CO_2 which results in the rise in pH in soil fertilizer reaction site. This causes considerable loss of N through volatilization. Moreover, urea being highly soluble, much of the fertilizer may be lost through leaching, before it undergoes hydrolysis. Accordingly the nitrogen use efficiency of urea is abysmally low (around 30 to 40 %) under predominantly subtropical agriculture in India (Suri *et al.*, 2001).

To make this primary source of fertilizer more efficient, various modifications, like manipulation of

granular size and coating with materials have been effected. Development of controlled release N carriers / formulations are one of the strategies used to increase nitrogen use efficiency. An advantage of this coated fertilizer is that different quantity of controlled N release to match the crop need can be chosen freely. Moreover, by utilizing the characteristics of slow release fertilizer, N absorption by plants can be improved. Though quick release N fertilizer is lost easily from rice fields and hence can pollute the environment, the N of slow release nitrogenous fertilizers is hard to be lost because of its slow release characteristics. Therefore, the utilization of this coated fertilizer has a significant role in establishing fertilization technique preservative to the environment. Recently, in Tamil Nadu, Southern Petrochemical Corporations Ltd. (SPIC) has evolved such a strategy by bringing slow release N fertilizers, which are new formulations containing N source as neem coated urea