

**NOSTOC GROWN IN PARBOILED EFFLUENT AS A BIOFERTILIZER IN COMBINATION WITH INORGANIC FERTILIZERS FOR PADDY CULTIVATION IN THE DRY ZONE OF SRI LANKA**

A.M.C. Jayawardhana<sup>1\*</sup>, N. Gnanavelrajah<sup>1</sup>, S. Sivaneson<sup>2</sup> and A. Ponnegipprenthiraraja<sup>2</sup>

<sup>1</sup>Department of Agriculture Chemistry, Faculty of Agriculture, University of Jaffna.

<sup>2</sup>Rice Research Station, Department of Agriculture, Paranthan, Sri Lanka

**Abstract**

Rice is the staple food of Sri Lanka. Fertilizer application is one of the avenues in improving paddy yield. Cyanobacteria biofertilizers contain both micronutrients and macronutrients which can be used to reduce the usage of inorganic fertilizers and ensure environmental sustainability. However, the cultivation of cyanobacteria demands a nutrient medium. As rice parboiled water is rich in nutrients, it could be used as a low-cost growing medium for *Nostoc*. *Nostoc* is a genus cyanobacteria and fix atmospheric nitrogen into plant available form. The mass culture of *Nostoc* was done in 460 L parboiled water for 28 days with 2000 lux light intensity and 200 rpm shaking provided by aerators. A field trial was conducted at the rice research station in Paranthan to study the effectiveness of *Nostoc* with urea inorganic fertilizer combination on growth performance and yield of paddy variety Bw 312. The experiment design was RCBD with four treatments with four replicates. Treatments were T1 - control, T2 - 100 % urea + P and K fertilizers, T3 - 75 % urea + 100 % P and K fertilizers, T4 - 75 % urea + 100 % P and K fertilizers + *Nostoc* foliar application. Plant height, leaf length, number of leaves, and number of tillers were measured as vegetative parameters. The final grain yield was measured as the reproductive parameter. Data analysis was done by using a Statistical analytical system with LSD mean separation at P=0.05. Considering all parameters, T4 was recorded as significantly higher or equal results than T2 in both vegetative and reproductive parameters. From the study results, it can be concluded that using parboiled water as a medium for *Nostoc* cultivation provides an eco-friendly alternative to partially substitute synthetic nitrogen fertilizers for paddy cultivation.

**Keywords:** *Nostoc*, Bio-fertilizer, Paddy cultivation

\*Corresponding author: mewanche1999@gmail.com