

Research Paper :

## **Influence of micronutrients fortified organic manures on the growth and yield of rice in Coastal saline soil**

S. KAMARAJ, R. SINGARAVEL, D. ELAYARAJA AND G. VEMBU

Accepted : April, 2010

See end of the article for authors' affiliations

Correspondence to :

**D. ELAYARAJA**

Department of Soil  
Science and Agricultural  
Chemistry, Faculty of  
Agriculture, Annamalai  
University, ANNAMALAI  
NAGAR (T.N.) INDIA

### **ABSTRACT**

A field experiment was conducted to find out the effect of organic manure fortified with micronutrients viz., ZnSO<sub>4</sub> and FeSO<sub>4</sub> on the growth and yield of rice in coastal saline soil. The experiment was conducted in farmers field at Sillankuppam village in Cuddalore district, Tamil Nadu during October – January 2009. The initial fertility status of experimental soil was pH - 8.88, EC - 2.16 dS m<sup>-1</sup> and OC - 0.22 g kg<sup>-1</sup> and represented low status of micronutrients. The treatments were T<sub>1</sub> – Recommended level NPK, T<sub>2</sub> – NPK + ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 25 Kg ha<sup>-1</sup>, T<sub>3</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 75% RL, T<sub>4</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 100% RL, T<sub>5</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 125% RL, T<sub>6</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 75% RL, T<sub>7</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 100% RL, T<sub>8</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 125% RL. The results showed that, micronutrients fortified composted green leaf manure significantly increased the growth and yield parameters of rice as compared to other treatments.

**Key words :** Micronutrient fortified organic manure, Coastal saline soil, Rice

The coastal salt affected soils are low in productivity due to various soil fertility constraints. The high salinity and pH cause changes in solubility, availability and efficiency of plant nutrients, besides deteriorating the physical condition of soil (Bandyopadhyay and Rao, 2001). To alleviate the deficiency of micronutrients, fortification technique of enriching the organics with micronutrients is an effective tool as it increases the availability through complexation and chelation reactions. The organic manures are also known to improve physical, chemical and biological properties of the soil. Hence, an attempt was made to increase rice production in coastal saline soil with the use of micronutrients fortified organic manures.

### **MATERIALS AND METHODS**

A field experiments was conducted in a farmers field at Sillankuppam village during October – January 2009. The experimental soil was saline sodic and represented low status of macro and micronutrients. The following eight treatments were studied to evaluate the efficacy of micronutrients fortified organic manures on the growth and yield of rice.

T<sub>1</sub> – Recommended level NPK, T<sub>2</sub> – NPK + ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 25 Kg ha<sup>-1</sup>, T<sub>3</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 75% RL, T<sub>4</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 100% RL, T<sub>5</sub> – NPK + Green manure fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 125% RL.

T<sub>6</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 75% RL, T<sub>7</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 100% RL and T<sub>8</sub> – NPK + Coir pith fortified ZnSO<sub>4</sub> + FeSO<sub>4</sub> @ 125% RL.

These eight treatments were tested in 5m x 4m plots arranged in Randomized Block Design with three replications. Twenty six days old seedlings of rice variety cv. ADT36 as test crop were transplanted with 2-3 seedlings hill<sup>-1</sup> at 20x10 cm spacing level. A fertilizer dose of 120:38:38 NPK Kg ha<sup>-1</sup> was followed. The biometric observations at active tillering, panicle initiation and harvesting stages and yield were recorded.

### **RESULTS AND DISCUSSION**

The results obtained from the present investigation as well as relevant discussion have been presented under following heads :

#### **Growth characters:**

Application of micronutrients alone and micronutrients fortified organic manure significantly enhanced the plant height of rice. Among the various fortified organic manures, green manure fortified with ZnSO<sub>4</sub> and FeSO<sub>4</sub> @ 100 and 125% recommended level rated at par and registered the highest plant height. At harvest stage the treatments T<sub>4</sub> and T<sub>5</sub> recorded a plant height of 79.98 cm and 80.06 cm, respectively. Singh *et al.* (2003) reported that the combined application of