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Influence of foliar application of phytohormones and nutrients on yield and nutrient uptake of transplanted rice in Annamalainagar, (T.N.) India

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SUMMARY

Field experiments were conducted at Annamalai University Experimental farm during Navarai and Kuruvai season to study the effect of foliar spray of phytohormones and Nutrients on yield and nutrient uptake of transplanted rice.The results revealed that foliar application of miraculan 1000 ppm recorded an added beneficial effect over other treatments. The foliar application of miraculan (Triacontarol) at 1000 ppm concentration resulted in maximum grain yield of 5.40 and 5.70 t ha^{-1} in Navarai and Kuruvai seasons, respectively. The grain yield and straw yield were higher in Kuruvai compared to Navarai season. N uptake was highest with foliar application of miraculan at 1000 ppm, 138.6 kg ha^{-1} and it was on par with miraculan spray at 2000 ppm concentration. The micraculan spray at 1000 ppm recorded significantly higher P and K uptake compared to other treatments. This results may help to introduce right type of nutrient spray at optimum concentration for efficient use of nutrients to sustain rice production.

Key words: Rice, Foliar application, Phytohormones, Nutrients, Yield and nutrient uptake.

At present, due to enormous increase in the cost of fertilizers and increased unfavourable field condition for fertilizer application it is necessary to search for an approach wherein the physiological efficiency of the plant could be increased. Good responses to foliar spray of nutrients and phytohormones through higher yield have been realised in crops like rice, wheat and cotton.

Higher crop production through either breeding or better agronomic practices and nutrition is a continuous endeavour. But the growth regulators have been shown to be one of the quick means of increasing production. Paraye *et al.* (1995) observed that foliar application of triacontanol at 25^{th} and 50^{th} day after transplanting significantly increased the grains $panicle^{-1}$, number of effective tillers m^{-2} and 1000 seed weight and the ultimate yield over control on hormonal treatment. The foliar spray of salicylic acid @ 100 ppm exhibited significant higher grain yield over unsprayed control (Thangaraj, 1997). Though the quantities of micro nutrients required for normal plant growth are extremely small as compared to the major nutrients, a deficiency of any micronutrient may cause an extremely disturbing effect on vital plant growth process and consequent reduction in crop yield.

Binod Kumar and Singh (1996) reported higher rice yield was obtained with 0.5%, $ZnSO_4$ spray weeks after transplanting. 2 per cent DAP foliar spray given at boot leaf stage, at 50 per cent flowering and at post milky stage recorded more grain and straw yield in rice crop (Binod Kumar and Singh, 1966). In the light of the above facts, it is imperative to identify the suitable phytohormone and nutrient spray which influence the yield and nutrient uptake to a greater extent. Besides, the knowledge of effect of the phytohormones and nutrients would pave way to develop a successful nutrient management strategy in transplanted rice.

MATERIALS AND METHODS

A field experiment was conducted at the Annamalai University Experimental Farm, Annamalainagar, during the Navarai and Kuruvai season, respectively. The experiments were aimed to study the effect of folair spray of phytohormones and nutrients on the yield and nutrient uptake of transplanted rice. The rice cv. ADT 36 were chosen for the experimentation. The phytohormones and nutrients were tested at different times with varying concentrations. The soil at the experimental field was clayey (43.5% clay, 14.3% silt, 12.4% coarse sand and 32.7% fine sand), with a pH of 6.7 electrical conductivity of 0.34 dsm^{-1}. $KmnO_4$ - N of 246.50 kg ha^{-1}, olsen-P of 8.5 kg ha^{-1}, NH_4O AC-K of 280-75 kg ha^{-1} and organic carbon of 0.68.

The experiment was conducted in radomised block design (RBD) with three replications. The treatments

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