

Research Paper :

Response of transplanted rice to levels, splits and timing of NPK application : Effect on growth, grain yield and economics

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ABSTRACT

A Experiment was conducted at Agricultural Research Station, Gangavathi, Karnataka during *kharif* 2000 and summer 2001 to study the effect of levels, splits and timing of NPK application on growth, yield and economics in transplanted rice. Application of 250:55:104 kg N,P and K ha⁻¹ with NPK split application up to the beginning of grain filling stage recorded significantly higher grain yield of 7.02 and 8.03 t ha⁻¹ in *kharif* and summer season, respectively with corresponding net returns of Rs 36967 and Rs 33593 ha⁻¹.

Key words : Dry matter, Harvest index, Net returns, Split application and Transplanted rice

Timing of N application is an important factor for achieving higher grain yield in rice. Dobermann *et al.* (2000) opined that reducing pre plant N-applications and increasing the number of split applications had greater effect on increasing yield than increasing the amount of N applied. Stalin *et al.* (1999) reported that application of 150 kg N ha⁻¹ in five splits at 7 days after transplanting (25 kg), active tillering (50 kg), panicle initiation (25 kg) mid heading (25kg) and first flowering (25kg) recorded higher yield. Similarly, higher grain yield in rice due to split application of 150 to 180 kg N ha⁻¹ in four to five splits were reported (Motomatsu *et al.*, 2002). In the present investigation, the effect of levels, splits and timing of NPK application on growth and yield of transplanted rice was studied.

MATERIALS AND METHODS

The experiment was conducted at Agricultural Research Station, Gangavathi of University of Agricultural Sciences, Dharwad of Karnataka state. The soil was typical vertisol with neutral to alkaline in reaction (pH 8.3) and low in electrical conductivity (2.1 dS/m) and had CEC of 48.4 c.mol (p⁺) kg⁻¹. The soil had KMnO₄-N of 247 kg ha⁻¹, Olsen P of 28.3 kg ha⁻¹ and ammonium acetate K of 456 kg ha⁻¹ in the surface 20 cm depth.

Two levels of NPK (L₁; 150:33:62 and L₂; 250:55:104 kg ha⁻¹ respectively) as main plot treatments, two types of split application (N splits(N) and NPK splits(NPK)) as sub plot treatments and four timings and proportion of application (50% at transplanting (TR), 25% each at active tillering(AT) and panicle initiation(PI)(T₁); 33% each at TR, AT and PI (T₂); 25% each at TR, AT,PI and panicle

emergence(PE)(T₃) and 25% each at TR, AT,PI and 12.5% each at PE and beginning of grain filling stage(BGF)(T₄) as sub-sub plot treatments were tried in split-split-plot design with three replications. In addition recommended practice (RP) of applying 150:33:62 kg N,P and K ha⁻¹ with full P and K and 50 per cent N at TR and 25 per cent N each at AT and PI stage and farmers practice (FP) of applying 230:40:90 kg NPK ha⁻¹ in five splits at an interval of 8-10 days starting from 10 DAT and a no-N control were included for comparison. During *kharif* BPT-5204, a long duration (145 days) and in summer IR-64, a medium duration (120 days) rice variety was grown. Thirty days aged seedlings were transplanted at a hill spacing of 20 cm x 10 cm with 3-4 seedlings hill⁻¹ on August 24th 2000 and January 23rd 2001 in the *kharif* and summer season, respectively. The crop was manually harvested on 20th December 2000 and 27th April 2001 in *kharif* and summer season, respectively and the grain yield was determined at 14 per cent moisture.

Five plant hills from each treatment at AT, PI, PE, BGF and harvest (HAR) stages were collected and partitioned into leaf, stem + culm and panicle, oven dried at 70^o C to constant weight and the dry matter was recorded.

The data were analysed in the split-split-plot design using dry soft programme and LSD were provided. The interaction data were further subjected to Duncan's multiple range test (DMRT) at 5 per cent probability under MSTAT-C programme.

RESULTS AND DISCUSSION

The results obtained from the present investigation