

ABSTRACT

The Efficiency of Urea in Broadcast Seeded and Transplanted Systems of Rice Production

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High efficiency of fertiliser N is important for high grain yields in rice (*Oryza sativa* L.). In this thesis, urea efficiency on Cunupia silty clay was evaluated in pot and field experiments with cultivar IR5 in broadcast seeded and transplanted systems of production.

In the field experiment, the transplanted system gave significantly higher grain yields than the broadcast system, whereas, in the pot experiment, similar yields were obtained in both systems. However, in both experiments, there were similar recoveries of fertiliser N in the two systems.

In both systems of production, fertiliser application of 40 kg N ha⁻¹ and 80 kg N ha⁻¹ gave significant increases in exchangeable NH₄⁺-N (in the soil) over unfertilised plots up to 21 days after seeding (DAS). There were no differences in NH₄⁺-N levels between 40 kg N ha⁻¹ and 80 kg N ha⁻¹ treatments. Application of 40 kg N ha⁻¹ at mid-season gave no significant increases in NH₄⁺-N levels over the unfertilised plots.

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In the transplanted system, applying N (20 kg ha^{-1}) to the nursery did not significantly affect grain yields. In the broadcast seeded system, grain yields were not significantly affected by increasing N from 80 to 100 kg ha^{-1} , delaying the first application of N from 0 to 14 DAS and delaying the second application from panicle initiation to 8 days after panicle initiation. However, the split-application of N gave significantly higher yields than the single application, except in the broadcast seeded system of the field experiment. Invaluable assistance in the laboratory.

Urea application was necessary for highest grain yields and profits in both systems of production.

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