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Leaf nitrogen concentration (LNC), nitrogen use efficiency and quality of (*Oryza sativa L.*) CoRH2 as influenced by establishment methods and nitrogen management

S. RAMESH*, B. CHANDRASEKARAN, P. MUTHUKRISHNAN AND S. RAVI
Department of Agronomy, Tamil Nadu Agricultural University, COIMBATORE (T. N) INDIA

ABSTRACT

Field experiments were conducted during the *rabi* season 2001 and 2002 at Wetland Research Farm of Tamil Nadu Agricultural University, Coimbatore with the objective of developing suitable and efficient crop establishment techniques and to optimize the nutrient management strategy for rice hybrid CoRH2. The results revealed that the leaf nitrogen concentration (LNC) was not significantly influenced by the crop establishment methods. Wet seeded rice crop registered earlier flowering of seven days as compared to the transplanted crop. Nitrogen use efficiency recorded significantly higher value by the seeding through all the holes (M_2) and it was at par with transplanting (M_1) and seeding through one out of two holes (M_3). Application of N based on Soil Test Crop Response (STCR) for a yield target of 8 t ha^{-1} registered significantly higher leaf nitrogen concentration and was comparable with N application in four splits plus green manure application @ 6.25 t ha^{-1}. The Nitrogen use efficiency was significantly higher with the N application based on Leaf Colour Chart (LCC) cv.4 whereas least NUE was registered with STCR based N application as compared to rest of treatments. The N management exerted significant variation in days to 50 per cent flowering in both the years. Maximum number of days to 50 per cent flowering was noticed with STCR based N application and minimum number of days was invariably noticed in control. The crop establishment methods did not cause significant variation in the quality parameters of hybrid rice. Significantly higher protein content was recorded with N application based on STCR and it was comparable with green manure 6.25 t ha^{-1} plus N application in four splits. Application of 100 per cent N as organic manures recorded significantly higher amylase (28.76 per cent) and the lowest amylase content was observed in N application based on STCR.

Key words : Establishment techniques, Leaf Nitrogen Concentration, Hybrid rice, Quality parameters.

INTRODUCTION

The evolution of hybrid rice technology has generated high hopes in rice growing regions for meeting the food demands of the ever growing population. It is generally felt that a yield plateau has been reached in conventional rice varieties and any further increase in the productivity of rice warrants the breaking of this yield barrier. India is yet to fully exploit the hybrid rice technology which offers a 10-15 per cent yield advantage over the best conventional inbred varieties (Krishnakumar and Subramanian, 1994; Yang and Sun, 1992). Growing hybrid rice is a complex process since agronomic management of hybrid rice differs considerably from that of conventional inbred varieties in many respects. Agronomic inputs for realizing the full yield potential of hybrids are yet to be fully evaluated and optimized in various rice growing regions of Tamil Nadu. Of the many agronomic requirements for success in hybrid rice culture, plant density plays an important role, which is an important aspect in wet seeding. Economy in seed rate of wet seeded rice had been made possible through the invention of drum seeder. The drum seeder enables sowing rice seeds in rows, which facilitates easy manual weeding. Studies on effect of wet seeded short duration hybrid rice using drum seeder on various physiological parameters have not so far been taken up.

Nitrogen is the most limiting nutrient in irrigated rice system and grain yield is closely correlated with the total plant N accumulation. Nitrogen management is a vital strategy in hybrid rice production because of higher N demand and lower N use efficiency. In order to minimize N-fertilizer use and to maximize nitrogen fertilizer efficiency for enhancing rice yield, an innovative N management approach was introduced which estimate the leaf N concentration by the measurement of leaf greenness. Maintaining adequate leaf N concentration throughout the critical stages of crop growth was important to achieve higher NUE in terms of growth, yield and

* Author for correspondence.