



RESEARCH PAPER

Genotypic variability of rice cultivars in distribution of yield attributes, yield and major total plant nutrient uptake under phosphorus starvation condition

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Abstract : Phosphorus (P) is an essential element classified as a macronutrient because of the relatively large amounts of P required by plants. Phosphorus is one of the major factors worldwide limiting crop growth. In most soils, soil and fertilizer P are easily bound by either soil organic matter or chemicals and thus are unavailable to plants unless hydrolyzed to release inorganic phosphate. Therefore, the development of P-efficient rice varieties that can grow and yield better with low P supply is a key to improve crop production. P efficient plants play a major role in increasing crop yields due to shortage of inorganic P fertilizer resources, limited land and water resources and increasing environmental concerns. Focusing on this, a field experiment was conducted in Paddy Breeding Station, Tamil Nadu Agricultural University (TNAU), Coimbatore with 22 rice genotypes at 0 and 50 kg P₂O₅ ha⁻¹ in P deficient soil of Noyyal series. Application of 50kg P₂O₅ ha⁻¹ increased the plant height and also progressive increase in panicle initiation, flowering and harvest stage. Genotype TNRH-180 produced taller plants at all growth stages. Maximum grain yield was registered in TNRH-180 (7434 kg ha⁻¹) at control P followed by CB08504 (7061 kg ha⁻¹) at higher level of P. The lowest grain yield was recorded in CB08513 at higher level of P application while AS06016 recorded the lowest grain yield at control level of P. The highest total nitrogen, phosphorus and potassium uptake was found in CB08504 and the lowest was found in AS06016. Among the rice genotypes, CB08504 registered the maximum total calcium and magnesium uptake.

Key Words : Rice genotypes, Nutrient uptake, Phosphorus levels, Yield attributes, Low P.

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