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Evaluation of genotypic variation in Rice for nitrogen use efficiency under irrigated system

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Nitrogen is the key nutrient element required by rice and its recovery efficiency is low (25-40%). Varieties differ in their ability to absorb and utilize nutrients and genetic variation in nitrogen use efficiency (NUE) in rice was reported by many workers. Hence, to understand this genetic variation in NUE and to identify efficient rice genotypes for their responsiveness and use of soil and applied N, 45 genotypes were tested at two nitrogen levels (0 and 100 kg N/ha) in three years under field experiments on a black clayey vertisol soil at the Directorate of Rice Research, Hyderabad, India. Different parameters of NUE indices were computed using grain yield and nitrogen uptake data.

Based on three years data on grain yield and several NUE indices, genotypes were grouped into efficient (E), responsive (R), efficient and responsive (ER) and non-efficient and non-responsive (NE, NR) varieties. Accordingly, the ER group comprising Varadhan, Akshayadhan, RP bio 4918-248, RP bio 4919-458, DRRH82 and KRH2 is the most ideal group that can perform well under wide range of soil N availability. Next is the efficient group (Swarna, MTU 1010, RP bio 4919-377-13), that performs better under low soil N conditions and these varieties can be used directly in N limiting soils. The third is responsive group (Rasi, Aditya and Vikas) which can be used in the breeding program for the development of efficient cultivars.

Thus, rice genotypes differ in their efficiency in utilizing the soil available N and also in their response to added N which can be explored and further utilized in the development of efficient genotypes for N limiting environments. Some genotypes exhibited superior performance over others due to their inherent efficiency in utilizing the soil available N and also response to added N without depleting the soil reserves.

Biography

K. Surekha has completed her Ph.D. from ANGR Agricultural University, Hyderabad, India in Soil Science and has been working as Soil Scientist at the Directorate of Rice Research (Indian Council of Agricultural Research) since 1993. She has published around 40 research papers in reputed Journals, 45 papers in Symposia, 25 popular articles and 6 technical bulletins. At present, she is involved in research, training and extension activities.

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