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Mitigating water stress for future climate change in Rice

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Rice is the staple food for more than half of the Indian population. The crop occupies one-third of the world's total area planted to cereals and provides 35-60% of the calories consumed by 2.7 billion people. More than 80% of the fresh water resources in Asia are used for irrigation purposes and more than 90% of the total irrigation water is used for rice production (Bhuiyan 1992). Success and sustenance of future rice production will therefore depend primarily on developing and adopting strategies that will use water more efficiently. Depleting fresh water resources, increasing growing population, limited availability of farm labourers resulted to breed and screen varieties and hybrids for water saving technology and shift for crop diversification of water loving rice into aerobic rice cultivation. Aerobic rice is a form of water saving technology in which high yielding rice grown in non-puddled aerated soil condition without standing water and without stress. Aerobic rice technology is mainly meant for irrigated lowland conditions (favorable lowland) with assured irrigation and it is different from upland rice, wherein which rice mainly depends on rainfall (unfavorable upland). The main purpose of aerobic cultivation is to save water without yield penalty. Varieties bred for irrigated lowland and upland were screened under aerobic conditions and some found suitable viz., Rasi, IR 64, MTU 1010, PMK 3, Vandana, Apo, Shabagidhan, MAS ARB26, MAS ARB946-1, PHB 71, PA 6444, JKRH 3333, DRRH2 and KRH 2. Research needs to be intensified in this area, so far best aerobic varieties are not released for proposed ecology. While, significant advances have been made in irrigation management, the genetic research to alter the basic water requirement of rice has to be strengthened. Based on research, it is proven that 30-50 % reduction in water requirement, reduction in methane emission, better aeration to root zone, hence better yield and biomass and ultimately better substitute of present "looming water crises.

Biography

P. Senguttuvel has completed his Ph.D. at the age of 28 years from Tamil Nadu Agricultural University. He is working as a scientist at Directorate of Rice Research for past 6 years with research focus on Breeding genotypes and hybrids for abiotic stresses (especially for drought & aerobic, salinity and heat stress) through conventional and molecular markers. He has published more than 15 papers in reputed journals, 2 book chapters, 3 popular articles and serving as an editorial board member of repute.

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