

PHYSIOLOGICAL BEHAVIOUR AND YIELD PERFORMANCE OF HYBRID RICE VARIETIES IN AEROBIC AND ANAEROBIC CONDITIONS

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Extended Summary

Aerobic system of rice cultivation has been developed very recently. As fresh water for irrigation is getting increasing scarce, system of aerobic rice cultivation is being expanded as an appropriate technology in the rice growing countries. Currently, aerobic system of rice cultivation has been advocated towards saving irrigation water for Boro rice (Satter, 2009; Reddy, 2013). Research on aerobic cultivation of hybrid rice is absent or meager in Bangladesh. So, an experiment was conducted at the Research Farm of Sher-e-Bangla Agricultural University, Dhaka from November, 2015 to May, 2016 to study the physiological behaviour and yield performance of hybrid rice varieties in aerobic and anaerobic conditions. The experiment was comprised of two factors - 1) system of cultivation: three (3) viz. Low land transplant (anaerobic) condition, raised upland (aerobic) condition, and Raised transplant (aerobic) condition, and (2) variety: five (5) viz. BRRI hybrid dhan3, Bolaka, Moina, Gold and BRRI dhan45. The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. Significant variation was observed on growth, yield and yield contributing parameters. All the studied hybrid varieties showed superiority in respect of physiological characters, yield and yield attributes in anaerobic condition over aerobic condition. BRRI hybrid dhan3 accumulated the highest amount of chlorophyll (2.47 mg g^{-1}) in its flag leaves at anaerobic condition which was at par with Bolaka and BRRI dhan45 contained the minimum chlorophyll (1.83 mg g^{-1}) at raised transplant condition. BRRI hybrid dhan3 showed the highest leaf area index (4.25), while the minimum leaf area index was found in BRRI dhan45 (3.56). The highest (34.97%) shoot reserve translocation was exhibited by BRRI hybrid3 and closely followed by Gold at low land transplant condition. The minimum shoot reserve translocation was recorded from BRRI dhan 45 (7.78%) at raised transplant condition. The highest grain dry matter accumulated from current photosynthesis (85.87%) was achieved from BRRI hybrid3 at low land transplant condition and the lowest was recorded from BRRI dhan45 (70.67%) at raised transplant condition. BRRI hybrid dhan3 provided the highest grain yield (8.05 t ha^{-1}) at low land transplant condition due to its higher filled grains panicle⁻¹ and 1000 grain weight, and the lowest (4.28 t ha^{-1}).

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