

Category	: International Rice Research Conference
Select Theme	: Genetics of Abiotic interactions: Stress tolerance and Mitigation
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Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 1	: Drought
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Title of Entry	: Grain yield and head rice yield of rice varieties in response to aerobic condition and water deficit at flowering and during grain filling
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Water deficit at flowering and grain filling stage in relation to head rice yield (HRY), grain yield (GY) and their stability in an aerobic production environment has not been investigated. A series of experiments were sown across two years (2016 and 2017) to investigate the stability and GxE interaction of HRY and GY of 20 rice varieties grown under various levels of water availability and deficit. In year 1, water stress was imposed through utilisation of a rainout shelter facility with two sowing times which ensured 1-week water deficit developed at either flowering or at early grain filling (EGF) with this result compared to two sowing times under irrigated aerobic conditions (four environments). In the second year, two experiments which differed in frequency of irrigation, which induced an intermittent water deficit (2 irrigations/week), compared to an irrigated aerobic experiment (two environments) were conducted. The effect of water deficit on HRY and GY of 20 varieties were determined. The result of year 1 indicated that mean grain yield under aerobic condition was 8.3 t/ha. For 11 varieties within the same phenology group, GY was reduced by 68% and 56% at flowering and EGF due to water deficit. A number of varieties such as Sherpa and Tachiminori were relatively stable with high grain yield production (>6.0t/ha) across aerobic and water deficit conditions. Under aerobic condition mean HRY was \geq 68.8% and a number of varieties were able to maintain a consistently high HRY. For example, Sherpa had stable head rice

yield (63%) across four environments. Significant genotypes and GxE interaction effect existed within the same phenology group, water deficit reduced HRY to 54 and 49% at flowering and EGF. Both HRY and GY response to water deficit depended on variety. The year 2 data is currently being analysed and will be combined with year 1 to examine the performance of varieties across environments and years. For successful aerobic production, it is important to ensure that varieties are stable in both yield and quality.

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