

## **Drought Tolerance and Nitrogen Use Efficiency of Upland Rice (*Oryza sativa* L.) Genotypes Grown Under Varying Water and Nitrogen Regimes**

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### **Abstract**

Three screenhouse experiments were conducted at Crop Science Cluster, College of Agriculture, University of the Philippines Los Baños (UPLB) to evaluate drought tolerance and nitrogen (N) use efficiency of selected upland rice (*Oryza sativa* L.) genotypes grown under varying water and nitrogen regimes, based on growth and yield parameters. Results showed that sufficient soil moisture content (SMC) and high N level caused optimum growth of the genotypes. Moderate drought stress does not necessarily affect the response to moderate N rates, provided that drought does not induce plant high and that fertilizer N is properly managed. PSB Rc14, P42, and P38 (drought tolerant genotypes) had high number of tillers, number panicles per hill, number of spikelets per panicle, relative growth rate (RGR), water use efficiency (WUE), harvest index (HI), straw yield, grain weight, and grain yield at field capacity (FC). These genotypes also had high values in the aforementioned growth and yield parameters at 120 kg N ha<sup>-1</sup> treatment. In terms of the efficiency in the use of N as indicated by agronomic efficiency of nitrogen application (AEN), recovery efficiency of nitrogen application (REN), and internal efficiency of nitrogen application, PSB Rc14, P42, and P38 still performed better than the rest of the genotypes tested. The evaluation of the combined effect of water and N application showed that PSB Rc14, P42, and P38 significantly produced high grain yields among the genotypes under SMC at FC with 120 kg N ha<sup>-1</sup> which suggests that water plays a fundamental role in rice growth in combination with N.