

# PERFORMANCE OF ADVANCED RICE LINES DERIVED FROM HEAT TOLERANCE BREEDING PROGRAMME IN HIGH TEMPERATURE CONDITIONS

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The study was conducted to evaluate the performance of 12 advanced rice lines derived from a heat tolerance breeding programme during the *Yala* season, 2022, inside a plant house arranged in CRD with four replicates, under heat stress (HS), in the Rice Research and Development Institute (RRDI), *Bathalagoda* (BG), and in open field conditions at BG and *Murunkan* (MR), Sri Lanka. The seedlings of 12 advanced rice lines were transplanted in open fields in RCBD with three replicates. Location  $\times$  variety interaction in BG and MR open fields was significant only in filled grain percentage (FGP) and thousand grain weight (TGW) ( $p < 0.05$ ). In the pot experiment, *Nona bokra* showed significantly higher pollen viability (PV). The number of spikelets per panicle (NSP) was significantly higher in HT07 among varieties, and the significantly higher FGP was represented by N22. Rice line IR64EMF recorded as significantly higher TGW in the pot experiment and in the open field at BG. In the open field experiment at BG, a significantly higher PV was recorded in Bg 374. The significantly lowest NSP and TGW were recorded by HT04 and *Moroberekan*. Among rice lines, HT02 had significantly higher FGP and TGW. The open-field experiment at MR revealed that Bg 374 was significantly higher for NSP and significantly lower FGP was demonstrated by *Moroberekan* ( $p < 0.05$ ). A significantly higher TGW in the pot experiment and the highest significant NSP in the open field at BG were recorded by Bg 20-1204 with a grain production of 4.53 t ha<sup>-1</sup>. In the open-field experiment at MR, even though IR64EMF had the least PV, Bg 20-1204 was significantly greater in PV and FGP than others, with a yield of 2.57 t ha<sup>-1</sup> ( $p < 0.05$ ). The results led to the identification of Bg 20-1204 as the promising line for heat tolerance.

**Keywords:** Heat resistance, Pollen viability, Spikelet fertility