

## **Evaluation of Screening Methods for Heat Stress Tolerance in Peanut at Reproductive Stage**

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Heat causes adverse effects on crop's production and quality. Due to the inconsistent and seasonal limitation when screening for heat tolerance in the field, the necessity of developing a reliable protocol under controlled conditions that allows simultaneous screening of multiple genotypes is needed. In this study, selected peanut accessions from the U.S. minicore collection along with checks were evaluated in two independent greenhouse studies, in which accessions were subjected to severe heat stress at the reproductive stage to identify superior genotypes based on physiological performance. Significant variation was observed among all physiological measurements studied. Correlation analysis revealed that enhanced respiratory biodegradation under stress showed significant positive correlation with relative heat injury ( $r=0.757$   $p = 0.002$ ). A positive and significant correlation was found between pollen fertility and flower ratio under stress ( $r=0.833$   $p = 0.014$ ). Interestingly, acquired thermotolerance (ATT) had a highly significant positive correlation with pollen fertility under stress ( $r=0.60$   $p= 0.0001$ ) and negative correlation with relative heat injury ( $r=-0.50$   $p= 0.005$ ). The findings in this study suggest that screening based on ATT could be used as a rapid measure of heat tolerance.