

SCREENING FOR ELITE CULM AND LEAF CHARACTERISTICS OF SELECTED PARENTAL LINES AND TRADITIONAL RICE VARIETIES TO ENHANCE YIELD

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Leaves as the source, mobilize the photo-assimilates to grains and the sturdy culms resist the lodging, which in a robust relationship for enhancing the yield. This research was conducted to screen elite leaf and culm characteristics related to yield and to explore their relationships with lodging, in the Rice Research and Development Institute, Bathalagoda, during the *Maha* season 2020/2021. The experiment was laid-out in a randomized complete block design, comprised with 78 cultivars of 3.5-month age group and two replicates. Leaf characteristics; vein density, SPAD value, leaf area and culm characteristics; length, diameter, and strength were screened. Analysis of variance and mean separation by Tukey's HSD and contrasts at $p < 0.05$ were used. Correlation analysis, multiple regression analysis, and cluster analysis were used for data analysis. The cultivars were substantially heterogeneous and illustrated greater variance of observed parameters of leaf and culm. The culm length ranged from 58cm to 131.7cm, while the highest was recorded in 445Pokkali. Culm diameter ranged from 3.1 to 6.4mm and the highest was observed in NSICRC182. Vein density ranged from 7.3 to 15.7veinsmm⁻¹, and the highest vein density was recorded in IR71033-121-15. Chlorophyll content ranged from 35.1 to 50.4µmolgm⁻² of leaf, while the highest was from purple seed. Varieties were grouped into six distinctive clusters and culm diameter, leaf area, culm strength, vein density and culm thickness were the parameters linked to yield positively. According to the stepwise regression, the variability of yield was proportionately related to lodging (42%), culm length (6%), culm diameter (5%), parenchyma cells (3%), vein density (1%) and SPAD (1%), while the lodging was depended on culm length (45%). In conclusion, purple seed, NSICRC182 and IR71033-121-15 were selected as elite cultivars.

Keywords: Culm strength, Culm thickness, Lodging, Vein density, Yield