

Agronomic Traits and Grain Yield Performances of Traditional and Improved Varieties of Rice Cultivated during Yala and Maha Seasons

R. F. Hafeel^{1*}, H. C. W. S. Erandika¹, M. G. M. Dulanthi¹, V. P. Bulgahapitiya², A. P. Bentota³, G. E. D. De Zoysa⁴ and H. M. S. Herath¹

¹ Rice Research Station, Department of Agriculture, Ambalantota, Sri Lanka

² Department of Chemistry, Faculty of Science, University of Ruhuna, Wellamadama, Matara, Sri Lanka

³ Ministry of Agriculture, Battaramulla, Sri Lanka

⁴ Department of Bio Chemistry, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka

Abstract

To investigate growth and yield performances of popular traditional (15) and improved (15) rice varieties, 14 day old seedlings were transplanted in experimental plots (8x3m) with 3 replicates to randomized complete block design during 2017 yala and 2017/18 maha seasons. Agronomic practices were done according to the recommendation of the Department of Agriculture. Tiller count, plant height (PH), leaf length (LL) and leaf width were measured before heading. Lodging and culm strength were monitored throughout the growth and recorded at visibility. Panicle length, total and filled grains per panicle (FGP), grain shattering, thousand grain mass (TGM) and plot grain yields were recorded after harvest. Most of the improved rice varieties recorded higher tiller numbers at 4, 6 and 8 weeks after transplanting (WAT). Prominent vegetative growth of traditional varieties was expressed through higher PH and LL or leaf area than improved during each season. When panicles bear more grains, FGP also tends to increase (positively significant correlation yala 0.903/maha 0.943). All 15 improved varieties had more than 75% of filled grains. More than 10% of shattering was observed in some of the traditional varieties such as Rathsuwandel, Suwanda samba, Pachchaperumal, Kalu heenati, Suwandel and Beheth heenati. Among traditional varieties TGM were significantly high in Wannidahanala (27.6g/27.3g) during both the seasons, Sulai (27.2 g) in yala, Hondarawala (27.4g) in maha and Masuran (27.9g) in maha. Significant lower grain yields were obtained in traditional varieties (3.83 t/ha-yala /4.4 t/ha - maha) than improved (6.41 t/ha-yala/ 5.6 t/ha - maha). In 2017 yala majority of the improved (10 out of 15) varieties yielded more than 6 t/ha where none of the traditional varieties could perform. More vegetative growth like PH and LL/leaf area and weak culm strength in traditional varieties have caused the plant to lodge at grain filling. Different agronomic traits have contributed to achieve significantly high grain yield in improved rice varieties favourably. Although some traditional varieties inherit desirable traits for high yields, plant height accompanied by lodging as well as grain shattering and more unfilled seeds per panicle had affected the poor yield. To maintain sustainable rice cultivation and to get optimum yield via traditional rice varieties will be a challenging target to the rice growers in future.

Keywords: Agronomic traits, Improved, Rice, Traditional

***Corresponding Author:** rinthaaj@yahoo.com