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Yield Components Evaluation of Lowland Rice Varieties in Rice Producing Lands Areas of Ethiopia

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A field experiment was conducted to evaluate the performance of rice varieties for grain yield and other agronomic traits in the rainfed lowland rice producing areas of Ethiopia; Assosa, Bako, Pawe and Tepi during 2017 and 2018 cropping season. Six lowland rice varieties were included for evaluation and laid out in Randomized Complete Block Design with four replications. The combined analysis across years and locations revealed significant variations ($p \leq 0.001$) among the tested varieties for days to heading, days to maturity, plant height, grain yield and thousand seed weight while non-significant difference was observed for number of filled grains per panicle and panicle length. Both location and year effects were highly significant for all measured traits. Variety by location and variety by year were highly significant ($p \leq 0.001$) for days to heading, days to maturity, plant height, number of filled grains per panicle, and grain yield though variety by year was not significant for thousand seed weight. Variety by location and variety by year were non-significant for panicle length. Based on the performance of the variety in each test location and year, variety Ediget is recommended for Assosa (2.93 tha⁻¹) and Bako (3.39 tha⁻¹)) areas with days to heading and maturity (85 and 145 days) among the tested varieties, and variety Fogera-2 (5.19 tha⁻¹) for Pawe areas with maturity date (121 days) while, in Tepi area variety Hibir followed by Gumara are recommended for better productivity (4.83 tha⁻¹ and 4.68 tha⁻¹) respectively. However, based on average grain yield over four locations and two years variety Ediget (3.22 tha⁻¹) followed by Fogera-2 (3.07 tha⁻¹) performed better than others and they are recommended for production. Even though there is huge potential and increasing demand of the crop, lack of high yielding varieties, terminal moisture stress and low soil fertility, disease and cold effect are the constraints that hinders the expansion and productivity of the crop (Abebaw, 2018). One of the major constraints in rice producing areas is lack of adaptable and high yielding improved rice varieties. So far eleven improved lowland rice varieties had been released in Ethiopia. However, cultivation of improved lowland varieties in most rice growing is limited, due to unavailability of adaptable rice varieties. Farmers grow old rice varieties venerable to disease and ends with low productivity. Therefore, this study was designed to select adapted and high yielding lowland rice varieties in the testing rice producing areas. The combined analysis of variance over years and locations showed that there were high interactions of variety by location, variety by year and variety by location by year. This indicated that varieties performance varies in each location and year. Therefore, the variety Ediget had best performance in Bako and Assosa and it is recommended for production in the areas. While Fogera-2 had better performance in Pawe and is recommended for production in the area. In Tepi area variety Hibir and Gumara followed by Ediget had better performance and they are recommended for production. However, the combined the combined analysis over years and locations indicated that variety Ediget had better performance and it is recommended for early maturity and good yield followed by Fogera-2 for good yield and late maturity.

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