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PERFORMANCE OF Bw RICE VARIETIES GROWN IN THREE DIFFERENT SOIL TYPES IN THE WET ZONE OF SRI LANKA

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EXTENDED ABSTRACT

Rice occupies approximately 33% of the total cultivated land extent in Sri Lanka accounting to 0.78 million ha (CBSL, 2010). It is grown under more diverse environmental conditions than any other food crop in Sri Lanka (Panabokke & Punyawardena, 2000). About 80% of the cultivated land extent of the Wet zone spread across in the Low Country Wet Zone (LCWZ). Rice sown extent under LCWZ is 73,226 ha in *Maha* 2014/15 (Department of Cenusus and Statistics, 2015). Rice yield in LCWZ is comparatively low due to abiotic limitations such as salinity, iron toxicity, flash flood and poor drainage conditions. Soil types in LCWZ mainly divided in to two groups, namely, mineral and organic soil. Generally these organic soils lie in lower part of the catena and while upper positions of the catena occupy with mineral soils. Texture in upper catenal positions is rather varying. Since soil problems vary from location to location, it requires location specific cultivation packages including appropriate cultivars to increase the paddy yield in the LCWZ. Regional Rice Research and Development Centre (RRDC), Bombuwela has released 14 rice varieties until 2013 to address the issue of adverse soil and weather conditions of this region. However, these varieties do not perform equally well in different soil types in the region while some varieties are performing better in some soils than others. Therefore, this study was focused to identify suitable Bw rice varieties for three different soil types in the LCWZ where rice is the major land use.

Experiment was carried out in *Yala* 2014 , *Maha* 2014/15 and *Yala* 2015 at the research field of the RRDC, Bombuwela, located in the LCWZ. Three locations were selected in different parts of the research field according to soil texture and organic matter content (sandy, mineral and half-bog). Popular six Bw rice varieties Bw-372, Bw-367, Bw-361, Bw-363, Bw- 267-3 and Bw-272 6/b and one Bg variety Bg-300 were used as test entries. Varieties were arranged in the field as a Randomized Complete Block Design (RCBD) and treatments were replicated three times in selected three different locations.

Organic matter content and texture of the soil varied in selected three locations. Highest organic matter content (17-18%) was in half bog soil and it was located in lower part of the soil catena. The lowest organic matter content (4-5%) was found in upper catenal positions of the research field. Exchangeable K, available P and total N content in the soil were higher in the half-bog soil and lower in upper catenary positions in both seasons. Analysis of variance and mean separation showed that significant differences of yield (t/ha) among locations. Crop grown in half bog soil resulted in average yield of 3.94 t/ha than that of mineral soil with 2.8 t/ha average yield. The lowest rice yield was recorded in sandy soil (1.65 t/ha). Results also reveal that different varieties differently perform in each location. In half bog location, Bw- 367 (4.79 t/ha), Bw-372 (4.41 t/ha), Bw-267-3(4.18 t/ha) and Bw -361 (4.04 t/ha) performed well and gave the highest yield. In sandy soil location, Bw-372 (1.99 t/ha) resulted the highest yield followed by Bw-361 (1.94 t/ha) and Bw-363 (1.87 t/ha). Yield of all recommended Bw varieties performed equally well in mineral soil location and yields were not significantly different among them. However, Bg-300 resulted the lowest yields in all locations compared with the Bw varieties.

When considering Kalutara District, the total rice cultivation extent in *Maha* 2014/15 was 13,864 ha with over 53% of total sown with Bg varieties where only 27.1% of the total sown extent was under Bw varieties. Considering the poor performance of Bg-300 despite its popularity among farmers, there is a potential to improve rice yield in LCWZ by increasing the extent under Bw varieties. This study reveals that Bw-372, Bw-367, Bw-267-3 and Bw- 361 rice varieties are suitable candidate varieties for half-bog soil type and Bw- 372, Bw-361 and Bw-363 are well suited to the soils with sandy loam texture. Thus, it can be safely concluded that, Bw 372 and Bw 361 rice varieties are the most adaptable and productive LCWZ rice eco-system.

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