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**Growth, Yield and Plant Health of Rice Grown Under Different Eco-Friendly Fertilizer Technologies (EFTs) in Intermediate and Dry Zones of Sri Lanka**

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**Abstract**

Two field experiments were conducted in Maha season, 2020 at Batalagoda (BG) and Maha illuppallama (MI) to evaluate the effects of several Eco-Friendly Fertilizer Technologies (EFTs) on growth, yield, and plant health of rice variety Bg 352. These EFTs were developed using site-specific fertilizer recommendations, biofertilizers containing locally isolated phosphate solubilizing bacteria and cyanobacteria and biochar-urea based slow-release fertilizers (SRF), individually or in combination to minimize the present usage of synthetic fertilizers. Number of tillers/hill and panicles/hill, plant height at maturity, root volume and root dry weight after harvesting, incidence of brown spot disease and leaf eating and leaf rolling pest damage in different EFTs were compared with the fertilizer recommendation by the Department of Agriculture (T2) which is completely based on synthetic Nitrogen (N), Phosphorous (P) and Potassium (K) fertilizers and, a control treatment (T1), which contained no N and P. All the tested growth and yield parameters significantly differed ( $P < 0.05$ ) between the two locations and among treatments. Compared to the plants grown without N and P (T1), tillers/hill, panicles/hill, plant height, root volume and root dry weight were significantly higher ( $P < 0.05$ ) in the rest of the treatments at both locations, with the exception of the number of tillers/hill and root dry weight in MI-grown plants. In BG-grown plants, tillers and panicles/hill showed no significant difference between T2 and T3 treatments (i.e., 100% N in the form of urea as a site-specific recommendation). T4 and T5 treatments at MI have resulted in significantly higher number of tillers and panicles/hill and root volume and dry weight. T4 and T5 treatments contained 65% of site-specific N recommendation in the form of SRF. T1 reported the highest brown leaf spot incidence at both locations. No significant difference was reported in the incidences of leaf rolling and leaf eating pest damage between the locations and among treatments. Results revealed the possibility of implementing EFTs, especially T3, T4 and T5 in a location specific manner without compromising the tested growth and yield parameters and susceptibility to studied pest and diseases and most importantly by reducing the present usage of urea by about 30%.

**Keywords:** Biofertilizers, Site specific nutrient management, Slow-release fertilizers

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