

Impact of zinc fertilizer on zinc content rice varieties to curve the disease status at farmer's field in Bangladesh

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Abstract

Zinc (Zn) is an essential micronutrient, that play a positive role in plant defense system to exclude the development and enzymatic reaction of different phytopathogens. Zn is responsible for sustainable plant growth by focusing the nutrient signaling and disease resistance mechanism. Zinc is also a crucial micronutrient for human health. In Asia, more than one billion peoples, specifically children and pregnant women are suffering to Zn deficiency problem. So, by producing zinc content rice variety we can reduce rice disease pressure and can fill-up our zinc requirements in human health. We did an experiment to observe the Sheath blight, Brown spot and Bacterial leaf blight disease status in farmer's field under Shirajgonj district in Bangladesh, where soil content minimum zinc level. Two zinc content rice variety BRRI dhan62 (19.8 milligram/kg), BRRI dhan72 (22.8 milligram/kg) and as a control check two non-zinc rice variety BRRI dhan52 and BRRI dhan87 were transplanted in rain fed season. Three doses of zinc fertilizer were used i) Zn present in soil 0.93 ppm (control) ii) soil test based recommended dose iii) soil test base double of recommended dose. Split-plot design and three replications were followed, where zinc fertilizer were applied in main plot and variety in subplot. We found that disease incidence (DI and Disease severity (DS) in all three diseases like Sheath blight, Brown spot and Bacterial leaf blight disease significantly lower where applied zinc double of recommended doses in rice variety BRRI dhan62 and BRRI dhan72. Disease incidence were 4% (sheath blight), 3% (Brown spot) and 5.7% (Bacterial leaf blight) in BRRI dhan72, where in BRRI dhan87 DI were 12.3% (Sheath blight), 11.7% (Brown spot) and 14% (Bacterial leaf blight) in double of recommended doses zinc treatment. Double doses recommended zinc decrease nitrogen content in all four rice varieties, but Potassium content increase in Zinc rice variety (BRRI dhan72, and BRRI dhan62) and decrease in non-zinc variety (BRRI dhan52 and BRRI dhan87) at booting stage. Zinc content were found 44.95 ppm, 50.17ppm, 52.09 ppm and 62.59ppm at BRRI dhan52, BRRI dhan87, BRRI dhan62 and BRRI dhan72, respectively at booting stage. Disease incidence and severity were minimum in BRRI dhan 72, because it contents higher zinc. Thus, it is important to cultivate zinc content rice variety and apply soil test base zinc fertilizer to reduce disease pressure for better yield and ensure sound health status.

Key wards: Zinc, Disease severity, Disease incidence, Nitrogen, Potassium.

