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Yield, physicochemical properties and sensory qualities of NSIC Rc218 (*Oryza sativa* L.) as influenced by water and fertilizer applications

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Yield, physicochemical properties and sensory qualities of rice are affected by several environmental factors. This study was conducted to evaluate the growth and yield, physicochemical properties, sensory qualities and productivity of NSIC Rc 218 as influenced by water and fertilizer applications. The experiment was laid out in Split Plot Randomized Complete Block Design (RCBD) with three replications. Water applications (WM₁- Flooded and WM₂-AWD) were designated as the main plot while fertilizer application (T₁-No fertilizer as control, T₂-100-60-60 kg N, P₂O₅ and K₂O ha⁻¹ (RRIF), T₃-Vermicast at 10t ha⁻¹ (RRVC), T₄- 75% RRIF+25% RRVC, T₅-50% RRIF+50% RRVC and T₆-25% RRIF+75% RRVC) were designated as the sub-plot. NSIC Rc 218 developed a significantly higher growth and yield characteristics when planted under flooded condition; however, it did not cause significant differences on the total grain yield. Grain yield of NSIC Rc 218 was significantly higher by 25 to 35% when the treatments were applied with inorganic fertilizer at a rate of 100-60-60 kg N, P₂O₅ and K₂O ha⁻¹, 75% RRIF+25% RRVC and 50% RRIF+50% RRVC compared to unfertilized plants. On the other hand, sensory attributes and physicochemical properties were markedly enhanced under AWD condition. Percent brown rice recovery, total milled rice and CP were significantly higher in treatments applied with RRIF at a rate of 100-60-60-N, P₂O₅ and K₂O ha⁻¹ which is comparable to 75% RRIF+25% RRVC and 50% RRIF+50% RRVC. Likewise, percent head rice recovery, VER and WU were significantly enhanced with the application of pure vermicast at 10t ha⁻¹ or in combination with little amount of inorganic fertilizer. Moreover, sensory ratings for color, aroma and tenderness by touching of freshly milled cooked NSIC Rc 218 were significantly higher in treatments subjected to AWD condition. Likewise, tenderness by chewing and general acceptability were significantly enhanced when rice plants were applied with either pure vermicast at 10 tha-1 or supplemented with little amount of inorganic fertilizer or without fertilizer application. A positive correlation was noted between the yield and other contributory characters of NSIC Rc 218 except on number of spikelet per panicle. Productive tillers were highly positively correlated to the yield while panicle length, percent filled spikelet weight of 1000 grains and leaf area index were significantly correlated to the yield. Moreover, there was no significant difference on the net income of growing rice under flooded and AWD conditions. However, treatments applied with RRIF at a rate of 100-60-60 kg N, P₂O₅ and K₂O ha⁻¹ and treatments applied with 75% RRIF+25% RRVC obtained the highest net income of PhP 66,915.00 PhP 60,440.00 respectively. However, pure vermicast treatment got a negative net income of PhP11, 265.00 due to high cost of purchasing vermicast and the labor in hauling and application.

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A bio-control agent that induces resistance to biotic and abiotic stress

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T*richoderma* is a fungus acting as a biocontrol agent. Biological control, the use of specific organisms that interfere with plant pathogens is a nature-friendly, ecological approach to overcome the problems caused by hazardous chemical methods in plant protection. Mycoparasitism is an efficient biocontrol mechanism evolving extracellular chitinases, β -1-3 glucanases and proteases. Cloning these genes into plants can induce their resistance to diseases. Moreover, these fungi can induce systemic resistance (ISR) to diseases by priming the expression of several plant defense related genes which enables *Trichoderma*- treated plants to be more resistant to subsequent pathogen infection. Root colonization by *Trichoderma* strains results in massive changes in plant metabolism leading to accumulation of antimicrobial compounds in the whole plant. Recent studies demonstrate that *Trichoderma* can also include resistance to plants in the presence of various abiotic stresses like drought and salinity. Understanding the molecular basis of the diverse modes of action of these versatile beneficial fungi is a central goal of our research.

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