

**PERFORMANCE EVALUATION OF DRIP IRRIGATION SYSTEM IN UPLAND
AREA OF PALAYAN CITY, NUEVA ECIJA USING RED RICE, BLACK RICE,
AND HYBRID RICE (*Oryza sativa*)**

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ABSTRACT

CAMANIA, DENIELLE T. and CRUZ, DIANE C., Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2023, PERFORMANCE EVALUATION OF DRIP IRRIGATION SYSTEM IN UPLAND AREA OF PALAYAN CITY, NUEVA ECIJA USING RED RICE, BLACK RICE, AND HYBRID RICE (*Oryza sativa*).**

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The semi-aquatic plant known as *Oryza sativa*, commonly referred to as rice, relies on approximately 24-30% of the Earth's freshwater supply. However, the increasing global population and the growing scarcity of water resources pose significant challenges to rice production in various regions. In present day, various water saving technologies were made. One of the most efficient practices is drip irrigation system. The objective of this research was to develop a layout for gravity-fed drip irrigation specifically designed for upland areas cultivating hybrid rice, red rice, and black rice. The study also assesses various performance parameters of the drip irrigation system, including the uniformity coefficient (CU%), application efficiency (Ea%), distribution uniformity (DU%), emission uniformity (EU%), and average discharge. Additionally, it evaluates important plant growth parameters such as plant height, number of leaves, and crop yield. The findings demonstrate the successful implementation of the drip irrigation system in hybrid rice, red rice, and black rice. Overall, the application efficiency (Ea%) was determined to be 70.05%. The measured uniformity coefficient (CU%) was found to be 58%, while the distribution uniformity (DU%) achieved a value of 74.32%, calculated based on the field test emission efficiency. The average recorded discharge was 15.47 l/h. In summary, these results highlight the effective

performance of the constructed and installed drip irrigation system. In addition, statistically, a 5% significance level indicated no significant difference in plant height, leaf count, and yield among the three treatments. However, Red rice showed the tallest plants. Longping 2096 had the highest leaf count, while Black rice achieved the highest yield, followed by Red rice. Longping 2096 had the lowest yield. Based on these findings, it can be concluded that Black rice is the most suitable variety for upland farming when utilizing gravity-fed drip irrigation.

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