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Assessing the effect of pruning on growth and yield enhancement in climate-resilient rice farming practices in coastal flood-prone area

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Abstract

Pruning represents a new technique for increasing rice growth and productivity, with the objective of optimising this staple food in Indonesia. The effects of climate change, including erratic weather patterns, soil salinity, and saltwater intrusion, particularly in coastal regions, present significant challenges to the sustainability of rice farming. Pruning has the potential to optimise nutrient allocation, stimulate the optimal air circulation, improve input efficiency, and stimulate productive tiller growth. However, pruning of rice is uncommon in Indonesia. This study evaluates the effect of pruning timing in various rice varieties to achieve maximum rice yield potential. This research was carried out as farmer-led research in Bojong Village, Pangandaran Regency, West Java. The research was conducted from December 2024 to March 2025 growing season, to evaluate the impact of pruning on the growth characteristics of rice varieties. Field research used eco-climate friendly farming techniques, such as : organic fertiliser, mechanical and biological pest and disease control. This study used a randomised block design (RBD) with two factors and 3 replications. The first factor included five rice varieties: Baroma (V1), Inpari-43 (V2), Inpari Genah (V3), Mantap (V4), and Ngaos mawar (V5). The second factor included three pruning times: without pruning (P0), 28 days after transplanting (DAT) (P1), and 42 DAT (P2). The interaction between rice variety and pruning timing significantly affected several yield components. The findings of this study indicate that the optimal pruning timing varies significantly depending on the rice genotype and its associated growth and development characteristics. Pruning at 28 DAT is more suitable for superior rice varieties, namely Inpari-43 and Inpari Genah and pruning at 42 DAT is more effective for local rice varieties, including Baroma, Mantap and Ngaos mawar. Pruning can be conducted effectively at 25–35 % of the rice varieties harvest age, calculated based on days after sowing. The findings highlight the significance of variety specific pruning strategies in enhancing rice productivity, optimising plant architecture, improving nutrient uptake, and supporting yield stability under variable climate conditions. The implementation of pruning has the potential to contribute to the development of more resilient and sustainable rice farming practices in Indonesia.

Keywords: Climate adaptation, pruning, Rice productivity, Timing, Variety