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Shifting Optimal Rice Transplanting Dates for Enhanced Yield and Quality in the Central and Northern regions of South Korea

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[Introduction]

Global warming has led to significant increase in average temperatures during crop growing period, necessitating adjustments in agricultural practices, particularly in rice cultivation. The 5-year (2018-2022) experiment was conducted to determine the optimal rice transplanting dates for different rice maturity across various rice cultivation regions in the Central-Northern part of South Korea.

[Materials and methods]

The experiment aimed to determine the optimal transplanting dates for three rice cultivars representing early, mid, and mid-late maturing varieties: Odae (early-maturing), Cheongpum (mid-maturing), and Samkwang (mid-late maturing) at 9 sites that classified into five rice cultivation regions. The study involved transplanting 30-day-old seedlings of each cultivar at 4-5 different time points, with a 10-day interval between transplanting events. The starting date of the transplanting was adjusted for each study site, taking into account the previously recommended optimal transplanting dates.

[Results and discussion]

The results indicate that the optimal transplanting dates for all rice varieties have generally been delayed across different regions by 2-26 days compared to the previous recommended transplanting dates in 2005. These adjustments of a later transplanting date lead to a higher head rice yield due to the optimal ripening environment even though the vegetative periods were shortened. Additionally, in the Mid-Northern Inland and Mid-mountainous regions that previously did not recommend mid-late maturing rice varieties now have updated transplanting dates for them, suggesting a possible adaptation to changing conditions. Adjusting the rice transplanting date to a later period offers several benefits, including better synchronization with favorable environmental conditions specifically ripening temperatures, and enhanced climate resilience. The findings provide valuable insights for rice farmers, agricultural extension services, and policymakers in South Korea, emphasizing the importance of adaptive climate-smart rice cultivation practices and collaboration among stakeholders to ensure the long-term sustainability of rice production in the face of global warming.

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