

Article title	Resilient rice fertilization strategy for submergence-prone savanna agro-ecological zones of Northern Ghana
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Abstract	<p>Efforts to mitigate the negative impacts of flooding on rice production have focused mainly on varietal improvement. However, there is the need to find a technological fit between genotypes and nutrient management strategies to ensure sustainable production in submergence-prone areas. During the 2016 and 2017 growing seasons, we compared effectiveness and resilience of the traditional farmer practice of rice fertilization (FP), where fertilizers are surface broadcast, with three fertilization strategies commonly used in rice production systems to determine the most efficient fertilization strategy for submergence-prone rice production areas in northern Ghana. The fertilization strategies were (i) urea deep placement technology (UDP), (ii) microdosing (MD) and (iii) modification of the farmer practice (MFP), where fertilizers are soil-incorporated. Two submergence-tolerant rice varieties, NERICA L-19 and NERICA L-49 were used as test varieties. Compared to production under non-submergence conditions, UDP resulted in <30% decrease in grain yield under submergence conditions; MFP by 57%, MD by 60% and FP by 75%. In submergence-prone areas, agronomic efficiency increased by 4.4× in UDP, relative to FP, 1.7× in MFP, and 1.5× in MD. Only UDP resulted in positive gross profit margin for rice production under submergence conditions. All other fertilization strategies resulted in negative gross profit margin values. From the combined results we conclude that under submergence-prone environment UDP is the most effective and resilient fertilization strategy for rice production and that farmers will realize profitable return on their investment with a combined use of submergence-tolerant rice cultivars and UDP fertilization strategy.</p>
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