

Cutting nitrogen fertiliser amounts raise rice yields

By [Paul Adepoju](#)

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The amount of nitrogen in fertilisers could be reduced to achieve high rice yields and boost food security in sub-Saharan Africa, a [study](#) says.



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Despite rice being a major staple in sub-Saharan Africa, only about 60% of rice consumed is produced locally, according to researchers who conducted a study in 17 countries in sub-Saharan Africa.

The researchers add that poor nutrient management practices and deficiencies in major soil nutrients account for low yields of rice in the region, thereby resulting in interventions to increase application of nitrogen, phosphorus and potassium fertilisers.

“ This study adds more pieces to the emerging puzzle of how to achieve fertiliser efficiency in rice farming. Isaiah Sesan, Federal University Wukari, Nigeria ”

According to findings in a study published this month (15 March) in the journal *Geoderma*; when the target yield is between four and eight tonnes per hectare, the amount of nitrogen could be cut by eight to 12%, taking into account factors such as production systems and types of farms.

"We will use results from this study to further improve RiceAdvice [an app for educating rice farmers] providing decision support tailored to the particular site, zone, or production system, thereby closing yield gaps, improving fertiliser nutrient efficiency and preventing negative environmental consequences of fertiliser use," says Kazuki Saito, a co-author and a principal scientist at the Africa Rice Center based in Côte d'Ivoire.

Saito, who is an agronomist, says that the study was carried out to develop site-specific nutrient management for rice in sub-Saharan Africa.

Researchers assessed current on-farm yield gaps and nutrient deficiency levels in different rice production systems — irrigated lowland, rainfed lowland and rainfed upland rice systems — in different agricultural zones including highlands.

They conducted on-farm nutrient omission trials with different combinations of nitrogen, phosphorus and potassium fertilisers in 17 countries in sub-Saharan Africa including Benin, Burkina Faso, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Madagascar, Nigeria, Rwanda, Tanzania, Togo and Uganda.

The findings of the study show that nitrogen was most limiting nutrient. For instance, rice yields with nitrogen, phosphorus and potassium were 68% while those with only phosphorus and potassium fertilisers were 84 and 89% of yields respectively.

According to Isaiah Sesan, an agronomist at the Federal University Wukari, Nigeria, the results are consistent with insights from previous studies and field reports.

"This study adds more pieces to the emerging puzzle of how to achieve fertiliser efficiency in rice farming because farmlands are not expanding even though the demand for rice is," says Sesan. "We need more efficient ways to get the most yields from the cultivated lands, one of which is the efficient use of fertilisers."

[This piece](#) was produced by SciDev.Net's Sub-Saharan Africa English desk.

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Paul Adepoju who is one of SciDev.Net correspondents is an academician, journalist, author, geneticist, local content creator and media entrepreneur. He teaches genetics and histopathology at Nigeria's Babcock University and he covers health and tech in Africa for CNN, Quartz and several other media outlets.

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