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Enhancing Rice Yield through Good Agricultural Practices in Sub-Saharan Africa

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Abstract

In sub-Saharan Africa (SSA), rice is an increasingly important crop but with low productivity levels currently. The estimated farm level yield gap is between 1 to 4 t ha^{-1} depending on the rice growing condition due to sub-optimal crop management practices. As a measure to enhance rice yields, good agricultural practices (GAP) were tested in farmers' fields in 33 sites in 19 African countries between 2013 to 2015. A set of 3–4 GAP component technologies were identified based on results from yield gap surveys (YGS) and diagnostic surveys, and expert knowledge. The most prominent GAP components tested were land preparation using locally available tools and implements, improved varieties and certified seeds, optimal crop density, optimal and timely application of organic and inorganic fertilisers, and environmental friendly weed management options. In total, 3000 farmers participated in GAP testing. Yields from GAP plots were compared with yields from YGS for a given site to quantify the impact of GAP on yield. Average yields were higher in GAP plots than in YGS in 90 % of the sites. Overall, a yield advantage of 1 t ha^{-1} was realised through GAP introduction. The yield increase was highest in rainfed lowland at 1.2 t ha^{-1}, followed by rainfed upland and irrigated lowland at 1 and 0.7 t ha^{-1}, respectively. Largest yield gains (>100 %) were achieved under rainfed lowland conditions in Benin, Ghana, and Sierra Leone; under upland conditions (>88 %) in Ghana, Madagascar and Benin; under irrigated lowland conditions (>50 %) in Cote d'Ivoire, Uganda and Ghana. Yields were lower with GAP in rainfed conditions in a few sites due to severe drought and/or improper execution of GAP. The results of this Africa-wide study suggest that yield can be improved by large-scale introduction of best-bet and best-fit GAP component technologies in SSA. The farmers who participated in the GAP testing were monitored subsequently to assess the adoption potential of GAP component technologies in all sites. The presence of an enabling environment for easy accessibility and affordability of GAP technologies are important to achieve rice self-sufficiency in Africa.

Keywords: Irrigated lowland, rainfed lowland, upland, yield gap

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