

# **Efficacy of lowland rice production agronomic practices by smallholder farmers in developing countries – a case from Uganda**

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Low rice productivity among smallholder farmers is a challenge that must be solved if developing countries are to attain rice self-sufficiency. This low productivity is mainly attributed to yield limiting factors, supposed to be fixed by farmers' agronomic practices. There is a knowledge gap of which among the farmers' agronomic practices as measured/assessed in the field, acting together, affect the rice grain yield in a specific lowland production condition. This study was undertaken on 253 smallholder lowland rice farmers from Eastern and Northern Uganda in East Africa with the aim of addressing this knowledge gap. Data on rice farmers' agronomic practices was collected throughout the rice production cycle, from planning stage, land preparation to harvesting. Data was collected using two methods; structured questionnaires administered to member of each household in charge of rice production activity and measurements and verification in the rice field. At maturity rice grain yield from 12m<sup>2</sup> was harvested, weighed and its moisture content taken. Data was analyzed using STATA and IBM SPSS statistics version 20 softwares. At average grain yield of 4878 Kg Ha<sup>-1</sup>, irrigated lowland Ecology (ILE) fields yielded significantly ( $p<0.05$ ) higher than rain-fed lowland Ecology (RLE). High yielding varieties under ILE were not necessarily high yielding under RLE, a result which calls for ecology specific rice variety development. Broadcasting, results into loss of yield gains, which would otherwise be attained from weeding and use of improved varieties. Grain yield from *wet* and *ponded* fields was not significantly ( $p<0.05$ ) different, pointing towards the possibility of reducing amount of water used for rice production. The dismal and statistically equal ( $p=0.05$ ) grain yield obtained from fields under *dry* and *submerged* water conditions confirms that the two extreme water conditions negatively affect rice returns alike. Weeding of rice at least once is recommended since additional weeding did not translate into significantly ( $p<0.05$ ) higher yield. Yield under ILE is highly influenced by factors under planning and field siting while RLE yield cut across the whole production cycle; planning, land preparation and rice growth. This study concludes that lowland rice grain yield is significantly influenced by a collection agronomic practices being undertaken by smallholder farmers usually specifically dependent on the type of rice ecology.

**Key words:** Crop, Productivity, Agronomy, Lowland, Food Security

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