Increasing Crop Productivity through Agronomic Management in

Rain-fed Rice Systems in Central Uganda

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Smallholder farmers in Uganda generally obtain low production levels in rice cropping. Since rice consumption in East Africa increases and prices are extremely volatile, there is a trend to expand local production. Aiming to find best management options to boost productivity and maintain soil fertility, this study explores nine different management strategies for rain-fed rice production in valley swamps of Uganda. The research is embedded in a GlobE Project, which assesses the potential of wetlands to contribute to food security while promoting a sustainable use.

We discuss management practices looking at single-season rice cropping with the baseline of common farmers´ practice, different management strategies (bunding and weeding), nutrient management (mineral and organic) and two-season rice cropping. A randomized complete block design was repeated at three toposequence positions of an inland valley swamp for three subsequent seasons (planting cv. NERICA 4) at Namulonge, Central Uganda. We assessed biomass, yield parameters and nutrient uptake complemented with data of soil characteristics and climatic conditions.

Simple management practices like bunding and three times weeding resulted in a significant increase of grain yield. In third season these differences were highest with 3.1 versus 1.8 t ha–1 following farmers´ practice (unbunded, single weeding). Maximum attainable yields of 6.3 to 7.2 t ha–1 were recorded for the treatment fertilized with mineral NPK (120:60:60), no weed competition and irrigation. Promising alternative management options were the application of chicken and green manure giving an average yield of 5.0 t ha–1 (bunded, three-times weeding). Double cropping resulted in an additional harvest of 2.3 or 3.7 t ha–1 depending on fertilizer type (organic manure or NPK; both bunded and three times weeding). Yield levels in fringe position were higher (in part significantly) compared with center and mid-position. Fertilizer response was lowest in center position probably due to extreme flooding.

We will discuss site specific recommendations for rice cropping in valley swamps of Uganda with a focus on short-term productivity and soil fertility, with the overall aim to combine higher rice productivity with a sustainable wetland use.

Keywords:

inland valley, animal and green manure, cropping intensity, NERICA 4