Nutrient Management Strategies for Rice Production in the Kilombero Flood Plain in Tanzania

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Introduction

Tanzania is an important rice producer with about 16% of the total rice area of East Africa. Some 75% of the rice is grown by smallholder farmers under rainfall conditions in floodplain wetlands. Grain yields and returns to investments are modest and soil fertility tends to decline. In the frame of the interdisciplinary research project we investigate integrated nutrient management options for lowland rice in comparison with farmer methods.

Materials and Methods

- Establishment of a one-factorial field trial with rice cv. Saro 5 (RCB, 4 reps) at Ifakara, Morogoro Region, TZ, in three hydrological zones of Kilombero floodplain (fringe, middle, center) in March 2015
- Assessments: Crop phenology, crop growth and nutrient uptake, grain yield and yield structure, ANOVA

Objectives

- Determine yield limiting factors in rice
- Quantify the effect of mineral fertilizers, green and animal manure on grain yield and nutrient flows
- Compare hydrological zones (fringe, middle, center) and land use intensification (double vs. single cropping) with respect to rice productivity
- Develop a basket of technologies for sustainable rice production in wetlands
- Assess economic and ecological impacts

Findings

- In 45 d lablab produced ~3 t ha⁻¹ of DM
- Bunding compared with no bunding (farmer’s approach) resulted in higher grain yield (3.1 vs. 4.9 t ha⁻¹), mean of two zones) and biomass (Fig. 1 - 4)
- Highest grain yields (unmilled) were recorded after intensive fertilizer application (up to 10.1 t ha⁻¹)
- Organic N sources from green and animal manure application had no yield increasing effect, however cumulative effects of repeated manuring are expected
- There is a considerable yield gap for rice in the Kilombero flood plain

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