1. Introduction

Cereal production covers only 4.5 months of annual household consumption in the Timbuktu region, at the edge of the Sahara desert. Along the Niger River and its seasonally flooded arms, small-scale, village-based irrigation schemes, 30-35 hectares in size, have become important for food security. Irrigation using diesel motor pumps is costly. Cropping area per household is only 0.3 hectares, driving farmers to increase rice productivity. Since 2007, the NGO Africare and the Regional Government Agriculture Service have worked with communities to adapt the System of Rice Intensification (SRI) to local conditions. In 2007, one farmer achieved a 9.1 t/ha SRI yield compared to 4.9 t/ha in his control plot (Africare, 2008). In 2008, 60 farmers from 12 villages averaged a 9.1 t/ha SRI yield compared to 4.9 t/ha in their surrounding fields (86% increase) (Styger, 2009).

Water availability for irrigation depends on the rise and recession of the Niger River, which is determined by the date the rainy season begins and by amount of rain in the watershed. In 2009, when 270 farmers from 28 villages practiced SRI, flooding was delayed by more than one month compared to 2008. Villages that are located at a greater distance from the Niger River need to wait longer for the water to arrive. This creates a natural gradient for when the cropping season will begin (see satellite photo). This poster looks at how SRI practices combine the transplanting of single seedlings at the 2-leaf stage (1), with wide spacing (25cmx25cm) and planted in line (2), alternate wetting and drying irrigation (2), the use of a cono-weeder instead of hand weeding (3), and the application of organic manure during soil preparation (not shown). Last picture shows SRI field at harvest (4).

2. Methodology

270 farmers from 28 villages, located in four communes (Doulakire, Arham, Bourem and Kondi), and two Circles (Goundam and Dire) of the Timbuktu region in Mali, participated as volunteers (no subsidies) in planting SRI plots in collaboration with the NGO Africare and the Regional Government Agriculture Service during the 2009/2010 season. For each farmer data was collected on SRI application, varieties used, dates and practices for nursery, planting, plot size, field preparation, organic manure and fertilizer subsidies) in planting SRI plots in collaboration with the NGO Africare and the Regional Government Agriculture Service during the 2009/2010 season. For each farmer data was collected on SRI application, varieties used, dates and practices for nursery, planting, plot size, field preparation, organic manure and fertilizer applications, varieties used, dates and practices for nursery, planting, weeding and irrigation. Harvest was done with 130 farmers (randomly selected, but within each of the 28 villages) on SRI and adjacent conventional plots. Five 1m² squares were placed at random in each of the 260 plots. Grain was harvested separately for adjacent conventional plots. Five 1m² squares were placed at random in each of the 260 plots. Grain was harvested separately for the 2009/2010 season. For each farmer data was collected on SRI application, varieties used, dates and practices for nursery, planting, field preparation, organic manure and fertilizer

3. Results

Yield and Yield parameters

Average paddy yield for 130 SRI farmers was 7.71 t/ha compared to their conventionally grown fields with 4.48 t/ha (72% increase). All measured yield parameters were superior in the SRI plots compared to farmers’ fields. (Table 1).

Yields in relation to the beginning of cropping season

The range of yields was larger for this season as compared to the previous season (Styger, 2009). For SRI, lowest yield was 2.7 t/ha and highest 13.4 t/ha, for farmers’ practice yields ranged from 0.3 t/ha to 9.8 t/ha. With the delay of the rainy season, farmers installed their nurseries more than 110 days apart from each other depending on the location along the river arms. Range of planting parameters can be seen in Table 2.

Analysis of yields in relation to the beginning of cropping season shows that yields decline when seeding takes place later in the season, both for SRI and control plots. (Figure 1).

4. Conclusions

Farmers in the Timbuktu region depend on the timeliness and amount of seasonal rise of water to begin seeding their rice crop. In 2009, the rainy season was delayed by more than one month. Farmers had to wait with planting until the waters arrived. The results of our study show that even with a 2-month delay past optimal planting time, SRI farmers were able to produce a similar yield (6-8 t/ha) as rice grown under conventional practices started at the optimal date. May of the marginal villages where rice was planted very late were still able to produce a good rice crop by applying SRI practices, and so improved food security in the Timbuktu region.

References:

Impact of System of Rice Intensification (SRI) Practices on Cropping System Resilience to Fluctuating Climate Conditions in Timbuktu Region, Northern Mali, West Africa

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References:

Acknowledgements: This study is a result of exceptionally strong teamwork among farmers, Africare staff, and the Mali Government Agriculture Service in Timbuktu. I am very grateful to have been part of it. Special thanks to the funding organizations: the United States Agency for International Development in Mali and the Better U Foundation of Los Angeles, California, USA.