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Annual Variation of Water Use and Yield of Irrigated Rice in the Sahel

Sabine Stürz[1], Abdoulaye Sow[2], Isabel Schlegel[1], Baboucarr Manneh[2], Folkard Asch[1]

[1] *University of Hohenheim, Institute of Crop Production and Agroecology in the Tropics and Substropics, Germany*

[2] *Africa Rice Center (WARDA), Sahel Station, Senegal*

Abstract

Rice production in the Senegal River Valley strongly depends on inter-annual climatic variation. At present, rice is grown in the hot and dry period from March to July and in the hot and wet period from August to October. During the cold and dry season from November to February fields remain fallow. Rising temperatures and shifts of seasons are already observed and are expected to increase. With a changing climate, shifting of planting dates might be necessary.

In Senegal, rice is the most important cereal and its consumption is steadily increasing. The Senegal River valley is characterised by Sahelian climatic conditions and an annual rainfall of less than 350 mm. Currently, fuel prices are an important economic factor, since water is pumped from the river to the fields. With an increasing demand for arable land, water will be the limiting factor for rice production in the near future. Water use, plant development, and yield differ strongly as a function of sowing date within a year. Adaptation of cropping calendars might be needed aiming at lower water consumption and stable, high yields.

For the ongoing study 10 contrasting genotypes were selected representing a large variation in terms of duration, water use, and heat and cold tolerance. In bi-monthly planting dates, irrigation water input, water use, plant development, physiological parameters and yield were observed at 2 climatically different sites in order to characterise genotypic traits enhancing water saving rice production the Sahel. Results for water use, crop development, and yield for the first completed year at WARDA's Sahel station in Ndiaye will be presented and possibilities for adaptations of cropping calendars and choice of genotype will be discussed.

Keywords: Climate change, genotype adaptation, irrigated rice, water use efficiency

Contact Address: Sabine Stürz, University of Hohenheim, Institute of Crop Production and Agroecology in the Tropics and Substropics, Garbenstr. 13, 70599 Stuttgart, Germany, e-mail: sabine.stuerz@uni-hohenheim.de