RISOCAS
Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

UNIVERSITÄT HOHENHEIM
Department of Plant Production and Agroecology in the Tropics and Subtropics
Section: Crop Waterstress Management

Developing Rice and Sorghum Crop Adaptation Strategies for Climate Change in Vulnerable Environments in Africa — Risocas

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Introduction

Climate change in Africa affects staple crop productions systems by increasing climate variability and weather extremes. To avoid negative impacts for food production and security, crop adaptation strategies are required that comprise varietal development and crop management.
The RISOCAS project, a collaboration between the University of Hohenheim, AfricaRice, CIRAD and two national partners IER and FOFIFA, focuses on irrigated rice, sorghum and upland rice as representatives for cereal cropping systems in Sub-Saharan Africa.

Research areas of the RISOCAS project (irrigated rice in Senegal, Sorghum in Mali, upland rice in Madagascar)

Goals and Outlook

- Identification of valuable traits for better adapted cultivars.
- Extrapolation of the varietal responses and adaptation potentials for different climate change scenarios using.
- Development of ideotype concepts for varietal selection
- Develop a basis for tactical and strategic decision making to adapt African cereal cropping systems to climate change.

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Research Concept

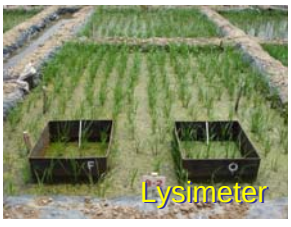
Staggered planting dates for Sorghum in Mali.

- Responses of a wide range of contrasting genotypes to existing environmental gradients covering the range of expected climate change scenarios allow the assessment of adaptation potential within the existing genetic variability in each crop.
- With 5 – 12 staggered planting dates at each site genotypes are subjected to a large number of climatic environments.
- existing phenological and agronomic crop models (RIDEV, IMPATIENCE, SARRAH and the architectural model ECOMERISTEM) will be adapted and validated with field data.

Mini Rice garden in Senegal for phenological observations.

Materials and Methods

Climate gradients in this study cover oceanic to continental climate with 2 sites in Senegal as representative environments for irrigated rice production in the Sahel, a latitudinal rainfall gradient representing environments for low altitude dryland sorghum production with 3 sites in Mali and an altitudinal temperature gradient for rainfed upland rice on 3 sites in Madagascar. Meteorological and phenological observations, growth and yield analysis are combined with physiological measurements including a field plot water balance and studies on microclimate effects on the canopy structure.



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