

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



Sabine Stürz¹, Abdoulaye Sow², Isabel Schlegel¹, Baboucarr Manneh², Folkard Asch¹

¹University of Hohenheim; ²AfricaRice, St. Louis, Senegal

Introduction

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. Water use, plant development, and yield differ strongly as a function of sowing date within a year. Rising temperatures and shifts of seasons are already observed and are expected to increase. With a changing climate, adaptation of cropping calendars might be needed aiming at lower water consumption and stable, high yields. .



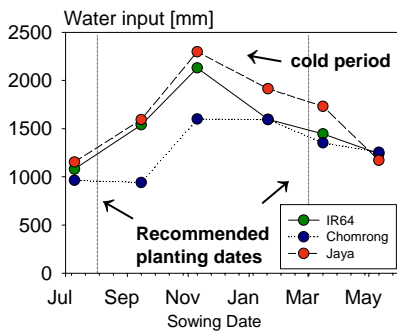
Conclusions

- Seasonal pattern exceeded varietal differences
- Planting dates in January and June seem to be promising
- For cropping calendar decisions further planting dates need to be studied

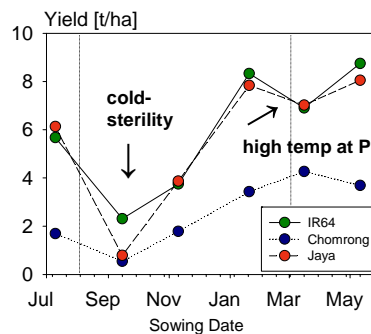
Outlook

- Field trials are ongoing for higher temporal resolution
- Further observations on heat-tolerance trait of Chomrong
- Results will be used to model yield and water use under rising temperatures

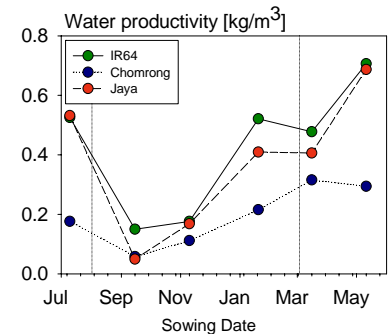
Results and Discussion



- Long duration variety Jaya shows the highest water consumption, short duration Chomrong the lowest
- Water input is mainly a function of duration
- Higher demand in cold season due to extended crop duration



- Very low yields in September
- Flowering during cold period
- Yield reduction for IR64 and Jaya in March
- Very high temperatures during reproductive phase



- Highest water productivity for planting during late dry-season (IR64, Jaya)
- Short duration, no yield reduction due to temp.
- Chomrong shows it's maximum in March
- Heat-tolerance?

Materials and Methods

For the ongoing study in the Senegal river valley, 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, water input (irrigation, precipitation), water use, plant development, physiological parameters and yield were observed at the Sahel Station of AfricaRice in Ndiaye in order to characterize genotypic traits enhancing water saving rice production the Sahel.

