

# Phenological responses of irrigated rice in the Sahel

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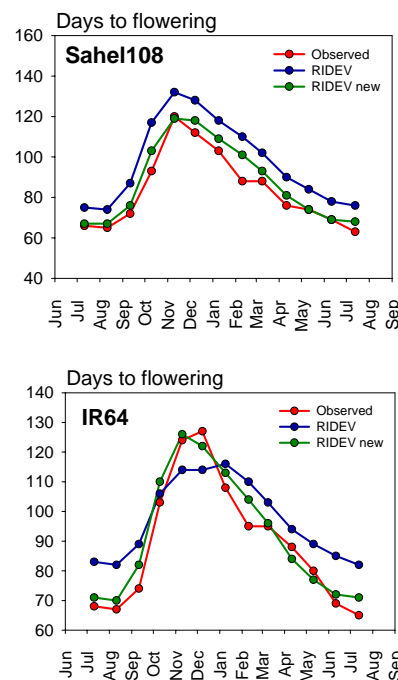
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## Introduction

Worldwide rising temperatures are already being observed and are expected to increase within the next decades. Positive as well as negative effects on rice production are expected due to higher temperatures. The complexity of those phenomena requires well validated crop models able to precisely assess development and yield according to genotype and climate for predictive conclusions and adaptive decisions (choice of genotype, sowing date) under changing climatic conditions. In the early 1990s a phenological model (RIDEV) was developed to estimate duration and sterility in the Sahel. However, differences between crop duration observed in farmers' fields and assessed by RIDEV have been reported and an improvement of the model is required.



## Results and Discussion

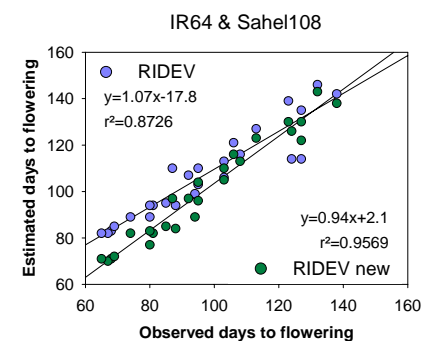


- Observed duration during the hot season was generally shorter than predicted
- Sowing during the cold season resulted in either shorter or longer duration
- ⇒ Higher TOPT\* and adjusted CPP\* resulted in better fit for some varieties
- ⇒ Since the comparison of weather data showed no significant difference, results indicate varietal adaptation
- ⇒ Shorter duration is a desirable trait to escape cold sterility at end of the cropping season

\*TOPT = Optimum temperature  
CPP = Photoperiodic slope constant

## Conclusions and Outlook

- Amelioration of the model for IR64 and Sahel108
- Only TOPT and CPP respected
- High TOPT desirable for hot environments
- So far duration until flowering only
- ⇒ Model will be validated with results from a second field site (Fanaye)
- ⇒ Extrapolation to predict effects of climate change and to identify suitable varietal traits
- ⇒ Better fit after evaluation of complete data set expected
- ⇒ Recalculation of other photo-thermal constants
- ⇒ Varietal analysis to identify heat tolerant traits
- ⇒ Maturation rate needs to be recalculated



## Materials and Methods

For the ongoing study at the Sahel Station of AfricaRice in Ndiaye, phenology is observed on 10 contrasting genotypes grown in monthly staggered sowing dates in a mini rice garden trial on 1m<sup>2</sup> plots. For the first completed year, observed duration to flowering was compared to flowering dates generated by RIDEV. Preliminary results about the adjustment of photo-thermal constants are presented.

