

# Alternate wetting and severe drying: A sustainable irrigation strategy for rice production in Burkina Faso?



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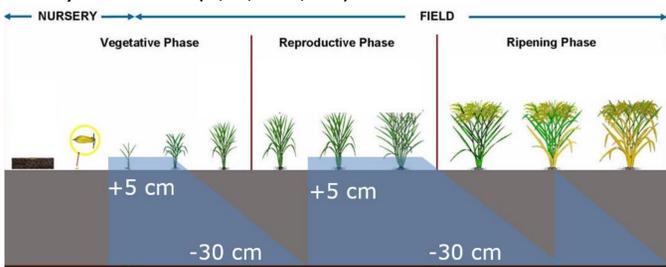
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## 1. Introduction

- Water scarcity threatens irrigated rice production in dry zones in West Africa.
- It is of critical importance to reduce water input, while maintaining yield and nutrient use efficiency.
- Prospective solution:** Alternate wetting and moderate drying irrigation.
- Alternate wetting and severe drying (AWD30)** could further reduce the water input compared to farmers' irrigation practices (FP).
- Possible drawbacks:** Acute drying phases may cause nitrate losses and reduce the bio-availability of some key nutrients (P, K, Mn, Zn).

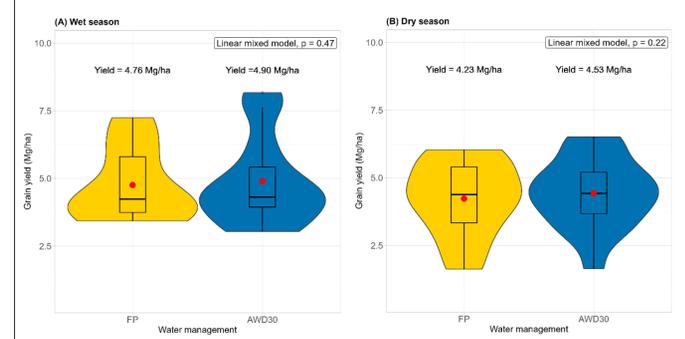
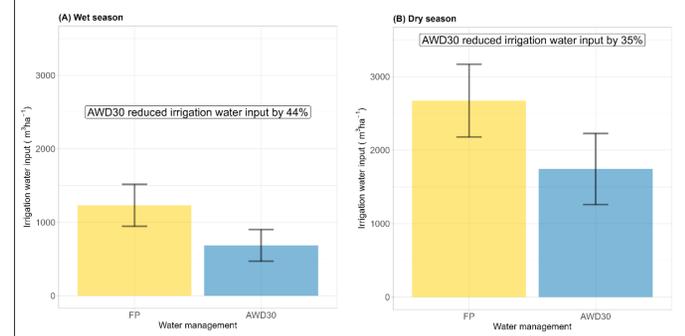


### Research question:

- Does AWD30 compromise both yield and nutrient use efficiency?

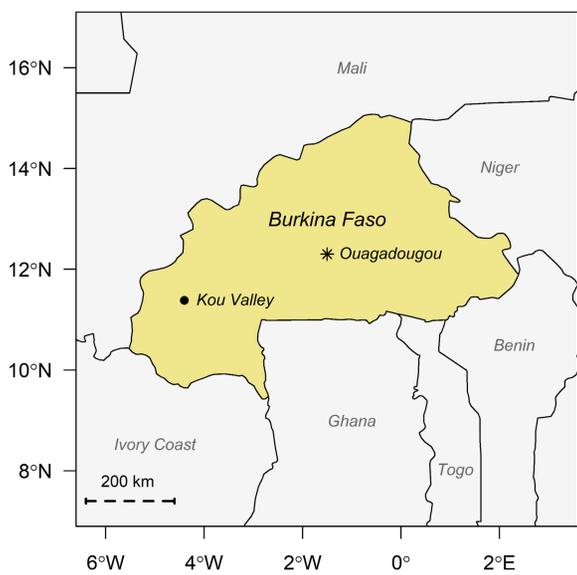


## 3.1. Results



Irrigation water input reduced by ~37% without yield penalty

## 2. Study area & Methods



- Site: **Kou Valley** irrigation scheme

- Period: Wet and dry seasons **2019-2020**

- 33 on-farm field trials**

- Two water management regimes:

- AWD30** (re-irrigation when the water level reaches -30 cm) and
- Farmers' irrigation practices (FP)** (maintain a ponded water whenever possible)

- Analysis of soil and plant samples

- Data collected: Yield and yield attributes, water input

- Statistical analysis: **Linear mixed effect model**; Spearman correlation

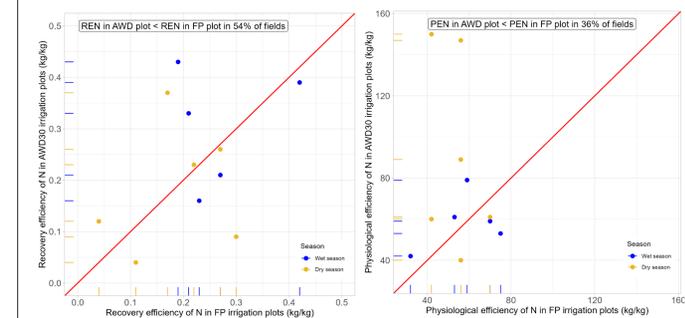
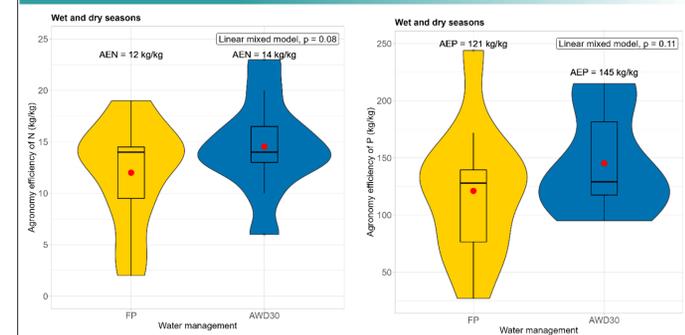
## 4. Key findings & Conclusion

- AWD30 appears to be an effective strategy to save irrigation water without a significant reduction in yield and N, P, and K use efficiency.
- Water productivity increased by 45%.
- The observed reduction in P and K contents in grain points towards possible negative hidden impacts on grain quality.



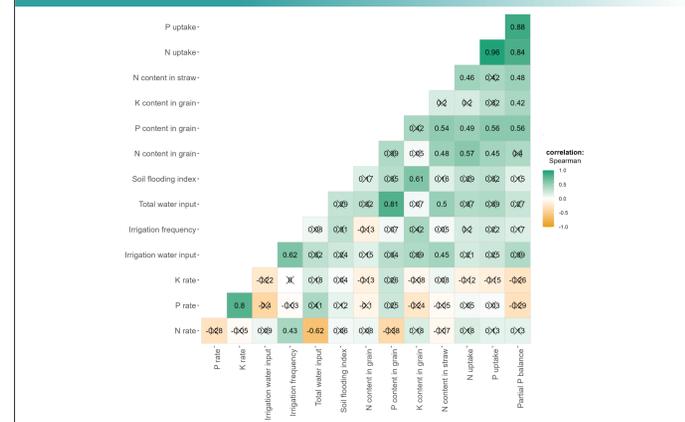
Alternate wetting and drying

## 3.2. Results



AWD30 had no negative impact on nutrient use efficiency

## 3.3. Results



P and K in grain positively correlated with water input



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