

Adapting « alternate wetting and drying irrigation » technique in the dry prone area for strengthen climate resilience in Burkina Faso, West Africa.

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Introduction

In this study, a field experiment based on alternate wetting and drying irrigation «AWDI» technique was implemented to identify optimal water depth that could be used to better mitigate the impact of water scarcity in dry prone area such as Burkina Faso. That should empower farmers resilience to climate change by improving water productivity in order to sustain rice production in Burkina Faso.

Methodology

The design was a complete randomized block in four replications with three treatments T-20, T-25 and T-30 representing soil water depth at 20 cm, 25 cm, and 30 cm, respectively below soil surface compared with the recommended depth of 15 cm (T-15). After transplanting «orylux 6» rice variety at one seedling per hill, 5 cm water depth was daily applied during two weeks for seedlings adaptation. Two week after transplanting, fertilizer (NPK) with a ratio of 14:23:14 was applied at a rate of 150 kg/ha. In addition, Urea (46%) was applied two times at rates of 25 kg/ha and 75 kg/ha at active tillering and panicle initiation respectively. 15 days after transplanting, an irrigation of 5 cm water depth was applied when soil water reached tested levels in each treatments. Soil water fluctuation was monitor through water tube installed in each plot.



Photo 1 : Sketch of the trial

Photo 2 : Water fluctuation measurement

Results

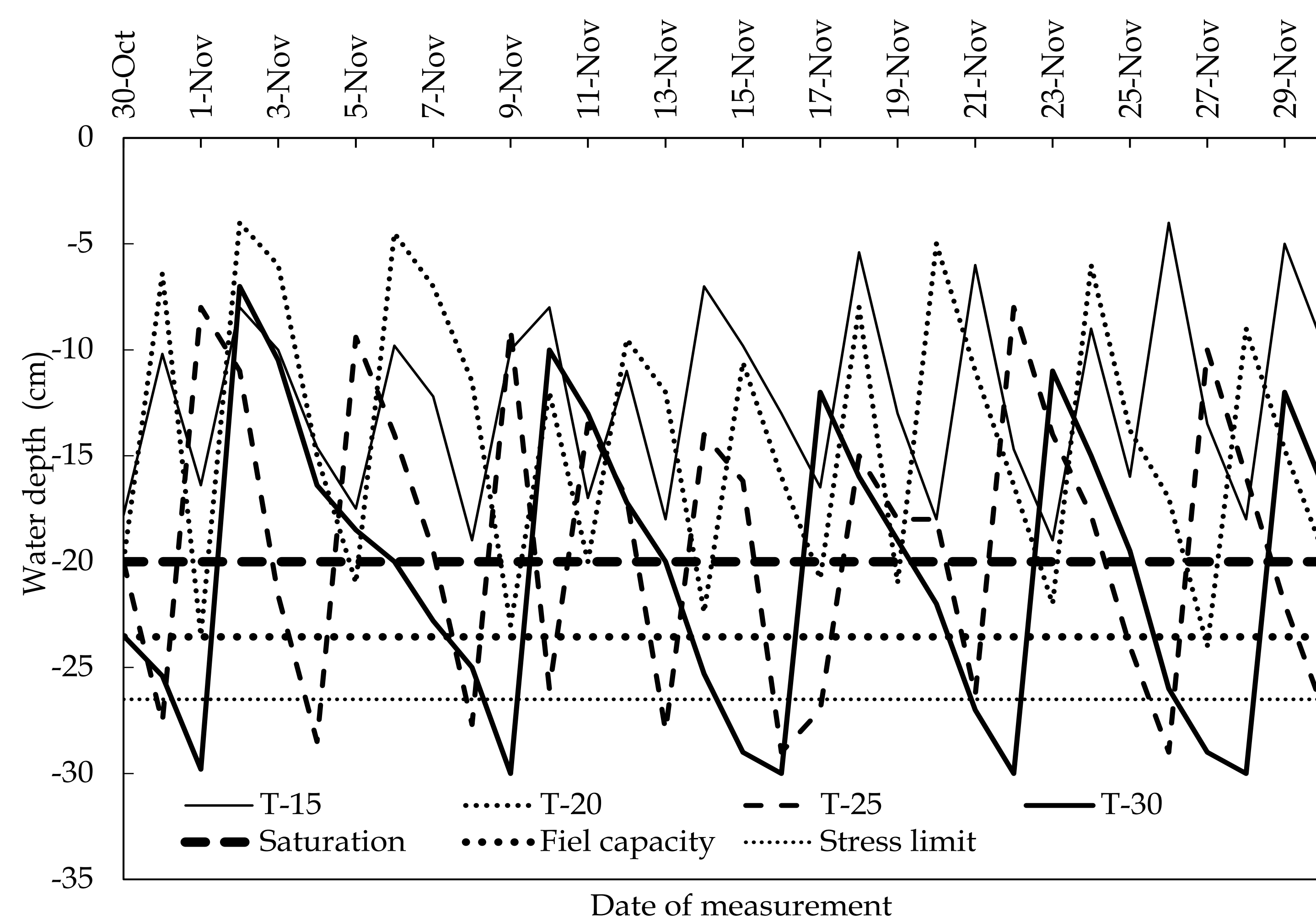


Figure 1. Soil water fluctuation from panicle initiation to harvest



Photo 3. Rice at ripening stage

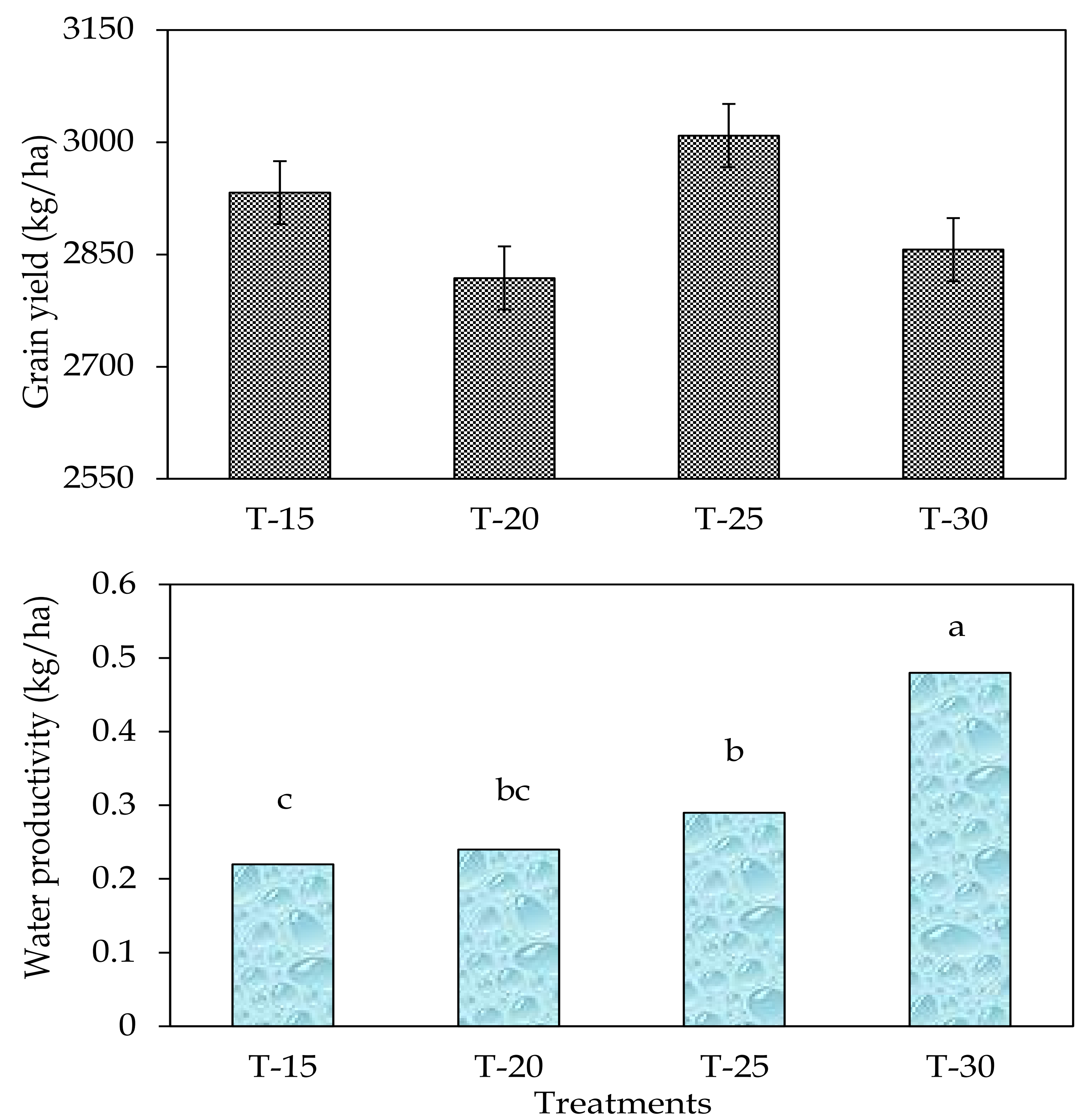


Figure 2. Effects of treatments on rice yield and water productivity

Decreasing water level to 10 cm (T₂₅) and 15 cm (T₃₀) below recommended level (T₁₅) induced low and moderate water stress respectively with no significant yield variation while increasing water productivity by about 120% in average.

Conclusion

The findings of this study suggest that maintaining soil water at 30 cm below soil surface prior to the application of 5 cm depth of irrigation have the potential for improving water productivity and and thus enhance the resilience of the smallholder farming system under Sahel conditions.

Reference

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