P76

S1 - Posters

Climate change impacts on sorghum adaptation in Mali

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Introduction: Climate models are foreseen the future distribution of rainfall in Africa differently. However, an increase in climate variability and a succession of droughts and floods are unanimously expected. Climate variability is an inherent feature in Sub-Saharan environments where farmers acquired expertise to mitigate climate change impacts by developing climate smart varieties over generations. The objective of this work is to determine the impacts of climate change on sorghum adaptation in Mali using the CERES crop model under future climate scenarios.

Material and Method: Data predicted by 6 climate models following the medium scenario (RCP4.5) were extracted for 16 rainfall stations in Mali from 2023 to 2052. Predicted values were corrected for biases against historical data. Phenological module of CERES crop model was calibrated for two Malian sorghum varieties. One corresponds to research ideotype (early maturing type) and the other one is photoperiod-sensitive, late maturing inspired by landraces. CERES model was used to predict flowering time of the two varieties, which permitted to delimit their upcoming growing areas.

Results and Discussion: Climate models predict differently the upcoming rainfall evolution. Most climate models used do not respect the current structure of rainy season in sub-Saharan Africa, which can be considered as bias calculations. The CCCma model was used because it better respects the known structure of rainy season.

Climate change impacts differ according to sorghum varieties photoperiod sensitivity thresholds. The most photoperiodic sorghums are less affected by climate change with a slight shift from North to South for growing areas. Photoperiodism will always be an essential factor in climate change adaptation.

Conclusion: Currently, climate models must be used cautiously to accurately predict crop adaptation, which depends primarily on the start and end dates of the rainy season.

Table of contents