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Response of Dual Purpose Sorghum Varieties to Fertiliser and Sowing Dates in Mali Sudanian Zone

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Abstract

Sorghum is an important multipurpose traditional cereal crop widely grown and consumed by the smallholder farmers in the drylands of Sub-Saharan Africa. Due to the low soil fertility, the limited use of fertiliser and the erratic rainfall distribution induced by the climate change and land degradation, it is relevant to investigate an appropriate sowing time and an effective fertiliser strategy to reduce risks and increase sorghum productivity. The objective of this study is to analyse the interaction between sowing date (early, medium and late) × fertiliser types (mineral, organic, the combined and the control), to assess the synergy and trade-off between these agricultural practices and to evaluate their impact on the agronomic performance of 2 dual purpose sorghum varieties (Soubatimi and Peke) in the Sudanian region of Mali. Experiments were carried out at the research station of ICRISAT-Mali, during the 2019 and 2020 rainy seasons and laid out in a split-split plot design. Destructive and non-destructive measurements on crop phenology parameters, leaf number and size, Leaf area index, crop biomass at 3 stages and crop yield at harvest were assessed as well as soil volumetric water content changes during crop growth. Results show that, the highest average grain and stover yield was obtained with Soubatimi followed by Peke both sown early (DS1) under the combined fertiliser treatment (mineral+organic). In general, a negative effect of late sowing was observed on the grain yield of both varieties. In 2019, there is an interaction of sowing date × variety × fertiliser types on the grain and stover yield of the two dual purpose varieties. This study reveals the potential and constraints of production, as well as the production zones target of the 2 improved dual-purpose genotypes that are used as source of feed for livestock and as source of food for human consumption.

Keywords: Dual purpose sorghum, fertiliser, Mali, sudanian zone, sowing date