Improving morphological and physiological efficiency of sorghum (*Sorghum bicolor* L. Moench) through foliar application of potassium silicate and salicylic acid under drought conditions

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ABSTRACT

A field experiment was conducted to improve morphological and physiological efficiency of sorghum through foliar application of potassium silicate and salicylic acid under drought conditions at Agricultural College Farm, Bapatla, Andhra Pradesh during *rabi*, 2023-24. The experiment was laid out in split plot design with two main treatments *i.e.,* water stress treatments *viz.,* M_1 (stress treatment *i.e.,* moisture stress was imposed from vegetative to flowering 25-70DAS) and M_2 (No stress treatment) and eight sub treatments *viz.,* No spray (S_1), K-Silicate @50ppm at 35+45 DAS (S_2), K-Silicate @100ppm at 35+45 DAS (S_3), SA @150ppm at 35+45 DAS (S_4), SA @200ppm at 35+45 DAS (S_5), K-Silicate @50ppm + SA @200ppm at 35+45 DAS (S_6), K-Silicate @100ppm + SA @200ppm at 35+45 DAS (S_7) and K-Silicate @150ppm + SA @200ppm at 35+45 DAS (S_8) and replicated thrice. The soil moisture content was depleted from 22.4 to 16.5 per cent at 0-15 cm and 21.5 to 15.9 per cent at 15-30 cm depth from 30 DAS to 70 DAS in the plots that were not received irrigation from vegetative stage *i.e.,* 25 DAS to 70 DAS (flowering) *i.e.* M_1 treatment. The sorghum plants under water stress showed drastic reductions in all the morphological and physiological parameters *viz.,* plant height, days to 50 % flowering, days to maturity, leaf area index, total dry matter and SCMR. The combined spray of potassium silicate @100ppm + SA @200ppm exhibited superior performance by enhancing all the morphological and physiological parameters under both stress and non stress treatments.

Key words: *Drought stress, Morphological Parameters, Physiological parameters and Sorghum*