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Growth performance, nutritional status, forage yield and photosynthetic use efficiency of sorghum [*Sorghum bicolor* (L.) Moench] under salt stress

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Abstract
The present study was carried out to evaluate the effects of salt stress on the yield and quality parameters of sorghum genotypes. After screening of sorghum genotypes (23), two sorghum genotypes *viz*., G-46 and CSV 44F were screened at different salinity levels. The results indicated that increasing salt stress reduced the forage dry matter yield, but no significant effect was observed on protein yield. Among the screened genotypes, G-46 recorded maximum digestible dry matter yield (30.6 q/ha). The non-structural carbohydrates, crude protein, *in-vitro* dry matter digestibility (IVDMD), and hydrogen cyanide (HCN) increased, and digestible dry matter yield decreased with increasing salinity levels. Salinity also increased the carbohydrate contents, especially in the salt-tolerant variety. Results showed that G-46 sorghum had the highest TPC at 955.88 mg/100g GAE. The reduction in photochemical quantum yield was more at maturity stage (G-46: 32.5%; CSV 44F: 63.6% at 140 mM). The percent reduction in relative water content (RWC) in G-46 was less (46.9%) at 140 mM NaCl, while CSV 44F had more reduction (63%). Values of chlorophyll content decreased with the progress of salt concentration. CSV 44F had more decrease in chlorophyll content (32.8) as compared to G-46 (25.6) at 140 mM NaCl. The decline in chlorophyll stability in terms of loss of chlorophyll was higher in CSV 44F (61.3%) and lower in G-46 (49%) at 140 mM. But at 100 mM NaCl, the reduction was less (38% and 57.4%, respectively), indicating the tolerance behavior of G-46 genotype. Based on the studied parameters, sorghum genotype G-46 was found to perform better under salt stress.

Keywords: Chlorophyll content, Forage quality, Phenolic compounds, Sorghum, Yield