

Comparison of Yield and Leaf Minerals Concentration of Sorghum and Kochia under Irrigation Water Salinity and Different Kochia Planting Density

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Abstract

A field study was carried out to determine the effect of kochia (*Kochia indica*) planting density and water salinity on sorghum and kochia yield performance during 2012 and 2013. Treatments were irrigation water salinity levels (2, 6, 10 and 14 dS m⁻¹) and kochia planting density of 0.0, 2.5, 3.3 and 5.0 plants m⁻² on the sorghum rows. Results showed that sorghum dry matter (SDM) decreased as kochia density increased in all salinity levels. Salt tolerance threshold values for SDM were obtained at EC_e 4.1 dS m⁻¹. Each unit increase in EC_e above this point reduced SDM by 10.5%. Contrary to the SDM, kochia dry matter was not affected by salinity levels in both years. Irrigation water salinity reduced height of sorghum and kochia in both years. Averaged over two years, leaf Na⁺ concentrations of kochia were 94.4, 88.6, 78.7, and 76.8 times more than that of sorghum at 2, 6, 10 and 14 dS m⁻¹, respectively. Leaf Cl⁻ concentrations of kochia were about 2.3, 2.4, 2.0 and 2.2 times higher than those obtained in sorghum under 2, 6, 10 and 14 dS m⁻¹ salinity treatments in 2012, respectively. These values for 2013 were 3.6, 2.9, 2.5 and 1.9 times, respectively. Calcium concentration of kochia leaves at 2, 6, 10 and 14 dS m⁻¹ were 2.9, 3.4, 2.4 and 2.7 times more than that of sorghum, respectively. In addition, kochia as a superior competitor could reduce yield of summer crops such as sorghum in saline conditions. It is recommended to cultivate the plant in marginal lands for forage production.

Keywords: Calcium, Chloride, Competition, Salt tolerance threshold, Sodium.

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