Range Mgmt. & Agroforestry 42 (2) : 246-254, 2021
ISSN 0971-2070

Biomass repartitioning, tiller regeneration and salt secretion through leaf microhairs for salinity tolerance in guinea grass (*Megathyrsus maximus* Jacq.)

Edna Antony[1*], Apoorva B Kawadikai[2], Savitha Hullur[2], K. Sridhar[1], Seva Nayak[3] and V.K. Yadav[3]
[1]Southern Regional Research Station, ICAR-IGFRI, Dharwad-580005, India
[2]University of Agricultual Sciences, Dharwad-580005, India
[3]ICAR-Indian Grassland and Fodder Research Institute, Jhansi-284003, India
*Corresponding author e-mail: edna.antony@icar.gov.in
Received: 16th November, 2020 Accepted: 5th October, 2021

Abstract
In this study, guinea grass (*Megathyrsus maximus* Jacq.) genotypes were evaluated in artificially created saline soils for forage yield and to understand the salinity tolerance mechanism in tolerant genotypes. Varieties BG-1, BG-2, DGG-1, BG-4, CO-1 and Riversdale were planted in control and artificially created 4 ECe, 8 ECe and 12 ECe soils containing NaCl, Na_2SO_4, $MgCl_2$ and $CaSO_4$ in the ratio of 13:7:1:2, respectively. Varieties CO-1 and Riversdale failed to survive beyond 4 ECe and 8 ECe soils, respectively. DGG-1 followed by BG-4 and BG-2, recorded highest fresh biomass yield among all the genotypes at 12 ECe. Leaf to stem ratio, senescence index and mean productivity index were also highest in DGG-1. Senescence of the older leaves improved regeneration and tiller number in tolerant genotypes. The correlation of senescence index with fresh biomass, regeneration index and tiller number indicated biomass repartitioning influence. Micro hairs present on the leaves secreted salts in BG-4 and DGG-1. An efficient dry matter partitioning, recycling of dry matter from older leaves to photosynthetically active leaves was observed as growth strategy in tolerant genotypes. The tolerance mechanism also included investment in thin roots, salt secretion through micro hairs, storing salts away from photosynthetic organs, replacing Na^+ with K^+ and secure osmotic adjustment systems.

Keywords: Guinea grass, Micro hairs, Osmotic adjustment, Regeneration, Salinity, Salt secretion