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ASSESSING SALT TOLERANCE OF RANGE SPECIES THROUGH VEGETATION MONITORING

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ABSTRACT

Vegetation on saline, sandy clay-loam pocket of a protected natural range-land in western Rajasthan was monitored for eight years. Salt tolerance of different species has been interpreted from their occurrence and productivity under different soil salinities.

INTRODUCTION

Documentation of natural occurring plant species in saline range-land is essential to arrive at promising forage species for converting a salt affected wasteland into a usable pastureland. Saxena and Gupta (1973) and Gupta (1983) have described vegetation of Pachpadra salt basin in western Rajasthan and plant communities of salt affected soils, respectively. The listed species include many naturally occurring edible plant species and definitely point to their potentials for exploitation in management of such saline range-lands. The present paper deals with monitoring of natural vegetation on a protected saline range-land vis-a-vis its in situ soil salinity. The species suitable for gainful utilisation of such waste-lands are suggested.

MATERIAL AND METHODS

The study was conducted from 1974 to 1981 at the range management and soil conservation area at Jadan, Pali-Marwar, under the Central Arid Zone Research Institute, Jodhpur. The area has loamy sand to sandy loam soils and the range of salinity was from 4 mmhos/cm to 16 mmhos/cm (Table 1). Occurrence and yield of different plant species were recorded in 18 quadrats of 10 sq m size every year after the monsoon season. The size of quadrats was taken as recommended by Jain (1967). Quadrats were grouped into four salinity levels viz., ECe $<$ 4 mmhos, ECe 4 - $<$ 8 mmhos, ECe 8 - $<$ 16 mmhos and ECe $<$ 16 mmhos. Based on their occurrence and yield contribution, the vegetation on these salinity groups were, respectively, considered sensitive, semi-tolerant, tolerant and highly tolerant. soils under the different plant species were analysed for pH, ECe, Ca+Mg, Na, Cl and exchangeable Na as per procedure described by Richard (1954). Annual rainfall during the study period (Mean 518.7 mm) ranged between 176.5 mm (1981) and 801.0 mm (1979).

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Among annual edibles *Aristida funiculata* Trin. et. Rupr. and *Digitaria adscendens* Heist were recorded as 'tolerant' because of adecline in their contribution in soils with Ece 16 mmhos *Heteropogon contortus* (Linn.) p. Beauv. ex Roem & Schult. and *Brachiaria ramosa* (Linn.) Stapf yielded significantly only in soils with ECe in the range of 4.0 to 8.0 mmhos and were hence considered 'semi-tolerant'. Presence of *Eragrostis ciliaris* Linn. R. Br. was appreciable only in soils having ECe upto 4 mmhos/cm and was thus 'sensitive'. Other species (*Dactyloctenium sindicum* Boiss. and *Cyperus rotundus* Linn.) with negligible contribution to the total biomass were not considered for the groupings.

From the non-edible category *Fagonia cretica* Linn. *Taverniera cuneifolia* Arn. and *Barleria acanthoides* Vahl were in 'highly salt tolerant' group; *Lepidogathis* sp., *Tephrosia purpurea* (Linn.) Pers. and *Boerhavia diffusa* Linn. in 'tolerant' and *Ziziphus nummularia* (Burm.f.) Wt. and *Tribulus terrestris* Linn. in 'semi-tolerant' group. *Mimosa hamata* contributed insignificantly and hence withdrawn from this classification. Obviously, *Sporobolus marginatus* grows best in soils with more than 16 ECe. Soils salinities of ECe 8 mmhos and above also encourage edible grasses *Eleusine compressa* (Forssk.) Aschers. et. Sch. and *Eremopogon foveolatus*. The lower perennial edible group, as a whole, spreads more under higher soil salinities in the region.

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