D-24 : TOLERANCE OF EIGHT FOREST TREE SPECIES TO SUBSTRATE SALINITY UNDER FIELD AND CONTROLLED CONDITIONS

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Percentage survival of 8 forest tree species to varying degrees of substrate salinity was studied in a field trial in Mahaleeay (ML), Mirrijjawila (MJ) and Nelumpathwila (NP) in the Hambantota District. The first two sites were along the coastline while the latter site was interior. The first two sites were saline (salinity = 5 mmho, pH = 4.2 and 3.13 mmho, pH = 5.1) while the latter was alkaline (2 mmho, pH = 9.0). In the controlled trial in the greenhouse, 3 months old seedlings were planted on soil taken from each site and watered with a similarly saline solution twice a week at 100 ml/pot.

Soils of the field trial were treated with Gypsum (166 g/pit), Farm yard manure (FYM) (1 kg/pit) and some were left untreated.

In the field trial, the % survival varied significantly (p) among the tree species used. In the saline sites of ML and MJ, *Azadirachta indica* showed the highest survival (85%) followed by *Acacia senegal* (79%), *Casuarina equisetifolia* (63.5%)

Callophyllum inophyllum (63%), *Terminalia catappa* (63%), *Eucalyptus camaldulensis* (60.5%), *Acacia auriculiformis* (48%) and *Anacardium occidentale* (31%).

In the alkaline site at NP, *A. indica* showed the highest survival (88%) followed ny *A. senegal* (85%), *E. camaldulensis* (80%), *A. auriculiformis* (78%) and *C. equisetifolia* (37%).

The watered trial of the same soils in the greenhouse *C. equisetifolia, A. indica, A. auriculiformis* and *E. camaldulensis* showed 100% survival in saline soils of MJ and ML and *C.equisetifolia, A. indica, A. auriculiformis* and *E. camaldulensis* showed 100% survival in soils from NP. This implies that reduction of survival of these species in the field stage was due to drought conditions which triggered a moisture stress than to substrate salinity. In the alkaline soils compaction due to drought seems unfavourable to plant growth. In *C. inophyllum* the survival was only 62.5% in the watered trial.

On both saline and alkaline soils in the greenhouse trial the mean height increment and leaf number were significantly (p) higher in *C. equisetifolia* when compared with *A. indica* and *A. senegal.* They survived better in the field compared with *Casuarina.*

Of the soil treatments 166 g Gypsum/pit showed an average survival of 68.5% compared with 1 kg/pit FYM (66%) and the control (63.5%) in the more saline sites in MJ and ML. In the more alkaline site in NP, the soil treatments did not show any positive effect on the % survival, the figures being 76% for the control, 71% for 1 kg/pit FYM and 73% for the 166 g/pit Gypsum.

A. indica, A. senegal, C. inophyllum, T. catappa, C. equisetifolia and *E. camaldulensis* can be recommended for saline sites which also experience water stress, & *A. indica, A. senegal, A. auriculiformis* and *E. camaldulensis* for alkaline sites which experience water stress. In sites where both salinity and moisture content are high the following can be grown successfully: *C. equisetifolia, A. indica, A. auriculiformis, E. camaldulensis.*