Water Relations in Native Trees, Northeastern Mexico

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Key words : water stress , water potential , soil water content , water relations

Introduction Native trees that grow in the semiarid regions of northeastern Mexico are important feed resources for range ruminants and white-tiled deer (Ramirez , 1999) . They also provide high quality fuelwood and timber for fencing and construction . Since water stress (González *et al* ., 2004) is the most limiting factor in this region , the present work was focused to study how diurnal and seasonal leaf water potentials (Ψ) of native tree species are related to soil water availability and evaporative demand components .

Materilas and methods This study was carried out at the Faculty of Forest Sciences of the Autonomous University of Nuevo Leon (24°47′N ; 99°32′W ; 350 masl) Mexico . Studied tree species were : *Cordia boissieri* (Boraginaceae) , *Condalia hookeri* (Rhamnaceae) *Diospyros texana* (Ebenaceae) and *Bumelia celastrina* (Sapotaceae) . Determinations of in the four tree species were at 10 days intervals between July 10 and November 30 , 2007 by using a Scholander pressure bomb . Ψ was monitored in five different plants per species at 2-h intervals between 06 :00 (predawn) and 18 :00 h . Air temperature , relative humidity vapor pressure deficit , precipitation and soil water content were registered throughout . data were subjected to one-way ANOVA .

Results During the wettest period (Sep-10) Ψ ranged from - 0. 72 (*C . boissieri*) to - 1. 30 MPa (*B . celastrina*) , in contrast , during the driest period (Nov-30) , varied from - 2. 90 (*B . celastrina*) to - 6. 10 MPa (*D . texana*) (Figure 1) . Diurnal Ψ values were negatively correlated with air temperature and vapor pressure deficit , in contrast , a positive relationship was found with relative humidity . Gravimetric soil water content and precipitation data were linearly correlated with predawn Ψ .

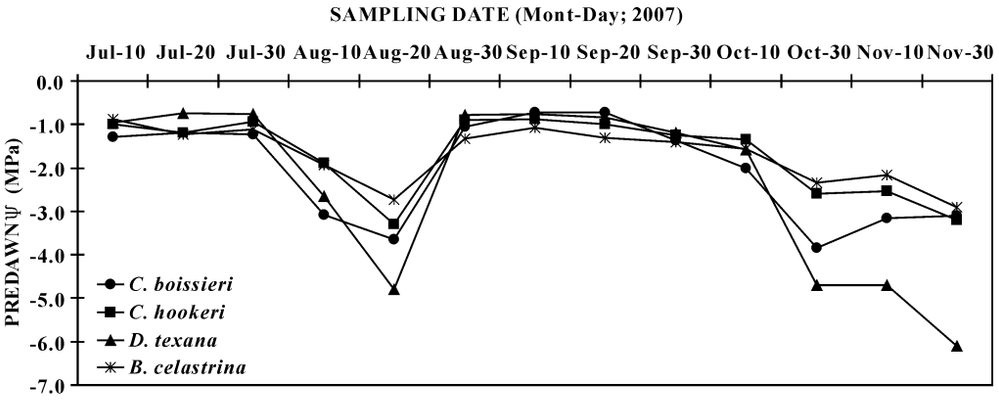

Figure 1 *Predawn leaf water potential (Ψ) in four native tree species , northeastern Mexico .*

Conclusion The ability of tree species to cope with drought stress depends on the pattern of water uptake and the extent to control water loss through the transpirational flux .

References

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