

Genetic differences between *Lotus glaber* populations tolerant and susceptible to salinity, growing in a non restrictive soil condition

[ADRIANA ANDRÉS](#)* and BEATRIZ ROSSO

EEA-INTA Pergamino, Argentina.

* Corresponding author

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Lotus glaber Mill (*Lotus tenuis* Waldst. et Kit) is a perennial forage legume native from the Mediterranean Basin. It grows during spring-summer and autumn. In Argentina it has been naturalized in the lowlands of the Salado River (Buenos Aires Province). In this area, *L. glaber* has shown adaptation to ecological conditions due to its ability to overcome frequent drought and flooding, the adaptation to soils poor in phosphorus, poor drainage and its ability to natural reseeding.

At Pergamino Gene Bank are conserved populations of *L. glaber* collected in the lowlands of Salado River, and landraces that seed growers maintain by their own. Several studies were done by INTECH and Pergamino Experimental Station (EEA Pergamino) INTA on 23 accessions in order to evaluate tolerance to salinity, and several morphological, physiological and biochemical attributes were evaluated (Pesqueira *et al.*, 2007). Other studies performed under spaced plant conditions indicated appreciable genetic variation between and within *L. glaber* populations on forage and seed production attributes (Andrés and Rosso, 2007). In accordance with the results obtained 2 pools of 3 populations each: tolerant to salinity (TOL) and susceptible to salinity (SUS), were transplanted on 28 November 2006, at the experimental grounds of EEA Pergamino under spaced plant conditions, in a randomized block design with 2 replicates. Each pool was compound by 3 populations (20 genotypes/population), and all genotypes were measured or scored for a range of morphological attributes related to forage and seed production during 2006 and 2007. Analysis of variance was performed on the attributes considering individual populations and the 2 pools. Estimates of genetic and environmental variances were calculated from one-way ANOVA performed on each individual population.

The results showed highly significant differences between pools (SUS vs TOL) for all attributes analyzed. SUS populations had plants with larger diameter (plant diameter: 150 cm vs 120,17 cm), higher branching number (274 vs 168), higher dry matter weight (253,83 g vs 130,83 g), early flowering (92 vs 115 days), higher seed yield (7,42 g vs 1,68 g) than TOL populations. The better performance of SUS populations suggested that they were grown or selected under environment with no salinity stress, and they should be tested under both restricted and non restricted soil conditions. There were significant differences between populations for all attributes and the broad sense heritability reached values higher than 0.41,

suggesting that this variability may account for future selection response.

References

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