

LOTASSA: first glance of model to cultivated forage legumes

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Due to the current pressure imposed by the expansion of intensive crop systems, pasture areas are banished to marginal, low fertility soils. Further, abiotic stress tolerance in crop and pasture plants is becoming increasingly important with global climate changes and other consequences of anthropogenic activities, such as the global increase in desertification, soil salinity, etc. As a consequence, pastures are grown increasingly at the limit of their adaptation, in areas where the ability to survive periodic (i.e. drought, flooding) or continuous (i.e. pH stress, salinity) environmental stresses become an essential characteristic for success. One of the main challenges for breeders will be the production of superior germplasm that allows to maintain, if not enhance the current agricultural yields under increasingly adverse environmental conditions. Consequently, breeding programmes that aim to systematically improve general abiotic stress tolerance in plants are of prime importance for the sustainability of food production. The implementation of breeding programs, assisted by the latest knowledge and technologies, towards the development of improved cultivars adapted to environmental stresses, appears as a feasible strategy to increase the productivity of current grazing areas, essential for enhancing livestock production. Compared with *Trifolium* or *Medicago*, *Lotus* species have a number of advantages that make them successful in the Southern Cone, like better adaptability to low P availability and low pH soils, as well as excellent animal performance in grazing systems. Breeding for tolerance to abiotic stresses in *Lotus* spp. of agronomic interest has been restricted by the reproduction system and the complexity of the physiological and metabolic responses involved, as well as the symbiotic specificity. Although progress could be made in developing stress-tolerant cultivars of cultivated species using conventional breeding, the pace of this progress may be too slow to meet the growing needs of improving natural pastures. Given the close genetic relatedness among *Lotus* species, the LOTASSA project aims to promote the existing genetic and genomic resources for the model species *Lotus japonicus* to improve adaptation and sustainable production of agriculturally important *Lotus* species in environmentally constrained soils in South America. The innovation of LOTASSA is the joint research on plant and rhizobia of model and cultivated *Lotus* species by European and South American Institutes on the genetic and metabolic bases of the physiological processes involved in salt, water and Al stresses.