

## Genetic resources of forage legumes for agriculture-pastoral system in Uruguay

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Animal production in Uruguay is limited by the productivity and quality of natural pastures that represent more than 70% of the grazing area. Temperate forage legumes have been adopted since the 60s, particularly in intensive systems with cereal - perennial pastures rotations. Forage legumes are important in the sustainability of agricultural systems and natural ecosystems, with increments of up to 8 folds in the organic matter of agricultural rotations compared with monoculture systems. However, the low proportion of cultivated pastures reflects the difficulties in the establishment and persistence of introduced legumes. The main cultivated legumes in rotation with cereals are *Lotus corniculatus* (LC), *Trifolium repens* (TR) and *T. pratense* (TP), while *L. subbiflorus* (LS) and more recently *L. uliginosus* (LU) are sown in natural pastures. The wide utilization of LC, LS, LU, is due to their adaptation to soils with low P availability and the presence of tannins that diminish bloat occurrence in cattle. The production of perennial legumes is limited by several environmental restrictions (drought and flooding, acid soils, diseases and pests), even in the adapted species. An additional restriction in Uruguay is the incompatibility of rhizobia strains between species of the same genus. Strains of LC are parasitic in LS and LU; similar incompatibility takes place with the introduction of TR or TP in areas with *T. polymorphum*, a perennial native species. Plant breeding (PB) during the last decade has concentrated on *Lotus* and *Trifolium* whose distribution varies with soil and climatic conditions. The collection of landvarieties increases the possibility to generate differences due to natural selection, through the adaptation to specific edaphic and climatic conditions. The strategy to evaluate those differences is centered in the use of biochemical, physiologic and genetic markers. Naturalized populations have been used in the past in PB (LC cv INIA Draco, a cultivar more persistent and tolerant to short periods of drought in the summer). Farmers' participation in collection and characterization of LC and TP assures a quick adoption of the generated products (Project LESIS - FONTAGRO FTG 787/2005). The integration of a multidisciplinary team carries out the research for water stress in the genus *Lotus* (Project LOTASSA - FP6-2003-INCO-DEV2 PL-517617). Research advances in breeding of LC and TP are described during the presentation.