

Contribution of *Lotus tenuis* to the ecological services of grasslands under different productive scenarios of the Flooding Pampa, Argentina

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During the last 15 years, the Flooding Pampa grassland has been subjected to agricultural intensification in terms of increased land use for annual crops and of livestock stocking rate. This trend was led by innovative high-tech enterprises and is currently encouraged through government financial aids to improve livestock productivity. These public subsidies promote the intensive use of herbicides for the establishment of fertilized pasture crops, among other agronomic technologies. The contribution of *L. tenuis* to forage production in sub-humid temperate pampa grasslands is highly valued for low-inputs calf production systems where this legume establishes naturally or is introduced to improve fodder quality. Because its role as a N-fixing plant, *L. tenuis* is considered a key-stone species able to colonize a wide range of the regional semi-natural plant communities, where other forage legumes fail to establish and persist under cattle grazing.

However, as better quality soils are being used for annual crops and pure or mixed pastures in more intensive production systems, the agro-ecological niches of *L. tenuis* come increasingly restricted to more hydro- halophytic habitats. Although fertilized mixed pastures can support high stocking rates and solve in the short term the increased fodder needs, the potential contribution of *L. tenuis* to the nitrogen budget and to forage quality of natural grasslands can be wasted.

Plant breeding efforts to create new cultivars able to be productive and to persist under saline-alkaline soil conditions (*e.g.* cv Pampa INTA) is opening new opportunities for *L. tenuis* to fit that new scenario. However, though preliminary results by our group about the performance of this cultivar under field conditions are encouraging, new challenges are nowadays emerging. As pasture crops (*e.g.* annual ryegrass) come increasingly sown over those marginal soil conditions the persistence and growth of *L. tenuis* become seriously threatened by herbicide and plant competition pressures.

To make compatible increasing fodder needs and the benefits associated to the ecological service of symbiotic N fixation by legumes it must be taken into account those critical demographic processes in *L. tenuis* populations (*i.e.* seedling establishment and periodic seed bank reload). These processes can be seriously compromised for example by bad or not

prescribed use of N fertilization and herbicides (*e.g.* glyphosate). Our presentation to this workshop aims primarily at focusing the population dynamics and management of *L.tenuis* in the very heterogeneous and dynamic agro-ecological sceneries of the Flooding Pampa landscapes.