

Rhizobiology research in *Lotus* species.

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The Uruguayan natural grasslands are the nutritional base of livestock production and occupy more than 70 % of the surface of the country. These grasslands are very stable, but they present limitations of quantity and quality of forage inside and between years. The improvements of grasslands are been done by sod seeding of forage legumes inoculated with specific strains of *Rhizobium sp.* and phosphate fertilizers. This technology was validated in commercial farms in the eastern and the center regions of the country. These improvements are realized principally with species of the genera *Lotus* (*L. subbiflorus* cv. "Rincón ", *L. uliginosus* cv. "Makú ", *L. corniculatus* cv. "San Gabriel "). However the situation is not the same in the basaltic region in the north part of the country, for which new species of forage legumes are been evaluated, since traditional *Lotus* species are not adapted due to restrictions related to edaphically factors (mix of superficial and deep soils) and climatic conditions (high temperature in summer and freezes in winter). Main lines of rhizobiological research in species of *Lotus* are:

- Rhizobia strain selection for species of agronomic interest.
- Evaluation of compatibility between rhizobia strains and *Lotus* species
- Analysis of biodiversity patterns of strains able to nodulate *Lotus corniculatus*.

In the first case the introduction and isolation of new rhizobia strains allows the evaluation in symbiosis of the agronomic potentiality of *Lotus* species of current and potential use. This activity begins with a preliminary testing of symbiotic efficiency of strains and isolations in growth chambers under controlled conditions. Superior strains pass to greenhouse evaluation in "soil cores" to imitate field conditions. In this stage there is an evaluation of *Lotus* and grassland dry matter production. The strains of better behavior in greenhouse go to field evaluation in plots in several localities.

Final selection is based in field results. Selected strains are evaluated for genetic stability and are used to study interspecific compatibility, and ability to growth in the industry conditions for inoculant production.

We are also performed biodiversity studies of the native and introduced rhizobia populations in soils and in the roots system associated with the persistence of commercial *Lotus* species. The principal outcomes of this research relates with:

- I) the knowledge of the characteristics of the native and introduced rhizobia strains,
- II) the isolation and conservation of about 150 isolations able to nodulated *Lotus* species,
- III) Inoculant development and use in farm conditions.