

## Legume Utilization in Grazing Systems in Southern Brazil

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The Brazilian subtropical region is limited northwise by the Tropic of Capricorn (24 ° S) and in the south by the extreme south of the state of RS, which borders Uruguay. Despite this political limitation, the “Campos” area, in a broad sense, at the southern cone of South America, encompasses an area of about 45million of ha with an enormous potential of improvement and utilization. The natural pastures are still the most important forage resource for animal production in the Brazilian subtropics. In the case of the state of RS, the initial participation of the native pastures, that was of about 60% of all of the area, decreased to about 10,5 million in 1995/96 and it is calculated today in less than 8 million of ha, in its majority substituted by summer crops (soybeans, maize and rice), fruits (specially with temperate species) and more recently by the aggressive advance of forestry (*Pinnus*, *Eucalyptus* and *Acacia*). Despite all of this, this entire region could potentially be improved by the introduction of temperate legumes due to its high forage value. The use of cultivated temperate pastures of winter is also a good alternative to compose integrated crop-grazing systems, since from the total area of approximately six million of ha cultivated with summer crops in the state, only 12% are cultivated with wheat or other cultures in the winter, being the rest rarely used (CONAB, 2007). This clearly indicates the great potential of use of winter pastures that we have and that are not used, especially if legumes are incorporated to the production systems. Despite its recognized importance, the use of legumes in practically all the grazing systems is very limited. Although the legumes are extremely important species in any system of utilization, its lack of persistence has been pointed as the biggest limitation to its use and inadequate practices of management have been considerate as the main cause of this failure at the level of the farmers. (Beuselinck *et al.*, 1994). Rochon *et al.*,(2004) consider that the benefits provided by the use of legumes partially are counterbalanced, in tempered regions as well as in the Mediterranean regions, due to the difficulties in the establishment, maintenance and management under grazing. Therefore, it seems clear that, although the innumerable benefits of the use of legumes, its lack of persistence has been an important factor that has limited the expansion of its use in different regions. In global terms, recent data (Shelton *et al.*, 2005) indicate that, in Brazil, only around 2% of its 130 million of ha of cultivated tropical pastures possess some participation of legumes. In the Southern of Brazil, even though reliable estimates are not available, the picture is not very different. Therefore, it seems important that, at this moment, the causes of the small use of legumes in grazing systems be studied and understood, and it is important as well to have a re-study of the potential areas of use and the benefits from them. In this context, one of the important temperate groups of forage species is the genus *Lotus*. The genus *Lotus* possesses more than 170 species, presenting varied forms of growth, and cycles

of life, distributed throughout different climatic regions. Amongst these species one of the most important for the south region of Brazil is the *Lotus corniculatus*. Hopkins *et al.* (1996) reported that the pastures formed with *Lotus* can play a significant role in situations in which fertilizers and the management, necessary to support fertilized grasses with N or mixed with white clover, cannot be justified by economic or environmental reasons. Despite all this potential, Brazil possesses only one cultivar commercially available, a material that was developed and released in the decade of 1960, lacking, therefore, a more modern germoplasm, with superior characteristics. Compared with other tempered species, the birdsfoot trefoil is a much less demanding species in soil fertility, demanding a lower amount of inputs, although it requires more care about management related to frequency and intensity of utilization. Moreover, it is a species very well adapted to most of our climatic conditions, presenting an excellent natural reseeding and not causing bloating to the animals. Despite these advantages, its use in production systems has been very limited and its lack of persistence for long periods also has been observed, mainly due to problems of management and the presence of diseases. Therefore, the possibilities of use of legumes with proven forage potential and that require less amount of inputs should be stimulated and at the same time we should try to understand the reasons for its low use. Moreover, some native species, as for example, those that belong to the genus *Trifolium*, *Adesmia*, and *Desmodium*, whose productive potential have been indicated many years ago, and that are also species with less requirements in terms of soil fertility, must also be present in the evaluation programs and breeding programs of all research institutions, at least in the public ones. Currently, due to the pressure imposed by the expansion of crop areas, the areas of pastures have been dislocated to marginal areas, in degraded soils with low fertility. As a consequence of this, the pastures have been constantly defied in their adaptative capacity to the different conditions of stress, as salinity, alkalinity, drought, acidity, amongst others, generating frustrating results. Therefore, an alternative would be the use of species that already possess some degree of tolerance to these stresses or even the improvement of species, aiming at the adaptation in these stressful environments. Since many years, the traditional concept of, adapting the environment to the plant, in accordance with its requirements has shown its incapacity to deal with the problem, especially in developing countries. Therefore, a new alternative is been seeked for many years, that is, to adapt the plant to the stressful environment, always remembering that minimum levels of production are necessary to reach sustainable levels of production. That is, some amount of inputs must be added, even to the plants that are considered tolerant or adapted, otherwise, zero input, generally results in zero output! (Sanchez and Salinas, 1981).

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