

Effect of phosphorus, potassium and sulphur application on productivity of *Lotus* spp. in two big groups of Chilean soils

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The results of five experiments are reviewed. 1) Two experiments carried out in volcanic soils with high P retention, and 2) three experiments carried out in clay soils poorly drained. These studies involve the use of *Lotus corniculatus*, *L. glaber* and *L. uliginosus*; different levels of phosphorus, potassium and sulphur applications, as triple superphosphate, potassium chloride and sodium sulphate, respectively; and different levels of soil water availability. Dry matter production, changes in soil availability of N, P, K and other elements, concentration of these elements on herbage and, in some cases, growth variables, were measured. The results allow the description of the three *Lotus* species' response to P, K and S in both environments and, on volcanic soils, the comparative response with *Trifolium repens*.

The effect of phosphorus was evident, clearer in clay soils despite that in both environments the soil P availability was low. The dry matter production increased 25 % when the annual P application was increased from 10 to 20 kg/ha, which allowed the *L. corniculatus* dry matter yield to go from 7,48 to 9,51 ton of DM per ha per year. In volcanic soils, *L. corniculatus* and *L. glaber* response was lower than *Trifolium repens*, 20 % vs. 300 % when zero and 15 kg/ha of P were applied, respectively, in a condition without K, S and water restrictions. However, the DM production levels of *Lotus* species were far higher than the *Trifolium* levels. There was no potassium response. The sulphur application improved productivity in volcanic soils but did not affect the DM production on clay soils.

It is concluded that among the studied elements the most important for the *Lotus* spp. nutrition is phosphorus. The Blumenthal *et al* (1993) statement - *Lotus* species are more efficient in absorbing phosphorus than other forage legumes- was confirmed, which among other relevant characteristics of this forage legume genus, allows the successful use of these species in "low input" production systems and improve their sustainability.

References

BLUMENTHAL M.J., KELMAN W.M., LOLICATO S., HARE D.M. AND BOWMAN A.M. 1993. Agronomy of improvement *Lotus*: A review. In Alternative pasture legumes. Department of Primary Industries, South Australia. *Technical Report* 219, pp. 74-85.