

Fertilisation strategies for sown organic pasture in the Mediterranean Mountains of North-east Portugal

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Introduction

- Leptosols are dominant in North-east of Portugal
- These areas are important to the sustainability of bovine and ovine meat production in organic farming
- This paper shows the results of fertilisation strategies in sown long-term legume-rich pastures in organic farming in these leptosol areas

Material and methods

- Location
 - Vila Meã, Portugal 41° 50' N 6° 35' W 860 m a.s.l.
- Soil fertility
 - 24 g·Kg⁻¹ OM 4.5 pH(H₂O) 42 mg·Kg⁻¹ P₂O₅ 81 mg·Kg⁻¹ K₂O
- Treatments
 - Pasture (PA)
 - Spontaneous vegetation (SV)
 - Sown pasture (SP)
 - Fertilisers
 - Control (C) (without fertilizer)
 - Lime (Ca) 1.5 t·ha⁻¹
 - Bovine farmyard manure (M) 30 t·ha⁻¹
 - Phosphorous (P) 380 kg·ha⁻¹ (rock phosphate - 26%)
 - Boron (B) 7 kg·ha⁻¹ (borax - 15.2%)
 - Fertiliser combinations
 - (i) - C
 - (ii) - Ca
 - (iii) - M
 - (iiii) - Ca+P
 - (v) - Ca+P+B
 - (vi) - M+Ca+P+B
- Six fertiliser combinations applied within the two pasture types (SV and SP)
- Mixture sown (SP) (kg ha⁻¹): *T. subterraneum* Denmark (1.3), Gosse (1.3); *T. Vesiculosum* Zulu (1.3); *T. michelianum* Bolta (0.6); *T. incarnatum* Inta (1.3); *O. sativus* Emena (1.3); *O. compressus* Avila (0.6); *B. pelecinus* Casbah (0.6); *T. resupinatum* Kyambro (0.6); *T. repens* Haifa (0.6); *T. fragiferum* Palestine (0.3); *C. intybus* Puna (0.6); *L. multiflorum* Pollanum (2.5); *L. perenne* Victorian (3.8); *D. glomerata* Amba (0.4); *Ph. aquatica* Holdfast (0.6);
- Data available from 2004 to 2007: yields in DM obtained at the end of spring and end of autumn in enclosure cages on a 0.5*0.5 m quadrat
- Data analysed as a two-factor nested design with season x year as repeated measures (SY)

Results

- Treatments with manure were always among the highest yielding group (Fig. 1);
- SV C treatment (control) was always among the lowest yielding group (Fig. 1);
- Only the SP Ca and SP Ca P treatments had similar yields to the manure treatments in spring 07, after natural reseeding (Fig. 1);

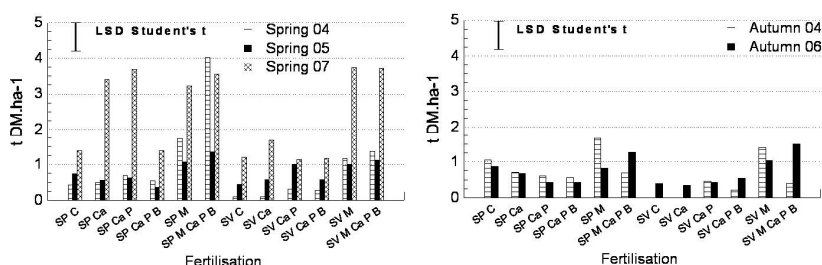
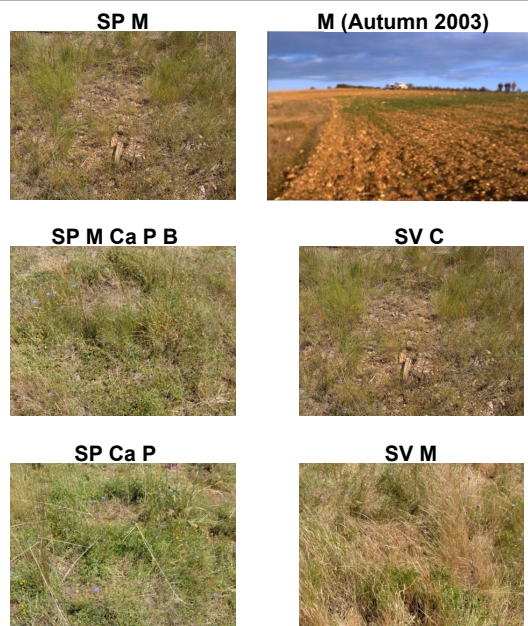


Fig.1 - DM yields in spring and autumn for the (F(PA)) treatments
 (LSD Student's $t_{(0.05; 96)} = 0.785 \text{ t DM}\cdot\text{ha}^{-1}$)



Conclusions

- Manure demonstrated itself to be an indispensable fertilisation strategy for pasture yield in these low fertility soils and climate conditions;
- Liming may boost the reseeding of annual legumes and have also a significant effect in the medium term