

Fertilisation with different types of sewage sludge on pasture production and protein concentration in a silvopastoral system developed under *Fraxinus excelsior* L.

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► INTRODUCTION



SEWAGE SLUDGE STABILISATION

- Anaerobic digestion
- Composting
- Pelletisation ↓ water content and reduces storage, transport and spreading costs

OBJECTIVE

The objective of this study was to evaluate the effect of municipal sewage sludge that have been stabilised using anaerobic digestion, composting, and pelletisation on pasture production and on concentration of crude protein compared to control treatments (mineral and no fertilisation) in a silvopastoral system under *Fraxinus excelsior* L.

► MATERIALS AND METHODS

LOCALIZATION



EXPERIMENT DESIGN

- Randomized block (5 treatments and 3 replicates).
- 15 experimental units (168m²) with 25 *Fraxinus excelsior* L.
- Sowing with *Dactylis glomerata* L., *Lolium perenne* L. and *Trifolium repens* L.

TREATMENTS

- (1) No fertilization (NF)
- (2) 500 kg ha⁻¹ of 8:24:16 (MIN) in spring
- (3) 320 kg N ha⁻¹ anaerobically digested sludge (ANA) in the winter of 2004
- (4) 320 kg N ha⁻¹ composted sewage sludge (COM) in the winter of 2004
- (5) 320 kg N ha⁻¹ pelletised sewage sludge (PEL) (134 kg N ha⁻¹ in the winter of 2004 and 93 kg N ha⁻¹ in late 2005 and 2006)

SAMPLE COLLECTION: four samples of pasture per plot (0.3 × 0.3 m²)

ANALYSIS IN THE LABORATORY: samples were dried, weighed and the crude protein was determined

STATISTICAL ANALYSIS: ANOVA

► RESULTS

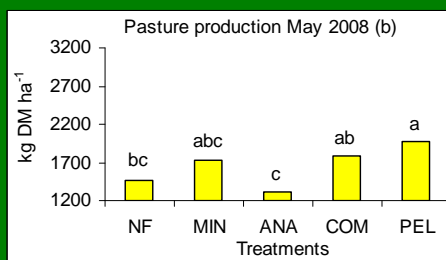
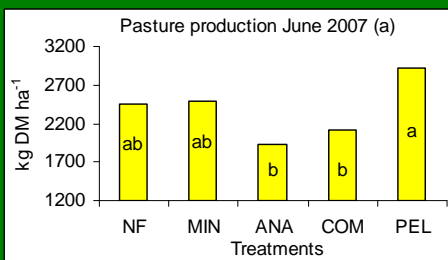


Figure 1. Pasture production (kg dry matter (DM) ha⁻¹) in the harvests of June 2007 (a) and May 2008 (b)

PASTURE PRODUCTION (Figure 1)

JUNE 2007: PEL ↑ ANA and COM ↓
MAY 2008: PEL ↑ and ANA ↓

CRUDE PROTEIN (Figure 2)

JUNE 2007: PEL ↑ and COM ↓
MAY 2008: MIN ↑ and NF ↓

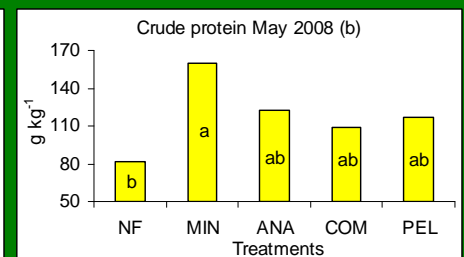
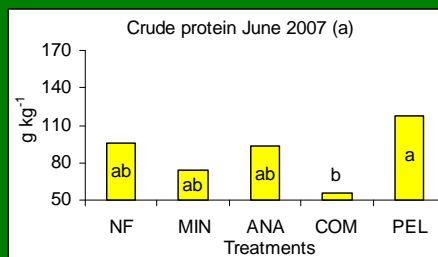


Figure 2. Concentrations of crude protein in pasture (g kg⁻¹) in the harvests of June 2007 (a) and May 2008 (b)

► **CONCLUSIONS:** Pelletised sludge should be recommended among all the types of sludge tested, as it increases pasture production and the concentration of crude protein in pasture. Moreover, pelletised sludge presents lower proportion of water than anaerobic sludge and composted sludge which reduces application and storage costs.