

SOIL FERTILITY AND FORAGE YIELD IN A MAIZE-ITALIAN RYEGRASS ROTATION FERTILIZED WITH PELLETIZED BROILER LITTER

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INTRODUCTION

The main destination of broiler litter (Figure 1) is its application as fertilizer on agricultural land. The dehydration and granulation of this manure can ease handling and storage, helping to minimize nutrient losses and other environmental risks and facilitating dosage and distribution in the field.

The aim of this work was to study the effects of a dried pelletized broiler litter fertilizer (Figure 2) on soil fertility and forage production in a maize (*Zea mays* L.)-Italian ryegrass (*Lolium multiflorum* L.) rotation, as compared with conventional mineral fertilization.



Figure 1

METHODS

A field experiment was established in a 1000 m² plot at Antas de Ulla (Lugo, NW Spain).

Main soil characteristics were: pH (H₂O) 4.87, Al saturation 63.7%, OM 13.7 P-Olsen 8.9 mg kg⁻¹, and assimilable K 64.1 mg kg⁻¹.

The soil was limed and the following fertilization treatments applied randomly in 60 m² subplots:

Control: NPK application before sowing Italian ryegrass and no further fertilization.

Mineral: fertilization with NPK fertilizers both for Italian ryegrass and maize, and calcium ammonium nitrate for Italian ryegrass.

Biof-1: 3500 kg ha⁻¹ of dried pelletized broiler litter for Italian ryegrass and 7500 kg ha⁻¹ for maize.

Biof-2: 4500 kg ha⁻¹ of dried pelletized broiler litter for Italian ryegrass and 10000 kg ha⁻¹ for maize.



Figure 2

Properties of the Biofertilizer: humidity 12.7%, OM 72.6%, N 4.1%, P 1.2%, K 1.4%, Ca 2.3 %, Mg 0.4%.

RESULTS

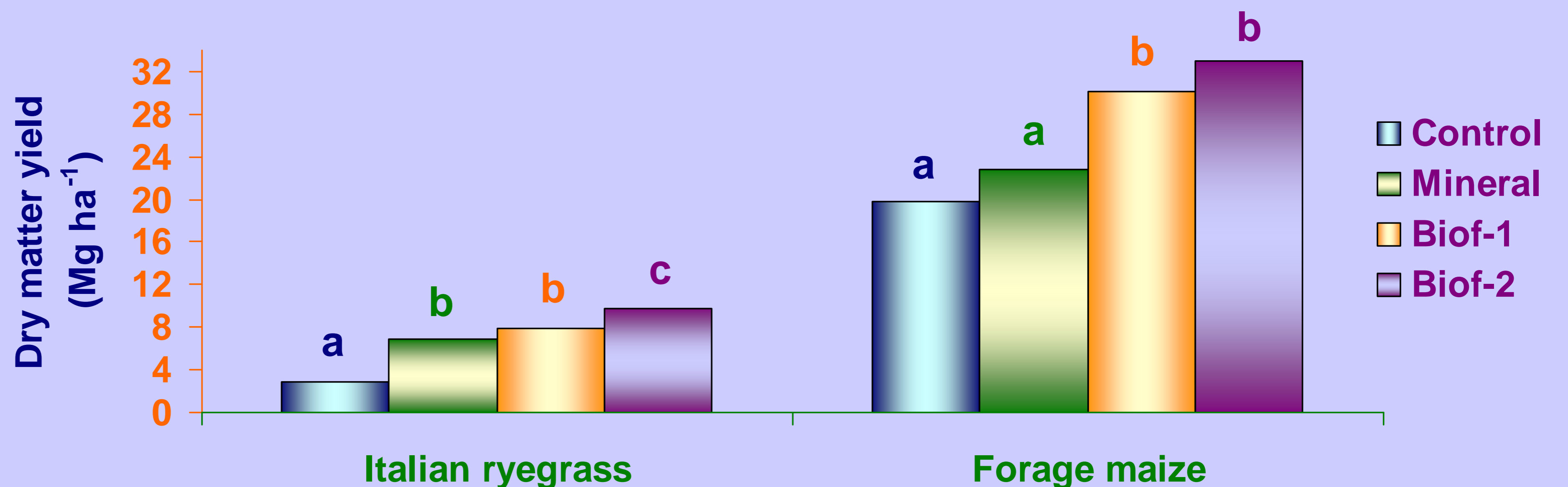


Figure 3. Dry matter yield of Italian ryegrass and forage maize in the different fertilization treatments. For each forage crop, values followed by a different letter are significantly different for $P < 0.05$.

Soil fertility characteristics after cutting forage maize for silage.

Treatment	pH	C	OM	N	C/N	P	Ca	Mg	K	Al	Al sat.
	H ₂ O		%			mg kg ⁻¹		cmol kg ⁻¹			%
Control	5.62	7.63	13.17	0.60	12.81	6.05 b	4.83 bc	0.32 b	0.28 b	0.40 ab	6.42 a
Mineral	5.41	7.13	12.31	0.58	12.38	15.54 a	4.33 c	0.30 b	0.37 b	0.46 a	7.98 a
Biof -1	5.71	9.44	16.30	0.73	12.96	16.72 a	5.88 ab	0.82 a	0.48 a	0.31 bc	3.87 b
Biof -2	5.44	8.92	15.39	0.71	12.54	19.52 a	6.60 a	0.89 a	0.54 a	0.28 c	3.17 b

* Within each column, values followed by a different letter are significantly different for $P < 0.05$.

CONCLUSIONS

The dried pelletized broiler litter fertilizer was competitive for forage production with respect to the conventional mineral fertilization.

The use of this organic fertilizer on fodder crops improved soil fertility and provided similar or higher fresh and dry matter yields, being an effective way of recycling broiler litter from intensive farms.