

INFLUENCE OF CONVENTIONAL vs. ORGANIC MANAGEMENT SYSTEMS ON DEGRADABILITY CHARACTERISTICS OF GRASS SILAGES FOR DAIRY COWS

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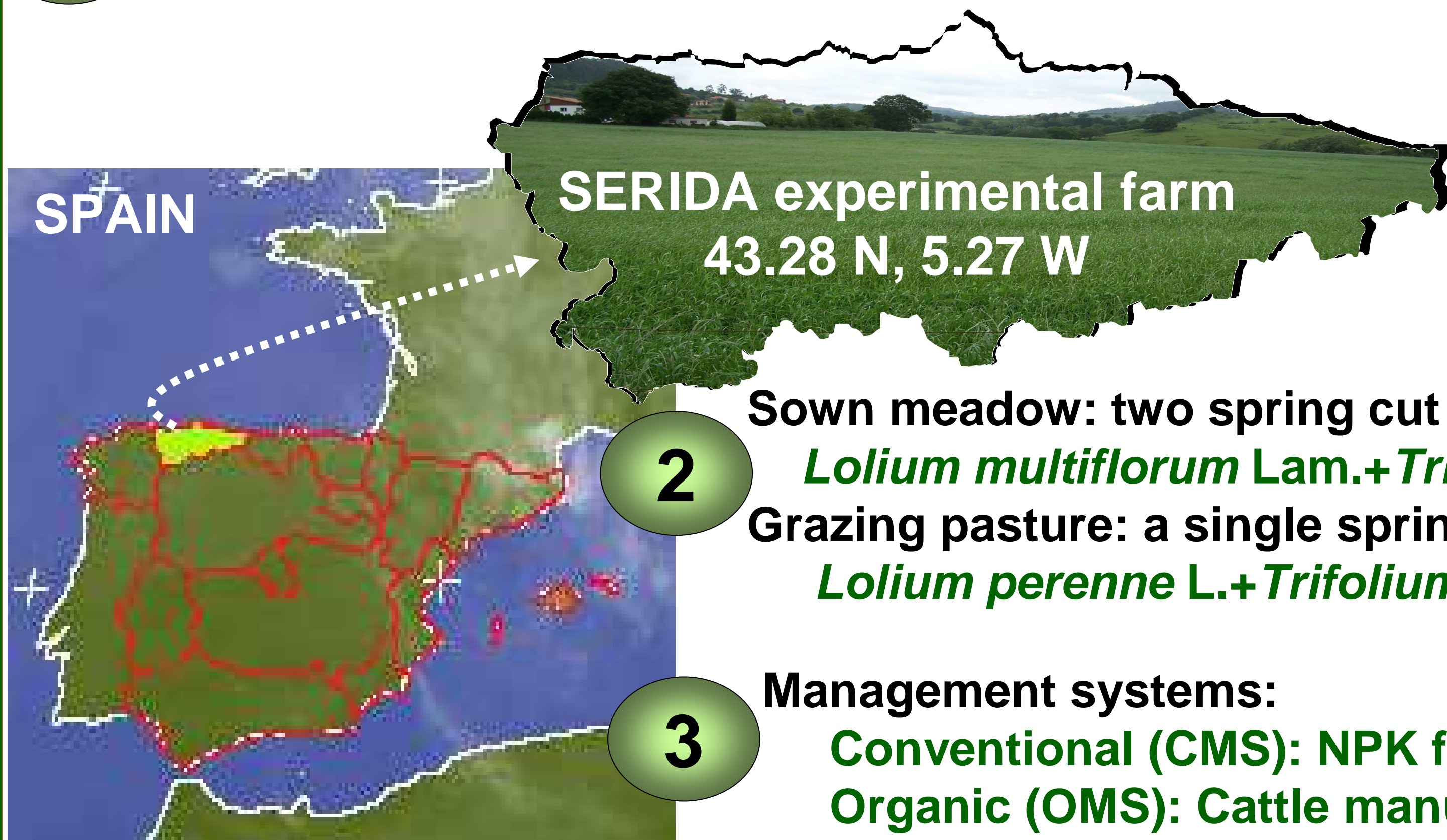
INTRODUCTION

In order to improve environmental conditions, there is a growing interest in lower input pasture systems. In this sense, forage production is changing to a health environment, going from conventional (CMS) to organic managements (OMS) to reduce agricultural and livestock waste. Previous results have shown that silages obtained from OMS forages have lower effluent losses and rates of proteolysis and secondary fermentations, and better aerobic stability characteristics. However, information concerning to studies related with degradability parameters of silages obtained under OMS in oceanic climatic conditions are very limited.

OBJECTIVE

Evaluation and comparison the degradability characteristics of six grass silages from meadows and grazing pastures allocated in temperate areas of the North Spain, growing under organic or conventional systems.

1 Assays Location



SERIDA experimental farm
43.28 N, 5.27 W

2 Sown meadow: two spring cut silages
Lolium multiflorum Lam.+*Trifolium pratense* L.
Grazing pasture: a single spring cut silage
Lolium perenne L.+*Trifolium repens* L.

3 Management systems:
Conventional (CMS): NPK fertilization
Organic (OMS): Cattle manure fertilization

MATERIAL and METHODS

4 ANIMALS & MEASUREMENTS



ASSAY DAY	1		2		3		4		5	
INCUBATION TIME	0	2	4	8	16 / 24	48	72	96		
EXTRACTION HOUR	10'00	12'00	14'00	18'00	10'00	10'00	10'00	10'00		

- Size particle: 2 mm
- Size bag: 20 x 10 cm
- Sample weight: 25 mg cm⁻²
- Porous size: 50 µm
- Replicates: 6 silages x 2 bags x 3 non lactating Holstein cows
- Incubation time: 0, 2, 4, 8, 12, 16, 24, 48, 72, 96 h
- Analysis: Dry matter and crude protein (N*6.25)



RESULTS

Table 1. Nutritive value, energy content and fermentative parameters of grass silages

	<i>Lolium multiflorum</i> <i>Trifolium pratense</i>				<i>Lolium perenne</i> <i>Trifolium repens</i>	
	OMS		CMS		OMS	CMS
	1 st cut	2 nd cut	1 st cut	2 nd cut	Single cut	Single cut
pH	4.17	4.43	4.54	4.80	4.61	4.89
Dry matter	17.44	18.64	15.26	28.86	30.66	34.18
Ash (%DM)	22.06	12.05	16.02	9.23	11.00	10.64
Crude protein (%DM)	10.90	11.94	12.89	14.08	13.50	10.68
Neutral detergent fibre (%DM)	62.27	61.75	60.17	61.39	54.36	66.32
Acid detergent fibre (%DM)	31.38	37.84	34.25	38.05	33.80	39.13
Crude fibre (%DM)	30.86	34.82	32.33	34.15	29.88	34.03
Metabolizable energy (MJ kg ⁻¹ DM)	7.98	8.88	8.82	9.08	9.36	8.15
Soluble nitrogen (g kg ⁻¹ total N)	441	400	533	459	332	459
Lactic acid (g kg ⁻¹ DM)	50.90	29.90	26.10	26.30	13.70	27.20
Acetic acid (g kg ⁻¹ DM)	48.40	27.70	58.50	18.20	11.10	13.30
Butiric acid (g kg ⁻¹ DM)	14.10	25.00	29.10	24.50	11.00	22.90

OMS: organic management; CMS: conventional management; DM: Dry matter.

Table 2. Ruminal degradability parameters of *Lolium multiflorum-Trifolium pratense* silages

	1 st cut		2 nd cut		s.e.	M	C	M*C	
	CMS	OMS	CMS	OMS					
DM	a	0.3211	0.3409	0.3124	0.2908	0.0023	NS	***	**
	b	0.6293	0.5900	0.5116	0.5892	0.0206	NS	NS	NS
	a+b	0.9504	0.9308	0.8240	0.8800	0.0196	NS	*	NS
	c	0.0358	0.0518	0.0466	0.0392	0.0042	NS	NS	NS
	ED	0.5548	0.6145	0.5159	0.5228	0.0055	*	***	*
CP	a	0.5683	0.6202	0.6242	0.6285	0.0085	NS	NS	NS
	b	0.3610	0.3152	0.2667	0.2522	0.0132	NS	*	NS
	a+b	0.9293	0.9354	0.8909	0.8808	0.0140	NS	NS	NS
	c	0.0888	0.0780	0.0429	0.0812	0.0063	NS	NS	NS
	ED	0.7836	0.7963	0.7237	0.7732	0.0051	*	**	NS

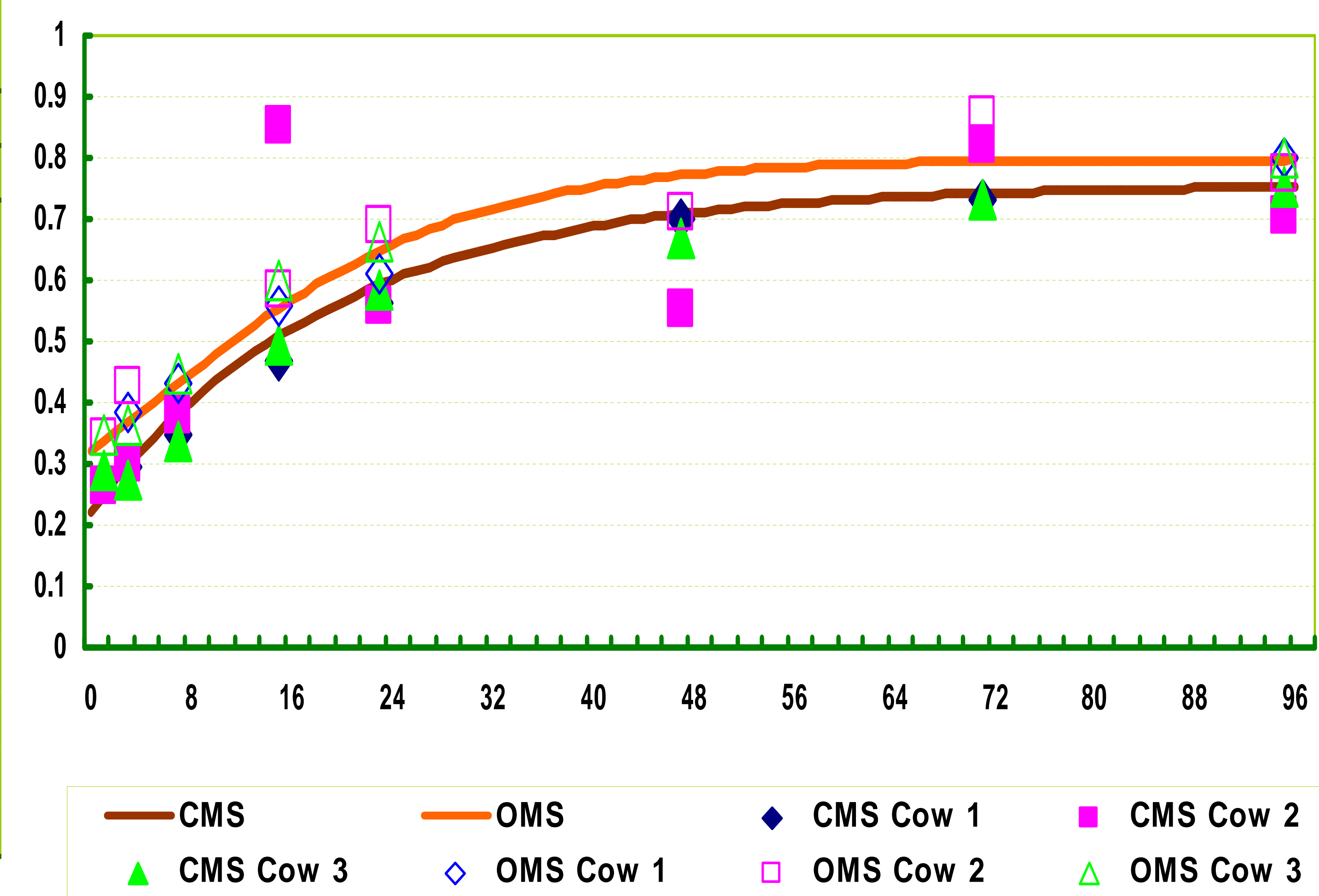
OMS: organic management; CMS: conventional management; M: Management; C: Cut; DM: Dry matter; CP: Crude protein a, b, and c: soluble, non-soluble and undegradable fractions, respectively; ED: Effective degradability; s.e.: standard error.

*, ** and *** Significant at 0.05, 0.01 and 0.001 % levels, respectively. NS p>0.05.

PRELIMINARY CONCLUSIONS

Results indicate that for temperate areas the values of potential dry matter and crude protein degradability in organic silages are higher than those obtained for conventional management, regardless of the type of meadow and the silage cut.

A) Dry matter



B) Crude protein

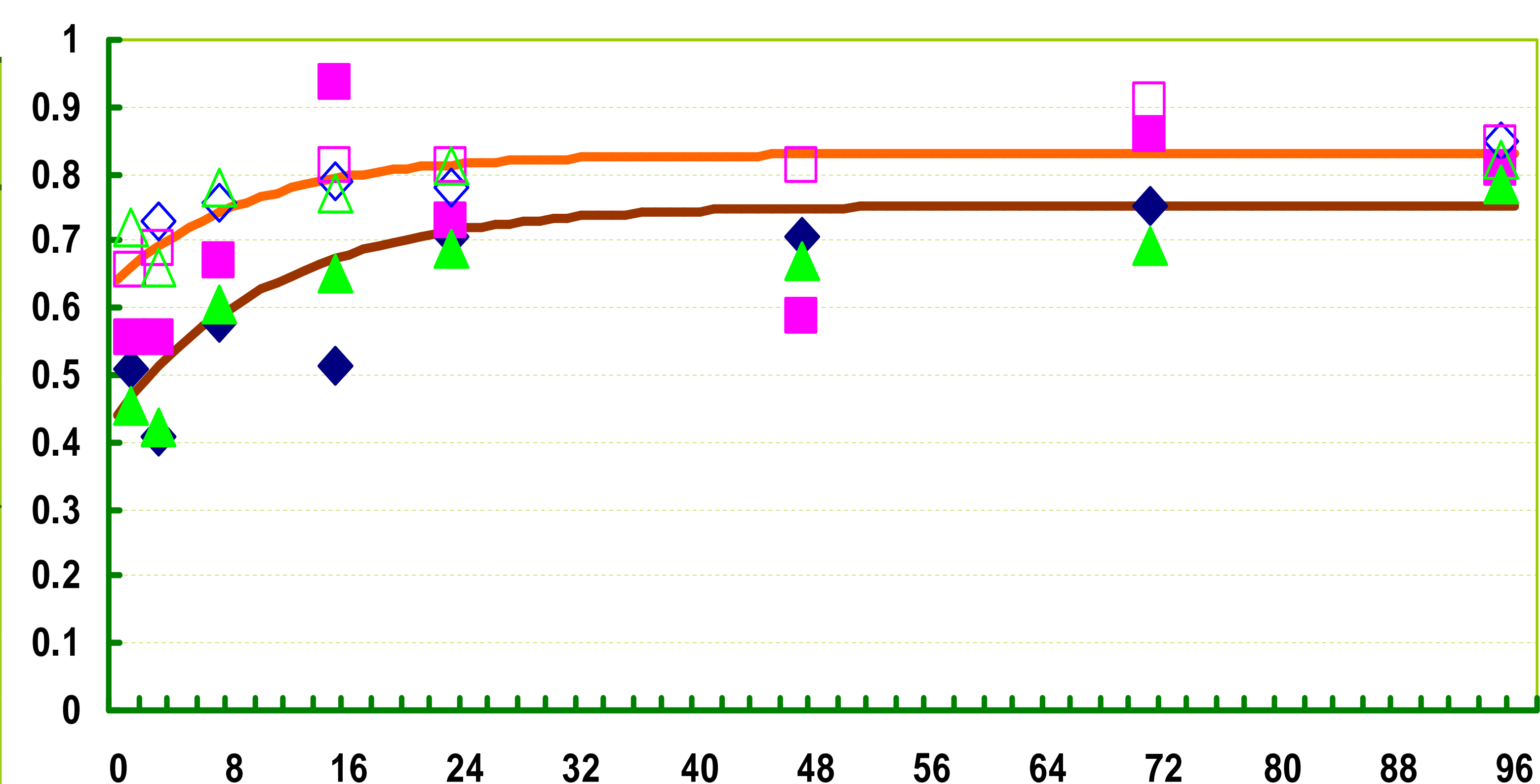


Figure 1. Ruminal degradability of *Lolium perenne-Trifolium repens* silages under conventional (CMS) or organic (OMS) management systems