

# EVALUATION OF *LOLIUM PERENNE* AND *LOLIUM MULTIFLORUM* CULTIVARS IN CHILEAN ANDISOLS

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## ABSTRACT

During the seasons 1992/93, 1993/94, 1994/95, the productive pattern of seven cultivars of *Lolium perenne*: Nui, Ellett, Santa Elvira, Solo, Embassy, Super Nui, Marathon and five *Lolium multiflorum*: Tetrone, Montblanc, Concord, Aberoscar, Abercomo, was evaluated in a dryland area of Southern Chile. The average season at yield reached by the evaluated cultivars was statistically similar ( $P < 0.05$ ). However, Ellett, Solo and Marathon, showed a higher persistence and Tetrone and Montblanc presented a plant structure which might allow a greater complementation with *Trifolium pratense*.

## KEYWORDS

Ryegrass, cultivars, Diploid, Tetraploid, *Lolium multiflorum*, *Lolium perenne*, Italian ryegrass

## INTRODUCTION

In Southern Chile, *Lolium perenne* is the most widely used species for milk and beef production systems. Sown alone or associated with *Trifolium repens*, it is the most important grazing resource, constituting 65% of the pasture of the region (Demagnet, 1994). *Lolium multiflorum*, in monoculture or with *Trifolium pratense* is used in intensive systems for silage elaboration (Demagnet, 1994). In the last decade, new cultivars coming from New Zealand, France, England, Denmark and Holland have been introduced in the country, whose production levels are unknown. Considering this feature, two experiments were designed in order to evaluate production pattern of *Lolium perenne* and *Lolium multiflorum* in dryland area of Andisols of Southern Chile.

## METHODS

The experiments were carried out in University of La Frontera Experimental Station, Temuco, Chile, in an Andisol of average fertility. Using a randomized block design in 12 m<sup>2</sup> lots with three replications and under a cut system (4m<sup>2</sup>), the early flowering *Lolium perenne* cultivars of Ellett, Santa Elvira, Solo, Embassy, Super Nui and Marathon were evaluated during the seasons 1992/93, 1993/94 and 1994/95. The *Lolium multiflorum* cultivars: Tetrone, Montblanc, Concord, Aberoscar and Abercomo, were evaluated in the seasons 1994/95 and 1996. In order to determine dry matter content, fresh forage was dried in forced ventilation at 65°C for 48 hours. The botanical composition was determined by manual separation and tiller number was evaluated in one lineal meter per plot at the end of the third season.

## RESULTS AND DISCUSSION

In Table 1, forage production from the seven *Lolium perenne* cultivars are presented. During the first season, Nui, Ellett, Santa Elvira and Embassy reached a significantly higher yield than the rest of the evaluated cultivars, demonstrating their initial higher aggressivity characteristic which has appeared in various Southern places of the country, especially for Embassy and Santa Elvira cultivars (Demagnet, 1994). During the second season, the mean yield was 5.76 t DMha<sup>-1</sup>, and showed no statistical differences. However, in this period, the cultivars showed different growth habits, most notably an upward growth habit for Embassy, prostrate growth habit for Solo and Marathon and a very irregular growth for Santa Elvira. During 1994/95 season, Nui, Santa Elvira and Solo showed a yield lower than 8 t DMha<sup>-1</sup>. This yield was statistically lower than the rest of the cultivars.

The average production of the cultivars was similar; nevertheless, Ellett, Solo and Marathon contained as endophyte fungus showed a higher tiller number m<sup>-2</sup>, indicating a better adaptation on dryland conditions of Southern Chile.

In *Lolium multiflorum*, the mean yield of the five cultivars in two evaluation seasons was statistically similar ( $P < 0.05$ ), showing no relevant differences between diploid and tetraploid cultivars. This agrees with the results reported by Castle and Watson, (1971); Davies *et al.* (1989) and Vipond *et al.* (1993). But during the second year, the yield reached by Aberoscar was significantly lower ( $P < 0.05$ ). All the cultivars had an upward growth; however the diploid ones excelled for high tiller amount and the thin leaf type, and are therefore poorly suited to establishing a mixture with *Trifolium pratense*. Tetraploid cultivars had thick leaves with low tiller density. This type of plant is best suited for the association with clover.

## ACKNOWLEDGMENTS

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**Table 1**

Production (t DM/ha), of seven cultivars of *Lolium perenne*, in the dryland area in IX Region. Maipo Experimental Station, Temuco - Chile.

Cultivars	1992/93	1993/94	1994/95	Average	N <sup>o</sup> Tillerm <sup>-2</sup>
Nui	7.43 ab	5.93 a	7.40 b	6.92 a	2.890 b
Ellett	8.48 a	5.38 a	8.02 ab	7.29 a	3.022 a
Santa Elvira	7.68 ab	5.41 a	7.45 b	6.85 a	2.740 b
Solo	6.88 b	5.85 a	7.08 b	6.60 a	3.601 a
Embassy	8.52 a	6.62 a	8.24 a	7.79 a	2.180 b
Super Nui	6.95 b	5.25 a	8.33 a	6.84 a	2.250 b
Marathon	6.46 b	5.89 a	9.01 a	7.12 a	3.450 a
Average	7.49	5.76	7.93	7.06	2.876
CV. (%)	9.38	12.31	10.41	10.02	12.16

Different letter is significantly different at P< 0.05 (Duncan Test)

**Table 2**

Production (t DM/ha), of five cultivars of *Lolium multiflorum*, in the dryland area in IX Region. Maipo Experimental Station, Temuco - Chile.

Cultivars	1994/95	1995/96	Average
Tetrone	8.44 a	9.11 a	8.78 a
Montblanc	7.72 a	9.28 a	8.50 a
Concord	8.64 a	8.49 ab	8.57 a
Aberoscar	8.23 a	7.60 b	7.92 a
Abercomo	8.83 a	9.13 a	8.98 a
Average	8.37	8.72	8.55
CV. (%)	6.80	7.5	6.9

Different letter is significantly different at P< 0.05 (Duncan Test)