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PRODUCTION OF ORCHARD-GRASS CULTIVARS (*Dactylis glomerata*) IN MIXTURES WITH ALFALFA (*Medicago sativa*), UNDER GRAZING CONDITIONS.

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Abstract

In the Lower Valley of the Río Negro (northern Patagonia, Argentina), six binary mixtures of orchard-grass (*Dactylis glomerata*) cultivars (Porto, Currie, Filox, a Local ecotype, Pergamino El Cencerro MAG) and alfalfa (*Medicago sativa*) Monarca SP INTA, were tested under grazing and irrigation. Mixtures were evaluated during three growing seasons (96/97; 97/98 and 98/99). Total forage production of mixtures and botanical composition was measured (orchard-grass cultivars and alfalfa). Porto, Currie, Filox, Local and Cencerro cultivars reached similar yield, while Amba produced less forage ($p < 0.05$). Mixture yield showed no significant difference, except Porto + alfalfa, which was lower ($p < 0.05$). The grass was higher in spring (1st grazing) of three growing seasons. Orchard-grass + alfalfa showed highest dry matter production in 2nd and 3rd grazing. Alfalfa increased production along the three seasons in replacement of the declining tendency of orchard grass cultivars.

Keywords: Orchard-grass, cocksfoot, *Dactylis glomerata*, grass-legume mixtures, alfalfa, *Medicago sativa*, irrigated pastures, Patagonia

Introduction

Forage mixtures of grass with alfalfa (*Medicago sativa*) are the main fodder resources for direct grazing in irrigated valleys of the northern Patagonia. The most used species are tall fescue (*Festuca arundinacea*), tall wheatgrass (*Thinopyrum ponticum*), canary grass (*Phalaris aquatica*) and in less proportion, orchard-grass (*Dactylis glomerata*). The sowing of orchard-grass has decreased in Argentina in general, and particularly in Patagonia, due to the use of unadapted cultivars. There is very scarce information about the behaviour of cultivars, sown pure or in mixtures with alfalfa, under cutting conditions (Zabala, 1997; Larrosa and Castaño, 1998). No data exist about performance of cultivars under actual system requirements in northern Patagonia. The objective of this trial was to evaluate the forage production of orchard-grass cultivars in mixtures with alfalfa, under grazing in irrigated paddocks.

Material and Methods

The experiment was carried out at the Agricultural Experimental Station Valle Inferior (40° 48' S, 63° 05' W, 4 m elevation), located at 6 km west from Viedma, Río Negro. Average annual temperature is 14 °C degrees and rainfall media about 400 mm (1965-1989) (Alonso and Rebay, 1995), within a semi-arid mesothermal (Thorntwaite) climate (Arroyo, 1969). Mixtures were sown on a loamy to clay-loam Mazacuent Entico Chacra Series soil (Masota, 1970), in autumn 1995. During three growing seasons (96-97; 97-98; 98-99) six orchard-grass cultivars, in binary mixtures with alfalfa (cv Monarca SP INTA), have been evaluated. Orchard-grass cultivars were: Porto, Currie, Amba, Filox, Pergamino El Cencerro MAG and a Local ecotype. A randomized complete block design with four replications was used; experimental units were 333 m² plots. All the plots were grazed by steers, weighting between 280 and

380 kg, by the time alfalfa showed flower buds or basal regrowth of 5-7 cm. High stocking rate and occupation periods of 1 to 3 days were used. In each growing seasons nine water applications (100mm each time). were made. Forage mixtures were grazed five times each growing season. Four samples of 0.125 m²/plot were taken before each grazing, to measure forage production and botanical composition of the pasture (grass and grass + alfalfa).

Total forage production (Σ 96-97, 97-98 and 98-99) of orchard-grass cultivars and orchard-grass + alfalfa mixtures have been statistically analysed. The model included effects of blocks and cultivars. Differences between means were evaluated through Tukey's multiple range test.

Results and Discussion

Total production was analysed and relevant differences were found in average values of the different cultivars ($p < 0.0195$). Two homogeneous groups, partially overlapped, were obtained. Only Amba variety (77.3 ± 7.4 b g DM/0.125 m²) had a significantly lower total production compared with Currie and Local (153.3 ± 19.4 a and 151.6 ± 17.9 a respectively), and showed no difference with the other varieties (Porto, 126.4 ± 24.6 ab; Cencerro, 117.2 ± 10.6 ab and Filox, 94.8 ± 15.9 ab). Besides, all cultivars except Amba, conform another homogeneous group. In a cutting trial, Zabala (1997) found the same low results with Amba. Relevant differences of average values ($P < 0.0324$) between grass cultivars and mixture were found. About the different mixtures with alfalfa, Filox (767.2 ± 35.5 a) showed higher yield ($p < 0.05$) than Porto (576.9 ± 31.0 b) which not differed from the remaining mixtures (Currie: 655.6 ± 56.4 ab; Amba: 645.5 ± 44.6 ab; Cencerro: 637.0 ± 6.5 ab and Local: 588.6 ± 26.8 ab). Cultivars had a tendency to reduce yield within each growing season and decreased

production along the three trial periods (Figure 1). The mixtures yield reached their highest performance during the second and third grazing of each season, and showed no tendency to decline throughout the three growing seasons (Figure 2), opposite to orchard-grass cultivars behavior. This may be due to an increase of alfalfa production, replacing the reduction of the different varieties.

Under similar management conditions as the ones used by the production systems of irrigated valleys in northern Patagonia, Currie, Porto, Cencerro, Filox and Local cultivars had a similar behavior, while Amba did not adapt to local conditions and showed less yield. Contribution of the different cultivars to mixtures declined throughout time. Five mixtures reached similar yield, with the exception of Porto + alfalfa, of lower performance. Forage production of mixtures may not have decreased due to the alfalfa yield increase. This could have replaced the minor production of the different orchard-grass cultivars.

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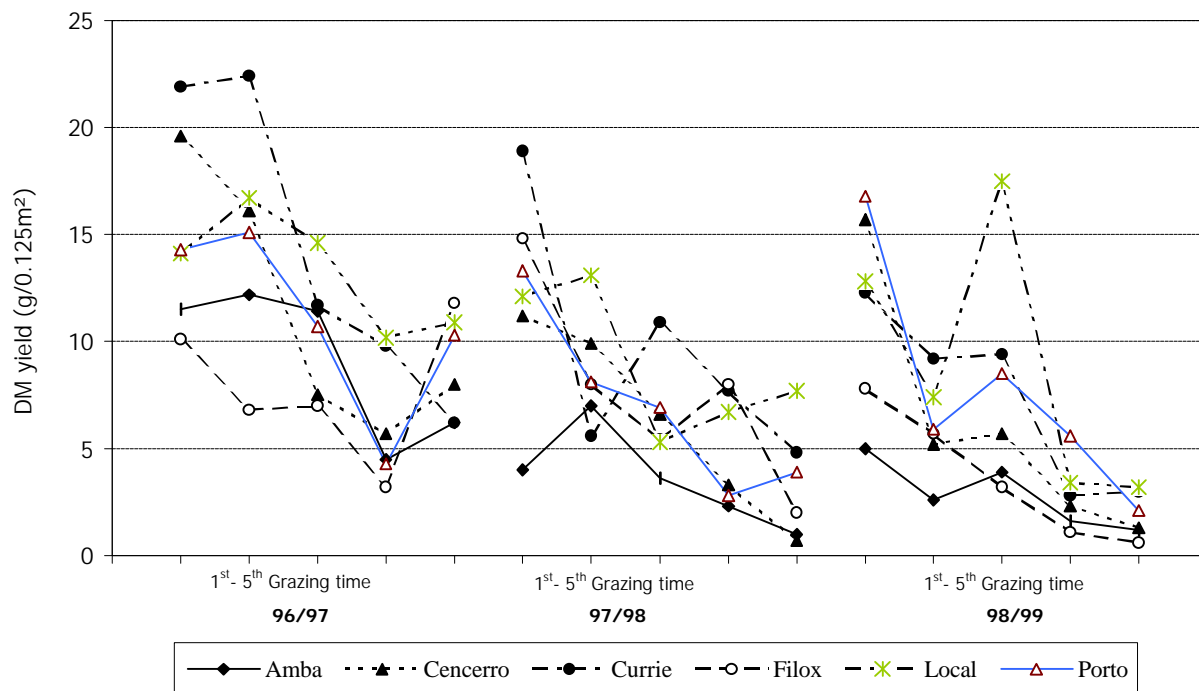


Figure 1 - Yield of grazed Orchard grass cultivars during three growing seasons.

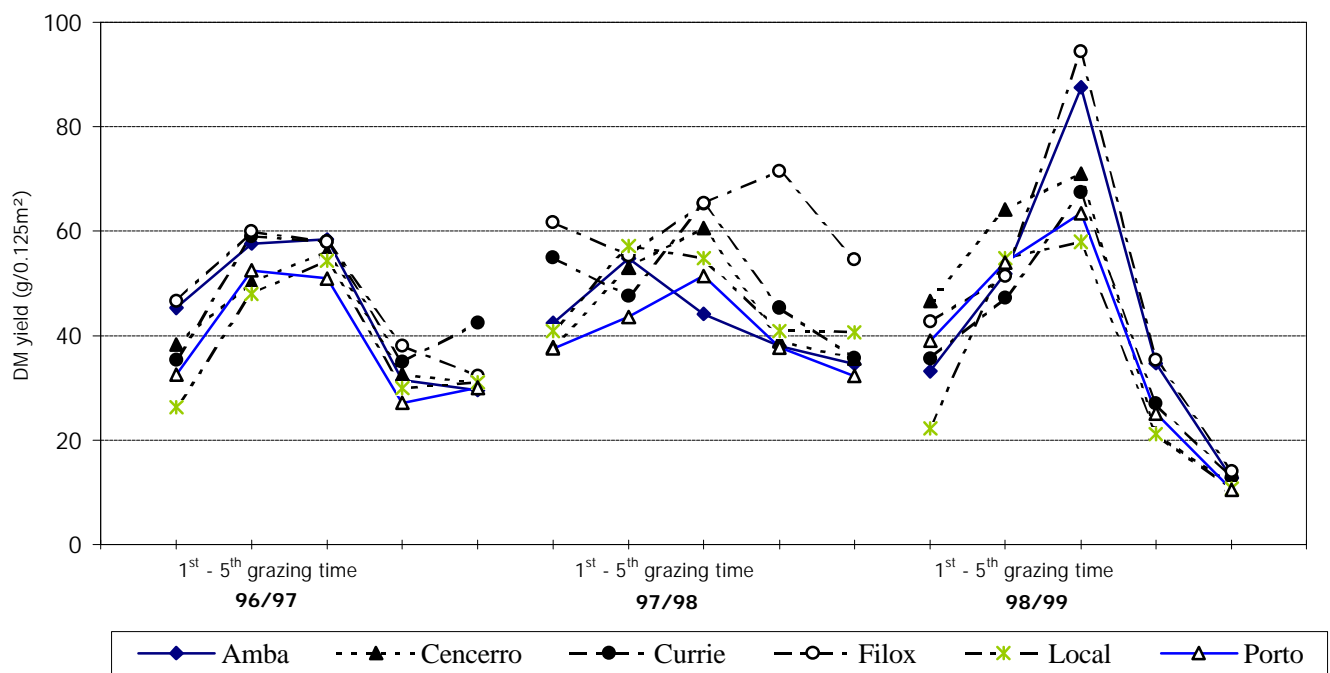


Figure 2 - Yield of grazed Orchard grass cultivars + alfalfa mixture during three growing seasons.