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Oat and wheat added to annual ryegrass pasture to improve the seasonal forage offer

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Key words : mixtures, annual ryegrass, oat, wheat, seasonal yield

Introduction Grazing of annual ryegrass (*Lolium multiflorum* L.) pasture is extensively used on livestock farms of Argentina (Jacobó et al., 2000) providing high quality forage during winter and early spring. Nevertheless, in the subhumid region of the country, forage shortage begins during fall and early winter annual crops such as oat can be more adequate (Brizuela et al., 2001). Complementary use of winter annual crops with different seasonality is proposed in mixtures to elongate the grazing period during the cold season (Juskiw et al., 2000).

Materials and methods During 2004 and 2005 an experiment was conducted in the south of Buenos Aires Province (sub-humid area) to evaluate the mixture of annual ryegrass (cv. Magnum) with oat (cv. Boyera), and wheat (cv. Estrella). Treatments (9) were ryegrass (600 live seeds m⁻²) and the addition of each cereal to ryegrass at seeding rates of 29, 117, 206 and 290 live seeds m⁻². These treatments were seeded in March on a Hapludol soil of moderate fertility on 5 complete randomized blocks and fertilized with 120 Kg/ha of urea in April. Forage yield was evaluated by cutting the central 5 m² area of each plot in June (fall yield), September (winter) and November (spring). Effects of year, treatment and period were analysed by ANOVA and orthogonal contrasts were used to evaluate the effect of both cereal additions, when significant F-test was reported for treatments.

Results The annual forage yield was not different between years and effects of treatment. However, period and their interactions were significant ($P \leq 0.01$) and consequently results of each period are presented (Table 1). Both cereals added to ryegrass increased the fall yield and the effect of oat was higher than that of wheat. An inverse effect and trend along seeding rates occurs in spring and in winter by adding oat. The total yield was increased when both cereals were added.

Table 1 Forage yield of annual ryegrass and its mixtures with oat and wheat at different seeding rates.

		Fall	Winter	Spring	Total
		DM Kg ha ⁻¹			
Pure ryegrass		1045	1984	1910	4939
Oat added	Seeds m ⁻²				
	29	1598	1659	1728	4986
	117	2231	1313	1500	5044
	206	2894	1198	1378	5470
	290	3213	1342	1333	5888
Wheat added	Seeds m ⁻²				
	29	1181	1973	2168	5323
	117	1348	1888	1873	5108
	206	1640	1880	1865	5384
	290	1873	1821	1608	5301
Effects					
	Oat addition	** , L**	** , L* , Q*	* , L**	* , L**
	Wheat addition	** , L** , Q*	NS	* , L**	* , L**
	Oat vs wheat	**	**	**	NS

** : $P < 0.01$; * : $P < 0.10$; NS : $P > 0.10$; L and Q : linear and quadratic effects of seeding rate, respectively.

Conclusions Addition of cereals of early fall growth to annual ryegrass pasture can improve seasonal distribution of forage yield and it could be a profitable practice if adequate species and varieties are used.

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