

Variety-trials with *Lolium multiflorum* and *Lolium x hybridum* under organic and non-organic conditions

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Abstract

Forty-five varieties of *Lolium multiflorum* L. and 24 varieties of *Lolium x hybridum* Hausskn. were examined in pure stands at three experimental sites over a three year period. One of these sites was on an organic farm, which was managed according to the 'BIO SUISSE' guidelines. Under organic conditions nitrogen supply was low (100 kg N ha⁻¹ y⁻¹) and the fertiliser was applied as strongly diluted cattle manure. At the non-organic experimental sites the moderate annual amounts of nitrogen (250 kg N ha⁻¹ y⁻¹) were applied as ammonium nitrate. At the organic site the invasion of unsown clover and forb species was not suppressed. The pure grass stands at the other sites were treated once with a herbicide against dicots...

Keywords: *Lolium*, manure, organic farming, ryegrass, variety, yield

Introduction

Lolium multiflorum and *Lolium x hybridum* Hausskn. are high yielding forage grasses. Their leaf-rich yields in spring and autumn are highly valued as they contain high levels of digestible energy and sugar. During the summer the harvested plant material of *Lolium multiflorum* contains a high proportion of stems and this results in fibre-rich forage. However, by using appropriate *Trifolium pratense* varieties, optimal grass-clover-mixtures can be created, which have a good forage-quality during the summer months...

Materials and methods

From 1997 to 1999 forty-five varieties of *Lolium multiflorum* and twenty-four varieties of *Lolium x hybridum* were tested in variety trials at three locations for each species. Detailed information on the experimental sites, sowing dates and number of cuts with yield dry matter measurements is given in Table 1. Pure stands of *Lolium multiflorum* and *Lolium x hybridum* were sown at a rate of 27 kg ha⁻¹ and 20 kg ha⁻¹, respectively. The plot size was 1.5 × 6.0 m. The experiment was designed as a latin square. The experimental site 'Bad Knutwil' was on an organic farm managed according to the 'BIO SUISSE' guidelines (organic). All the other experimental sites were located on conventional farms (non-organic)...

Results and discussion

Both *Lolium* species exhibited a lower mean annual dry matter yield at the organic site compared to the non-organic sites (Fig. 1). *Lolium multiflorum* at the organic site showed annual yields from 3,100 to 8,400 kg DM ha⁻¹ y⁻¹, depending on the variety, while the annual

DM yields at the non-organic sites were between 6,200 and 12,700 kg ha⁻¹. *Lolium x hybridum* showed values comparable to these of *Lolium multiflorum*.
The marked differences between the organic and non-organic experimental sites may ...

Conclusion

Based on the strong correspondence between the results of all experimental sites, it can be concluded that the 'list of recommended varieties of forage crops' (Suter *et al.*, 2002) contains the best varieties of grass species for both non-organic and organic systems...

References

- Lehmann J., Briner H.U., Schubiger F.X. and Mosimann E. (2000) Italienisches Raigras und Bastard-Raigras: Sortenversuche 97 bis 99. *Agrarforschung*, 7, 124-129.
Suter D., Briner H.U., Mosimann E. and Bertossa M. (2002) Liste der empfohlenen Sorten von Futterpflanzen. *Agrarforschung*, 9, I-XVI.

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Table 1. Experimental sites and sowing dates of variety trials with *Lolium multiflorum* and *Lolium x hybridum* from 1997 to 1999.

Site	Altitude m ASL	Sowing date	<i>Lolium multiflorum</i>			<i>Lolium x hybridum</i>		
			replicates	number of cuts with DM measure ments		replicates	number of cuts with DM measure ments	
				1998	1999		1998	1999
FAL Reckenholz	440	10.04.19 97	4	5	4	-	-	-
Oensing en	460	08.04.19 97	4	5	4	4	5	4
Bad- Knutwil (organic)	490	17.07.19 97	4	5	3	4	5	4
Ellighaus en	520	09.04.19 97	-	-	-	4	5	4

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Site	Altitude m ASL	Sowing date	<i>Lolium multiflorum</i>			<i>Lolium x hybridum</i>		
			replicates	number of cuts with DM measurements		replicates	number of cuts with DM measurements	
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Dry Matter Yield 1998/1999

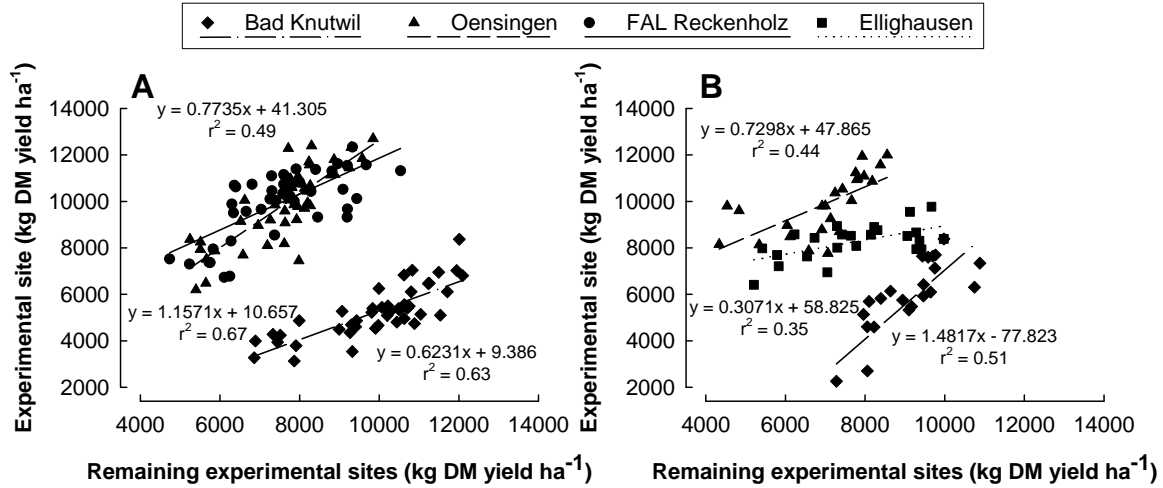


Figure 1. Correspondence of the annual dry matter yields (kg DM ha⁻¹ y⁻¹) of the varieties of *Lolium multiflorum* (A) and *Lolium x hybridum* (B) at the respective experimental site with the mean of the annual dry matter yields (kg DM ha⁻¹ y⁻¹) at the remaining experimental sites.