

Manipulation of grass growth through strategic distribution of nitrogen fertilisation

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Introduction The objective of this study was to evaluate possibilities and limits of manipulating the grass growth of pastures by different nitrogen (N) application strategies with the aim to better synchronise grass supply and feed demand. In Switzerland, the use of N is strongly restricted by legislation. An efficient and well allocated N fertilisation is therefore important.

Materials and methods Experiments were performed on two sites in the Swiss lowlands, on a sown pasture (sown 2000, with 50% *Lolium perenne*, 20% *Poa pratensis*, 25% *Trifolium repens*) and a permanent pasture (40% *Lolium perenne*, 25% *Poa trivialis*, 20% *Poa pratensis*, 10% *Trifolium repens*). Grass growth was measured with an adapted method of Corrall & Fenlon (1978) for three replicates each of four different N strategies of distributing 150 kg N ha⁻¹ as ammonium nitrate fertiliser and a zero N strategy (Figure 1). The trial lasted over two grazing seasons (March 2003 to November 2004). On both sites, 30m³ cattle slurry was applied each winter. Analysis of variance was carried out using the general linear models approach.

Results The zero N strategy reached high average annual yields of 12.4 t DM on the sown pasture and 8.9 t DM on the permanent pasture. The annual DM yields of the fertilised plots were higher ($p < 0.05$) than of the zero N plots (+ 8.7% on the new pasture, + 14.9% on the permanent pasture). The annual DM yield of the four different N distribution strategies did not vary significantly ($p < 0.05$), but differences could be observed in the seasonal growth distribution pattern (Figure 1). The clover content of the zero N strategy was higher ($p < 0.05$) (+ 10% on average) than that of fertilised treatments.

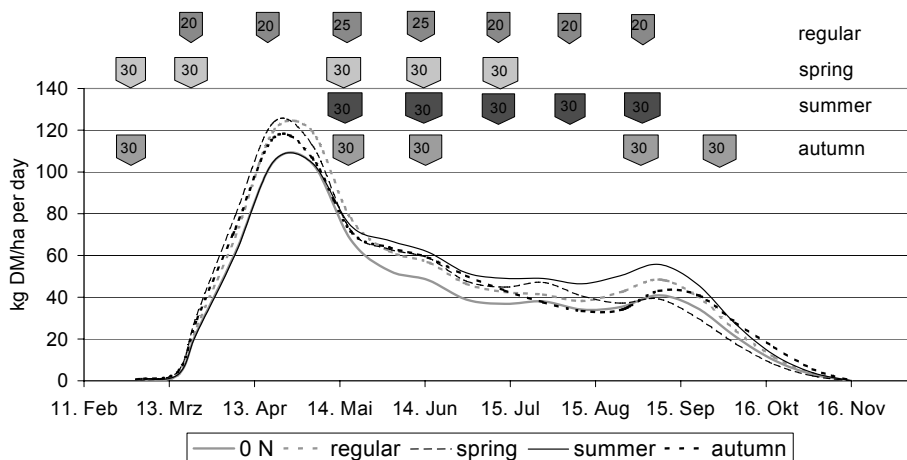


Figure 1 N fertiliser application patterns (kg N/ha) and grass growth curves (mean grass growth over two years) for four N distribution strategies and a zero N strategy.

Conclusions This study demonstrated that the grass growth curve can be manipulated by seasonal N distribution strategies without significantly affecting annual DM yield, especially on pastures with low clover content. N fertilisation can be an important management tool for farmers with seasonal dairy grazing to better synchronise grass supply and feed demand on pastures.

References

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