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## The Grazemore decision support system to optimise utilisation of grazed grass in dairy production

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**Key words :** software , grazing management , grazing schedule , milk production

**Introduction** Grazing systems are complex and requires good management to obtain a balance between high animal production and efficient utilisation of the grass . The Grazemore Decision Support System (DSS) is a management tool to increase the utilisation of grazed grass in European dairy production (Hetta et al . , 2005) . The system enables simulations of the effects of different grazing strategies and climates on milk production and grass growth . The aim of this study was to evaluate if the DSS is able to provide a schedule for rotation grazing of high yielding dairy cows with high utilisation of grazed grass in the north of Scandinavia .

**Material and methods** To evaluate Grazemore DSS ability to design a grazing schedule by user defined grazing rules , a grazing experiment was performed during the summer 2005 at the Forage Research Centre , Umeå , Sweden (63°45' N ; 20°17' E ; 12 m elevation) . The experiment run for six weeks and included forty dairy cows of the Swedish Red and White breed . The herd was rotating between four paddocks with a total area of 11.9 ha . The pastures consisted mainly of timothy (*Phleum pratense* L .) and meadow fescue (*Festuca pratense* L .) . The average supplementary feeding was 2 kg hay and 9 kg concentrate/cow/day . During the experiment , the actual milk yield was recorded twice a week and grass samples were cut once a week to estimate the herbage mass .

Prior to the experiment simulations with the software were run to get a grazing schedule , called Grazing calendar 1 , which allocated the herd to the different paddocks . Due to practical conditions the grazing calendar 1 was updated during the experiment , which resulted in the Grazing calendar 2 . The difference between actual and predicted milk yield were analysed statistically with a regression analysis and the mean square prediction error (MSPE) was estimated .

**Results and discussion** Comparisons between the actual milk yield and the milk yield predicted by the Grazemore DSS (Table 1) show that the model had a low prediction error of 5 and 6 percent respectively . Both the milk yield observed and the ability of the DSS to predict this value were satisfactory . The herbage mass during the experiment was higher than predicted by the model resulting in a surplus of grass in the paddocks that was not utilised . The herbage growth model in the Grazemore DSS and its ability to predict the herbage mass could be improved to provide a schedule that gives a higher utilisation of grazed grass .

**Table 1** Mean values of actual milk yield (A) and milk yield predicted by the Grazemore DSS (P) in suggested Grazing calendar 1 and performed Grazing calendar 2

Calendar	n	Milk yield (kg/cow/day)			R <sup>2</sup>	MSPE	MPE	Part of MSPE		
		A	P	Bias				Bias	Line	Random
1	13	29.9	30.8	-0.9	0.25	2.1	0.05	0.38	0.00	0.62
2	13	29.9	31.5	-1.6	0.40	3.7	0.06	0.71	0.01	0.28

n=Number of observations , MSPE=Mean square prediction error , MPE=Mean prediction error

**Conclusion** Grazemore DSS has a good ability to predict milk yield and has potential to be a helpful tool for optimising grass utilisation in dairy production .

### Reference

Hetta , M . , Norrskén-Eriksson , M . , Persson , S . , Larsson , E . , Karlsson , L . , Alvarez-Torre , N . , Eriksson H . & Martinsson , K . (2005) . The Grazemore decision support system for grazing management of dairy cows . *The XX International Grassland Congress : Offered papers* , p . 907 .