

## THE EFFECT OF GRAZING DATES IN SPRING ON GRASS/CLOVER RATIO IN A PASTURE

D. MACESIC, Z. STAJA, M. KNEZEVIC AND J. LETO

The objective of this experiment was to measure the effect of four grazing dates in spring differing by one week on grass/clover ratio in a pasture within 3 years. A grazing experiment with Charolais yearling steers (*Bos Taurus* L.; average 360 kg) was conducted on an experimental pasture in the region of Medvednica mountain, at an altitude of 680 m, from May to October. These grasslands are anthropogenic communities and belong to the following associations: *Arrhenatheretum medioeuropaeum* (Br-BI-19) Oberd. and *Lolio-Cynosuretum* (Tx 37). They show the tendency of vegetation growth towards the climatic i.e. forest community. The pasture predominant grasses were orchardgrass (*Dactylis glomerata* L.), perennial ryegrass (*Lolium perenne* L.) and red fescue (*Festuca rubra* L.), while the major legume was white clover (*Trifolium repens* L.). The experiment was designed as a randomised block of four treatments (grazing dates). It could be concluded that grazing dates had an important influence on grass/clover ratio in a particular pasture during 3 years period, showing tendency of increasing percentage of both grass and clover in 2 earlier grazing dates, compared to delayed 2 grazing dates.

## INFLUENCE OF CUTTING AND GROWING STAGES ON THE DEGRADABILITY OF ALFALFA

MEHRDAD, N.; ALIKHANI, M. AND GHORBANI, G.H.R.

In this study three fistulated sheep with average body weight of 45-50 kg were used to determine the effect of cutting and growing stages (no bloom, early bloom and full bloom) on chemical compositions and *in situ* degradability of alfalfa (*Medicago sativa*). Nylon bags filled with 3.5 gr of each sample were suspended in the rumen of sheep immediately before feeding and incubated for seven different times (0, 2, 4, 8, 16, 24, and 48 h). The results of this study showed that alfalfa in no bloom stage had the highest and lowest crude protein and crude fiber; respectively. The third cutting alfalfa had the highest degradability of dry matter and organic matter. As the alfalfa matured, the percentages of crude protein, degradability and soluble material decreased and percentages of crude fiber, neutral detergent fiber (NDF), acid detergent fiber (ADF), dry matter (DM), neutral detergent insoluble crude protein (NDICP) and acid detergent insoluble crude protein (ADICP) increased. Effective degradability (ED) of crude protein was significantly different between stages of maturity ( $p < 0.05$ ). Among three stages of maturity no significant differences were observed in the rates of organic matter degradation, although it tended to be higher in full bloom. Dry matter effective degradability (EDDM) with 6%/h passage rate was significantly higher in third cutting alfalfa.

## MODELING YIELD AND QUALITY DYNAMICS OF FORAGE CROPS

HERRMANN, A.; KORNHER, A. AND TAUBE, F.

The optimal harvest time for forage crops is of vital concern for ruminant nutrition since crop maturity at harvest affects both roughage yield and quality. Environmental conditions, particularly temperature and soil water supply play a key role in the dynamics of growth and quality. In this respect, forage crop simulation models can serve as useful tools for optimizing fodder quality. The main objective of our study was to develop a tool for yield and quality prediction of whole crop cereals and forage maize, based on FOPROQ (Forage Production Quality), a model originally developed at our department for forage grasses. Data for model calibration and validation originated from several multi-year, multi-site experiments. FOPROQ is one of few models that not only predicts biomass but also provides a comprehensive simulation of various forage quality parameters. It consists of two dynamically interacting submodels for dry matter production and quality development driven by plant and soil characteristics and environmental conditions such as temperature, radiation, photoperiod, and soil water availability. The adaptation from grassland to whole crop cereals and forage maize required only minor modifications with respect to model algorithms. Calibration and validation showed good results for yield and various quality characteristics. A comparison with the empirical growing-degree-day concept demonstrated a pronounced superiority of FOPROQ, which seems primarily due to the fact that our model considers radiation and soil water availability. In conclusion, FOPROQ proved to be a reliable tool for the prediction of fodder yield and quality of whole crop cereals and forage maize.



## SOURCE OF NITROGEN FOR NEW LEAVES AND TILLERS GROWTH IN DEFOLIATED *Panicum maximum* PLANTS

SANTOS, P.M.; THORNTON, B. AND CORSI, M.

Recent experiments have demonstrated that nitrogen reserves may be as important as carbohydrate reserves for grass growth following defoliation. This study used <sup>15</sup>N tracer techniques to determine the degree to which defoliated *Panicum maximum* utilised root uptake and mobilisation, to supply nitrogen to growing leaves and new tillers. Plants were grown in sand culture supplied with a complete nutrient solution containing 1.5 mol m<sup>-3</sup> NH<sub>4</sub>NO<sub>3</sub> and cut weekly for seven weeks to a height of either 15 or 30 cm. Eight weeks after the first cut, plants were defoliated to remove either 0, 25, 50, 75 or 100 % of total leaf area. Both immediately and one week after the final defoliation plants were harvested and separated into components including growing leaves and side tillers. Increases in total nitrogen content were observed in growing leaves (23 - 29 mgN plant<sup>-1</sup> at 15 cm and 9 - 33 mgN plant<sup>-1</sup> at 30 cm) and side tillers (1 - 5 mgN.plant<sup>-1</sup> at 15 cm and 3 - 10 mgN.plant<sup>-1</sup> at 30 cm) during the week following the final defoliation. Root uptake was the main source of nitrogen both for new leaves (86 % at 15 cm and 83 % at 30cm) and side tillers (95 % at 15 cm and 67 % at 30 cm). The relative importance of nitrogen remobilization for new growth was greater at the 30 cm cutting height, suggesting that the older leaf material remaining after defoliation may be the major source of mobilised nitrogen for new growth.