Grassland and Society

Proceedings of the 15th General Meeting of the European Grassland Federation,
June 6 – 9, 1994

L. 't Mannetje
J. Frame

Editors in chief
Contents

Opening Session

Towards sustainable grassland management in The Netherlands
L.'t Mannetje
Keynote address: Grassland and society
H.G. van der Meer

Session I. Forage Production and Utilization (editor H.G. van der Meer)

Invited papers

New Targets for Sustainable Forage Production and Utilization
S. Peel and J. Lloveras 35
Forage quality, feeding value and animal performance
D.E. Beever and C.K. Reynolds 48

Offered papers

The influence of nitrogen application on the yields of birds-foot trefoil (Lotus corniculatus L.) / grass mixtures
Stanislaw Benedycki, Stefan Grzegorczyk, Zofia Benedycka 61
Contribution to the N supply in grassland of ten white clover varieties
I. Breazu, G. Oprea, C. Chiper and Gh. Panga 65
Contrasting perennial ryegrass / white clover mixtures under cutting and grazing
A. Elgersma and H. Schlepers 69
Companion species to improve seasonality of production and nutrient uptake in grass/clover swards
A. Hopkins, T.M. Martyn and P.J. Bowling 73
Composition and herbage yield of grass/white clover mixtures in relation to N fertilization under cutting
J. Čop and J. Korošec 77
Defoliation pattern in early spring of a grass-clover sward sown in alternate rows and continuously stocked with sheep
F. Louault, P. Carrère and J.F. Soussana 81
Development of white clover under rotational and continuous cattle grazing
J. Øyen and M. Pestalozzi 85

Grassland and Society VII
Effect of spring application of nitrogen, cutting frequency and management on
the dry matter and nitrogen yield of a grass/white clover mixture
R.L.M. Schils and T. Kraak
Herbage quality of white clover and perennial ryegrass throughout the growing
season
Karen Søegaard
Evaluation of the production and persistence of white clover varieties in Slovakia
M. Zimkova and V. Smajstrla
Forage production, quality and persistence of lucerne cultivars in intensive cropping
systems
R. Paoletti, F. Magro and C. Locatelli
Effect of nitrogen fertilization and cutting time on the quality and variable costs
of red clover and timothy herbage production
H. Hakkola and P. Nykänen-Kurki
Effect of fertilizer nitrogen (with or without Phosphorus and Potassium) on yield
and botanical composition of some grass and legume species
T. Totev, VI. Lingorsky, Tz. Mihovsky, K. Tankov, B. Alexandrova,
D. Gheorghieva, Kr. Belperchinov and P. Todorova
The effect of a bacterial inoculant on silage fermentation and animal performance
using forage ensiled at a high dry matter content
J.P. Moran and T.R. Owen
Simulation and measurement of spatial variations in cylindrical cores of
grass silage exposed to air
A.G. Williams and A.M. Reynolds
Apparent digestibility of eastern gamagrass silage with and without silage
enzyme additive
P. Salon, P. van Soest, D. Hogue and M. van der Grinten
Influence of botanical composition and stage of maturity of forage on
fermentation quality and in-silo losses
U. Wyss and R. Vogel
Evaluation of a silage additive based on granular sulphuric acid
A.H. Breeze and S. Peel
Estimation of the amount of bacterial protein in grass silage
F. Driehuis and P.G. vanWikselaar
Prewilting of lucerne for ensiling: an empirical model
M. Acutis, G. Borreani and A. Ciotti
About the ryegrass endophyte (Acremonium lolii) in Belgium
J. Baert, I. Verbruggen and L. Carlier
Herbage production from grass seeds inoculated with Azospirillum
L. Carlier and I. Verbruggen
Variability in anatomy of leaves of perennial ryegrass (Lolium perenne)
B. Deinum
Digestibility of cell walls of ageing grass leaves as estimated from in vitro and gas production techniques

Jeroen C.J. Groot, Bauke Deinum, Egbert A. Lantinga
and Jan H. Neuteboom

In vitro digestibility of green leaves of Dactylis glomerata in relation to leaf demography

M. Duru and H. Ducrocq

The establishment of Festuca arundinacea and Chloris gayana in pure stands and in combination with Medicago sativa

A.z. Abd El-Halim, A.M. Rammah and I.A. Hanna

Competition between grasses during early growth

W. Harkot and M. Warda

Does interspecific competition affect the nutritive value of grassland species?

J. Isselstein

Yield and quality of forage sorghum as affected by water supply

T. Kipnis, G. Krivat, Levana Dvash, I. Granoth and R. Jonathan

Effect of autumn treatment on winter survival of cultivars of perennial ryegrass (Lolium perenne) under Swedish conditions

Magnus A. Halling

Estimating errors in calculating herbage growth from net herbage accumulation rates in continuously stocked swards

A.S. Laidlaw, J.A. Withers and Sally Watson

Effects of grazing and cutting on grassland yield and sward composition

Lars Nesheim

The use of somaclonal variability in ryegrass-fescue hybrids for breeding acceleration

M.K. Pavlova, O.E. Shvedova, B.Z. Pilipchuck and I.G. Shmat’ko

Effect of bracken control and introduction of improved grass species on botanical composition and yield of natural meadow

P. Petrov and D. Mitev

Herbage palatability, intake by dairy cows and the productivity of sown pasture swards

H. Raave and A. Selge

Indoor feeding or grazing

K. Rinne, M. Suvitie and S-L. Rinne

Productivity-evapotranspiration relationship in a temperate high quality pasture.

E. Riveros, V. Garcia de Cortázar and H. Landi

Determining fertilizer requirements for the maintenance of permanent pastures

M. Rodriguez, A.G. Sinclair, M. Oyanarte and G. Besga

Effects of soil compaction on yield and nitrogen uptake of perennial ryegrass on a sandy soil.

P.J.M. Snijders, F.A. Wopereis, H. Everts and A.P. Wouters

GRASSLAND AND SOCIETY
The assessment of potassium nutrition status of tall fescue and its effect on production
L. Thélier-Huché and J. Salette 219

Effects of inclusion of a grazing period on performance of fattening bulls
I. Dufrasne, M. Gielen, P. Limbourg, J.L. Hornick and L. Istasse 224

Sward renovation by oversowing tall oatgrass alone or in mixture with common birdsfoot trefoil
J. Filipček and M. Kasperekzyk 228

The regrowth time of the mountain pasture sward
E. Firek 231

The soil conservation role of permanent pastures in the Mediterranean environment
Claudio Porqueddu, Pier Paolo Roggero, Maria Sitzia and Leonardo Sulas 235

Seasonal variation in changes of quality parameters of contrasting varieties of Lolium perenne as affected by N supply
R. Wulfes, F. Taube and A. Kornher 239

Analysis of potassium and magnesium contents in herbage samples from natural grasslands using Near Infrared Reflectance Spectroscopy
B.R. Vázquez de Aldana, M.E. Pérez-Corona, B. García-Criado and A. García-Ciudad 243

A description and parameterisation of a dynamic model of tiller appearance and death in perennial ryegrass (Lolium perenne)
Anthony J. Brereton 247

Session II. Grassland and Nature Conservation (editor L.'t Mannetje)

Invited papers

Grassland production systems and nature conservation

Conservation and development of floristically diverse grasslands in Central Europe
M. Rychnovská, D. Blažková and F. Hrabě 266

Offered papers

Co-evolution of grassland biodiversity and farm management
Gérard Balent and Danièle Magda 278
The establishment of a species rich hay meadow community in lowland
SE Northumberland, England
R. Chapman and A. Younger

The ecology of sheep and goat grazing in semi-natural hill pastures in Scotland
G.E.J. Fisher, S. Scanlan and A. Waterhouse

Effect of extensification on sheep production from an upland permanent pasture
D.A. Davies, C.T. Morgan and M. Fothergill

Herbal meadows - a source of feed and an element of environmental protection
M. Falkowski, S. Kozlowski and J. Kukuła

The potential for amenity use of grassland in Hungary
Géza Nagy

Grassland ecological restoration in Russia
A. Tishkov

The function and protection of grassland in Polish National Parks
P. Stypiński

Structure and production characteristics of limestone grasslands in western
Macedonia, Greece
V. Papanastasis

Cattle weight changes and botanical composition of an unfertilized grass
sward under continuous grazing
J.H. Neuteboom, L.'t Mannetje, E.A. Lantinga and K. Wind

Botanical composition, yield and herbage quality of swards of different age
on organic meadowlands.
A.L. Nielsen and K.K. Debosz

Decreasing grassland production by management of vegetation and groundwater
M.J.M. Oomes and H.J. Altena

The effect of inorganic fertilizer on a species-rich grassland - implications
for nature conservation
and K.H. Lakhani

The chemical composition of forage herbs and weeds in relation habitat, fertiliser application and time of harvesting
M. Trzasko

Session III. Emissions from Ruminant Production Systems
(editor O. Oenema)

Invited papers

Nutrient budgets and farm management to reduce nutrient emissions
F. Weissbach and P. Ernst

Energy use and emission of greenhouse gases from grassland agriculture systems
Lars Bakken, Karen Refsgaard, Søren Christensen and Arild Vatn

GRASSLAND AND SOCIETY XI
## Offered papers

Nitrogen budgets and nitrate leaching from an experimental system for sustainable dairy farming at 'De Marke'

**H.F.M. Aarts, M.J.D. Hack-ten Broeke, W.J.M. de Groot and J.P. Dijkstra**  
A drained plot study of the impact of cutting/grazing management and N fertilization level on nitrate leaching under grassland

377

**M.L. Decau and L. Le Corre**  
Defining and evaluating grassland management systems associated with contrasting nitrogen inputs

382

**J.A. Laws and B.F. Pain**  
Denitrification and N$_2$O emission from urine-affected grassland soil in The Netherlands

387

**Cecile A.M. de Klein**  
Comparison of nitrate leaching risks under grass/clover and pure grass swards in Brittany, France

392

**A. Farruggia and A. Pflimlin**  
Regrowth components of perennial ryegrass swards under climate change

397

**J.F. Soussana, E. Casella and P. Loiseau**  
Preliminary studies of the exchanges of methane between grassland and the atmosphere

402

**S.C. Jarvis, D.R. Lockyer, G. Warren, D.J. Hatch and G. Dollard**  
Ammonia volatilization from urine applied to the floor of a dairy cow barn

408

**J.J.M.H. Ketelaars and H. Rap**  
Nitrogen losses from grassland on peat soil through denitrification

413

**J.G. Koops and O. Oenema**  
Changes in quantity of mineral soil nitrogen below different pasture ranges in an extensively managed pasture

418

**A. Milimonka, K. Richter, M. Jurkschat and G. Ebel**  
Nitrogen balances on a farm scale: results from dairy farms in north west France

423

**J.C. Simon, L. Le Corre and F. Vertès**  
Effects of reduced N application on mineral N contents, DM yield and botanical composition of permanent grassland

429

**M. Elsaesser**  
Nitrogen utilization and sward damage after slurry application with sod and shallow injection techniques

434

**A.P. Wouters, R. Schreuder and P.J.M. Snijders**  
Balanced phosphorus fertilization on dairy farms in The Netherlands

438

**A. van den Ham and M.E.G. Berghs**  
Towards sustainable maize growing

443

**W. van Dijk, J. Schröder, D.A. van der Schans, W. de Groot and J. Alblas**  
A mathematical approach for comparison of environmental and economic goals in dairy farming at regional scale

447

**G.W.J. van de Ven**

453

---

**GRASSLAND AND SOCIETY**
Effect of nitrogen fertilizer type and urine on nitrous oxide flux from grassland in early spring

G.L. Velthof and O. Oenema 458

Surplus of nutrients on dairy farms in Belgium

I. Verbruggen, L. Carlier and E. Van Bockstaele 463

Nitrate leaching under pastures: study of the soil-plant system in a lysimeter experiment

F. Vertès, J.C. Simon and L. Le Corre 466

Ammonia emission and denitrification following surface spreading and injection of cattle slurry to grassland

T.J. van der Weerden, T.H. Missenbrook and B.F. Pain 471

Session IV. Socio-economic Aspects of Forage Production
(editor Th. V. Vellinga)

Invited papers

Socio-economic aspects of forage production, rural development and surpluses of animal products

Hans W. Popp 477

Development in ruminant production systems in Eastern Europe

Hindrek Older, Piotr Stypinski, Norbert Gáborcik 485

Offered papers

The effects of extensification of hill sheep farming on labour requirements and socio-economic considerations

S.W. Ashworth and A. Waterhouse 497

Workshops
(editor Th. V. Vellinga)

Invited papers

Modelling grassland production and utilization

B.W.R. Torssell 503

Agronomy of white clover

Karen Søegaard 515

Factors limiting white clover growth in grass/clover systems

W. Kessler and J. Nösberger 525

GRASSLAND AND SOCIETY XIII
Forage production under suboptimal conditions: an overview of drought problems in Mediterranean-type ecosystems
A.J. Hernández, J. Pastor and J.M. Rey Benayas 539

The effect of low temperatures on forage grass production. A review
Antti E. Hannukkala 549

Aspects of forage intake regulation
Ad. M. van Vuuren 556

Influences of air on silage preservation and aerobic stability
S.F. Spoelstra 566

Reducing emissions from land associated with ruminant production
Brian Pain 578

Fertilizer recommendations for intensively managed grassland
R.J. Unwin and Th.V. Vellinga 590

Botanical composition of forages estimated with NIRS
N. Berardo, U. Ziliotto and M. Odoardi 603

Monitoring botanical change in semi-natural hill in Scotland
G.E.J. Fisher and A. Waterhouse 607

Response of grass/clover mini-swards to slurry application
Patricia S. Wightman and David Younie 611

A study of the relationship between white clover ground cover and clover content in the dry matter in grass/clover swards
David Younie and Andrea Giordano 616