

Twentieth International Grassland Congress: Main Congress - Offered Papers July 2005, Dublin, Ireland.

[MÓNICA REBUFFO](#)

INIA, National Institute of Agricultural Research, La Estanzuela, Colonia, Uruguay.

The Main Congress of the XX International Grassland Congress had 894 offered papers, mainly focus on the main temperate forage species, such as perennial ryegrass, white clover, alfalfa. This review describes 33 papers related to the genus *Lotus*, and includes details such as title, authors (with email links to the emails for all scientists registered at LN), page number, addresses, email of the corresponding author and keywords. The index and the publication is available at <http://www.wageningenacademic.com/books/igcpapers.htm>

THEME EFFICIENT PRODUCTION FROM GRASSLAND

Section “Grass and forage plant improvement”

There were two papers related to *Lotus* species breeding. The paper from Australia compared two testing techniques for screening cyanide content in a native perennial tetraploid *Lotus*, whereas the paper from Uruguay presented data of participatory collection of local landraces of *Lotus corniculatus*, red clover and alfalfa.

Breeding *Lotus australis* Andrews for low cyanide content.

[REAL D.](#)¹, [SANDRAL G.A.](#)^{1,2}, WARDEN J.¹, NUTT L.¹, BENNETT R.¹ and KIDD D.¹.

Main Congress offered paper 85.

¹*Cooperative Research Center for Plant-Based Management of Dryland Salinity. The University of Western Australia, University Field Station, 1 Underwood Avenue, Shenton Park, WA 6009, Australia. Email: dreal@cyllene.uwa.edti.au*

²*NSW Department of Primary Industries, Wagga Wagga Agricultural Institute, PMB, Fine Gully Road, Wagga Wagga, NSW2605, Australia*

Keywords: *Lotus australis*, cyanide

Participatory collection of forage species in Uruguay.

[REBUFFO M.](#), [CONDÓN F.](#) and CUITIÑO M.J.

Main Congress offered paper 61.

INIA, National Institute of Agricultural Research, La Estanzuela, Colonia, Uruguay.

Email: rebuffo@inia.org.uy

Keywords: germplasm collection, *Lotus*, luceme, clover.

Two other papers of this section quote *Lotus* species as examples for model legume and condensed tannins.

New approaches to clover breeding.

ABBERTON M.T., WILLIAMS T.A., MICHAELSON-YEATES T.P.T., MARSHALL A.H., JONES C., SIZER-COVERDALE E. and COLLINS R.P.

Main Congress offered paper 78.

Institute of Grassland and Environmental Research, Plas Gogerddan, Aberystwyth, Ceredigion, SY 23 3EB, UK. Email: michael.abberton@bbsrc.ac.uk

Keywords: white clover, red clover, environment, quality, breeding programmes.

Foliar expression of candidate genes involved in condensed tannin biosynthesis in white clover (*Trifolium repens*).

PANTER S.N.^{1,2}, SIMMONDS J.^{1,2}, WINKWORTH A.^{1,2}, MOURADOV A.^{1,2} and SPANGENBERG G.C.^{1,2}

Main Congress offered paper 167.

¹*Primary Industries Research Victoria, Plant Biotechnology Centre, La Trobe University, Bundoora, Victoria 3086, Australia.*

²*Molecular Plant Breeding Cooperative Research Centre, Australia.* Email: stephen.panter@dpi.vic.gov.au

Keywords: transgenic white clover, condensed tannins, chalcone synthase, anthocyanidin and leucoanthocyanidin reductases, bloat safety. [Mention of *Lotus corniculatus* as an example]

Section “Animal production”

Two papers from Uruguay compared meat production obtained with *Lotus corniculatus* and *L. subbiflorus* in comparison with white clover.

Mixed fattening of steers and lambs on improved grasslands in Uruguay: I. pasture performance.

[RISSE D.F.](mailto:drisso@tb.inia.org.uy), MONTOSSI F., BERRETTA E.J., CUADRO R., DE BARBIERI I., SAN JULIÁN R., DIGHIERO A. and ZARZA A.

Main Congress offered paper 170.

Instituto Nacional de Investigación Agropecuaria (INIA), Ruta 5 Km 386, Tacuarembó, Uruguay. Email: drisso@tb.inia.org.uy

Keywords: improved grasslands, mixed grazing, availability.

Mixed fattening of steers and lambs on improved grasslands in Uruguay: II. animal performance and productivity.

[RISSE D.F.](mailto:drisso@tb.inia.org.uy), MONTOSSI F., BERRETTA E.J., CUADRO R., DE BARBIERI I., SAN JULIÁN R., DIGHIERO A. and ZARZA A.

Main Congress offered paper 171.

Instituto Nacional de Investigación Agropecuaria (INIA), Ruta 5 Km 386, Tacuarembó, Uruguay. Email: drisso@tb.inia.org.uy

Keywords: mixed fattening, steer, lamb, performance.

Section “Improving quality of products from grassland”

There was only one paper from New Zealand that compared legumes with different condensed tannin concentrations (*white clover*, *Lotus comiculatus* and *Lotus pedunculatus* [=*L. uliginosus*]).

Effect of three legumes containing different condensed tannin concentrations on the *in vitro* formation of the pastoral flavour compound; skatole.

SCHREURS N.M.^{1,2}, TAVENDALE M.H.¹, LANE G.A.¹, BARRY T.N.² and MCNABB W.C.¹.

Main Congress offered paper 195.

¹*AgResearch Ltd, Grasslands Research Centre, Private Bag 11008, Palmerston North, New Zealand.* Email: nicola.schreurs@agresearch.co.nz

²*Institute of Veterinary, Animal and Biomedical Sciences, Massey University, Private Bag 11222, Palmerston North, New Zealand*

Keywords: legumes, skatole, pastoral flavour, condensed tannins.

Section “Forage quality for animal nutrition”

This is one of the most prolific sections of the Main Congress. It includes eight papers of *Lotus*, mainly research from European countries related to tannins and chemical composition. The influence of condensed tannins on reproductive parameter of sheep grazing *L. corniculatus* compared with perennial ryegrass / white clover was studied in New Zealand. The paper from Germany compares protein degradation of Red clover, birdsfoot trefoil, alfalfa, kura clover and white clover. There were two contributions from Italy; one determines the influence of light on tannin production of *L. corniculatus*, and the other compares several species of *Lotus* spp. (*L. cytisoides*, *L. corniculatus*, *L. edilis*, *L. ornithopodioides*) with *Hedysarum* and *Onobrychis* in terms of proanthocyanidins and condensed tannins. Two papers from United Kingdom compare varieties of *L. corniculatus* (forage yield, plant height, tannin content). Forage yield and chemical composition of perennial swards containing *Trifolium repens*, *Trifolium hybridum*, *Trifolium pratense* or *Lotus corniculatus* and complementary grasses for organic farming were evaluated in Finland. There is only one paper from South America that compares Chilean accessions of *L. glaber* in terms of yield, N-fixation and forage quality parameters, including total condensed tannins.

Mating ewes on condensed tannin-containing forages increases ewe reproductive rate and reduces lamb mortality.

BARRY T.N., RAMIREZ-RESTREPO C.A., MCWILLIAM E.L., LÓPEZ-VILLALOBOS N. and [KEMP P.D.](#)

Main Congress offered paper 222.

Massey University, Palmerston North, New Zealand. Email: T.N.Barry@massey.ac.nz

Keywords: condensed tannin, reproduction, lamb mortality.

Variation in protein quality of forage legumes during spring growth.

GIERUS M., KLEEN J. and TAUBE F.

Main Congress offered paper 240.

Grass and Forage Science/Organic Agriculture, Institute of Crop Science and Plant

Breeding, Christian Albrechts University of Kiel, 24118 Kiel, Germany. Email: mgierus@email.unl-kiel.de

Keywords: protein quality, forage legumes

Light intensity is positively correlated with the synthesis of condensed tannins in *Lotus corniculatus*.

ARCIONI S., BOVONE T., [DAMIANI F.](#) and PAOLOCCI F.

Main Congress offered paper 244.

Plant Genetic Institute - Research Division of Perugia-CNR, via Madonna Alta 130, 06128 Perugia, Italy. Email: sergio.arcioni@igv.cnr.it

Keywords: condensed tannins, DFR, gene expression, light, real time PCR

Variation in tannin content and morphological traits in *Lotus corniculatus* L. (bird's-foot trefoil).

MARSHALL A.H., RIBAIMONT F., COLLINS R.P., BRYANT D. and ABBERTON M.T.

Main Congress offered paper 245.

Institute of Grassland and Environmental Research, Plas Gogerddan, Aberystwyth, Ceredigion, SY23 3EB, UK. Email: athole.marshall@bbsrc.ac.uk

Keywords: *Lotus corniculatus*, agronomic traits, tannin content

Condensed tannins in different varieties of *Lotus corniculatus*.

[MARLEY C.L.](#), FYCHAN R. and JONES R.

Main Congress offered paper 246.

Institute of Grassland and Environmental Research, Plas Gogerddan, Aberystwyth, SY23 3EB, UK. Email: christina.marley@bbsrc.ac.uk

Keywords: *Lotus* varieties, *Lotus* species, condensed tannins, birdsfoot trefoil

Herbage production, nitrogen fixation and condensed tannin concentrations in *Lotus glaber* Mili. germplasm.

[ACUÑA H.](#), FIGUEROA M., HELLMAN P. and CONCHA A.

Main Congress offered paper 247.

Instituto de Investigaciones Agropecuarias, INIA, Centro Regional de Investigación Quilamapu, Casilla 426, Chillan, Chile. Email: hacuna@quilamapu.inia.cl

Keywords: *Lotus glaber*, N-fixation, extractable condensed tannins, bound condensed tannins

Proanthocyanidins from *Hedysarum*, *Lotus* and *Onobrychis* spp. growing in Sardinia and Sicily and their antioxidant activity.

TAVA A.¹, DE BENEDETTO M.G.¹, TEDESCO D.², DI MICELI G.³ and PILUZZA G.⁴.

Main Congress offered paper 271.

¹*Istituto Sperimentale per le Colture Foraggere, v.le Piacenza 29, 26900 Lodi, Italy. Email: aldotava@katamail.com*

²*Dipartimento di Scienze e Tecnologie Veterinarie per la Sicurezza Alimentare, Università di Milano, v. Celoria 10, 20133 Milano, Italy.*

³*Dipartimento di Agronomia Ambientale e Territoriale, Università di Palermo, v.le delle Scienze, 90128 Palermo, Italy.*

⁴CNR, Istituto per il Sistema Produzione Animale in Ambiente Mediterraneo Sez. Sassari, v. E. de Nicola, 07100 Sassari, Italy

Keywords: proanthocyanidins, condensed tannins, quantification, antioxidant activity, quality

Characterisation of herbage from temperate organic pastures.

KUUSELA E.

Main Congress offered paper 274.

University of Joensuu, Department of Biology, PO Box 111, FIN-80101 Joensuu, Finland. Email: eeva.kuusela@joensuu.fi

Keywords: organic dairy farming, pastures, herbage nutritive value.

This section also includes a French paper that mention *Lotus corniculatus* as an example for tannins.

Effect of condensed tannins in sainfoin on *in vitro* protein solubility of Lucerne.

AUFRERE J., DUDILIEU M., PONCET C. and BAUMONT R.

Main Congress offered paper 248.

INRA, Unité de Recherches sur les Herbivores, Centre de Clermont-Theix-Lyon F-63122 St Genes Champanelle, France. Email: aufreere@clermont.inra.fr

Keywords: tannin, soluble nitrogen, protein, sainfoin, lucerne

Section “Grassland management”

There was only one paper from United States that analyses the effect of defoliation management on the botanical balance of binary mixtures with *Lotus corniculatus*.

The interaction of management with botanical composition of irrigated grass-legume pasture mixtures in the Intermountain West USA.

MACADAM J.W., GRIGGS T.C. and MILESKI G.J.

Main Congress offered paper 357.

Utah State University, Logan, Utah 84322-4820 U.S.A. Email: jenmac@cc.usu.edu

Keywords: irrigated pasture, *Lotus corniculatus*, *Trifolium repens*, rotational stocking management

Section “Grass and forage agronomy”

This section includes only one study carried out in Colombia that compares the compatibility of several grass species with *L. corniculatus*.

Adaptation, compatibility and acceptability of grass-legume pastures in the Andean region of Colombia.

CÁRDENAS E. and CASTRO E.

Main Congress offered paper 426.

Universidad Nacional de Colombia, 30th Avenue with 45th Street, Bogotá, Colombia. Email: eacardenasr@unal.edu.co

Keywords: *Pennisetum clandestinum*, *Lotus corniculatus*, adaptation, acceptability

Section “Overcoming seasonality of production”

There was only one paper from United States that compared several mixtures combines with forage allocation under grazing, including one system with fescue/birdsfoot trefoil (*Lotus corniculatus* L.).

Year-round forage systems for beef cows and calves.

FONTENOT J.P.¹, CLAPHAM W.M.², SWECKER W.S.Jr.¹, FISKE D.¹, HALL J.B.¹, FIKE J.¹ and SCAGLIA G.¹.

Main Congress offered paper 464.

¹Virginia Polytechnic Institute and State University, Blacksburg, VA 2406, U.S.A. Email:

cajunjoe@vt.edu

²USDA-Agricultural Research Service, Beaver, WV25813, USA.

Keywords: beef cows, forages, systems

Section “Animal-plant relations”

This section includes two papers from Uruguay studying the effect of the animal on sward characteristics of *Lotus corniculatus*, *Lotus pedunculatus* (= *L. uliginosus*), *Lotus subbiflorus* and *Trifolium repens*.

Effect of forage legume species and stocking rate of lambs on sward characteristics in Uruguay.

MONTOSSI F., [RISSO D.F.](#), SAN JULIÁN R., IGLESIAS M., RAMOS N., DE BARBIERI I., CUADRO R. and ZARZA A.

Main Congress offered paper 536.

Instituto Nacional de Investigación Agropecuaria (INIA), Ruta 5, km 386, PC: 45000, Tacuarembó, Uruguay. Email: fmontossi@tb.inia.org.uy

Keywords: stocking rate, lambs, legume species, sward height

The effect of stocking rate and lamb grazing system on sward performance of *Trifolium repens* and *Lotus corniculatus* in Uruguay.

MONTOSSI F., SAN JULIÁN R., NOLLA M., CAMESASCA M. and PREVÉ F.

Main Congress offered paper 537.

Instituto Nacional de Investigación Agropecuaria (INIA), Ruta 5, km 386, PC: 45000, Tacuarembó, Uruguay. Email: fmontossi@tb.inia.org.uy

Keywords: stocking rate, grazing system, lambs, sward height

THEME GRASSLAND AND THE ENVIRONMENT

Section “Biodiversity in grassland”

This section has a large number of contributions, and several refer to *Lotus* species. One study on diversity carried out in Algeria mention a high number of species of *Lotus* present in the country. *Trifolium subterraneum* L. and *Lotus ornithopodioides* L. are described as the most represented legume species in overgrazed areas of Sardinia, Italy. Two studies on floristic composition in Serbia describe *Lotus corniculatus*, among other legumes, as useful legumes. One paper from Germany studies the establishment under grazing of *Lotus corniculatus*, among other legumes and herbs. Species diversity and productivity in mixtures

describes birdsfoot trefoil (*Lotus corniculatus* L.), together with grasses, described as the most abundant species (United States). Two papers refer to saline environments, indicating the presence of *Lotus tenuis* (= *L. glaber*), among other species in a saline community (Germany), and indicating that *Lotus* genus is among high priority legumes (Australia).

Diversity and adaptation of perennial plants from North Africa: legumes and grasses.

ABDELGUERFI A.¹, LAOUAR M.², ABBAS K.³ and M'HAMMEDI BOUZINA M.⁴.

Main Congress offered paper 608.

¹Lab-RGB, INA Belfort, El Harrach 16200 Alger, Algérie. Email: aabdelguerfi@yahoo.fr

²WRAA Belfort, El Harrach 16200 Alger, Algérie.

³INRAA. Unité de Sétif, Algérie. ⁴Université de Chief, Chief, Algérie.

Keywords: species, diversity, forage, pastoral, adaptation.

The effect of sheep grazing at two stocking rates on the seedling recruitment of grassland forbs.

ISSELSTEIN J., KOWARSCH N., BONN S. and HOFMANN M.

Main Congress offered paper 625.

Institute of Agronomy and Plant Breeding, University of Goettingen, Von-Siebold-Str. 8, 37075 Goettingen, Germany. Email: jissels@gwdg.de

Keywords: oversowing wildflower seeds, seedling establishment, sward management

Development of saline vegetation on embanked grasslands at the Baltic Sea coast after 10 years of extensive pasture use.

BOCKHOLT R., SCHMITZ S. and NOEL S.

Main Congress offered paper 629.

The Faculty for Agricultural and Environmental Science at the Rostock University, 18051 Rostock, Federal Republic of Germany. Email: Renate.bockholt@uni-rostock.de

Keywords: saline grassland, plant community, permanent grassland, extensive pasture, *Juncus gerardii*

Overgrazing influence on the presence of legumes in a natural pasture of Sardinia.

SALIS L.¹, VARGIU M.^{1,2}, SPANU E.¹ and LOCHE F.¹.

Main Congress offered paper 635.

¹Centro Regionale Agrario Sperimentale, Viale Trieste 111, Cagliari, Italy. Email: foraggisassari@tiscali.it

^{1,2} foraggicoltura@cras.sardegna.it

Keywords: natural pasture, botanical composition, legumes, forage production

Floristic composition as a parameter of the quality of the grassland type *Festucetum vallesacae* in the Stara Planina hilly-mountainous region of Serbia.

NESIC Z., TOMIC Z., MRFAT-VUKELIC S., ZUJOVIC M., DJALOVIC I. and DJORDJEVIC S.

Main Congress offered paper 638.

Institute for Animal Husbandry, Autoput 16, Beograd, SCG, Serbia. Email: zonen@eunet.yu

Keywords: floristic composition, quality, natural meadows, Stara Planina Mountain

Floristic composition as parameter of quality of ass. *Agrostietum vulgaris*.

TOMIC Z, MRFAT-VUKELIC S., NESIC Z., ZUJOVIC M. and DJORDJEVIC-MILOSEVIC S.
Main Congress offered paper 639.

Institute for Animal Husbandry, Autoput 16, Beograd, SCG, Serbia. Email:
zotom@mail.com

Keywords: floristic composition, useful grasses, useful legumes, other species.

The relationship between species diversity and productivity of cool-season grassland.

FLORINE S.E., [MOORE K.J.](#), FALES S.L. and HINTZ R.L.

Main Congress offered paper 642.

Department of Agronomy, Iowa State University, Ames, Iowa, 50011, USA. Email:
kjmoore@iastate.edu

Keywords: diversity, species richness, biomass productivity

Selecting grassland species for saline environments.

ROGERS M.E., CRAIG A.D., COLMER T.D., MUNNS R., [HUGHES S.J.](#), EVANS P.M.,
NICHOLS P.G.H., SNOWBALL R., HENRY D., DERETIC J., DEAR B. and [EWING M.](#)

Main Congress offered paper 696. *Cooperative Research Centre for Plant-Based
Management of Dryland Salinity, Perth, Western Australia 6909, Australia.* Email:

MaryJane.Rogers@dpi.vic.gov.au

Keywords: genetic diversity, plant salt tolerance, soil salinity

Section “Soil quality and nutrients”

There were three papers on this section. One paper from *Colombia* analyses the N balance of 10 grass species sown with *L. corniculatus*. The other two papers are from Uruguay, and involved studies on the effect of P on production of *Lotus pedunculatus* (= *L. uliginosus*) and the production of *L. subbiflorus*, *L. corniculatus*, *L. pedunculatus* (= *L. uliginosus*), compared *Trifolium repens*, under different cutting regimes under acidic stress.

Sustainable pastures for the high altitude Andean tropics of Colombia.

CÁRDENAS E. and PANIZZO L.

Main Congress offered paper 704.

Universidad Nacional de Colombia 30th Avenue 45th Street Bogotá, Colombia. Email:
eacardenasr@unal.edu.co

Keywords: nitrogen, pastures, grass, *Lotus*, sustainable grassland farming

Effect of different phosphorous sources and levels on the productive behaviour of a *Lotus pedunculatus* cv. Grasslands Maku oversown pasture.

BERMÚDEZ R.E. and [AYALA W.](#)

Main Congress offered paper 711.

INIA National Institute of Agricultural Research, Uruguay, R8 Km 281, Treinta y Tres, Uruguay, PC 33000. Email: rbermudez@tyt.inia.org.uy

Keywords: *Lotus*, phosphorous sources, phosphorous response, oversown pastures, rhizomes

Soil constraints (pH and aluminium) for legume performance in hill country of Uruguay.

[AYALA W.](#) and BERMÚDEZ R.

Main Congress offered paper 740.

National Institute of Agricultural Research of Uruguay, Casilla de Correo 42, Treinta y Tres, Uruguay CP33000. Email: wayala@tyt.inia.org.uy

Keywords: *Lotus* spp., white clover, pH, aluminium tolerance

THEME DELIVERING THE BENEFITS FROM GRASSLAND

Section “Adoption of new technology”

One paper from United States mention *Lotus corniculatus*, among other legumes, that did not persist or contribute significantly to the overall system.

Sustaining grass-legume pastures for cow-calfherds: a case study.

CADDEL J.L.¹, REDFEAM D.D.¹ and WOODS R.L.².

Main Congress offered paper 788.

¹Plant and Soil Sciences Department, Oklahoma State University, Stillwater, OK 74078, USA. Email: john.caddel@okstate.edu

²Oklahoma Cooperative Extensión Service, Muskogee, OK 74401, USA

Keywords: grasslands, mixed pastures, beefcattle

Section “Tools for grassland management”

There was only one paper from France that evaluated the soil fertility status through in native pastures, where *Lotus corniculatus* is present, among other legumes.

Diagnosing nitrogen, phosphorous and potassium status of natural grassland in the presence of legumes.

JOUANY C., CRUZ P., THEAU J.P. and DURU M.

Main Congress offered paper 860.

UMR 1248 ARCHE - INRA, BP27, 31326 Castanet-Tolosan Cedex, France. Email: cjouany@toulouse.inra.fr

Keywords: diagnosis, grassland, legume, nutrition index.

Section “The role of the International Grassland Congress and Grassland Societies in technology interaction and influencing policy”

This section includes posters about the National Grassland Societies of Ireland, United Kingdom, Portugal, Northern Ireland, Scotland, Estonia, Slovenia, Greece, Bosnia and Herzegovina, Czech Republic, Germany, Spain, New Zealand, Australia, Japan and United States. *Lotus* Newsletter was the only reference to an international group. The poster is on the web site: <http://www.inia.org.uy/sitios/lnl/vol35/poster.html>

[REBUFFO M.](#) **The *Lotus* Newsletter: an electronic *Lotus* research community.** Main Congress offered paper 951. INIA, National Institute of Agricultural Research, La Estanzuela, Colonia, Uruguay. Email: rebuffo@inia.org.uy

Keywords: *Lotus* Newsletter, *Lotus*, research.