

The Journal of Agricultural Science

SENIOR EDITOR
W. J. Whittington

EXECUTIVE EDITOR
N. M. Boston

*Journal of Agricultural Science, University of Nottingham, Faculty of Agricultural and Food
Sciences, Sutton Bonington Campus, Loughborough, Leicestershire LE12 5RD, UK*

EDITORIAL BOARD

E. J. Allen
University of Cambridge, UK

B. W. Bache
University of Cambridge, UK

W. Day
Silsoe Research Institute, UK

M. F. Franklin
*Scottish Agricultural Statistics
Service, Rowett Research
Institute, Aberdeen, UK*

M. F. Fuller
*Rowett Research Institute,
Aberdeen, UK*

M. D. Gale
*Cambridge Laboratory,
JI Centre, Norwich, UK*

K. E. Giller
Wye College, UK

J. C. Gower
Wheathampstead, UK

J. F. D. Greenhalgh
Comwy, UK

A. E. Johnston
IACR-Rothamsted, UK

R. A. Kempton
*Scottish Agricultural Statistics
Service, University of
Edinburgh, UK*

T. Lewis
IACR-Rothamsted, UK

D. B. Lindsay
Cambridge, UK

J. S. Macfarlane
*Centre for Tropical Veterinary
Medicine, University of
Edinburgh, UK*

T. R. Morris
University of Reading, UK

J. B. Owen
*University College of
North Wales, Bangor, UK*

C. J. Pollock
*Institute of Grassland and
Environmental Research,
Aberystwyth, UK*

T. J. Riggs
*Horticulture Research
International,
Wellesbourne, UK*

J. A. Rooke
*Scottish Agricultural College
Aberdeen, UK*

P. E. Russell
*AgrEvo UK Limited,
Chesterford Park,
Saffron Walden, UK*

R. K. Scott
*University of Nottingham,
Sutton Bonington, UK*

R. Thompson
*Roslin Institute
(Edinburgh), UK*

D. Wilman
*University College of Wales,
Aberystwyth, UK*

INTERNATIONAL CONSULTANTS

P. Day
*Rutgers University of
New Jersey, New
Brunswick, USA*

S. K. Sinha
*Indian Agricultural
Research Institute,
New Delhi, India*

W. Erskine
*ICARDA,
Aleppo, Syria*

J. H. Topps
*University of Zimbabwe,
Harare, Zimbabwe*

G. M. O. Maloiy
*Institute of Animal Physiology
and Biotechnology Research,
Nairobi, Kenya*

VOLUME 125

CAMBRIDGE UNIVERSITY PRESS

Cambridge

New York Port Chester Melbourne Sydney

1995

CAMBRIDGE
UNIVERSITY PRESS

PUBLISHED BY
THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE

The Pitt Building, Trumpington Street, Cambridge CB2 1RP
40 West 20th Street, New York, NY 10011-4211, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1995

Printed in Great Britain by the University Press, Cambridge

CONTENTS

PART I (AUGUST 1995)

	PAGE
Instructions to Authors	
CROPS AND SOILS	
AINSLEY, A. E., DYKE, G. V. AND JENKYN, J. F. Inter-plot interference and nearest-neighbour analysis of field experiments	1
WEBB, J. AND SYLVESTER-BRADLEY, R. A comparison of the responses of two cultivars of late-autumn-sown wheat to applied nitrogen	11
WEBB, J., SYLVESTER-BRADLEY, R. AND WAFFORD, J. D. Influence of sowing date on the uptake of and responses to soil and fertilizer nitrogen by the spring wheat cultivar Tonic	25
ZHANG, J. H., LUO, Y. N., WANG, Z. X. AND GAO, X. Z. Quantitative selection for compact, high-yielding maize hybrids	39
MTENGETI, E. J., WILMAN, D. AND MOSELEY, G. Physical structure of white clover, rape, spurrey and perennial ryegrass in relation to rate of intake by sheep, chewing activity and particle breakdown	43
HIDE, G. A., WELHAM, S. J., READ, P. J. AND AINSLEY, A. E. Influence of planting seed tubers with gangrene (<i>Phoma foveata</i>) and of neighbouring healthy, diseased and missing plants on the yield and size of potatoes	51
ALLISON, M. F. AND HETSCHKUN, H. M. Five years of straw incorporation and its effect on growth, yield and nitrogen nutrition of sugarbeet (<i>Beta vulgaris</i>)	61
HOLTOM, M. J., POONI, H. S., RAWLINSON, C. J., BARNES, B. W., HUSSAIN, T. AND MARSHALL, D. F. The genetic control of maturity and seed characters in sunflower crosses	69
NDUNGURU, B. J., NTARE, B. R., WILLIAMS, J. H. AND GREENBERG, D. C. Assessment of groundnut cultivars for end-of-season drought tolerance in a Sahelian environment	79
AGUILERA-DIAZ, C. AND RECALDE-MANRIQUE, L. Effects of plant density and inorganic nitrogen fertilizer on field beans (<i>Vicia faba</i>)	87
KUMAR, D., SWARUP, A. AND KUMAR, V. Effect of rates and methods of urea-N application and presubmergence periods on ammonia volatilization losses from rice fields in a sodic soil	95
ANIMALS	
SEMIADI, G., BARRY, T. N., MUIR, P. D. AND HODGSON, J. Dietary preferences of sambar (<i>Cervus unicolor</i>) and red deer (<i>Cervus elaphus</i>) offered browse, forage legume and grass species	99
SEMIADI, G., BARRY, T. N. AND MUIR, P. D. Comparison of seasonal patterns of growth, voluntary feed intake and plasma hormone concentrations in young sambar deer (<i>Cervus unicolor</i>) and red deer (<i>Cervus elaphus</i>)	109
STEEN, R. W. J. AND ROBSON, A. E. Effects of forage to concentrate ratio in the diet and protein intake on the performance and carcass composition of beef heifers	125
CHEN, X. B., MEJIA, A. T., KYLE, D. J. AND ØRSKOV, E. R. Evaluation of the use of the purine derivative:creatinine ratio in spot urine and plasma samples as an index of microbial protein supply in ruminants: studies in sheep	137
FONDEVILA, M., CASTRILLO, C., GASA, J. AND GUADA, J. A. Rumen-undegradable dry matter and neutral detergent fibre as ratio indicators of digestibility in sheep given cereal straw-based diets	145
MCCRABB, G. J., BORTOLUSSI, G., HENNSTE, L. M. AND McDONALD, B. J. The thermal response of sheep to a hot environment in different years	153
AGRICULTURAL RESEARCH MODELLERS' GROUP. Proceedings of the Twenty-Sixth Meeting of the Agricultural Research Modellers' Group	159
BOOK REVIEWS	165

PART 2 (OCTOBER 1995)

Instructions to Authors	PAGE
CROPS AND SOILS	
RAMOS, J. M., DE LA MORENA, I. AND GARCÍA DEL MORAL, L. F. Barley response to nitrogen rate and timing in a Mediterranean environment	175
CONRY, M. J. Comparison of early, normal and late sowing at three rates of nitrogen on the yield, grain nitrogen and screenings content of Blenheim spring malting barley in Ireland	183
O'REAGAIN, P. J., GOETSCH, B. C. AND OWEN-SMITH, R. N. Ruminant degradation characteristics of some African rangeland grasses	189
COCKS, P. S. Genotype × site interactions in seed production, hard seed breakdown and regeneration of annual medics (<i>Medicago</i> spp.) in west Asia	199
LERIN, J. AND BADENHAUSSER, I. Influence of the leaf curling plum aphid (<i>Brachycaudus helichrysi</i>) on stem diameter, seed yield, and their relationship, in sunflower	211
KUMAR, A. AND JOSHI, H. K. Development of leaf spot caused by <i>Ramularia carthami</i> and reaction of safflower cultivars	223
COBBINA, J. Herbage yields of pigeonpea (<i>Cajanus cajan</i>) accessions in a humid tropical environment as affected by pruning management	227
STEVENS, R. J., O'BRIC, C. J. AND CARTON, O. T. Estimating nutrient content of animal slurries using electrical conductivity	233
STEVENS, R. J., LAUGHLIN, R. J. AND O'BRIC, C. J. The fate of nitrate in cattle slurries acidified with nitric acid	239
MOAL, J.-F., MARTINEZ, J., GUIZIOU, F. AND COSTE, C.-M. Ammonia volatilization following surface-applied pig and cattle slurry in France	245
ANIMALS	
VANHATALO, A. AND VARVIKKO, T. Effect of rumen degradation on intestinal digestion of nitrogen of ¹⁵ N-labelled rapeseed meal and straw measured by the mobile-bag method in cows	253
IJI, P. A., UMUNNA, N. N., ALAWA, J. P. AND IKWUEGBU, O. A. The performance of West African Dwarf does and their kids at various stocking densities on stylo-based pasture in the subhumid zone of Nigeria	263
IASON, G. R., SIM, D. A. AND FOREMAN, E. Seasonal changes in intake and digestion of chopped timothy hay (<i>Phleum pratense</i>) by three breeds of sheep	273
NIEZEN, J. H., WAGHORN, T. S., CHARLESTON, W. A. G. AND WAGHORN, G. C. Growth and gastrointestinal nematode parasitism in lambs grazing either lucerne (<i>Medicago sativa</i>) or sulla (<i>Hedysarum coronarium</i>) which contains condensed tannins	281
WAGHORN, G. C. AND SHELTON, I. D. Effect of condensed tannins in <i>Lotus pedunculatus</i> on the nutritive value of ryegrass (<i>Lolium perenne</i>) fed to sheep	291
VAN OS, M., LASSALAS, B., TOILLON, S. AND JOUANY, J. P. <i>In vitro</i> degradation of amines by rumen micro-organisms	299
ATTEH, J. O., IBIYEMI, S. A. AND OJO, A. O. Response of broilers to dietary levels of thevetia cake	307
BOOK REVIEWS	311

PART 3 (DECEMBER 1995)

	PAGE
Instructions to Authors	
CROPS AND SOILS	
WITHERS, P. J. A., TYTHERLEIGH, A. R. J. AND O'DONNELL, F. M. Effect of sulphur fertilizers on the grain yield and sulphur content of cereals	317
FLAGELLA, Z., PASTORE, D., CAMPANILE, R. G. AND DI FONZO, N. The quantum yield of photosynthetic electron transport evaluated by chlorophyll fluorescence as an indicator of drought tolerance in durum wheat	325
GRIFFITHS, M. W., KETTLEWELL, P. S. AND HOCKING, T. J. Effects of foliar-applied sulphur and nitrogen on grain growth, grain sulphur and nitrogen concentrations and yield of winter wheat	331
MCTAGGART, I. P. AND SMITH, K. A. The effect of rate, form and timing of fertilizer N on nitrogen uptake and grain N content in spring malting barley	341
MAROSKY, F. J. AND BLONDON, F. Red and far-red light influence carbon partitioning, growth and flowering of bahia grass (<i>Paspalum notatum</i>)	355
RUZ-JEREZ, B. E., WHITE, R. E. AND BALL, P. R. A comparison of nitrate leaching under clover-based pastures and nitrogen-fertilized grass grazed by sheep	361
FRASER, J. AND KUNELIUS, H. T. Herbage yield and composition of white clover/grass associations in Atlantic Canada	371
FIRMAN, D. M., O'BRIEN, P. J. AND ALLEN, E. J. Appearance and growth of individual leaves in the canopies of several potato cultivars	379
KALRA, A., PARAMESWARAN, T. N., RAVINDRA, N. S. AND DIMRI, B. P. Effect of powdery mildew (<i>Erysiphe polygoni</i>) on yields and yield components of early and late maturing coriander (<i>Coriandrum sativum</i>)	395
ANIMALS	
HOWSE, A. J., SEMIADI, G., STAFFORD, K. J., BARRY, T. N. AND MUIR, P. D. Digestion and chewing behaviour of young sambar and red deer consuming a low quality roughage	399
DRYDEN, G. McL., STAFFORD, K. J., WAGHORN, G. C. AND BARRY, T. N. Comminution of roughages by red deer (<i>Cervus elaphus</i>) during the prehension of feed	407
DEVIR, S., ZUR, B., MALTZ, E., GENIZI, A. AND ANTLER, A. A model for the prediction of dairy cow body weight based on a physiological timescale	415
FAICHNEY, G. J., WELCH, R. J. AND BROWN, G. H. Prediction of the excretion of allantoin and total purine derivatives by sheep from the 'creatinine coefficient'	425
SCOLLAN, N. D. AND JESSOP, N. S. Diet-induced variation in acetate metabolism of ovine perirenal adipose tissue <i>in vitro</i>	429
BOOK REVIEWS	437
VIEWPOINT	
HANCOX, M. Badgers and bovine tuberculosis: a reappraisal of aetiology and pathogenesis	441
INDEX	445

Copying. No contents may be reproduced by any means without the permission of Cambridge University Press. This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. Organizations in the USA who are also registered with the C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$11.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0021-8596/95 \$11.00+0.10. *ISI Tear Sheet Service*, 3501 Market Street, Philadelphia, PA 19106, USA, is authorized to supply single copies of separate articles for private use only. Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. *For all other use*, permission should be sought from Cambridge or the American Branch of Cambridge University Press.

CAMBRIDGE UNIVERSITY PRESS

The Pitt Building, Trumpington Street, Cambridge CB2 1RP
40 West 20th Street, New York, NY 10011-4211, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

Printed in Great Britain by the University Press, Cambridge

CONTENTS

	PAGE
Instructions to Authors	
CROPS AND SOILS	
WITHERS, P. J. A., TYTHERLEIGH, A. R. J. and O'DONNELL, F. M. Effect of sulphur fertilizers on the grain yield and sulphur content of cereals	317
FLAGELLA, Z., PASTORE, D., CAMPANILE, R. G. and DI FONZO, N. The quantum yield of photosynthetic electron transport evaluated by chlorophyll fluorescence as an indicator of drought tolerance in durum wheat	325
GRIFFITHS, M. W., KETTLEWELL, P. S. and HOCKING, T. J. Effects of foliar-applied sulphur and nitrogen on grain growth, grain sulphur and nitrogen concentrations and yield of winter wheat	331
MCTAGGART, I. P. and SMITH, K. A. The effect of rate, form and timing of fertilizer N on nitrogen uptake and grain N content in spring malting barley	341
MAROUSKY, F. J. and BLONDON, F. Red and far-red light influence carbon partitioning, growth and flowering of bahia grass (<i>Paspalum notatum</i>)	355
RUZ-JEREZ, B. E., WHITE, R. E. and BALL, P. R. A comparison of nitrate leaching under clover-based pastures and nitrogen-fertilized grass grazed by sheep	361
FRASER, J. and KUNELIUS, H. T. Herbage yield and composition of white clover/grass associations in Atlantic Canada	371
FIRMAN, D. M., O'BRIEN, P. J. and ALLEN, E. J. Appearance and growth of individual leaves in the canopies of several potato cultivars	379
KALRA, A., PARAMESWARAN, T. N., RAVINDRA, N. S. and DIMRI, B. P. Effect of powdery mildew (<i>Erysiphe polygoni</i>) on yields and yield components of early and late maturing coriander (<i>Coriandrum sativum</i>)	395
ANIMALS	
HOWSE, A. J., SEMIADI, G., STAFFORD, K. J., BARRY, T. N. and MUIR, P. D. Digestion and chewing behaviour of young sambar and red deer consuming a low quality roughage	399
DRYDEN, G. McL., STAFFORD, K. J., WAGHORN, G. C. and BARRY, T. N. Comminution of roughages by red deer (<i>Cervus elaphus</i>) during the prehension of feed	407
DEVIR, S., ZUR, B., MALTZ, E., GENIZI, A. and ANTLER, A. A model for the prediction of dairy cow body weight based on a physiological timescale	415
FAICHNEY, G. J., WELCH, R. J. and BROWN, G. H. Prediction of the excretion of allantoin and total purine derivatives by sheep from the 'creatinine coefficient'	425
SCOLLAN, N. D. and JESSOP, N. S. Diet-induced variation in acetate metabolism of ovine perirenal adipose tissue <i>in vitro</i>	429
BOOK REVIEWS	437
VIEWPOINT	441
INDEX	445

CAMBRIDGE
UNIVERSITY PRESS



0021-8596(199512)125:3;1-5