

The Journal of Agricultural Science

Senior Editors

Prof. R. E. L. Naylor, *Department of Agriculture and Forestry, University of Aberdeen, Room G29, 23 St Machar Drive, Aberdeen AB24 3RY, UK*

Prof. J. Wiseman, *University of Nottingham, School of Biosciences, Sutton Bonington Campus, Loughborough, Leicestershire LE12 5RD, UK*

Editorial Board

M. Abberton, *IGER, Aberystwyth, UK*

T. Aveling, *University of Pretoria, South Africa*

P. Bilborrow, *Newcastle University, UK*

S. C. Bishop, *Roslin Institute, Edinburgh, UK*

M. D. Casler, *US Dairy Forage Research Center, Madison, USA*

B. R. Cullis, *Wagga Wagga Agricultural Institute, Australia*

J. Dijkstra, *Wageningen University, The Netherlands*

R. N. Edmondson, *Warwick HRI, Wellesbourne, UK*

W. Erskine, *ICARDA, Aleppo, Syria*

J. France, *University of Guelph, Canada*

P. Hobbs, *Cornell University, Ithaca, NY*

G. Hoogenboom, *The University of Georgia, USA*

M. O. Humphreys, *Institute of Grassland and Environmental Research, Aberystwyth, UK*

R. Hunter, *CSIRO, Livestock Industries, Division of Tropical Production, Queensland, Australia*

P. S. Kettlewell, *Harper Adams University College, UK*

D. B. Lindsay, *Cambridge, UK*

S. J. Mooney, *University of Nottingham, UK*

C. K. Reynolds, *University of Reading, UK*

H. Riley, *Norwegian Institute for Agricultural and Environmental Research, Kapp, Norway*

J. A. Rooke, *SAC, Edinburgh, UK*

P. E. Russell, *Cambridge, UK*

U. R. Sangakkara, *University of Peradeniya, Sri Lanka*

N. St. Pierre, *Ohio State University, USA*

C. Watson, *Scottish Agricultural College, Aberdeen, UK*

SUBMISSIONS

The Journal has moved to electronic submission. Manuscripts should be uploaded to <http://mc.manuscriptcentral.com/jagricsci>. Double-blind refereeing has also been adopted, therefore the authors' names, addresses and emails should be removed from the main document and uploaded as a title page in a separate file, tagged 'Not for Review'. Help is available on the website.

SUBSCRIPTIONS

The Journal of Agricultural Science (ISSN 0021-8596) is published six times a year in February, April, June, August, October and December. Six parts form a volume. The subscription price (excluding VAT) of Volume 147 (2009) (which includes delivery by air where appropriate, plus electronic access to institutional subscribers) is £645 net (US \$1185.00 in the USA, Canada and Mexico). Single parts are £106 net (US \$197 in the USA, Canada and Mexico). The electronic only price available to institutional subscribers is £545.00 (\$1010.00 in USA, Canada and Mexico). Back issues are also available.

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York 10994-2133. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for Institutions are available from Kinokuniya Company Ltd, PO Box 55, Chitose, Tokyo 156, Japan.

POSTMASTER: send address changes in the USA, Canada and Mexico to: *The Journal of Agricultural Science*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994-2133. Claims for missing issues should be made immediately on receipt of the subsequent issue.

(Continued on inside back cover)

THE JOURNAL OF AGRICULTURAL SCIENCE

CONTENTS

CROPS AND SOILS PAPERS

- J. HENKE, K. SIELING, W. SAUERMAN and H. KAGE Analysing soil and canopy factors affecting optimum nitrogen fertilization rates of oilseed rape (*Brassica napus*) 1
- S. MELERO, K. VANDERLINDEN, J. CARLOS RUIZ and E. MADEJÓN Soil biochemical response after 23 years of direct drilling under a dryland agriculture system in southwest Spain 9
- A. IDRIS, N. LABUSCHAGNE and L. KORSTEN Efficacy of rhizobacteria for growth promotion in sorghum under greenhouse conditions and selected modes of action studies 17
- H. ZHANG, M. XU and F. ZHANG Long-term effects of manure application on grain yield under different cropping systems and ecological conditions in China 31
- H. MIKSCHOFSKY, G. MANN and I. BROER Soil adaptation of transgenic *in vitro* carrot plantlets 43
- A. CANSEV, H. GULEN and A. ERIS Cold-hardiness of olive (*Olea europaea* L.) cultivars in cold-acclimated and non-acclimated stages: seasonal alteration of antioxidative enzymes and dehydrin-like proteins 51
- A.-M. KIRKKARI, P. PELTONEN-SAINIO and L. JAUHAINEN Trichome numbers in naked-oat cultivars 63
- C. ARUNA and P. G. PADMAJA Evaluation of genetic potential of shoot fly resistant sources in sorghum (*Sorghum bicolor* (L.) Moench) 71

ANIMAL PAPERS

- A. HAILE, B. K. JOSHI, W. AYALEW, A. TEGEGNE and A. SINGH Genetic evaluation of Ethiopian Boran cattle and their crosses with Holstein Friesian in central Ethiopia: reproductive traits 81
- H. SANO, H. SAWADA, A. TAKENAMI and M. AL-MAMUN Effects of diet and cold exposure on rates of plasma leucine turnover and protein synthesis in sheep 91

BOOK REVIEWS 99

FORTHCOMING EVENTS 103

Journal of Agricultural Science now accepts submissions via Manuscript Central.
Go to <http://mc.manuscriptcentral.com/jagricsci>

Cambridge Journals Online

For further information about this journal please
go to the journal website at:
journals.cambridge.org/ags

CAMBRIDGE
UNIVERSITY PRESS