Experimental Agriculture

Improving Water Productivity of Crop-Livestock Systems in Drought-prone Regions

CONTENTS

Amede, T., Tarawali, S. and Peden, D. Improving water productivity in crop-livestock systems of drought-prone regions. Editorial Comment 1

Amede, T., Menza, M. and Awlachew, S. B. Zai improves nutrient and water productivity in the Ethiopian highlands 7

Descheemaeker, K., Amede, T., Haileslassie, A. and Bossio, D. Analysis of gaps and possible interventions for improving water productivity in crop livestock systems of Ethiopia 21

Derib, S. D., Descheemaeker, K., Haileslassie, A. and Amede, T. Irrigation water productivity as affected by water management in a small-scale irrigation scheme in the Blue Nile Basin, Ethiopia 39

Awulachew, S. B. and Ayana, M. Performance of irrigation: an assessment at different scales in Ethiopia 57

Ali, H., Descheemaeker, K., Steenhuis, T. S. and Pandey, S. Comparison of landuse and landcover changes, drivers and impacts for a moisture-sufficient and drought-prone region in the Ethiopian Highlands 71

Mekonnen, S., Descheemaeker, K., Tola, A. and Amede, T. Livestock water productivity in a water stressed environment in Northern Ethiopia 85

Deneke, T. T., Mapedza, E. and Amede, T. Institutional implications of governance of local common pool resources on livestock water productivity in Ethiopia 99

Haileslassie, A., Blümmel, M., Clement, F., Descheemaeker, K., Amede, T., Samireddyppalle, A., Acharya, N. S., Radha, A. V., Ishaq, S., Samad, M., Murty, M. V. R. and Khan, M. A. Assessment of the livestock-feed and water nexus across a mixed crop-livestock system's intensification gradient: an example from the Indo-Ganga Basin 113


An established international journal of research on crop science and systems of agricultural production, especially in the warmer regions
Experimental Agriculture

Editor
Dr D. Harris, ICRISAT, Kenya
N. L. Innes (Book Review Editor)
14 Hazel Drive, Dundee, DD2 1QQ, UK
Email: minnes1960@aol.com

Editorial Board
S. N. Azam-Abb, University of Nottingham, UK
M. K. V. Carr, Bloemfontein, UK
P. J. M. Cooper, Motcombe, Dorset, UK
R. H. V. Codley, Redford, UK
T. Crawsell, Australian National University, Australia
P. Q. Cruft, University of Reading, UK
E. Ersken, CLIMA, University of Western Australia
F. J. Ferrer, University of Córdoba, Spain
D. Gholson, Shingapore, UK
P. J. Gregory, Scottish Crop Research Institute, UK
D. Harris, ICRISAT, Kenya
N. Hatibu, Kilimo Trust, Kampala, Uganda
A. Kassam, University of Reading, UK
C. King, University of Queensland, Australia
R. Lockwood, Kent, UK
A. Martin, Natural Resources Institute, University of Greenwich UK
D. Midmore, Central Queensland University, Australia
U. Mkwvure, Accra, Ghana
L. Nortonh, The Energy and Resources Institute, New Delhi, India
C. O. Qualter, University of California, USA
F. M. Quin, Uki, New South Wales, Australia
N. Sanginga, TSB-CIAT, Nairobi, Kenya
S. Shankugandaram, Somerset, New Jersey, USA
G. Singh, Central Soil Salinity Research Institute, Karnal, India
G. B. Squire, Scottish Crop Research Institute, UK
S. Tarawali, ILRI, Addis Ababa, Ethiopia
J. T. Walker, Alzeim Ltd, Talgarth, UK

Subscriptions
Experimental Agriculture (ISSN 0014–4797) is published quarterly in January, April, July and October by Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK/Cambridge University Press, 32 Avenue of the Americas, New York, N.Y. 10013–2473. Orders, which must be accompanied by payment, may be sent to any 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. The subscription price (excluding VAT) of Volume 46 2011 is $389 net (including postage by air where appropriate, plus electronic access to institutional subscribers) ($US746 in the USA, Canada and Mexico), payable in advance. Single parts are $103 ($US188 in the USA, Canada and Mexico): A print only price is available to institutional subscribers at $375 ($US733 in USA, Canada and Mexico).

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. Periodicals postage paid at New York, NY and at additional mailing offices. POSTMASTER: send address changes in the USA, Canada and Mexico to: Experimental Agriculture, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994–2133.

Copying
This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are also registered with CCC may therefore copy material (beyond the limits permitted by sections 107 and 108 of US Copyright law) subject to payment to CCC of the per copy fee of US$16.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0014-4797/11 US$16.00. ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, 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.

Electronic Access and Information
Experimental Agriculture is one of the many titles included in the Cambridge Journals Online service which can be found at journals.cambridge.org. For further information on other Press titles access uk.cambridge.org or us.cambridge.org

Back Volumes
Previously published parts of Experimental Agriculture are available from Cambridge or the American branch of Cambridge University Press. Please contact for availability.

INSTRUCTIONS TO CONTRIBUTORS
Electronic Submission of Manuscripts
Contributions for consideration for publication should be submitted online at http://www.editorialmanager.com/eaag

Editorial Policy
With a focus on the tropical and sub-tropical regions of the world, Experimental Agriculture publishes the results of original research on field, plantation and herbage crops grown for food or feed, or for industrial purposes, and on farming systems, including livestock and people. It reports experimental work designed to explain how crops respond to the environment in biological and physical terms, and on the social and economic issues that may influence the uptake of the results of research by policy makers and farmers, including the role of institutions and partnerships in delivering impact. The journal also publishes accounts and critical discussions of new quantitative and qualitative methods in agricultural research, and of contemporary issues arising in countries where agricultural production needs to develop rapidly. There is a regular book review section and occasional, often invited, reviews of research. Most papers are published within six months from acceptance. The minimum standards for a paper to be considered by the Editor and the referees are set out below:

- The title page, all headings and the references must conform to the style of Experimental Agriculture.
- Each table and figure must be cited in the text of the typescript.
- All figures to be supplied as separate TIFF or EPS files wherever possible.

This journal has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see www.fsc.org for information.

© Cambridge University Press 2011

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 8RU, United Kingdom
32 Avenue of the Americas, New York, NY 10013–2473, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain
Dock House, The Waterfront, Cape Town 8001, South Africa

Printed in the United Kingdom by the University Press, Cambridge
Improving Water Productivity of Crop-Livestock Systems in Drought-prone Regions

Sponsor:
We would like to acknowledge the kind support of ‘Bundesministerium fuer Wirtschaftliche Zusammenarbeit und Entwicklung,’ Germany, for financing the project through the grant agreement, 06.7860.7-001.00

Guest Editors:
Tilahun Amede, Shirley Tarawali and Don Peden