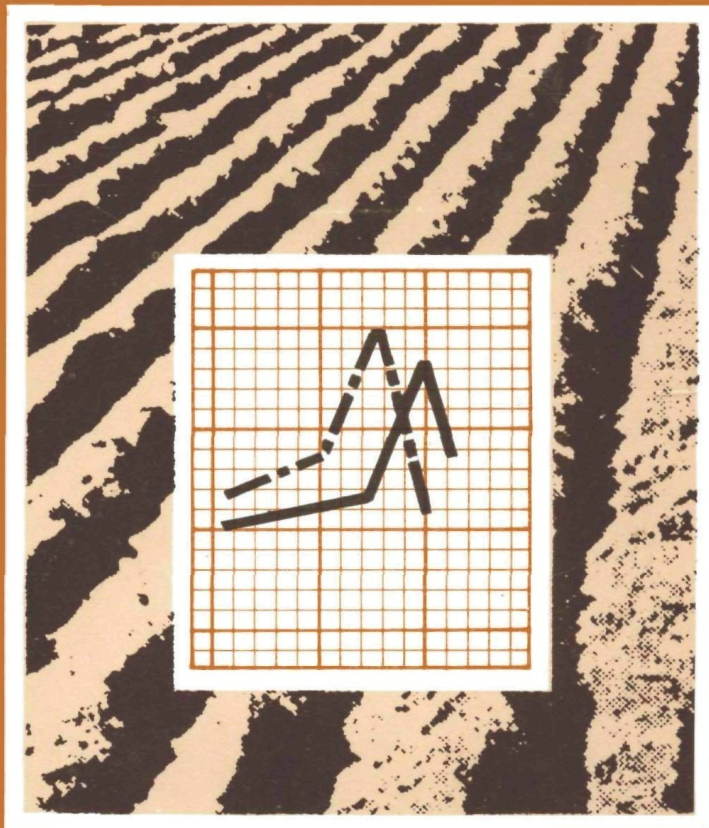


VOLUME 113 PART 2 OCTOBER 1989

The Journal of Agricultural Science



CAMBRIDGE UNIVERSITY PRESS

The Journal of Agricultural Science

EXECUTIVE EDITORS

J. Cheney and S. Jellis

Department of Applied Biology, Pembroke Street, Cambridge CB2 3DX, UK

SENIOR EDITOR

D. E. Walters

Churchill College, Cambridge, UK

EDITORIAL BOARD

E. J. Allen
University of Cambridge, UK

R. B. Austin
*Institute of Plant Science
Research (Cambridge
Laboratory), UK*

B. W. Bache
University of Cambridge, UK

Sir James Beament
University of Cambridge, UK

Sir Kenneth Blaxter
Stradbroke, UK

A. D. Care
University of Leeds, UK

J. A. Currie
Harpden, UK

W. Day
*AFRC Engineering,
Silsoe, UK*

S. K. Eltringham
University of Cambridge, UK

W. G. Hill
University of Edinburgh, UK

A. E. Johnston
*Institute of Arable Crops
Research, Rothamsted, UK*

R. N. B. Kay
Aberdeen, UK

C. N. Law
*Institute of Plant Science
Research (Cambridge
Laboratory), UK*

T. R. Morris
University of Reading, UK

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

M. Peaker
*Hannah Research
Institute, UK*

P. E. Russell
*Chesterford Park
Research Station, UK*

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

INTERNATIONAL CONSULTANTS

D. B. Lindsay
*Tropical Cattle Research
Centre, Australia*

G. M. O. Maloiy
*University of Nairobi,
Kenya*

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

The Journal of Agricultural Science publishes papers from all over the world based on original data and on reassessments of past data covering the whole range of agricultural science. **The Journal** was launched in 1905 by the Cambridge Professors of Agriculture and the Director of the Rothamsted Experimental Station and their policy of making it a major source for agricultural education has been followed throughout. Thus all papers submitted are carefully refereed for their scientific content and those published edited to ensure that the English (the only language used) is unambiguous and easily understood by speakers of other languages.

Subscriptions. *The Journal of Agricultural Science* is published annually in two volumes of three parts. All orders must be accompanied by payment. The subscription price for 1989, volumes 112 and 113, is £141.00 in UK, £155 elsewhere net (USA and Canada US \$305) per volume (post free); single parts are available at £26 net (USA and Canada US \$56) plus postage. Orders or enquiries may be sent to any bookseller or subscription agent, or to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU (USA and Canada, Cambridge University Press, Journals Department, 40 West 20th Street, New York, NY 10011, USA). Second class postage paid at New York, NY, and at additional mailing offices. POSTMASTER: send address changes in USA and Canada to *The Journal of Agricultural Science*, Cambridge University Press, 110 Midland Avenue, Port Chester, New York, NY 10573.

© Cambridge University Press 1989

Instructions to Authors

Failure to comply with the Instructions to Authors may delay publication

The Journal welcomes concise papers reporting original experimental data or experimental methods, or new analyses of already existing data, in any aspect of Agricultural Science. The Journal publishes short reviews which are written only at the express invitation of the Editors. Submitted reviews will not normally be considered. The Editors must be informed if any of the material submitted has been published elsewhere. If a paper is accepted, it must not be published elsewhere in the same form. Experiments on animals must conform with legislation in the country where the experiments are carried out. Papers should be submitted to the Executive Editors, Journal of Agricultural Science, Department of Applied Biology, Pembroke Street, Cambridge CB2 3DX.

Scripts. Papers, written in English, should be typed in double spacing on one side of the paper with a margin of at least 4 cm on the left-hand side. Two copies should be submitted.

Layout and style. Authors are recommended to use the style adopted in recent issues. Details and sample pages showing preferred layout for various subjects may be obtained in advance of submission from the Executive Editors, at the address given above.

Title. The title must be specific and suitable for indexing by the automatic methods now being employed. Male authors should give surnames and full initials, female authors should give one forename. The full name and address of the institution where the research was done should be stated. Change of address may be given as a footnote. A short title, not exceeding 50 characters, should be provided for the running headlines.

A summary, placed at the beginning of the text, should briefly indicate the experiments described, the main result and important conclusions.

The text. The Editors do not insist on a rigid format but it is usually convenient to divide the paper into sections, e.g. Introduction, Materials and Methods, Results, and Discussion. An excess of headings and subheadings should be avoided. The Introduction should show why the work was

carried out; a detailed review of literature is not necessary. Relevant details should be given of the experimental materials and design, and the techniques and statistical methods used. Numerical results should be shown in Tables and not repeated in the text. Metric units should be used.

Experimental details and Results should be recorded in the past tense. The Discussion should relate the author's results to other work on the subject and give the author's conclusions. A simple direct style of writing, avoiding unnecessary repetition and circumlocution, is preferred. Footnotes should not be used.

Tables must be self-explanatory, typed on separate sheets, numbered consecutively and carry an appropriate title. Numerical results should be displayed as means with their relevant standard errors. Normally a mean should be rounded to one tenth of its standard error and the standard error given to one place of decimals more than the mean.

Figures should be restricted to the display of results when a large number of values can be comprehended more easily; Tables and Figures may not reproduce the same data. Line drawings should be 25 cm wide and drawn in black waterproof ink on Bristol Board, graph paper with blue lines or tracing paper. Numbering and lettering, which must be kept to an absolute minimum, should be legibly inserted in soft pencil. A photocopy of the line drawing should be provided; a full legend describing the Figure and giving a key to all the symbols on it should be typed on a separate sheet.

Plates may be accepted, but only if they make a definite contribution to the value of the paper. They should be good quality, unmounted, glossy prints and be lightly numbered in pencil on the reverse side. If several plates or coloured photographs are submitted the author may be asked to contribute to the cost of reproducing them.

References. In the text a reference should be quoted by the author's name and date (in parentheses). Where there are three authors, all names should appear at the first mention; thereafter, and at all

times if there are four or more authors, the first name followed by *et al.* should be used, unless there is ambiguity, in which case all the names should be given at each occurrence. A list of References should be given at the end of the text listing, in alphabetical order, surname of authors, initials, year of publication (in parentheses), title of paper, name of journal in full (underlined to denote italics), volume and first and last pages of the reference. Authors should check that all references in the text appear at the end of the paper and vice versa, and that names and dates correspond in the two places.

Short notes may be accepted provided they are based on adequate experimental evidence; special provision is made for their publication with the least possible delay. MSS should not exceed 1500 words in length or their equivalent (a Summary is not required). For tabulated matter allow 25 words per line of the table (including headings). For line illustrations allow 225 words per quarter of page.

Series. The Editors do not wish to publish continuing series and will divide work into parts

only if they consider it of advantage to the readers; the whole work must be submitted at the same time. In general the first part must include in the Introduction the reasons for carrying out the whole work and the final part must end with a Discussion of all the findings to show the progress made.

Mathematical models. Authors preparing papers involving complex mathematical models are advised to obtain, from the above address, notes setting out the Editor's policy on these models.

Proofs will be sent to authors to enable them to check the correctness of the type-setting. Excessive alterations due to amendments of the author's original agreed copy may be charged to the author.

Offprints. Contributors will receive 25 copies of their papers free and can order others when they receive the proofs.

Books for review. Books should be sent to the Review Editor, W. J. Ridgman, 1 Hillside Lane, Arrington, Royston, Herts SG8 0DA.