# EXPERIMENTAL AGRICULTURE

**VOLUME 5 1969** 

### Editor

PROFESSOR J. P. HUDSON

#### Editorial Board

PROFESSOR SIR J. B. HUTCHINSON (Chairman)

PROFESSOR D. K. BRITTON

DR E. E. CHEESMAN

PROFESSOR E.W. RUSSELL

PROFESSOR J. D. IVINS

DR G. WATTS PADWICK

SIR G. W. NYE DR C. C. WEBSTER

CAMBRIDGE AT THE UNIVERSITY PRESS 1969

### PUBLISHED BY

# THE SYNDICS OF THE CAMBRIDGE UNIVERSITY PRESS Bentley House, 200 Euston Road, London, N.W.I American Branch: 32 East 57th Street, New York, N.Y. 10022

Printed in Great Britain by Adlard & Son, Dorking

## CONTENTS

Part 1 (January 1969)

H. Doggett: Yields of Hybrid Sorghums	I			
A. Pinkerton and K. R. Bock: Parallel Streak of Sisal (Agave sisalana) in				
Kenya	9			
<b>D. A. Rijks and J. F. Harrop:</b> Irrigation and Fertilizer Experiments on Cotton at Mubuku, Uganda				
J. J. Hardon, C. N. Williams and I. Watson: Leaf Area and Yield in the	17			
Oil Palm in Malaya	25			
P. D. Turner: Evaluation of Fungicides for the Control of Helmintho-	<del>-</del> 5			
sporium heveae on Hevea Rubber in Malaysia. I. Laboratory Assessment	33			
R. L. Wastie: Evaluation of Fungicides for the Control of Helmintho-				
sporium heveae on Hevea Rubber in Malaysia. II. Field Tests				
R. J. Haggar: Use of Companion Crops in Grassland Establishment in				
Nigeria	47			
B. Walker: Effects of Feeding Hay on the Early Wet Season Weight Loss				
of Cattle in Western Tanzania  J. J. Hardon and M. D. Davies: Effects of Vacuum-Drying on the	53			
Viability of Oil Palm Pollen	50			
S. C. Pearce: Multivariate Techniques of Use in Biological Research	59 67			
Book Reviews:				
Fertilizer Guide for Tropical and Sub-Tropical Farming: J. G. De Geus	79			
Urea as a Protein Supplement: M. H. Briggs	80			
Mechanisation and the World's Rice: Massey-Ferguson	18			
Plant Protection and World Crop Production: H. H. Cramer	82			
Chemical Fertilizers: G. Fauser	83			
Soil Acidity and Liming: R. W. Pearson and F. Adams	84			
Part 2 (April 1969)				
P. C. Owen: The Growth of Four Rice Varieties as Affected by Tempera-				
ture and Photoperiod with Uniform Daily Periods of Daylight	85			
A. R. Bromfield: Uptake of Phosphorus and other Nutrients by Maize in				
Western Nigeria	91			
P. C. Owen: Comparative Potential Yields of Rice Varieties in the				
Australian Tropics	101			
O. L. Oke: Sulphur Nutrition of Legumes  K. C. Anarth, Timing and Engagency of Spraying for Control of Coffee	III			
K. C. Ananth: Timing and Frequency of Spraying for Control of Coffee Leaf Rust in Southern India				
H. K. Pande and Panjab Singh: Effects of Moisture and Nitrogen on	117			
Growth, Yield and Mineral Content of Rice	125			
R. W. Smith: Fertilizer Responses by Coconuts (Cocos nucifera) on two	123			
Contrasting Jamaican Soils	133			
Abdalla Ahmed Abdalla: Effects of Planting Date and Spacing on Yields	- 33			
of Onion Seed under Hot Arid Conditions in the Sudan	147			
D. A. Holland: Component Analysis: An Aid to the Interpretation of	1,			
Data	151			

-	•	*	•		
Boo	k	Кe	VI	ews	•

Environmental Control in Poultry Production: T. C. Carter Tropical Crops, Dicotyledons, Vols. 1 and 2: J. W. Purseglove	165 166
Part 3 (July 1969)	
<ul><li>J. C. Hudson: The Available-Water Capacity of Barbados Soils</li><li>C. N. Williams and S. M. Ghazali: Growth and Productivity of Tapioca</li></ul>	167
(Manihot utilissima). I. Leaf Characteristics and Yield  A. H. El Nadi: Water Relations of Beans. I. Effects of Water Stress on	183
Growth and Flowering  Faisal M. Ali: Effects of Rainfall on Yield of Cocoa in Ghana	195 209
B. Walker: Effects of Nitrogen Fertilizer on Natural Pastures in Western Tanzania	215
Mahendra P. Varma and M. S. Subba Rao Kanke: Selection of Intercrops for Cotton in India	223
Sivanadyan Kathirgamaraj, C. N. Williams and K. T. Joseph: Effects of Sea Water on Growth of Reyong-20 Rice in Malaysia	231
<b>B. W. Bache and R. G. Heathcote:</b> Long-Term Effects of Fertilizers and Manure on Soil and Leaves of Cotton in Nigeria	241
Man Singh Manohar: Pod Development and Germination of Bhindi (Abelmoschus esculentus)	249
Deals Destaura	
Book Reviews:  Tobacco: B. C. Akehurst Diseases and Disorders of the Oil Palm in Malaysia: P. D. Turner	257
and R. A. Bull	258
Pests of Coffee: R. H. E. Le Pelley The Oil Palm: C. W. S. Hartley	260 261
Part 4 (October 1969)	
D. Stephens: Changes in Yields and Fertilizer Responses with Continuous	
Cropping in Uganda  F. J. Nutman and F. M. Roberts: Coffee Berry Disease: Epidemiology	263
in Relation to Control  D. Hopkinson: Leguminous Cover Crops for Maintaining Soil Fertility	271
in Sisal in Tanzania. I. Effects of Growth and Yield  L. B. Chaudhari and R. C. Acharya: Genetic Variability and Path	283
Coefficient Analysis of Components of Ragi (Eleusine coacana)	295
J. B. D. Robinson: Effects of Environment and Cultural Conditions on Nitrogen and Phosphorus in Coffee Leaves	301
J. B. D. Robinson: Effects of Environment and Cultural Conditions on Potassium, Calcium and Magnesium in Coffee Leaves	311
N. F. Derera, D. R. Marshall and L. N. Balaam: Genetic Variability in Root Development in Relation to Drought Tolerance in Spring Wheats	327
A. Bar-Akiva, D. Tal and J. Hirsh: Use of Aerial Sprays for Correcting Magnesium Deficiency in Orange Groves	339

## **Book Reviews:**

Plant Growth Regulators: S.C.I. Monograph 31	342
The Role of Potassium in Agriculture: V. J. Kilmer, S. E. Younts	
and N. C. Brady (eds.)	344
Test Crops of Northeastern and Central Africa, with particular	
reference to the Sudan: H. Schmutterer	345
Climate and Agriculture—An Ecological Survey: Jen-Itu Chang	347

tion. It is particularly important, for example, that the title should contain references, where relevant, to the crop, the character of the investigation, the factors under review, and the climatic or geographic area in which the work was done.

Headings. The following details should be given at the head of the first sheet: the full title of the paper; a short title for running headlines, not exceeding 48 characters, counting each letter and space as one character; the name(s) of the author(s); the address at which the work was carried out; the present address(es) of author(s), if different from the previous item; and the address (normally of the senior author or his proxy) to which proofs should be sent.

Summary. A short but accurate and informative summary must be included. The preparation of the summary, which requires much care, is not an Editorial responsibility. Papers received without adequate summaries will be returned to the author.

Experimentation. This journal specialises in the presentation of data based on up-to-date methods of experimentation. It is therefore important that, where appropriate, papers should include: an adequate account of lay-outs; description of treatments and general management; and assessments of experimental variability (e.g. coefficient of variation) and of the statistical significance of the results, specifying the methods used for the analysis (but without showing any details of the calculations). Authors are urged to give the dates when experiments were carried out.

Plates. These should only be included where they are essential to the understanding of the paper, and will only be accepted if of high quality. Photographs should be provided as unmounted glossy black-and-white prints (colour prints, but not colour transparencies, are acceptable for reproduction in black-and-white; they can only be reproduced in colour if a financial subsidy is provided). If lettering is to be inserted on a print, this should be shown on a spare copy or an overlay, and an unmarked print provided for marking by the printer. Please do not write heavily on the back of prints or use clips that mark them.

Diagrams. The most satisfactory size for diagrams is about twice the size of the finished block, with lines and points appropriately thickened. Diagrams should be drawn in Indian ink on white drawing paper, tracing linen or graph paper ruled in faint blue (but not other colours). Lettering and figures will be inserted by the printers, but the precise position of all lettering should be indicated in soft pencil, or preferably on a sketch showing the required lay-out of the whole diagram. Each illustration should bear the name of the author(s) and the figure number, written clearly in the margin or on the back. On no account should any diagram be submitted on a sheet larger than foolscap size.

Legends. The legends for all illustrations should be given on a separate sheet of paper, clearly marked with the number of each plate or diagram. The ideal position for each diagram should be marked in the text, although it may not always be possible to put the illustration exactly in that place. Plates will normally be bound immediately after the end of the paper.

Tables. Each table should be typed on a separate sheet of paper, and its preferred position indicated on the typescript. Each table should be numbered and bear an appropriate title, along the lines normally used for tables in this publication. Contributors are specially asked to avoid presenting tables that are too large to print across the page.

Units. It is hoped to change to metric S.I. units in the early 1970's but use of those units will be welcomed at any time. A leaflet giving full details of the S.I. system is available from the Editor.

References. The Harvard system of citation is used throughout as follows: name and initial(s) of author(s); year of publication in parentheses, further distinguished by the addition of small letters a, b, c, etc., where there are citations to more than one paper published by the same author(s) in one year; contracted title of periodical as given in the World List of Scientific Periodicals; volume number in arabic figures; number of the first page of the paper. In the text, references should be denoted by giving the name of the author(s) with the date of publication in parentheses, e.g. Brown (1937) ..., (Brown, 1937a; Jones and Smith, 1942a, b). In the list of references all names should be given in full, but where more than two collaborating authors are quoted in the text, only the first name is normally shown, followed by et al.

Referees. All manuscripts are critically reviewed by expert referees, on whose advice the Editor accepts or rejects contributions, or returns them to authors for reconsideration.

Proofs. Two sets of single-sided page proofs will be sent to each author, but it is the responsibility of the senior author to collate the views of his co-author(s) and submit a consolidated set of corrections to the Editor, by returning to him the printers' marked proof (identified by the words 'marked copy') with all required corrections. No further corrected proof will be sent to the author, unless this is specially requested. Excessive alterations, other than corrections of printers' errors, may be disallowed or charged to the author. Corrections should be made using the symbols in British Standard 1219:1958, or its shortened version B.S. 1219C:1958, obtainable from the British Standards Institution, 2 Park Street, London, W. 1.

Offprints. Fifty offprints will be sent free of charge to the author. Where there are two or more authors, all fifty offprints will be sent to the senior author, unless the Printer is asked to divide them. Additional offprints may be ordered on the form sent out with the proofs (to the senior author only if there is more than one) provided this is returned to the Printer within seven days of its receipt by the author.

The Editor will be pleased to send on request:
Notes on the choice of titles and preparations of
summaries (based on a paper by G. V. Jacks).
Suggestions on the use of English for scientific
papers (based on a paper by A. S. Kirkman).
Details on the use of metrical units in scientific
journals (as agreed by the Royal Society Conference
of Editors—see note on Units above).

## EXPERIMENTAL AGRICULTURE VOLUME 5, NUMBER 4, OCTOBER 1969

## CONTENTS

D. Stephens: Changes in Yields and Fertilizer Responses with Continuous Cropping in Uganda	263
F. J. Nutman and F. M. Roberts: Coffee Berry Disease: Epidemiology in Relation to Control	271
D. Hopkinson: Leguminous Cover Crops for Maintaining Soil Fertility in Sisal in Tanzania. 1. Effects on Growth and Yield	283
L. B. Chaudhari and R. C. Acharya: Genetic Variability and Path Coefficient Analysis of Components of Ragi (Eleusine Coracana)	295
J. B. D. Robinson: Effects of Environment and Cultural Conditions on Nitrogen and Phosphorus in Coffee Leaves	301
J. B. D. Robinson: Effects of Environment and Cultural Conditions on Potassium, Calcium and Magnesium in Coffee Leaves	311
N. F. Derera, D. R. Marshall and L. N. Balaam: Genetic Variability in Root Development in Relation to Drought Tolerance in Spring Wheats	327
A. Bar-Akiva, D. Tal and J. Hirsh: Use of Aerial Sprays for Correcting Magnesium Deficiency in Orange Groves	339
Book Reviews:	
Plant Growth Regulators: The Role of Potassium in Agriculture: V. J. Kilmer, S. E.	343
Younts and N. C. Brady (Eds.)	344
Pests of Crops in Northeastern and Central Africa, with Particular Reference to the Sudan: H. Schmutterer Climate and Agriculture—An Ecological Survey: Jen-Itu	345
Chang	347

Printed in Great Britain by Adlard & Son Ltd. Bartholomew Press, Dorking, Surrey