THE JOURNAL OF AGRICULTURAL SCIENCE

EDITED BY

- Professor Sir R. H. BIFFEN, M.A., F.R.S., School of Agriculture, Cambridge E. M. CROWTHER, D.Sc., F.I.C., Rothamsted Experimental Station, Harpenden
- J. HAMMOND, M.A., D.Sc., F.R.S., School of Agriculture, Cambridge
- H. HUNTER, M.A., D.Sc., 176 Huntingdon Road, Cambridge
- B. A. KEEN, D.Sc., F.R.S., East African Agriculture and Forestry Research Organisation, Nairobi, Kenya
- F. H. A. MARSHALL, C.B.E., Sc.D., LL.D., F.R.S., School of Agriculture, Cambridge
- SIR E. J. RUSSELL, D.Sc., F.R.S., Campsfield Wood, Woodstock, Oxon.

IN CONSULTATION WITH

- PROFESSOR B. T. P. BARKER, M.A., Agricultural and Horticultural Research Station, Long Ashton, Bristol
- DR I. B. POLE-EVANS, C.M.G., Department of Agriculture, Pretoria, South Africa
- PROFESSOR J. HENDRICK, B.Sc., F.I.C., Marischal College, Aberdeen
- DR A. E. V. RICHARDSON, C.M.G., M.A., Commonwealth Council for Scientific and Industrial Research, Melbourne, Australia

VOLUME XXXVIII 1948

CAMBRIDGE
AT THE UNIVERSITY PRESS
1948

Printed in Great Britain at the University Press, Cambridge
(Brooke Crutchley, University Printer)
and published by the Cambridge University Press
Cambridge, and Bentley House, London
Agents for U.S.A.: The University of Chicago Press
Canada, and India: Macmillan

${\bf CONTENTS}$

PART 1 (JANUARY 1948)

	$\mathbf{P}I$
BLAXTER, K. L. Severe experimental hyperthyroidism in the ruminant. I. Metabolic effects. (With Eight Text-figures)	12
BLAXTER, K. L. Severe experimental hyperthyroidism in the ruminant. II. Physiological effects. (With Three Text-figures)	
Rutledge, W. A. and Common, R. H. The composition and digestibility of Northern Irish hays. II. Meadow hays	
Ferguson, W. S. The effect of late nitrogenous top-dressing on the digestibility of hay. Tyler, Cyrl. Studies in the absorption and excretion of certain minerals by poultry.	
IV. An analysis of available data, with a discussion of some theoretical aspects. (With Fourteen Text-figures)	
WOODMAN, H. E. and EVANS, R. E. The nutrition of the bacon pig. XII. The value of dried grass meal for growing and fattening pigs	
COMMON, R. H., RUTLEDGE, W. A. and HALE, R. W. Observations on the mineral metabolism of pullets. VIII. The influence of gonadal hormones on retention of	
calcium and phosphorus. (With Plates 1-4 and Three Text-figures) Gane, R. The water content of the seeds of peas, soya beans, linseed, grass, onion and	
carrot as a function of temperature and humidity of the atmosphere. (With Three Text-figures)	
Gane, R. The effect of temperature, water content and composition of the atmosphere on the viability of carrot, onion and parsnip seeds in storage. (With Six Text-figures).	
GANE, R. The effect of temperature, humidity and atmosphere on the viability of Chewing's Fescue grass seed in storage. (With One Text-figure)	
Part 2 (April 1948)	
Wallace, L. R. Growth of lambs before and after birth in relation to the level of nutrition. Part I. (With Plates 1-16 and Eighty-six Text-figures)	
FIELDING, W. L. Experimental methods with cotton. V. A study of ginning percentage and its determination in variety trials	J
FIELDING, W. L. Experimental methods with cotton. VI. The determination of staple-length in single plant selections and variety trials. (With Plate 5 and Two Text-figures)]
TALAPATRA, S. K., RAY, S. C. and SEN, K. C. Calcium assimilation in ruminants on oxalate-rich diet	J
Callow, E. H. Comparative studies of meat. II. The changes in the carcass during growth and fattening, and their relation to the chemical composition of the fatty and muscular tissues. (With Seventeen Text-figures)]
WOODMAN, H. E. and Evans, R. E. The composition and nutritive value, when fed to pigs, of whale-meat meal, white-fish meal, feeding-meat meal, extracted decorticated ground-nut meal, bean-meal and dried yeast	2
BLAXTER, K. L. The effect of iodinated casein on the basal metabolism of the sheep. (With Five Text-figures)	9

iv Contents

·	PAGE			
MARSTON, HEDLEY R., LEE, HECTOR JOHN and McDonald, IAN W. Cobalt and copper in the nutrition of sheep (1). (With Two Text-figures)	216			
MARSTON, HEDLEY R., LEE, HECTOR JOHN and McDonald, IAN W. Cobalt and copper in the nutrition of sheep (2). (With Plate 6 and One Text-figure)	222			
Marston, Hedley R. and Lee, Hector John. The effects of copper deficiency and of chronic overdosage with copper on Border-Leicester and Merino sheep. (With Plates 7-10 and Two Text-figures)	229			
110005 1-10 and 1wo lozi-nguios)	220			
Part 3 (July 1948)				
Wallace, L. R. The growth of lambs before and after birth in relation to the level of nutrition. Parts II and III.	243			
Galpin, L. A study of wool growth. Part II. Mean fibre thickness, density of fibre population, the area of skin covered by fibre, and the mean fibre length. (With				
Four Text-figures)	303			
QUASTEL, J. H., HEWITT, E. J. and NICHOLAS, D. J. D. The control of manganese deficiency in soils. I. The effects of sulphur and thiosulphates on crops growing on manganese-deficient soils	315			
Mann, T. Fructose content and fructolysis in semen. Practical application in the evaluation of semen quality. (With One Text-figure)	323			
HOWARD, H. W. Meiotic irregularities in hexaploid oats. II. A cytological survey of the variety Picton. (With Eighteen Text-figures)	332			
GORFINKEL, L. The influence of crossing on the nicotinic acid content of maize	339			
SMALL, J. and Jackson, T. Relative buffer-index values for root saps of some crop plants	343			
Robinson, P. The effect of supermaintenance and submaintenance diets on mature Border Leicester-Cheviot ewes. (With Three Text-figures)	345			
WOODMAN, H. E. and Evans, R. E. Nutrition of the bacon pig. XIII. The minimum level of protein intake consistent with the maximum rate of growth (Part V).	354			
Part 4 (October 1948)				
Wallace, L. R. The growth of lambs before and after birth in relation to the level of nutrition. Part III	367			
Pearce, S. C. and Taylor, J. The changing of treatments in a long-term trial. (With Two Text-figures)	402			
FINDLAY, J. D. Experiments on the ventilation of cattle byres. (With Seven Text-figures)	411			
Holmes, W. The intensive production of herbage for crop-drying. Part I. A study of the productivity of two annual crops and two leys and of their responses in yield and	405			
chemical composition to applications of nitrogenous manure. (With Three Text-figures)	425			
HALE, R. W. and Bolton, W. Sesame cake meal as a protein concentrate for laying pullets	437			
CROOK, E. M. and WATSON, D. J. Studies on the storage of potatoes. I. Changes in composition during storage in clamps. (With Four Text-figures)	44 0			
ROBERTS, WINIFRED O. Prevention of mineral deficiency by soaking seed in nutrient solution. (With Plate 11 and Eight Text-figures)	458			

A few MICHROME BRAND

STAINS & REAGENTS FOR MICROSCOPY

Adonitol Janus Blue Auramine, O Janus Green, B Azocarmine **Tanus** Red Azur I & II Leishman Stain Brilliant Cresyl Blue May-Grunwald Stain Cedarwood Oil Nile Blue Evans Blue Rosolic Acid Field's Stain Thionin Giemsa Stain Trypan Red

Stains in tablet form.
Water soluble indicators, etc.
Laboratory Sundries: Slides, Cover Glasses,
Dropping Bottles, etc.

Wright's Stain, etc.

Haematoxylin

Price list on application

EDWARD GURR, LTD.

108 WATERFORD ROAD WALHAM GREEN, LONDON, S.W.6

Tel.: Renown 2011 Cables: Gurt, Renown 2011, London
For Service, Uniform High Quality, Reliability,
AND FOR IMMEDIATE DELIVERY STIPULATE

MICHROME BRAND

BLACKWELL'S

University Booksellers

want to buy

BOOKS

on

AGRICULTURE BOTANY HORTICULTURE

Good prices given for suitable items

*

Please submit lists showing author, title and date

*

Catalogues issued periodically Are you on our mailing list?

BROAD ST., OXFORD

COMMONWEALTH AGRICULTURAL BUREAUX

The journals and occasional publications of the two Institutes and ten Bureaux in this organization provide an introduction to the world literature on all aspects of crop, grassland and animal husbandry, horticulture, dairy science, forestry, and the health of crops and animals.

TECHNICAL COMMUNICATIONS

Phenothiazine 1942-46: a Review and Bibliography.	4s.
Pregnancy diagnosis tests: a Review.	15s.
List of Recorded Cotton Insects of the World.	55.
West African Meliolineae. II. Meliolineae collected by F. C. Deighton.	125.
The Plant Diseases and Fungi Recorded from Mauritius.	58.
Fungi of Barbados and the Windward Islands.	3s. 9d.
A List of Plant Diseases of Economic Importance in Tanganyika Territory.	3s. 9d.
List of Common Tropical Plant Diseases.	35.
Bibliography of Systematic Mycology 1947.	Is. 6d.
Diet in Relation to Reproduction and the Viability of the Young. Part I. Rats	
and other Laboratory Animals.	6s.
Seed Production of European Vegetables in the Tropics.	25.
Growth Substances and their Practical Importance in Horticulture.	12s. 6d.
Five Hundred Varieties of Herbage and Fodder Plants.	155.
The Technique of Breeding for Drought Resistance in Crops.	2s. 6d.
New and Promising Varieties recently described in the Literature (7th issue).	2s. 6d.
The Practice of Soil Conservation in the British Colonial Empire.	IOS.

All correspondence regarding above publications may be addressed to:

COMMONWEALTH AGRICULTURAL BUREAUX (Central Sales Branch)
Penglais, Aberystwyth, Great Britain

CONTENTS

		PAGE
1.	Wallace, L. R. The growth of lambs before and after birth in relation to the level of nutrition. Part III	367
2.	Pearce, S. C. and Taylor, J. The changing of treatments in a long-term trial. (With Two Text-figures)	402
3.	FINDLAY, J. D. Experiments on the ventilation of cattle byres. (With Seven Text-figures)	411
4.	Holmes, W. The intensive production of herbage for crop-drying. Part I. A study of the productivity of two annual crops and two leys and of their responses in yield and chemical composition to applications of nitrogenous manure. (With Three Text-figures)	425
5.	HALE, R. W. and Bolton, W. Sesame cake meal as a protein concentrate for laying pullets	437
6.	CROOK, E. M. and WATSON, D. J. Studies on the storage of potatoes. I. Changes in composition during storage in clamps. (With Four Text-figures	440
7.	ROBERTS, WINIFRED O. Prevention of mineral deficiency by soaking seed in nutrient solution. (With Plate 11 and Eight Text-figures)	458

The Journal of Agricultural Science is issued in quarterly parts of about 120 pages with plates and figures, four parts constituting a volume.

Volumes XVI–XX (1926-1930) are out of print. Quotations can be given for other back volumes and parts.

Quotations can also be given for buckram binding cases. (Suspended.)

Papers for publication should be typewritten or written in a very legible hand, and may be sent to Dr F. H. A. Marshall, School of Agriculture, Cambridge, or to the associate Editors. Other communications should be addressed to the University Press, Cambridge.

Bibliography should be given under the heading of "References" in the following form:

Surname of authors (in alphabetical order), initials, date of publication (in brackets), title of Journal (abbreviated according to the World List of Scientific Periodicals), volume and pages of reference. In the text a reference should be quoted by the author's name and date (in brackets).

All names of Journals and books should be in italics.

Contributors will receive twenty-five copies of their papers free.

The subscription price for each volume, payable in advance, is 40s. net per volume (post free); single numbers 15s. net. Subscriptions may be sent to any Bookseller, or to The Cambridge University Press, Bentley House, 200 Euston Road, London, N.W.1.

The Cambridge University Press has appointed the University of Chicago Press, agents for the sale of *The Journal of Agricultural Science* in the United States of America.

Printed in Great Britain at the University Press, Cambridge (Brooke Crutchley, University Printer)