THE JOURNAL OF AGRICULTURAL SCIENCE

EDITED BY

- G. D. H. BELL, C.B.E., PH.D., F.R.S., Plant Breeding Institute, Cambridge
- K. L. BLAXTER, Ph.D., N.D.A. (HONS.), D.SC., F.R.S.E., Rowett Research Institute, Bucksburn, Aberdeen
- G. W. COOKE, Ph.D., F.R.I.C., Rothamsted Experimental Station, Harpenden
- JOHN HAMMOND, Jr., M.A., School of Agriculture, Cambridge
- PROF. SIR J. B. HUTCHINSON, C.M.G., SC.D., F.R.S., School of Agriculture, Cambridge
- H. L. PENMAN, O.B.E., PH.D., F.R.S., Rothamsted Experimental Station, Harpenden
- H. H. ROGERS, B.SC., DIP.AG.SCI., Plant Breeding Institute, Cambridge
- PROF. E. W. RUSSELL, C.M.G., PH.D., F.INST.P., Department of Soil Science, University of Reading
- F. YATES, C.B.E., SC.D., F.R.S., Rothamsted Experimental Station, Harpenden

VOLUME LXVII 1966

CAMBRIDGE AT THE UNIVERSITY PRESS 1966

PUBLISHED BY

THE SYNDICS OF THE CAMBRIDGE UNIVERSITY PRESS

Bentley House, 200 Euston Road, London, N.W.1. American Branch: 32 East 57th Street, New York, N.Y.10022

Printed in Great Britain at the University Printing House, Cambridge

Contents

PART 1 (AUGUST 1966)

·	PAGE
ALSTON, A. M. The effects of limestone, N, K and Mg fertilizers on Mg absorption by oats and barley. (With Five Text-figures)	1
Symington, R. B. and Oliver, J. Observations on the reproductive activity of tropical sheep in relation to the photoperiod. (With Two Text-figures)	7
GREENHALGH, J. F. D., REID, G. W., AITKEN, J. N. and FLORENCE, E. The effects of grazing intensity on herbage consumption and animal production. I. Short-term effects in stripgrazed dairy cows. (With Two Text-figures)	
Doney, J. M. Breed differences in response of wool growth to annual nutritional and climatic cycles. (With Four Text-figures)	25
DOGGETT, H. and JOWETT, D. Yields of maize, sorghum varieties and sorghum hybrids in the East African Lowlands. (With Three Text-figures)	31
LARGE, R. V. and Spedding, C. R. W. The health and performance of the grazing animal in relation to fertilizer nitrogen usage. II. Weaned lambs. (With Six Text-figures)	41
BRAUDE, R. and ROWELL, J. G. Comparison of meal and pellets for growing pigs fed either in troughs or off the floor	53
WILLIAMS, V. J. and Christian, K. R. Rumen fermentation of fresh herbage. (With Three Text-figures)	59
BLAXTER, K. L., CLAPPERTON, J. L. and WAINMAN, F. W. Utilization of the energy and protein of the same diet by cattle of different ages. (With Four Text-figures)	67
ASHTON, W. M. and Yousef, I. M. A study of the composition of Clun Forest ewe's milk. II. Mineral constituents	77
GRIFFITH, G. ap and Walters, R. J. K. The sodium and potassium content of some grass genera, species and varieties	. 81
COKER, E. G. The value of lipid digested sewage sludge. I. The effect of liquid sewage sludge on growth and composition of grass-clover swards in South-east England	91
COKER, E. G. The value of liquid digested sewage sludge. II. Experiments on rye-grass in South-east England, comparing sludge with fertilizers supplying equivalent nitrogen, phosphorus, potassium and water	
COKER, E. G. The value of liquid digested sewage sludge. III. The results of an experiment on barley	. 105
AUCKLAND, A. K. Soyabeans in Tanzania. I. The exploitation of hybridization for the improvement of soyabeans. (With Three Text-figures)	. 109
WIDDOWSON, F. V., PENNY, A. and WILLIAMS, R. J. B. An experiment measuring effects of N, P and K fertilizers on yield and N, P and K contents of grazed grass. (With One Text-figure)	
Saba, N., Burns, K. N., Cunningham, N. F., Hebert, C. Nancy and Patterson, D. S. P. Some biochemical and hormonal aspects of experimental ovine pregnancy toxaemia	. 129
DAVIES, ALISON. The regrowth of swards of S24 perennial rye-grass subjected to different pre-treatments. (With One plate and Three Text-figures)	t . 139

vi Contents

Part 2 (October 1	(966)
-------------------	-------

2 (00102211 1000)	PAGE
BLORE, T. W. D. Further studies of water use by irrigated and unirrigated Arabica coffee in Kenya. (With Two Text-figures)	145
Hodgson, J. and Spedding, C. R. W. The health and performance of the grazing animal in relation to fertilizer nitrogen usage. I. Calves. (With Five Text-figures)	155
Juma, K. H. and Faraj, M. Factors affecting birth weights of Awassi lambs	169
Lees, J. L. Variations in the time of onset of the breeding season in Clun ewes	173
ALEXANDER, G. and WILLIAMS, D. Teat-seeking activity in new-born lambs: the effects of cold. (With Three Text-figures)	181
MORRIS, J. G. Finishing steers on sorghum grain and sorghum silage. Effects of grain-to-roughage ratio, urea supplementation and hexoestrol implantation on rate of body-weight gain, efficiency and carcass compositions	191
CAMPBELL, A. G. Grazed pasture parameters. I. Pasture dry-matter production and availability in a stocking rate and grazing management experiment with dairy cows. (With Three Text-figures)	199
CAMPBELL, A. G. Grazed pasture parameters. II. Pasture dry-matter use in a stocking rate and grazing management experiment with diary cows. (With one Text-figure)	211
CAMPBELL, A. G. Grazed pasture parameters. III. Relationships of pasture and animal parameters in, and general discussion of a stocking rate and grazing management experiment with dairy cows. (With Two Text-figures)	217
GARNER, H. V. Experiments on the direct, cumulative and residual effects of town refuse manures and sewage sludge at Rothamsted and other centres 1940–1947	223
BOND, D. A., FYFE, J. L. and TOYNBEE-CLARKE, GILLIAN. Yields of mixtures of single-cross hybrid field beans (<i>Vicia faba</i> L.) with one of the parental inbred lines	235
EDDOWES, MAURICE. Chemical weed control in potatoes	239
Lewis, Joseph. The relationship between seed yield and associated characters in meadow fescue (Festuca pratensis). (With Two Text-figures)	243
Zaleski, A. White clover investigations. III. Effect of irrigation on seed production	249
MACER, R. C. F. and VAN DEN DRIESSCHE, M. Yellow rust (<i>Puccinia striiformis</i> Westend.) of barley in England, 1960–65. (With one Text-figure)	255
GARNER, H. V. Comparisons of farmyard manure, sewage sludge, and other organic manures tested on potatoes and a succeeding cereal crop at Rothamsted	267
LACHOVER, D. and FELDHAY, HELENA. The evaluation of potassium metaphosphate as a source of potassium for potatoes with special references to foliar diagnosis, yield and quality of tubers. (With One plate and Three Text-figures)	281

Contents vii

Part 3 (December 1966)	DAGE
Edex, T. N. Nutritional stress and pre-implantation embryonic mortality in Merino sheep. (With Two Text-figures)	287
L'Estrange, J. L. and Axford, R. F. E. Mineral balance studies on lactating ewes with particular reference to the metabolism of magnesium. (With Two Text-figures)	295
COOP, I. E. Effect of flushing on reproductive performance of ewes. (With Six Text-figures)	305
Bond, D. A. Yield and components of yield in diallel crosses between inbred lines of winter beans (Vicia faba). (With Eight Text-figures)	325
Drysdale, A. D. and Strachan, N. H. Liquid manure as a grassland fertilizer. IV. The effect of liquid manure on the mineral content of grass and clover. (With Two Text-figures).	337
HAYMAN, R. H., BEESTON, J. W. U., ALLEN, T. E. and NAY, T. Skin thickness in Sahiwal and Jersey cattle and its measurements. (With One Text-figure)	345
YEATES, N. T. M. and MURRAY, D. M. Walking trials with cattle. I. A breed comparison in moderate heat. (With One Plate and Four Text-figures)	353
FOLMAN, Y., VOLCANI, R. and EYAL, E. Mother-offspring relationships in Awassi sheep. I. The effect of different suckling regimes and time of weaning on the lactation curve and milk yield in dairy flocks. (With Four Text-figures)	359
FOLMAN, Y., EYAL, E. and VOLCANT, R. Mother-offspring relationships in Awassi sheep. II. Milk yields and weight gains of lambs in a mutton flock	369
FOLMAN, Y., EYAL, E. and VOLCANI, R. Mother-offspring relationships in Awassi sheep. III. The effect of different suckling regimes and weaning age on weight gains of lambs in dairy flocks	371
Manns, J. G. and Boda, J. M. The influence of age of lambs on the ketogenicity of butyrate and tolerance to exogenous glucose in vivo	377
VAN DYNE, G. M. and Weir, W. C. Comparison of microdigestion techniques under range and drylot conditions	381
MACER, R. C. F. Resistance to eyespot disease (Cercosporella herpotrichoides Fron) determined by a seedling test in some forms of Triticum, Aegilops, Secale and Hordeum. (With Three Plates)	389
CASTLE, M. E. and DRYSDALE, A. D. Liquid manure as a grassland fertilizer. V. The response to mixtures of liquid manure (urine) and dung. (With Two Text-figures)	397
RUSSELL, G. E. Observations on the settling behaviour of aphids on sugar-beet plants in the	405

ANIMAL PRODUCTION

JOURNAL OF THE BRITISH SOCIETY OF ANIMAL PRODUCTION

Contents of Volume 9, Part 1, February 1967 include

LEVI, SOLLER and SHILO. Dressing percentage and fat content in bulls.

BROADBENT and WATSON. Sire and progeny performance.

VANSCHOUBROEK, DE WILDE and LAMPO. Feed restriction in fattening pigs.

STOBO, ROY and GASTON. Protein requirement of ruminant calf.

TAYLOR and CRAIG. Growth of twin cattle.

OWEN and RIDGMAN. Dietary energy and voluntary intake.

OAKES. The assessment of a variety of chicken.

DALTON, PEARSON and SHEARD. Behaviour of dairy bulls.

PURSER and KARAM. Lamb performance and birthcoat type.

ROLLINS and CASADY. Pre-weaning deaths in rabbits.

Broadbent, Dodsworth, Ball and Sampford. Semi-intensively reared Charolais crosses.

RUSSEL. Goitre in lambs grazing rape.

SMITH. Selecting on components of a trait.

The Journal is published quarterly in February, May, August and November.

The annual subscription rate is 90s. (U.S.A. \$14.00) single copy 25s. (U.S.A. \$4.00). Orders and subscriptions may be sent to any Bookseller or direct to:

OLIVER & BOYD LTD.

Tweeddale Court, 14 High Street, Edinburgh, 1

CONTENTS

Vol. 67 Part 3 December 1966

	PAGE
EDEY, T. N. Nutritional stress and pre-implantation embryonic mortality in Merino sheep. (With Two Text-figures)	287
L'ESTRANGE, J. L. and AXFORD, R. F. E. Mineral balance studies on lactating ewes with particular reference to the metabolism of magnesium. (With Two Text-figures)	295
Coop, I. E. Effect of flushing on reproductive performance of ewes. (With Six Text-figures) .	305
BOND, D. A. Yield and components of yield in diallel crosses between inbred lines of winter beans (Vicia faba). (With Eight Text-figures)	325
DRYSDALE, A. D. and STRACHAN, N. H. Liquid manure as a grassland fertilizer. IV. The effect of liquid manure on the mineral content of grass and clover. (With Two Text-figures)	337
HAYMAN, R. H., BEESTON, J. W. U., ALLEN, T. E. and NAY, T. Skin thickness in Sahiwal and Jersey cattle and its measurements. (With One Text-figure)	345
YEATES, N. T. M. and MURRAY, D. M. Walking trials with cattle. I. A breed comparison in moderate heat. (With One Plate and Four Text-figures)	353
FOLMAN, Y., VOLCANI, R. and EYAL, E. Mother-offspring relationships in Awassi sheep. I. The effect of different suckling regimes and time of weaning on the lactation curve and milk yield in dairy flocks. (With Four Text-figures)	359
FOLMAN, Y., EYAL, E. and VOLCANI, R. Mother-offspring relationships in Awassi sheep. II. Milk yields and weight gains of lambs in a mutton flock	369
FOLMAN, Y., EYAL, E. and VOLCANI, R. Mother-offspring relationships in Awassi sheep. III. The effect of different suckling regimes and weaning age on weight gains of lambs in dairy flocks	371
Manns, J. G. and Boda, J. M. The influence of age of lambs on the ketogenicity of butyrate and tolerance to exogenous glucose <i>in vivo</i>	377
VAN DYNE, G. M. and WEIR, W. C. Comparison of microdigestion techniques under range and drylot conditions	381
MACER, R. C. F. Resistance to eyespot disease (<i>Cercosporella herpotrichoides</i> Fron) determined by a seedling test in some forms of <i>Triticum</i> , <i>Aegilops</i> , <i>Secale</i> and <i>Hordeum</i> . (With Three Plates)	389
CASTLE, M. E. and DRYSDALE, A. D. Liquid manure as a grassland fertilizer. V. The response to mixtures of liquid manure (urine) and dung. (With Two Text-figures)	397
Russell, G. E. Observations on the settling behaviour of aphids on sugar-beet plants in the glasshouse	405

SUBSCRIPTIONS. Two volumes of three parts (each about 150 pages long) are published annually. The subscription price is 75s. net (U.S.A. \$13.50) per volume (post free); single parts are available at 32s. 6d. net (U.S.A. \$5.50) plus postage. Orders or enquiries may be sent to any bookseller or subscription agent, or to Cambridge University Press, Bentley House, 200 Euston Road, London, N.W. 1. (U.S.A. and Canada, Cambridge University Press American Branch, 32 East 57th Street, New York, N.Y. 10022, U.S.A.)