# THE JOURNAL OF AGRICULTURAL SCIENCE

EDITED FOR THE PLANT BREEDING AND ANIMAL NUTRITION RESEARCH INSTITUTES AT CAMBRIDGE, AND THE ROTHAMSTED RESEARCH INSTITUTES BY

PROFESSOR SIR R. H. BIFFEN, M.A., F.R.S., School of Agriculture, Cambridge SIR A. D. HALL, K.C.B., M.A., LL.D., F.R.S., John Innes Horticultural Institution, Merton Park, Surrey

B. A. KEEN, D.Sc., F.INST.P., Rothamsted Experimental Station, Harpenden F. H. A. MARSHALL, Sc.D., F.R.S., School of Agriculture, Cambridge SIR E. J. RUSSELL, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden

#### IN CONSULTATION WITH

B. C. ASTON, Department of Agriculture, Wellington, New Zealand

DR C. A. BARBER, C.I.E., Cambridge

PROFESSOR B. T. P. BARKER, M.A., Agricultural and Horticultural Research Station, Long Ashton, Bristol

I. B. POLE EVANS, Department of Agriculture, Pretoria, South Africa

PROFESSOR J. HENDRICK, B.Sc., Marischal College, Aberdeen

SIR T. H. MIDDLETON, K.C.I.E., K.B.E., C.B., M.A., The Development Commission, London

DR A. E. V. RICHARDSON, Waite Agricultural Research Institute, Glen Osmond, South Australia

DR FRANK T. SHUTT, F.I.C., Experimental Farms, Ottawa, Canada

DR H. J. WHEELER, American Agricultural Chemical Co., Agricultural Service Bureau, 419 Fourth Avenue, New York, U.S.A.

#### VOLUME XXII 1932

## CAMBRIDGE AT THE UNIVERSITY PRESS 1932

#### PRINTED IN GREAT BRITAIN

	PAGE
DEIGHTON, THOMAS. The determination of the surface area of	
swine and other animals. (With Plates I and II and three	
text-figures)	418

## PART 3 (JULY 1932)

CHIPPINDALE, H. G. and MILTON, W. E. J. Note on the occur- rence of buried seeds in the soil	451
WILSON, W. KING and MORRIS, S. Studies in the composition of rabbit carcasses	453
ISAACHSEN, HAAKON. Accessory food factors. The fat-soluble vitamin requirements of cattle and pigs during growth, with remarks on some other questions as to the vitamin problem in cattle and pig feeding. (With three text- figures)	460
MALHOTRA, R. C. The distribution of some reserve substances in hard winter wheat plant at successive growth stages and their possible utilisation. (With five text-figures)	485
HOBSON, R. P. and PAGE, H. J. Studies on the carbon and nitrogen cycles in the soil. VII. The nature of the organic nitrogen compounds of the soil: "humic" nitrogen. (With one text-figure)	497
HOBSON, R. P. and PAGE, H. J. Studies on the carbon and nitrogen cycles in the soil. VIII. The nature of the organic nitrogen compounds of the soil: "non-humic" nitrogen. (With one text-figure)	516
WOODMAN, H. E. and STEWART, J. The mechanism of cellulose digestion in the ruminant organism. III. The action of cellulose-splitting bacteria on the fibre of certain typical feeding stuffs	527
GREEN, W. HEBER. The representation of soil analyses by the device of double plotting. (With one text-figure)	548
GARNER, F. H. and SANDERS, H. G. Investigations in crop husbandry. I. The effects of seed treatments on the ger- mination and yield of sugar boot	551
AUCHINACHIE, D. W. and FRASER, A. H. H. The effect of lime and cod-liver oil on sheep fed on a calcium deficient ration.	551
(With two charts)	560
COMMON, R. H. Mineral balance studies on poultry	576
MARTIN, H. and SALMON, E. S. The fungicidal properties of certain spray-fluids, IX. The fungicidal properties of the	
products of hydrolysis of sulphur	595
GREGORY, F. G., CROWTHER, F. and LAMBERT, A. R. The inter- relation of factors controlling the production of cotton under irrigation in the Sudan. (With Plate III and five	
text-figures)	617

	PAGE
SCOTT BLAIR, G. W. and YATES, F. The effect of climatic varia-	
tions on the plasticity of soil	639
SHUTT, FRANK T., HAMILTON, S. N. and SELWYN, H. H. High-	
protein pasture. The rotational or close-grazing system of	
pasture management	647
WOODMAN, H. E., EVANS, R. E. and MENZIES KITCHIN, A. W.	
The value of oats in the nutrition of swine	657
WOODMAN, H. E. and EVANS, R. E. The value of degermed	
maize meal (cooked) in the nutrition of swine	670
PIPER, C. S. The determination of sodium by precipitation as	
the triple salt sodium-uranyl-magnesium acetate	676

### PART 4 (OCTOBER 1932)

689
704
736
755
767
783
797
811
838
845
852
874