

# 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., Cambridge  
SIR A. D. HALL, K.C.B., M.A., LL.D., F.R.S., Ministry of Agriculture, London  
B. A. KEEN, D.Sc., F.INST.P., Rothamsted Experimental Station, Harpenden  
F. H. A. MARSHALL, Sc.D., F.R.S., Cambridge  
SIR E. J. RUSSELL, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden  
PROFESSOR T. B. WOOD, C.B.E., M.A., F.I.C., F.R.S., Cambridge

## IN CONSULTATION WITH

B. C. ASTON, Department of Agriculture, Wellington, New Zealand  
DR C. A. BARBER, C.I.E., School of Agriculture, Cambridge  
PROFESSOR B. T. P. BARKER, M.A., Agricultural and Horticultural Research Station, Long Ashton, Bristol  
W. BATESON, M.A., F.R.S., John Innes Horticultural Institute, Merton, Surrey  
J. R. CAMPBELL, B.Sc., Department of Agriculture, Dublin  
I. B. POLE EVANS, Department of Agriculture, Pretoria, South Africa  
F. B. GUTHRIE, Department of Agriculture, Sydney, N.S.W.  
PROFESSOR J. HENDRICK, B.Sc., Marischal College, Aberdeen  
SIR T. H. MIDDLETON, K.B.E., C.B., M.A., The Development Commission, London  
DR FRANK T. SHUTT, F.I.C., Experimental Farms, Ottawa, Canada  
PROFESSOR W. SOMERVILLE, M.A., D.Sc., School of Rural Economy, Oxford  
DR A. C. TRUE, Department of Agriculture, Washington, D.C., U.S.A.  
SIR FRANCIS WATTS, K.C.M.G., Barbados  
DR H. J. WHEELER, American Agricultural Chemical Co., Boston, Mass., U.S.A.

VOLUME XV 1925

CAMBRIDGE  
AT THE UNIVERSITY PRESS

1925

**PRINTED IN GREAT BRITAIN**

	PAGE
KEEN, BERNARD A. and HAINES, WILLIAM B. Studies in soil cultivation. I. The evolution of a reliable dynamometer technique for use in soil cultivation experiments. (With Plate I and three text-figures)	375
HAINES, WILLIAM B. and KEEN, BERNARD A. Studies in soil cultivation. II. A test of soil uniformity by means of dynamometer and plough. (With one text-figure)	387
HAINES, WILLIAM B. and KEEN, BERNARD A. Studies in soil cultivation. III. Measurements on the Rothamsted classical plots by means of dynamometer and plough. (With Plate II and six text-figures)	395
PART 4 (OCTOBER 1925)	
JOSEPH, A. F. Alkali investigations in the Sudan. (With one text-figure)	407
HARDY, F. Cohesion in colloidal soils	420
HARDY, F. Percolation in colloidal soils, considered in relation to swelling and cohesiveness	434
AMOS, ARTHUR and WOODMAN, HERBERT ERNEST. A study of the process of making clamp silage	444
BAL, D. V. The determination of nitrogen in heavy clay soils. (With one text-figure)	454
VANSTONE, ERNEST. The available phosphate in soils. (With two text-figures)	460
SMITH, A. M. The exchangeable bases in some Scottish soils. (With one text-figure)	466
GOODWIN, W. and MARTIN, H. The chemical effect of the addition of a "spreader" to the mixed lime sulphur-lead arsenate spray	476
VANSTONE, ERNEST. A new method of evaluating basic slags and mineral phosphates. (With two text-figures)	491
SEN-GUPTA, NAGENDRA NATH. Dephenolisation in soil. II. (With one text-figure)	497
WARREN, R. G., GIMINGHAM, C. T. and PAGE, H. J. The chemistry of basic slag. I. The determination of fluorine in basic slag. (With one text-figure)	516
HAINES, WILLIAM B. Studies in the physical properties of soils. II. A note on the cohesion developed by capillary forces in an ideal soil. (With two text-figures)	529
HAINES, WILLIAM B. Studies in the physical properties of soils. III. Observations on the electrical conductivity of soils. (With four text-figures)	536