

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
E. M. CROWTHER, D.Sc., F.I.C., Rothamsted Experimental Station, Harpenden
SIR A. D. HALL, K.C.B., M.A., LL.D., F.R.S., John Innes Horticultural Institution,
Merton Park, London, S.W. 19
B. A. KEEN, D.Sc., F.R.S., Rothamsted Experimental Station, Harpenden
F. H. A. MARSHALL, C.B.E., Sc.D., M.A., 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, F.I.C., Department of Agriculture, Wellington, New Zealand
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
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.



LONDON

Cambridge University Press
Fetter Lane, E.C. 4

CHICAGO: The University of Chicago Press
(Agents for the United States)

BOMBAY, CALCUTTA, MADRAS: Macmillan

TOKYO: Maruzen Company, Ltd.

All rights reserved

Price Ten Shillings net

Imperial College of Science and Technology

COURSES IN AGRICULTURAL CHEMISTRY and Allied Subjects

Fee £22. 10s. 0d. per annum

Students are prepared for the *Higher Degrees of the University of London* (by Research or Dissertation) and for the *Fellowship of the Institute of Chemistry* (Branch F.—Agricultural Chemistry).

Arrangements are made for the study of the Chemistry of Soils, Fertilizers, Feeding Stuffs, and Farm Products; Plant and Animal Nutrition, Insecticides, Fungicides, etc., and will include courses of lectures, laboratory instruction, together with demonstrations and practical work at the College Biological Field Station at Slough.

*Intending students should apply
to the Registrar*

IMPERIAL COLLEGE OF SCIENCE
AND TECHNOLOGY
PRINCE CONSORT ROAD
SOUTH KENSINGTON, S.W. 7

THE JOURNAL OF AGRICULTURAL SCIENCE

AN INDEX TO VOLUMES I-XX

(1905-1930)

has been prepared, and
may be obtained from any
bookseller or from The
Cambridge University Press
Fetter Lane, London, E.C. 4

The price is 3s. 6d. net
in paper covers and
9s. net bound in
buckram

THE ROTHAMSTED MONOGRAPHS on AGRICULTURAL SCIENCE

Edited by Sir E. John Russell, D.Sc., F.R.S.

NEW VOLUME

PROBLEMS IN SOIL MICROBIOLOGY

By

D. Ward Cutler, M.A., & Lettice M. Crump, M.Sc.

The contents are largely the result of work carried out in the General Microbiology Department of the Rothamsted Experimental Station by the authors and their colleagues, and is in no sense a textbook of soil microbiology.

The theme throughout is to show that from the biologist's viewpoint the soil is an eminently suitable home for living organisms and that, through the long ages of evolution, a population has been selected which is, on the whole, so unspecialised that almost any substance which finds its way into the soil, either naturally or in the course of modern agricultural practice, will eventually become incorporated into the general soil economy.

With Diagrams and Folding Map.

9s. net

LONGMANS, GREEN & CO., LTD., 39 Paternoster Row, London, E.C. 4

THE JOURNAL OF THE American Society of Agronomy

ISSUED ON THE 15th OF EACH MONTH AT GENEVA, N.Y., U.S.A.

Vol. 27. No. 6

CONTENTS

JUNE, 1935

The Interdependence of Agronomic Research and Resident and Extension Teaching. J. S. OWENS.

Helps to Extension Workers in Determining the Needs of Soils and Crops. ERNEST VAN ALSTINE.

A Coordinated Program for Research and Extension. C. H. MYERS.

A Comparison of Glass and Quinhydrone Electrodes for Determining the pH of Some Iowa Soils: I. A Comparison of Different Types of Glass Electrodes. HAROLD L. DEAN and R. H. WALKER.

Conversion of Soil Potash from the Non-replaceable to the Replaceable Form. F. A. E. ABEL and O. C. MAGISTAD.

Decomposition of the Base-exchange Compounds of Soils by Acids and its Relation to the Quantity of Alumina and Silica Dissolved. G. S. FRAPS and J. F. FUDGE.

Studies of the Inheritance of and the Relationships between Kernel Texture, Grain Yield, and Tiller-survival in Crosses between Reward and Milturum Spring Wheats. O. S. AAMODT, J. H. TORRIE, and A. WILSON.

The Influence of Low Temperature on Seedling Development in Two Inbred Lines of Corn. OLIVER F. SMITH.

Analysis of Variance of Corn Yields Obtained in Crop Rotation Experiments. R. J. GARBER and T. C. McILVAINE.

Defoliation Experiments with Kaoliang (*Andropogon sorghum*). H. W. LI and T. N. LIU.

Inheritance of Annual Habit and Mode of Pollination in an Annual White Sweet Clover. ALFRED E. CLARKE.

Notes: An Inexpensive Type of Construction for Concrete Tanks for Soil Investigations.—A Simple Method of Threshing Single Oat Panicles.—The Toxicity of *Crotalaria spectabilis* Roth to Livestock and Poultry.—Comments on the Whole Wheat Meal Fermentation Time Test.—Further Comments on the Whole Wheat Meal Fermentation Time Test.

SUBSCRIPTION

Price \$5.00 per volume (12 numbers) in United States
and Canada, \$5.50 elsewhere.

ADDRESS ALL COMMUNICATIONS TO

J. D. LUCKETT, Editor

Journal of the American Society of Agronomy

GENEVA, N.Y., U.S.A.

THE EMPIRE JOURNAL OF EXPERIMENTAL AGRICULTURE

THIS JOURNAL offers agricultural research workers a medium for disseminating the records and results of their investigations on the feeding and management of live stock, cultivation and manuring of crops, trial of farm machinery, agricultural economics, and experimental technique.

Vol. III. No. 11

CONTENTS

July 1935

- W. E. J. MILTON: The Dry-Matter Content of Certain Grass and Clover Species.
Observations on Coffee in Kenya: Introductory by A. D. TRENCH and V. A. BECKLEY.
I. V. A. BECKLEY: Chlorosis and Die-Back in Coffee. With Plates 13, 14.
II. S. GILLETT: Vegetative Propagation of Coffee. With Plates 15, 16.
C. C. RHODES, L. H. BARTEL, and P. E. F. JOOSTE: The Effects of Varying Amounts of Animal Protein fed to White Leghorn Pullets. Pt. I. The Influence of Low-, Medium-, and High-Protein Diets on the Weight and Number of Eggs.
E. S. WEST: Rice-Growing in Australia.
J. SYDNEY DASH: The Rice Industry of British Guiana. With Plate 17.
W. G. OGG: The Soils of Scotland. Pt. II. The North-Eastern Region.
D. V. BAL: Some Aspects of the Black Cotton Soils of Central Provinces, India. With Plate 18.
H. TREFOR JONES: Soils of Yorkshire.
A. R. LAMBERT and F. CROWTHER: Further Experiments on the Interrelation of Factors controlling the Production of Cotton under Irrigation in the Sudan. Pt. I. Experimental.

Royal 8vo. 7s. 6d. net. Annual subscription (four numbers) 20s. post free

OXFORD UNIVERSITY PRESS, Amen House, LONDON, E.C. 4



THERE are nearly 4000 Institutions of pure and applied botany. There are between 60,000 and 70,000 botanists. There are about 1000 periodicals concerned with botany! How can you keep in touch with all this activity? How can you find out what other botanists are doing and what new work they are planning? **CHRONICA BOTANICA** will help you. Subscribe to it and help with the compilation of the next volume.

All directors of institutions and secretaries of societies will receive a copy of our questionnaire at the beginning of December of each year. Replies should reach the Editor-in-Chief, Dr F. Verdoorn, Leiden, Holland, not later than January 30th, as it will generally be impossible to make use of information received after that date. Directors or Secretaries,

who do not receive our Autumn Bulletin, which should reach them annually before Oct. 15th, are kindly requested to acquaint us of the fact at their earliest convenience, which will enable us to include them in our mailing list, and will ensure their receiving a copy of the questionnaire in December.

Prospectus, sample pages and further information may be had from the

EDITORIAL AND PUBLISHING OFFICE, P.O. BOX 8, LEIDEN, HOLLAND