

The Journal of the Faculty of Agriculture (Imperial College of Tropical Agriculture) University of the West Indies

Editor-in-Chief: Professor F. W. Cope

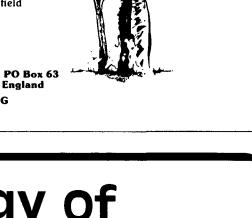
Published quarterly, TROPICAL AGRICULTURE with its broad and authoritative coverage and international contributors, is the world's leading journal in this field and is therefore ESSENTIAL READING

for further information or sample copy, contact

Sheila Smith

Butterworth Scientific Ltd — Journals Division PO Box 63
Westbury House Guildford Surrey GU2 5BH England

Telephone: 0483 31261 Telex: 859556 Scitec G



The Ecology of Tropical Food Crops

M.J.T. NORMAN, C.J. PEARSON and P.G.E. SEARLE

The ecology and environmental requirements of the major tropical food crops, their individual responses to variations in climate and soil, and their place in cropping systems are comprehensively discussed in this advanced textbook, which will prove a must for those concerned with research and teaching in relation to the agriculture of developing countries. Species discussed include rice, maize, groundnut, cassava and banana.

Hard covers £32.50 net Paperback £12.95 net

CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England

THE ZIMBABWE JOURNAL OF AGRICULTURAL RESEARCH

Vol. 21, No. 2

CONTENTS

1983

Animal Production

The influence of diet on water balance of the East African goat by L. Reynolds

Coffe

The growth and development of lateral branches in the top, middle and bottom of pruned coffee trees in a hedgerow, by M. St. J. Clowes and J. C. S. Allison

Cowpea

Effect of Alectra vogelii Benth. on cowpea (Vigna unguiculata (L.) Walp.), by Ntombi R. Mugabe. 1. Some aspects of reproduction of cowpea

Tohacco

Comparing the efficiencies of very-low-volume and low-volume sprays of contact fungicides in tobacco, by M. W. Deall and J. S. Cole

Insecticide Toxicity

Toxicity of endosulfan to some aquatic organisms of southern Africa, by C. H. D. Magadza

Research Notes

Gene complementation in seed coloration of maize (Zea mays L.) hybrids of inbreds extracted from Zimbabwean and exotic open-pollinated varieties, by S. C. Muchena, M. A. Schweppenhauser and K. Mashingaidze

Effect of day-length on the development of a low and a high latitude wheat cultivar, by P. Tongoona and J. Mottley

The control of bacterial barn rot of tobacco leaves with streptomycin sulphate, by M. W. Deall Identification of black leg and charcoal rot diseases of tobacco in Zimbabwe, by Z. Hussain

A method of recording the growth of coffee trees in Zimbabwe, by M. St. J. Clowes and J. C. S. Allison

Book Reviews

The Locust and Grasshopper Agricultural Manual

Improvement of Oil-seed and Industrial Crops by Induced Mutations

Pesticides, Theory and Application, by George W. Ware

Author Index to Vols, 20 and 21

The Journal is published twice yearly. The annual subscription is Z.\$10 (single copies Z.\$5,00) in Zimbabwe and adjoining countries and U.S.\$16,00 (single copies U.S.\$8,00) for subscribers elsewhere. These rates include all charges.

Reproduction of author's summaries in abstracting and other reputable journals and publications is authorized.

Published by R. & S. S. Information Services, Department of Research and Specialist Services, Ministry of Agriculture P.O. Box 8108, Causeway, Zimbabwe

EXPERIMENTAL AGRICULTURE

VOLUME 20 1984

Editor

DR F. G. H. LUPTON

Editorial Assistant

MRS SUSAN CARR

Book Review Editor

PROFESSOR N. W. SIMMONDS

Editorial Board

PROFESSOR E. W. RUSSELL (Chairman)

K. R. M. ANTHONY

DR M. H. ARNOLD

PROFESSOR A. H. BUNTING

DR M. K. V. CARR

DR I. D. CARRUTHERS

DR R. K. CUNNINGHAM

PROFESSOR J. P. HUDSON

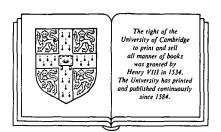
DR N. W. HUSSEY

PROFESSOR J. L. MONTEITH

DR R. D. STERN

DR R. J. SUMMERFIELD

DR C. C. WEBSTER



CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE
LONDON NEW YORK NEW ROCHELLE
MELBOURNE SYDNEY

PUBLISHED BY

THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE

The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, N.Y. 10022, USA 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1984

Printed in Great Britain by Adlard & Son Ltd, Bartholomew Press, Dorking

CONTENTS

Part 1 (January 1984)

R. J. Summerfield, F. J. Muehlbauer and E. H. Roberts: Controlled Environments as an Adjunct to Field Research on Lentils (<i>Lens culinaris</i>) III. Photoperiodic Lighting and Consequences for Flowering (Methodology of Experimental Agriculture - Number 34)	1
Janet Riley: A General Form of the 'Land Equivalent Ratio' (Methodology of Experimental Agriculture - Number 35)	19
C. K. Ramanatha Chetty and M. Narayana Reddy: Analysis of Intercrop Experiments in Dryland Agriculture	31
A. Hadjichristodoulou: Performance of Triticale in Comparison with Barley and Wheat in a Semi-arid Mediterranean Region	41
G. O. Kayode: Effects of Sett Size and Spacing on Tuber Yield of White Guinea Yam (<i>Dioscorea rotundata</i>) in the Rainforest and Savanna Zones of Nigeria	53
S. Sarig, Y. Kapulnik, I. Nur and Y. Okon: Response of Non-irrigated Sorghum bicolor to Azospirillum Inoculation	59
Mabrouk A. El-Sharkawy, James H. Cock and Giovanna de Cadena: Stomatal Characteristics among Cassava Cultivars and their Relation to Gas Exchange	67
R. J. Summerfield, P. Hadley, E. H. Roberts, F. R. Minchin and S. Rawsthorne: Sensitivity of Chickpeas (<i>Cicer arietinum</i>) to Hot Temperatures during the Reproductive Period	77
Book Reviews	95
Part 2 (April 1984)	
J. L. Monteith: Consistency and Convenience in the Choice of Units for Agricultural Science (Methodology of Experimental Agriculture - Number 36)	105
S. Rawsthorne and R. J. Summerfield: An Assessment of Different Techniques for Inoculating <i>Phaseolus vulgaris</i> with <i>Rhizobium</i> (Methodology of Experimental Agriculture - Number 37)	119
S. N. Saha and S. C. Bhargava: An Evaluation of the Oil Concentration in Sesame Seeds in Relation to Developmental Stage, Node Position and Capsule Age	129

G. R. Squire, P. J. Gregory, J. L. Monteith, M. B. Russell and Piara Singh: Control of Water Use by Pearl Millet (Pennisetum typhoides)	135
D. Boobathi Babu and S. P. Singh: Studies on Transpiration Suppressants on Spring Sorghum in North-Western India in Relation to Soil Moisture Regimes. I. Effect on Yield and Water Use Efficiency	151
D. Boobathi Babu and S. P. Singh: Studies on Transpiration Suppressants on Spring Sorghum in North-Western India in Relation to Soil Moisture Regimes. II. Effect on Growth and Nutrient Uptake	161
M. Narayana Reddy and C. K. Ramanatha Chetty: Staple Land Equivalent Ratio for Assessing Yield Advantage from Intercropping	171
Book Reviews	179
Part 3 (July 1984)	
R. Mead: Confounded Experiments are Simple, Efficient and Misunderstood (Methodology of Experimental Agriculture - Number 38)	185
S. N. Azam-Ali, P. J. Gregory and J. L. Monteith: Effects of Planting Density on Water Use and Productivity of Pearl Millet (<i>Pennisetum typhoides</i>) Grown on Stored Water. I. Growth of Roots and Shoots	203
S. N. Azam-Ali, P. J. Gregory and J. L. Monteith: Effects of Planting Density on Water Use and Productivity of Pearl Millet (<i>Pennisetum typhoides</i>) Grown on Stored Water. II. Water Use, Light Interception and Dry Matter Production	215
A. M. Alghali and E. O. Osisanya: Effect of Damage by Stalk-eyed Fly (Diopsis thoracica) on Yield Components of Rice	225
E. Haller: Effect of the Germinating Seed Environment on Crop Yields. II. Effect of the Water and Air Regime during Germination on Cereal Yields	235
Apurba Sarkar, Gitasree Sarkar and Anupam Sarkar: Coated and Uncoated Urea in Ramie Leaf Production	245
A. B. Waghmare and S. P. Singh: Sorghum-Legume Intercropping and the Effects of Nitrogen Fertilization. I. Yield and Nitrogen Uptake by Crops	251
A. B. Waghmare and S. P. Singh: Sorghum-Legume Intercropping and the Effects of Nitrogen Fertilization. II. Residual Effect on Wheat	261
Book Reviews	267
Part 4 (October 1984)	
	975
J. Smartt: Evolution of Grain Legumes. I. Mediterranean Pulses	275
Anjana Banerjee, D. K. Bagchi and L. K. Si: Studies on the Potential of Winged Bean as a Multipurpose Legume Cover Crop in Tropical Regions	297

V. Arunachalam, G. D. Pungle, M. Dutta, P. T. C. Nambiar and P. J. Dart: Efficiency of Nitrogenase Activity and Nodule Mass in Predicting the Relative Performance of Genotypes Assessed by a Number of Characters in Groundnut (Arachis hypogaea)	303
A. M. A. Ismail: The Movement of ¹⁴ C-Labelled Products from Source Leaves During the Growth and Development of Broad Bean	311
D. K. Muldoon: Self-Regenerating Annual Forage Legumes for Double ping with Irrigated Wheat or Sorghum	319
P. Soman, J. M. Peacock and F. R. Bidinger: A Field Technique to Screen Seedling Emergence of Pearl Millet and Sorghum through Soil Crusts	327
G. O. Kayode: Effect of Iron on Maize Yields in Forest and Savanna Zones of Nigeria	335
H. E. Nyirenda and V. E. T. Ridpath: Criteria for Clonal Selection in Tea (Camellia sinensis). I. The Relation Between Mother Bushes and their	
Clonal Derivatives for Bush Area, Shoot Number and Yield	339
Book Reviews	345
Erratum (J. L. Monteith, volume 20, 105-117)	347



Volume 20, Number 4 October 1984

CONTENTS

J. Smartt: Evolution of Grain Legumes. I. Mediterranean Pulses	275
Anjana Banerjee, D. K. Bagchi and L. K. Si: Studies on the	
Potential of Winged Bean as a Multipurpose Legume Cover Crop	
in Tropical Regions	297
V. Arunachalam, G. D. Pungle, M. Dutta, P. T. C. Nambiar	
and P. J. Dart: Efficiency of Nitrogenase Activity and Nodule	
Mass in Predicting the Relative Performance of Genotypes Asses-	
sed by a Number of Characters in Groundnut (Arachis hypogaea)	303
A. M. A. Ismail: The Movement of 14C-Labelled Products from	
Source Leaves During the Growth and Development of Broad	
Bean	311
D. K. Muldoon: Self-Regenerating Annual Forage Legumes for	
Double Cropping with Irrigated Wheat or Sorghum	319
P. Soman, J. M. Peacock and F. R. Bidinger: A Field Technique to Screen Seedling Emergence of Pearl Millet and Sorghum	
through Soil Crusts	327
G. O. Kayode: Effect of Iron on Maize Yields in Forest and	
Savanna Zones of Nigeria	335
H. E. Nyirenda and V. E. T. Ridpath: Criteria for Clonal	
Selection in Tea (Camellia sinensis). I. The Relation Between	
Mother Bushes and their Clonal Derivatives for Bush Area, Shoot	
Number and Yield	339
Book Reviews	345
Erratum (J. L. Monteith, volume 20, 105-117)	347
Notes for Contributors	349

CAMBRIDGE UNIVERSITY PRESS

The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, N.Y. 10022, U.S.A. 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

Printed in Great Britain by Adlard & Son Ltd, Bartholomew Press, Dorking