ERRATUM

The detection and measurement of mite infestation in animal feed using near infra-red reflectance

By D. R. WILKIN, I. A. COWE, B. B. THIND, J. W. MCNICOL AND D. C. CUTHBERTSON

J. agric. Sci., Camb. (1986), 107, 439-448

The publisher apologizes for the omission of the following copyright line: © Crown copyright 1986.



FAO Food and Agriculture Organization

FOR THE BEST IN AGRICULTURAL Research and Reference

SESAME AND SAFFLOWER Status and Potentials

Edited by A. Ashri Based on a recent FAO Expert Consultation, this volume examines the major characteristics and problems of sesame and safflower growing in different regions and countries. This document identifies ways to improve productivity, increase yields, reduce losses, and enhance yield stability. (FAO Plant Production and Protection Paper No. 66) FAO. 1986. 221pp. ISBN 92-5-102306-9 ORDER #6071-F2875 Paper: \$16.95

CONSTRUCTION OF CRIBS FOR DRYING AND STORAGE OF MAIZE

By: Ole Bodholt

Based on experiments carried out in the humid and semi-humid tropics worldwide—as well as full-scale trials conducted by the FAO—this bulletin provides extension workers with a better understanding of drying and storing maize in cribs and facilitates the selection and implementation of new or improved conservation techniques.

(FAO Agricultural Services Bulletin No. 66) FAO. 1986. 73pp. ISBN 92-5-102325-5 ORDER #6071-F2873 Paper: \$7.50

A GUIDE TO FOREST SEED HANDLING

By: R. L. Willan

This illustrated guide to forest seed handling focuses on seed quality, i.e., the physiological viability and vigor of seeds. Seed development is covered in detail, from germination through collection methods, to all the stages of seed processing, including seed pretreatment and testing methods. (FAO Forestry Paper No. 20/2.) FAO. 1986. 379pp. ISBN 92-5-102291-7 ORDER #6071-F2883 Paper: \$28.00

INTENSIFIED PLANT BREEDING AND SEED PRODUCTION IN POLAND

This volume presents, in the form of short monographic papers, important achievements of the FAO/UNDP project on the intensification of plant breeding and seed production in Poland. It highlights the practical results achieved in several of Poland's most important crops, including barley, maize, peas, rye, soybean, triticale, and winter rape. FAO. 1986. 343pp. ISBN 92-5-102335-2. ORDER #6071-F2879 Paper: \$25.00

UNIPUB

a division of Bernan Associates

10033-F M.L. King Highway, Lanham, MD 20706-4391. Or call toll-free 800-233-0506 (in Canada, 800-233-0504; in MD, AK, HI, 301-459-7666).

Jnl. of Agricultural Science, 107, 3

THE JOURNAL OF AGRICULTURAL SCIENCE

EDITED BY

R. B. AUSTIN, D.SC., Plant Breeding Institute, Cambridge

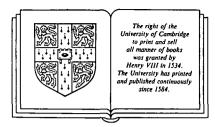
- B. W. BACHE, M.A., PH.D., C.CHEM., F.R.S.C., Department of Applied Biology, Cambridge
- PROF. SIR J. W. L. BEAMENT, sc.D., F.R.S., Department of Applied Biology, Cambridge
- G. D. H. BELL, C.B.E., PH.D., SC.D.(h.c.), D.SC.(h.c.), F.R.S., 6 Worts Causeway, Cambridge
- SIR K. L. BLAXTER, PH.D., N.D.A. (HONS.), D.SC., F.R.S.E., F.R.S., Stradbroke Hall, Stradbroke, Suffolk
- PROF. A. D. CARE, D.SC., M.R.C.V.S., Department of Animal Physiology and Nutrition, Leeds
- J. A. CURRIE, PH.D., 6 Falconers Field, Harpenden
- S. K. ELTRINGHAM, PH.D., Department of Applied Biology, Cambridge
- PROF. J. L. JINKS, C.B.E., D.SC., F.I.BIOL., F.R.S., Agricultural and Food Research Council, 160 Great Portland Street, London W1N 6DT
- D. B. LINDSAY, B.SC., M.A., D. PHIL., CSIRO Division of Tropical Animal Science, Tropical Cattle Research Centre, Rockhampton, Queensland, Australia
- PROF. J. B. OWEN, B.SC., PH.D., M.A., Department of Agriculture, Bangor
- W. J. RIDGMAN, M.A., Department of Applied Biology, Cambridge
- PROF. E. W. RUSSELL, C.M.G., D.SC., 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 107

CAMBRIDGE UNIVERSITY PRESS CAMBRIDGE

LONDON NEW YORK NEW ROCHELLE MELBOURNE SYDNEY

1986



PUBLISHED BY

THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE

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

© Cambridge University Press 1986

Printed in Great Britain by the University Press, Cambridge

PART 1 (AUGUST 1986)

	PAGE
COSTIGAN, P. A. The effects of soil type on the early growth of lettuce	1
WILMAN, D. and MZAMANE, NTHOANA. The effect of field drying on the concentrations of some major elements in herbage	9
SHARMA, R. C. Nitrogen management of potatoes in the presence of farmyard manure and PK fertilizer on acid hill soil of Shimla.	15
CHURCH, B. M. and SKINNER, R. J. The pH and nutrient status of agricultural soils in England and Wales 1969-83.	21
TAYO, T. O. Flower and pod production at various nodes of <i>Phaseolus vulgaris</i> L.	29
THOMAS, D. and DE ANDRADE, R. P. The evaluation under grazing of legumes associated with Andropogon gayanus in a tropical savannah environment on the central plateau of Brazil	37
CAIRD, LINDSAY and HOLMES, W. The prediction of voluntary intake of grazing dairy cows	43
TAPSELL, C. R. and THOMAS, W. T. B. Comparison of the predicted and observed potential of four spring barley crosses	55
REDDY, M. D., GHOSH, B. C. and PANDA, M. M. Effect of seed rate and application of N fertilizer on grain yield and N uptake of rice under intermediate deepwater conditions (15-50 cm)	61
JOHNSON, A. O. and ONI, O. O. Oestrous detection by mounts received in Friesian × Bunaji and Bunaji heifers	67
ROWLANDS, G. J., BUNCH, KATHRYN J., BROOKES, P. A. and MANSTON, R. Relationship between the blood composition of Friesian (Holstein) bulls and their improved con- temporary comparisons for production traits	71
RAI, R. and PRASAD, V. Chemotaxis of <i>Cicer Rhizobium</i> strains to root exudates of chick pea (<i>Cicer arielinum</i> L.) genotypes and their interaction response on nodulation, nodulins, leghaemoglobin and grain yield in calcareous soil	75
O'BRIEN, P. J. and ALLEN, E. J. Effects of site of seed production on seed yields and regrowth progeny tubers in potatoes	83
O'BRIEN, P. J. and ALLEN, E. J. Effects of nitrogen fertilizer applied to seed crops on seed yields and regrowth of progeny tubers in potatoes	103
SINGH, R. K., DE, R. and TURKHEDE, B. B. Effect of fertilizer placement and row arrange- ments on the yield of two varieties of wheat grown under dryland conditions	113
AL-NAKIB, F. M. S., FINDLAY, R. H. and SMITH, C. Performance of different Scottish Blackface stocks and their crosses	119
VERMA, R. S. and YADAV, R. L. Growth and yield of sugarcane and potato in companion cropping system	125
HALL, S. J. G. Genetic conservation of rare British sheep: the Portland, Manx Loghtan and Hebridean breeds .	133
ARMSTRONG, M. J., MILFORD, G. F. J., POCOCK, T. O., LAST, P. J. and DAY, W. The dynamics of nitrogen uptake and its remobilization during the growth of sugar beet	145
SAHOTA, T. S. and SHARMA, R. C. Comparative performance of Mussoorie rockphosphate, single super phosphate and their combinations in potato	155

Marrie D. W. LAND, C. S. and Cox grown Damperts M. The use of decod and herbagen alleges	PAGE
MAYES, R. W., LAMB, C. S. and COLGROVE, PATRICIA M. The use of dosed and herbage n-alkanes as markers for the determination of herbage intake	161
WATSON, CATHERINE J. Preferential uptake of ammonium nitrogen from soil by ryegrass under simulated spring conditions	171
ABD EL MONEIM, A. M. and COCKS, P. S. Adaptation of <i>Medicago rigidula</i> to a cereal-pasture rotation in north-west Syria	179
JONES, J. L. and Allen, E. J. Development in barley (Hordeum sativum)	187
SHORT NOTES	
PRASAD, S. S., SARKAR, A. K. and SINHA, N. P. Forms of nitrogen in waterlogged soils and their contribution to yield and nitrogen uptake by rice	215
WATSON, CATHERINE J. and ADAMS, S. N. Effect of simulated wet spring conditions on the relative efficiency of three forms of nitrogen fertilizer on grassland	219
SHARMA, K. N., SINGH, BIJAY and RANA, D. S. The use of soil solution K value for assessing the K status of soil during a rotation of crops	223
PART 2 (OCTOBER 1986)	
VAN EYS, J. E., MATHIUS, I. W., PONGSAPAN, P. and JOHNSON, W. L. Foliage of the tree	
legumes gliricidia, leucaena and sesbania as supplement to napier grass diets for growing goats	227
EDUVIE, L. O. and DAWUDA, P. M. Effect of suckling on reproductive activities of Bunaji cows during the postpartum period	235
GIBSON, J. P., WIENER, G. and FIELD, A. C. Concentrations of blood constituents from 12 to 72 weeks of age in genetically high and low milk production lines of Friesian and Jersey cattle	239
FINCH-SAVAGE, W. E. Effects of soil moisture and temperature on seedling emergence from natural and pre-germinated onion seeds	249
WHYTOCK, GILLIAN P. and POWELL, ALISON A. Assessments of visible mechanical damage to barley grain and its effect on seed germination and seedling vigour	257
ROOKE, J. A., ALVAREZ, P. and ARMSTRONG, D. G. The digestion by cattle of barley and silage diets containing increasing quantities of soya-bean meal	263
SINGH, A. L. and SINGH, P. K. Comparative studies on different methods of <i>Azolla</i> utilization in rice culture	273
ELLIS, S. A., CLEMENTS, R. O. and BALE, J. S. The interaction of seed rate and pesticide on the tiller density, herbage yield and frit fly population of newly sown grass	279
GREEN, C. F., VAIDYANATHAN, L. V. and IVINS, J. D. Growth of sugar-beet crops including the influence of synthetic plant growth regulators	285
MCCARTNEY, H. A., LACEY, M. E. and RAWLINSON, C. J. Dispersal of <i>Pyrenopeziza brassicae</i> spores from an oil-seed rape crop	299
O'BRIEN, P. J., JONES, J. L., ALLEN, E. J. and RAOUF, G. S. M. Effects of physiological age of seed tubers on seed yield and regrowth of progeny tubers in potatoes	307
LEIGH, R. A. and JOHNSTON, A. E. An investigation of the usefulness of phosphorus concen- trations in tissue water as indicators of the phosphorus status of field-grown spring barley	329
BAHL, G. S. and SINGH, N. T. Phosphorus diffusion in soils in relation to some edaphic factors and its influence on P uptake by maize and wheat	335

	PAGE
DHINGRA, K. K., DHILLON, M. S., GREWAL, D. S., and SHARMA, K. Effect of row orientation on growth, yield and yield attributes of wheat sown on three dates	343
STODDARD, F. L. Effects of irrigation, plant density and genotype on pollination, fertili- zation and seed development in spring field beans (<i>Vicia faba</i> L.)	347
COPPOCK, D. L., SWIFT, D. M., ELLIS, J. E. and GALVIN, K. Seasonal patterns of energy allocation to basal metabolism, activity and production for livestock in a nomadic pastoral ecosystem	357
WADDINGTON, S. R. and CARTWRIGHT, PHYLLIS. Modification of yield components and stem length in spring barley by the application of growth retardants prior to main shoot stem elongation	367
HADJIPANAYIOTOU, M. The effect of type of suckling on the pre- and post-weaning lactation performance of Damascus goats and the growth rate of the kids	377
WILLIAMSON, CYNTHIA J. and MACFARLANE SMITH, W. H. Fungicidal control of powdery mildew and its effect on yield, digestibility and chemical composition of eight forage rape cultivars	385
COLOMER-ROCHER, F., DUGANZICH, D. M. and BASS, J. J. Relationship between bone dimensions and conformation in beef carcasses	393
JENKINS, P. D. and LEITCH, M. H. Effects of sowing date on the growth and yield of winter oil-seed rape (<i>Brassica napus</i>)	405
MILLARD, P. and MARSHALL, B. Growth, nitrogen uptake and partitioning within the potato (Solanum tuberosum L.) crop, in relation to nitrogen application	421
KHAH, E. M., ELLIS, R. H. and ROBERTS, E. H. Effects of laboratory germination, soil temperature and moisture content on the emergence of spring wheat	431
WILKIN, D. R., COWE, I. A., THIND, B. B., MCNICOL, J. W. and CUTHBERTSON, D. C. The detection and measurement of mite infestation in animal feed using near infra-red reflectance	439
HARIKA, A. S., TOMER, P. S. and GANGULY, T. K. Effect of dose and time of atrazine application on weed infestation and yield of fodder sorghum	449
ARRIAGA-JORDAN, C. M. and HOLMES, W. The effect of concentrate supplementation on high- yielding dairy cows under two systems of grazing	453
SHORT NOTES	
KOTHARI, S. K. and SARAF, C. S. Response of green gram (Vigna radiata (L.), Wilczek) to bacterial seed inoculation and application of phosphorus fertilizer	463
OFUYA, T. I. Use of wood ash, dry chilli pepper fruits and onion scale leaves for reducing Callosobruchus maculatus (Fabricius) damage in cow-pea seeds during storage	467
CHAUHAN, Y. S. and BHARGAVA, S. C. Comparison of pods of the terminal raceme of rapeseed (Brassica campestris var. Yellow Sarson) and mustard (Brassica juncea) cultivars	469
GOODING, M. J., KETTLEWELL, P. S., DAVIES, W. P. and HOCKING, T. J. Effects of spring nitrogen fertilizer on the Hagberg falling number of grain from breadmaking varieties of winter wheat	475
SHARMA, R. C. and GREWAL, J. S. Further effects of manurial treatments on yield, com- position and nutrient uptake of potato tubers, and on soil properties (1976–9)	479

PART 3 (DECEMBER 1986)	PAGE
ROWAN, T. G. and LAWRENCE, T. L. J. Growth and metabolism studies in growing pigs given diets containing a low glucosinolate rapeseed meal	483
ROWAN, T. G. and LAWRENCE, T. L. J. Ileal apparent digestibilities of amino acids, growth and tissue deposition in growing pigs fed low glucosinolate rapeseed meals	493
ROWAN, T. G. and LAWRENCE, T. L. J. Growth, tissue deposition and metabolism studies in growing pigs given low glucosinolate rapeseed meal diets containing different amounts of copper and polyethylene glycol	505
SCULLION, J., MOHAMMED, A. R. A. and RAMSHAW, G. A. Statistical evaluation of drainage treatments in simple field trials with special reference to former opencast coal mining land	515
SCULLION, J. and MOHAMMED, A. R. A. Field drainage experiments and design on former opencast coal mining land	521
SMITH, HELEN K., MILNE, J. A. and MAYES, R. W. Within-animal variances for flow rates of metabolites in an open-compartment model with continuous isotope infusion in sheep	529
KHALIL, M. H., OWEN, J. B. and AFIFI, E. A. Selection indices for rabbit improvement .	537
SINGH, S., PAWAR, I. S. and SINGH, I. P. A study of genotype × environment interaction in three chickpea triple test crosses	549
NIMJE, P. M. and SETH, JAGDISH. Effect of phosphorus, farmyard manure and nitrogen on some soil properties in a soya bean-maize sequence	555
DUNWELL, J. M., CORNISH, M., POWELL, W. and BORRINO, E. M. An evaluation of the field performance of the progeny of plants regenerated from embryos of <i>Hordeum vulgare</i> cv. Golden Promise	561
STEVENS, R. J. and WATSON, CATHERINE, J. The response of grass for silage to sulphur application at 20 sites in Northern Ireland	565
LUCAS, E. O. The effect of density and nitrogen fertilizer on the growth and yield of maize (Zea mays L.) in Nigeria	573
MILLER, B. G., JAMES, P. S., SMITH, M. W. and BOURNE, F. J. Effect of weaning on the capacity of pig intestinal villi to digest and absorb nutrients	579
POWLSON, D. S., PRUDEN, THE LATE G., JOHNSTON, A. E. and JENKINSON, D. S. The nitrogen cycle in the Broadbalk Wheat Experiment: recovery and losses of ¹⁵ N-labelled fertilizer applied in spring and inputs of nitrogen from the atmosphere	591
Powlson, D. S., HART, P. B. S., PRUDEN, THE LATE G. and JENKINSON, D. S. Recovery of ¹⁵ N-labelled fertilizer applied in autumn to winter wheat at four sites in eastern England.	611
BANDYOPADHYAY, S. K. and DE, R. Plant growth and seed yield of sorghum when inter- cropped with legumes	621
BANDYOPADHYAY, S. K. and DE, R. Nitrogen relationships and residual effects of inter- cropping sorghum with legumes	629
LEWIS, G. C. and CLEMENTS, R. O. A survey of ryegrass endophyte (Acremonium loliae) in the U.K. and its apparent ineffectuality on a seedling pest	633
PREW, R. D., BEANE, J., CARTER, N., CHURCH, B. M., DEWAR, A. M., LACEY, J., PENNY, A., PLUMB, R. T., THORNE, G. N. and TODD, A. D. Some factors affecting the growth and yield of winter wheat grown as a third cereal with much or negligible take-all	639
SAMANTA, R. and SEN, S. P. Further observations on the utility of N ₂ -fixing micro-organisms in the phyllosphere of cereals	673

	PAGE
SAMANTA, R., DUTTA, A. K. and SEN, S. P. The utilization of leaf wax by N ₂ -fixing micro- organisms on the leaf surface	681
REID, D. The effects of frequency of cutting and nitrogen application rates on the yields from perennial ryegrass plus white clover swards	687
PARTRIDGE, G. G., DANIELS, Y. and FORDYCE, R. A. The effects of energy intake during pregnancy in doe rabbits on pup birth weight, milk output and maternal body com- position change in the ensuing lactation	697
COLEMAN, G. S. The amylase activity of 14 species of entodiniomorphid protozoa and the distribution of amylase in rumen digesta fractions of sheep containing no protozoa or one of seven different protozoal populations	709
WILCOCKSON, S. J. Effects of defoliation and time of harvest on tuber dry-matter percentage of Pentland Crown potatoes	723
SHORT NOTE	
ROWAN, T. G. and LAWRENCE, T. L. J. Effects on nutritive value for growing pigs of pelleting diets containing low glucosinolate rapeseed meals	735

.

v

Continued from back cover

	FAUE
LEWIS, G. C. and CLEMENTS, R. O. A survey of ryegrass endophyte (Acremonium loliae) in the U.K. and its apparent ineffectuality on a seedling pest	633
PREW, R. D., BEANE, J., CARTER, N., CHURCH, B. M., DEWAR, A. M., LACEY, J., PENNY, A., PLUMB, R. T., THORNE, G. N. and TODD, A. D. Some factors affecting the growth and yield of winter wheat grown as a third cereal with much or negligible take-all	639
SAMANTA, R. and SEN, S. P. Further observations on the utility of N ₂ -fixing micro-organisms in the phyllosphere of cereals	673
SAMANTA, R., DUTTA, A. K. and SEN, S. P. The utilization of leaf wax by N ₂ -fixing micro-organisms on the leaf surface	681
REID, D. The effects of frequency of cutting and nitrogen application rates on the yields from perennial ryegrass plus white clover swards	687
PARTRIDGE, G. G., DANIELS, Y. and FORDYCE, R. A. The effects of energy intake during pregnancy in doe rabbits on pup birth weight, milk output and maternal body composition change in the ensuing lactation .	697
COLEMAN, G. S. The amylase activity of 14 species of entodiniomorphid protozoa and the distribution of amylase in rumen digesta fractions of sheep containing no protozoa or one of seven different protozoal populations	709
WILCOCKSON, S. J. Effects of defoliation and time of harvest on tuber dry-matter percentage of Pentland Crown potatoes	723
SHORT NOTE	
ROWAN, T. G. and LAWRENCE, T. L. J. Effects on nutritive value for growing pigs of pelleting diets containing low glucosinolate rapeseed meals	735

THE JOURNAL OF AGRICULTURAL SCIENCE

CONTENTS

Vol. 107 Part 3 December 1986

PAGE

ROWAN, T. G. and LAWRENCE. T. L. J. Growth and metabolism studies in growing pigs given diets containing a low glucosinolate rapeseed meal	483
ROWAN, T. G. and LAWRENCE, T. L. J. Ileal apparent digestibilities of amino acids, growth and tissue deposition in growing pigs fed low glucosinolate rapeseed meals	493
ROWAN, T. G. and LAWRENCE, T. L. J. Growth, tissue deposition and metabolism studies in growing pigs given low glucosinolate rapeseed meal diets containing different amounts of copper and polyethylene glycol.	505
SCULLION, J., MOHAMMED, A. R. A. and RAMSHAW, G. A. Statistical evaluation of drainage treatments in simple field trials with special reference to former opencast coal mining land	515
SCULLION, J. and MOHAMMED, A. R. A. Field drainage experiments and design on former opencast coal mining land	521
SMITH, HELEN K., MILNE, J. A. and MAYES, R. W. Within-animal variances for flow rates of metabolites in an open-compartment model with continuous isotope infusion in sheep	· 529
KHALIL, M. H., OWEN, J. B. and AFIFI, E. A. Selection indices for rabbit improvement	537
SINGH, S., PAWAR, I. S. and SINGH, I. P. A study of genotype × environment interaction in three chickpea triple test crosses	549
NIMJE, P. M. and SETH, JAGDISH. Effect of phosphorus, farmyard manure and nitrogen on some soil properties in a soya bean-maize sequence	555
DUNWELL, J. M., CORNISH, M., POWELL, W. and BORRINO, E. M. An evaluation of the field performance of the progeny of plants regenerated from embryos of <i>Hordeum vulgare</i> cv. Golden Promise	561
STEVENS, R. J. and WATSON, CATHERINE J. The response of grass for silage to sulphur application at 20 sites in Northern Ireland	565
LUCAS, E. O. The effect of density and nitrogen fertilizer on the growth and yield of maize (Zea mays L.) in Nigeria	573
MILLER, B. G., JAMES, P. S., SMITH, M. W. and BOURNE, F. J. Effect of weaning on the capacity of pig intestinal villi to digest and absorb nutrients	579
POWLSON, D. S., PRUDEN, THE LATE G., JOHNSTON, A. E. and JENKINSON, D. S. The nitrogen cycle in the Broadbalk Wheat Experiment: recovery and losses of ¹⁵ N-labelled fertilizer applied in spring and inputs of nitrogen from the atmosphere	591
POWLSON, D. S., HART, P. B. S., PRUDEN, THE LATE G. and JENKINSON, D. S. Recovery of ¹⁵ N-labelled fertilizer applied in autumn to winter wheat at four sites in eastern England.	611
BANDYOPADHYAY, S. K. and DE, R. Plant growth and seed yield of sorghum when intercropped with legumes	621
BANDYOPADHYAY, S. K. and DE, R. Nitrogen relationships and residual effects of intercropping sorghum with legumes	629

Continued on inside back cover

C Cambridge University Press 1986

COPYING. This journal is registered with the Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970. Organizations in the USA who are also registered with the copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970. Dermitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$05.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0021-8596/86/107-03 \$05.00.

ISI Tear Service, 3501 Market Street, Philadelphia, Pennsylvania 19106, USA, is authorized to supply single copies of separate articles for private use only. For all other use, permission should be sought from Cambridge or the American Branch of Cambridge University

Press.