

SEED SCIENCE RESEARCH

SPECIAL ISSUE

Includes papers presented at the 2nd International
Workshop on Desiccation Tolerance and Sensitivity
of Seeds and Vegetative Plant Tissues



CAB INTERNATIONAL

SEED SCIENCE RESEARCH

Aims and Scope

Seed Science Research provides an international vehicle for the publication of original papers and review articles on the fundamental aspects of seed research. The emphasis is on the physiology, biochemistry, molecular biology and ecology of seeds, covering the following key topics:

- chemical and structural defences
- reserve mobilization
- establishment
- ecophysiology
- vigour
- biotechnology
- maturation
- dormancy
- computer modelling
- germination
- seed-soil and seed-animal interactions
- seed and embryo development
- longevity
- viability
- seed engineering (modification)

Editor

Professor M. Black

Division of Life Sciences, King's College London, Campden Hill Road, London, W8 7AH, UK
Tel: +44 (0)171 333 4212 Fax: +44 (0)171 333 4500 Email: michael.black@kcl.ac.uk

Associate Editors

M.A. Cohn, *Louisiana State University Agricultural Center, Baton Rouge, USA*
C.M. Karssen, *Wageningen Agricultural University, Wageningen, The Netherlands*
K. Thompson, *University of Sheffield, UK*

Editorial Board

- J.M. Baskin, *University of Kentucky, Lexington, USA*
J.D. Bewley, *University of Guelph, Ontario, Canada*
K.J. Bradford, *University of California, Davis, USA*
C.M. Bray, *University of Manchester, UK*
D. Côme, *Université Pierre et Marie Curie, Paris, France*
A. Cuming, *University of Leeds, UK*
M. Delseny, *Université de Perpignan, France*
M. Fenner, *University of Southampton, UK*
G.B. Fincher, *University of Adelaide, Commonwealth Research Centre, Victoria, Australia*
J. Greenwood, *University of Guelph, Ontario, Canada*
G. Hendry, *University of Sheffield, UK*
H.W.M. Hilhorst, *Wageningen Agricultural University, The Netherlands*
R. Hill, *University of Manitoba, Winnipeg, Canada*
A.C. Leopold, *Cornell University, Ithaca, New York, USA*
A. Mayer, *Hebrew University of Jerusalem, Israel*
B. McKersie, *University of Guelph, Ontario, Canada*
D. Osborne, *Open University, Milton Keynes, UK*
N. Pinfield, *University of Bristol, UK*
R.J. Probert, *Royal Botanic Gardens, West Sussex, UK*
E.H. Roberts, *University of Reading, UK*
P. Schopfer, *Biologisches Institut II der Universität, Freiburg, Germany*
M.K. Walker-Simmons, *Washington State University, Pullman, USA*
C.W. Walters, *National Seed Science Laboratory, Fort Collins, USA*
T. Wang, *John Innes Institute, Norwich, UK*

© CAB INTERNATIONAL 1997 All rights reserved.

Published by CAB INTERNATIONAL, Wallingford, UK. New York, USA



Seed Science Research



Guest Editorial	59
2nd International Workshop on Desiccation-Tolerance and -Sensitivity of Seeds and Vegetative Plant Tissues	61
Review Update	
Obendorf, R. L. Oligosaccharides and galactosyl cyclitols in seed desiccation tolerance	63
Special Review	
Kermode, A. R. Approaches to elucidate the basis of desiccation-tolerance in seeds	75
Biochemistry and Metabolism	
Boubriak, I., Kargiolaki, H., Lyne, L. & Osborne, D. J. The requirement for DNA repair in desiccation tolerance of germinating embryos	97
Górecki, R. J., Piotrowicz-Cieślak, A. I., Lahuta, L. B. & Obendorf, R. L. Soluble carbohydrates in desiccation tolerance of yellow lupin seeds during maturation and germination	107
Russouw, P. S., Farrant, J., Brandt, W. & Lindsey, G. G. The most prevalent protein in a heat-treated extract of pea (<i>Pisum sativum</i>) embryos is an LEA group I protein; its conformation is not affected by exposure to high temperature	117
Walters, C., Ried, J. L. & Walker-Simmons, M. K. Heat-soluble proteins extracted from wheat embryos have tightly bound sugars and unusual hydration properties	125
Physiology	
Farrant, J. M., Pammenter, N. W., Berjak, P. & Walters, C. Subcellular organization and metabolic activity during the development of seeds that attain different levels of desiccation tolerance	135
Ntuli, T. M., Berjak, P., Pammenter, N. W. & Smith, M. T. Effects of temperature on the desiccation responses of seeds of <i>Zizania palustris</i>	145
Sacandé, M., Groot, S. P. C., Hoekstra, F. A., De Castro, R. D. & Bino, R. J. Cell cycle events in developing neem (<i>Azadirachta indica</i>) seeds: are they related to intermediate storage behaviour?	161
Recalcitrant seeds	
Motete, N., Pammenter, N. W., Berjak, P. & Frédéric, J. C. Response of the recalcitrant seeds of <i>Avicennia marina</i> to hydrated storage: events occurring at the root primordia	169
Normah, M. N., Saraswathy, R. D. & Mainah, G. Desiccation sensitivity of recalcitrant seeds—a study on tropical fruit species	179

Research Papers

Development

- Górecki, R. J., Piotrowicz-Cieślak, A. & Obendorf, R. L.** Soluble sugars and flatulence-producing oligosaccharides in maturing yellow lupin (*Lupinus luteus* L.) seeds 185

Ecology

- Seiwa, K.** Variable regeneration behaviour of *Ulmus davidiana* var. *japonica* in response to disturbance regime for risk spreading 195

- Walck, J. L., Baskin, J. M. & Baskin, C. C.** A comparative study of the seed germination biology of a narrow endemic and two geographically-widespread species of *Solidago* (Asteraceae). II. Germination responses of buried seeds in relation to seasonal temperature cycles 209

Correspondence

- Hilhorst, H. W. M.** Seed dormancy 221

Seed Science Research is covered in Current Contents®/Agriculture, Biology & Environmental Sciences, SciSearch®, Research Alert®, BIOSIS, CAB ABSTRACTS, and Current Awareness in Biological Sciences (CABS)

Papers presented at the



CAB INTERNATIONAL and the Editor of Seed Science Research are pleased to acknowledge the support given by the International Plant Genetic Resources Institute (IPGRI) in the publication of this Special Issue



IPGRI is the sponsor of this Special Issue but as such does not necessarily subscribe to the views put forward in the papers