ISSN: 0960-2585

# SEED SCIENCE RESEARCH journals.cambridge.org/ssr









Seen Science Research



Seed Science Research is the official Journal of the International Society for Seed Science

The contents of this journal are available to subscribers online at journals.cambridge.org/SSR

#### 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:

- germination
- dormancy
  - ecophysiology
- reserve mobilization
- viability
- longevity vigour
- establishment
- seed and embryo development
- maturation
- -----
- chemical and structural defences
  - biotechnology
    - physiology of seed pathology

computer modelling

seed-soil and seed-animal interactions

### Editor

H.W.M. Hilhorst Lab of Plant Physiology, Wageningen University, Arboretumlaan 4, 6703 BD Wageningen, The Netherlands

## **Review Editor**

#### J.D. Bewley

Department of Molecular & Cellular Biology, University of Guelph, Guelph, Ontario N1G 2W1, Canada

#### **Associate Editors**

Professor Julia Buitink, INRA, France W. Finch-Savage, Warwick HRI (Wellesbourne), UK H.W.M. Hilhorst, Wageningen University, The Netherlands Professor Hiro Nonogaki, Oregon State University, USA

K. Thompson, University of Sheffield, UK

#### **Editorial Board**

P. Allen, Brigham Young University, Provo, USA

C.C. Baskin, University of Kentucky, Lexington, USA

R. Benech-Arnold, University of Buenos Aires, Argentina

P. Berjak, University of KwaZulu-Natal, South Africa

M. Black, King's College London, UK

K.J. Bradford, University of California, Davis, USA

M.A. Cohn, Louisiana State University, USA

F. Corbineau, Université Pierre et Marie Curie, Paris, France

- J.M. Farrant, University of Cape Town, South Africa
- M. Fenner, University of Southampton, UK
- D. Job, CNRS, Bayer CropScience, Lyon, France

- O. Leprince, Institut National d'Horticulture, Angers, France
- G. Leubner-Metzger, Albert-Ludwigs-University, Freiburg, Germany
- P. Milberg, Linkoping University, Sweden
- E. Nambara, University of Toronto, Canada
- H. Nonogaki, Oregon State University, Corvallis, USA
- H. Pritchard, Royal Botanic Gardens, West Sussex, UK
- A. Richter, University of Vienna, Austria
- C.A. Thanos, University of Athens, Greece
- P. Toorop, Royal Botanic Gardens, West Sussex, UK
- C.W. Walters, National Seed Science Laboratory, Fort Collins, USA

© Cambridge University Press 2009 Published by Cambridge University Press Cambridge CB2 8RU: New York, NY 10013-2473

# Seed Science Research

| Hilhorst, H.W.M. Editorial  | 1    |
|---|------|
| Research Opinion  |      |
| Jayasuriya, K.M.G.G., Baskin, J.M. & Baskin, C.C. Sensitivity cycling<br>and its ecological role in seeds with physical dormancy                                    | 3    |
| Invited Review  |      |
| Sliwinska, E. Nuclear DNA replication and seed quality  | . 15 |
| Kreitschitz, A., Tadele, Z. & Gola, E.M. Slime cells on the surface of <i>Eragrostis</i> seeds maintain a level of moisture around the grain to enhance germination | . 27 |
| Soós, V., Juhász, A., Light, M.E., Van Staden, J. & Balázs, E.<br>Smoke-water-induced changes of expression pattern in Grand Rapids<br>lettuce achenes              | . 37 |
| Mitschunas, N., Filser, J. & Wagner, M. On the use of fungicides in ecological seed burial studies  | 51   |
| Book Review   |      |
| Thompson, K. Seedling ecology and evolution   | . 61 |

Seed Science Research is covered in the Science Citation Index<sup>®</sup>, Current Contents<sup>®</sup>/Agriculture, Biology & Environmental Sciences, SciSearch <sup>®</sup>, Research Alert <sup>®</sup>, BIOSIS<sup>®</sup> Database, CAB ABSTRACTS, and Elsevier BIOBASE/Current Awareness in Biological Sciences

Subscribing organizations are encouraged to copy and distrubute this table of contents for non-commercial purposes.

# Seed Science Research

journals.cambridge.org/ssr ISSN: 0960-2585

Publishing, Production, Marketing, and Subscription Sales Office:

Cambridge University Press The Edinburgh Building Shaftesbury Road Cambridge CB2 8RU UK journals@cambridge.org

#### For Customers in North America:

Cambridge University Press Journals Fullfillment Dept 100 Brook Hill Drive West Nyack New York 10994-2133 USA journals\_subscriptions@cup.org

*Seed Science Research* is an international journal published quarterly by Cambridge University Press in March, June, September and December.

#### Special sales and supplements:

This journal accepts relevant advertising and inserts. We also provide bulk reprints of suitable papers to meet teaching or promotional requirements. The journal also publishes abstracts and proceedings on behalf of academic and corporate sponsors. Please contact special\_sales@cambridge.org

#### Subscription information:

The subscription rates for Volume 19, 2009 (4 issues) are: Organisational, Online & Print: £457/\$909 Organisational, Online only: £364/\$724 Individual, Online & Print: £266/\$529 Individual, Online only: £105/\$210 Individual, Print only: £252/\$501 ISSS members can benefit from discounted subscriptions. The Journal can be accessed online at http://

journals.cambridge.org/ssr

Any **supplements** to this journal published in the course of the annual volume are normally supplied to subscribers at no extra charge.

**Back volumes** are available. Please contact Cambridge University Press.

**Claims** for non-receipt of journal issues will be considered on their merit and only if the claim is received within six months of publication. Replacement copies supplied after this date will be chargeable.

**US POSTMASTERS:** please send address corrections to CUP Cambridge.

**Notes for Authors:** may be found at http:// journals.cambridge.org/SSR. Please note there are no page charges or handling fees to publish in SSR.

**Offprints:** The author (or main author) of an accepted paper will receive a free PDF file via email.

**Copyright:** CUP, 2009. All rights reserved: permission for reproduction of any part of the journal (text, figures, tables or other matter) in any from (on paper, microfiche or electronically) should be sought directly from the Publisher, or a licence permitting restricted copying obtained from the Copyright Licensing Agency, Tottenham Court Road, London W1P 9HE, UK, or in the USA by the Central Clearance Center, 27 Congress Street, Salem MA 01970.

**Disclaimer:** The information contained herein, including any expression of opinion and any projection or forecast, has been obtained from or is based upon sources believed by us to be reliable, but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk.

Cambridge University Press does not accept responsibility for any trade advertisement included in this publication.

This journal is printed on acid-free paper from renewable sources Printed by Latimer Trend, Devon, UK.