

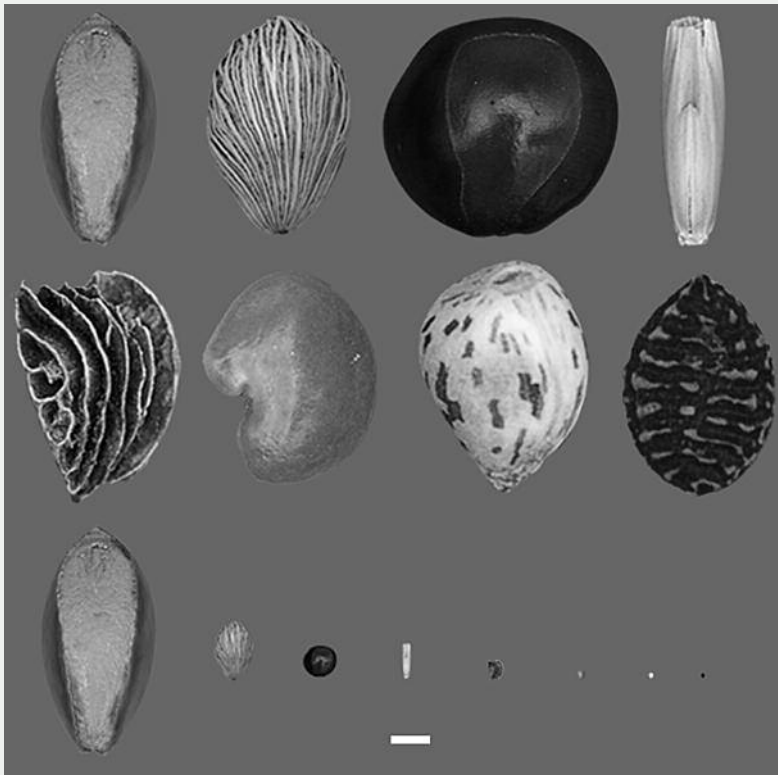
Seed Technology

An International Journal Serving Seed Scientists and Technologists

Volume 35

2013

Number 1



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Seed Technology

*An International Journal
Serving Seed Scientists and Technologists*

Volume 35, Number 1 • 2013



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ASSOCIATION OF OFFICIAL SEED ANALYSTS
SOCIETY OF COMMERCIAL SEED TECHNOLOGISTS

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Seed Technology

THIS JOURNAL is co-sponsored by the two predominant organizations in North America with a direct interest in seed technology: the Association of Official Seed Analysts and the Society of Commercial Seed Technologists.

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AIMS AND SCOPE – *Seed Technology* is an international journal containing scientific and technological papers in all areas of Seed Science and Technology. The emphasis is on applied and basic research in seed physiology, pathology and biology that may relate to seed development, maturation, germination, dormancy and deterioration. Studies on seed production, sampling, testing, conditioning, distribution and storage are also included. Short communications from seed analysts and technologists are encouraged and will be published as Seed Tech Notes. These notes include new techniques, standardization of laboratory tests and documentation of anatomical and pathological observations of seed and seedling development. The journal also includes timely review articles of seed technology that may relate directly to the seed industry.

TYPES OF PAPERS – Original research papers, review articles and Seed Tech Notes are reviewed for publication. All manuscripts should be submitted online. Potential authors should note that there are no page charges and reprints can be ordered directly from the printer at a minimal fee. Refer to the last pages of this volume (Instructions to Authors) for detailed instructions regarding manuscript submissions.

SUBSCRIPTIONS – *Seed Technology* is published two times annually. The 2013 subscription price for print copies is \$125.00 for individuals in North America and \$145.00 outside of North America; institutional subscriptions are \$195.00 in North America and \$215.00 outside of North America. The 2013 subscription price for electronic (PDF) copies is \$75.00 for individuals and \$125.00 for institutions. The 2013 subscription price for both print and electronic copies is \$150.00 for individuals in North America and \$170.00 outside of North America; institutional subscriptions are \$225.00 in North America and \$245.00 outside of North America. All subscription prices are in US dollars and include postage. Subscriptions should be sent directly or through a bookseller to: SCST Business Office, 653 Constitution Ave. NE, Washington, D.C. 20002, USA, www.seedtechnology.net. For more details, refer to the 'Instructions to Authors' section at the end of this volume.

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EDITORIAL

WE ARE PLEASED that this volume of Seed Technology includes a special section entitled "Seed Science and Technology—Research and Testing Needs." In this section, three invited authors with long and distinguished careers in seed testing share their insights as well as suggestions for future seed testing needs. The present volume also includes nine full-length manuscripts and two Seed Tech Notes, with subjects ranging from characterization of genotypes to physiology of germination and novel techniques for seed and seedling evaluation. Seed Technology continues to attract authors and readers from around the globe. The recent financial reorganization of our two sponsoring organizations has resulted in longer publication delays than we had anticipated. However, we remain committed to producing a quality publication and to publishing two issues annually.

The role played by the Journal Committee in promoting and publishing this journal has always been greatly appreciated, but never more so than in 2013. The Journal Committee played a critical role in securing the needed funds and support for publication of this issue. Without their commitment and perseverance, publication would not have been possible. As with every issue, we value the contributions of the many associate editors and peer reviewers. The continued support of our two sponsoring organizations, the Association of Official Seed Analysts and the Society of Commercial Seed Technologists, is highly appreciated.

Riad Baalbaki
Editor

Susan Alvarez
Assistant Editor

COVER ILLUSTRATION: Structures commonly referred to as "seeds," whether true seeds or botanically fruits, exhibit a high degree of variation, especially in size and external morphology. The top two rows illustrate variations in external morphology observed among "seeds" of different species. From top left: *Pouteria* Aubl. sp., SAPOTACEAE; *Dypsis lutescens* (H. Wendl.) Beentje & J. Dransf., ARECACEAE; *Adenanthera pavonina* L., FABACEAE; *Avena sativa* L., POACEAE; *Bourreria succulenta* Jacq., BORAGINACEAE; *Crotalaria senegalensis* (Pers.) Bacle ex DC., FABACEAE; *Viola palmata* L., VIOLACEAE; *Oxalis corniculata* L., OXALIDACEAE. The bottom row lists the same species in the same order, presented to scale (scale line = 1 cm), to illustrate size differences. Photo credit: Riad Baalbaki, California Department of Food and Agriculture.

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ERRATUM: Volume 34, no. 2

In the article by Barbour and Carvalho (2012), an error occurred on pages 231 and 232, in the legends of figures 1 and 2. The figures with correct legends should be as follows:

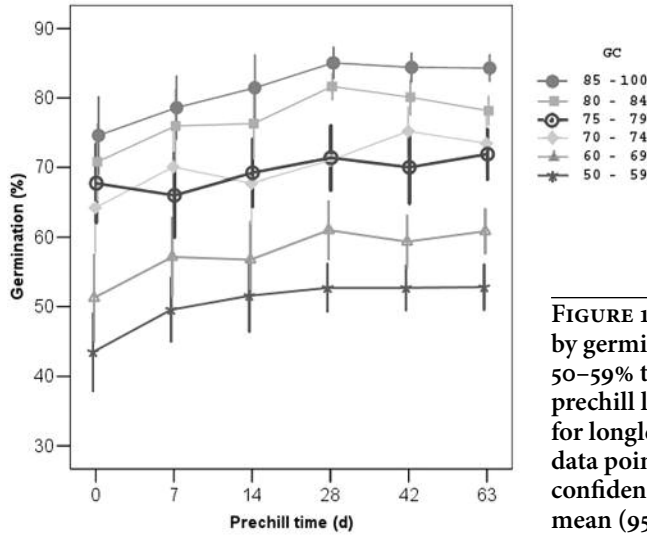


FIGURE 1. Total germination by germination classes (GC 50–59% to 85–100%) and prechill length (0 to 63 d) for longleaf pine seeds. Each data point represents the confidence interval for the mean (95% level).

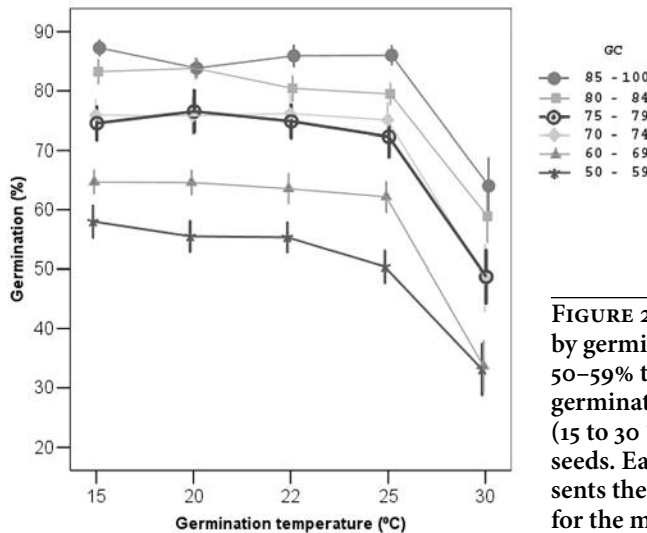


FIGURE 2. Total germination by germination classes (GC 50–59% to 85–100%) and germination temperature (15 to 30 °C) for longleaf pine seeds. Each data point represents the confidence interval for the mean (95% level).

Reference

Barbour, J.R. and J.P.F. Carvalho. Pretreatment effects on germination and vigor of longleaf pine (*Pinus palustris*) seeds. *Seed Technol.* 34 (2): 227–242.

Seed Technology

Instructions to Authors

Seed Technology is an international journal that publishes original papers, review articles, technical notes and symposia in all areas of seed science and technology. This includes information from applied and basic seed research in physiology, pathology and biology for all plant species. The journal relates to individuals interested in seed production, sampling, testing, conditioning, distribution and storage of agronomic, horticultural and forest seed crops. Papers are accepted on the understanding that they have not been published or submitted to any other scientific journal. The criteria for acceptance are originality, quality of research and interest to readership. Manuscripts are peer-reviewed by two or more anonymous reviewers, with final acceptance resting with the Editorial Board. The journal is published two times per year and is available as paper copies by contacting: SCST Business Office, 653 Constitution Ave. NE, Washington, D.C. 20002, USA (phone: 202-870-2412). Subscription information and order forms are available online at: <http://www.seedtechnology.net/journal.htm>.

Manuscripts must be clearly written using proper English. If English is not the primary language of the author, the manuscript should be reviewed by someone proficient in English prior to submission to the journal. Manuscripts should be submitted online; see “**Guidelines for Submission**” at the end of the instructions. Five types of submissions will be considered for publication:

- a. **Full-length manuscripts** should report new information to the subject area or expand on established knowledge to contribute additional information of value. Manuscripts undergo peer review to determine that adequate scientific methods were applied, that interpretations and conclusions are valid, and that all aspects of the study are adequately presented.
- b. **Seed Tech Notes** are appropriate for the reporting of seed laboratory or seed production research that may not justify a full paper, but provide important information of potential practical importance. This may include new techniques or developments, standardization of old techniques or anatomical, pathological or other documentation of seed or seedling development. The requirements for such notes are described below.
- c. **Technical Papers** presented orally or by poster at the annual meeting of the Association of Official Seed Analysts (AOSA) and Society of Commercial Seed Technologists (SCST) are invited, which cover topics of general interest to the seed biologist or technologist.
- d. **Symposia** or workshops presented to the AOSA/SCST membership may be recorded in the journal for future reference. Organizers should prearrange with the Editor to receive papers from the presenters of symposia and workshops within a specified timeframe for inclusion in a single journal issue.
- e. **Review articles** are welcomed by special prior arrangement with the Editor. Reviews should cover a summary of a seed biology or seed technology topic

or an evaluation of a seed science or technology related publication. The content of reviews should have a strong technical and/or scientific base.

INSTRUCTIONS FOR FULL LENGTH MANUSCRIPTS

Instructions for full length manuscripts should be carefully reviewed to ensure that the submitted manuscript complies with *Seed Technology* standards and requirements. **If these guidelines are not closely adhered to, papers will be returned to authors for revision or released from further consideration for the journal.**

Manuscripts should be arranged in the following order: **Title** (no separate title page), **Author(s)**, **Abstract**, **Text**, **Acknowledgments**, **References**, **Tables**, **Captions for Figures** (separate page) and **Figures**. Do not include a list of key-words. The title should be concise (10 to 12 words) but informative, containing key words which describe the subject matter for use in abstracting systems. The name of the author(s) should be placed below the title with an asterisk (*) after the name of the corresponding author.

The **abstract** should concisely summarize the entire scope of the paper including findings and conclusions without reference to text or figures. **All categories of manuscripts or papers submitted to the journal must have an abstract.** It should appear immediately below the title and authors and consist of not more than 250 typed words. **Authors may provide a translation of the abstract in one additional language, which will be printed in the journal following the primary abstract in English.** Availability of abstracts in alternate languages should be discussed with the Editor early in the submission process. Accuracy in regard to content and grammar of the second abstract is the responsibility of the corresponding author. Do not include a list of key words.

The **text** of the manuscript should normally have the subject matter grouped under the following major headings: **Introduction**, **Materials and Methods**, **Results**, **Discussion** (Results and Discussion may be combined), **Acknowledgments** (optional) and **References**. Main headings are centered on each page and capitalized in bold type. Secondary headings begin at the left margin (do not indent) with the first letter capitalized and the entire heading in bold print. Use of a previous issue of the journal as a guide to format is recommended.

Author-Paper Documentation. Author-paper documentation is a single paragraph at the bottom of the first page (under abstract). The first sentence lists the authors (without professional titles) and their complete addresses. If the author has moved, provide the current address. Always end the author-paper documentation with: *Corresponding author (e-mail address of corresponding author). Received _____.

Style Manual. *Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers*, 6th edition, prepared by the Style Manual Committee of the Council of Biology Editors and published by the Cambridge University Press should be followed for writing papers submitted to *Seed Technology*. *The Publications Handbook and Style Manual* of the American Society of Agronomy can also be used as a detailed guide for both paper and electronic manuscript preparation and can be accessed online at

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Abbreviations. Use standard abbreviations (for example, Fig., RH, °C) listed in *Scientific Style and Format*, SI units and chemical element symbols without definition. Other abbreviations should be defined at first usage in the abstract or text and may be used thereafter without further definition, and again in every table and figure. Names of states, provinces and countries should be abbreviated following city names, using appropriate abbreviations of the postal service in that country.

Units. Metric units must be used for all measurements and the SI system (Système International d'Unités) used insofar as possible.

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- AOSA. 2010. Rules for testing seeds, Vol. 1. Principles and procedures. Assoc. Offic. Seed Anal., Ithaca, NY.
- Bernard, R.L. and M.G. Weiss. 1973. Qualitative genetics. p. 117–154. *In Soybeans: improvement, production, and uses*. B.E. Caldwell, R.W. Howell, J.W. Judd and H.W. Johnson (eds.). 1st ed. Agron. Monogr. 16. ASA, CSSA, and SSSA, Madison, WI.
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- Koning, G., D.M. TeKrony, T.W. Pfeiffer and S.A. Ghabrial. 2001. Infection of soybean with soybean mosaic virus increases susceptibility to *Phomopsis* spp. seed infection. *Crop Sci*. 41: 1850–1856.

McGee, D.C. 1992. Soybean diseases. Am. Phytopathol. Soc., St. Paul, MN.

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The format for *Seed Tech Notes*, technical papers and presentations from symposia or workshops is as for full length papers insofar as practical. The text headings may be the same as a full paper or may be arranged by **Abstract, Experimental Techniques, Results and Discussion, and References**, if that format is more suitable to the presentation of the material. The Experimental Techniques section will include a brief narrative of those elements normally included in the Introduction and Materials and Methods sections of full length papers. *Seed Tech Notes* and technical papers are usually much shorter and may present only preliminary research data compared to full length papers. These papers usually do not exceed four pages of printed text and a maximum of two figures, tables or photographs. Papers presented at committee meetings, symposia and workshops not containing cited references or other conventional journal paper elements may be considered for publication if these presentations

contain information of a practical nature or general interest in seed biology and technology.

SYMPOSIA PUBLICATIONS

Manuscripts resulting from symposia on seed biology or technology topics will be considered for publication in a single volume of *Seed Technology* by prearrangement with the Editor. Manuscripts may originate from symposia sponsored by the Association of Official Seed Analysts or the Society of Commercial Seed Technologists or from appropriate seed symposia sponsored by other organizations. Symposia organizers desiring to publish a set of manuscripts in *Seed Technology* must solicit the Editor with the following information: (i) title, date and location of the symposium, (ii) the organization affiliated with the symposium, (iii) names, addresses, e-mail and telephone numbers of symposium organizers and (iv) titles and abstracts for each paper to be considered for publication. Symposia papers are subject to the usual format described above for *Seed Technology* and will be reviewed by the editorial board prior to acceptance for publication.



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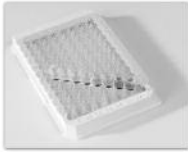
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