

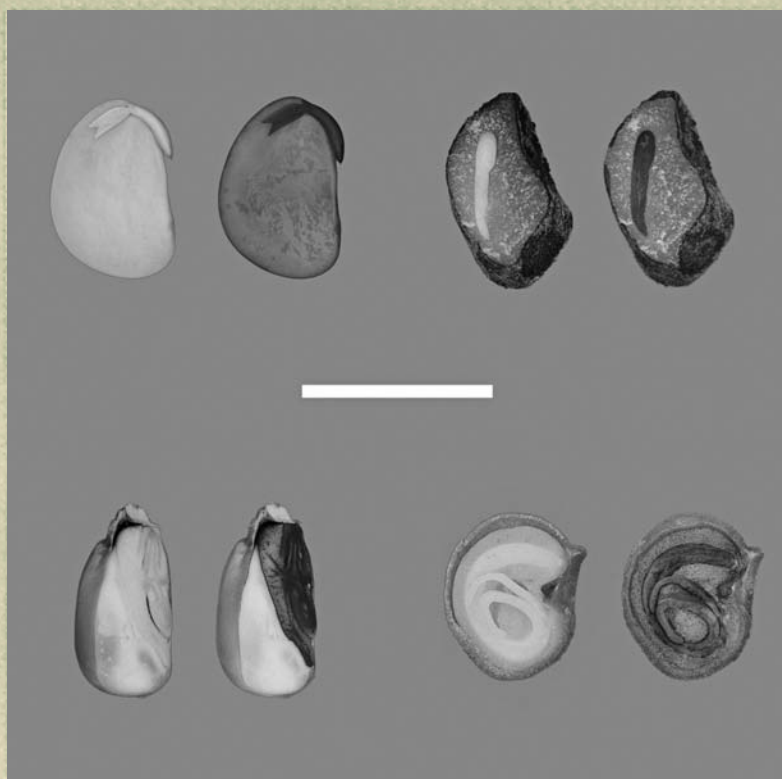
Seed Technology

An International Journal Serving Seed Scientists and Technologists

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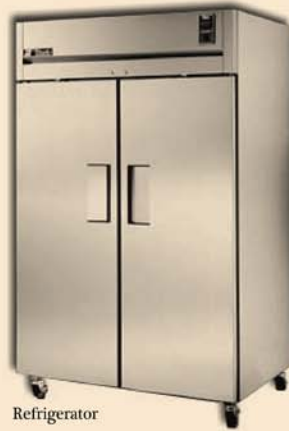


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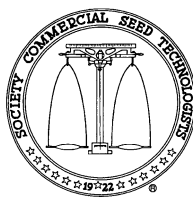
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Seed Technology

*An International Journal
Serving Seed Scientists and Technologists*

Volume 34, Number 2 • 2012



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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 direct or through a bookseller to: Anita Hall, Executive Director, Society of Commercial Seed Technologists, Inc., 101 East State St., #214, Ithaca, NY 14850, USA. For more details, refer to the 'Instructions to Authors' section at the end of this volume.

SEED TECHNOLOGY typesetting and graphic production by
Charles Chandler, The Typewright, Lexington, KY (TheTypewright@me.com)

EDITORIAL

WE ARE PLEASED that this volume of Seed Technology includes a translation of Lakon's seminal paper on tetrazolium testing. Lakon's original German-language paper, published in 1942, described methodologies still employed today in seed testing, and the article remains one of the most frequently cited papers in the field of seed science. We hope that the English translation will make this important article accessible to a majority of interested scientists. The present volume also includes seven full-length manuscripts and four Seed Tech Notes, as well as abstracts from oral and poster presentations at the 102nd AOSA/SCST annual meeting. Topics range from ecological studies on seed survival and enumeration, treatments affecting seed viability, to recent trends in seed production.

The editorial staff remains committed to producing a quality publication with broad appeal to seed scientists, seed analysts and the seed industry. This commitment is made possible through the help of the many associate editors and peer reviewers, as well as the support provided by the Journal Committee. As always, the sponsorship and continued support of the Association of Official Seed Analysts and the Society of Commercial Seed Technologists are highly appreciated.

Riad Baalbaki
Editor

Susan Alvarez
Assistant Editor

COVER ILLUSTRATION: Living seed structures stain red when placed in a tetrazolium solution, while structures composed of non-living tissue at maturity do not stain. Presence, intensity and staining patterns of living seed structures are used to evaluate seed viability and vigor. An illustration of different tetrazolium staining patterns of viable seeds (clockwise from top left): lima bean (*Phaseolus lunatus* L., scale line = 2.0 cm), cyclamen (*Cyclamen* sp., scale line = 0.4 cm), pepper (*Capsicum* sp., scale line = 0.8 cm) and corn (*Zea mays* L., scale line = 1.2 cm), each showing the same seed before (left) and after (right) exposure to a tetrazolium solution. Photo credit: Riad Baalbaki, California Department of Food and Agriculture.

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ERRATUM: Volume 34, No. 1

In the article by Munkvold (2012), an error occurred on page 36, in the 4th sentence of the 3rd paragraph. The sentence should read as follows: “False **positive** results for this pathogen can (and have) led to costly delays and rejections of seed shipments, and the needless destruction of valuable seedlots.”

Reference

Munkvold, G. 2012. Phytosanitary risk assessment and molecular seed health tests: time to make the connection. *Seed Technol.* 34 (1): 35–37.

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: Anita Hall, Executive Director, Society of Commercial Seed Technologists, Inc., 101 East State St., #214, Ithaca, NY 14850. 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.

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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.

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

It is always preferred for papers to have references, but some papers based on presentations or workshops may be acceptable without them by prior arrangement with the Editor.

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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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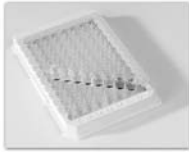
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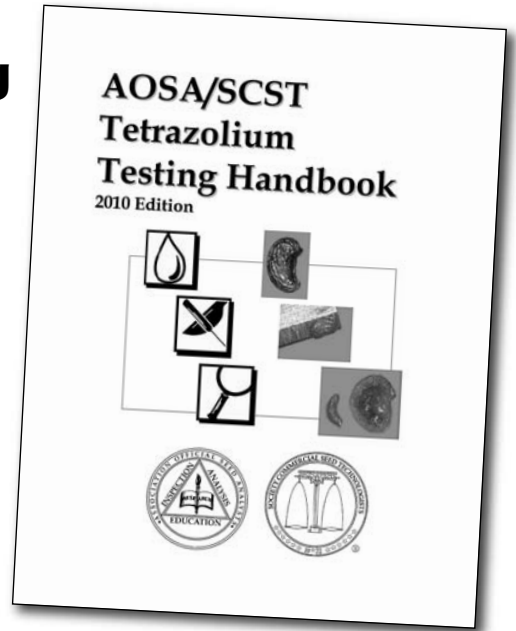


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AOSA/SCST Tetrazolium Testing Handbook

2010 Edition

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A combination of illustrations and photographs are used to describe seed/embryo morphology, preparation/cutting techniques, and TZ staining patterns.

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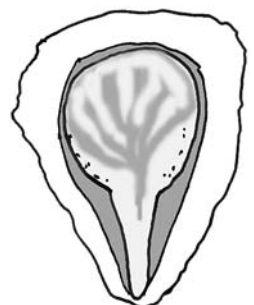
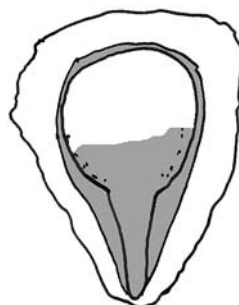
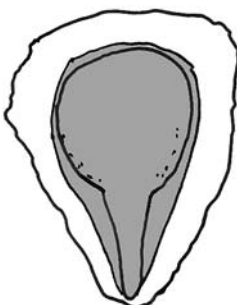
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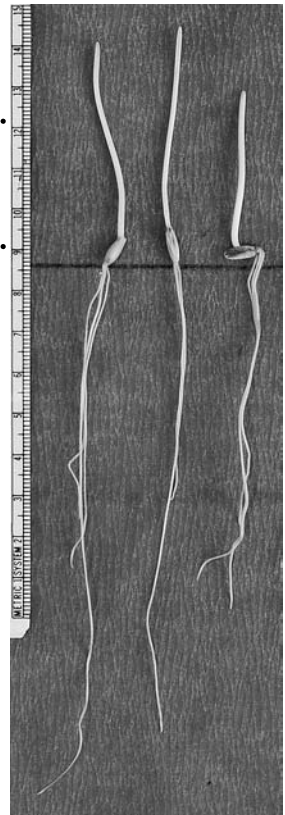
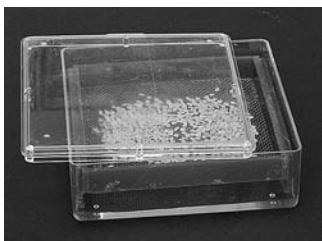
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(CONTINUED FROM Back Cover)

**ABSTRACTS from oral and poster presentations
at the 2012 AOSA/SCST MEETING, Des Moines, Iowa**

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