The Seed Technologist Newsletter

A newsletter for members of AOSA-SCST

Volume 93 No. 1
April 2026

Photo: Quinn Gillespie, Lauritzen Gardens, Omaha, NE

Analyzeseeds.com

Contact by mail:
8918 W 21st St N.
Suite 200 #246
Wichita, KS 67205

Phone: 202-870-2412
AOSA email: aosa@aosaseed.com
SCST email: scst@seedtechnology.net

The Seed Technologist Newsletter

A newsletter for
The Association of Official Seed Analysts and
The Society of Commercial Seed Technologists
March 2026

Volume 93, Issue 1

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AOSA Board of Directors

James Smith, President (2026)
Mississippi State Seed Lab
PO Box 5207
Mississippi State, MS 39762
Email: JamesS@mdac.ms.gov
Phone: (662) 325-3993

Emily Lapinel, Board Member (2026)
New York State Department of Agriculture & Markets
6 Harriman Campus Road
Albany, NY 12206
Email: emily.lapinel@agriculture.ny.gov
Phone: (518) 457-4035

Leanna Leach, Board Member (2027)
South Carolina Department of Agriculture
123 Ballard Court
West Columbia, SC 29172
Email: lleach@scda.sc.gov
Phone: (803) 939-5758

Jenny Hall, Board Member (2027)
Georgia Department of Agriculture Seed Division
3150 U.S. Hwy 41 South
Tifton Georgia 31793
Email: jenny.hall@agr.georgia.gov
Phone: (229) 386-3151

Nishit Patel, Secretary-Treasurer (2027)
Pennsylvania Department of Agriculture
Bureau of Plant Industry
2301 North Cameron St.
Harrisburg, PA 17110
Email: nishpatel@pa.gov
Phone: (717) 772-5534

Diandra Viner (2026)
Minnesota Department of Agriculture
601 Robert Street North
St. Paul, MN 55155
Email: diandra.viner@state.mn.us
Phone: (651) 201-6450

Victor Vankus, Board Member (2026)
USDA Forest Service
5675 Riggins Mill Rd.
Dry Branch, GA 31020
Email: victor.vankus@usda.gov
Phone: (478) 751-3551

Kathy Mathiason, Board Member (2027)
SDSU Seed Testing Lab
Seed Tech 124, Box 2207-A
Brookings South Dakota 57007
Email: katherine.mathiason@sdstate.edu
Phone: (605) 688-6636

Leanne Duncan, Board Member (2027)
CFIA Saskatoon Laboratory, Seed Science & Technology Section
301-421 Downey Rd.
Saskatoon Saskatchewan S7N 4L8
Email: leanne.duncan@inspection.gc.ca
Phone: 306-385-4858

Lan Chi Trinh, Ex-Officio Board member
USDA, AMS, S&T, Seed Regulatory & Testing Division
801 Summit Crossing Place Suite C
Gastonia North Carolina 28054
Email: lan-chin.trinh@usda.gov
Phone: (704) 810-7272

SCST Board of Directors

Quinn Gillespie, President (2027)
Universal Seed LLC
3465 Independence Hwy
Independence, OR 97351
Email: qgillespie@universalseed.com
Phone: (360) 335-6707

Brad Johnson, Vice President (2027)
Bayer
460 E Adams St
Waterman Illinois 60556
Email: bradley.johnson@bayer.com
Phone: 815-786-5865

Molly Richeson, Director-at-Large (2026)
AgReliant Genetics
418 N. Jefferson St.
Brimfield, IL 61517
Email: molly.richeson@agreliant.com
Phone: (309) 446-9830

Marija Topic, Director-at-Large (2026)
Crookham Company, Inc.
301 Warehouse Ave
Caldwell, ID 83605
Email: marijat@crookham.com
Phone: (208) 459-7451

Nicolette Rusch, Director-at-Large (2027)
Eurofins BioDiagnostics, Inc.
507 Highland Dr.
River Falls, WI 54022
Email: nicolette.rusch@genomics.eurofinsus.com
Phone: (715) 4260-246

Emily Morrison (2028)
Indiana Crop Improvement Association
7700 Stockwell Road
Lafayette Indiana 47909
Email: morrison@indianacrop.org
Phone: (866) 899-2518

Morgan Webb (2028)
Seed Check Technologies Inc.
101, 5906-50 Street
Leduc Alberta T9E 0R6
Email: morgan@seedcheck.net
Phone: (780) 974-3493

AOSA & SCST Editors

AOSA Editor

Kathryn McGinnis, Botanist
USDA, AMS, S&T, Seed Regulatory and Testing Division
LPS Program, AMS-USDA Testing Section
801 Summit Crossing Place, Suite C Gastonia, North Carolina 28054
Kathryn.McGinnis@usda.gov

SCST Editor

Quinn Gillespie, RST
Universal Seed LLC
3465 Independence Hwy, Independence OR, 97351
quinn.f.gillespie@gmail.com

Communications & Publications Committee & Newsletter Contributors

Editorial Group

Scottie Pouliot
Tammy Stark
Sarah Schulthies
Lauren Bogi
Maggie Risher

Technical Publication Group
Ruojing Wang
Eunsoo Choe
Steve Jones

Historical Documents Group
Steve Jones
Kaitlin Korn
Scottie Pouliot
Tammy Stark
Carolyn Langley

Communications and Publications Committee Members
Laura Donaldson
Diandra Viner
Victor Vankus
Brooke Malotte

Affiliate Outreach Group
Tammy Stark – ASTA Communications
Yoana Uzunova – ISTA Marketing
Lan Chi Trinh – USDA-AMS

Contributors
Diandra Viner
Quinn Gillespie
NW Seed Analyst Group
OSA
Brent Reschly
Leanne Duncan
Sarah Graybill
Nish Patel
Morgan Webb
Eunsoo Choe
Chi Trinh
Bridget Westfall
AOSCA
Kaitlyn Crawford – ASTA
Gil Waibel

Newsletter Submission Guidelines

Articles should be typed, pertaining to some aspect of seed testing or other items of interest to the AOSA and SCST membership. These may include, but are not limited to:

Ongoing research

Committee and Working Group activity

Updates on the financial state of the organizations

Distinguished member profiles

Profiles of new members to the organizations.

Research paper abstracts

Results of research, referees, and validation studies

Upcoming changes to the AOSA Rules

Survey study results

Information from other seed-trade organizations

Regional updates to state seed laws or RUSSL

Information on upcoming workshops or other opportunities for training

Book and resource reviews

Impressions from the Annual Meeting

Formatting:

Please include images as **separate** files, with credit to the photographer if different than the author. All images used will be credited.

For specific formatting within a document, please do not insert images, but leave a placeholder so that the editorial staff can include appropriate images, graphics, and tables within articles.

Please do not submit PDFs of articles.

Citations:

Cite image sources and references used.

Cite any additional sources used to compose the article, including co-authors so that they may be credited.

Author's name and contact information to be included in our contributor's page.

Publications must be in accordance with the Anti-trust policy of the AOSA- SCST.

Calendar of Events

April

OECD Forest Seeds TWG *Poland*	April 28-29, 2026
ISU Seed Analyst Short Course - Germination *Ames, IA*	April 27-20, 2026
OSA/NW Seed Analysts Cool Season Grass Workshop *Salem, OR*	April 27 – May 1, 2026

May

Deadline for Merger Vote!	May 1, 2026
ISU Seed Analyst Short Course – Purity *Ames, IA*	May 4-7, 2026
Purity Practical Examination (in person) *Ames, IA*	May 8
Purity Written Examination *Virtual online*	May 11, 2026
Germination Written and Practical Examination *Virtual online*	May 12, 2026
ISF World Seed Congress *Lisbon, Portugal*	May 16-28, 2026

June

AOSA/SCST Annual Meeting *Rochester, NY*	June 6-11, 2026
ASTA Leadership Summit Milwaukee, WI	June 9, 2026
ISTA Workshop on Seed Health Testing *Edmonton, AB, Canada*	June 15-17, 2026
AOSCA Annual Meeting *Golden, CO*	June 15 – 18, 2026
OECD Annual Meeting *Paris France*	June 15 – 19, 2026
ISTA Workshop on Seed Identification Resources *Edmonton, AB, Canada*	June 16-18, 2026
ISTA Annual Meeting *Calgary, AB, Canada*	June 22-25, 2026

July

AASCO Annual Meeting *Minneapolis, MN*	July 14-16, 2026

August

ABRATES Congress *Foz do Iguaçu, Brazil*	August 25-28. 2026

September

ISF Forest Meeting *Galicia, Spain*	September 08-11, 2026

October

OECD Forest Seeds TWG *Paris, France*	October 6-7, 2026
ISTA Workshop: Imaging Technologies for Seed Testing *Buenos Aires, Argentina*	October 20-22, 2026

From AOSA and SCST Leadership

Quinn Gillespie, SCST President

The past year has been one of a lot of major projects slowly coming to fruition. The analogy I use, as someone who grew up around boats, is that a lot of these are like turning a ferry or sailboat. We take a long time to come about, but once we've turned, we're ready to pick up the pace and get moving.

I feel like that is where a lot of our work has come to in 2026. Ballots are currently out for members to vote on approving the merger between AOSA and SCST. And while there have been a lot of webinars, emails, and meetings about the merger in the past year, we would be remiss if we didn't acknowledge that some of the earliest mentions of a possible unified North American seed testing association started back in the early 2000s. We have made a tremendous amount of progress in three years, but this is an idea that has been a long time coming for us and is the result of the hard work of dozens of members over the last twenty years. Thank you to everyone who has participated in consolidation working groups, participated in joining together the committees of AOSA and SCST, worked to develop rules voting procedures that encourage participation from both regulatory labs and private industry, reviewed constitutions and bylaws, and has provided feedback getting us to this point.

The examination committee has also seen some major changes over the past year, with the implementation of online written exams for purity and germination, and online practical exams for germination. Travel costs and stress can be a serious hinderance to those preparing for the exam, and this is a big step forward in making sure that the exam remains accessible to everyone who has put in the hard work to qualify and prepare for it. Preparing all the questions and learning the ins and outs of the exam platform has also been no small feat. The success of our first online exam is a feather in the cap of everyone involved.

We have also been working with a developer to produce a custom website portal for the membership, to streamline our functions and allow for storage of documents and better communication between our members. The original date proposed by the developers was fall of 2025, which has obviously passed. Some of the delays were in programming, some in data integration, some are financial. With the merger vote currently taking place, the boards reviewed the options and the Executive Director consulted with the developer. While the site is prepared to go live, if the merger takes place it will require re-coding portions after the site that have been designed to keep AOSA and SCST as separate entities. Making changes to this after the website is up and running would accrue additional costs that we are trying to avoid by waiting until after we have a decision on the merger so that the site only has to be brought live once. This is another "turning the ship" project that has been in development for several years, and the boards are working to make sure that it is as cost effective and functional as possible.

SCST has also agreed to sponsor a student at the Kansas State University "Feeding Your Future" agricultural camp. This camp connects high school students with opportunities in agricultural careers. As a sponsor, SCST will also have the opportunity to have a table at the career night after the camp to connect with students in person. The board felt this would be a good opportunity to reach students when they are still deciding whether or not to pursue a career in agriculture and provide them with information about seed testing and the seed industry.

Hot Topics at the State and Federal Levels for the Seed Industry

Kaity Crawford, ASTA Marketing and Communications Director

State Update:

ASTA's government affairs team has been busy with the state legislative season. ASTA is currently tracking 66 pieces of legislation across the entire U.S. and working through new regulations in at least four states.

Treated Seed:

ASTA is tracking 35 bills related to treated seed during this legislative season. While many haven't seen movement, seven bills did get a hearing in which ASTA submitted written testimony in opposition. Many of these bills aim to outright ban the sale and/or purchase of treated seeds in their state. Only a few allow for a waiver for growers to utilize, but they must "show their need" to be granted it.

On the regulatory side, New York and Vermont are in the process of crafting their new rules and waivers. The seed industry has major concerns with this particular waiver process as it seems difficult to acquire and get approval. In California, the California Department for Food and Agriculture (CDFA) has proposed rules on including the list of active ingredients (A.I.) used in a seed treatment to seed bags. All bags of seed packaged starting January 1, 2027, must include additional information for each A.I ., including its EPA number, the chemical name, and amount within the treatment.

Right to Farm (Save Seed)

Another big issue hitting the states is the right to "save and exchange seed" that is within the larger topic of right to farm. ASTA has previously worked to create a standard definition for "non-commercial sharing" that is widely used and accepted. In 2025, ASTA took another look at this issue, as it began to pop back up, and crafted amendment language that would include protections around patent laws, intellectual property rights, and contractual obligations.

For more in-depth information on ASTA's state activities, please reach out to ASTA's Director, State Government Affairs, Jordan Gregory at jgregory@betterseed.org.

Federal Update

Amid a time of uncertainty and volatility in Washington, D.C., ASTA continues to engage Congress and the Federal government on a variety of pressing issues that challenge the seed supply chain.

USMCA

The United-States-Mexico-Canada Agreement (USMCA), which enables the tariff free movement of seeds and other products critical to the supply chain, is set for renegotiation this year. The government affairs team has partnered with dozens of like-minded agricultural trade organizations to write letters of support, meet with congressional offices, and call government officials to express support for USMCA. Separately, ASTA staff has testified at public hearings, submitted written comments to government agencies, and wrote statements for the record during congressional hearings explaining the value of the standards on biotechnology and market access that USMCA erects to the seed industry.

Tariffs

The free movement of seeds across international borders is critical for crop production and for the research of plant genetics varieties. However, the tariffs established in 2025 have slashed seed exports and forced companies to pay hefty fees. Now that the Supreme Court has declared those tariffs unconstitutional, ASTA sees an opportunity to call for an exemption from tariffs for seeds, due to their essential role in the agricultural supply chain. The team has engaged with other trade associations, met with congressional staff, and submitted testimony during government agency hearings to advocate for such a policy.

Farm Bill

The Farm Bill is a five-year bill that sets the country's agriculture policy, but Congress has not passed a new version since 2018. The government is using strategies and authorities that are nearly a decade old to address the challenges the agriculture industry is facing today. The ASTA team has called for Congress to pass a new, five-year Farm Bill, and offers its expertise to ensure that legislative proposals would strengthen the seed industry. For example, the Farm Bill proposal that the House Committee on Agriculture passed earlier this month includes a provision that establishes a federal definition for "biostimulants." ASTA staff helped advocate for this language, as well as other sections of the Farm Bill that would update and modernize the way that the Federal government regulates biotech seeds.

To learn more about ASTA's federal affairs activities, please contact Director, Government Affairs, Brandon Pachman at bpachman@betterseed.org.

AOSCA Grass Variety Fluorescence Levels, March 2026

Rebecca Papke, Chair of the Grass Variety review Board

Please note that the VFL list is no longer distributed in PDF format. It is now available as the Ryegrass VFL Index on the AOSCA website at AOSCA.org . Select Variety Review Boards, Ryegrass VFL and VFL Index. The online index is fully searchable and sortable for ease of use. This VFL list accepted as of Mar 23, 2026 is a condensed list; older varieties that have been declared by the owner as no longer in production have been removed. A legacy list of all varieties up until August 12, 2024 have been permanently published on the AOSCA website. Select Variety Review Boards then click on Ryegrass VFL.

If you require a PDF or printed version of the VFL list, you may use the "Print" or "PDF" options available on the website as needed.

Please also be aware that foreign synonyms are only added upon request of the applicant, or if they are found in the Oregon Seed Certification Service's database. We make no claim that the list represents a complete compilation of foreign synonyms.

Click on the corresponding links to view the VFL Memorandum and/or the Ryegrass VFL Index.

VFL Memorandum (March 2026)

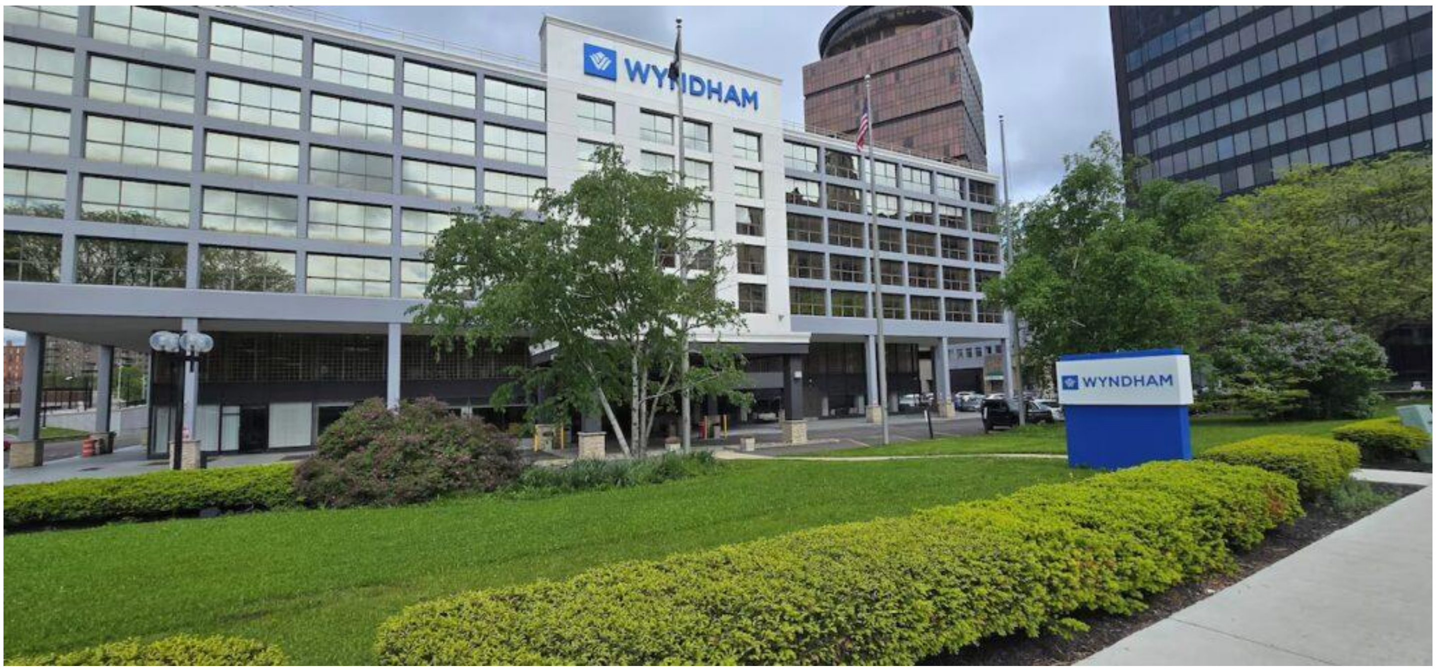
Ryegrass VFL Index – AOSCA

Or Visit:
AOSCA Grass Variety Fluorescence Levels – Analyzeseeds

Thank you for your interest in this report. If you have questions regarding this report, please contact Rebecca Papke, Chair of the Grass Variety Review Board at Ph: 406-994-5121 or email: rebecca.papke@montana.edu

Annual Meeting 2026 – Hotel Information

Thank you to everyone who called attention to confusing messaging on the hotel's website. The previously advertised hotel, the Holiday Inn Rochester – Downtown was purchased by another group. The hotel will be the **Wyndham Rochester Downtown.** The contract signed with AOSA/SCST is being honored and due to the confusion stating that the hotel was closed they have waived our attrition for this booking, which is great news! The hotel is also working to update their images on Google to accurately reflect that they are open, have been remodeled, and are under a new hotel management group. The room block is currently open for registration.



Hotel Address and Contact Information

70 STATE STREET

ROCHESTER, NY 14614

585-371-5456

https://www.wyndhamhotels.com/wyndham/rochester-new-york/wyndham-rochester-downtown/overview

Non Per Diem Reservation Link

Per Diem Reservation Link

Cool Season Grasses Workshop

April 27 – May 1, 2026

Agenda Includes:

Grass Seed PSUs

TZ on 4 species

OSA Seed Labeling Database

Canada Grade Tables XI, XII, XIV & Classification of weeds, coated seeds, and mixes

Fluorescence and RAD testing on Ryegrass

AI in Seed Testing

Tour of Southern Willamette Valley

Ploidy testing of grasses

Approved for 5 Continuing Education Points!

REGISTER ONLINE AT
OREGONSEED.ORG

Get a head start on grass seed identification by reviewing the guide produced for the RST Study Hall on pages 20-27.

Resources: New Wild Species Website

Submitted by Gil Waibel, Ruojing Wang, WSC Committee


Amberboa moschata


Verbesina alternifolia


Sphaeralcea grossularifolia


Euphorbia platyphyllos

We are pleased to announce the new Testing Wild Seeds Website. The address is:

The ISTA Wild Species Committee (WSC) is responsible for developing this website. The committee is comprised of technicians/researchers from ISTA, AOSA, ISTA and the KEW Millenium Seed Bank and research labs.

This ISTA website is free for all to use and there is no subscription needed. The following sections of the website include:

1. **Seed testing protocols** organized by species.
2. **Galleries** of seeds, seedlings and tetrazolium images. Currently, we are focusing on seed images.
3. **Methodology Chapters**
4. **Glossary**

By fall, we plan to finish programming e-submission forms for any analyst or researcher to submit protocols, seed images, seedling images and/or tetrazolium images.

AOSA-SCST Presidential Candidates

If the merger is approved by the membership, voting members of AOSA and SCST will vote for president of AOSA-SCST. Diandra Viner has withdrawn her candidacy for President. AOSA members were asked for nominations. James Smith was willing to accept the nomination.

The candidate who receives the most votes will be president, the second most votes will be vice president. The Bylaws of AOSA-SCST also require the Immediate Past President to serve on the board as an ex-officio member for a period of two years. As a new entity there will not yet be a past president to fill that role. To maintain compliance with the Bylaws, the remaining candidate will function in that role as Immediate Past President. Ballots for president and top three logo selection will be sent out after the merger vote is completed.

Brad Johnson, Bayer Crop Science

Brad Johnson has been working in Seed Quality Testing for 25 years. He worked for AgReliant Genetics for 19 years before moving to Bayer Crop Science to lead their N. American Seed Physiology Lab in Waterman, IL for the last 6 years. He holds both the RST and RGT certifications since 2005 & 2008, respectively. At Bayer, Brad oversees 55 Full time employees along with up to 40 more part-time employees seasonally. Brad served as the Nominations Chair for the SCST, served as the co-chair of the Genetic Technology committee, served as Director at Large, and helped host the AOSA/SCST meetings in both St. Louis in 2010 and in Skokie, IL in 2022. Brad grew up on a farm in west-central Illinois and has always loved agriculture and the outdoors. He earned his BS in Crop Science from the University of Illinois and his MS in Weed Science from Southern Illinois University.

Random fact: he has completed the Missouri River 340 canoe race three times meaning he has paddled 1,020 miles on the Missouri River.

James Smith, Mississippi State Seed Testing Lab

James Smith serves as the current President of the Association of Official Seed Analysts (AOSA) and the Association of American Seed Control Officials (AASCO). He has been an active leader within AOSA for many years, previously serving as Vice President, a member of the Board of Directors, and Chair of the Vigor Committee.

James earned his Bachelor of Science degree in Agronomy from Mississippi State University and became a Registered Seed Technologist in 1991. He currently holds the position of State Seed Analyst and State Seed Control Official for the Mississippi Department of Agriculture and Commerce, where he also oversees the state seed testing laboratory.

With a career spanning nearly four decades, James brings extensive experience across all facets of the seed industry. His background includes seed procurement, storage, operation of conditioning plants, sales, logistics, and regulatory labeling.

Quinn Gillespie, Universal Seed LLC

Quinn serves as the current SCST President. She has worked in seed testing since 2006, starting as seasonal analyst and working for the Oregon State University Vegetable Research Farm as a farmhand and seed cleaner. She obtained her RST in 2012. She has served as SCST Constitution and Bylaws Committee Chair, Referee Committee regional chair and as the current SCST Referee Committee chair. As the SCST Communication and Publications chair she is leading a project to index back issues of the AOSA Newsletter, Seed Technologist News, and the Seed Technologist Newsletter, revived the Seed Technologist Newsletter, and established contacts with other industry organizations to receive regular updates for publication.

Quinn also served as Director at Large from 2016 – 2019. As Vice President and then President of SCST she has worked closely with the consolidation group on the merger and with the organization's legal counsel. Other projects have included drafting procedures for conducting virtual audits of new labs, and working with the consolidation group, committee chairs, and membership to capture necessary procedures in SOPs and policy documents, and working on proposed changes to the AOSA Rules.

Quinn has a Bachelor of Arts in Literature from Whitman College and has also illustrated a children's book. Outside of the lab Quinn enjoys art, concerts, knitting, typewriters, and video games.

Committee Updates

As submitted by Committee Chairs

AOSA Elections Committee

We have received 2 nominations from 2 people for Director at Large positions. James Smith has agreed to accept the nomination as a Presidential candidate of AOSA-SCST.

Communications and Publications Committee

The Communications and Publications Committee met on January 23, 2026. The committee discussed the indexing project. All the SCST Newsletters and AOSA Newsletters and AOSA/SCST Newsletters have been collected as either physical or digital copies, minus a very few that are difficult to track down. There is a running list of who has volunteered to help with indexing, starting with the SCST Newsletters. The committee received a request from the Chicago Botanic Garden for an article published in the Newsletter in the 1980s. Quinn was able to find a physical copy of the article and scan it for the requester.

The Committee decided to change the fall deadline for the Newsletter to October 1. The Newsletter will still be published in November; the change was made to allow for more editing time during the busy fall season. We will work to maintain the 3 issues per year schedule, with a November publication, April publication, and a late May/Early June publication as a special Annual Meeting issue as there was very positive feedback about the Annual Meeting issue last year. The Committee also discussed possible perennial topics for the Newsletter, including Rules, workshops, new Registered and Certified Members, and the Annual Meeting. It was discussed that publishing ID guides and seed testing vocabulary games may help the committee meet our training requirements as a committee.

For additional topical articles, updates from other organizations were suggested, including Seeds Canada, as well as RAD testing, and AI use in the seed industry. Steve Jones mentioned that ISTA has a position paper on advanced technology and it would be good for us to align with the global industry.

With Publisher being sunset by Microsoft, the committee is looking at alternatives. The current issue is being formatted in Word, which may turn out to be the best option.

Consolidated Exam Committee

The Consolidated Exam Committee has been actively preparing for the Purity and Germination examinations scheduled for May 2026. With the transition to a virtual format for both the Germination examination and the Purity written examination, the only component remaining in person is the Purity practical examination. Applications are still under review; however, the Purity examination has reached capacity.

The committee has also completed updates to several key documents, including:

- Seed Identification List
- Exam Application
- Re-examination Application

Planning is underway for a fall examination session in August, with a practical exam currently scheduled to be offered in Gastonia and potentially at additional locations. Please watch for formal announcements in the coming months. Candidates interested in the Purity examination are encouraged to submit their applications early, as this exam consistently fills quickly.

For individuals currently preparing for an examination or considering applying in the future, the committee recommends compiling application materials throughout the training process. Candidates should retain screenshots documenting webinar completion, as well as scanned copies of seed schools and other relevant coursework. Maintaining training records is the responsibility of each candidate, and these materials must be submitted at the time of application.

The committee is also seeking Certified Seed Analysts (CSA) and Registered Seed Technologists (RST) who are interested in contributing to committee activities.

If you have questions about the committee or upcoming examinations, please contact Sarah Graybill (SCST) or Leanne Duncan (AOSA).

Cultivar Purity Committee

The cultivar purity committee has drafted an SOP on how to conduct referee studies to add new methods to the cultivar purity handbook. Members wanting to review the SOP or join the committee should contact Diandra Viner.

Flower Seed Committee

Kathy Mathiason has stepped down as AOSA co-chair for the Flower Seed Committee. Miranda Klemann from Applewood Seed has been appointed co-chair.

The committee has paused identifying an AOSA co-chair until after the merger vote.

Genetic Technology Committee

Every two years, the Genetic Technology committee presents our most anticipated training event: the Genetics Superworkshop. Our 2026 edition continued this tradition at Iowa State University, drawing nine attendees, one of which took the RGT exam. Participants rotated through a series of foundational subjects designed to strengthen both conceptual understanding and practical laboratory technique including Molecular Genetics, Herbicide Bioassay, ELISA, Electrophoresis, and PCR. Each subject blended instruction, demonstration, and guided hands-on opportunities to give attendees the chance to work directly with techniques commonly used in the industry. The workshop finished off by crowning a new Jeopardy champion for this year: Chelsea Riley from Illinois Crop Improvement.

After expenses, the workshop netted $1903.04 for SCST and also provided CE points for every attendee and speaker. Feedback was generally positive especially where it concerned hands-on activities and food and also included suggestions for more intense and longer days, later start time on Monday to allow for travel time, and adding a red trophy for negative Jeopardy values.

The Genetic Technology committee would like to extend our heartfelt gratitude to every speaker, organizer, and attendee that made another Genetics Superworkshop possible.

For photos of the Genetic Technology Superworkshop, see page 23.

Proficiency Testing Committee

The proficiency results for the written exam on the AOSA Rules, Canada M&P, and Federal Seed Act have been sent to the membership. The overall results were very high, with an overall average of 98% across all accredited and non-accredited individuals. All participants received passing scores of 80% or higher.

The upcoming 2026-2027 planned proficiencies are:

Mid-Summer/Fall 2026: Written exam on sampling and dividing.

Winter/Early Spring 2027: Virtual exam of borderline seedlings.

The Proficiency Committee would like to take this opportunity to solicit photos of borderline seedlings in germination tests. Please send photos to Heidi Arneson or Jeanna Mueller if you have good quality photos of borderline seedlings.

Analysts are also reminded to keep an eye out for future proficiency testing requirement updates as the possible merger process progresses.

The full overview of the proficiency test results can be viewed here: Written Proficiency - 2026

Purity Committee

Debbie Meyer stepped down as the SCST purity chair, we thank her for all the guidance and direction she has given over the years to the committee and analysts for both AOSA and SCST. She remains an active member of the committee and her willingness to do so is greatly appreciated.

Morgan Webb has graciously agreed to be the new SCST purity chair. Morgan has vast experience in purity and brings great knowledge. You can check out Morgan frequently on Facebook where he posts helpful and fun videos on seed testing. The committee appreciates him for stepping up.

The committee has one active project: The Common Names Project, which they will be actively working on more frequently this coming year.

Referee Committee

The Referee Committee met on February 9, 2026, to discuss referees for the year 2025-2026. The following studies have been in process this year: Canola, top of paper, organized by Nicolette Rusch; Illinois Seed Trade, to be presented by Tammy Stark; Poa secunda germination, organized by the CRTS committee with Randy Crowl and Jack Lempke; Sorghum-sudangrass media study referee, organized by Tyann Alexander; Thlaspi arvense germination study, organized by Melissa Phillips; a study comparing white blotter to white filter paper and conducting the fluorescence test in *Lolium spp.* using KNO3 in addition to distilled water conducted by Diandra Viner, and studies on mechanically damaged soybeans, organized by Eunsoo Choe. During the discussion of projects guidance was requested regarding sending seed from the US into Canada for referee testing. Some organizations have success with sending seed direct to CFIA and then having them distribute it once it arrives in Canada. In other cases, the shipping agent may also function as a broker. Nicolette Rusch will work on a guidance document to ensure our Canadian members are able to participate in referees and receive samples.

Several other topics were suggested for upcoming referees. At the Saskatoon meeting in 2023 Moses Palmer had expressed an interest in comparing pea germination with field emergence. Sharon Davidson has also shared images of abnormal pea seedlings which could be incorrectly called normal if evaluated too early. There may be room for study and a possible rule proposal to add a note in Volume 4 cautioning analysts against reading samples too early. Quinn Gillespie and Barbara Cleave are working on collecting seed counts on coriander mericarps, with the goal of determining an appropriate weight for *Coriandrum sativum* samples which are identified as "splits" or mericarp-only samples. Ten lots have been collected so far, but more data will be helpful as this is a commonly produced crop. Other topics mentioned were the possible addition of pleated paper as a method for uncoated *Beta vulgaris*, a virtual referee on beets comparing 4 vs. 7 day seedlings, large-seeded cucurbits which may need 10 days for complete germination, studies comparing soybean mechanical damage comparing 7 and 12 day seedlings, germination issues in FarMore treated cucurbits, and an ongoing project to determine a method for evaluation of mechanical damage in onion seedlings. A study on hollow tips in sweet corn is being designed, to compare leaf extending halfway into the coleoptiles in sweet corn, popcorn, ornamental corn and field corn to determine if hollow tips can be considered normal seedlings.

The committee also discussed the new structure of the committee, removing regions from the required structure, and how that may affect the Buzz session layout. Rather than splitting into regions, the discussion will remain as a large group, with a list of topics in discussion presented and time for members to discuss and suggest new topics. The goal is to have a larger group discussion across regions.

The committee also discussed potential updates to the referee guidelines, to maintain consistency with possible updates to the Rule Proposal guidelines.

The meeting closed with discussion of the merger and combining research, referee, and statistics into a single committee. The referee committee chair also met with the chairs of the research and statistics committees to discuss what this may look like. For the present, it was determined to keep a method validation and training working group, statistics working group, and independent research and outreach group, although this structure may change as committees develop into new roles in the organization.

Research Committee

The chairs of the Referee Committee, Statistics Committee, and Research Committee met February 25, 2026, to discuss the anticipated merger of these three committees under a single Research Committee and to outline how a unified structure could operate effectively. All three committees have overlapping responsibilities and are likely to retain independent working groups covering topics of method development/referee studies, statistics, and scientific outreach.

There is a need to harmonize requirements and expectations for research studies, statistical analysis, and method validation. The committee would like to emphasize use of best scientific practices, including multi-year data collection, varied seed qualities, and attention to environmental/storage effects.

A workshop on Statistics focusing on data analysis and AI use in statistical analysis was proposed. There may also be supplemental webinars for continued learning. No structural changes to the meeting agenda are proposed for the meeting in Rochester, the research paper, referee, and buzz sessions will remain separate. The new Bylaws would allow for more flexible structural adjustments in the future.

Following the meeting, there was additional discussion carried out over email with the general consensus being that the technical committees should more directly oversee research pertaining to their specific committees and that the separate research committee may be phased out as technical committees take on more of this task. The Statistics committee would remain a standalone committee to develop statistical tools in collaboration with and developing calculators for different purposes. An invitation is also going to be extended to a Seed Biologist at Cornell to attend the annual meeting in Rochester and share research with the group.

Rules Committee

The Rules Committee reviewed ten proposed changes to the AOSA Rules and seven were approved to move forward to a vote by the membership. There was also one editorial change noted by a member which will be made to correct a rounding error in one of the examples which is also published here along with the proposed changes to the Rules.

The Rules Committee would also like to invite members to attend the Open Rules discussion at the Annual Meeting, which will be a brief overview of the Rule proposals followed by a round-table discussion about rule proposals and their requirements with the goal of improving the Rule Proposal Guidelines.

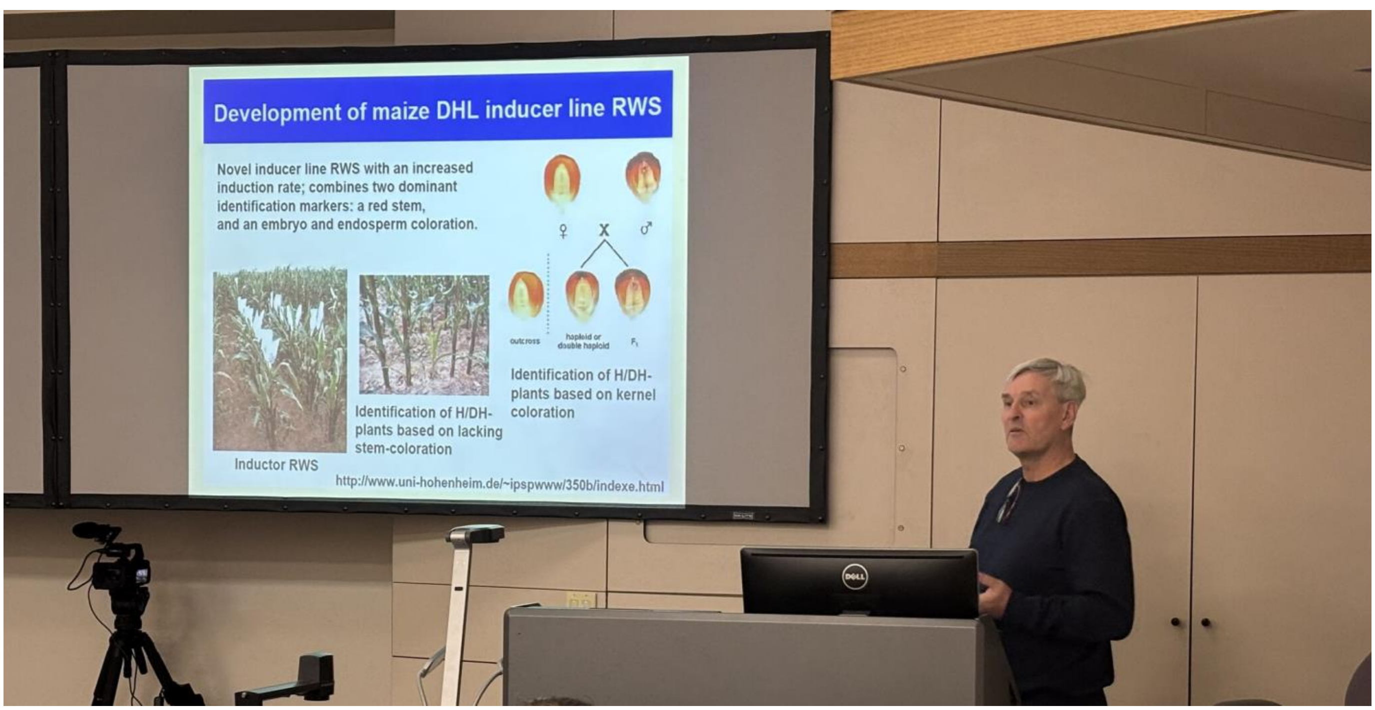
Tetrazolium Committee

The TZ Committee met in January to identify new opportunities for collaboration and training. The group outlined several promising projects, including:

- Submitting photos to the AOSA/SCST Newsletter with explanations of viability and the methods used
- Hosting live webinars to demonstrate cutting techniques on different species, allowing participants to request alternative cutting methods in real time
- Exploring the use of recorded cutting videos that could be shared during the annual meeting.

Photos: Genetic Technology Superworkshop

Brent Reschly, RST, Syngenta




NIKE


Champion
SALEM

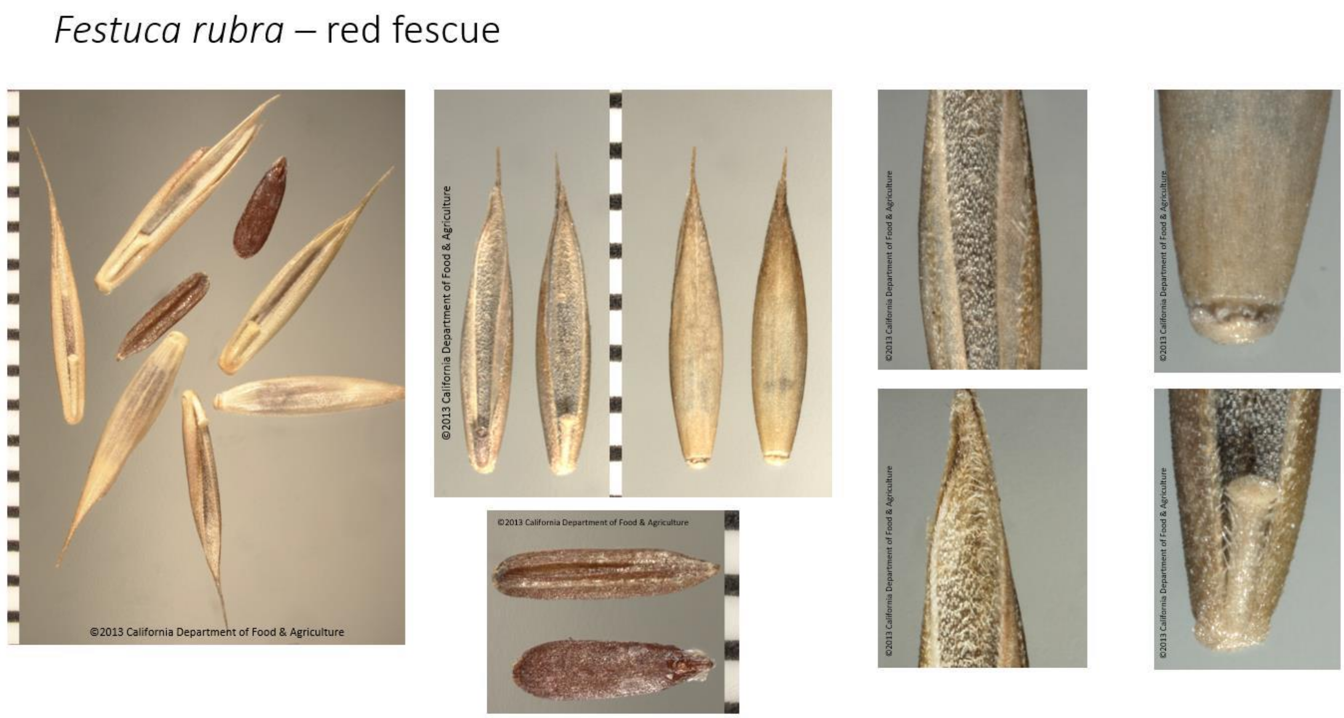
Festuca spp., Lolium spp., Carex spp. Identification Tips

Submitted by Diandra Viner, from the Teaching and Training Committee Study Hall

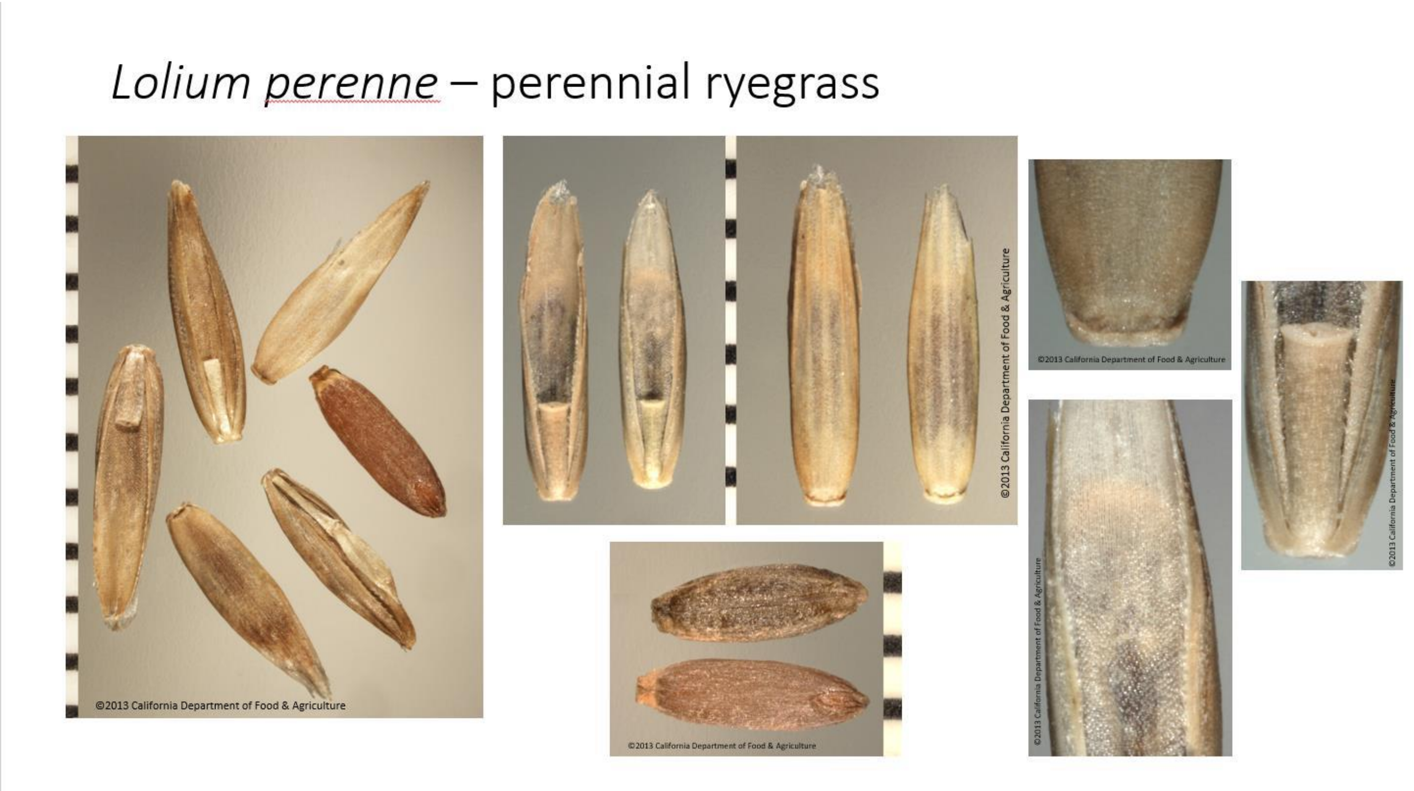
Festuca arundinacea - tall fescue

FLORET
General shape: lance-shaped, widest near mid-point, dorsal-ventrally compressed
Size: 5.0 – 9.0 (11.5) mm long x 1.5 – 1.75 mm wide
Color: straw color to light brown, sometimes green or purple tinged
Lemma: papery and coarsely granular with short stiff hairs near margins, veins, and near apex
Palea: papery and coarsely granular; +/- same length as lemma, with short stiff hairs along the keels
Callus: blunt, thick, often with an indentation on upper edge
Awn: up to 4.0 mm long
Rachilla: slender, round in cross-section with slightly flared disk at apex
CARYOPSIS
Shape: oblong, oval, or ovate, dorsal-ventrally compressed
Size: 2.0 – 4.0 mm long x 0.9 x 1.6 mm wide
Color: brown, sometimes with purplish tinge
Texture: smooth to slightly rough
Embryo: ⅕ - ⅓ the length of caryopsis

Endosperm: solid
Hilum: linear, located in a longitudinal depression
Description based on Meyer (2021) and other sources listed under references. Images by D. Meyer and J. Effenberger



FLORET
Shape: lance-shaped, widest near mid-point, dorsal-ventrally compressed
Size: 4.0 – 9.0 mm long x 1.0 – 1.5 mm wide
Color: straw color to light brown with green or purple tinge
Lemma: papery and smooth, glabrous or with short stiff or soft hairs near apex
Palea: papery, coarsely granular, slightly shorter than lemma, with short stiff hairs along the keels and short soft hairs near apex
Callus: blunt and thick
Awn: up to 4.5 mm long
Rachilla: slender, round in cross-section with flared disk at apex, +/- covered with short hairs
CARYOPSIS
Shape: narrowly oblong, oval, or obovate, dorsal-ventrally compressed
Size: 2.5 – 4.0 mm long x 1.0 – 1.5 mm wide
Color: reddish-brown, sometimes with purplish tinge
Texture: smooth to slightly rough, lemma and/or palea may be adherent
Embryo: ⅕ - ⅓ the length of caryopsis
Endosperm: solid
Hilum: linear, nearly as long as caryopsis, located in longitudinal depression
Description based on Meyer (2021) and other sources listed under references. Images by D. Meyer and J. Effenberger



FLORET
Shape: oblong (sides mostly parallel the entire length) to lance-shaped, dorsal-ventrally compressed
Size: 3.5 – 9.0 mm long x 0.8 – 2.0 mm wide
Color: straw color, sometimes with greenish tinge
Lemma: papery and smooth, glabrous or with short stiff hairs near margins and apex
Palea: papery, +/- equal in length to lemma, coarsely granular in lower half transitioning to smooth and lustrous in upper half, with short stiff hairs along keels
Callus: blunt, narrow, glabrous
Awn: if present, short, straight, and attached slightly below apex
Rachilla: glabrous or with short hairs, flat, wide, strap-like, apex usually not expanded
CARYOPSIS
Shape: dorsal-ventrally compressed, mostly oblong or elliptic
Size: (2.0) 3.0 – 5.5 mm long x 0.7 – 1.5 mm wide
Color: light to reddish-brown
Texture: smooth to slightly rough
Embryo: ⅕ - ⅓ the length of caryopsis
Endosperm: solid
Hilum: linear, nearly as long as caryopsis
Description based on Meyer (2021) and other sources listed under references. Images by D. Meyer and J. Effenberger.

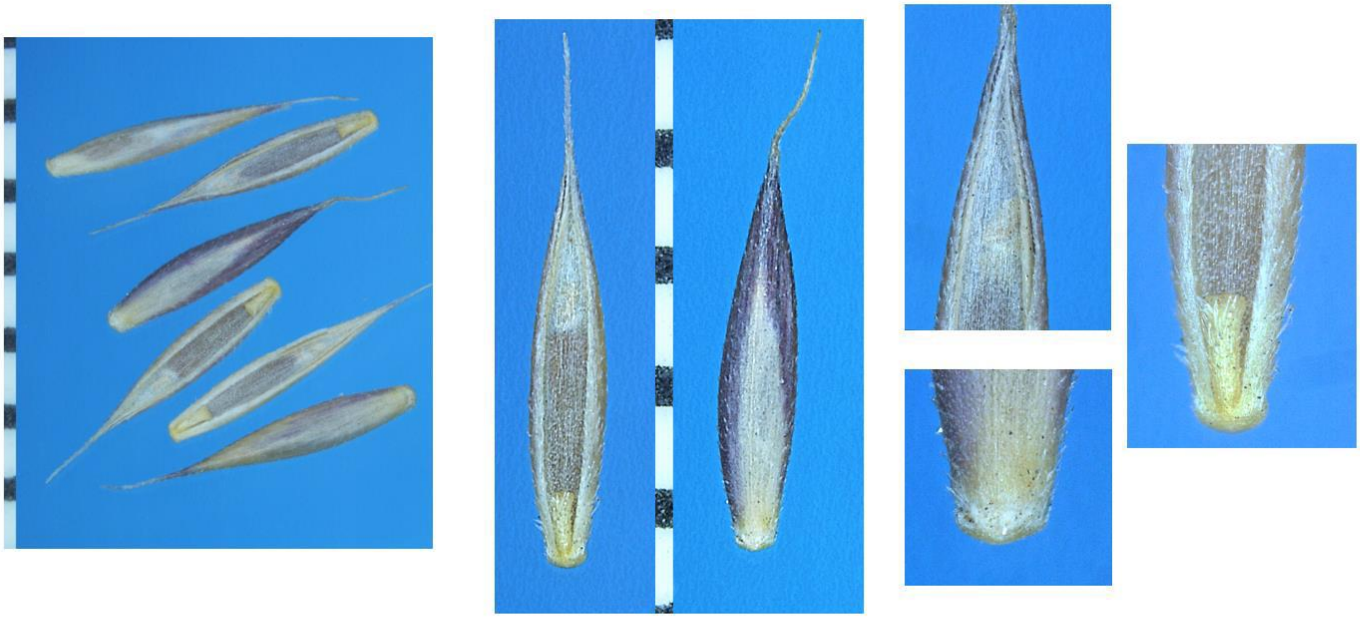
Lolium temulentum - darnel

FLORET
Shape: lance-shaped to oval, not strongly dorsal-ventrally flattened - in lateral view, lemma side (dorsal) mostly flat, while palea side (ventral) arched (thickest near mid-point)
Size: 4.5 – 8.5 mm long x 1.5 – 3.5 mm wide
Color: straw color
Lemma: papery and smooth, glabrous or with a few short stiff hairs near apex
Palea: papery, slightly shorter, or longer than lemma, often transversely wrinkled, surface coarsely granular in lower two-thirds transitioning to smooth and lustrous in upper one-third, keels with short, stiff, blunt, or pointed hairs
Callus: blunt, narrow, glabrous; lemma indented above callus
Awn: up to 23 mm long, attached below tip of lemma, stout, broad base, short stiff hairs along awn margins
Rachilla: broad, flat, strap-like, apex not expanded, mostly glabrous
CARYOPSIS
Shape: oval, dorsal-ventrally compressed
Size: (3.8) 4.0 – 7.0 mm long x (1) 1.5 – 3.0 mm wide
Color: reddish-brown
Texture: smooth to slightly rough
Embryo: ¼ the length of caryopsis
Endosperm: solid
Hilum: linear
Images and description by D. Meyer (measurements based on Barkworth et al., 2007).

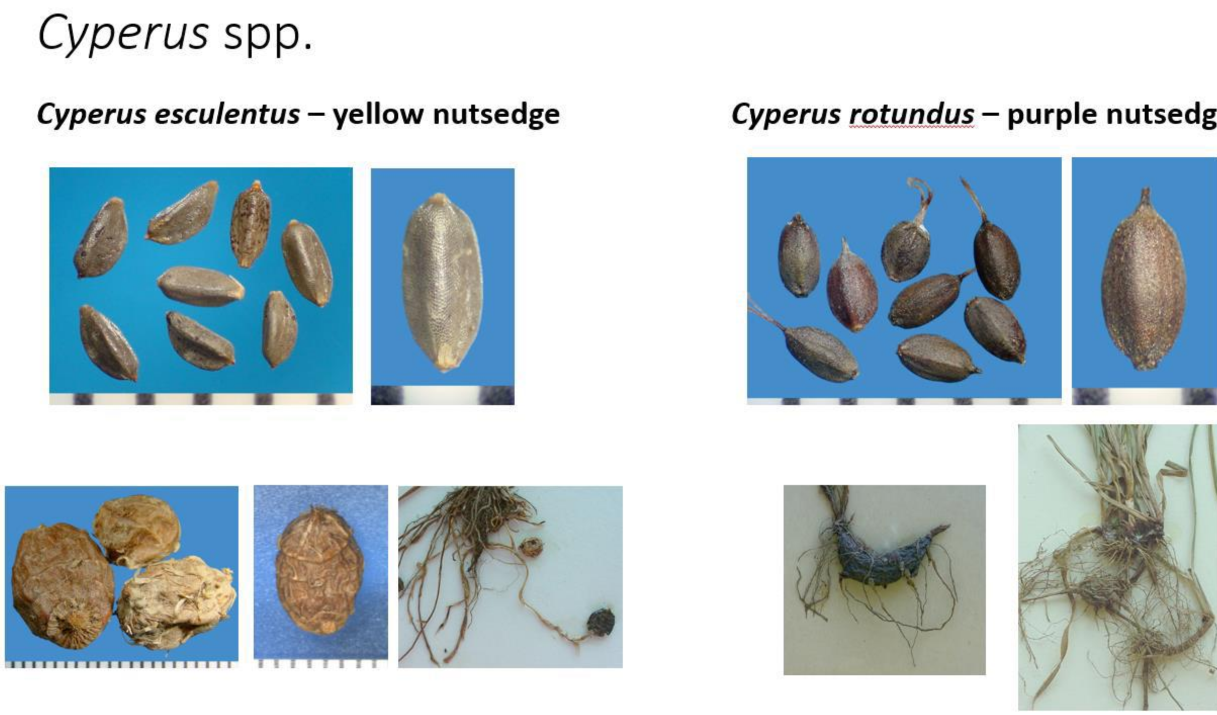
Vulpia myuros – rattail fescue

FLORET
Shape: narrowly lance-shaped
Size: 4.5 – 7.5 mm long x 0.4 – 0.6 (0.8) mm wide
Color: pale straw colored, +/- with purple tinge
Lemma: thin and papery, 5-veined, tapered into terminal awn, covered with short stiff hairs, and margins on upper half glabrous or with long ciliate hairs
Palea: membranous, +/- translucent, +/- equal to lemma length
Awn: 5.0 – 22.0 mm long
Callus: pointed and glabrous
Rachilla: thin cylindrical, generally 0.75 – 1.0 mm long, covered with very short stiff hairs
CARYOPSIS
Shape: narrowly linear or spindle-shaped, dorsal-ventrally compressed, with deep longitudinal depression on palea (ventral) side
Size: 3.0 – 5.0 mm long x 0.4 – 0.6 (0.8) mm wide
Color: brown
Texture: smooth and glabrous, the lemma and palea +/- adherent
Embryo: ⅛ the length of the caryopsis
Endosperm: solid
Hilum: linear, ⅔ – ¾ the length of the caryopsis, located in a longitudinal depression
Description based on Meyer (2021) and other sources listed under references. Images by D. Meyer and J. Effenberger. Description encompasses both forms of the species: V. m. forma megalura and V. m. forma myuros.

Vulpia octoflora – six-weeks fescue



FLORET
Shape: lance-shaped, widest near mid-point, dorsal-ventrally compressed
Size: 2.7 – 6.5 mm long
Color: straw color to light brown with purple tinge
Lemma: thin and papery, pubescent in upper one-third, glabrous or sparsely pubescent in lower two-thirds
Palea: thin and papery, semi-transparent (dark caryopsis visible through palea), slightly shorter than lemma, +/- hairy at apex, keels with short stiff to long pointed hairs
Callus: blunt, narrow, or slightly puffy
Awn: 0.3 – 9.0 mm long
Rachilla: slender, round in cross-section with flared disk at apex, +/- covered with short hairs, straw color to purple
CARYOPSIS
Shape: narrowly oblong, dorsal-ventrally compressed
Size: 1.7 – 3.7 mm long
Color: reddish-brown
Texture: smooth to slightly rough, lemma and/or palea may be adherent
Embryo: 1/6 the length of caryopsis
Endosperm: solid
Hilum: linear, one-half the length of caryopsis
Images and description by D. Meyer (measurements based on Barkworth et al., 2007, and encompasses all three varieties, V. o. var. glauca, V. o. var. hirtella, and V. o. var. octoflora).



Cyperus esculentus

Achenes oblong, three-sided (triangular in cross-section, angles rounded), sides +/- equal in width, 1.0-1.5 mm long x 0.5-0.75 mm wide, light brown to amber, somewhat glossy, surface texture finely reticulate to bubbly. Embryo in lower quarter of achene, surrounded by mealy endosperm.

Rhizomes terminate with tubers (short, swollen, underground stem) that are irregularly round, 0.3-1.5 cm in diameter, brown to black, hard, smooth when fresh (hydrated) becoming wrinkled when dried. Scaly at nodes, but buds usually only at apex. Edible, almond flavored.

Cyperus rotundus

Achenes oval, three-sided (triangular in cross-section, angles rounded), one side slightly wider than the other two, 1.5-2.0 mm long x 1.5 mm wide, dark grayish brown to nearly black, dull, surface texture finely reticulate to bubbly. Embryo in lower quarter of achene, surrounded by mealy endosperm.

Rhizomes develop chains of several tubers that are irregularly shaped to oblong or nearly round, up to 2.5 cm long and usually less than 1 cm in diameter. Buds scattered over entire surface. Bitter flavored.

Descriptions by D. Meyer based on DiTomaso and Healy (2007) and Musil (1963). Images by D. Meyer.

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AOSA Rule Proposals - 2026

As submitted by the AOSA Rules Committee

#	Purpose	Author
1	To add TB to the list of substrata for Ocimum basilicum.	Nicolette Rusch, RST Eurofins Biodiagnostics
2	Clarification to section 5.2.b.2. of the rules and correcting "Example 8, Mixture of annual and perennial ryegrass".	Dr. Sabry Elias, Oregon State University Adam Schrankler, Minnesota Department of Agriculture
3	To change the abbreviation (symbol) of the substrate for "Between Blotters" in Table 6A from "B" to a more intuitive abbreviation of "BB"	Adam Schrankler Minnesota Department of Agriculture
4	To add Field Pennycress *(Thlaspi arvense)* purity weights into the AOSA Rules Volume 1.	Melissa Phillips, RST/ CGT Bayer Crop Science
5	To amend the contaminating classification for Field Pennycress *(Thlaspi arvense)* in the AOSA Rules Volume 3.	Melissa Phillips, RST/ CGT Bayer Crop Science
6	To provide guidelines for adding and updating nomenclature and common name in the Rules.	Lan Chi Trinh, USDA Seed Regulatory and Testing Division
7	To modify germination condition of canarygrass (Phalaris canariensis).	Lei Ren and Julie Lu, Seed Science and Technology Section, CFIA
Editorial	Correction to example for calculating purity percentages when performing a 400, 800, or 1000 count seed separation of similar species.	AOSA Rules Committee

AOSA Rule Proposal #1

1. **Purpose of Proposal**: To add Top of Blotters to the list of substrata to be available to use for planting Sweet Basil (*Ocimum basilicum*).

2. **Present Rule:**

Table 6A. Methods of Testing for Laboratory Germination

Kind of Seed	Substrata[a]	Temperature (°C)	First Count (Days)	Final Count (Days)	Specific Requirements and Notes	Dormant Seed[f]
Ocimum basilicum Sweet Basil	B, T	20-30		14	KNO_3. Make first count when necessary or desirable.	

3. **Proposed Rule:**

Table 6A. Methods of Testing for Laboratory Germination

Kind of Seed	Substrata[a]	Temperature (°C)	First Count (Days)	Final Count (Days)	Specific Requirements and Notes	Dormant Seed[f]
Ocimum basilicum Sweet Basil	B, T, **TB**	20-30		14	KNO_3. Make first count when necessary or desirable.	

4. **Harmonization and Impact Statement:**

There are no current methods present for *Ocimum basilicum* in the Canadian Methods and Procedures. This rules proposal aligns with current ISTA Methods of TP.

Table 5A. Part 1. Detailed Methods for Germination Tests: Seeds of Agricultural, Vegetable, Flower, Spice, Herb, and Medicinal Species (Continued).

Species	Substrate	Temperature (°C)	First Count (D)	Final Count (D)	Recommendations for Breaking Dormancy	Additional Directions	Additional Advice	Seedling Evaluation Group
Ocimum basilicum	TP	20-30	4	14	KNO_3	-	-	A-2-1-1-1

Definition of Substrate:

TP: The seeds are germinated on top of one or more layers of paper which are placed:

- *on the Jacobsen apparatus (5.5.3.1);*
- *into transparent boxes or Petri dishes which may be placed in a flat or inclined position. The appropriate quantity of water is added at the beginning of the test and evaporation may be minimized by a tightly fitting lid or by enclosing the dishes in plastic bags;*
- *directly on trays in germination incubators which may be placed in a flat or inclined position. The relative humidity in the incubators must then be maintained at a level that prevents tests drying out. Moistened porous paper or absorbent cotton can be used as a base for the substrates.*

A. This update will assist with the time factor that is involved in seed testing. Quality is always the ultimate priority in seedling evaluation. However, there is an efficiency factor that needs to be involved in our day-to-day tasks. Based on the referee results, it shows that Top of Blotters is a more efficient way to process *Ocimum basilicum*.
B. This rules proposal should not impact other rules volumes.

5. **Supporting Evidence:**
See Supporting Evidence A (physical data) and Supporting Evidence B (referee presentation with data analysis).

6. **Submitted By:**
Nicolette Lee Rusch
Eurofins BioDiagnostics, LLC
507 Highland Dr.
River Falls, WI
(715)-781-7964
nicolette.rusch@genomics.eurofinsUS.com

7. **Date of Submission:**
Saturday, September 13th, 2025

View supporting evidence, Excel file of original test data.

Supporting Evidence A

View supporting evidence, Referee study presentation (pdf)

Supporting Evidence B

AOSA Rule Proposal #2

Purpose of Proposal: Clarification to section 5.2.b.2. of the rules and correcting "Example 8, Mixture of annual and perennial ryegrass".

Present Rule:

Examples with Blends and Mixtures

Clarifications for the following examples

Blends and mixtures are prepared based on percentage by weight. However, the fluorescence values of VFL and TFL are determined based on percentages by number. Thus, extrapolating the "expected" VFL values of various species (i.e., annual and perennial) or varieties (within the same species) may not predict the "actual" VFL of the seeds in the bag correctly. Sources of variation between the "expected" and the "actual" VFL are seed sizes of different species, germination values, variability of VFL within each variety, and sampling variation. These factors contribute to the variability between the expected, interpolated VFL value of a mixture and the actual, "observed", TFL value of the same mixture. Thus, the most reliable information on the actual fluorescent seeds in a mixture or a blend sample would be the TFL result of that sample. This is because the TFL integrates all variables and represents the fluorescence level of the blend or the mixture as it is in the bag, not based on the expected "ideal" VFL values description of each variety, or in some cases, based on random estimation of "0% for perennial varieties and "100%" of annual varieties.

When blending varieties within the same species with similar seed sizes and VFL values, using the extrapolated VFL may present a good approximation to the actual VFL of the blend in the bag (see example 6). However, when mixing annual (big seeds with high VFL) with perennial (small seeds with low VFL) ryegrass, extrapolating an "expected" VFL of the mixture based on percentage by weight would be misleading because of the large difference in seed sizes and VFL values which is calculated based on percentage by number. In such cases, the best predictor of the fluorescence level of the seeds inside the bag would be the TFL of the mixed product (see example 7, 8). If this is in doubt, simply conduct a supplementary test for more precise determinations.

Example 8. Mixture of annual and perennial ryegrass in the following proportions

Label List:

Annual ryegrass 58.41%

Creeping red fescue 18.41%

Variety A Perennial ryegrass 9.78%

Variety B Perennial ryegrass 9.56%

The pure ryegrass component in the sample = 78.06%

The two perennial varieties have the following descriptions:

VFL of Variety A = 0%

VFL of Variety B = 2.50%

VFL of the annual ryegrass (variety not stated), therefore it should be considered 100%

The laboratory TFL results = 81.91%

What are the percentages of perennial and annual ryegrass in this sample?

In this case, extrapolating the VFL for the mixture would be misleading. The 81.91% TFL of the mixture is the most reliable information and is closer to the VFL of the annual component (100%), indicating that the mixture is behaving as mostly annual ryegrass. Therefore, the formula of annual ryegrass can be applied.

% Perennial ryegrass = (%VFLA – %TFL)/100% × % pure ryegrass

% Perennial ryegrass = (100.00 % - 81.91%)/100% × 78.06% = 0.1809 × 78.06 % = 14.12%

% Annual ryegrass = 78.06% – 14.12% = 63.94%

Proposed Rule:

Examples with Blends and Mixtures of Annual and Perennial Ryegrass

Clarifications for the following examples

Blends and mixtures are prepared based on percentage by weight. However, the fluorescence values of VFL and TFL are determined based on percentages by number. Thus, ~~extrapolating~~ the weighted average of the "expected" VFL values of various species (i.e., mixture of annual and perennial) or varieties (blend within the same species) may not predict the "actual" VFL of the seeds in the ~~bag~~ container correctly.

Sources of variation between the "expected" and the "actual" VFL are seed sizes of different species, germination values, variability of VFL within each variety, and sampling variation. These factors contribute to the variability between the expected, ~~interpolated~~ weighted average of VFL value of a mixture and the actual, "observed", TFL value of the same mixture. Thus, the most reliable information on the actual fluorescent seeds in a mixture or a blend sample would be the TFL result of that sample. This is because the TFL integrates all variables and represents the fluorescence level of the blend or the mixture as it is in the ~~bag~~ container, not based on the expected "ideal" VFL values description of each variety, or in some cases, based on random estimation of "0%" for perennial varieties and "100%" of annual varieties.

Blends: When blending varieties within the same species (all annual or all perennials) with similar seed sizes and VFL values, using the ~~extrapolated~~ weighted average of VFL for all varieties may present a good approximation to the actual VFL of the blend in the ~~bag~~ container, and should be calculated (see example 6).

Mixtures: When mixing annual (big seeds with high VFL) with perennial (small seeds with low VFL) ryegrass, the weighted average ~~extrapolating an~~ "expected" VFL of all varieties in the mixture (based on percentage by weight) would be misleading. This is because of the large difference in seed sizes and VFL values which is calculated based on percentage by number. In such cases, do not calculate the weighted average of the varieties in the mixture. The best predictor of the fluorescence level of the seeds inside the ~~bag~~ container would be the TFL of the mixed product (see example 7, 8). If this is in doubt, simply conduct a supplementary TFL test for more precise determinations.

In summary, in case of blend samples, weighted average of VFL of all varieties in the blend should be calculated, but in case of mixture of annual and perennial varieties, weighted average should not be calculated since the TFL is the most reliable indicator to determine whether the mixture behaves like annual or perennial.

Example 8. Mixture of annual and perennial ryegrass in the following proportions (sec. 5.2.b.2).

Label List:

Annual ryegrass 58.41%
Creeping red fescue 18.41%
Variety A Perennial ryegrass 9.78%
Variety B Perennial ryegrass 9.56%

The pure ryegrass component in the sample = ~~78.06~~ 77.75%

The two perennial varieties have the following descriptions:

VFL of Variety A = 0%
VFL of Variety B = 2.50%

VFL of the annual ryegrass (variety not stated), therefore it should be considered 100%

The laboratory TFL results = 81.91%

What are the percentages of perennial and annual ryegrass in this sample?

In this case, ~~extrapolating~~ the weighted average of VFL for all the varieties in the mixture would be misleading, so do not calculate it.

The 81.91% TFL of the mixture is the most reliable information and is closer to the VFL of the annual component (100%), indicating that the mixture is behaving as mostly annual ryegrass. Therefore, the formula of annual ryegrass can be applied.

% Perennial ryegrass = [(%VFL_A – %TFL)/100~~%~~] × % pure ryegrass

% Perennial ryegrass = [(100~~.00 %~~ - 81.91~~%~~)/100~~%~~] × ~~78.06%~~ 77.75= 0.1809 × ~~78.06 %~~ 77.75 = ~~14.12%~~ 14.06%

% Annual ryegrass = ~~78.06%~~ 77.75– ~~14.12%~~ 14.06 = ~~63.94%~~ 63.69%

Table 14 I can be used to compare the % of PRG or ARG in the label (or the 1st test) to the 2nd test based on the percentage of the TFL.

Harmonization/Impact Statement:

ISTA does not have fluorescence test in their rules, therefore, this rule proposal is not relevant to ISTA. Federal Seed Act follows AOSA Rules in regard to fluorescence test calculations and they may want to consider the clarifications and corrections in this proposal. Canadian Methods and Procedures for Testing Seeds (M&P) use the fluorescence test in their rules to distinguish between annual and perennial ryegrass and may want to consider the clarifications and corrections in this proposal.

Supporting Evidence:

Recently, questions from seed analysts were sent to the statistics committee regarding the ambiguity of calculating the percentages of annual and perennial ryegrass in mixture samples in section 5.2.b.2 of the AOSA Rules, as well as the unclarity in Example 8. Therefore, this rule change proposal focused on adding clarification to the paragraphs that explain the calculations pertaining to the mixture of annual and perennial samples in Examples 7 and 8.

The current rules indicated that "When mixing annual (big seeds with high VFL) with perennial (small seeds with low VFL) ryegrass, the extrapolating (or the weighted average) "expected" VFL of the mixture based on percentage by weight would be misleading because of the large difference in seed sizes and VFL values which is calculated based on percentage by number. In such cases, the best predictor of the fluorescence level of the seeds inside the bag would be the TFL of the mixed product (see example 7, 8).

Therefore, we added in this proposal the following clarification statement: " In such cases, do not calculate the weighted average of the varieties in the mixture". We also changed the word "extrapolated" to "calculating the weighted average" throughout all paragraphs as it is the correct terminology in this situation.

In regard to the blend samples (i.e., all varieties are annual, or all varieties are perennial) with similar seed sizes and VFL values, using the weighted average of VFL may present a good approximation to the actual VFL of the blend in the bag, and should be used (see example 6). We add in this proposal that: "the weighted average of all varieties included in the blend should be calculated".

In addition, in this proposal we corrected the error in Example 8 in sec. 5.2.b.2. The Rule stated that the pure ryegrass component in the sample = 78.06%, the correct value is 77.75%. We corrected all calculations based on the new correct value.

In summary, we made it clear that in case of blend samples, weighted average of VFL of all varieties in the blend should be calculated, but in case of mixture of annual and perennial varieties, weighted average should not be calculated since the TFL is the most reliable indicator to determine whether the mixture behaves like annual or perennial. This is because of the difference in seed sizes among species, variability of VFL within each variety, and the sampling variation.

Submitted by: Sabry G. Elias, (OSU Seed Lab), and Adam Schrankler (MN Department of Agriculture)
Date Submitted: 10/3/2025

AOSA Rule Proposal #3

PURPOSE OF PROPOSAL:

Change the abbreviation (symbol) of the substrate for "Between Blotters" in Table 6A from "B" to a more intuitive abbreviation of "BB"

PRESENT RULE: Sec 6.9 Explanation of Table 6A, then used as listed in Table 6A Substrata column

Sec 6.9 Explanation of Table 6A

B: between blotters

Table 6A Example

Alcea rosea hollyhock	B, T	20	5b	18c	Hard seeds: see sec. 6.2d and 6.9m (6)	
Allium cepa onion Alternate methods Chemically treated, pelleted or film-coated	B, T, PP S OT	20 20 20	6 6	12 12 12	 See sec. 6.8r and sec. 6.9a	

PROPOSED RULE:

Sec 6.9 Explanation of Table 6A

BB: between blotters

Table 6A Example

Alcea rosea hollyhock	BB, T	20	5b	18c	Hard seeds: see sec. 6.2d and 6.9m (6)	
Allium cepa onion Alternate methods Chemically treated, pelleted or film-coated	BB, T, PP S OT	20 20 20	6 6	12 12 12	 See sec. 6.8r and sec. 6.9a	

HARMONIZATION/IMPACT STATEMENT:
ISTA and Canadian M&P use different substrate categories and abbreviations; there is no correlated method for between blotters.

SUPPORTING EVIDENCE:
There is no change to the method, this proposal provides clarification of the abbreviations/symbols.

SUBMITTED BY:
Adam Schrankler
Minnesota Department of Agriculture
601 Robert Street North, Saint Paul, MN 55155
651-201-6150 |adam.schrankler@state.mn.us

DATE SUBMITTED: 10/13/25

AOSA Rule Proposal #4

PURPOSE OF PROPOSAL:

The purpose of this proposal is to add Field Pennycress *(Thlaspi arvense)* purity weights into the AOSA Rules Volume 1.

PRESENT RULE:

New Rule

PROPOSED RULE:

Table 2A. Weights for working samples.

Pure Seed Unit #	Chaffy Seed [a]	Kind of seed	Minimum weight for purity analysis [b]	Minimum weight for noxious-weed seed or bulk examination	Approximate number of seeds per gram [c]	Approximate number of seeds per ounce [d]
			Grams	Grams	Number	Number
2		*Thlaspi arvense* L. Fanweed; Frenchweed; pennycress,field	3.5	35	1532	43,356

HARMONIZATION/IMPACT STATEMENT:

Thlaspi arvense is currently not included in the ISTA Rules, Canadian Methods and Procedures or the Federal Seed Act.

SUPPORTING EVIDENCE:

Thlaspi arvense is an annual winter oilseed crop, also a well-known species as a weed and in some states a noxious weed. There has been interest and work done to understand the use of this species as an oilseed crop. Companies and universities have been working on developing versions of *Thlaspi arvense* for this purpose. With all this work on development it has become necessary to include the species in the AOSA Rules to enable this new market.

The Purity Committee was consulted prior to the start of the process to confirm the Pure Seed Unit (PSU) designation. Debbie Meyers determined that the PSU shall be #2. This is aligned with other species of Brassica already in table 2A. Eight (8) replicates of one hundred (100) seeds were counted and weighed for each sample per the guidance provided in committee protocol. The Purity Weight Calculator v3 was used for all 18 samples. One sample was found to have excessive size variation, and an additional 8 replicates were counted and weighed.

It should be noted that the locations of the domesticated samples in the table are concentrated in the mid-west and have a shorter span of harvest years. This can be attributed to the span of time the domesticated version has been in development and the growing area in which the work was done. The domesticated samples used are gene edited and visually look different by color from the wild type.

Table 1 Samples with harvest, location and type.

Sample ID	Harvest	Location	Type
CC1:WG:AVI	2022	Arenzville, IL	Domesticated
CC1:WG:AVI	2023	Arenzville, IL	Domesticated
CC3:WG:AVI	2021	Arenzville, IL	Domesticated
CC3:WG:RMCI	2024	Mascoutah, IL	Domesticated
CC4:WG:AVI	2022	Arenzville, IL	Domesticated
CC4:WG:GH	2022	St. Louis, MO	Domesticated
CC5:WG:AVI	2022	Arenzville, IL	Domesticated
CC5:WG:AVI	2023	Arenzville, IL	Domesticated
CC5:WG:HVI	2020	Havana, IL	Domesticated
CC6:WG:MPI	2023	Mt. Pulaski, IL	Domesticated
CC6:WG:RMCI	2024	Mascoutah, IL	Domesticated
Beecher	2011	Macomb IL	Wild
Beecher	2015	Macomb IL	Wild
CC12:WT:HVI	2024	Havana, IL	Wild
CC12:WT:SKM	2024	Sikeston, MO	Wild
CC7:WT:VNI	2020	Venedy, IL	Wild
CC9:WT:GH	2022	St. Louis, MO	Wild
Elizabeth	2019	Macomb IL	Wild

Figure 1 shows higher than expected variation in size as identified by the CV% of 15. This is an indicator for excessive variation of seed size. Per the purity weight calculator, the projected weight should be 2.6 grams for a purity. Section E of Figure 1 indicates that for the samples utilized there were several samples with less than the desired 2500 seed count at 2.6 grams. It is my recommendation with consultation with the Purity Committee to propose a larger amount than suggested by the tool. A 3.5-gram purity weight as seen in chart E of Figure 2 ensures all the samples meet the 2500 seed target for purity assessment. Although in most cases the test will be on more seeds than needed, the purity for the species is uncomplicated and should not pose an excessive burden on the analyst.

D

D1. For each seed lot, enter the average purity weight calculated in either B5 or C5 without further rounding.

D2. Check the CV. The CV should not exceed 10% for either chaffy or non-chaffy kinds. If the CV is greater than 10%, single reliable estimates of minimum purity and bulk/noxious weed weights cannot be calculated based on the sampled seed lots.

D3. The average purity weight from all lots is calculated. *Do not use this value when proposing an addition/change to Table 2A of the Rules, vol. 1 (2022).*

D4. The **Minimum Purity Working Weight (g)**, derived from the value in D3, is calculated without rounding. This value is the upper limit 95% confidence interval for the mean calculated in D3. Results must be rounded to the correct number of decimal places, as described in sec. 13.4b.1 of the rules, vol. 1 (2022) and section IV.4 of the instructions, before inclusion in Table 2A of the rules.

D5. Manually enter the correctly rounded mean from D4 in the provided field. *This is the value to be proposed for addition to Table 2A of the rules*.

D6. The minimum bulk/noxious weed weight for inclusion in Table 2A is automatically generated.

Before a new analysis for a different species, make sure to clear the data entered under A, B1, B4, C4, D1 and D5.

D1. Average purity weight for each seed lot		
Lot No.	**ID**	**Calculated purity weight (g)**
1	CC5:WG:HVI2020	2.21
2	CC3:WG:AVI2021	2.3325
3	CC4:WG:AVI2022	1.985
4	CC4:WG:GH2022	2.6475
5	CC1:WG:AVI2023	1.855
6	CC6:WG:MPI2023	2.75
7	CC3:WG:RMCI2024	2.2675
8	CC1:WG:AVI2022	2.08
9	CC5:WG:AVI2023	2.1
10	CC5:WG:AVI2022	2.1675
11	CC6:WG:RMCI2024	3.425
12	Beecher 2011	2.345
13	Beecher 2015	2.6575
14	Elizabeth 2019	2.345
15	CC7:WT:VNI2020	2.735
16	CC9:WT:GH2022	2.45
17	CC12:WT:HVI2024	2.5575
18	CC12:WT:SKM2024	2.53
19		
20		

D2. CV (%):	15.0
D3. Mean purity weight	2.4133
D4. Unrounded Minimum Purity Working Weight (g):	2.56197
Minimum purity weight rounded to 2 decimals:	2.56
Minimum purity weight rounded to 1 decimal:	2.6
Minimum purity weight rounded to whole number:	3
D5. Minimum Purity Working Weight (g):	2.56
D6. Minimum bulk/noxious weed weight (g):	25.6

E (Optional)

E1. The minimum purity working weight entered in D5 is automatically imported.

E2. The purity weights for each lot are imported from D1. The estimated number of seeds for each lot is automatically calculated.

Before a new analysis for a different species, make sure to clear the data entered under A1, B1, B4, C4, D1 and D5.

E1. Minimum purity working weight (g):	2.56

E2. Estimated seed number		
Lot ID	**Purity weight**	**Seed number per lot**
CC5:WG:HVI2020	2.21	2896
CC3:WG:AVI2021	2.3325	2744
CC4:WG:AVI2022	1.985	3224
CC4:WG:GH2022	2.6475	2417
CC1:WG:AVI2023	1.855	3450
CC6:WG:MPI2023	2.75	2327
CC3:WG:RMCI2024	2.2675	2822
CC1:WG:AVI2022	2.08	3077
CC5:WG:AVI2023	2.1	3048
CC5:WG:AVI2022	2.1675	2953
CC6:WG:RMCI2024	3.425	1869
Beecher 2011	2.345	2729
Beecher 2015	2.6575	2408
Elizabeth 2019	2.345	2729
CC7:WT:VNI2020	2.735	2340
CC9:WT:GH2022	2.45	2612
CC12:WT:HVI2024	2.5575	2502
CC12:WT:SKM2024	2.53	2530

Figure 1. Excerpt from Purity Weight Tool

D

D1. For each seed lot, enter the average purity weight calculated in either B5 or C5 without further rounding.

D2. Check the CV. The CV should not exceed 10% for either chaffy or non-chaffy kinds. If the CV is greater than 10%, single reliable estimates of minimum purity and bulk/noxious weed weights cannot be calculated based on the sampled seed lots.

D3. The average purity weight from all lots is calculated. *Do not use this value when proposing an addition/change to Table 2A of the Rules, vol. 1 (2022).*

D4. The **Minimum Purity Working Weight (g)**, derived from the value in D3, is calculated without rounding. This value is the upper limit 95% confidence interval for the mean calculated in D3. Results must be rounded to the correct number of decimal places, as described in sec. 13.4b.1 of the rules, vol. 1 (2022) and section IV.4 of the instructions, before inclusion in Table 2A of the rules.

D5. Manually enter the correctly rounded mean from D4 in the provided field. *This is the value to be proposed for addition to Table 2A of the rules*.

D6. The minimum bulk/noxious weed weight for inclusion in Table 2A is automatically generated.

Before a new analysis for a different species, make sure to clear the data entered under A, B1, B4, C4, D1 and D5.

D1. Average purity weight for each seed lot		
Lot No.	ID	Calculated purity weight (g)
1	CC5:WG:HVI2020	2.21
2	CC3:WG:AVI2021	2.3325
3	CC4:WG:AVI2022	1.985
4	CC4:WG:GH2022	2.6475
5	CC1:WG:AVI2023	1.855
6	CC6:WG:MPI2023	2.75
7	CC3:WG:RMCI2024	2.2675
8	CC1:WG:AVI2022	2.08
9	CC5:WG:AVI2023	2.1
10	CC5:WG:AVI2022	2.1675
11	CC6:WG:RMCI2024	3.425
12	Beecher 2011	2.345
13	Beecher 2015	2.6575
14	Elizabeth 2019	2.345
15	CC7:WT:VNI2020	2.735
16	CC9:WT:GH2022	2.45
17	CC12:WT:HVI2024	2.5575
18	CC12:WT:SKM2024	2.53
19		
20		

D2. CV (%):	15.0
D3. Mean purity weight	2.4133
D4. Unrounded Minimum Purity Working Weight (g):	2.56197
Minimum purity weight rounded to 2 decimals:	2.56
Minimum purity weight rounded to 1 decimal:	2.6
Minimum purity weight rounded to whole number:	3
D5. Minimum Purity Working Weight (g):	3.5
D6. Minimum bulk/noxious weed weight (g):	35

E (Optional)

E1. The minimum purity working weight entered in D5 is automatically imported.

E2. The purity weights for each lot are imported from D1. The estimated number of seeds for each lot is automatically calculated.

Before a new analysis for a different species, make sure to clear the data entered under A1, B1, B4, C4, D1 and D5.

E1. Minimum purity working weight (g):		3.5
E2. Estimated seed number		
Lot ID	Purity weight	Seed number per lot
CC5:WG:HVI2020	2.21	3959
CC3:WG:AVI2021	2.3325	3751
CC4:WG:AVI2022	1.985	4408
CC4:WG:GH2022	2.6475	3305
CC1:WG:AVI2023	1.855	4717
CC6:WG:MPI2023	2.75	3182
CC3:WG:RMCI2024	2.2675	3859
CC1:WG:AVI2022	2.08	4207
CC5:WG:AVI2023	2.1	4167
CC5:WG:AVI2022	2.1675	4037
CC6:WG:RMCI2024	3.425	2555
Beecher 2011	2.345	3731
Beecher 2015	2.6575	3293
Elizabeth 2019	2.345	3731
CC7:WT:VNI2020	2.735	3199
CC9:WT:GH2022	2.45	3571
CC12:WT:HVI2024	2.5575	3421
CC12:WT:SKM2024	2.53	3458

Figure 2 Purity Weight Tool with adjusted weights

The following figures are excerpts from the Purity Weight Calculator -v3 for all of the individual samples tested.

A

Lot/sample identification

Lot	ID
1	CC3:WG:AVI2021
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking on the destination cell before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0946	13
2	0.0906	11
3	0.0935	15
4	0.0925	14
5	0.0934	16
6	0.0982	10
7	0.0883	9
8	0.095	12
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	3.2
B3. Mean before rounding:	0.09326
Mean after rounding to 4 decimals:	0.0933
Mean after rounding to 3 decimals:	0.093
Mean after rounding to 2 decimals:	0.09
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0933

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.3325
Bulk/noxious weed wt. (25,000 seeds):	23.325

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

A

Lot/sample identification

Lot	ID
1	
2	CC3:WG:AVI2021
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part **C**.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0946	13
2	0.0906	11
3	0.0935	15
4	0.0925	14
5	0.0934	16
6	0.0982	10
7	0.0883	9
8	0.095	12
9		● 1
10		● 1
11		● 1
12		● 1
13		● 1
14		● 1
15		● 1
16		● 1

B2. CV (%): first 8 replicates:	3.2
B3. Mean before rounding:	0.09326
Mean after rounding to 4 decimals:	0.0933
Mean after rounding to 3 decimals:	0.093
Mean after rounding to 2 decimals:	0.09
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0933

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.3325
Bulk/noxious weed wt. (25,000 seeds):	23.325

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

A Lot/sample identification	
Lot	ID
1	
2	
3	CC4:WG:AVI2022
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	Rank
1	0.0743	3
2	0.078	11
3	0.0777	8
4	0.0772	6
5	0.0743	3
6	0.0847	● 2
7	0.081	9
8	0.0804	12
9	0.0812	7
10	0.0791	15
11	0.0779	10
12	0.08	14
13	0.0803	13
14	0.0769	5
15	0.0797	16
16	0.0884	● 1

B2. CV (%); first 8 replicates:	4.5
B3. Mean before rounding:	0.07845
Mean after rounding to 4 decimals:	0.0785
Mean after rounding to 3 decimals:	0.078
Mean after rounding to 2 decimals:	0.08
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0785

B5. Purity and bulk/noxious weed exam weights

Purity wt. (2500 seeds):	1.9625
Bulk/noxious weed wt. (25,000 seeds):	19.625
C1. Revised CV (%); all replicates:	4.4

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed on the complete data set (16 replicates), and should not be used after a replicate weight has been deleted from the data. If the replicate with the largest difference from the mean (Rank 1) is identified as an outlier ('YES' result), while Rank 2 replicate is not an outlier ('NO'), delete the replicate weight corresponding to Rank 1 and proceed to C3 after confirming that the revised CV (C1) is now within acceptable limits. However, if the second ranked replicate weight (Rank 2) is also identified as an outlier ('YES') before any replicate weight is deleted, this seedlot's replicate results cannot be used for determining purity/bulk/noxious working weights. *Presence of more than one outlier indicates possible methodological errors. Check your data for possible errors and refer to the accompanying instructions for possible remedies..*

C3. The unrounded revised mean of all remaining replicates is calculated. Use section 2.3a of AOSA Rules, vol. 1 (2022), or refer to section II.5 of the accompanying instructions to determine the correct number of decimals for your final answer.

C4. Manually enter the correctly rounded mean from C3.

C5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter the purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation rather than the actual value. Double clicking on the destination cell before pasting is another way of just adding cell value (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot when the CV is above acceptable limits. Before each new seedlot analysis, make sure you clear the data you entered in B1, B4, and C4.

C2. Outlier check

This test is designed to check for outliers using the full data set. Do not use after a replicate weight is discarded.

100-seed weight rank	Outlier
Rank 1	NO
Rank 2	NO

C3. Revised mean before rounding:	0.079444
Mean after rounding to 4 decimals:	0.0794
Mean after rounding to 3 decimals:	0.079
Mean after rounding to 2 decimals:	0.08
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
C4. Enter rounded mean value here:	0.0794

C5. Purity and bulk/noxious weed exam weights

Purity wt. (2500 seeds):	1.985
Bulk/noxious weed wt. (25,000 seeds):	19.85

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Lot/sample identification

Lot	ID
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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	Rank
1	0.1099	9
2	0.1073	12
3	0.1059	16
4	0.1056	15
5	0.1054	13
6	0.1042	11
7	0.10321	10
8	0.1055	14
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	1.9
B3. Mean before rounding:	0.10588
Mean after rounding to 4 decimals:	0.1059
Mean after rounding to 3 decimals:	0.106
Mean after rounding to 2 decimals:	0.11
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.1059
B5. Purity and bulk/noxious exam weights	
Purity wt. (2500 seeds):	2.6475
Bulk/noxious weed wt. (25,000 seeds):	26.475
C1. Revised CV (%); all replicates:	1.9

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed on the complete data set (16 replicates), and should not be used after a replicate weight has been deleted from the data. If the replicate with the largest difference from the mean (Rank 1) is identified as an outlier ('YES' result), while Rank 2 replicate

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Lot/sample identification

Lot	ID
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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part **C**.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0702	9
2	0.0714	10
3	0.0742	16
4	0.0757	12
5	0.0763	11
6	0.075	15
7	0.0751	14
8	0.0756	13
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	3.0

B3. Mean before rounding:	0.07419
Mean after rounding to 4 decimals:	0.0742
Mean after rounding to 3 decimals:	0.074
Mean after rounding to 2 decimals:	0.07
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0

B4. Enter rounded mean value here:	0.0742

B5. Purity and bulk/noxious exam weights	
Purity wt. (2500 seeds):	1.855
Bulk/noxious weed wt. (25,000 seeds):	18.55

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1118	13
2	0.1137	10
3	0.1105	15
4	0.109	14
5	0.1125	12
6	0.1098	16
7	0.1064	11
8	0.1061	9
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.5
B3. Mean before rounding:	0.10998
Mean after rounding to 4 decimals:	0.1100
Mean after rounding to 3 decimals:	0.110
Mean after rounding to 2 decimals:	0.11
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.11

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.75
Bulk/noxious weed wt. (25,000 seeds):	27.5

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

Lot	ID
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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part **C**.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0859	10
2	0.0839	15
3	0.0854	11
4	0.0837	16
5	0.0852	12
6	0.0821	14
7	0.0777	9
8	0.0819	13
9		● 1
10		● 1
11		● 1
12		● 1
13		● 1
14		● 1
15		● 1
16		● 1

B2. CV (%); first 8 replicates:	3.2
B3. Mean before rounding:	0.08323
Mean after rounding to 4 decimals:	0.0832
Mean after rounding to 3 decimals:	0.083
Mean after rounding to 2 decimals:	0.08
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0832

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.08
Bulk/noxious weed wt. (25,000 seeds):	20.8

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

Lot	ID
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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0812	9
2	0.0844	15
3	0.0852	13
4	0.0855	11
5	0.0853	12
6	0.0851	14
7	0.0841	16
8	0.0815	10
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.1
B3. Mean before rounding:	0.08404
Mean after rounding to 4 decimals:	0.0840
Mean after rounding to 3 decimals:	0.084
Mean after rounding to 2 decimals:	0.08
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.084

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.1
Bulk/noxious weed wt. (25,000 seeds):	21

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry		
Replication	100-seed weight (g)	
1	0.0889	12
2	0.0845	11
3	0.0894	9
4	0.0884	13
5	0.0852	14
6	0.0844	10
7	0.0875	16
8	0.0855	15
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.4
B3. Mean before rounding:	0.08673
Mean after rounding to 4 decimals:	0.0867
Mean after rounding to 3 decimals:	0.087
Mean after rounding to 2 decimals:	0.09
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0867

B5. Purity and bulk/noxious exam weights	
Purity wt. (2500 seeds):	2.1675
Bulk/noxious weed wt. (25,000 seeds):	21.675

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1408	11
2	0.1361	14
3	0.1364	15
4	0.1418	10
5	0.1314	9
6	0.1366	16
7	0.1388	13
8	0.1332	12
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.6
B3. Mean before rounding:	0.13689
Mean after rounding to 4 decimals:	0.1369
Mean after rounding to 3 decimals:	0.137
Mean after rounding to 2 decimals:	0.14
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.1369

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	3.4225
Bulk/noxious weed wt. (25,000 seeds):	34.225

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0948	14
2	0.0957	11
3	0.0946	15
4	0.0965	10
5	0.0902	9
6	0.0925	13
7	0.094	16
8	0.0922	12
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.2
B3. Mean before rounding:	0.09381
Mean after rounding to 4 decimals:	0.0938
Mean after rounding to 3 decimals:	0.094
Mean after rounding to 2 decimals:	0.09
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.0938

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.345
Bulk/noxious weed wt. (25,000 seeds):	23.45

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1047	12
2	0.1052	14
3	0.1082	11
4	0.105	13
5	0.1073	15
6	0.1058	16
7	0.1101	9
8	0.1041	10
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%): first 8 replicates:	1.9
B3. Mean before rounding:	0.10630
Mean after rounding to 4 decimals:	0.1063
Mean after rounding to 3 decimals:	0.106
Mean after rounding to 2 decimals:	0.11
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.1063

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.6575
Bulk/noxious weed wt. (25,000 seeds):	26.575

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* *<u>Double clicking</u> <u>on the destination cell</u> <u>before pasting</u> is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0944	15
2	0.0904	10
3	0.0947	14
4	0.0919	11
5	0.0948	13
6	0.0982	9
7	0.0937	16
8	0.0919	11
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.6

B3. Mean before rounding:	0.09375
Mean after rounding to 4 decimals:	0.0938
Mean after rounding to 3 decimals:	0.094
Mean after rounding to 2 decimals:	0.09
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0

B4. Enter rounded mean value here:	0.0938

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.345
Bulk/noxious weed wt. (25,000 seeds):	23.45

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1057	11
2	0.1118	13
3	0.1102	16
4	0.1132	10
5	0.1113	15
6	0.1119	12
7	0.1042	9
8	0.1071	14
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%): first 8 replicates:	3.0
B3. Mean before rounding:	0.10943
Mean after rounding to 4 decimals:	0.1094
Mean after rounding to 3 decimals:	0.109
Mean after rounding to 2 decimals:	0.11
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.1094

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.735
Bulk/noxious weed wt. (25,000 seeds):	27.35

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part C.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value.* Double clicking *on the destination cell* before pasting *is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.0991	12
2	0.0994	11
3	0.0969	13
4	0.0958	9
5	0.0996	10
6	0.0983	16
7	0.0975	15
8	0.0973	14
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	1.4

B3. Mean before rounding:	0.09799
Mean after rounding to 4 decimals:	0.0980
Mean after rounding to 3 decimals:	0.098
Mean after rounding to 2 decimals:	0.10
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0

B4. Enter rounded mean value here:	0.098

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.45
Bulk/noxious weed wt. (25,000 seeds):	24.5

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part **C**.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1066	11
2	0.1004	13
3	0.0979	10
4	0.1042	14
5	0.0968	9
6	0.1026	16
7	0.1066	11
8	0.1034	15
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	3.6

B3. Mean before rounding:	0.10231
Mean after rounding to 4 decimals:	0.1023
Mean after rounding to 3 decimals:	0.102
Mean after rounding to 2 decimals:	0.10
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0

B4. Enter rounded mean value here:	0.1023

B5. Purity and bulk/noxious exam weights	
Purity wt. (2500 seeds):	2.5575
Bulk/noxious weed wt. (25,000 seeds):	25.575

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

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Lot/sample identification

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B

B1. Enter the weights of 8 replications (1-8) for a single sampled seedlot. Ignore the ranked results with marked red dots generated for the first 8 replicates. Ranked results are only used in Part C below.

B2. Check the CV. If the CV is 6% or less for chaffy kinds, or 4% or less for non-chaffy kinds, proceed to B3. If the CV is greater than 6% or 4% for chaffy and non-chaffy kinds, respectively, skip steps B3-B5 and go to part **C**.

B3. The output shows the unrounded mean, with all possible rounding options. Use section 2.3a of AOSA Rules, vol. 1 (2021) to determine the correct number of decimals for your final answer. Section II.5 of the accompanying instructions also describes correct rounding.

B4. Manually enter the correctly rounded mean from B3 in the provided field.

B5. The purity and bulk/noxious weed exam weights are calculated for this seedlot. Enter this purity weight without further rounding in D1 for that seedlot. *If you copy and paste the purity weight from B5 to D1, make sure you use the 'Paste as value' function in Excel. Otherwise, Excel will paste the equation for calculating the purity weight rather than the actual value. Double clicking on the destination cell before pasting is a shortcut for pasting just cell values (double clicking only works for single cells, not when multiple cells are selected).*

Repeat for samples from each seed lot. Before each new analysis, make sure you clear the contents you entered under B1 and B4.

B1. Data entry

Replication	100-seed weight (g)	
1	0.1028	12
2	0.0987	11
3	0.1006	15
4	0.1047	10
5	0.1011	16
6	0.1027	13
7	0.0968	9
8	0.1018	14
9		1
10		1
11		1
12		1
13		1
14		1
15		1
16		1

B2. CV (%); first 8 replicates:	2.5
B3. Mean before rounding:	0.10115
Mean after rounding to 4 decimals:	0.1012
Mean after rounding to 3 decimals:	0.101
Mean after rounding to 2 decimals:	0.10
Mean after rounding to 1 decimal:	0.1
Mean after rounding to whole number:	0
B4. Enter rounded mean value here:	0.1012

B5. Purity and bulk/noxious exam weights

Purity wt. (2500 seeds):	2.53
Bulk/noxious weed wt. (25,000 seeds):	25.3

C

This part is only needed if the CV(%) calculated in part B is above the maximum acceptable limit for either chaffy or non-chaffy seeds.

Enter the additional replicate weights (9-16) from the same sample in B1. The rank of each replicate weight, based on its absolute difference from the mean, is displayed to the right of the data. Among the 16 replicates, the two replicate weights with the largest absolute difference from the mean, ranked 1 and 2 from higher to lower, are marked by corresponding red dots.

C1. A revised CV is calculated based on all 16 replicates. If the CV is within acceptable limits (equal to or less than 4% or 6%) skip C2 and proceed to C3 without checking for outliers. If the CV is greater than the acceptable limit, go to C2.

C2. Outlier checks for the two replicate weights with the largest absolute difference from the mean are displayed. Note that outlier checks are only valid when performed

Purity weight Calculator, https://analyzeseeds.com/committees/purity-analysis/, accessed 9/25/2025

SUBMITTED BY:

Melissa Phillips, RST/ CGT

melissa.phillips@bayer.com
630-383-1569
Bayer Crop Science
460 E. Adams St.
Waterman, IL 60556

DATE SUBMITTED: October 13, 2025

AOSA Rule Proposal #5

PURPOSE OF PROPOSAL:

The purpose of this proposal is to amend the contaminating classification for Field Pennycress *(Thlaspi arvense)* in the AOSA Rules Volume 3.

PRESENT RULE:

NOMEN #	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPP. CLASS	CONTAMINATING CLASSIFICATION						
					A	F	H	R	S	T	V
105522	*Thlaspi arvense* L.	fanweed; Frenchweed; pennycress, field	Brassicaceae	W	W	W	W	W	W	W	W

PROPOSED RULE:

NOMEN #	SCIENTIFIC NAME	COMMON NAME	FAMILY	SPP. CLASS	CONTAMINATING CLASSIFICATION						
					A	F	H	R	S	T	V
105522	*Thlaspi arvense* L.	fanweed; Frenchweed; pennycress, field	Brassicaceae	A	W	W	W	W	W	W	W

HARMONIZATION/IMPACT STATEMENT:

Thlaspi arvense is currently not included in the ISTA Rules, Canadian Methods and Procedures or the Federal Seed Act.

SUPPORTING EVIDENCE:

Thlaspi arvense is a well-known weed species in the Brassicaceae family that has been recently used for cover crops. The seed has also shown potential to be utilized as a source of bio-fuel. Private companies and universities have been working with the species for several years for these expanded purposes. States such as Minnesota have already made changes to their regulation that recognizes in the state's noxious weed list the usage of this species as a cover/ oilseed crop. The Rule change to assist in enabling the species in the agricultural market.

2025 State Noxious-Weed Seed Requirements
Recognized in the Administration of the Federal Seed Act

***Field pennycress/Frenchweed (*Thlaspi arvense*) is classified as agricultural seed when intentionally planted as a cover crop, oilseed crop, for research, or for seed increase, using cultivars developed for these purposes.

Figure 3 Excerpt from USDA Noxious Weed List 2025 https://www.ams.usda.gov/sites/default/files/media/StateNoxiousWeedsSeedList.pdf

SUBMITTED BY:

Melissa Phillips, RST/ CGT

melissa.phillips@bayer.com
630-383-1569
Bayer Crop Science
460 E. Adams St.
Waterman, IL 60556

DATE SUBMITTED: October 13, 2025

AOSA Rule Proposal #6

Purpose of proposal:
Provide guidelines for adding and updating nomenclature and common name in the Rules.

Present rule: AOSA Volume 1 Introduction
This four-volume document constitutes the official AOSA statement regarding seed testing procedures and is referred to as the AOSA Rules for Testing Seeds or the "Rules." The four volumes are as follows:
AOSA Rules for Testing Seeds Volume 1. Principles and Procedures
AOSA Rules for Testing Seeds Volume 2. Uniform Blowing Procedure
AOSA Rules for Testing Seeds Volume 3. Uniform Classification of Weed and Crop Seeds
AOSA Rules for Testing Seeds Volume 4. Seedling Evaluation

Changes or additions to any of these documents cannot be considered official until proposed to and accepted by the AOSA and SCST memberships in the general business meeting at an annual convention of the associations. Additional directions for updating Volume 3, Uniform Classification of Weed and Crop Seeds, are found on page viii of that volume.

Proposed rule
This four-volume document constitutes the official AOSA statement regarding seed testing procedures and is referred to as the AOSA Rules for Testing Seeds or the "Rules." The four volumes are as follows:
AOSA Rules for Testing Seeds Volume 1. Principles and Procedures
AOSA Rules for Testing Seeds Volume 2. Uniform Blowing Procedure
AOSA Rules for Testing Seeds Volume 3. Uniform Classification of Weed and Crop Seeds
AOSA Rules for Testing Seeds Volume 4. Seedling Evaluation

Changes or additions to any of these documents cannot be considered official until proposed to and accepted by the AOSA and SCST memberships in the general business meeting at an annual convention of the associations. Nomenclature across AOSA Rules shall follow the USDA Germplasm Resources Information Network (GRIN) taxonomy. Common names will be based on the English names listed in both the USDA GRIN and USDA PLANTS Database. Both common and scientific names will be reviewed and updated periodically to maintain consistency and accuracy across all volumes of the Rules. Additional directions for updating Volume 3, Uniform Classification of Weed and Crop Seeds, are found on page viii of that volume.

Harmonization and Impact statement:
This proposal is meant to provide a clear guideline on updating common names and nomenclature in the Rules. It was put together as a part of the effort to ensure the consistency throughout the Rules.

Submitted by:
Lan Chi Trinh, USDA Seed Regulatory and Testing Division
801 Summit Crossing Place, Suite C
Gastonia, NC 28054
Lan-ChiN.Trinh@usda.gov 704-810-7272

9/30/25

AOSA Rule Proposal #7

Proposal Title:

Modify germination condition of canarygrass (*Phalaris canariensis*).

Purpose of proposal:

Add 15-25°C to the germination method and change the first counting day to 7 days and final counting day to 14 days for canarygrass.

Present rule:

Table 6A. Method of testing for laboratory germination

Kind of Seed	Substrata	Tempearature (C)	First Count (days)	Final Count (days)	Specific requirements and nots	Dormant seed
Phalaris canariensis canarygrass	B, T	20-30	3	7		

Proposed rule:

Table 6A. Method of testing for laboratory germination

Kind of Seed	Substrata	Tempearature (C)	First Count (days)	Final Count (days)	Specific requirements and nots	Dormant seed
Phalaris canariensis canarygrass	B, T	20-30 15-25	7	14		

Harmonization and Impact statement:

Comparison of Germination Conditions for Canarygrass

Source	Germination Temperature (°C)	First Count (days)	Final Count (days)
ISTA	20–30 or 15–25	7	21
M&P	15–25	7	10

Supporting evidence:

An AOSA referee study report is attached as supporting evidence. The study indicated that the germination of canarygrass showed no significant difference between the two temperature regimes, 15–25 °C and 20–30 °C, from day 7 to day 21.

Regarding counting days, the referee study results showed that the germination percentage was not significantly different between day 14 and day 21. The comparison of repeatability and reproducibility between the two temperature regimes also demonstrated that variation within and among laboratories was similar when seedlings were counted on day 14 and day 21, but not at earlier counts.

These findings support the use of day 7 as the first count, day 14 as the final count, and either 15–25 °C or 20–30 °C as suitable germination temperatures for canarygrass.

Submitted by:
Lei Ren and Julie Lu, Seed Science and Technology Section, CFIA
301 421 Downey Road, Saskatoon, SK, S7N 4L8

Date submitted:
October 14, 2025

View supporting evidence, research paper published in the Seed Technologist Newsletter Volume 91, Issue 2, (pdf):

Supporting Evidence A

View supporting evidence, Referee study presentation (ppt)

Supporting Evidence B

AOSA Rules – Editorial Change

Purpose: This change is being made to correct an error in a rounding example in the 2025 edition of the AOSA Rules. This was pointed out by Rhonda Benham at HM Clause. Because this is a correction to an example the Rules committee determined that making the change will be only an editorial change and not subject to a vote.

Original Text:

Examples:

(1) 800-seed separation of wheatgrasses

Purity analysis	**Percent by weight**
Pure seed (wheatgrasses)	95.10
Other crop seed	0.00
Inert matter	4.25
Weed seed (3 *Bromus rubens*)	0.65

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2025

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Kind	Weight (g)	Percent by weight		Percent of sample
762 Canada wildrye (*Elymus canadensis*)	4.039	96.88 × 0.9510	=	92.13
32 Slender wheatgrass (*Elymus trachycaulus*)	0.108	2.59 × 0.9510	=	2.46
6 Beardless wheatgrass (*Pseudoroegneria spicata*)	0.022	0.53 × 0.9510	=	0.51
	4.169			

The percentages of slender and beardless wheatgrasses are added together and included under other crop seed.

Purity analysis	**Percent by weight**
Canada wildrye	92.13
Other crop seed	2.97
Inert matter	4.25
Weed seed	0.65

Corrected text:

Kind	Weight (g)	Percent by weight	Percent of sample
762 Canada wildrye *(Elymus canadensis)*	4.039	96.88 × 0.9510	~~92.13~~ 92.14
32 Slender wheatgrass *(Elymus trachycaulus)*	0.108	2.59 × 0.9510	2.46
6 Beardless wheatgrass *(Pseudoroegneria spicata)*	0.022	0.53 × 0.9510	~~0.51~~ 0.50
	4.169		

The percentages of slender and beardless wheatgrasses are added together and included under other crop seed.

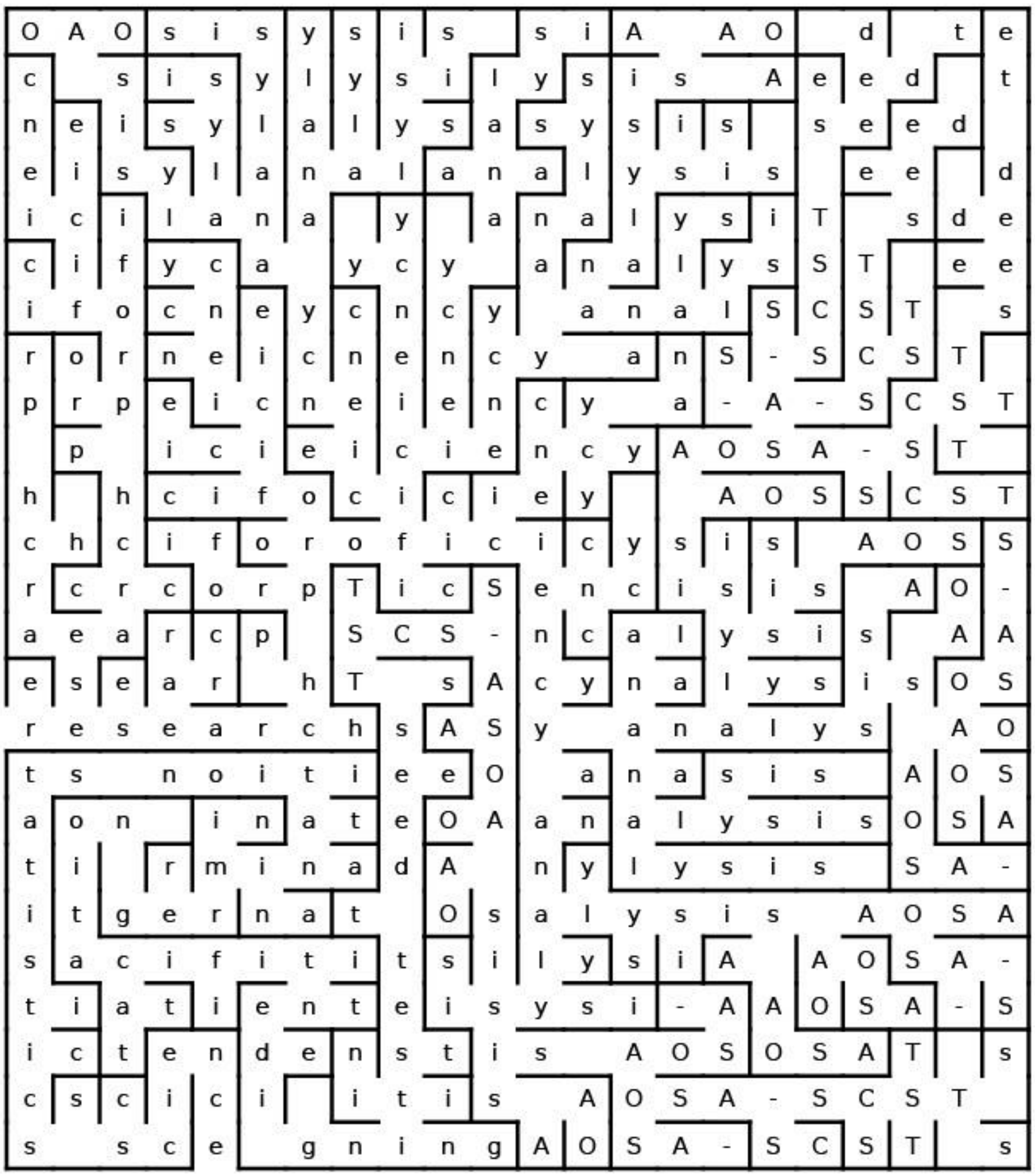
Purity analysis	**Percent by weight**
Canada wildrye	~~92.13~~ 92.14
Other crop seed	~~2.97~~ 2.96
Inert matter	4.25
Weed seed	0.65

Supporting Evidence:

In the example provided, $0.53 \times 0.9510 = 0.50403$, the total should be rounded down to 0.50 when rounded to two decimal places. Added to the percent of Slender wheatgrass the new total for other crop seed would be 2.96. This would make the total percentage 99.99. The largest portion of 92.13 should be increased by 0.01, per 3.1 (b) (5) to make 100.00%.

Study Guide

Follow the foundations of seed testing through the maze!



research
proficiency
analysis
AOSA-SCST
seed testing
identification
germination
statistics
science

Lost Resources

Obituaries as submitted

Stanley Ray Grote

Stanley Ray Grote, known affectionately by family and friends as Stan, passed away peacefully on January 3, 2026, at the age of 77. Born on October 5, 1948, in Sabetha, Kansas, Stan was a man whose gentle nature, wisdom, and humor brought light into the lives of all who knew him.

Stan is survived by his beloved wife Rose, with whom he shared a life full of love and adventure, his sons, Jesse (Karen), Ely (Teri), Caleb (Stephanie), daughters Lydia (Josh) Reis, Dora (Quentin) Marquez, and sister Nancy (Jerry) Cox. His legacy continues through his cherished grandchildren: Gabriel, George, Caroline, Anna, Margaret, Aubrey, Penelope, Henry, and Violet, and many nieces and nephews. Stan was preceded in death by his mother Lois and father Harold, his brothers Larry, Roger, and Paul, and grandparents and relatives.

He grew up in Sabetha where the rowdy Gro te boys were always up to shenanigans. He spent many hours at the Grote Motor Company learning the trade of mechanics from his dad. Stan was a proud alumnus of the University of Missouri, where he earned Bachelor's degrees in forestry and agronomy. There he met his beloved wife of 54 years. His time with his "Rosebud," as he lovingly called Rose, was among his most treasured. At Mizzou, Stan and Rose cultivated a tight-knit group of life-long friends.

Stan's passion for the outdoors led him to a fulfilling career as a registered seed technologist, and for 37 years, he ran the seed lab at Garst Seed Company. His daily ritual was perusing the grocery store after work, which he continued into retirement, and eating a Salted Nutroll on his drive home.

An avid outdoorsman, Stan loved hunting and fishing with his friends and family and took many hunting trips over the years. His love for the outdoors extended to his farm, where he was often found tending to his garden, kitties, and dogs. Stan imparted his farming and gardening knowledge to his children, ensuring a legacy of respect for the land. He loved watching football on the daybed with a glass of J&B scotch in hand or spending time with his kids and grandkids. The close-knit Grote family loved gathering at the farm where he was a fixture for 39 years. Whether lighting fireworks or sharing a morning cup of coffee while reading the newspaper, Stan's presence was a comforting constant.

He was gentle, wise, and funny — often leaving notes and lists that would leave the family chuckling. You could always find the pen for his notes in his pocket, along with a buckeye and Chapstick.

His stories, his laughter, and the wisdom he shared will continue to echo through the lives of all who knew him.

People will forget what you said. People will forget what you did. People will never forget how you made them feel. - Maya Angelou.