



Seed Regulatory and Testing Division Winter 2024



ITEMS OF INTEREST IN SEED

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RECENT ACTIVITIES

SRTD HOSTS WEBINAR TRAINING

In January, Botanist Kathryn McGinnis presented for the AOSA/SCST Teaching and Training Committee on seed structure, endosperm development, and identifying fescue and ryegrass species. These webinars help promote uniformity among seed testing laboratories and are available here: [AOSA / SCST Teaching and Training – Analyzeseeds](#).

AOSA/SCST MERGER UPDATE

In February, SRTD Laboratory Supervisor, Todd Erickson, participated in the presentation of a recommended plan of action for the merger of the Association of Official Seed Analysts (AOSA) and the Society of Commercial Seed Technologists (SCST). The presentation was given by the merger working group to the Executive Boards of both organizations. SRTD works closely with both organizations to ensure uniformity of seed testing among U.S. laboratories and to strengthen enforcement of State and Federal seed laws. The objective of this merger is to reduce costs and redundancy in the seed testing industry. In the next few months, the proposal will be presented to the membership for comments.

SRTD ASSISTS WITH GUIDANCE ON HEMP LABELING

Throughout this quarter, SRTD staff worked with AMS Specialty Crops Program to review the production of a hemp seed labeling educational presentation. SRTD consulted on properly labeling hemp seed under the Federal Seed Act. The presentations are part of an outreach project for USDA Hemp Licensees regarding the purpose of the Federal Seed Act, the requirements for hemp seed labels, and information about certified hemp seed.

STATE SEED REGULATORS QUARTERLY MEETING

The Seed Regulatory and Testing Division (SRTD) conducts regional quarterly virtual meetings with State Seed Control Officials (SCO). The goal of the meetings is to promote better communication and working relationships with SCOs and discuss current industry issues. Topics from the most recent meetings included: trueness-to-variety trials, seed labeling for seeds one pound or less, ladino clover kind name violations, and an update on the USDA Seed Liaison Initiative priorities.

State regulator quarterly meetings are intended to be comprehensive where SCOs can have all their questions answered. To this effect, SRTD ensures that all relevant staff are available. These staff members include the SRTD Director, Laboratory Supervisor, OECD Seed Schemes Program Manager, and regulatory staff.

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DETECTING ENDOSPERM

In grass seeds, the endosperm is the nutritive tissue surrounding the embryo of a seed derived from the fusion of a sperm cell with the polar nuclei of the embryo sac. Endosperm plays an important role in supporting embryonic growth by supplying nutrients, protecting the embryo, and controlling embryo growth by acting as a mechanical barrier during seed development and germination.

There are three ways in which a seed analyst can determine if a grass seed has enough endosperm to be considered pure seed.

- The first method is to use the blowing point of the species to separate the seed via the general seed blower. The uniform blowing procedure is used for separation of pure seed and inert matter in the following: Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*P. compressa*), rough bluegrass (*P. trivialis*), weeping alkaligrass (*Puccinellia distans*), 'Pensacola' variety of bahiagrass (*Paspalum notatum*), orchardgrass (*Dactylis glomerata*), blue grama (*Bouteloua gracilis*), and side-oats grama (*B. curtipedula*). No further examination of the endosperm is necessary if the blowing point is used.
- The second method is to examine the seeds over light. Endosperm is thicker and darker than the lemma and palea of a grass seed. When it is examined over light, a seed without endosperm will appear lighter and more transparent than a seed that contains an endosperm.
- The third method is to apply slight pressure to the seed with forceps. If a floret does not contain an endosperm, it will usually fold or crumple like paper, whereas an endosperm will feel firm inside the floret.

Structures that are not specifically described as part of the pure seed unit (PSU) shall be removed and classified as inert matter. The PSU numbers given for species in Table 2A correspond to the PSU numbers in Table 3A. It is important to double check the rules for any special PSU definitions in different species to get the most accurate results possible. For some seeds to be considered pure,

such as *Festuca* and *Lolium* species, they must contain an endosperm that is at least one third the length of the palea. If it is smaller than that, it is not considered pure seed. Florets containing flower parts are considered inert matter and not pure seed. Identifying flower parts can be difficult because they look very similar to endosperm when examined over light, but there are a few identifying characteristics. Flower parts include stamens that look like fingers or prongs broken up vertically. They also easily break up when gently poked with forceps, whereas an endosperm will remain firm. Knowing how to identify the differences between flower parts and sufficient endosperm is crucial for getting accurate purity test results.



Left: Floret with endosperm that is less than one third the length of the palea. **Center:** Floret with sufficient endosperm. **Right:** Floret with flower parts and lacking endosperm. (D.J. Lionakis Meyer CDF/PPDC 2007)

For more information regarding this article, contact Botanist Kathryn McGinnis at (704) 810-8872; kathryn.mcginnis@usda.gov.

INTERNET SEED SALES AND THE FEDERAL SEED ACT

SRTD is strengthening internet monitoring on seeds sold over the internet. The Division is taking appropriate actions on quality and advertisement violations regarding this issue. Seed internet sales are subject to the same labeling and advertising requirements of the Federal Seed Act as any other seed shipped interstate commerce. Information on the Federal Seed Act regulations can be found here: www.ams.usda.gov/rules-regulations/fsa

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DIFFERENTIATING KENTUCKY 31 VARIETY OF TALL FESCUE

In 2017, SRTD and cooperating State regulatory agencies began noticing high contamination levels in seed lots of the Kentucky 31 variety of tall fescue. Shortly after, several seed industry organizations and seed companies approached SRTD to request assistance with the issue. SRTD noted that mislabeling for the variety was more than 30%, much higher than the 3-6% the agency was accustomed to seeing. Contaminated seed lots were found at all levels of production and distribution within the industry indicating a systemic problem. This unexpected issue highlighted the lack of testing options available to quickly differentiate the Kentucky 31 variety from other varieties of tall fescue.

Distinguishing the Kentucky 31 variety from other tall fescue varieties based on seed morphological characteristics is challenging. The most common method for identifying the variety is a field grow-out test. While highly accurate in varietal determination, the field test can take six to eight months to complete. During that time, the plants may face several hardships from unfavorable weather, pests, and disease.

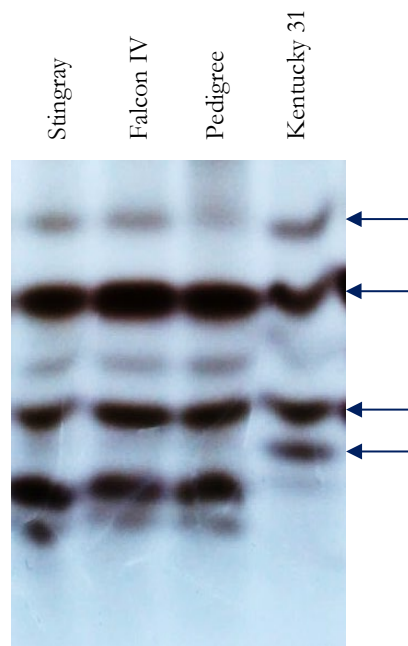
SRTD Plant Physiologist, Dr. Yujia Wu, led the development of a method using polyacrylamide isoelectric focusing electrophoresis (PA-IEF) to verify the Kentucky 31 variety of tall fescue. The method highlights a unique 4-band pattern found only in Kentucky 31 when compared to other tall fescue varieties. The duration of the method is approximately 4 weeks, making it more efficient than a field grow-out test.

Over a two-year period, field grow-out tests and the PA-IEF tests were compared for 276 tall fescue samples. The results between the two test methods were consistent. Approximately 30% of samples were found to be off-types in the PA-IEF test and 31% by field grow-out test.

To further validate the PA-IEF method, Dr. Wu worked with analysts in four State seed laboratories. Statistical data analysis indicated that the method is repeatable and reproducible. In April of 2023, the method was published in the International Seed Testing Associations online journal. Dr. Wu then presented at the 2023

American Seed Trade Association Annual Meeting to show the benefits of the PA-IEF method of lower over-all costs and faster testing time when compared to a field grow-out test.

By using the PA-IEF method, SRTD tested samples submitted by State regulators and industry stakeholders who voluntarily submitted their seed lots that showed signs of tall fescue variety contamination. This combined effort reduced contamination in domestically traded Kentucky 31 grass seed lots from 30% to back to the historical average of 3%.



IEF gel patterns of Tall Fescue varieties, the arrows indicate the unique 4-band pattern of Kentucky 31 variety. (Yujia Wu AMS SRTD 2023)

For more information regarding this article, contact Plant Physiologist Yujia Wu at (704) 810-7267; yujia.wu@usda.gov.

OECD TECHNICAL WORKING GROUP MEETING

On January 29 - February 2, Dr. Steve Malone represented the U.S. at the Technical Working Group (TWG) meeting of the Organization for Economic Cooperation & Development (OECD) Seed Schemes in Livingstone, Zambia. The week began with a workshop on the impact of the OECD Seed Schemes on improved availability of high-quality seed across Africa, especially in those countries that have joined the Seed

Schemes in the past decade. Ad Hoc Working Groups discussed the Digital Hub development which will help verify seed lots and share information between participating countries. They also discussed a proposal to change rules concerning labelling of small packages of seed (less than 2Kg). The outcomes of those discussions were forwarded to the TWG for further consideration. The technical field trip took delegates to a hybrid maize production location and post-control plots for maize and soybean.

The TWG agreed to forward several rules and procedural proposals for approval at the annual meeting later in the year including clarification of guidelines for Multiplication Abroad Agreements, next phases of the Digital Hub, the list of eligible varieties, and updated taxonomy within the Sorghum and Pearl Millet Seed Scheme. The TWG recommended that the annual meeting not adopt the proposed changes to small packages, and to move forward with further exploration of rearrangement of the Schemes to possibly split the Grass & Legume Seed Scheme into a Grass Scheme, and separate Schemes for small-seeded versus large-seeded legumes. Similar considerations may be considered regarding the Crucifer and Other Oil & Fiber Seed Scheme.

The Annual Meeting of the OECD Seed Schemes is scheduled for June 10-14 in Nice, France.

For more information regarding this article, contact OECD Program Manager Steve Malone at (704) 810-8888; steve.malone@usda.gov.

CALENDAR OF EVENTS

- Association of Official Seed Certifying Agencies Southern Region Meeting
Cary, NC; March 26-27, 2024
- Association of Official Seed Certifying Agencies North and West Regional Meeting
Custer, SD; April 8-10, 2024
- Association of Official Seed Analysts/ Society of Commercial Seed Technologist Annual Meeting
Rapid City, SD; June 1-6, 2024
- Organization for Economic Cooperation and Development Seed Schemes Annual Meeting
Nice, France; June 10-14, 2024
- Association of Official Seed Certifying Agencies Annual Meeting
Destin, FL; June 16-19, 2024
- International Seed Testing Association Annual Meeting
Cambridge, UK, July 1-4, 2024
- The Association of American Seed Control Official Annual Meeting
Salt Lake City, UT; July 14-20, 2024
- Seed Regulatory and Testing Division Seed School
Gastonia, NC; August 2024
- American Seed Trade Association Forage, Turf and Conservation Seed Conference
Kansas City, MO; October 30, 2024

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