



Seed Regulatory and Testing Division

# ITEMS OF INTEREST IN SEED

October 2015

[www.usda.ams.gov/seed](http://www.usda.ams.gov/seed)



# TABLE OF CONTENTS

Editor's Notes .....	2
Seed Division Marketing Specialist Linda Vanderhoof Retires .....	3
SRTD Welcomes New Employees .....	4
SRTD Welcomes New Director .....	5
FSA Cases Settled.....	5
Trueness-To-Variety Overview.....	6
An Important Note to State Seed Control Officials.....	6
SRTD Donates 2,500 Pounds of Watermelon in Support of USDA's Feds Feed Families.....	7
2015 Ag-Discovery.....	7
USDA AMS Holds First Seed Stakeholders Meeting .....	8
AOSA-SCST 2015 Annual Meeting.....	9
Meeting of the International Seed Testing Association .....	10
Association of American Seed Control Officials Annual Meeting .....	12
Tetrazolium Testing Under the Federal Seed Act.....	12
Internet Seed Sales and the Federal Seed Act.....	13
Loan Procedure for Association of Official Seed Analysts Master Calibration Sample.....	13
Beet, Swiss Chard: Washing and Drying Prior to Germination .....	15
Comparing DNA Extractions between Alfalfa Seeds and Seedlings for Trait Testing .....	16
Quality Management Training at STRD.....	17
2015 Seed Analysts Training Workshop in Gastonia, NC.....	18
Ryegrass Fluorescence List .....	20
Plant Variety Protection Certificate Status.....	20
Noxious-Weed Seed List for 2015 .....	20
Calendar of Events .....	21
Staff Directory .....	22
IOI Staff Contributors .....	23

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## EDITOR'S NOTES

The Seed Regulatory and Testing Division (SRTD) had several personnel changes this year. As the new Items of Interest in Seed (IOI) editor, I would like to highlight the retirement of previous IOI editor Linda Vanderhoof with an article about her retirement and many contributions to the Division. Other personnel changes include the selection of Director Ernest Allen, the hiring of Seed Marketing Specialist Akhtar Kazmi, and the addition of U.S. Organization for Economic Cooperation and Development Seed Schemes Program Manager Stephen Malone, Ph.D.

This edition also includes summaries of meetings that SRTD staff members participated in this year, such as the Association of Official Seed Analyst and Society of Commercial Seed Technologists joint meeting and the Association of American Seed Control Officials meeting. In addition, SRTD hosted in-house workshops including the updated Quality Management training and Annual Federal Seed Schools.

Of particular interest are two articles featuring Plant Physiologist Yujia Wu's comparison of DNA extraction techniques on alfalfa seed versus seedlings and Botanist Anitra Walker's detailed explanation on germination procedures for beet seed.

Recently, the AMS Web site was updated. It contains a new index to retrieve past issues of the IOI or to search for articles by subject matter. SRTD is committed to providing quality service. Please send your comments or suggestions to me at [elizabeth.tatum@ams.usda.gov](mailto:elizabeth.tatum@ams.usda.gov).

On behalf of the SRTD staff, I would like to thank our readers for their continued support of the IOI publication.

Elizabeth Tatum  
IOI Editor

## **SEED DIVISION MARKETING SPECIALIST LINDA VANDERHOOF RETIRES**

On July 31, 2015, SRTD Seed Marketing Specialist Linda Vanderhoof retired after approximately 36 years of service in the Federal Government, 20 of those with SRTD. Prior to joining SRTD, she worked with the District of Columbia Police and the Defense Logistics Agency. Ms. Vanderhoof began her career with SRTD as an Office Automation Clerk. In 2003, she was selected for a Seed Marketing Specialist position where she excelled.

Many accomplishments define Ms. Vanderhoof's career with SRTD. Most notably, since 2006, she served as the editor of the Items of Interest in Seed online journal. This journal serves as a valuable resource to the seed industry. It includes articles that encourage uniformity in the seed industry through testing and training, reviews of industry and State rules and policies, and Federal Seed Act regulations.

Ms. Vanderhoof's many years of exceptional service to the seed industry, keen knowledge of Federal Seed Act regulations, and professionalism shown to her teammates at SRTD will be truly missed. SRTD thanks Ms. Vanderhoof for her years of Federal service and consistent dedication throughout her career and wishes her success and happiness in all her future endeavors.



Seed Marketing Specialist Linda Vanderhoof receives her retirement service award from Director Ernest Allen.

## **SEED REGULATORY AND TESTING DIVISION WELCOMES NEW EMPLOYEES**

Dr. Stephen Malone and Akhtar Kazmi have recently joined the SRTD staff. Beginning on July 27, 2015, Dr. Stephen Malone joined SRTD as the United States Organization for Economic Cooperation and Development (OECD) Seed Schemes Program Manager. He will also serve as a Regulatory Seed Marketing Specialist tasked with promoting Federal Seed Act (FSA) compliance through industry outreach and conducting investigations of FSA violations. He has a B.S. degree in Agronomy and an M.S. degree in Crop Science, both from the University of Arkansas, and a Doctorate in Crop Production and Physiology from Iowa State University.

Prior to joining SRTD, Dr. Malone worked for the Minnesota Department of Agriculture where he served as Supervisor of the Seed, Noxious Weed, and Biotechnology Unit. He also worked in various roles in the seed industry, academic, and research organizations. From 2013-2015 he served as the President of the Association of American Seed Control Officials. He is currently on the Board of Directors of the Crop Science Society of America.

Akhtar Kazmi started as a Seed Marketing Specialist on June 29, 2015. Mr. Kazmi has both B.S and M.S degrees in Agriculture, Plant Breeding, and Genetics from N.W.F.P Agricultural University in Peshawar, Pakistan. His previous work experience includes: project manager with National Logistic Cell, agricultural research officer with the Government of Pakistan Department of Agriculture, design engineering test technician with Teledyne Storm Products Company, supervisor and manager with Monsanto Soybean Breeding Station, field research biologist with Dow AgroSciences, and a substitute teacher with the Will County Regional Office of Education.

Please join SRTD in congratulating the new Seed Marketing Specialist and U.S OECD Seed Schemes Program Manager!



Seed Marketing Specialist Akhtar Kazmi



U.S OECD Seed Scheme Manager Stephen Malone, Ph.D.

## **SEED REGULATORY AND TESTING DIVISION WELCOMES NEW DIRECTOR**

Ernest Allen has been selected to serve as the Director of the Livestock, Poultry, and Seed Program's SRTD in Gastonia, NC. Before this selection, he served as the Deputy Director and Laboratory Supervisor of SRTD.

Mr. Allen is a Certified Seed Analyst and has earned B.S and M.S degrees in biological sciences from Winthrop University in Rock Hill, SC. Prior to joining SRTD as a seed analyst in 2004, Mr. Allen served in several management roles in the service industry, where he cooperated with diverse groups of stakeholders, handled administrative issues, and managed financial resources. As a botanist for SRTD, Mr. Allen played an integral role in administering the Federal Seed Act, carrying out seed testing services, and other outreach activities for State government and industry partners. He served as the voting AMS representative for the Association of Official Seed Analysts (AOSA), the voting delegate for the United States at the International Seed Testing Association (ISTA) Ordinary Meetings, and Acting U.S. Organization for Economic Cooperation and Development (OECD) Seed Schemes Program Manager for AMS. He also served on several committees and working groups for various seed industry organizations.

Please join SRTD in congratulating its new Director!



LPS Seed Regulatory and Testing Division Director Ernest Allen

## **FEDERAL SEED ACT CASES SETTLED**

The Federal Seed Act (FSA) provides authority for the regulation of the interstate shipments of agricultural and vegetable seeds. The FSA requires that seed shipped in interstate commerce be labeled with certain information necessary for the seed buyer to make an informed choice. The labeling information and any advertisements pertaining to the seed must be truthful.

Between September 3, 2014, and September 1, 2015, a total of 40 seed companies paid \$75,900 to settle alleged violations of the FSA. For specific information regarding these violations, please visit <http://www.ams.usda.gov/rules-regulations/fsa> then [Filing a Complaint](#)

and [View a list of settled FSA cases](#). AMS administers the FSA by leveraging its resources with State departments of agriculture. These investigations were a result of joint efforts with seed regulatory officials in AR, GA, IL, IN, KY, MD, MO, NE, NM, NY, OH, PA, TX, VA, and WV. By working collaboratively with State partners, SRTD helps promote uniformity among State laws and fair competition within the seed trade through the enforcement of the FSA.

## **TRUENESS-TO-VARIETY OVERVIEW**

Each year SRTD conducts trueness-to-variety (TTV) field tests to determine if seed lots are properly labeled for variety, as required by the Federal Seed Act and State seed laws. Field testing is conducted by crop experts at State universities and State departments of agriculture in cooperation with SRTD. SRTD relies on State seed control programs to submit samples for inclusion in the TTV tests.

This summer, SRTD conducted TTV tests on okra at the Sandhills Research Station in Jackson Springs, NC, and on tomatoes and watermelon at the Piedmont Research Station in Salisbury, NC.

SRTD would like to thank the States which participated in the TTV program. Once results and information have been compiled, participating States will be notified of any mislabeling.

If there are any questions concerning the TTV program or directions for submitting samples, please contact Seed Marketing Specialist Kevin Robinson, at (704) 810-7264; [kevin.robinson2@ams.usda.gov](mailto:kevin.robinson2@ams.usda.gov).

## **AN IMPORTANT NOTE TO STATE SEED CONTROL OFFICIALS**

Please contact SRTD when your office or laboratory has changes regarding the following information:

- Seed Control Officials or regulatory and laboratory contacts
- Commissioners, Directors, or Secretaries
- Titles
- Department names (division, section, bureau, etc.)
- Addresses (physical or mailing)
- Telephone numbers (voice and fax)
- E-mail addresses
- Web sites

SRTD strives to ensure that laboratory reports, copies of regulatory correspondence, training notices, program announcements, and requests for information reach the correct person as soon as possible.

For more information or to submit updates, please contact Seed Marketing Specialist Kevin Robinson, (704) 810-7264; [kevin.robinson2@ams.usda.gov](mailto:kevin.robinson2@ams.usda.gov).

## **SEED DIVISION DONATES 2,500 POUNDS OF WATERMELON IN SUPPORT OF USDA'S FEDS FEED FAMILIES**

On August 5, 2015, SRTD, in cooperation with the North Carolina Department of Agriculture's Piedmont Research Station, harvested over 2,500 pounds of various types of watermelon. They were donated to several food banks in North Carolina including Main Street Mission in China Grove, Rowan Helping Ministries in Salisbury, and Second Harvest in Dallas. These are nonprofit community service organizations that provide supplemental food assistance and other outreach activities for those in need. Together, they help to feed more than 1,500 families each month. The watermelon was donated as part of the USDA's Feds Feed Families campaign, which strives to help our neighbors in need. SRTD will donate okra, tomatoes, and additional watermelon in the coming weeks.

SRTD grows various types of agricultural and vegetable crops each year to verify that seeds being sold in the United States are accurately labeled. This practice helps to ensure that businesses, farmers, and home gardeners get the products that they expect in seed packets.



AMS Plant Physiologist Yujia Wu, Ph.D., evaluates several varieties of watermelon to ensure seed being sold in the United States are truthfully labeled.

For more information regarding this article, please contact Plant Physiologist Yujia Wu Ph.D., (704) 810-7267; [yujia.wu@ams.usda.gov](mailto:yujia.wu@ams.usda.gov).

### **2015 AG-DISCOVERY CAMP**

SRTD Plant Pathologist Sandra Walker taught a session on seed testing at the 2015 AgDiscovery camp at the North Carolina State University campus in Raleigh, NC. She talked to the students about the mission of SRTD and helped each student set up a germination test on vegetable seeds. The following week, Ms. Walker assisted the students in evaluating their germination tests. The students enjoyed the hands-on experiment.



AgDiscovery camps are sponsored by USDA and held for two weeks each summer at several universities across the United States. The camps are designed to introduce high school students to careers in agriculture. An opening session and luncheon introduced the students to USDA and its various missions. Representatives from Forest Service, Veterinary Services, Animal Plant Health and Inspection Services, and the Science House from North Carolina State University were present to greet students and answer questions about jobs in agriculture.



Plant Pathologist Sandra Walker teaches students about seed testing.

For more information about this article, please contact Plant Pathologist Sandra Walker, (704) 810-7268; [sandra.walker@ams.usda.gov](mailto:sandra.walker@ams.usda.gov).

### **USDA AGRICULTURAL MARKETING SERVICE HOLDS FIRST SEED STAKEHOLDERS MEETING.**

On January 12, 2015, AMS Livestock, Poultry, and Seed (LPS) and Science and Technology (S&T) Programs hosted a stakeholder meeting with 16 leaders from 10 organizations representing seed sector stakeholders. This was the third of a planned series of meetings with stakeholders from sectors served by LPS. The purpose of the meeting was to determine how AMS could best leverage its resources to promote and support the U.S. seed sector both domestically and internationally.

The meeting took place at the U.S. Department of Agriculture's South Building in Washington, DC, and started with introductory remarks from AMS Administrator Anne Alonzo. LPS Deputy Administrator Craig Morris and S&T Deputy Administrator Ruihong Guo explained the purpose of the stakeholder meeting and provided brief summaries of print materials provided to participants. Former SRTD Director Fawad Shah and S&T Plant Variety Protection Office Commissioner Paul Zankowski briefly explained the roles of each of their respective programs within AMS. Stakeholders came well prepared and a productive dialogue on seed sector issues began. Topics discussed included challenges facing the seed sector, updating the Federal

Seed Act, electronic plant variety protection applications, ensuring U.S. representation at international meetings, marketing the U.S. seed industry to foreign countries, and AMS' participation in developing audit programs specific to the seed industry.

Feedback from the meeting was positive and proved helpful to AMS in providing areas of focus for resources. Stakeholder meetings are critical to AMS's strategic planning and ensure services and regulatory programs are meeting the needs of U.S. agriculture.

For more information regarding this article, please contact SRTD Director Ernest Allen, (704) 810-8877; [ernest.allen@ams.usda.gov](mailto:ernest.allen@ams.usda.gov).

## **2015 ASSOCIATION OF OFFICIAL SEED ANALYSTS-SOCIETY OF COMMERCIAL SEED TECHNOLOGISTS ANNUAL MEETING**

The joint Association of Official Seed Analysts (AOSA) and Society of Commercial Seed Technologists (SCST) annual meeting was held in Tampa Bay, FL, from May 30 to June 4, 2015. Four representatives from the SRTD gave presentations regarding SRTD activities, provided input on new rule proposals and policies, and assisted with training sessions.

The purpose of the annual meetings is to update and vote on proposed changes for AOSA rules. These rules are used by testing laboratories and State departments of agriculture around the country and to help keep seed testing methods uniform in the United States. The meetings also provide an opportunity for members, which include regulatory agencies, universities, certification entities, and private seed companies to collaborate and discuss current issues important to the seed industry.

Several meetings took place throughout the week. During the germination committee meeting, the use of agar as an alternative growing media was discussed. The teaching and training meeting focused on the consolidated exam. New computer based trainings were presented which included the proper way to collect a sample, use of the mechanical dividers, and use of the uniform blower.

In the regulatory meeting, members discussed ways that AMS can help State laboratories with quality workshops and the benefits of using a third party for testing regulatory samples. The cultivar purity committee presented a new formula to consider for the annual – perennial ryegrass determinations of fluorescence test results. The tetrazolium (TZ) committee then discussed issues with TZ testing and an idea to make the TZ handbook part of the AOSA Rules.

AMS also serves as a member of the AOSA rules committee. The rules committee receives submissions for rule change proposals to ensure that they contain all of the necessary information before submitting them to the membership for review and vote. This year, all 29 submitted proposals for changes to AOSA rules passed. The first 20 proposals involved adding several native species to the AOSA Rules Volume One Table 2A and classifications in Volume 3. Other rule proposals included limiting noxious-weed seed sample size for coated large-seeded kinds, clarifying the test extensions by allowing for flexibility when an extended test would fall on a weekend, and modifying the test duration of *Sorghum bicolor subsp. bicolor* from 10 days to 7 days. A complete listing of the 2015 rule proposal voting results can be found at [www.aosaseed.com/rulescommittee.htm](http://www.aosaseed.com/rulescommittee.htm) and [www.seedtechnology.net/rulescommitte.htm](http://www.seedtechnology.net/rulescommitte.htm).

For more information regarding this article, please contact Botanist Elizabeth Tatum, (704) 810-8873; [elizabeth.tatum@ams.usda.gov](mailto:elizabeth.tatum@ams.usda.gov).

## MEETING OF THE INTERNATIONAL SEED TESTING ASSOCIATION

SRTD Director Ernest Allen participated in the annual meeting of the International Seed Testing Association (ISTA), June 15-18, 2015, in Montevideo, Uruguay.

The meeting consisted of several reports from committees within ISTA which included updates on current and future projects, finalized projects, and rule proposals submitted by various committees. Mr. Allen presented the Nomenclature Committee report on behalf of the chairman, John Wiersema (USDA's Agricultural Research Service), who not could attend the meeting. Committee reports can be viewed on the [ISTA Web site](#).

At the Ordinary Meeting on June 18, Mr. Allen served as the voting delegate on behalf of AMS, which is the U.S. Designated Authority to ISTA. Of the 77 ISTA member countries, 39 were represented at the meeting. Twenty-seven Designated Members entitled to vote at the Ordinary Meeting were present, exceeding the required quorum. ISTA President Joël Léchappé (France) gave the welcome address and chaired the Ordinary Meeting.

Decisions of the Ordinary Meeting:

- The membership voted to amend the ISTA Rules of Order by changing the voting method to include electronic voting. Each member country is, under the new method, assigned an electronic keypad to vote at the ISTA Ordinary General Meeting. The ability to vote by voting cards will remain an option in the event of the unavailability of keypads.
- ISTA annual membership fees for 2016 will remain unchanged. No increase was proposed by the Executive Committee or the Secretariat of the organization.
- There were a total of 20 proposals submitted to the membership for vote. Approved rule changes, which will take effect January 1, 2016, include the following:
  - Clarification of requirements to retain separated components of the purity test. The new rule restricts the “must be retained” to the other seeds component and not to include the pure seed or inert matter. 3.5.2 “After weighing, the other seeds component must be retained and stored for reference until sample disposal...” *Storing the sample purity components after testing ensures the sample physical identity is kept for quality purposes. Keeping only the other seed component would mean that the inert component identity is lost. AMS voted not to accept this rule.*
  - Clarification on how to proceed when counting errors happen during germination testing. 5.6.1 “When due to counting errors more than 5 seeds are lost or found during a germination test (i.e.  $\pm 1.25\%$  for a total of 400 seeds), the test must be repeated.” *This rule clarifies how much counting errors can deviate during germination examinations. The ISTA Statistics chair concluded that the rule will not significantly affect testing results or tolerances. AMS voted to accept this rule.*
  - Addition of a new paragraph to Table 2A to clarify maximum lot and sample size requirements. 2.8 Table 2A “Note 2: For all species the maximum seed lot size stated can be exceeded by no more than 5%, except for...” 2.5.4.2 “Large

herbage seed lots of *Poaceae* species may have a maximum size of 25000kg (with a 5% tolerance) if produced by an approved production plant.” *AMS voted to accept this rule.*

- Allow the testing of 200 seeds for germination in the case of an ISTA Blue International Certificate only. 5.6.1 “...At the request of the applicant, a germination test can be carried out on 200 seeds, for issuance on a Blue International Seed Sample Certificate only. In this case, the number of seeds tested is less than 400 and must be reported under ‘Other Determinations’...” *AMS voted not to accept this rule.*

For a complete list of changes approved during the Ordinary meeting please visit the ISTA Web site at [www.seedtest.org](http://www.seedtest.org). Next year’s ISTA Congress is scheduled for June 15-21, 2016, in Tallinn, Estonia.



AMS Seed Regulatory and Testing Division Director Ernest Allen gives a presentation to the membership during the ISTA meeting in Montevideo, Uruguay.

For more information regarding this article, please contact Director Ernest Allen, (704) 810-8877; [ernest.allen@ams.usda.gov](mailto:ernest.allen@ams.usda.gov).

## **ASSOCIATION OF AMERICAN SEED CONTROL OFFICIALS ANNUAL MEETING**

SRTD Seed Marketing Specialists Roger Burton and Kevin Robinson attended the 29<sup>th</sup> Annual Meeting of the Association of American Seed Control Officials (AASCO) from July 12-16, 2015. The meeting was hosted by the Missouri Department of Agriculture in St. Louis, MO. Representatives from 17 State seed control programs, American Seed Trade Association, Association for Official Seed Certifying Agencies, Canadian Food Inspection Agency, and six seed companies attended the meeting. Mr. Burton and Mr. Robinson each reported the 2014 Federal Seed Act activities at the general session and regional group meetings.

Other discussions included:

- The importance of labeling and seed control from the industry's point of view
- How will seed libraries affect State seed laws

The following announcements were made:

- The 30<sup>th</sup> annual meeting will tentatively be held July 2016 in Kalispell, MT
- The current AASCO officers are:
  - President Steve Malone (MN)
  - First Vice President Jim Drews (MD)
  - Second Vice President Johnny Zook (PA)
  - Treasurer Greg Helmbrecht (WI)
  - Secretary Larry Nees (IN)

For more information regarding this article, please contact Seed Marketing Specialist Kevin Robinson, (704) 810-7264; [kevin.robinson2@ams.usda.gov](mailto:kevin.robinson2@ams.usda.gov).

## **TETRAZOLIUM TESTING UNDER THE FEDERAL SEED ACT**

When conducting a germination test according to the Federal Seed Act (FSA) Regulations, all seeds, other than hard seeds that are viable and yet fail to germinate when provided the specified germination conditions for the seed in question, are to be considered dormant (Section 201.57a). The FSA Regulations indicate four methods for determining whether the ungerminated seeds are viable, and therefore dormant: cutting test, tetrazolium (TZ) test, scarification, or application of germination promoting chemicals (201.57a(a)). SRTD prefers the use of the TZ test to determine dormancy. The TZ test provides rapid results; however, preparation of the seeds can be labor-intensive, and correct interpretation of the results requires some practice.

Paragraph (b) of section 201.57a in the FSA Regulations lists the kinds that require a dormant seed determination at the end of a germination test. These are bahiagrass, basin wildrye, big bluestem, little bluestem, sand bluestem, yellow bluestem, bottlebrush-squirreltail, buffalograss, buffelgrass, galletagrass, forage kochia, blue grama, side-oats grama, Indian ricegrass, johnsongrass, sand lovegrass, weeping lovegrass, mountain rye, sand dropseed, smilo, switchgrass, veldtgrass, western wheatgrass, and yellow indiagrass. This does not mean that kinds not included in this list cannot be tested for dormancy.

It is important to note that a TZ test is not a substitute for a germination test. The TZ test cannot distinguish between seed that would germinate under normal conditions and dormant seed. Also, the TZ test cannot detect pathogens in the seed which could interfere with germination and cause abnormal seedling development.

For more information regarding this article, please contact Botanist Todd Erickson, (704) 810-7266; [todd.erickson@usda.gov](mailto:todd.erickson@usda.gov).

*(Article written by Botanist Todd Erickson and originally published in the April 2011 IOI publication.)*

## **INTERNET SEED SALES AND THE FEDERAL SEED ACT**

The SRTD often receives complaints from consumers regarding the sale of small-packet vegetable seed over the Internet. State Seed Control Officials have also expressed concerns over requirements of the Federal Seed Act (FSA) relating to Internet seed sales when shipped in interstate commerce. Ultimately, seed sold or offered for sale over the Internet **is not exempt** from the requirements of the FSA; it is subject to the same requirements of the FSA as any other seed shipped in interstate commerce. Seed advertised on the Internet is also subject to the advertising requirements of the FSA.

Requirements for small-packet vegetable seed (one pound or less) are covered in sections 201(b) (1) and 201(b) (2) of the FSA and sections 201.25 through 201.31 of the FSA Regulations. These sections require the packets or containers to include on the label the correct kind and variety names as determined in accordance with section 201.34 of the Regulations, the word “Hybrid” if the variety is hybrid seed, and the complete name and address of the interstate shipper.

Section 201(b) (2) of the FSA and 201.29 of the FSA Regulations require that vegetable seeds in containers of one pound or less must germinate at or above the minimum standard set forth in section 201.31. If the vegetable seed germination percentage is less than the standard, then the label shall have the words “Below Standard” clearly stated in type no smaller than 8-point font. Each variety that germinates less than the standard is required to show the percentage of germination, the percentage of hard seed (if any), and the calendar month and year the test was completed.

Section 202 “Records” of the FSA and sections 201.4, 5, 6, 7, and 7a “Records for Agricultural and Vegetable Seeds” of the FSA Regulations address the records requirements pertaining to all persons transporting agricultural and vegetable seed in interstate commerce. Such records shall be accessible for inspection by authorized agents of the Secretary of Agriculture for the purposes of the effective administration of the Act at any time during customary business hours.

Section 205 of the Act and 201.36b of the Regulations address “Advertising” and “False Advertising” of agricultural and vegetable seeds.

For more information regarding this article, please contact Seed Marketing Specialist Roger Burton, (704) 810-7265; [roger.burton@ams.usda.gov](mailto:roger.burton@ams.usda.gov).

*(Article written by Seed Marketing Specialist Roger Burton and originally published in the April 2010 IOI publication.)*

## **LOAN PROCEDURE FOR ASSOCIATION OF OFFICIAL SEED ANALYSTS MASTER CALIBRATION SAMPLES**

The uniform blowing procedure uses a mechanical blower to help separate pure seed from inert matter in certain kinds of grass seeds. Calibration is necessary to determine the proper gate setting of the blower in order to establish the optimum uniform blowing point for a particular species, which requires measurement of air velocity using an anemometer. Master Calibration Samples (MCSs) are available for loan from SRTD and must be used for the calibration.

Forms and additional information about the equipment and procedure are located on the Association of Official Seed Analysts (AOSA) Web site (Go to [www.aosaseed.com](http://www.aosaseed.com) and click the

resources tab). It is helpful to read the current version of the AOSA Rules for Testing Seeds Volume 2 prior to using the calibration procedure for the first time

#### Requesting and Returning Master Calibration Samples:

- Request the MCSs from the SRTD laboratory by phone, fax, or e-mail
  - MCS Program Administration  
USDA AMS LPS SRTD  
801 Summit Crossing Place  
Suite C  
Gastonia, NC 28054
  - PHONE (704) 810-8870
  - FAX (704) 852-4189
  - [charlene.burton@ams.usda.gov](mailto:charlene.burton@ams.usda.gov)
- Include the following information with your request:
  - a signed and dated Loan Agreement Form for the Master Calibration Samples
  - species (only orchardgrass and Kentucky bluegrass MCSs are available at this time)
  - laboratory name
  - contact name
  - street address
  - phone number
  - fax number or e-mail address, if available
- Laboratories are notified if there is a waiting list at the time of a request and are contacted again when the samples are shipped. Whenever possible, samples are sent in the order requests are received.
- Upon receipt, a laboratory has five days, not counting the day of receipt, to calibrate and send samples back to SRTD.
- Copies of the *Guidelines for Users of Master Calibration Samples* and the *User's Data Sheet for Tracking Master Calibration Samples* will arrive with the MCSs. Read this information before calibrating.
- Perform the calibration as instructed in AOSA Rules for Testing Seeds Volume 2 and the *Guidelines for Users of Master Calibration Samples*. A Certified Seed Analyst (CSA), Registered Seed Technologist (RST), or person under the supervision of a CSA or RST should perform the calibration, taking care to follow the guidelines for **handling the samples** and **maintaining sample integrity**.
- Return the samples and the completed *User's Data Sheet for Tracking Master Calibration Samples* by traceable overnight service (UPS, FedEx, DHL, USPS Express, etc.).
- There is no charge for borrowing the MCSs if the borrower follows all requirements in the *Loan Agreement for the Master Calibration Samples*, *Guidelines for Users of Master Calibration Samples*, and the *MCS Borrower Responsibility Guidelines*.

For more information regarding this article, please contact Botanist Charlene Burton, (704) 810-8880; [charlene.burton@ams.usda.gov](mailto:charlene.burton@ams.usda.gov).

## **BEET, SWISS CHARD (*BETA* SPP.): WASHING AND DRYING PRIOR TO GERMINATION**

In order to promote germination, beet seeds must be washed and dried prior to planting according to the current Federal Seed Act (FSA) Regulations, section 201.58b (3); Association of Official Seed Analysts (AOSA) Rules, 6.8 c.; and International Seed Testing Association (ISTA) Rules 5.6.3.3. This is done in order to remove inhibitory substances. These substances are found in the pericarp or seed coat and must be properly removed by special procedures.

The procedure used to remove the inhibitory substances is called leaching. This exposes the seeds to an excess of water that dilutes or removes the inhibitor. The AOSA Rules and FSA Regulations recommend using at least 250 ml of water per 100 seeds.

If the beet seeds are not washed prior to germination, or if some of the toxins are not removed during the initial washing, the toxic chemicals will cause darkening of the radicles and/or excessive discoloration of the hypocotyls. If these symptoms still exist after germination, retest in soil or wash the seeds in running water for 3 hours and test on “Kimpak,” keeping the seeds covered with slightly moist blotters.

### **Leaching Methods**

FSA, AOSA, and ISTA have different methods for leaching. Soaking is letting the seed sit in water for a period of time. Washing involves applying running water to the seed.

	Federal Seed Act	Association of Official Seed Analysts	International Seed Testing Association
soak	2 hours	2 hours	not required
wash in running water	yes	yes	yes
washing temperature	>20 °C	>20 °C	25 ±2 °C
drying technique	excess water blotted	surface blotted dry	air dry at room temperature

According to AOSA and FSA, sugar beet seed may require 16 hours soaking in water at 25°C, followed by rinsing and then drying at room temperature for 2 hours.



Leaching- removal of inhibitory substances from beet by washing with running water





Unwashed beet-day 5

Washed beet-day 5

## References

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Copeland, L. O., and M. B. McDonald. *Principles of Seed Science and Technology*. 4th ed. New York, N.Y.: Chapman & Hall, 1995. 151. Print.

For more information regarding this article, contact Botanist Anitra Walker, (704) 810-7269; [anitra.walker@ams.usda.gov](mailto:anitra.walker@ams.usda.gov).

## COMPARING DNA EXTRACTIONS BETWEEN ALFALFA SEED AND SEEDLING FOR TRAIT TESTING

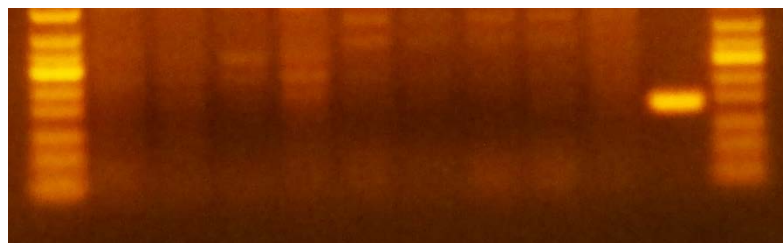
Alfalfa is a commonly produced crop in the United States. Recently, new varieties have been introduced that contain traits which differ from traditional varieties. Due to these advances, customers may request trait information to distinguish between varieties. In order to find the most efficient method to extract DNA from alfalfa, SRTD Plant Physiologist Yujia Wu compared tests between alfalfa seed and seedlings.

Two sets of 5.0 grams (around 2,500 seeds) were used in each test. Seedlings were grown in germination chambers at 20°C for 48 hours. The seeds were ground by an Osterizer blender at high speeds to create a powder, and the seedlings were ground by a motor pestle for 10 minutes. DNA was extracted by Qiagen DNeasy Plant mini kit procedure followed by running PCR with 35S promoter primers. The PCR results indicated that all seed and seedling samples had consistent negative results, as shown in the agarose gel picture below. When comparing DNA extractions from alfalfa seed versus seedling, the cost and quality of DNA material were similar, but the seedling samples needed about 48 hours to germinate before extracting.

Seedling
Seed

---

**Marker**   1   2   3   4   5   6   7   8   -   +   **Marker**



Alfalfa 35S Promoter PCR Results

Comparing DNA Extraction from seedling and seed

	<b>Seed</b>	<b>seedling</b>
<b>Seed Number</b>	2,500	2,500
<b>Germination Hours</b>	0	48
<b>Grinding Minutes</b>	2	10
<b>DNA Extra. (Hours )</b>	2	2
<b>DNA Ratio 260/280</b>	1.8	1.8
<b>DNA concentration (ng/ul)</b>	48.5	45.8
<b>DNA Extra. Cost</b>	same	same
<b>PCR Result</b>	same	same

For more information regarding this article, please contact Plant Physiologist Yujia Wu Ph.D., (704) 810-7267, [yujia.wu@ams.usda.gov](mailto:yujia.wu@ams.usda.gov)

### **QUALITY MANAGEMENT TRAINING AT SRTD**

On May 12-13, 2015, SRTD held a training course on quality management at its facility in Gastonia, NC. The course was taught by SRTD Director Ernest Allen and Botanist Todd Erickson, both of whom are auditors for the USDA Process Verified Programs for Seed. The focus of the training was on the requirements that a seed testing laboratory must meet in order to become an USDA Accredited Seed Laboratory. The training included hands-on exercises in writing quality documents and conducting internal audits, as well as in-depth discussions about the language and specific requirements of the USDA's Grading and Verification Division 1001 standard, which is based on the International Organization for Standardization 9001 standard. There were many engaging discussions centered on solutions to difficulties that laboratories may face on the road to becoming accredited. The feedback on the course was very positive. SRTD plans to offer future quality trainings in the hopes of promoting uniformity in seed testing and proper general laboratory practices.



Quality Management Training Participants (from L to R), Ernest Allen, Todd Erickson, Elizabeth Tatum, Yujia Wu, Deborah Meyer, Patsy Jackson, Amitra Berry, Sandra Walker, Desirae Jones, Fawad Shah

For more information on this topic, please contact Botanist Todd Erickson at (704) 810-8874 or [todd.erickson@ams.usda.gov](mailto:todd.erickson@ams.usda.gov)

### **2015 SEED ANALYSTS TRAINING WORKSHOPS IN GASTONIA, NC**

SRTD held two Seed Analyst Training Workshops in Gastonia, NC, on August 10-12 and 24-26, 2015. Thirty seed analysts from 17 States representing public and private laboratories attended. The workshops focused on purity and identification of similar crop and weed species with an emphasis on identification of noxious-weed seeds. Other topics included seed and seedling structures, pure seed unit definitions, grass mixture separations, uniform blowing procedure, and various calculations. This year also featured new presentations about endosperm development, coated seed units, tetrazolium testing, and seed-borne fungal diseases. Following the workshops, AOSA purity and germination exams were given to analysts working to become Certified Seed Analysts or Registered Seed Technologists.

The mission of the Federal Seed Act is to promote uniformity in seed laws and fair competition within the seed industry. This effort is supported by State seed control programs through authorization provided by cooperative agreements between the States and AMS. SRTD workshops, offered to State and other seed industry personnel, further these goals by promoting uniformity in testing and by fostering greater compliance with State and Federal seed-labeling laws.



From L to R: Ernest Allen (SRTD), Yuija Wu (SRTD), Charlene Burton (SRTD), Anitra Walker (SRTD), Rebekah Wagner (Syngenta), Patsy Jackson (SRTD), Todd Erickson (SRTD), Fanny Javier (Incotec), Michael Kelley (FL), Sam Banks (MN) Heidi Arneson (SGS), Sari Faye (FL), Sandra Walker (SRTD), Jonathan Collett (KY), Kristaan Meritt (SC), Isaiah Waddell (SGS), Tyann Alexander (SGS), Elizabeth Tatum (SRTD), Kathy Mathiason (SGS), and Michael Aberle (Ransom).



From L to R: Akhtar Kazmi (SRTD), Sandra Walker (SRTD), Jenny Mann (MS), David Wannabaker (SC) Anitra Walker (SRTD), Candance Rushing (MS), Amy Smeltzer (IN), Charlene Burton, (SRTD), Kathleen Willey (NM), Patsy Jackson (SRTD), Elizabeth Tatum (SRTD), Lindsay Patrick (CT), Pamela Sletten (CT), Robin Lambert (SC), John Armstrong (OH), Todd Erickson (SRTD), Robin Plexico (SC), Tracy Lamb (SC), Jessica Gray (IN), Kenneth Wilkins (DE), Chase Mowry (SGS), Anastasia Johnson (DE), Shonda Sears (GA), and Caitlyn Gilbert (Tangent)

For more information about this article or upcoming Seed Analysts Workshops, please contact Botanist Patsy Jackson, (704) 810-8881; [patsy.jackson@ams.usda.gov](mailto:patsy.jackson@ams.usda.gov)

## **RYEGRASS FLUORESCENCE LIST**

The Association of Official Seed Certifying Agencies (AOSCA) revises its report of the Variety Fluorescence Levels recognized by the AOSCA Grass Variety Review Board twice a year. Click on the Grass Variety Review Board section of the [Web site](#), then click on the link for the Perennial Ryegrass Variety Fluorescence Report to view the most current list.

## **PLANT VARIETY PROTECTION CERTIFICATE STATUS**

The Plant Variety Protection Office (PVPO) posts a public version of the Certificate Status Database. Visit the [PVPO Certificate Status Database](#) to check the status of certification or to search for expired certificates.

## **NOXIOUS-WEED SEED LIST FOR 2015**

The SRTD staff recently revised the State-Noxious Weed Seed Requirements recognized in the Administration of the Federal Seed Act. SRTD is grateful to the State seed control officials and contacts for submitting State seed law changes to this office.

To view the document go to <http://ams.usda.gov> and search for “noxious weed-seed.”

For State Seed Cooperators: Please send in changes for the State Noxious Weed-Seed list when the email notification is received in November.

For information regarding this article, contact Botanist Anitra Walker, (704) 810-7269; [anitra.walker@ams.usda.gov](mailto:anitra.walker@ams.usda.gov).

## CALENDAR OF EVENTS

ASTA 70th Corn & Sorghum Seed Research Conference and ASTA 45 <sup>th</sup> Soybean Seed Research Conference Seed Expo Chicago, IL	December 7, 2015 – December 11, 2015
ASTA 55 <sup>th</sup> Annual Vegetable & Flower Seed Conference Anaheim, CA	January 30, 2016 – February 2, 2016
Association of Official Seed Analysts/ Society of Seed Technologist Annual Meeting Portland, OR	June 2016
Organization for Economic Cooperation and Development (OECD) Seed Schemes Annual Meeting Paris, France	June 9-10, 2016
International Seed Testing Association (ISTA) Congress and Annual Meeting Tallinn, Estonia	June 15-21, 2016
American Seed Trade Association (ASTA) 133 <sup>rd</sup> Annual Convention Portland, OR	June 18-22, 2016
Association of Official Seed Certifying Agencies (AOSCA) Annual Meeting Park City, UT	June 26-29, 2016
Association of American Seed Control Officials (AASCO) Kalispell, MT	July 2016

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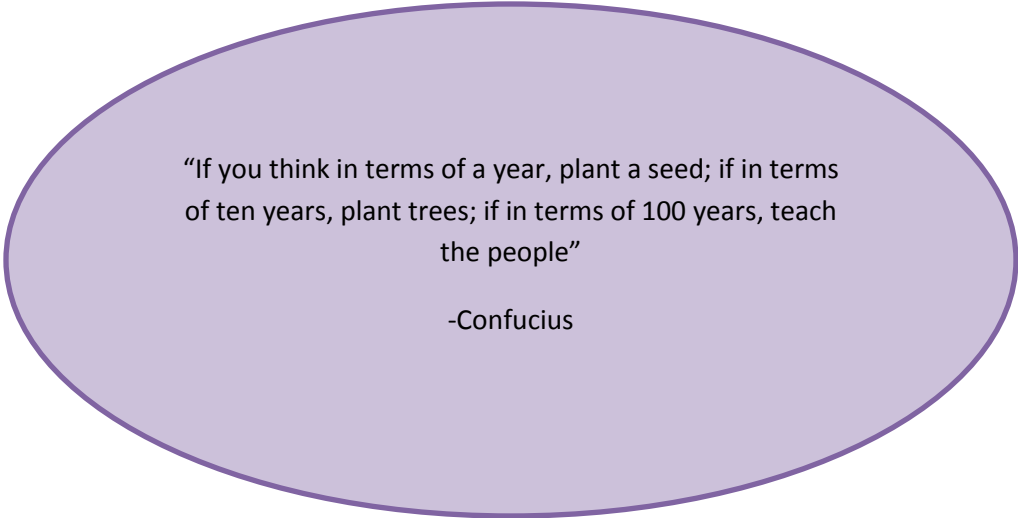
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*Elizabeth Tatum, Botanist*  
*Anitra Walker, Botanist*  
*Sandra Walker, Plant Pathologist*  
*Dr. Yujia Wu, Plant Physiologist*





“If you think in terms of a year, plant a seed; if in terms of ten years, plant trees; if in terms of 100 years, teach the people”

-Confucius

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