



United States Department of Agriculture



Agricultural Marketing Service
Seed Regulatory and Testing Division

ITEMS OF INTEREST IN SEED

2019

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<https://www.ams.usda.gov/about-ams/programs-offices/science-technology-program>

EDITOR'S NOTES

“Don't judge each day by the harvest you reap,
but by the seeds that you plant.”

- Robert Louis Stevenson



SRTD Agronomist Laura Berrios-Ortiz

Welcome to the 2019 edition of Items of Interest in Seeds! This year the Seed Regulatory and Testing Division's (SRTD) staff is growing. Please welcome the new Agronomist, Laura Berrios-Ortiz. She will be taking over the Trueness-to-Variety Program as well as working with the Botanists in seed testing.

Hemp seed testing is also continuing to grow this year. With the passing of the 2018 Farm Bill, SRTD will now test hemp seed for purity, germination, and noxious weed seed testing. To read about how to submit these samples, please see the article on page 12. Also see the article

“Testing Hemp Seed for Purity and Germination” for testing procedures on page 7. Fun facts about hemp: the first drafts of the American flag were made out of hemp fibers and the Declaration of Independence was written on hemp paper.

Other topics covered in this edition include wheat variety testing techniques, soybean hilum color, and seed morphology. As always, please let me know if you have suggestions for future topics by sending an email to elizabeth.tatum@usda.gov.

On behalf of the SRTD staff, I hope you enjoy these articles and continue to find them informative.

Elizabeth Tatum Stewart
IOI Editor

WHEAT VARIETY TESTING

Wheat is one of the highest grossing crops in the United States. There are many varieties of wheat, each with specific genetic character traits. The variety of wheat can be confirmed by different methods such as a phenol test, growth chamber test, protein electrophoresis, and DNA marker tests.

The phenol test involves incubating wheat seed in 1% phenol solution and the enzyme phenol oxidase stains the seed brown. The results are compared to a control of the same variety. The test is simple to perform and will provide results after four hours.

During a growth chamber test, wheat seeds are grown in sand at 25°C for seven days. The coleoptile colors of either red or green are then compared to a control sample of a known variety.

The electrophoresis test separates proteins into distinct bands in a gel as a result of differential migration in an electric field. The banding pattern is then compared with the control sample to identify varietal similarity. This method includes acid PAGE gel, SDS PAGE gel and non-denatured IEF gel testing.

The DNA-based test is a biomolecular method for verifying wheat varieties. The International Seed Testing Association (ISTA) has published a method which analyzes microsatellite markers. The marker DNA sequence can verify and identify varieties. For more details and sequence information please see Chapter 8 of the International Rules for Seed Testing.

All of these variety tests are based on similarities between a test sample and a reference sample. A standard reference sample should be a certified official sample.

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

NOXIOUS-WEED SEED SHOWCASE

Scientific Name:	Common Name:
<i>Aeginetia spp.</i>	Indian Broomrape, Forest ghost flower

Aeginetia spp. are in the Orobanchaceae family and are holoparasites, meaning they don't photosynthesize and depend on the host for all nutrients. These plants survive by tapping into the host's conducting tissues and gain access to water, minerals, and other organic products. *Aeginetia indica* is native to India and is known to attack sugar cane and cereals.



Aeginetia indica; Scher et al 2015

Scientific Name:	Common names:
<i>Ageratina adenophora</i>	sticky snakeroot, crofton weed

Ageratina adenophora is in the Asteraceae family and was originally grown as an ornamental plant. A native plant to Mexico, it spread to South America and California. The seeds are easily dispersed by wind and water because of their pappus hairs. Not only does the plant crowd out crops in the field, it is also poisonous to livestock and toxic to horses.



Ageratina adenophora; Scher et al. 2015



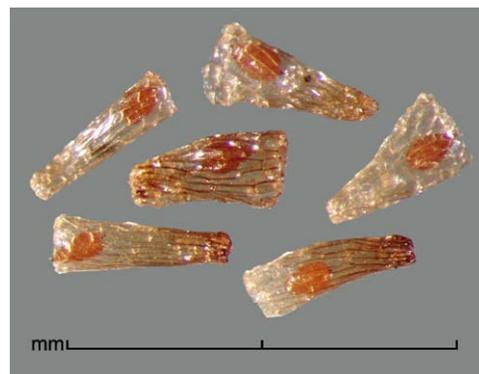
Ageratina adenophora; Scher et al. 2015

Scientific name:	Common name:
<i>Alectra spp.</i>	Yellow witchweed, cowpea witchweed

Alectra spp. is in the Scrophulariaceae family and is a hemiparasitic plant, which means it possesses chlorophyll and typically carries out photosynthesis but is partially parasitic on the roots or shoots of a plant host. The genus consists of about 40 species. *Alectra spp.* mostly affects legume crops, especially cow peas. The effected crop can be stunted with smaller leaves and petioles.



Alectra arvensis, Scher et al, 2015



Alectra arvensis, Scher et al, 2015

References:

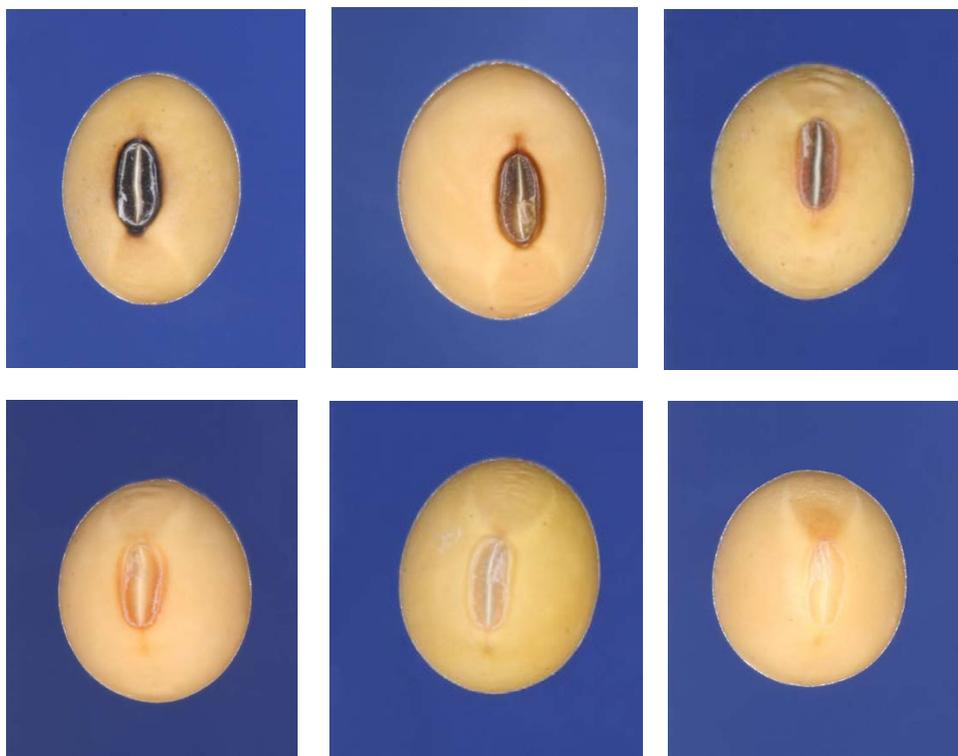
Reed, Clyde. *Economically Important Foreign Weeds - Potential Problems in the United States*. APHIS USDA, 1977.

Scher, J. L., et al. "Federal Noxious Weed Dissemminules of the United States." 1 Apr. 2015, <http://idtools.org/id/fnw/index.php>.

For information regarding this article, contact Botanist Elizabeth Tatum Stewart (704) 810-8873; elizabeth.tatum@usda.gov

SOYBEAN HILUM COLOR

Soybean hilum color is a key classification characteristic used to describe soybean varieties. Hilum colors can be used to help identify a variety and determine varietal purity. Hilum colors are generally classified as black, imperfect black, dark brown, light brown, gray, buff, or yellow. The hilum color and shape can be affected by plant maturity, environment, and disease.



Illustrations of various soybean hilum colors. Top level: Black, Brown, Imperfect Black. Second Level: Buff, Gray, Yellow or Clear.

For information regarding this article, contact Seed Marketing Specialist Akhtar Kazmi (704) 810-8878; akhtar.kazmi@usda.gov

WHAT IS SEED QUALITY?

Seed quality plays an important role in the production of agronomic and horticultural crops. Seed quality describes the potential of a seed lot. Characteristics of seed quality are determined through physical purity, genetic purity, physiological quality and seed health tests.

The physical composition of a seed lot is referred to as purity. The objective for the grower is to have the purest seed lot possible. Therefore, the seed lot should be as free as possible from other crop seeds, weed seeds, debris, inert matter, diseased seed and insect damaged seeds. Pure live seed, calculated by multiplying percent pure seed by percent germination, determines the planting value of the seed. This quality character can be achieved by proper cleaning and conditioning processes.

Viable seeds will germinate under favorable conditions of moisture, temperature, and oxygen. Not all seeds require light to germinate. When seed is purchased, the germination percentage expressed on the seed label is determined by a germination test conducted under controlled environmental conditions. The standard germination test measures the number of normal seedlings in a sample. Normal seedlings are those that produce a healthy hypocotyl, epicotyl, cotyledon(s), and roots. Substrate moisture is one of the most critical factors in obtaining good seed germination.

Genetic purity, or trueness-to-variety, indicates that the seeds being sold are of the variety stated on the label. Trueness-to-variety is often determined by records of seed sources, by field inspections, and laboratory testing. Field inspections are conducted by certification agencies or representatives of commercial seed companies who are trained and authorized by the certification agencies to look at the plant morphology. Seed morphology, electrophoresis, molecular markers, or microsatellites are some of the different testing methods that are used in the laboratory setting to determine trueness-to-variety.

Seed vigor is a determination of the seed's potential for rapid and uniform emergence, and the development of normal seedlings under a wide range of field conditions. Seed vigor tests include cold germination tests, accelerated aging, and radical emergence.

Seed health is determined by the presence or absence of diseased organisms, insects, or pests on seed. The quality of the seed lot depends to a great degree on its health. The presence of disease or insect pests will reduce the physiological and physical quality of the seed in long term storage.

Production of high seed quality is a difficult task. Seed producers go to great effort to ensure high levels of genetic integrity, physical quality, physiological quality, and seed health, in order to produce high quality seed. The use of good quality seed is essential for the satisfactory crop production, increasing agricultural productivity, and ensuring food security.

For information regarding this article, contact Seed Marketing Specialist Lan Chi Trinh (704) 810-7272; lan-chi.trinh@usda.gov

TESTING HEMP SEED FOR PURITY AND GERMINATION

The hemp plant of the Cannabinaceae family is cultivated for its fiber or seed, depending on the variety. The pure seed unit of industrial hemp is the whole achene larger than one-half the original size. The achenes are round to egg-shaped with veins around the edges. The color ranges from yellow to olive to brown and occasionally mottled with distinct white line venation.



There are some differences of purity and germination testing when comparing International Seed Testing Association (ISTA), Association of Official Seed Analyst (AOSA) and the Federal Seed Act regulations (FSA), as outlined below.

Hemp seed
Cappers, Rene T. ..., et al. 2009.

Weights of Purity and Noxious Tests

Method	Purity weight in grams	Noxious weight in grams
ISTA	60	600
AOSA	50	500
FSA	50	500

Pure Seed Unit Definitions

ISTA	AOSA	FSA
<p>“Achene, with or without beak, pappus or bracts, including achenes where two or more seeds units are joined together by fused pericarps, unless it is obvious that no seed is present.</p> <p>Piece of achene larger than one-half the original size, unless it is obvious that no seed is present.</p> <p>Seed, with the pericarp/testa partially or entirely removed.</p> <p>Piece of seed larger than one-half the original size, with the pericarp/testa partially or entirely removed.”</p>	<p>“Intact achene whether or not a seed is present. Piece of broken achene larger than one-half the original size, unless no seed is present.</p> <p>Seed, with or without pericarp/seed coat.</p> <p>Piece of broken seed, with or without pericarp/ seed coat, larger than one-half the original size.”</p>	<p>The FSA regulations do not list specific guidelines for the Cannabinacea family. The general pure seed unit description will apply.</p>

One main difference to note is that if it is obvious that no seed is present, the unit is considered inert in ISTA methods but pure in AOSA methods. Empty achene units are commonly encountered when conducting purity exams.

Germination Test Conditions

	Substrate	Temperature (°C)	First Count (days)	Final Count (days)
ISTA	TP;BP	20-30; 20	3	7
AOSA	B, T	20-30	3	7
FSA	B, T	20-30	3	7

The general description of a normal seedling according to the FSA regulations is:

201.56-12

(a) General description

- (1) Germination habit: Epigeal dicot.
- (2) Food reserves: Cotyledons; endosperm may or may not be present, depending on the kind.
- (3) Shoot system: The hypocotyl elongates, carrying the cotyledons above the soil surface. The epicotyl usually does not show any development within the test period.
- (4) Root system: A primary root; secondary roots may or may not develop within the test period depending on the kind.

(b) Abnormal seedling description:

- (1) Cotyledons:
 - (i) Less than half of the original cotyledon tissue remaining attached.
 - (ii) Less than half of the original cotyledon tissue free of necrosis or decay.
- (2) Epicotyl:
 - (i) Missing (May be assumed to be present if the cotyledons are intact.)
- (3) Hypocotyl:
 - (i) Malformed, such as markedly shortened, curled, or thickened.
 - (ii) Deep open cracks extending into the conducting tissue.
 - (iii) Watery.
- (4) Root:
 - (i) None.
 - (ii) Missing or stubby primary root with weak secondary or adventitious roots.
- (5) Seedling:
 - (i) One or more essential structures impaired as a result of decay from primary infection.
 - (ii) Albino

ISTA and AOSA have the same general description, both emphasizing that the primary root must be intact. ISTA also adds that the terminal bud is between the cotyledons yet hardly visible.



Normal Hemp Seedlings



Abnormal Hemp Seedlings with no primary roots

References:

Baxter, Doris, and Lawrence O. Copeland. *Seed Purity and Taxonomy: Application of Purity Testing Techniques to Specific Taxonomical Groups of Seeds*. Michigan State University Press, 2008.

Cappers, Rene T., et al. *Digital Atlas of Economic Plants Volume 2A: Acanthaceae - Hypoxidaceae*. Barkhuis & Groningen University Library, 2009.

AOSA Rules for Testing Seeds. Association of Official Seed Analysts, 2018.

International Rules for Seed Testing. The International Seed Testing Association, 2019.

Part 201- Federal Seed Act Regulations. Rules and Regulations of the Secretary of Agriculture. Agricultural Marketing Service, USDA.

For information regarding this article, contact Botanist Charlene Burton (704) 810-8880; charlene.burton@usda.gov; or Elizabeth Tatum Stewart (704) 810-8873; elizabeth.tatum@usda.gov

SEED MORPHOLOGY

Morphological characteristics provide useful data in seed identification and help solve systematic and phylogenetic problems. Seeds can usually be placed in the appropriate seed family based on characteristics such as seed shape, dimensions, surface texture, hilum shape, and internal characters. For example, seeds whose surface texture is warty or bumpy often belong to the Solanaceae family (see images below). Being able to identify seeds by external and internal characters can help identify some critical noxious-weed seeds quickly in order to eradicate or manage them, such as placing a stop sale on the seed lot.



Capsicum annuum (sweet pepper)

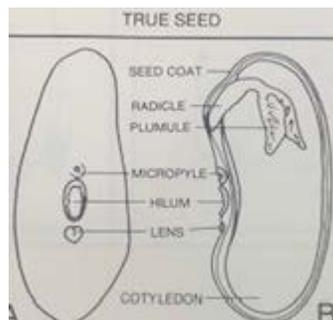


Datura stramonium (jimsonweed)

Not only are the external characters of a seed used for identification, the internal characters can help to determine its kind as well. View the cross sections of a legume (true seed) and the cereal seed (seed-like fruit). Do you see the differences? A trained analyst would be able to identify immediately that the legume is a dicot and the cereal is a monocot based on the embryo and/or the endosperm.



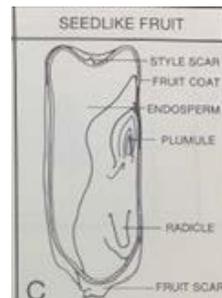
Phaseolus vulgaris
(Garden Bean)



Cross section of a legume
picture, Gunn, Ritchie 1988



Zea mays (Sweet Corn)



Cross section
of a cereal picture
Gunn, Ritchie 1988

Below are examples of some morphological structures in relation to the seed family it belongs to:

Morphological Structures	Family
Wing	Acereae
Mericaip	Asteraceae
Aril	Euphorbeaceae
Caryopsis and floret	Poaceae



Acereae- *Acer opalus* Mill.
wing



Asteraceae- *Coriandrum sativum*
mericarp



Poaceae- *Alopecurus* sp.
caryopsis and floret



Euphorbeaceae- *Ricinus* sp., aril

References:

Gunn, Charles R., and Carole A. Ritchie. Identification of Disseminules Listed in the Federal Noxious Weed Act. U.S. Department of Agriculture, Agricultural Research Service, 1988.

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

SUBMITTING HEMP SEEDS TO SRTD

With the enactment of the 2018 Farm Bill, hemp has been removed from Schedule I of the Controlled Substances Act and is no longer a controlled substance. As a result, the Seed Regulatory and Testing Division will now accept and test hemp seeds for voluntary service testing and/or testing in cooperation with State seed laboratories for violations of the Federal Seed Act (FSA).

Hemp transported in interstate commerce is treated like any other agricultural seed that is shipped across State lines. The FSA regulates the interstate shipment of agricultural and vegetable seeds. The FSA requires that seed shipped in interstate commerce be labeled with information that allows seed buyers to make informed choices. Seed labeling information and advertisements pertaining to the seed must be truthful. The FSA helps promote uniformity among State laws and fair competition within the seed trade.

Address for Submitting Federal Seed Act Complaints:

ATTN: Regulatory Samples
c/o Roger Burton, Regulatory Supervisor
USDA, AMS, S&T
Seed Regulatory and Testing Division
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193

Address for Submitting Service Testing samples:

c/o Todd Erickson, Lab Supervisor
USDA, AMS, S&T
Seed Regulatory and Testing Division
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193

For information regarding this article, contact Seed Marketing Specialist Rodney McNeace (704) 810-8879; rodney.mcneace@usda.gov

TRUENESS-TO-VARIETY OVERVIEW

Each year the Seed Regulatory and Testing Division (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 heavily on State seed control programs to submit samples for inclusion in the TTV tests.

SRTD conducted TTV field tests on soybean at the Sandhills Research Station in Jackson Springs, NC during the summer of 2019. Also, SRTD will plant tall fescue samples at the Sandhills Research Station in Jackson Springs, NC to be evaluated in the upcoming spring 2020. During the fall of 2018, the tall fescue seed was directly planted in the field. Due to weather related issues and volunteer ryegrass within the plots, the tall fescue plantings were essentially wiped out. This year SRTD will repeat these grow-outs by planting the tall fescue in the greenhouse in August 2019. The plantings will then be transplanted in the field in September 2019 for further evaluation in the spring of 2020. SRTD has also conducted electrophoresis tests on Kentucky 31 tall fescue samples to identify those samples that have

different banding patterns when compared with Kentucky 31 Foundation seed check samples. These results will be cross referenced against the field trials.

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.



Tall Fescue samples grown in greenhouse before transplanting in field



Soybean samples in TTV field trial

For information regarding the TTV program or directions for submitting samples, contact Seed Marketing Specialist Akhtar A. Kazmi (704) 810-8878; akhtar.kazmi@usda.gov.

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 are 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 1, 2018, and August 31, 2019, a total of 33 seed companies paid \$117,350 to settle alleged violations of the FSA.

For specific information regarding these violations, please visit <https://www.ams.usda.gov/rules-regulations/fsa> then [Filing a Complaint](#) and [View a list of settled FSA Cases](#). USDA's Agricultural Marketing Service (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 Arkansas, Florida, Indiana, Kentucky, Maryland, Missouri, North Carolina, Pennsylvania, Tennessee, Texas, Utah, Virginia, and Wisconsin. By working collaboratively with State partners, SRTD helps promote uniformity among State seed laws and fair competition within the seed trade through the enforcement of the FSA.

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

SEED ANALYSTS TRAINING WORKSHOP IN GASTONIA, NC

The Seed Regulatory and Testing Division (SRTD) held a Seed Analysts Training Workshop in Gastonia, NC on August 19-21, 2019. Eighteen seed analysts from State and private laboratories attended. The workshop focused on purity and identification of similar crop and weed species, with emphasis on identification of noxious-weed seeds. Other topics included: seed and seedling structures, germination and botany terms, pure seed unit definitions, uniform blowing procedure, and various calculations.

Following the workshops, the purity and germination exams were given to analysts to become either a Certified Seed Analyst (CSA) or a Registered Seed Technologist (RST).

The workshop promotes uniformity in testing by fostering greater compliance with State and Federal seed-labeling laws. 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 the USDA's Agricultural Marketing Service (AMS).



For information regarding this article, or information on how to register for 2020 seed school, contact Laboratory Supervisor Todd Erickson (704) 810-8877; todd.erickson@usda.gov

ASSOCIATION OF OFFICIAL SEED ANALYSTS – SOCIETY OF COMMERCIAL SEED TECHNOLOGISTS ANNUAL MEETING

The 2019 Joint Annual Meeting of the Association of Official Seed Analysts (AOSA) and the Society of Commercial Seed Technologists (SCST) was held from June 1 – 6 in Sparks, NV. SRTD Laboratory Supervisor Todd Erickson represented the USDA AMS at the meeting, along with the AMS Science and Technology program's Deputy Administrator Ruihong Guo.

Ms. Guo spoke at the opening meeting and outlined SRTD's ongoing projects that involve AOSA/SCST. Mr. Erickson, co-chair of the Laboratory Standards and Documentation committee, gave a presentation at that committee's meeting on the basic requirements for a

quality management system. Mr. Erickson is also on the Rules committee, and attended that committee's closed meeting to discuss this year's rule proposals.

Twenty-nine rule proposals were voted on at this year's meeting: twenty five passed, three failed, and one was removed. Testing methods for a number of native species were added. Clarifications were added for verification of species on coated purities, retesting when reps are out of tolerance, classifying contaminants that are not currently in volume 3, and updating lux values using the correct conversion factor.

Two main topics of discussion this year were hemp seed testing, and recruitment of new seed analysts/succession planning. With the passage of the 2018 Farm Bill, hemp seed can now be legally traded across state lines. SRTD has already begun receiving regulatory samples of hemp for testing. See the other articles in this publication on hemp seed testing and regulation.

There was also general agreement that more work needs to be done to promote the seed testing industry and recruit new analysts. Many of the current leaders in AOSA/SCST plan to retire in the next five years, making succession planning vital. AOSA/SCST, with help from USDA, is working on a promotional video highlighting the importance of the work that seed analysts do. Many analysts were interviewed by the video team at the meeting. They also plan to take videos of seed testing laboratories, as well as drone footage of agricultural fields.

For more information on this year's AOSA/SCST joint annual meeting, please visit www.analyzeseeds.com. The 2020 AOSA/SCST annual meeting will be a joint meeting with ASTA in Indianapolis, IN.

For information regarding this article, contact Laboratory Supervisor Todd Erickson (704) 810-8877; todd.erickson@usda.gov.

OECD SEED SCHEMES 2019

The Organization for Economic Cooperation and Development (OECD) Seed Schemes is an international agreement involving 61 countries for the purpose of promoting the use of high-quality seed around the world through the establishment of common standards for certified seed moving in international trade. The Seed Schemes was first established in 1958 and became part of OECD in 1961. The United States has been a participant in several of the individual schemes since the early days. USDA-AMS-S&T-SRTD serves as the National Designated Authority (NDA), representing the United States to the Seed Schemes and coordinating the OECD Seed Schemes activities performed by State Seed Certification Agencies (SCA's).

Rule Updates for 2020

At the Annual Meeting the following changes to the OECD Seed Schemes rules were agreed upon, which will go into effect, pending confirmation by the Committee on Agriculture (COAG) and the OECD Council, on January 1, 2020:

- Either the seed weight or number of seeds is to be stated on the OECD label, depending on how the seed is packaged.
- For seed lots of species that are commonly packaged by count, the weight of the seed lot may be omitted from the OECD Certificate.
- Standards for certification of hybrid barley varieties were approved.

- A long-debated revision to the guidelines for Control Plot Tests that dealt with the use of Biochemical and Molecule techniques as aids to determine variety purity and identity was approved. The change allows for greater use of these techniques at the discretion of the NDA. It also includes a longer list of internationally recognized methods. Future work will focus on streamlining the process for adding new methods.
- A 3-part training module on Seed Biology Breeding and Production and a module on Seed Lot Identification and Traceability was approved. Following on the reception to the maize field inspection module, the annual meeting agreed to the development of additional crop specific inspection training modules. The United States will work with Italy on a training module for rice, and with South Africa on modules for sunflower and sorghum.
- The publication of the list of label security, fastening and traceability methods catalog as a guideline was approved. The list specifically does not approve or prohibit specific methods but is to be used as a source of information for countries considering upgrades to their current practices.
- The request from Iran to extend their participation to include the Crucifer Seed and Other Oil and Fibre Species scheme was approved

Ongoing discussions to be continued by Ad Hoc and Technical Working Groups:

- Following the rule changes adopted in 2018, the subject of rules for mixtures was referred to the ad hoc working group (AHWG) and technical working group (TWG) for a new proposal to amend the common rules to make the mixture rules common across the various schemes.
- The AHWG on new seed production techniques will continue to work on general guidelines for development of certification standards for novel seed production systems under the schemes. In 2020, the AHWG will consider a revised proposal from New Zealand regarding what is being called an F1 Hybrid *Lolium* system. The current proposal on the later was sent back to New Zealand and the company that developed it for revision.
- The AHWG on Intervention Processes after Certification continues to revise their proposed rules changes. Although their initial proposals were good, the impact on other sections within the rules became apparent and will be addressed between now and the next set of meetings.

Current members of the Seed Schemes Bureau are Chair Pedro Lavignolle (Argentina), Vice-Chair Kristiina Digryte (Estonia), and Past-Chair Eddie Goldschaag (South Africa). Mona El-Kasier (Egypt) was elected by the Annual Meeting as Vice-Chair, and will join the Bureau in 2020, when Ms. Digryte becomes Chair, Mr. Lavignolle becomes Past-Chair, and Mr. Goldschaag's term on the Bureau concludes.

U.S. OECD Seed Schemes Program Manager Dr. Steve Malone represented the U.S. OECD Seed Schemes AHWG & TWG meetings held January 28-February 1 in Buenos Aires, Argentina; and at the Annual Meeting on June 10-14 in Vienna, Austria. Chi Trinh, Seed Marketing Specialist and OECD Seed Schemes Assistant, also participated in the annual meeting. Alan Galbreth, CEO of Indiana Crop Improvement Association, represented the American Seed Trade Association (ASTA). The Association of Official Seed Analysts (AOSA) was represented by Dan Curry, Oregon State University at the January meeting, and by Janine Marushak, from the Canadian Food Inspection Agency lab at Saskatoon, Saskatchewan at the June meetings.

In 2020, the TWG and AWHGs will meet January 27-30 in Milan, Italy. The 2020 annual meeting is scheduled for June 15-19 in Sofia, Bulgaria. The 2021 annual meeting will be hosted by Estonia.

U.S. Program Updates:

- Utah Crop Improvement Association and Colorado Seed Growers Association inquired have joined the Cooperative Agreement with AMS to participate in the U.S. OECD Seed Schemes program.
- Assessment fees for all species, except corn, were increased from 14 cents to 15 cents per hundredweight effective July 1, 2019. We will review revenue and expenses this fall and announce in December whether an increase is necessary to go into effect the following July 1, and the details if needed.

For information regarding this article, contact Steve Malone at (704) 810-8888; stephen.malone@usda.gov. For more information on the OECD Seed Schemes, go to <http://www.ams.usda.gov/rules-regulations/fsa/oecd-schemes> or <http://www.oecd.org>.

2019 NATIONAL INDUSTRIAL HEMP REGULATORY CONFERENCE

The 2019 National Industrial Hemp Regulatory Conference was held June 17-20, 2019 in Minneapolis, Minnesota. The meeting was hosted by the Minnesota Department of Agriculture, Wisconsin Department of Agriculture, Trade & Consumer Protection, and the North Dakota Department of Agriculture. There were approximately 150 attendees.

The Conference opening was addressed by Thom Petersen, Agriculture Commissioner of Minnesota Department of Agriculture.

Speakers and Topics of discussion included:

- "Federal Developments with Hemp" by Michael Bowman, Founding Board Chair National Hemp Association; and Aline DeLucia, Public Policy Director NASDA
- "Developing a U.S. Hemp Seed Industry" by Roger Burton, Seed Regulatory & Testing Division; and Fawad Shah, Minnesota Crop Improvement Association
- "Plant Variety Protection & Hemp" by David Chalkley, Plant Variety Protection Office
- "Genetic Testing to Determine THC Output" by Dr. George Weiblen and Jonathan Wenger, University of Minnesota
- "THC Proficiency Testing Results" by Frank Sikora, University of Kentucky
- "Importing Hemp Through Customs" by John Sagle, U.S. Customs and Border Protection
- "Hemp Economics and Pilot Program Update" by Dr. Tyler Mark, Jonathan Shepherd, and Will Snell, University of Kentucky
- "State Legal Perspectives" by Legal Counsel's from Multiple States and Tribal Governments
- "Law Enforcement Perspectives on Cannabis – Confusion and Dilemmas" by MN Law Enforcement Representatives

- “Lungs, Stomach or Skin: How to Deliver Cannabinoids” by Dr. Aidan Hampson, Program Officer, Clinical Research Grants Branch, Division of Therapeutics & Medical Consequences
- “Disease and Pest Issues in Hemp Production” by Dr. Burton Johnson, North Dakota State University
- “Pesticide Issues in Cannabis” by Dale Mitchell, OR Department of Agriculture; and Taryn LaScola, Massachusetts Department of Agriculture

For information regarding this article, contact Regulatory Supervisor Roger Burton (704) 810-8873; roger.burton@usda.gov

32nd INTERNATIONAL SEED TESTING ASSOCIATION CONGRESS

Seed Regulatory and Testing Division (SRTD) Director Ernest Allen, Agricultural Research Service Botanist Melanie Schori, and Forest Service’s National Seed Laboratory Botanist Victor Vankus, participated in the 32nd International Seed Testing Association (ISTA) Congress and Ordinary General Meeting (OGM), June 26 – July 3, 2019, in Hyderabad, India.

The Congress began with a three day symposium covering a variety of topics involving recent advances in seed technology. Presentations included topics on seed health, germination and dormancy, environmental effects on seed quality, and new approaches in determining seed quality using cellular and molecular methods. ISTA’s Technical Committee chairs reported on their activities since the last annual meeting, which included updates on current and future projects, finalized projects, and 2020 rule proposals submitted by various committees. Ernest Allen chairs the ISTA rules technical committee and reported on behalf of the group. Melanie Schori (USDA Agricultural Research Service) chairs the Nomenclature Committee and presented a report focusing on the groups work updating the ISTA Stabilized List of Plant Names. Reports can be viewed on the [ISTA web site](#).

At the OGM on July 2nd, Mr. Allen served as the voting delegate on behalf of the Agricultural Marketing Service, which is the U.S. Designated Authority to ISTA. Over 200 seed professionals attended the 2019 ISTA Congress. Of 77 ISTA member countries and distinct economies, 60 were represented at the meeting. Thirty-one designated members, entitled to vote at the OGM, were present. This exceeded the required quorum of 26. ISTA President, Craig McGill (New Zealand), gave the welcome address and chaired the OGM.

Discussion points and decisions of the Ordinary General Meeting:

- ISTA members voted to remove the industry member category from the ISTA Articles. ISTA remains committed to industry stakeholders and will continue to work with them on items of common interest primarily through the International Seed Federation.
- ISTA members voted to change the deadline for posting the OGM minutes on the website to two months prior to the next OGM. This change is consistent with other voting documents made available to the membership at the next OGM.

- ISTA annual membership fees for 2020 will remain unchanged. No increase was proposed by the Executive Committee or the Secretariat of the organization.
- There were a total of 24 proposals submitted to the ISTA Rules Committee. Three were withdrawn prior to final vote and 21 proposals were passed. Approved rule changes which will take effect January 1, 2020, include the following:
 - The ISTA List of Stabilized Plant Names has been updated and approved by the ISTA membership. The Stabilized List is reviewed and updated by the Nomenclature Committee every six years. The nomenclature changes have consequential effects on almost every chapter in the rules. It is important that seed analysts and companies take note of the changes and use them when conducting ISTA tests or issuing ISTA certificates. *This change will bring the Stabilized List into closer harmonization with the USDA Germplasm Resources Information Network (GRIN). SRTD voted to accept this change to the rules.*
 - Added the ability to use organic growing media for *Glycine max* and *Phaseolus vulgaris*. Table 5A Part 1. *This rule adds a method that has already been approved by AOSA. SRTD voted to accept these rules.*
 - Added the ability to use Crepe Cellulose Paper (CCP) for the germination of *Zea mays*. Table 5A Part 1. *This rule adds a method that has already been approved by AOSA. SRTD voted to accept these rules.*
 - Clarified requirements for test extensions and added additional flexibility related to adapting the date of the final count when it ends on a non-working day. 5.6.4 *This proposal put ISTA in better harmonization with AOSA. SRTD voted to accept this rule.*
 - Removed the requirement to conduct a control test when the prescribed ISTA protocol is followed for radical emergence. 15.8.4.4.1 *SRTD voted to accept this rule.*
 - For a complete list of changes approved during the Ordinary General Meeting please visit the ISTA website at www.seedtest.org.

Next year, the ISTA Annual Meeting will be held on May 25-28, 2020, in Verona, Italy.

For information regarding this article, contact SRTD Director Ernest Allen (704) 810-8884; ernest.allen@usda.gov.

33rd ANNUAL MEETING OF THE ASSOCIATION OF AMERICAN SEED CONTROL OFFICIALS

The Association of American Seed Control Officials (AASCO) held its 33rd Annual Meeting on July 14-18, 2019, in San Antonio, Texas. The meeting was hosted by the Texas Department of Agriculture. Representatives from 24 State seed control programs, the Association of Official Seed Certifying Agencies (AOSCA), the American Seed Trade Association (ASTA), the Association of Official Seed Analyst (AOSA), the Seed Innovation and Protection Alliance (SIPA), and nine industry representatives attended the meeting.

Deputy Administrator Dr. Ruihong Guo (AMS/Science & Technology Program) and Regulatory Supervisor Roger Burton represented the Seed Regulatory and Testing Division (SRTD) at the meeting. As part of the Monday morning session, Dr. Guo addressed current changes related to the moving of the Seed Regulatory and Testing Division to the AMS/Science & Technology Program in addition to hemp related issues and the current and upcoming Farm Bill. Roger Burton gave reports on 2018-2019 Federal Seed Act (FSA) activities and SRTD updates. Other presentations included Pat Miller (ASTA), Mike Stahr (AOSA/SCST), Chet Boruff (AOSCA), Christina Rowan (CFIA), and Todd Martin (ISPA).

In the general session, Mr. Burton gave presentations on "FSA Labeling Requirements for Hemp Seed" and "FSA Training for State Seed Control Officials."

Other general sessions topics and discussions included:

- "Hemp Facilitation" by Don Robinson (IN) & Jason Goltz (ND)
- "Wild Species Working group" by Gil Waibel (ICIA)
- "Weed Seed Risk Assessment Process" by Denise Thiede (MN)
- "Kentucky 31 Tall Fescue Issues" by Elizabeth Savory (OR)
- "Farmers Business Network" by Matthew Meisner
- "SIPA – Patent & PVP Expirations" by James Weatherly
- "Expired Germination Test dates" by Jeff Claxton (TX)
- "Inconsistencies in Laboratory Testing" by Jason Goltz (ND)

The current AASCO officers are:

- President Jason Goltz (ND)
- First Vice-President Jeff Claxton (TX)
- Second Vice-President Jan Morawski (NY)
- Treasurer Greg Helmbrecht (WI)
- Secretary Don Robison (IN)
- Past President Johnny Zook (PA)

The 2020 AASCO Annual Meeting will be held in New York. Meeting dates and location information will be announced later. For more information about AASCO, visit their website at www.seedcontrol.org.

For information regarding this article, contact Regulatory Supervisor Roger Burton (704) 810- 7265; roger.burton@usda.gov

AOSCA CELEBRATES 100th ANNIVERSARY

The Seed Regulatory and Testing Division (SRTD) congratulates the Association of Official Seed Certifying Agencies (AOSCA) on its 100th anniversary. Steve Malone and Chi Trinh from SRTD attended the annual meeting on June 23-26, 2019, in Chicago.

The General Membership meeting and the Standard Council meeting took place during this time. Some amendments to the existing AOSCA Standard included: changes for industrial

hemp, sunflowers, and the Pre Variety Germplasm programs. For more details about these proposals please visit www.aosca.org.

During the awards banquet, Alan Galbreth (Chief Executive Officer of Indiana Crop Improvement Association) and Cindy Wippler (General Manager of Minnesota Crop Improvement Association) were given the AOSCA Honorary Membership.

In addition to serving as a member of the AOSCA Advisory Committee, SRTD has a long-standing Memorandum of Understanding with AOSCA, whereby AOSCA is the liaison between SRTD and individual state Seed Certification Agencies who are AOSCA member agencies. This relationship has been very beneficial in promoting efficient communication and analysis of industry trends, making sure agencies understand and continue to adhere to FSA Regulations for seed certification, and in the development of new or revised Regulations to make the U.S. seed certification system work better for all stakeholders. The U.S OECD Seed Schemes program relies heavily on input and involvement from AOSCA and its member agencies. SRTD looks forward to continuing its working relationship with AOSCA and its member agencies.

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

CALENDAR OF EVENTS

Event Name	Date
Organization for Economic Cooperation and Development (OECD) Seed Schemes Technical Working Group Meetings Milan, Italy	January 27-30, 2020
American Seed Trade Association (ASTA) Vegetable and Flower Seed Conference Monterey, CA	February 1-4, 2020
Association of Official Seed Analysts/ Society of Commercial Seed Technologist (AOSA/ SCST) Annual Meeting with ASTA Indianapolis, IN	June 13-17, 2020
Organization for Economic Cooperation and Development (OECD) Seed Schemes Annual Meeting Sofia, Bulgaria	June 15-19, 2020
American Seed Trade Association (ASTA) Policy and Leadership Development Conference Denver, CO	June 16 - 17, 2020
Association of Official Seed Certifying Agencies (AOSCA) Annual Meeting Seattle, WA	June 23 - 24, 2020
International Seed Testing Association (ISTA) Annual Meeting Verona, Italy	May 25-28, 2020
SRTD Seed School Gastonia, NC	August 2020

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