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A newsletter for

The Association of Official Seed Analysts & The Society of Commercial Seed Technologists

2010 ANNUAL MEETING

The 2010 AOSA-SCST Annual Meeting is being hosted by the Illinois Seed Analysts. It will be held in St. Louis, Missouri, June 4 - June 10, 2010.

Workshops offered this year include a Statistics Workshop, a Genetic Technology Workshop, and a Flower Seed Workshop.

Visit the AOSA and SCST websites for complete registration information, meeting agendas, transportation, and local information.

2010 marks the 100th annual meeting for AOSA and the 87th for SCST. It will be the 85th joint meeting for the two organizations.

Inside this issue:

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AOSA President's Message

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What a winter it has been! Just as cold and snow have reached many of us, even those who typically see little or no inclement winter weather, there are topics that affect seed testing beyond groups of species (cereals, natives, vegetables, etc.) or regions of the country. This season these topics have included NIST considering the adoption of Section 12 of the Rules (with slight modifications), questions about the determination of percentage of annual and perennial ryegrass in seed samples, additional seed companies being bought out, and much more. To say that things aren't what they were ten, twenty, and thirty years ago is an understatement. Some things have not changed and for the most part they shouldn't (basic aspects of the Rules). Some things have changed for the better (renumbering components of the Rules, updating and simplifying portions of the Rules, exploration into consolidation of AOSA and SCST, etc.). Some items are negative for at least some of us (more seed labs testing for a smaller pool of seed companies - at least for corn and soybeans, reduced support of AOSA seed labs by their states, a tough economy for consumers and for businesses). As with other professions, many of us seem destined to do more with less. Can we make lemonade out of these sour lemons?

A new trend that troubles me are restrictions in the exchange of technical information that have come about due to proprietary, competitive, and even legal concerns. Limitations include descriptions and images of non-tolerant seedlings in herbicide bioassay tests, availability of training to all interested technologists, and restrictions on research. The AOSA Rules, Handbooks, and our collective knowledge base are what they are due to involvement and cooperation of many seed labs and companies. How sad when things within our control and beyond our control reduces this invaluable collaboration. I encourage you to offer your knowledge, experience, and time to one or more of many available areas – referees, committees, submitting Rule proposals, and so on. Your input is highly desired! Let's work together to advance seed testing, serve the seed industry, and support AOSA & SCST!

Hopefully there will be less travel restrictions in time for our annual meeting in St. Louis. It is very beneficial to meet to share ideas, make decisions, and just plain network. Be sure to check out information on this year's meeting and "meet me in St. Louis"!

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New rules are born of necessity. As the pace of crop breeding and improvement continues to escalate, more and more methods should evolve to better assess the quality or suitability of a seed lot for a particular purpose. The value of both new and old tests boils down to producing data that can be used to make a decision with the least amount of uncertainty possible. Uncertainty may sound like a bad word and high levels of uncertainty cannot support the decision making process. Ambiguity is the true enemy. All tests have some level of uncertainty. When a test is ambiguous you can be certain that you are guessing.

New and existing rules must be accurate and precise (uniform and repeatable) across labs and the genetic variation of a crop. "Long standing" does not mean "proven" or "suitable" in every situation. What was the best solution to a problem 30 years ago, a rule with an acceptable amount of uncertainty, may not have kept up with production practices or the genetic advancement and diversity level of a crop.

At the same time, a new or different method isn't automatically superior to the existing method. A new method must prove that it is not ambiguous and establish a level of certainty that will help us better manage our decision making process. From a regulatory point of view, new methods may seem to be a source of conflicting or contradictory information for truth-in-labeling. It must be recognized that new methods that do not produce conflicting results are simply alternate methods for arriving at the same decision. When a "proven" or "suitable" rule no longer leads to a good decision, action should be taken. The ultimate goal should be to elucidate why the current rule is not working in all situations and develop an alternate or supplemental method.

It was with great excitement that I saw a genetic method submitted as a rule proposal in 2010. I was excited because it had nothing to do with genetic engineering and it was aimed at a specific issue facing seed producers. Once it has been validated and confirmed by other laboratories it should be a great tool for the ryegrass industry.

Again, new rules are born when new challenges to seed purity and viability assessment emerge (pun intended). I encourage you to look beyond the challenges that a new, modified or alternate method poses to you and your lab. Not everyone may be able to apply a new method due to the cost of the equipment or skill sets you have.

In some crops, the rate of change in genetics is astounding and it does not make sense to adopt every new technology that comes along. Outsourcing and testing partnerships should be considered smart business and a responsible use of expertise and resources. Can you perform

President's message continued on bottom of next page.

Committee Reports

TZ COMMITTEE

Progress report - 2010 Edition of the AOSA/SCST Tetrazolium Testing Handbook Revision

The 2010 Edition of the AOSA/SCST TZ Testing Handbook revision is in progress.

About 92 family pages have been reformatted, revised, and reviewed so far and we have about 32 to go. (We are proceeding alphabetically and have nearly finished the Poaceae pages.) After that, we also have to revise the indices, the bibliography and the introduction.

Many thanks to the reviewers and those who have shared photos over the past year and are continuing with the reviews.

If you have photos of viable or non-viable seeds, preparation photos, or internal anatomy, please consider sharing them for this edition. Our biggest need is for images of non-viable seeds.

Photos do not have to be perfect. We will size, rotate, crop, and standardize the background for any photo you share. You and your lab will be given credit directly on the page where your photos are printed.

If you would like to participate in the review, please let me know if there are specific pages that you would like to review or if you would like to work on the bibliography.

The project is very large and unfortunately, I can only send Family pages singly. So, please be specific about the way in which you would like to help.

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SCST President's Address (continued from page 7)

every type of test currently available in the rules? Do you honestly operate as an island without participating in the society? Did you consider the industry recognition that your accreditation offers when offering a new method?

The principle of supply and demand also affects new or emerging methods. Is the crop important enough for you to expand your capabilities or business relationships? The economics of the situation is also important to those who develop methods as well. I would hope that our members recognize the value of intellectual property and will be willing to work within a system that rewards the development of methods that improve our service to the seed industry. Genetic techniques and their development are not cheap.

Procedures born on a manual typewriter and methods delivered as a pdf attached to an email must always be subject to a review of accuracy and uniformity. Without this we are more than ambiguous, we are irrelevant.

Respectfully submitted,
Doug Miller
President
Society of Commercial Seed Technologists

RULES COMMITTEE

2010 AOSA Rules Change Proposals

The following table summarizes the 15 proposals for changes or additions to the AOSA Rules for Testing Seeds that have been reviewed and approved by the Rules Committee for further consideration by the AOSA and SCST membership at the 2010 joint AOSA/SCST Annual Meeting in St. Louis, MO. Two proposals are included for review only that can be discussed, but will not voted upon. Please note that "approved" does not mean that the Rules Committee or individual members necessarily endorse these proposals.

Proposal	Brief Description
1	Modification of the germination directions (Table 6A) for pelleted or film-coated onion (Rules Vol. 1)
2	Reclassify junegrass (*Koeleria macrantha*) (Rules Vol. 3)
3	Add pleated paper to substrata for onion (*Allium cepa*) (Rules Vol. 1)
4	Update *Artemisia* sample size/PSU (Rules Vol. 1)
5	Update *Eremochloa ophiuroides* PSU; add definitions to Appendix 4 (AOSA Rules Vol. 1)
6	Update *Tripsacum dactyloides* PSU (Rules Vol. 1)
7	Update *Allium* PSU (Rules Vol. 1)
8	Update *Platycladus orientalis* PSU (Rules Vol. 1)
9	Update *Hordeum vulgare* PSU (Rules Vol. 1)
10	Clarify use of multiple unit procedures (Rules Vol. 1)
11	UBP sample condition (Rules Vol. 1, Vol. 2)
12	Add blowing procedure for tall fescue (Rules Vol. 1, Vol. 2)
13	Clarification of how to weigh and calculate results of purity analysis on mixtures (Rules Vol. 1)
14	Coated seed purity and germination procedures - Draft (Rules Vol. 1)
15	Refinement of blue grama (*Bouteloua gracilis*) blowing point procedures (Rules Vol. 1, Vol. 2)
Review	Combine instructions for seed counts (sec. 12) and weight determinations (Appendix 3) (Rules Vol. 1)
Review	Ryegrass discrimination (Rules Vol. 1)

Full text of the proposals and supporting evidence is contained in the accompanying PDF documents. Hard copies may be printed from these files.

Proposals are published in *The Seed Technologist Newsletter* for distribution to any interested parties within both public and private sectors prior to the 2010 annual meeting. All proposals are also posted online at the Rules Committee webpage (http://www.aosaseed.com/rules_committee.htm).

Names and addresses of proposal authors are included to contact them directly for additional information concerning a particular proposal. Written comments may be submitted to the Rules Committee Chair any time prior to the annual meeting. These comments will be posted online on the Rules Committee webpage and made available at the Open Rules Discussion.

Please note: Time will be available during the Open Rules Committee Meeting to discuss each proposal. All proposal amendments will be completed during the Open Rules Discussion, which is scheduled for Wednesday, June 9 at 2:15 pm. No amendments will be allowed from the floor during the joint voting session on Thursday, June 10 at 8:00 am. Please bring your own hard copy of the 2010 proposals with you to the annual meeting, as additional copies of the proposals will not be provided.

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MIDWEST SEED ANALYST 2008-2009 REFEREE: LEAF LESS THAN HALF THE LENGTH OF THE COLEOPTILE

One of the Midwest Seed Analysts' referees in 2008-2009 dealt with corn seedlings where the leaf was less than half the length of the coleoptile (LLTHL) which appeared to be an artifact of test conditions.

Many labs using crepe cellulose paper and light rarely experience this abnormality in field corn. Other laboratories using rolled towels experience the abnormality more frequently. A referee was conducted to assess the seedling abnormality within and among participating laboratories. A procedural survey was used to determine which factors might be associated with frequency. A field emergence study was linked to the referee to determine if the abnormality resulted in lower field emergence.

Testing Agricultural and Vegetable Seeds, Handbook No. 30, page 141 describes the corn abnormality: (4) a shortened plumule, extending no more than one-half the way up through the coleoptile. This abnormality is also described in ISTA Rules for Testing Seed abnormal seedling definitions section (5.2.5.A.VI).

Many large laboratories have switched to the crepe cellulose paper (CCP) tray method and seldom report this abnormality. There is the potential for stop sales due to differential results based on testing media or methodology if the seedling abnormality is linked to testing conditions.

Seed companies were solicited for seed lots. Donors were instructed to strip the seed bags of any varietal or lot information and send samples to Mike Stahr at the Iowa State University Seed Laboratory. ISU lab staff divided the samples, shipped the samples to participants and received the results.

Participating laboratories were requested to test samples on rolled towels and their existing in-house procedures or if rolled towels were currently in use, to compare that method with the alternate germination procedure.

Anonymous results were sent to Harold Armstrong, Monsanto Seed Company, for statistical analysis. A number of crop improvement agencies, universities and seed companies were invited to participate in a field emergence study. All participants agreed to destroy remaining seed and/or seedlings following data collection. Participating laboratories returned their results to the ISU Seed Laboratory. Anonymous results were forwarded for statistical analysis.

Results

The rep-to-rep results of each test was compared to determine if an individual test was out of tolerance (Table 1). Overall, the rolled towel (RT) tests resulted in a much higher percentage of tests where the replications were out of tolerance. CCP tests that were out of tolerance were due to a cart failure, which resulted in four trays drying out. None of the CCP tests would have been out of tolerance had this mechanical failure not occurred. When overall results in Table 1 were compared there would have been a substantial reduction in retests if the LLTHL seedling abnormality was counted as normal.

The next analysis step was comparison of the germination results within a lab between different test substrates (Table 2). Almost 50% of the time, an individual laboratory's test results were out of tolerance. This result would be cut in half if the LLTHL abnormality were considered to be normal. These results do point out that laboratories with one primary in-house method often could not repeat results across multiple testing substrates.

Each individual sample was compared for variability for each laboratory substrate combination and graphical results were calculated for the current seedling descriptions and if the abnormal seedlings were added to the percent normal seedlings.

Results from a comparison of sample D, one of the three worst examples, follow (Fig. 1). There was a visible difference be-

Table 1. Number of tests conducted, number of samples and the percentage of samples that were out of tolerance (between replications) within a single germination test.

	# of samples out of tolerance (OOT) rep-to-rep within a laboratory	Total tests	% of tests OOT
All Tests - categorized by present Rules	24	294	8.16
All Tests - normal seedlings plus count of seedlings with leaf less than half the length of the coleoptile (LLTHL) as normal	10	294	3.40
Rolled Towels (RT)	16	119	13.45
RT seedlings/no light	15	77	19.48
RT—normal seedlings plus LLTHL	3	119	2.52
Crepe Cellulose Paper (CCP)	4	77	5.19*
CCP—normal seedlings plus LLTHL	4	77	5.19*
Sand-Soil or Sand-CCP	4	95	4.21
Sand-Soil or Sand-CCP—normal seedlings plus LLTHL	3	95	3.16

*Cart seal failure resulted in CCP trays drying out.

tween comparisons. The ensuing whisker plot indicates a reduction in variability if LLTHL seedlings were not classified as abnormal.

An analysis of factors that led to increasing variability was conducted. Light was determined to substantially reduce the number of tests that were out of tolerance. Light and duration as reported by the laboratories conducting the

Continued on following page

Table 2. Comparison of normal seedlings or normal seedlings plus seedlings with leaf less than half the length of the coleoptile (LLTHL) within a laboratory across testing substrates.

	# of samples out of tolerance (OOT) within laboratory comparisons between tests	Samples tested	% of tests OOT
Normal	54	112	48.2
Normal plus LLTHL	24	112	21.4

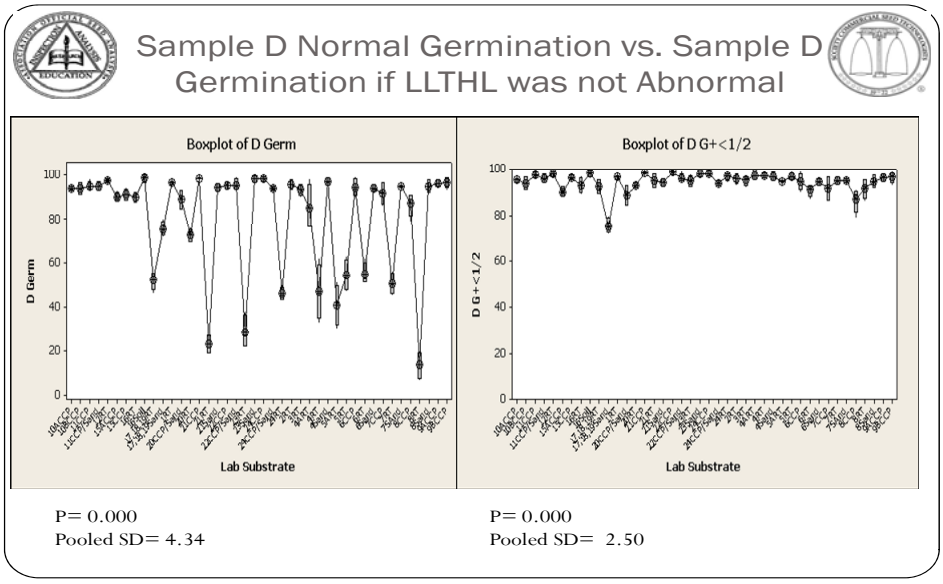


Fig. 1. Comparison of classification using current seedling descriptions (left panel) and inclusion of seedlings with leaf less than half the length of the coleoptiles (LLTHL) (right panel).

Leaf Less Than Half the Length of the Coleoptile Referee Continued

test are demonstrated with Sample D (Fig. 2).

A field emergence study was conducted to determine if the seedling abnormality adversely impacted field emergence. Environmental factors heavily impacted field emergence the past year (Fig. 3). Regression analysis found that even with these challenges there was better field emergence prediction if seedlings with the LLTHL abnormality were added to normal germination across the six field locations.

This study will be reformatted to fit the needs of ISTA Rules Proposal Standards for a potential harmonized germination rule change proposal. The referee coordinators will be soliciting companies for seed samples, the referee coordinators will be coordinating with ISTA and looking for laboratories interested in participating in the substrate referee, and finally a international field emergence trial will be attempted.

Harold Armstrong
Monsanto,
Waterman, IL

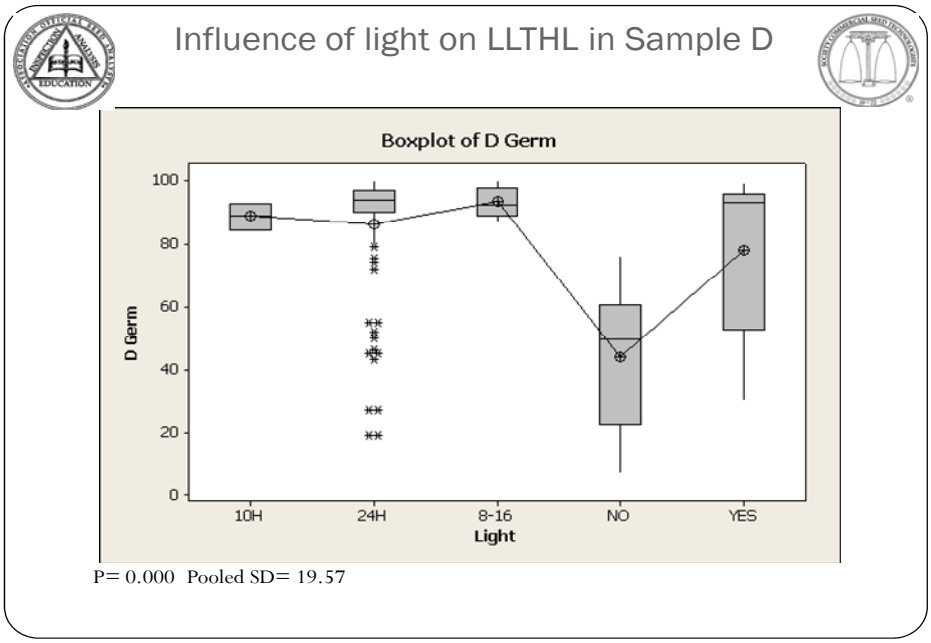


Fig. 2. Analysis of the influence of light on seedlings with leaf less than half the length of the coleoptiles (LLTHL)

There is greater correlation between stand and N+LLTHL than with Normal Germination

Regression Analysis: Stand versus Location, Sample, Normal

- The regression equation is
- Stand = 91.8 - 3.44 Location - 2.29 Sample + 0.146 Normal

Predictor	Coef	SE Coef	T	P	
Constant	91.805	9.166	10.02	0.000	***
Location	-3.435	1.043	-3.29	0.002	**
Sample	-2.2886	0.9416	-2.43	0.020	*
Normal	0.14568	0.0799	1.82	0.076	

- S = 11.5362 R-Sq = 39.6% R-Sq(adj) = 34.9%

Regression Analysis: Stand versus Location, Sample, N+LLTHL

- The regression equation is
- Stand = - 98.1 - 2.49 Location - 0.994 Sample + 2.02 N+LLTHL

Predictor	Coef	SE Coef	T	P	
Constant	-98.08	58.65	-1.67	0.103	
Location	-2.4882	0.9916	-2.51	0.016	*
Sample	-0.9936	0.9681	-1.03	0.311	
N+LLTHL	2.0220	0.5811	3.48	0.001	***

- S = 10.4756 R-Sq = 50.2% R-Sq(adj) = 46.3%

Fig. 3. Regression analysis of relationship between field stand and seedlings classified as normal versus normal plus seedlings with leaf less than half the length of the coleoptiles (LLTHL).

ILLINOIS SEED ANALYSTS' FALL MEETING

The Illinois Seed Analysts' fall meeting was held at the Monsanto Seed Technology Center on August 27th, 2009. The event was organized by Harold Armstrong and Jean Tolliver.

Thirty four individuals from thirteen labs were present. Seed analysts from Iowa, Wisconsin, Ohio, and Indiana joined the Illinois analysts.

The group was welcomed by the site manager, Kevin McKee. Brad Johnson, AgReliant Genetics, and Harold Armstrong, Monsanto, presented an overview of the Accredited Canadian Grader Program. Steve Beals, Illinois Crop Improvement, and Steve Schaefer, Illinois Foundation Seeds, presented the results of the 2008 corn, soybean, sweet corn and alfalfa referee as well as AOSA Rules changes.

Results from the Mid-West referee (leaf less than half the length of the coleoptiles) was reported by Mike Stahr, Iowa Seed Science Center. Harold Armstrong presented the results of the field emergence study on the samples from the Mid-West referee. One of the most significant findings was that emergence was more strongly related to percent germination plus the percent of leaf less than half the length of the coleoptiles than germination alone.

Following lunch, the group had the opportunity to participate in a germination practical covering cotton, camelina, sorghum, tomatoes, onion, squash, garden beans, field beans, broccoli, spinach, melon and peas. There was also a vigor practical on cotton and a seed identification.

The group then participated in a site tour which included distribution and sample storage, the vigor planting line, vigor evaluation, herbicide bioassay, germination and seed treatments. This was the first opportunity for many to see the newly expanded lab.

Harold Armstrong
Monsanto,
Waterman, IL
and
Steve Schaefer
IL Foundation Seeds
Tolono, IL

UNINTENDED BIAS TO RYEGRASS PURITY TESTS: SEEDLING ROOT FLUORESCENCE (SRF) AND MATURITY GROW-OUT (GOT)

In 1938, Dr. H.H. Rampton wrote in the Agronomy Journal,

"The fluorescence test is useful in the classification of the general run of domestic ryegrass seed and in making approximate determinations… It cannot be used as an infallible guide in classifying questionable lots of ... ryegrass seed."

Yet the grass seed industry and seed testing authorities made the Seedling Root Fluorescence (SRF) test more exacting by employing the Variety Fluorescence Level (VFL) for new ryegrass varieties. Perhaps it is time to put an end to the biased and improper abuses of the SRF test and the grow-out test (GOT). New molecular tools are available to provide more accurate results in less time than the GOT and the SRF tests.

The SRF Test in ryegrass has been discussed and cussed for many years. Generally, Italian (or annual) ryegrass seedling roots fluoresce under ultraviolet light and perennial ryegrass does not. In recent years we have found that the SRF overestimates the amount of annual-like contamination in perennial ryegrass seed lots. This bias has been costly to grass seed growers in the form of lowered seed payments and costly to seed companies because of an inappropriately labeled seed product being sold to the consumer.

To alleviate the income loss to seed growers, we developed a maturity GOT that was implemented for labeling seed in 2001. After several years experience with the GOT, we found that it was causing problems in the grass seed industry as well. Our research showed that the GOT consistently underestimated the amount of annual-like plants in the SRF seedlings (Fig. 1). This is because the AOSA-implemented GOT was too short and artificial lighting conditions were not standardized at high enough intensity levels. Heading of SRF positive plants continued to 9 weeks, showing that GOT tests terminated before 10 or 11 wks will be biased toward under representing annual-like plants. Plants heading at 12 weeks or later are SRF positive perennial-like. Plants with annual-like DNA markers increased at 12 weeks and later show that other genes involved in the flowering process are present.

The experiment that provided data in Figs. 1 and 2 was described and published in the May 2008 AOSA/SCST Newsletter. A presentation on this subject was made at the 2008 AOSA/SCST Annual Meeting. Basically, 20 seed lots were tested for SRF. All 359 plants with SRF (Fig. 1) and 490 plants without SRF

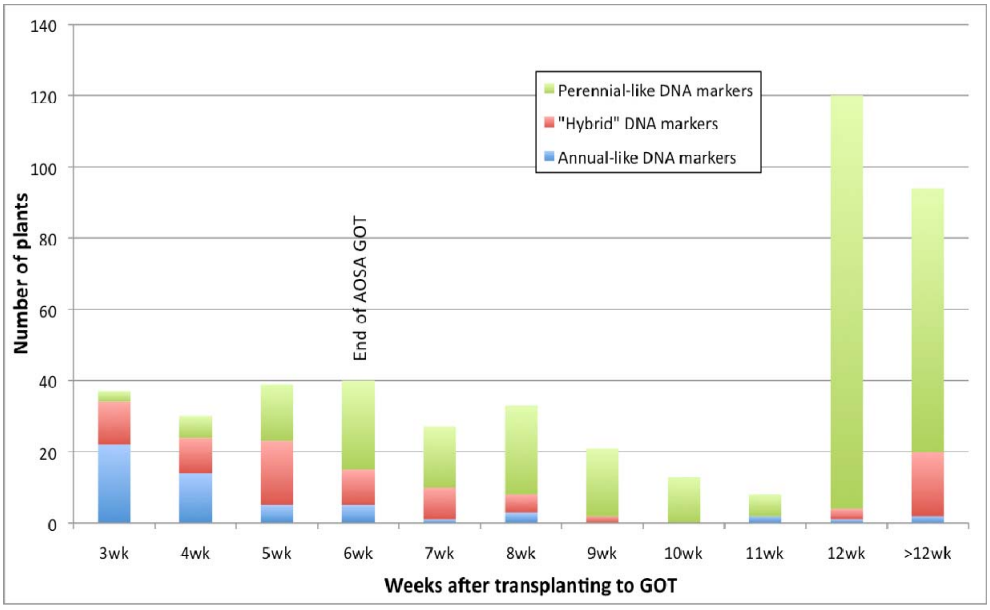


Fig. 1. Number of plants heading from 359 SRF positive seedlings in a GOT grown for 84 days under continuous light and high light intensity growth chamber using 20 ryegrass cultivars. The total number of plants heading in each weekly increment was divided into those with "annual-like," "perennial-like," and "hybrid" plants classified by DNA markers. According to the AOSA CPH, it is suggested that the GOT be terminated before or at week 6.

(Fig. 2) were transplanted to a GOT conducted for 12 weeks under continuous high intensity lights. Gene markers were measured on the DNA extracted from seedling leaves harvested soon after transplanting.

The number of SRF negative plants heading continued to increase to wk 8 before they began to decline (Fig. 2). Initially, a high percentage of the plants that headed had positive SRF, but then the percent of SRF plants declines and never falls below 30%. If there were a strong correlation between SRF and plant-type, it would be expected that the percentage SRF plants would drop to or near zero.

This result shows why SRF over represents annual-like plants. The number of plants for wk 12 is the number of plants that did not head at the end of the test and SRF was still at 34% of these plants that were perennial. On the other hand, using the two molecular markers, the percentage of plants starts high, and decreases to near zero, and these were mostly hybrids. These results indicate that molecular markers can be as good a predictor of plant type as an eight to 12 wk GOT, but can be completed in about two days.

Mounds of data and publications have been presented on the actual conducting of the SRF test, but in a landmark paper, Floyd and Barker (Crop Sci. 2002) were the first to report that the condition (or the environment) in which the grass plants were grown had profound effects on SRF test results. The chemical that is exuded during germination is annulolene. It fluoresces when exuded on white filter paper. Annulolene is a byproduct of lignin biosynthesis, but we were unable to determine if it was produced from luxurious or stress consumption during lignin biosynthesis. The very fact that growing conditions have large impact on SRF results leads us to believe that trying to rely on SRF as an "exact" test will be fruitless and actually introduces bias to the test results.

For the past 12 to 14 years, we have been working on a PCR test that was faster and more accurate than either the SRF test or the GOT. We are now successful in providing the protocol as an Allelic Discrimination (A/D) test (Fig. 3). We found single nucleotide polymorphisms (SNPs) to two major genes involved in the flowering control process in grasses and used these in developing an A/D test. A SNP is the cause of alleles, or alternate forms of genes. We are using the indeterminate gene (*LpID1*) and a vernalization gene (*LpVrn-1*).

Based on these data and other data not shown, we have introduced an AOSA Rule Proposal that is basically

Continued on page 20

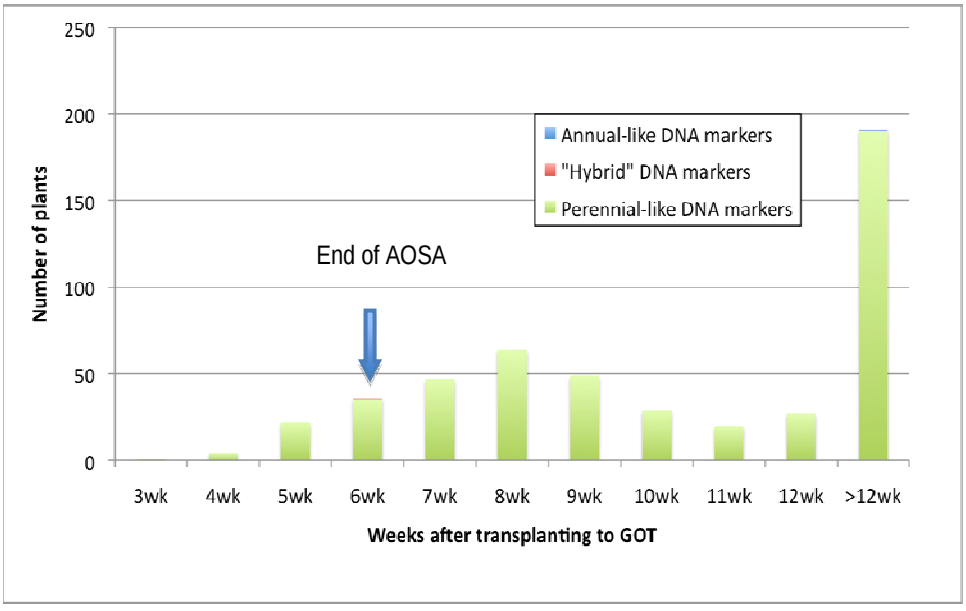


Fig. 2. Number of plants heading from 490 SRF negative seedlings in a GOT grown for 84 days under continuous light and high light intensity growth chamber using 20 ryegrass cultivars. The total number of plants heading in each weekly increment was divided into those with "annual-like" (one at >12 wk) "perennial-like," and "hybrid" (one at 6 wk) plants classified by DNA markers. According to the AOSA CPH, it is suggested that the GOT be terminated before or at week 6.

UPDATE ON SEED COUNT REGULATION

The leadership of AOSA and SCST have been working very closely with ASTA and other industry stakeholders to petition the National Conference on Weights and Measures (NCWM) to adopt the procedures and maximum acceptable variances for mechanical seed counts as established in the AOSA 'Rules for Testing Seeds'.

There is confusion in some states as to whether seed regulatory officials or weights and measures officials have jurisdiction over regulating seed counts. Weights and Measures departments reference the NIST Handbook #133, which stipulates a blanket tolerance of 1.5% for all products packaged by count. When seed regulatory officials look at seed count they use the AOSA Rules and the AOSA tolerances, or maximum allowed variation (MAV), which are 2% for corn, 4% for soybeans, 5% for field beans, and 3% for wheat. The seed industry needs a consistent standard for regulation of seed count. The petition made by ASTA is supported by the leadership of the AOSA, SCST, Independent Professional Seed Assoc., American Assoc. of Seed Control Officials, American Soybean Assoc., National Assoc. of Corn Growers, and Iowa State Soybean Assoc.

In January, AOSA President Mike Stahr attended the NCWM's Interim Meeting to answer questions and provide background information on the research and development of the AOSA mechanical seed count procedure and tolerances. The NCWM's Laws and Regulations Committee determined that ASTA's petition is fully developed and is ready for a final vote in July at the group's annual meeting.

Below is a position paper on seed counts that was adopted by the AOSA and SCST Executive Boards, this paper provides additional information on the seed count issue and history. If you have any questions about this issue please contact Anita Hall, Mike Stahr or Doug Miller.

Selling Seed by Seed Count
Officially adopted by the AOSA and SCST Executive Boards February 19, 2009

Introduction
In the past twenty-five years technical innovations have modernized agriculture beyond recognition. Some of these innovations have included the genetic alteration of seeds, advances in pesticides and fertilizers, and the development of precise and advanced equipment for all phases of production.

Precision planting of seeds has led to changes in the way seed is labeled and sold. Farmers need to know the number of seeds in a bag in order to predetermine their planting rates and to figure the costs associated with seeding a field. Seed is the product of a natural, biological process and therefore is not uniform in size and weight. Differing weather conditions and genetics will result in disparity in the size and weight of varieties of seed corn and soybeans. In order to compensate for the variability of these seeds, seed companies have started to sell seed by seed count rather than by weight. Selling seed by seed count provides farmers the information they need to purchase a specific and accurate amount of seed to plant their fields.

History of the Seed Count Rule
Seed companies first became interested in selling seed by seed count in the mid-1990's. In response a number of Association of Official Seed Analysts, Inc. (AOSA) and Society of Commercial Seed Technologists (SCST) laboratories began offering seed count services to their clientele. The addition of seed counts to the seed bag and label required the development of a standardized testing procedure and appropriate tolerances.

In 1995 AOSA passed a motion to appoint a committee to research and establish procedures for conducting seed counts. Dr. Richard Payne, USDA-AMS Seed Regulatory and Testing Branch Chief, chaired the committee. The committee recognized that the National Institute of Standards and Tech-

nology (NIST) stipulates a maximum allowable variation in packages labeled by count of 1.5%. The seed industry felt that this was an unattainable standard for seed labeled by count as NIST tolerances primarily addressed items where size and weight were precisely controlled in the manufacturing process.

The committee conducted referee tests in 1996 and 1997. In 1998 the AOSA Board of Directors approved a tentative rule for seed counts to be included in the AOSA *Rules for Testing Seeds*. The tentative rule allowed analysts to become familiar with the procedure and to suggest modifications to the procedure before it became a permanent rule. Additional referee projects were conducted in 1998 and 1999. In 2000 the final proposal was submitted by the Seed Count Committee and approved by the AOSA membership.

Key Components of an Accurate Seed Count

Research had indicated that there are a number of factors that must be considered when conducting a seed count. First, a representative sample of at least 500 grams must be drawn according to the sampling intensity and procedures specified in the AOSA *Rules for Testing Seeds*. The automatic seed counter must be calibrated daily prior to use. Detailed directions for maintaining a calibration sample and the calibration technique are included in the Rule.

A purity analysis must be conducted on the sample so that only pure seed units will be counted. There are specific pure seed unit definitions for corn and soybeans described in the AOSA Rules. The Rule provides a calculation for determining the number of seeds per pound based on the sample analyzed. The final component of the Seed Count Rule provides tolerances for comparing results between laboratories or comparing the label against a regulatory laboratory test. The tolerances were established from the research gathered during the referee projects. Variation in size and weight of corn and soybeans dictate a 2% tolerance between laboratories for corn and a 4% tolerance for soybeans.

Current State of Affairs

The current NIST standard does not include specific instructions for obtaining a representative seed sample or maintaining the moisture content of the sample. The standard does not include instructions for utilizing a mechanical seed counter or describe how to calibrate a seed counter. It does not take into account a pure seed analysis or the use of a trained analyst to perform the procedure. The NIST tolerance does not recognize that seed is a natural, not manufactured, product and therefore has variations in size and weight that necessitate the application of a reasonable and scientifically based tolerance.

The AOSA Seed Count Rule is the industry standard. It is also the standard used by seed regulatory officials in the states that have adopted the AOSA *Rules for Testing Seeds*. There is clear, scientific evidence to support the procedures and tolerances included in the AOSA *Rules for Testing Seeds*. More seed companies are serving the consumer by selling their seed by seed count. Seed companies should be held to a consistent and fair standard in all states. It is our position that this standard should be the AOSA Rules for Testing Seeds.

References

"Report of the AOSA Seed Count Committee", *AOSA Newsletter* (September 1996; pg. 51-53).

"Report of the AOSA Seed Count Committee", *Seed Technologist Newsletter* (February 1998; pg. 16-20)

"Report of the 1998 Open AOSA Seed Count Committee Meeting", *Seed Technologist Newsletter,* (September 1998; pg. 30-31).

"Report of the Seed Count Committee", *Seed Technologist Newsletter,* (September 1999; pg. 34-36).

"Rule Change Proposal No. 1: Seed Counts of Corn and Soybeans", *Seed Technologist Newsletter*, (February 2000; pg. 73-75).

SEED ANALYSIS — DUANE ISELY

I recently found one of the cornerstone publications of seed analysis training: **Seed Analysis** by Duane Isely, Iowa State College, Ames, Iowa, 1954, 164 pp.

This book was offered for sale in 1957 for $2.30, according to the college book store price sticker.

The original edition stated that there were no manuals or texts covering the field of seed technology as practiced in the United States in 1951. The following year, the USDA printed the seed testing classic text; Manual for Testing Agricultural and Vegetable Seed, which virtually all laboratories in the United States still use as a standard reference.

Isely's text was written to facilitate seed analyst training in the classroom and laboratory. The text states "Standardization of procedures and interpretations is one of the most important goals of seed technologists." This goal continues to fuel the combined efforts of AOSA and SCST.

The text follows the organization of the AOSA Rules for Testing Seed, 1949. One point that I find extremely helpful is that many of the "rules of thumb" are clearly and concisely stated.

Techniques for purity analysis are provided. These techniques are most commonly passed on from analyst to analyst and are not commonly described in most textbooks. Therefore, seed analysts in small laboratories may find it valuable to review the chapter to glean new techniques.

History and use of air blast blowers as a separation aid is discussed. I found this technique very useful when conducting purity tests on native seeds. (Note: the reason for use of an air blast blower is not to be confused with the Uniform Blowing Point.)

The text clearly elucidates why there is a difference between pure seed definitions of crops and the pure seed definitions of weed seeds.

In the book, it is pointed out that there was a movement for uniform classification of crop and weed seeds as early as 1951. The practical approach of separation of a portion of the sample as separation of the entire sample is impractical is discussed and explained. Early varietal purity tests are also discussed.

Isely provided a dichotomous key for seed identification. He pointed out that understanding general characteristics of a group of species will allow the analyst to concentrate identification efforts on a smaller group of species. I find the key useful for inclusion of characteristics in seed analyst seed identification training materials.

The largest section of the chapter is devoted to the Poaceae (Gramineae) or grass family. Isely pointed out that some weed seeds may commonly be associated with certain crops and linked weeds with specific crops. Some labs use similar lists of common weed contaminants in associated crops.

There is a very nice discussion of the evaluation of injured and immature weed seeds and techniques for bench analysts to determine the potential viability of weed seeds.

In the chapter on germination, there is a very interesting discussion of the consequence of excess water in a germination test providing a more favorable condition for growth of mold on weak or diseased seedlings.

The text provides a general discussion of state seed laws and provides an overview of the diversity of laws and the reason for the variations. Isely pointed toward the need of uniform seed laws, now known as RUSSL (the Recommended Uniform State Seed Law).

I find this book to be of value especially for training purposes due to the practical nature of the material covered, the techniques of use for bench analysts, and the clarity of writing.

The fundamental concepts discussed in the book will provide insight and compliment the current Rules. I would suggest laboratories use this text, if available, for analysts in the training stages.

Off the Bookshelf -
A Field Trip

While in California, I visited a landscape nursery, Australian Native Plants, just out of Ventura. I had noticed an article about the nursery in a local paper. Nursery visits are by appointment only, primarily Tuesday, Thursday or Saturday.

The proprietor, Ms. Jo O'Connell, is very knowledgeable about the species she offers for sale. An Australian native, Ms. O'Connell has extensive experience in xeriscape plantings and zoo horticulture. She suggests replacing water-dependent ornamentals with the plants developed in arid Australia.

Many of these species have striking floral forms and provide unusual textures.

This visit was the first time that I had ever seen a fig tree or a papaya tree in fruit.

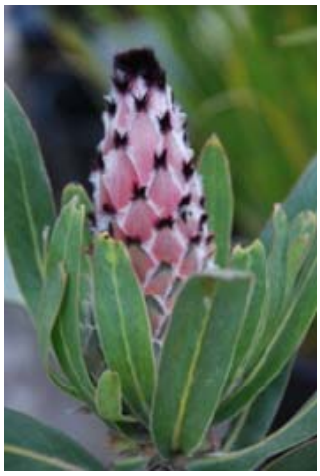
One of the most valuable aspects of shopping at a nursery is the guidance provided by the proprietor in selecting appropriate plants for your location. I discovered that some of the species in containers would make wonderful patio plants when brought into the house during winter in zones five and four.

Flower seed mixtures are available as well as plants in containers. The nursery has shipped plants across the United States. Photos of many of the species offered for sale are posted under the plants section of the company website (http://www.australianplants.com). The website also offers books for sale. Many of which I had found difficult to obtain elsewhere, one of these I previously reviewed for the Bookshelf.

O'Connell also lists a number of links to Australian botanical gardens that would be of great value if you are planning a trip.

O'Connell propagates most of her material herself and actively seeks new materials from Australia. The use of these water thrifty plants can provide unusual color and texture to the landscape while reducing your water bill. Best of all, you may have some specimen plants that do not look like anything in your neighbors' landscape.

Harold Armstrong
Monsanto
Waterman, IL



SANDRA HEGNA RETIRES

Sandra Hegna retired from the Iowa State University Seed Laboratory January 29th after more than 35 years of service to the seed industry.

This service included teaching portions of the AOSA Seed Analyst Short Course for many years, giving individual training to AOSA and SCST analysts, and conducting purities and noxious weed exams on thousands of samples.

Sandra clearly enjoyed her work and also the opportunity to be part of many people obtaining their RST or CSA credentials. She will be missed greatly and will very much be a hard act to follow.

Mike Stahr,
Iowa State University
Seed Laboratory
Ames, IA

Sandra Hegna retired in January, 2010 after more than 35 years of service to the seed industry.

Ryegrass purity tests (continued from page 15)

a reference to the Allelic Discrimination protocol to be placed in the AOSA Cultivar Purity Testing Handbook. These kinds of molecular tests will go a long way to solve the biased SRF and GOT tests that actually force false labeling of seed. The A/D test is an initial step toward getting acceptance by the regulatory agencies and correcting the bias problems.

Submitted by:
Reed E. Barker
(formerly USDA-ARS, Corvallis, OR)

Grass Genomic Testing, Inc.
1962 Davcor St. SE
Salem, OR 97302-1146

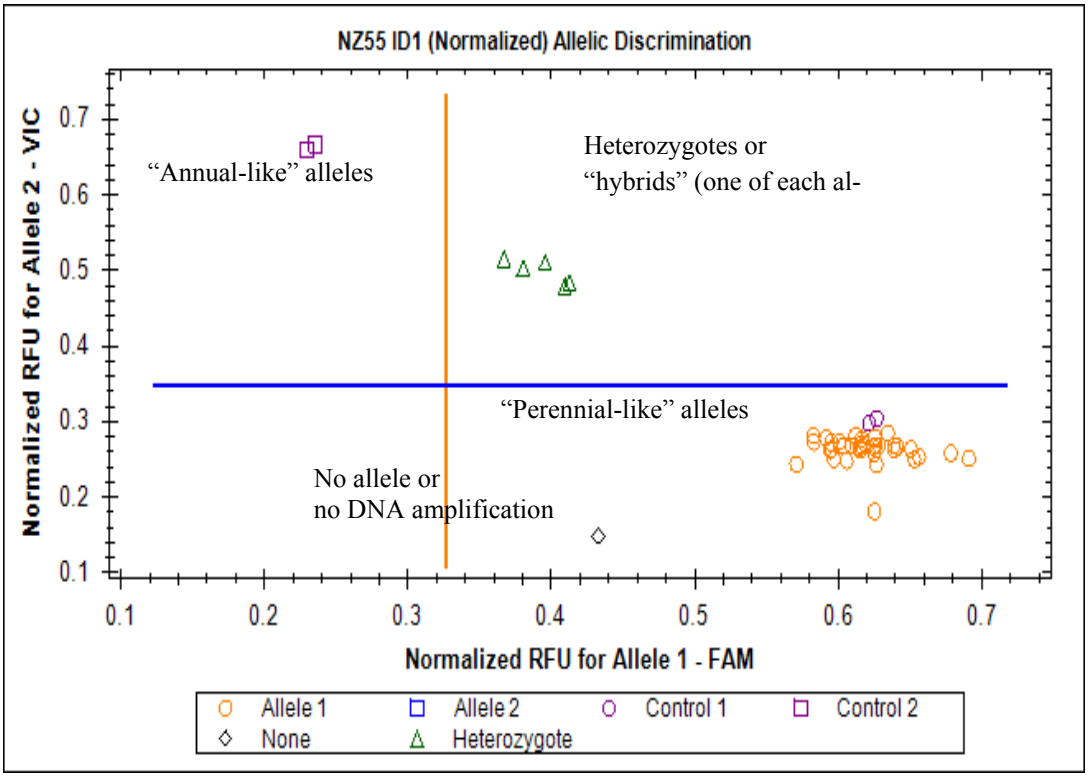


Fig. 3. Allelic Discrimination computer display from a Bio-Rad CFX96 rtPCR system for the ID1 gene marker in all plants tested from seed lot NZ55 perennial ryegrass by the Allelic Discrimination gene marker protocol. Blue squares are plants that are perennial-like, red circles are plants that are annual-like, and green diamonds are plants that are heterozygotes or "hybrids." The diamond had no DNA amplification in the analysis reaction. Each point on the chart represents an individual plant that has been identified. Final results are reported in spreadsheet and, when finally summarized, just three numbers are provided. Those numbers are the number of plants that were "A" for annual-like, "P" for perennial-like, and "H" for hybrids.

ISU SEED SCIENCE CENTER OFFERS WORKSHOPS

The Iowa State University Seed Science Center will be offering a full slate of workshops this spring and summer on seed analysis and seed conditioning.

Workshops start with the two-week AOSA Seed Analyst Short Course held in late April, continue with several works on conditioning, and conclude with the Corn and Soybean Quality Workshop in late August.

All workshops focus on hands-on experience with informative lectures and materials to take with you.

To get additional information or to register, please go to www.cepd.iastate.edu/events or www.seeds.iastate.edu/seedtest. Or, call Connie at 515-294-6821.

Mike Stahr,
Iowa State University Seed Lab
Ames, IA

NEW SEED ANALYST TRAINING CERTIFICATE PROGRAM

Colorado State University (CSU) is offering a new Certificate Program in Seed Technology to train analysts to work in state or commercial seed laboratories. The Certificate is an invaluable tool for anyone who wants a career in seed technology or for current seed analysts working to become a Registered Seed Technologist (RST) or Certified Seed Analyst (CSA). The Program is designed to help fill a well documented need for new seed analysts in the industry.

Although CSU has been offering courses in seed technology since 1998, it has recently expanded the training to a Certificate Program which includes 10 online courses and laboratory training. The program offers 10 distance education courses through CSU and 3 other institutions: the University of Kentucky, Virginia Polytechnic Institute and Iowa State University. The laboratory training may be taken at CSU or at a wide range of state and private seed testing labs throughout the U.S.A. The courses are:

Seed Anatomy and Identification ● Seed Development and Metabolism ● Seed Germination and Viability ● Seed Purity Analysis ● Seed Separation and Conditioning ● Seed Storage and Deterioration ● Large Seeded Legume Seed Production ● Vegetable Seed Production ● Seed Dormancy ● Vigor Testing

The Certificate Program is a two year program that costs about $3000. Scholarships are available for those needing financial assistance. Anyone interested in this new educational and employment opportunity should visit http://step.colostate.edu. For further information please contact Dr. Jack Fenwick at j.fenwick@colostate.edu or by phone (970-491-6907) at Colorado State University, Ft. Collins, Colorado.

IL CROP LEAD AUDITOR TRAINING A SUCCESS

Illinois Crop is proud to announce that four of its employees have successfully completed the RABQSA accredited and IRCA recognized ISO 9001 Lead Auditor Training Course.

While not certified lead auditors, the four will join three other employees who have previously taken the Lead Auditor course.

IL Crop employees now trained as lead auditors include an RST, RGT and CGT. From internal audits to process development, the course will strengthen IL Crop's services and its customer satisfaction.

The three day course along with an optional fourth day of live auditing was presented by Leigh Brand, IRCA Certified QMS Lead Auditor and Chairman of Brand Consulting Group, Inc.

Doug Miller,
Illinois Crop Improvement
Champaign, IL

2010 CALL FOR RESEARCH PAPERS AND POSTERS

Individuals who have conducted research on germination, purity, cultivar identification, molecular techniques, statistical techniques, bioassays, vigor testing methods or other aspects of seed physiology are encouraged to present a short paper or poster at the AOSA/SCST Annual Meeting in St. Louis, MO. It is important that association members hear about new scientific approaches to seed quality evaluation and other seed related topics.

Please prepare an abstract using the guidelines below and send to Jack Peters, SCST Research Committee Chair, no later than April 23, 2010 for publication in the May Seed Technologist Newsletter. Indicate if the presentation is oral or poster. Abstracts received by this date will be published (as submitted) in the May 2008, Seed Technologist Newsletter. Remember that a good, informative abstract presents the complete paper in miniature, and it should stand alone.

Abstract guidelines:

- State rationale for the study and objectives or hypotheses in one or two sentences
- Provide a brief description of materials and methods, key results, and their applications or conclusions
- Give the complete scientific name for plants and crops when first mentioned in the abstract.
- Provide common names and trade names of chemicals as appropriate, or other details that help explain the results
- Limit use of abbreviations, and define abbreviations that are used
- Do not cite figures, tables or references in the abstract
- Write in a single paragraph, and limit the abstract to 400 words or less
- Use Arial 12 point font size

Please include the author(s) name, address, institution or company. In the case of multiple authors for oral presentations, please indicate the corresponding author, their phone number and e-mail address and the individual who will be giving the presentation. Abstracts are to be submitted by e-mail as either a Word document or as a text file to: jyr23@aol.com. Please contact Jack Peters, SCST Research Chair, if you have any questions: 541-760-2109 or jyr23@aol.com.

AOSA/SCST RESEARCH FUNDING ANNOUNCEMENT 2010 REMINDER

The AOSA/SCST Research Committee is accepting proposals for the 2010 cycle. The deadline for submitting proposals is May 15, 2010. Please submit proposals to:

Brent Turnipseed
Professor/Manager, SDSU Seed Testing Lab
Ag Hall 227, Box 2207A
Brookings, SD 57007
Tel: 605-688-4590, Fax: 605-688-4013
Email: brent.turnipseed@sdstate.edu
Seed Lab Phone: 605-688-4589

Proposal details are available in the September issue of The Seed Technologist Newsletter or from Dr. Brent Turnipseed.

OUTLINE FOR AOSA/SCST SEED RESEARCH PROPOSAL

Title Page
Overall Aim and Specific Objectives
Relevance to Seed Testing/Technology
Rationale
Technical Work Plan
Staff and Resources
Budget Information

ANNA LUTE AWARD NOMINATIONS

The Front Range Seed Analysts (FRSA) created an award in the honor and memory of Anna Maude Lute, an accomplished seed analyst of her time. Anna Lute was the Director of the Colorado Seed Laboratory and Chief Seed Analyst from 1920 until retirement in 1941. She also served as the President of the AOSA in 1925 and taught grass systematics and taxonomy at Colorado State University. Prior to the CSU Seed Lab, she worked as a seed analyst and in seed research for the USDA. It was her understanding that to become a proficient seed analyst, one must have daily contact with the testing of seeds and with the identification of new seed species. Anna Lute stated in her 1925 AOSA Presidential Address:

> "*An understanding* [of seed analysis] *can only be gained by that familiarity which is born of long contact with a problem. It seems to me then, that one of our greatest immediate needs is to make of the seed laboratory a fit place for minds to live in, not to sleep or die in… My plea, then, is that we may make of seed laboratories a better environment for seed analysts… We need to continue our work to increasingly improve our laboratory methods and practices. It is constant attention and constant effort to attain a better result by a more reliable method that makes even the routine work of seed testing and analysis interesting… I speak as one who enjoys every phase of the seed work".*

Members of the Front Range Seed Analysts (FRSA) realize there are analysts out there who fit Anna Lute's model, and would like to see them recognized for their interest, dedication and desire for seed testing. Please help acknowledge these special people by submitting their name and qualifications for this award. The ***Anna Lute Award*** consists of an engraved plaque and a $100.00 monetary award and is presented by an FRSA representative at the annual AOSA/SCST joint meeting.

Nominations for the ***Anna Lute Award*** should be of a dedicated seed analyst who fits the Anna Lute model and meets the following criteria set by FRSA. The application form may be found on the FRSA website at www.frsa.org. Any member of AOSA or SCST is welcome to post a nomination and all are reviewed by the FRSA Awards Committee, which consists of two FRSA members, the FRSA Secretary and two past Anna Lute Award winners. The following criteria will be used to select the award recipient:

- presently engaged in seed testing, spending a minimum of 50% of their time actively involved in day-to-day seed analysis.
- made worthy contributions to the field of seed testing such as determining new or alternate methods of testing seed, involvement in education of the public in the field of seed testing, aiding in the training of new seed analysts, participation in workshops and seminars, etc. *Please include specific examples for the person you nominate.
- have effectively furthered the use of seed testing and of high quality seed through continued activity, local or national, in the seed industry. *Please include specific examples for the person you nominate.
- have contributed to the seed lab environment through continued helpfulness toward fellow seed analysts and with enthusiasm for the subject of seed testing. *Please include specific examples for the person you nominate.
- have established a local or national reputation as an interested, enthusiastic, and professional seed analyst.

Nominations are kept from year to year. Once you nominate an analyst, their name remains on our list. Past Award recipients are: *Sharon Davidson, Marie Greeniaus, Deborah Meyer, Susan Maxon, Nancy Vivrette, Annette Miller, Jim Effenberger, Tim Gutormson, Marilyn Milhous, Sandra Hegna, Aleta Meyer, Barbara Atkins, Pat Brownfield, and Brent Turnipseed*

Applications for the nomination for the Anna Lute award are due May 1st. Please return applications to Ethan Waltermire at csl@lamar.colostate.edu.

AOSA SEED VIGOR TESTING HANDBOOK

The Association of Official Seed Analysts is pleased to announce the publication of a new *Seed Vigor Testing Handbook*.

The new handbook is a comprehensive revision of the 1983 and 2002 versions that set the standard for vigor testing. As a methodical and detailed resource, the handbook will be of value to seed technologists, scientists, students, and industry personnel interested in the fascinating subjects of seed vigor and seed quality.

The *Seed Vigor Testing Handbook* has been internationally recognized as an important tool for all aspects of vigor testing, and the new edition represents the definitive authority on the theory, standardization, applications and methods of seed vigor testing.

The handbook is divided into four parts, each covering a different aspect of vigor testing.

Part One focuses on explaining the importance of vigor testing, its rich history, basic vigor concepts and definition of seed vigor.

Part Two emphasizes important issues related to the standardization of vigor tests such as use of standards, control samples, tolerances, sampling techniques, etc., general procedures for controlling variation, as well as presentation and interpretation of vigor test results.

In Parts Three and Four, the authors have taken a new approach to classifying seed vigor tests by dividing them into categories according to Aging, Cold, Conductivity, Seedling Performance, and Tetrazolium Tests. Part Three focuses on the principles of each vigor test, while Part Four presents detailed descriptions of test procedures. Considerable research in vigor testing has been reported since 1983 for specific crops. This information is compiled in an Appendix that lists more than 50 major crops and the vigor tests that have been successfully used to test them.

The Association of Official Seed Analysts acknowledges the significant contributions of all authors and especially the four editors who reviewed the final draft: Drs. Riad Baalbaki, Sabry Elias, Julio Marcos-Filho, and Miller B. McDonald; their contributions to the advancement of seed technology are sincerely appreciated.

The new *Seed Vigor Testing Handbook* is an important demonstration of AOSA's commitment to the refinement and modification of the rules and procedures for seed testing, ensuring that testing procedures are standardized between analysts and among laboratories.

BRIEF OVERVIEW OF CONTENTS

PART ONE: THE IMPORTANCE OF SEED VIGOR TESTING. History of Seed Vigor Testing; Standardization of Seed Vigor Tests; Seed Vigor Concepts.

PART TWO: VARIABLES AND GENERAL PROCEDURES IN VIGOR TESTING. Variables in Vigor Testing; Use of Control Samples; Tolerances; Proper Sampling Techniques; Determinations of Soil Moisture Content and Water Holding Capacity; Adjusting Seed Moisture Content; Assessing Seed Size (Weight) Variation; Proper Placement of Replicates in Germination Chambers.

PART THREE: SEED VIGOR TESTS – PRINCIPLES. Aging Tests; Cold Stress Tests; Conductivity Tests; Seedling Performance Tests; Tetrazolium Tests For Seed Vigor Determination.

PART FOUR: SEED VIGOR TESTS – PROCEDURES. Accelerated Aging Test; Saturated Salt Accelerated Aging Test; Controlled Deterioration Test; Cold Test; Saturated Cold Test; Cool Germination Test; Electrical Conductivity Test; Single Seed Conductivity Test; Potassium Leakage Test; Speed of Germination Test; Seedling Growth Rate Test; Computer Imaging Tests; Tetrazolium Vigor Test For Corn; Tetrazolium Vigor Test For Peanut; Tetrazolium Vigor Test For Cottonseed; Tetrazolium Vigor Test For Dry Beans; Tetrazolium Vigor Test For Soybeans.

APPENDIX

INDEX

ORDERING INFORMATION

In keeping with the diverse needs of the seed industry the handbook is available in alternate formats: a hard-copy three ring binder in full color, printed on archival quality paper; and, in an electronic format on CD. The CD does include one print license. The cost of the Handbook is $100 for the printed version and $75 for the electronic option. Please contact AOSA to order:

http://www.aosaseed.com/publications.htm

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2010 ANNUAL MEETING

The 2010 AOSA-SCST Annual Meeting is being hosted by the Illinois Seed Analysts in St. Louis, MO, June 4 - June 10, 2010. The meeting is an excellent opportunity for you to participate in all the activities AOSA and SCST offer. The convention schedule is filled with committee meetings, Referee Project presentations, a Research Symposium, the Seed Issues Forum, Open Rules Committee Meeting, Long Range Planning and Business Meetings. Preceding the meeting are a Seedcalc statistics workshop, a Genetic Technology Workshop, and a Flower Seed Workshop. The meeting will also offer many opportunities to interact and network with your fellow seed analysts and seed laboratory vendors. The host committee is also very excited to announce that there will be a tour and dinner at the Monsanto Chesterfield and Creve Coeur campuses on Monday June 7th.

****** Please note *******

The Monsanto Tour and dinner will be limited to 200 people and the deadline for signing up for the tour is May 20th, 2010. Registrants signing up after May 20th will not be allowed to take the Monsanto Campus Tour. This is to allow Monsanto time to be properly prepared. Please make sure to indicate on the registration form if you wish to participate in the tour.

Visit the AOSA and SCST websites for complete registration information, meeting agendas, transportation, and local information.

http://www.seedtechnology.net/2010/2010_AOSA-SCST.htm
http://www.aosaseed.com/2010/2010_AOSA-SCST.htm

For reservations, call the Hilton St. Louis at The Ballpark directly at 1-877-845-7354 and reference AOSA. Reservations must be made by May 3rd to guarantee the group room rate of $115 per night. Online registration is also available:

http://www.hilton.com/en/hi/groups/personalized/STLBVHF-AOS-20100604/index.jhtml

Please register for the meeting before May 1 to pay the early registration rate.

We hope to see you in St. Louis!

Statistics Workshop

June 4, 2010

8:00 am - 5:00 pm

Hilton St. Louis Ballpark

Fee: $125
(includes lunch and breaks)

Presenters: Kirk Remund and Tim Perez, Monsanto Company.

This hands-on, intensive workshop will provide one on one teaching of the Seedcalc statistics tool used in genetic seed testing plans. This tool can also be used for the analysis of traditional seed testing results (e.g., germination and vigor). SeedCalc will be provided to the participants. Workshop participants will need to bring a laptop with MS Excel® installed and attendance is limited to 20. In order to allow more laboratories to participate attendance will be limited to two individuals from each laboratory until May 1st, after this date registration will be open on a first come, first served basis.

Genetic Technology Workshop

June 5, 2010

8:30 am – 4:30 pm

Hilton St. Louis Ballpark

Fee: $125
(includes lunch and breaks)

The Genetic Technology workshop will cover challenges related to testing the new products coming on the market and the issues surrounding testing and labeling refuge-in-a-bag seed lots.

Flower Seed Workshop

June 6, 2010

8:30 am – 4:30 pm

Hilton St. Louis Ballpark

Fee: $125
(includes lunch and breaks)

This detailed workshop will focus on comparing differences in the seedling evaluation of flower seed families as well as differences in evaluation within families. The workshop will include a “tricks of the trade” presentation/discussion and will conclude with digital quizzes on ten seedling evaluations (normal, abnormal determinations) of many different species, followed with an explanation of each evaluation.

Friday 6/04/2010	
2:00pm - 5:00pm	Registration
8:00am - 5:00pm	**Statistics Workshop: Seedcalc**
6:00pm - 6:30pm	Meeting with RST Exam Candidates

Saturday 6/05/2010	
7:00am - 5:00pm	Registration
7:00am - 5:00pm	Business Office
7:45am - 6:00pm	**Genetic Technology Workshop**
8:00am - 5:00pm	AOSA Board Meeting
8:00am - 2:00pm	RST Exam
8:00am - 5:00pm	RST Exam Grading
10:00am - 10:30am	Morning Break (Workshop)
12:00pm - 1:00pm	Lunch (Workshop & Exam)
2:30pm - 3:00pm	Afternoon Break
6:00pm - 7:00pm	RST Exam Results
7:00pm - 8:00pm	Meeting with RGT Exam Candidates

Sunday 6/06/2010	
7:00am - 5:00pm	Registration
7:00am - 5:00pm	Business Office
7:30am - 6:00pm	**Flower Seed Workshop**
8:00am - 2:00pm	RGT Examination
8:00am - 5:00pm	RGT Grading
8:00am - 5:00pm	SCST Board Meeting
10:00am - 10:30am	Morning Break
12:00pm - 1:00pm	Lunch (Workshop & Exam)
12:00am - 5:00pm	Exhibitor Set-up
2:30pm - 3:00pm	Afternoon Break
7:00pm - 8:00pm	RGT Exam Results

Monday 6/07/2010	
7:00am - 5:00pm	Registration
7:00am - 5:00pm	Business Office
7:00am	Bean Buddy Walk- Run
8:00am - 5:00pm	Exhibits
8:00am - 9:00am	Newsletter Committee
8:00am - 9:00am	Digital Imagery Committee (Computer)
8:00am - 9:00am	Proficiency Testing Committee
9:00am - 10:00am	AOSA By-laws Committee
9:00am - 10:00am	Purity Committee
10:00am - 12:00pm	**Opening Session and Brunch**
12:30pm - 2:30pm	Affiliates/Liaison Meeting (closed)
12:30pm - 2:30pm	Rules Committee (closed)
12:30pm-3:00pm	**Research Papers**
2:15pm - 2:30pm	Afternoon Break
3:00pm-	**Monsanto Tour & Dinner**

Tuesday 6/08/2010	
7:00am - 5:00pm	Business Office/ Registration
7:00am - 8:00am	Breakfast
8:00am - 5:00pm	Exhibits
8:00am - 10:00am	Genetic Technology Committee
8:00am - 9:00am	Conservation and Reclamation Seed Committee
8:00am - 9:00am	Moisture Testing Committee

Tuesday 6/08/2010 Continued	
9:00am - 10:00am	SCST Ethics Committee
9:00am - 10:00am	Cultivar Purity/GMO Committee
10:00am - 10:30am	Morning Break
10:15am - 11:15pm	Germination and Dormancy Committee
10:15am - 11:15pm	International Committee
11:15am - 12:15pm	Lab Standards & Documentation Committee
11:15am - 12:15pm	Statistics Committee
10:15am - 12:15pm	Examination Committee (closed)
12:00pm - 1:00pm	Lunch New AOSA & SCST Member Recognition
1:00pm - 2:00pm	Immunoassay Working Group
1:00pm - 2:00pm	Tree and Shrub Committee
1:00pm - 3:00pm	Rules Issues and Review Committee
2:00pm - 3:00pm	Herbicide Bioassay Working Group
3:00pm - 4:00pm	Teaching and Training Committee
3:00pm - 4:00pm	Vigor Committee
4:00pm - 4:30pm	Afternoon Break
4:15pm - 6:00pm	**Referee Projects/ Buzz Session**
6:30pm - 8:30pm	**Poster Session/Seed Issues Forum Reception**

Wednesday 6/09/2010	
7:00am - 8:00pm	Business Office/ Registration
8:00am - 5:00pm	Exhibits
7:00am - 8:00am	Breakfast
8:00am - 9:00am	Flower Seedling Committee
8:00am - 9:00am	PCR Working Group
8:00am - 9:00am	Seed Pathology Committee
9:00am - 12:00am	**Long Range Planning Session**
10:00am	Morning Break
12:00pm - 1:00pm	Lunch Anna Lute Award Presentation
1:00pm - 2:00pm	Tetrazolium Committee
1:00pm - 2:00pm	Electrophoresis Working Group
1:00pm - 2:00pm	Handbook Committee
2:00pm - 2:15pm	Afternoon Break
2:15pm - 5:15pm	**Open Rules Committee**
6:00pm - 7:00pm	**Social Hour**
7:00pm - 10:00pm	**Banquet**

Thursday 6/10/2010	
7:00am - 8:00pm	Business Office/ Registration
8:00am - 10:00am	Exhibitors break down
7:00am - 8:00am	Breakfast
8:00am - 10:00am	**Joint AOSA-SCST Rules Voting & Business Meeting**
10:00am	Morning Break
10:15am - 12:15pm	**AOSA Business Meeting**
12:15pm - 1:15pm	Lunch
1:15pm - 3:15pm	**SCST Business Meeting**

Calendar

2010

February

1-5 SCST Genetic Technology Super Workshop, Ames, IA. Information: http://www.seedtechnology.net/

23-24 US Accredited Grader Workshop & Exam, ISU Seed Science Center, Ames, IA. Information: http://www.ams.usda.gov/seed

26-3/2 CGSA/OGSA Joint Conference, 43rd Annual Canadian International Turfgrass Conference & Trade Show. Information: Canadian Golf Superintendents Association, cgsa@golfsupers.com

March

2-5 ISTA Seed Health Workshop, Angers, France. Information: www.seedtest.org

April

19-22 Seed Analysts Short Course – Purity, Ames IA. Information: www.seeds.iastate.edu

26-29 Seed Analysts Short Course – Germination, Ames, IA. Information: www.seeds.iastate.edu

May

31 - 6/2 ISF World Seed Congress, Calgary, Canada. Information: http://www.amseed.com/

June

4-10 AOSA/SCST Annual Meeting, St. Louis, MO. Information: http://www.aosaseed.com/ or http://www.seedtechnology.net

9-14 ISTA Workshop on Viability and Germination Testing, Karlsruhe, Germany. Information: www.seedtest.org

11-13 ISTA Workshop on Species and Variety Testing / Proteinelectrophoresis**,** Hanover, Germany. Information: www.seedtest.org

16-22 29th ISTA Congress 2010, Cologne, Germany. Information: www.seedtest.org

August

8-11 92nd AOSCA Annual Meeting, Buffalo, New York. Information: http://www.aosca.org