

Native Seed Quality Task Force

Summary Presented by Gil Waibel



Native Seed Quality Bulletin

NSTF Has Disbanded

- ▶ Set up in 2005
- ▶ Group included members of:
 - AASCO
 - ASTA
 - AOSA
 - SCST
 - AOSCA
 - Researchers
 - Consumers (NRCS, BLM)
 - Highway Department

NSTF Has Disbanded

▶ Goal

- Publish bulletin on native species to educate people about the unique challenges of “Natives”
- Make suggestions to AOSA on how to improve the “Rules” to improve uniformity in the test results

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- ▶ This presentation only covers highlights of the bulletin
- ▶ Many more details, and pictures in the bulletin
- ▶ Bulletin is in the final editing stages
- ▶ May be posted on the SCST web site, once acceptable editing is complete

Native Seed Quality Task Force

- ▶ Understanding native seed quality
 - Differing goals
 - Some end users desire germination in a short period of time
 - Some want germination tests run for an extended period of time to gain a higher germination percent and a lower dormancy percent
 - Many species do not have procedures in the AOSA Rules for Testing Seed
 - Pure seed units can be difficult to determine, and need more definition in the Rules
 - Germination and Purity differences can cause large differences in PLS, which is used to determine the value of the seed lot

Native Seed Quality Task Force

- ▶ Understanding native seed quality
 - Germination and Purity differences can cause large differences in PLS
 - Used to determine the value of the seed lot
 - Different germination approaches
 - Germination alone (no dormancy determination)
 - Tetrazolium test alone to determine viability
 - Combination of germ. test and TZ to determine total viability (TV) of the seed lot (Germ% + Dormant%= TV)

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- ▶ Understanding native seed quality
 - Using the correct scientific name will help remove confusion on the kind of seed being sold
 - Common names can be used differently from place to place
 - Important to keep up with the nomenclature literature
 - Use the current scientific name on the Report of Analysis

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▶ Seed Sampling

- There can be unique challenges in obtaining a representative sample
 - Seed may not flow easily
 - Must use hand method of sampling
 - Some species are very light, and care must be taken to obtain enough seed for the sample

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▶ Seed Sampling

- Seed Mixtures
 - Seed density issues
 - Seed shape issues
 - Segregation issues in the bag of seed
 - Segregation issues in the seed sample
- Seed test can only represent the seed lot as well as the seed sample represents the seed lot – Proper care in sampling is critical!
- Use the AASCO Handbook on Seed Sampling

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▶ Seed Testing

◦ Pure seed unit (PSU)

- 49 descriptions of PSU's in the Rules define a PSU on the 749 species listed in the AOSA Rules
- Many “Natives” are not listed in the rules, and have no PSU definition (up to each analyst to decide PSU) –
 - A year later, the same analyst may choose another PSU definition, if the species is rarely tested in the lab
- In the AOSA Rules there are 15 different PSU descriptions on different grass species – This can be confusing to determine which definition should be applied to a species not in the rules
- For some species not in the Rules, no definition applies – Your seed analyst must become “creative”!

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▶ Seed Viability

- Variable: Seed maturity, quality at harvest, proper drying techniques, quality conditioning, and proper storage conditions.
- The germination or viability level of the seed lot must be monitored – it will change over time
- Seed dormancy issues
 - Species not in rules can be tested differently from lab to lab
 - Dormancy levels and germination levels will change over time

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- ▶ Tetrazolium Test (TZ)
 - Much quicker estimate of viability than germination test
 - Germination test, while considered optimal conditions, stresses weaker seeds and can give different results than a TZ test
 - The use of different PSU's can cause differences in germination and TZ tests
 - Technique and interpretation of the stained seed structures can cause differences in results

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- ▶ Dormancy Breaking
 - Methods to break dormancy: Prechill, Alternating Temperature, Light, Chemicals (KNO_3 and GA_3)
 - Dormancy breaking has been used for many years in the germination test
 - TZ can now be used to help determine dormancy in the germination test
 - In the future, we may evolve to less dormancy breaking in the germination test on some species

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▶ Reporting Dormancy

- Varies greatly between seed labs
- A root cause for differences among Reports of Analysis on the same seed lot
 - Was dormancy breaking method used in the germination test
 - How was dormancy determined
 - Paired tests
 - With the use of TZ
- More transparency - NSTF recommends reporting method of testing

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▶ Genetic Variation

- Wide ranging species have subpopulations on the globe
 - Some morphological differences
 - Variation in form
 - Physiological differences
- Can cause problems for end-use person if the seed is not of the local ecotype

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▶ Report of Analysis

- Dates –received, completed, issue, & days tested
- Sender Info –customer provides genus and species
- Viability –
 - Germination, dormant, and/or hard seed percentages
 - Total Viable seed ($\% \text{germ} + \% \text{dorm.} = \text{Total Viable}$)
 - TZ – estimate of maximum % of viable seed
- Pure seed
- Other crop and weed seed – report kinds and # found
- Dormancy breaking methods, or state no method used

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▶ Labeling

- Methods of labeling single species and mixtures were suggested.
 - How to deal with dormancy and hard seed
 - Germination or TZ test
 - Pure Live Seed
- Differences in seed laws (state and federal) has created challenges in labeling

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▶ Other topics

- Seed certification
 - Source ID program
- Production and marketing expectations
 - Note to regulators:
 - Testing differences affect value
 - There is a real need for consistent results
 - Seed industry relies on seed scientists and analysts to come up with uniform and fair methods in testing seeds
- Consumer expectations