

Appendix H

Item 260-4: Handbook 133, Seed Count for Agriculture Seed

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AMERICAN SEED TRADE ASSOCIATION



November 30, 2010

John Gaccione
Chairman, NCWM Laws & Regulations Committee
c/o Westchester County Dep't of Weights & Measures
112 East Post Road, 4th floor
White Plains, NY 10601

Re: Seed Count Rule for Agricultural Seeds

Dear Mr. Gaccione:

The American Seed Trade Association (ASTA) is writing to express opposition to the pending petition from the Western Weights and Measures Association to rescind the seed count rule for agricultural seeds in Handbook 133 that was adopted by the National Conference of Weights and Measures (NCWM) in July 2010. We are deeply concerned by this proposal because of the uncertainty it will cause for our members and the inconsistency it will create for the regulatory community. The seed count rule adopted by NCWM is a validated, consistent, and practical means of verifying labeled seed counts for agricultural seeds. It would be detrimental to regulators and farmers if the rescission petition moves forward.

Benefits of the Seed Count Rule

At its annual meeting in 2010, the Conference adopted a rule regarding agricultural seed count that harmonized Handbook 133 with the provisions for verifying seed count that are used throughout the seed regulatory community. This action gave regulators an important tool to ensure the accuracy of labeled net quantity of contents statements on large bags of agricultural seed, which increasingly include a statement of count. This was particularly important for regulators in agricultural states because, prior to adoption of the seed count rule, there was no effective means for weights and measures regulators to verify labeled statements of count.

The adopted procedures incorporated the seed count rules that the Association for Official Seed Analysts (AOSA) developed as a result of many years of careful study and consideration. AOSA is a professional organization of seed laboratories whose members include state and federal seed regulators. Because AOSA's rules are used by seed regulators when they verify labeled statements of count, NCWM's action created uniformity in the laws for determining seed count for corn, soybean, field bean and wheat seed. Without this uniformity, certain states would apply different procedures and MAVs depending on whether the seed regulators or weights and measures inspectors were verifying the accuracy of seed count labeling.

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The adopted procedures provide benefits to weights and measures regulators, farmers, and seed companies. Weights and measures regulators now have an effective and practical method to verify labeled seed count. This increases their ability to regulate labeling of these important commodities effectively. Farmers now have assurance that the seed they buy is accurately labeled. Seed companies now have assurance that a uniform testing procedure is in place for both weights and measures and seed regulators.

Concerns with the Rescission Proposal

The pending proposal would remove the seed count rule from Handbook 133 and establish a working group to consider next steps. Specifically, the working group would be directed to undertake “necessary studies, laboratory testing, field trial, and other appropriate measures to establish procedures for the verification of the accuracy and repeatability of ‘mechanical seed counter’ devices and/or to develop seed count procedures that are practical and reliable for field enforcement activities by Weights and Measures officials.” These steps are unnecessary and would be duplicative of the validation efforts already conducted by AOSA when the seed count rule was initially promulgated. Indeed, it is our understanding that the Conference originally rejected proposals to address this issue more than a decade ago due to the absence of the validating research that was subsequently undertaken by AOSA.

AOSA’s method verifies seed count with a mechanical seed counter. This method is widely used to verify seed count and was validated by the seed regulatory community. The rule is practical, straight forward, reliable, replicable, and cost effective. AOSA plans to submit to the Conference a white paper regarding the validation of its method. It is important to recognize that the procedure does not require any specialized knowledge or expertise to apply. Although its wording may sound technical, implementation is not. For example, the “purity analysis” in the rule simply requires separation of seeds from any debris such as sticks, rocks, and bugs that may be in the sample.

Although there may be concerns about the cost of mechanical seed counters, this does not justify rescission of the rule. There is no mandate to buy such equipment and, for states that do not expect to conduct inspections of seed count (i.e., non-agricultural states), it would not be worthwhile to do so. For states that do expect to do such inspections, purchase of seed counters will be a resource allocation issue that must be determined on a jurisdiction-by-jurisdiction basis. It is important to note, however, that most seed regulators and state seed laboratories already have mechanical seed counters that could be shared with their weights and measures colleagues. Furthermore, the Conference voted to adopt the seed count rule after discussing and debating cost concerns.

If the Conference adopts this proposal, it will rescind an efficient, practical, and effective means that weights and measures regulators have to verify seed count. Because the rule currently in place is validated and effective, efforts from a working group would be unnecessarily duplicative of AOSA’s previous work.

November 30, 2010
Seed Count Rule for Agricultural Seeds
Page 3



Implementation Assistance

Many of the concerns in the rescission proposal are appropriately addressed through training programs, as all new procedures inherently require training to ensure effective implementation. AOSA has offered to work with the Conference or interested states to disseminate training materials and also would welcome the opportunity to hold training webinars for interested states or regulators. Although no specialized knowledge is required to implement the seed count rule, such training programs will ensure that regulators have first hand knowledge of how the procedure works. Training, not amendments to Handbook 133, provide the traditional and appropriate vehicle for addressing implementation concerns.

In conclusion, ASTA opposes the petition to rescind the seed count rule because it would be a step backwards for the Conference. Keeping the rule in place is in the best interest of weights and measures regulators, seed regulators, farmers, and seed manufacturers.

If we may be of assistance or you have any questions, please do not hesitate to contact us. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink that reads "A. W. LaVigne". The signature is written in a cursive, flowing style.

Andrew W. LaVigne
President & CEO
American Seed Trade Association

cc: Lisa Warfield, NIST
Don Onwiler, NCWM

AOSA Rules for Testing

- (1) Coated or encrusted seed: seed that has been covered by a layer(s) of materials that obscure the original shape and size of the seed resulting in a substantial weight increase. The addition of biologicals, pesticides, identifying colorants or dyes, and/or other active ingredients including polymers can be included in this process. Refer to sections 3.8 and 6.8 I.
- (2) Film-coated seed: film-coated seed retains the shape and the general size of the raw seed with a minimal weight gain. The film coating may contain polymers, pesticides, biologicals, identifying colorants or dyes, and other additives. The coating should result in a more or less continuous covering that eliminates or minimizes product dust-off.
- (3) Inoculated seed: seed that has received a coating of a commercial preparation containing a microbial product, e.g. *Rhizobium* sp.
- (4) Pelleted seed: seed that has been covered by a layer(s) of materials that obscure the original shape and size of the seed resulting in a substantial weight increase and improved plantability or singulation. The addition of biologicals, pesticides, identifying colorants or dyes, and/or other active ingredients including polymers can be included in this process. Refer to sections 3.8 and 6.81.
- (5) Raw seed: seed that is free of any applied materials.
- (6) Treated seed: seed with a minimal covering of various materials whose primary objective is to reduce or control certain disease organisms, insects or other pests attacking the seed or seedlings growing therefrom and that contains identifying colorants or dyes.

22 Obtaining the working sample

The working sample on which the actual analysis is performed shall be taken from the submitted sample in such a manner that it will be representative. A suitable type of mechanical divider (conical, centrifugal, riffle, etc.) should be used. To avoid damage when dividing large-seeded crop kinds such as beans, peas, etc., prevent the seeds from falling great distances onto hard surfaces. When dividing coated, encrusted, and pelleted seeds, mechanical dividers may be used only if the distance of the fall does not damage the applied materials.

For seed moisture determination, sub-samples must be drawn quickly to avoid exposing the seeds to the ambient air. Mechanical dividers are not appropriate for this purpose. Refer to section 2.2 b (3).

- a. Mechanical dividers. — This method is suitable for most kinds of seeds. The apparatus divides a sample into two approximately equal parts. The submitted sample is mixed by passing it through the divider, recombining the two parts and passing the whole sample through a second time and similarly a third time. After

mixing, the sample shall be reduced by passing the seed through the divider repeatedly, removing half the sample on each occasion. This process of successive halving is continued until a working sample of approximately, but not less than the minimum weight(s) stated in Table 2A is obtained.

Use of compressed air or a vacuum is highly recommended for cleaning mechanical dividers.

- (1) Centrifugal divider (Garnet type): This divider is suitable for all kinds of seed though it is not recommended for oilseeds (such as rapeseed, canola, mustards, flax) and kinds susceptible to damage (such as peas, soybeans, etc) and the extremely chaffy types.

The divider makes use of centrifugal force to mix and scatter seeds over the dividing surface. The seed flows downward through a hopper onto a shallow rubber cup or spinner. Upon rotation of the spinner by an electric motor the seeds are thrown out by centrifugal force and fall downward. The circle or area where the seeds fall is equally divided into two parts by a stationary baffle so that approximately half the seeds fall in one spout and half in the other spout. The centrifugal divider tends to give variable results when not carefully operated, and therefore the following procedure must be used:

- (a) Preparation of the apparatus:

- (i) Level the divider using the adjustable feet.
- (ii) Check the divider and four containers for cleanliness. Note that seeds can be trapped under the spinner and become a source of contamination.

- (b) Sample mixing:

- (i) Place a container under each spout.
- (ii) Feed the whole sample into the hopper; when filling the hopper, the seed must always be poured centrally.
- (iii) After the sample has been poured into the hopper, the spinner is operated and the seed passes into the two containers. Turn off spinner.
- (iv) Full containers are replaced by empty containers. The contents of the two full containers are fed centrally into the hopper together, the seed being allowed to blend as it flows in. The spinner is operated.
- (v) The sample mixing procedure is repeated at least once more.

- (c) Sample reduction:

- (i) Full containers are replaced by empty containers. The contents of one full container are set aside and the contents of the other container are fed into the hopper. The spinner is operated.
- (ii) The successive halving process is continued until the working sample(s) of not less than the minimum weight(s) required stated in Table 2A are obtained.

(iii) Ensure that the divider and containers are clean after each mixing operation.

(2) Soil/Riffle divider: This divider is suitable for most kinds of seed. For round-seeded kinds such as *Brassica* species, the collection containers should be covered to prevent the seeds from bouncing out.

This divider consists of a hopper with attached channels or ducts, a frame to hold the hopper, four collection containers and a pouring pan. Ducts or channels lead from the hopper to the collection containers, alternate ones leading to opposite sides. Riffle dividers are available in different sizes for different sizes of seed. The width and number of channels and spaces are important. The minimum width of the channels must be at least two times the largest diameter of the seed or any possible contaminants being mixed.

This apparatus, similar to the centrifugal divider, divides the sample into approximately equal parts.

(a) Preparation of the apparatus:

- (i) Place the riffle divider on a firm, level clean surface. Ensure the divider is level.
- (ii) Ensure that the divider and the four sample collection containers are clean. Check all channels, joints and seams of the divider and collection containers to ensure there are no seeds or other plant matter present before each use.
- (iii) Two clean empty collection containers shall be placed under the channels to receive the mixed seed.

(b) Sample mixing:

- (i) Pour the whole sample into the divider by running the seed backwards and forwards along the edge of the divider so that all the channels and spaces of the divider receive an equal amount of seed.
- (ii) The two full containers shall be replaced with two clean empty containers.
- (iii) The contents of one full container shall be poured into the divider by holding the long edge of the pan against the long edge of the riffle hopper and then rotating the bottom up so that the seeds pour across all channels at the same time, followed by the other full container using the same procedure.
- (iv) This process of mixing the entire submitted sample shall be repeated at least one more time before successive halving begins.

(c) Sample reduction:

- (i) The contents of one full container are set aside. Empty containers are placed under each channel, and the contents of the other container is poured into the hopper by holding the long edge of the pan against the

- (a) Preparation of the apparatus: Ensure that two trays, spatula and spoon are clean.
 - (b) Sample mixing:
 - (i) The sample is poured uniformly over a tray with a side to side swinging motion.
 - (ii) The receiving pan should be kept level.
 - (iii) This mixing procedure is repeated a minimum of three times.
 - (c) Sample reduction:
 - (i) A tray, a spatula and a spoon with a straight edge are required. After the preliminary mixing, pour the seed evenly over the tray with a side-to-side swing, alternately in one direction and at right angles to it. The depth of the seed in the pan shall not exceed the height of the vertical sides of the spoon. Do not shake the tray thereafter.
 - (ii) With the spoon in one hand, the spatula in the other, and using both, remove small portions of seed from not less than five random places on the tray.
 - (iii) Sufficient portions of seed are taken until the working sample(s) of not less than the minimum weight(s) required stated in Table 2A are obtained.
- (2) Hand-halving method: This method can be used when a proper mechanical divider is not available.
- Procedure:
- (a) Seed is poured evenly onto a clean smooth surface.
 - (b) The sample shall be thoroughly mixed using a flat-edged spatula and placed into a pile.
 - (c) The pile shall be divided in half using a straight edge or ruler.
 - (d) Each half portion is divided in half.
 - (e) Each of the portions is divided into half again. There are now eight portions.
 - (f) Arrange the eight portions into two rows of four.
 - (g) Alternate portions should be combined to obtain two halves e.g. combine the first portion from row I with the second portion from row 2. Remove the remaining four portions.
 - (h) Repeat steps (a) to (g) until sufficient portions of seed are taken to constitute a working sample(s) of not less than the minimum weight(s) required stated in Table 2A are obtained.
- (3) For seed moisture determination, mix the submitted sample by tumbling or shaking the submitted sample bag, then open bag and use a spoon to remove portions from several random locations within the bag to obtain the appropriate working weight for one replicate. Place seeds in a moisture testing container. Repeat the procedure of mixing and sampling for the second replicate. Do not expose the sample to ambient air for more than one minute.

SECTION 12: MECHANICAL SEED COUNT

The following method shall be employed when using a mechanical seed counter to determine the number of seeds contained in a sample of soybean (*Glycine max*), corn (*Zea mays*), wheat (*Triticum aestivum*) and field bean (*Phaseolus vulgaris*).

12.1 Samples.

Samples for testing shall be of at least 500 grams for soybean, corn and field beans and 100 grams for wheat and received in moisture proof containers. Samples shall be retained in moisture proof containers until the weight of the sample prepared for purity analysis is recorded.

12.2 Seed counter calibration.

The seed counter shall be calibrated daily prior to use.

- (a) Prepare a calibration sample by counting 10 sets of 100 seeds. Visually examine each set to insure that it contains whole seeds. Combine the 10 sets of seeds to make a 1,000 seed calibration sample. The seeds of the calibration sample should be approximately the same size and shape as the seeds in a sample being tested. If the seeds in a sample being tested are noticeably different in size or shape from those in the calibration sample, prepare another calibration sample with seeds of the appropriate size and shape. Periodically re-examine the calibration samples to insure that no seeds have been lost or added.
- (b) Carefully pour the 1,000 seed calibration sample into the seed counter. Start the counter and run it until all the seeds have been counted. The seeds should not touch as they run through the counter. Record the number of seeds as displayed on the counter read out. The seed count should not vary more than ± 2 seeds from 1,000. If the count is not within this tolerance, clean the mirrors, adjust the feed rate and/or reading sensitivity. Rerun the calibration sample until it is within the ± 2 seed tolerance. If the seed counter continues to fail the calibration procedure and the calibration sample has been checked to ensure that it contains 1,000 seeds, do not use the counter until it has been repaired.

12.3 Sample preparation.

Immediately after opening the moisture proof container, mix and divide the submitted sample, in accordance with section 2.2, to obtain a sample for purity analysis and record the weight of this sample in grams to the appropriate number of decimal places (refer to section 2.3 a). Conduct the purity analysis to obtain pure seed for the seed count test.

RULES FOR TESTING SEEDS

12.4 Conducting the test.

After the seed counter has been calibrated, test the pure seed portion from the purity test and record the number of seeds in the sample.

12.5 Calculation of results.

Calculate the number of seeds per pound to the nearest whole number using the following formula:

$$\text{Number of seeds per pound} = \frac{453.6 \text{ g/lb} \times \text{no. of seeds counted in d.}}{\text{weight (g) of sample analyzed for purity}}$$

12.6 Tolerances for results from different laboratories.

Multiply the labeled seed count or first seed count test result by four percent for soybean samples, two percent for corn (round, flat or plateless) samples, five percent for field bean samples and three percent for wheat samples. Express the tolerance (the number of seeds) to the nearest whole number. Consider the results of two tests in tolerance if the difference, expressed as the number of seeds, is equal to or less than the tolerance.

Example:

Kind of seed: Corn
Label claim (1st test): 2275 seed/lb.

Lab Test (2nd test): Purity working weight = 500.3 g
Seed count of pure seed = 2479 seeds

$$\text{Number of seeds per pound} = \frac{453.6 \text{ glib} \times 2479 \text{ seeds}}{500.3 \text{ g}} = 2247.6 \text{ seeds/lb}$$

Rounded to the nearest whole number = 2248 seeds/lb

Calculate tolerance value for corn:

multiply label claim by 2%
 $2275 \text{ seeds/lb} \times 0.02 = 45.5 \text{ seeds/lb}$;
rounded to the nearest whole number = 46 seeds/lb

Determine the difference between label claim and lab test:


$$2275 \text{ seeds/lb} - 2248 \text{ seeds/lb} = 27 \text{ seeds/lb}$$

The difference between the lab test (2nd test) and the label claim (1st test) is less than the tolerance (27 < 46); therefore, the two results are in tolerance.

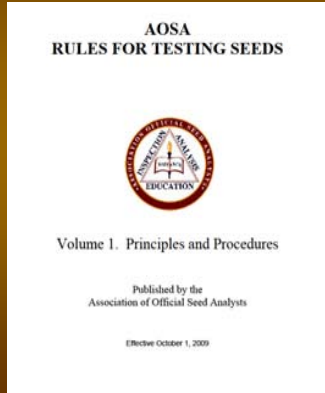
NIST HANDBOOK 133 New Procedure for Testing Seed Count

**A Call for Repeal of
 Action Taken at 95th Annual Meeting of
 National Conference on Weights & Measures
 Re:
 Testing Procedures for Seed Count**

Presented By
 Kurt Floren
 Director of Weights & Measures
 County of Los Angeles, California



Association of Official Seed Analysts "Rules for Testing Seeds"



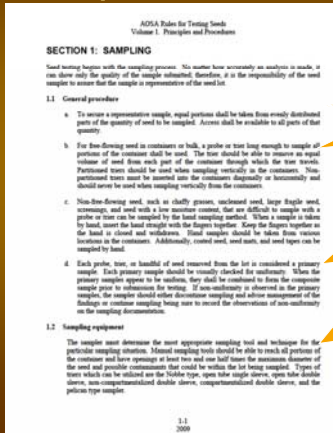
AOSA: Official nationwide association of seed analysts, formed in 1908 in response to actions by individual states to develop seed laws.

Members include state, federal & university seed labs of U.S. and Canada.

Primary Functions:

- Establish AOSA Rules for Testing Seeds, adopted by most states as seed rules
- Contribute to refinement & modification of rules and procedures for seed testing
- Ensure procedures are standardized between analysts and between labs
- Influence and assist in enforcement of appropriate seed legislation at state and federal levels

Procedure does **NOT** start with simple count of 10 groups of 100



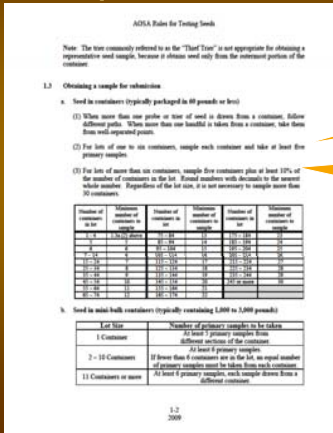
To secure a representative sample, **equal portions shall be taken from evenly distributed parts....**

...a probe or trier...shall be used... able to remove an equal volume... from each part of the container...

Each probe, trier, or handful... is considered a primary sample. Each should be visually checked for uniformity.

...determine the most appropriate tool and technique... Manual sampling tools should be able to reach all portions of the container and have openings at least 2½ times the maximum diameter of... seed and possible contaminants...

Procedure does **NOT** start with simple count of 10 groups of 100



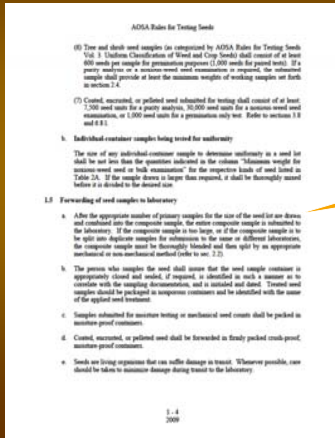
For lots of one to six containers, sample each... ..take at least five primary samples

For lots of more than six containers, Sample five...plus at least 10% of the number of containers in the lot. (up to 30 primary samples)

Samples are drawn to form composite sample.

All of this is required for Purity Analysis

Procedure Requires Lab Analysis



After...appropriate number of primary samples...are drawn and combined into the composite sample, the entire sample is submitted to the laboratory

As you will see, the procedure adopted into Hdbk 133 requires Purity Analysis testing by a seed analysis laboratory

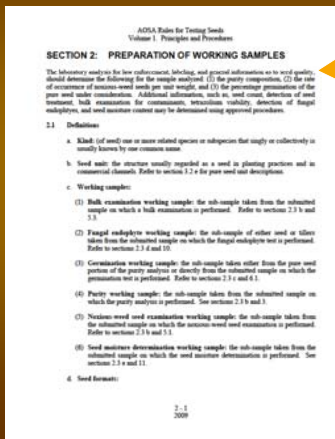
Why be concerned with portions not adopted into Hdbk 133?



This entire handbook shall be considered part of the Rules and its use is required for determination of classification of the kind of seed under consideration and classification of weed and crop seed contaminants for purity testing

Purity Testing is a requisite part of procedure adopted by NCWM

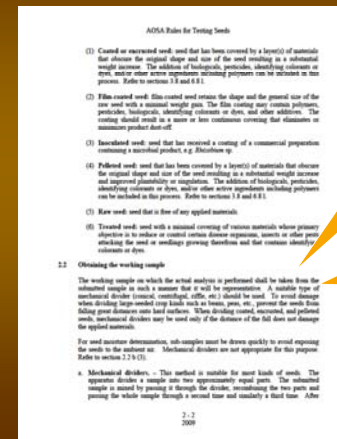
Seed Count Testing Procedure References AOSA "Rules" § 2.2



The laboratory analysis for law enforcement, labeling... should determine the following: (1) the purity composition (2) the rate of...noxious-weed seeds (3) the percentage germination...

By making reference to Section 2.2 (in Section 12 adopted by NCWM), all of Section 2 must be followed to ensure that seed count verification testing is defensible under legal challenge (i.e., defense in prosecution)

Seed Count Testing Procedure References AOSA "Rules" § 2.2



The working sample... shall be taken from the submitted sample

"Submitted sample" means that submitted to the seed laboratory (recall Section 1.5)

A suitable type of mechanical divider (conical, centrifugal, riffle, etc.) should be used

Mechanical dividers are costly, sensitive pieces of equipment that Weights & Measures agencies do not possess

Examples of Mechanical Dividers



Preliminary research
re: cost of
Centrifugal Divider:
\$2400 - \$3000

Centrifugal divider photos from
AOSA presentation to IPSA

Dividing seed with mechanical divider



Dividing seed with mechanical divider



← Riffle Divider: ~ \$400 - \$700

Boerner Divider: ~ \$1500 - \$1600 ▶



Pure Seed Sample: Required for Count Testing

Volume 1. Principles and Procedures

Particle analysis	Percent by weight
Common weeds	0.1-1.0
Other crop seeds	1.0-5.0
Plant matter	0.5-2.0
Weed seed	0.0-0.5

(3) 1000 seed separation of True seed

Particle analysis	Percent by weight
True seed (True crop)	97.0-99.0
Other crop seeds (False admixture rejected)	0.0-1.0
Weed seed	0.0-0.5

Kind	Weight of sample	Percent of sample
All common seeds (True admixture rejected)	40.00 ± 0.010	40.00
All common seeds (True admixture rejected)	20.00 ± 0.010	40.00
2 people seeds (True admixture rejected)	0.50 ± 0.010	0.50
	100.00	100.00

The percentage of common and other seeds on label represents in pure seed component of a sample. The percentage of other seeds from the pure seed and people seeds from the 1000 seed separation are added together and included under other crop.

For 400, 800, or 1000 seed separation techniques refer to section 13, Table 13E.

For determining the rate of acceptance of any admixture seed species that are similar in appearance to the kind or cultivar under consideration, refer to section 3.1.

3.2 Kind or cultivar considered pure seed. The pure seed shall include all seed units of each kind or cultivar and cultivar under consideration present in more than five percent of the whole. Kinds or cultivars and cultivars present to the extent of five percent or less of the whole may be considered pure seed if shown on a label as component of a mixture in amount of five percent or less.

3-3
2009

The **pure seed** shall include all seed units of each kind or each kind and cultivar under consideration...

Identification / determination of a PURE SEED sample is critical to the procedure and to demonstration of compliance with the Hdbk 133 procedure...

Are W&M field officials trained, qualified, certified?

Purity Analysis: Only The Basics

AOSA Rules for Testing Seeds
Volume 1. Principles and Procedures

SECTION 3: THE PURITY ANALYSIS

3.1 The purity analysis.

The objective of a purity analysis is to determine the physical composition of the working sample. The analysis shall include the identification of the kind, or kind and cultivar of seed under consideration, and all contaminating species and inert matter.

a. The purity working sample shall be separated into the following components: (1) kind or cultivar to be considered pure seed, (2) other crop seed, (3) inert matter, and (4) weed seed. The component shall be weighed or given to the same number of decimal places as the working sample, except as provided for in section 3.1 b (3) when it is not necessary to weigh the pure seed component.

Additional requirements of the components may include visual examination, magnification, use of transmitted light (light microscope), specific gravity (seed floater), or x-ray. Specific instructions for classification are in pure seed, other crop seed, inert matter, and weed seed sections in sections 3.2 through 3.7. For common, restricted, or selected seeds refer to section 3.8. Insects or other pests, and vegetative growth, classification as to weed or other crop seed shall be as specified in section 4. Specific instructions for reporting purity analysis results are given in section 14.

b. Calculation of component percentages.

(1) The percentage of each of the four components shall be determined to two decimal places.

(2) Minimum purity working sample less than 20 grams: Percentages shall be based on the sum of the weights of the components and not on the original weight of the pure seed. The sum of the weights of the components shall be weighed; its percentage may be determined by subtracting the sum of the percentages of the other three components from 100.

(3) Minimum purity working sample of 20 grams or more: The other crop seed, inert matter, and weed seed shall be weighed and their percentages calculated on the basis of the original weight. The pure seed and its percentage may be determined by subtracting the sum of the percentages of the other three components from 100.

(4) When rounding off the calculated percentages of each component to the second decimal place, round down of the third decimal place to 4 or less and round up if the third decimal place is 5 or more, except that if any component is determined to be present in any amount calculated to be less than 0.01 percent, then that component shall be reported as 0.01 percent. If any component is not found in the purity analysis, then that component shall be reported as 0.00 percent.

3-1
2009

...purity analysis...
determine the physical composition of the working sample.
The analysis shall include the identification of the kind... of seed under consideration, and all contaminating species and inert matter

The purity working sample shall be separated into the following components:
(1) kind or cultivar to be considered pure seed
(2) other crop seed
(3) inert matter, and
(4) weed seed

Requires seed identification expertise not possessed by most W&M officials

Can't we just count 1,000 seeds?

RECALL:

AOSA Rules for Testing Seeds
Volume 1. Principles and Procedures

SECTION 4: UNIFORM CLASSIFICATION OF WEED AND CROP SEEDS

For classification of weed and crop seeds, refer to AOSA Rules for Testing Seeds, Volume 1, Uniform Classification of Weed and Crop Seeds, AOSA 2009, and subsequent updates. This entire handbook shall be considered part of the Rules and its use is required for determination of classification of the kind of seed under consideration and classification of weed and crop seed contaminants for purity testing.

4.1 Classification of all contaminating species shall be based on the species classification accepted in the kind or cultivar under consideration. To determine the appropriate classification of a contaminating species:

a. Under the name of each kind or cultivar under consideration determine the species classification, see volume 1 crop seeds, AOSA 2009, in the classification section of Volume 1. Species classification will be assigned to one or more of the following categories: appropriate (A), Brown (B), Inert or open (O), restriction and regulated (R), Herb and tree (H), Not (N), or vegetable (V).

b. Under the name of the contaminating species that the classification (either seed or crop) in the corresponding volume of contaminating classification based on the species classification under A, B, H, N, T, or V is the kind under consideration. See page 9 of Volume 1 for an example.

c. For exceptions to the classification system see items 2, 3 and 5, on page 9, of Volume 1.

4. For procedures on the classification of contaminating species found in the purity analysis of a single kind with multiple species classifications or in mixtures of kinds with different species classifications, see page 9, item 4, of Volume 1.

4-1
2009

This **entire handbook** shall be considered part of the Rules and its use is required for determination of classification of the kind of seed under consideration and classification of weed and crop seed contaminants for purity testing

The procedure adopted by NCWM specifically requires calibration of mechanical seed counter using seed from a Pure Seed sample.....

Section 12.4: "After the seed counter has been calibrated, test the pure seed portion from the purity test..."

Section 12 of “Rules for Testing Seeds” Directly Adopted in NCWM Action



The following method **shall be employed** when using a **mechanical seed counter**...

Samples shall be retained in moisture proof containers until the weight of the sample prepared for **purity analysis** is recorded.

...after opening the moisture proof container, **mix and divide** the **submitted sample**, in accordance with **section 2.2**, to obtain a sample for **purity analysis**

Conduct the purity analysis to obtain pure seed for the seed count test

Can there be any question that we are bound by the entire AOSA procedure?

Examples of “Pure Seed” Criteria

For Field Bean and Soybean:

- Seed with at least a portion of the seed coat attached
- Broken seed larger than one-half the original size with at least a portion of the seed coat attached
- For Fabaceae (*includes Field Bean & Soybean*): Cotyledons that are broken apart but held together by the seed coat shall be classified as pure seed. Cotyledons that have separated and are not held together by the seed coat are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the seed coat may be attached.
- Wing, when present, is removed and considered inert matter.
- Chalcid-damaged seeds in Fabaceae that are puffy, soft, or dry and crumbly are considered inert matter.

Weights & Measures officials should have no trouble....
Right?

Examples of “Pure Seed” Criteria

For Corn:

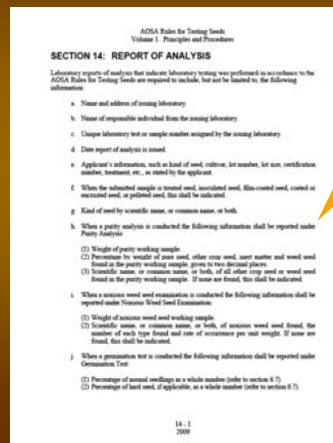
- Multiple floret, with or without awn, provided a caryopsis with some degree of endosperm development can be detected (either by slight pressure or by examination over light).
- Caryopsis or piece of broken caryopsis larger than one-half of the original size

Special Consideration:

- * A fertile floret attached to another fertile floret shall be separated
- * Attached glumes and empty florets shall be removed and classified as inert matter.

Again, the average W&M official can do this....
Right?

Purity Analysis: Seed Identification



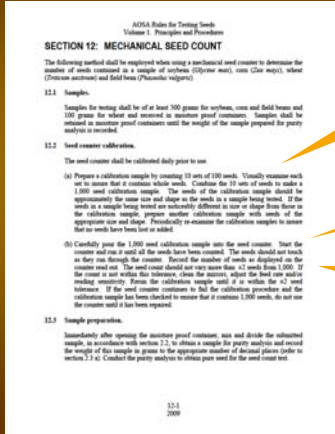
When a purity analysis is conducted, the following shall be reported under **Purity Analysis**:

- Weight of purity working sample
- Percentage..of pure seed, other crop seed, inert matter, and weed seed...
- Scientific name, or common name, or both, of all other crop seed or weed seed found...

Seed Analysts typically work 4-5 years in a seed laboratory to gain expertise to independently conduct seed analyses...

What percentage of Weights & Measures officials are qualified?
ANY?

Other Concerns: Repeatability?



Prepare a calibration sample by counting 10 sets of 100 seeds. Combine...to make a 1,000 seed calibration sample.

...pour...into the seed counter. ...run it until all seeds...counted. The seed count should not vary more than ± 2 seeds from 1,000.

If...not within this tolerance, clean...mirrors, adjust...feed rate and/or reading sensitivity. Rerun it until it is within the ± 2 seed count tolerance.

Calibration procedure mandates no steps to verify repeatability. Out-Of-Tolerance runs could be unlimited. Results may result in enforcement action: Defensible?

Mechanical Seed Counter

(Photo from AOSA presentation to IPISA)



Seen one? Own one?

Not subject to transportation on front seat of a pickup truck!

Preliminary Cost Estimate: \$8,000

Example of 100-Seed Sampling

(from AOSA presentation to IPISA)



Preparing calibration sample

Does this look like a field activity?

Other Concerns: Equipment Access? Portability?



Loading and running calibration sample. (Photos from AOSA presentation to IPISA)

Use of mechanical seed counter is clearly not a field operation. Equipment and analysis procedures are laboratory activities.



Call for Repeal of NCWM Adoption

Acknowledge:

1st: **We do need an accurate, reliable, consistent procedure for testing seed count.**

- Seed count is an important factor in farming to manage input costs & to meet needs of modern planting equipment
- Packers/Manufacturers are increasingly placing supplemental count statements on seed packages due to customer demand
- A procedure is needed by W&M to regulate labeled count accuracy

2nd: **AOSA standards are well developed and are in wide use by seed labs.**

BUT: Procedure was prematurely adopted by NCWM.
- Procedure provides little assurance of counter accuracy.
- We have adopted a **test procedure that few, if any, can actually perform!**

Call for Repeal of NCWM Adoption

NOT suggesting that procedure is not needed....

But,

New NIST Hdbk 133 sections 4.2 and 4.11

- Require expertise not held by W&M inspectors
- Require equipment not suitable for field use
- Require equipment that is cost restrictive
- Require steps that, if not precisely followed, subject W&M agencies to legal challenges and, potentially, litigation exposure for taking off-sale action.

Recommendation

WWMA should call on NCWM to:

Recognize that:

- State & local W&M agencies do not have required equipment
- State & local W&M agencies do not have required seed analysis expertise (licensing/certification)
- State & local W&M agencies are highly unlikely to have time (years for certification as seed analysts) or resources (\$\$) to meet requirements
- Adopted procedures do not facilitate field tests of seed count
- Adopted procedures will not result in enhanced enforcement due to all of above.

Recommendation

WWMA should call on NCWM to:

Take the following actions:

- Rescind action taken to adopt amendments to Hdbk 133 Section 4.2 and to add Section 4.11 et seq
- Direct NCWM Laws & Regulations (L&R) Committee to establish a working group to conduct appropriate studies, field trials, laboratory testing, and other measures to establish procedures for verification of repeatability of Mechanical Seed Counter devices (at a minimum)
- Direct NCWM L&R Committee to establish a working group to research, develop, and recommend alternative seed count testing procedures that are practical and reliable for field applications (preferred)