Appendix G

American Seed Trade Association (ASTA)

Seed Count Rule for Agriculture Seeds

(Letter dated September 11, 2009)

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AMERICAN SEED TRADE ASSOCIATION

September 11, 2009

Don Onwiler
Executive Director
c/o Laws & Regulations Committee
National Conference on Weights and Measures
1135 M Street, Suite 110
Lincoln, NE 68508

Jonelle Brent
Chair, Central Weights & Measures Association
Illinois Department of Agriculture
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Re: Seed Count Rule for Agricultural Seeds

Dear Mr. Onwiler and Ms. Brent:

The American Seed Trade Association ("ASTA") submits this proposal to request that the National Conference on Weights and Measures ("NCWM") amend Handbook 133 by adopting the mechanical seed count procedures for agricultural seed promulgated by the Association of Official Seed Analysts ("AOSA") in its *Rules for Testing Seeds*. ASTA is the national trade association representing about 750 companies involved in seed production and distribution, plant breeding, and related industries in North America on matters involving the purchase and sale of seed. ASTA advocates science and policy issues of industry importance and is informed by the seed industry's experience and expertise. Our mission is to enhance the development and free movement of quality seed worldwide. ASTA's members are directly affected by the method used for determining the accuracy of seed count declarations on seed labels and appreciate the opportunity to work with NCWM on this important issue.

As widely adopted planting technologies have modernized agriculture in recent years, farmers increasingly prefer to purchase bulk seed by count (versus weight). Because of changes in industry practice, field inspectors commonly are conducting compliance checks by verifying count rather than net weight. The current Handbook 133 standard for packages labeled by count is not practicable to apply to verify statements of count for corn seed, soybean seed, field bean seed, and wheat seed. While the Handbook 133 standard for packages labeled by count functions well for products that are manufactured to precise size and weight specifications, seed that is sold for planting is still produced in seed production fields resulting in inevitable size and

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weight variations between seeds or kernels. Against this backdrop, the seed industry and AOSA, along with state and federal seed regulators and academics at leading agricultural universities, have developed a uniform and practical method for determining seed count that is widely accepted and used. 1/ NCWM's adoption of the AOSA consensus standard for seed count would ensure that a fair, uniform system for seed count is applied in a manner that ensures an accurate statement of count to the benefit of purchasers and sellers alike.

I. Background on Issue

The American seed industry has had a long and rich history of producing quality products that meet rigorous seed standards, including purity. Members of the seed industry aim to deliver high quality seed products that meet or exceed federal and state standards, as well as customer expectations, and to label seed accordingly. To that end, the AOSA *Rules for Testing Seeds* provide a practical approach for sampling and verifying seed count. In recent months, it has come to our attention through conversations with the Iowa Department of Agriculture that the two different standards regarding seed count labeling, one in Handbook 133 and the other in AOSA's *Rules for Testing Seeds*, are causing confusion. The broad consensus that had developed in the seed industry and among state seed control officials and academics on seed count labeling is threatened unless regulatory clarity is provided through adoption of a uniform method for verifying seed count in Handbook 133.

The manner in which seed is purchased and sold has significantly changed in recent years. Planting equipment has become more sophisticated and precise and producers have become more focused on plant populations on a per acre/per hectare basis. Instead of being sold by weight measurements, seed is increasingly sold and labeled by count. Further, in most instances, even when sold by weight, the seed count per pound is provided on the package. Such information is critically important to modern farming techniques and highly desired by industry's farmer customers. The underlying impetus for the proposal is demand-driven. That is, the seed industry has moved to sale by count in response to the purchasing preferences of its farmer customers.

Selling and labeling by count (rather than by weight or volume) reflects the nature of the product and customary channels of trade that have emerged for seed in recent years. However, because seed is the product of a natural process and is not uniform in size and weight, traditional methods for determining count have proven impractical when applied to seed. Seed is a living biological product. Differing weather conditions, storage conditions, and genetics result in a disparity in

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1/ AOSA is an organization of official state, federal, and university seed laboratories and regulators from the U.S. and Canada whose mission is to promote uniform laws, regulations, and laboratory test methods. The organization publishes *Rules for Testing Seeds* to promote uniformity among testing labs in seed qualities and characteristics.

The *Rules for Testing Seeds* were developed to aid the agriculture industry in avoiding some of the hazards of crop production by furnishing needed information about seeds that are to be used for planting purposes. The *Rules for Testing Seeds* set definitions and fundamental procedures that are based on a thorough knowledge of the principles involved with seeds and attempt to summarize and make useful the accumulated experience of seed analysts.

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the size and weight of seeds grown not only in the same production field, but also on the same plant or even on the same pod (in the case of soybeans). Environmental factors that cause seed size variability include the growing season length, heat unit accumulation, rainfall, soil type, fertility, and individual variety response to stress conditions. The impacts of these factors are particularly pronounced for corn and soybeans. For example, corn kernels can range from round to flat and can have different sizes and shapes depending on their location on an ear of corn. Additional handling to increase uniformity, such as sizing or sieving, cannot be undertaken because it may significantly damage the seed and render it unsuitable for sale.

The challenges for weights and measures officials conducting accurate, uniform regulatory compliance checks have been managed historically by Handbook 133's methods relating to packages sold by weight. The now widespread use of count promoted the development and acceptance of the AOSA method. At the request of farmers, the seed industry is increasingly providing seed count information on the package and is selling seed by count rather than by weight or volume to provide farmers with the information they desire and to maximize the value they obtain in each bag of seed. Because planting equipment has become more precise, farmers are able to better control the plant populations in their fields. Additionally, as there is increased seed value (due to traits, genetics, and treatment), farmers prefer not to retain any surplus seed. Selling by seed count also allows farmers to make purchasing decisions solely on the basis of agronomic considerations, rather than discriminating against some varieties of seed because of large seed size, which was the case when seed was sold by weight. Therefore, the seed industry has sought to deliver and market products that reflect this purchase preference of the growers. Knowing the number of seeds needed for the specific planting rates of their fields, farmers are better able to determine the cost of planting associated with seeding their fields. Because seed count is an important service provided to customers to assist with planting accuracy, seed companies have a strong interest in accuracy of their seed count and have worked together with regulators to develop reliable methods for determining seed count. The proposal directly advances the important role that Handbook 133 plays in ensuring accuracy and fair-dealing in the sale of agricultural seed.

II. Regulatory History

Interest in selling and labeling seed by seed count arose in the mid-1990s. In response, a number of AOSA and Society of Commercial Seed Technologists ("SCST") laboratories began offering seed count services. The addition of seed counts to the seed bag and label required the development of a standardized sampling and testing procedure that allowed for an appropriate level of variation that is scientifically validated and verifiable.

In 1995, AOSA established a committee to research and establish procedures for conducting seed counts. This committee was chaired by Dr. Richard Payne, Chief of the USDA-AMS Seed Regulatory and Testing Branch. The committee recognized that Handbook 133 stipulates a maximum allowable variation ("MAV") in packages labeled by count of 1.5% for packages containing over 1,334 items, which applies to almost all types of products and is not a seed

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specific standard. 2/ The industry's experience indicated that the standard in Handbook 133 was unattainable, and very difficult to apply, when applied to seed labeled by count. Because seed is a living biological product sold in very high quantities, it differs from the uniformly produced commodities to which the "packages labeled by count" provisions of Handbook 133 are typically applied.

The AOSA committee conducted "referee tests" in 1996 and 1997. 3/ In 1998, the AOSA Board of Directors approved a tentative rule for seed counts to be included in the AOSA *Rules for Testing Seeds*. Additional referee projects were conducted in 1998 and 1999, after analysts had an opportunity to become familiar with the procedure and to suggest modifications. The final proposal was approved in 2000. This standard is widely used and accepted now by many state regulatory seed officials, as well as by industry.

During this time period, NCWM's Laws and Regulations Committee worked with members of the seed industry, trade associations, and other interested parties to develop a proposal for NCWM consideration regarding agricultural seed count. 4/ Around 1998, two differing standards were proposed for determining seed count. One standard was based on studies undertaken by ASTA and Iowa State University and the other was based on AOSA's studies. 5/ Due to the disparity in the recommended allowable variations from labeled count determined by the two studies, and despite efforts to develop a joint proposal, the NCWM committee voted in 2000 to withdraw consideration of amending Handbook 133 seed count procedures. 6/ The Committee stated that "variations on seed count make it impossible to determine and establish an appropriate MAV. The Committee believes that it will be some time before such standards can be determined and considered." 7/ Since this time, AOSA's rule has been adopted as the uniform standard for the seed industry and seed control community. Indeed, collective experts in this field have come together to establish and validate the AOSA rule for seed count. A validated, consensus method provides NCWM with the opportunity to revisit this issue and to adopt the proposal that would align Handbook 133 with the AOSA method.

III. Current Seed Count Standards

Currently, both Handbook 133 and AOSA's *Rules for Testing Seeds* have rules governing labeled weight and/or count on agricultural seed packages. Handbook 133 sets a general

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2/ *See* Handbook 133, Table 2-7, Maximum Allowable Variations for Packages Labeled by Count; § 4.4, Packages Labeled by Count of More than 50 Items.

3/ A referee test is a specially designed test which is sent out to a number of seed laboratories in order to obtain information intended to improve seed testing and to provide valuable feedback to the participating laboratories. Referee tests promote precision, standardization, and uniformity among seed laboratories with regard to seed testing methods. They also allow for testing of new methods, which may prove to produce more uniform results than existing methods.

4/ NIST, Special Publication No. 932, 83rd NCWM, L&R 18 (1998).

5/ *Id.*

6/ NIST, Special Publication No. 957, 85th NCWM, L&R 13 (2000).

7/ *Id.*

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standard of maximum allowable variation at 1.5% of labeled count for products containing over 1,334 units, rounded to the nearest whole number. 8/ The AOSA's *Rules for Testing Seeds* set the "tolerance" specifically for labeled seed count at 2.0% for corn seed, 4.0% for soybean seed, 5.0% for field bean seed, and 3.0% for wheat seed based on a properly calibrated mechanical seed counter and a properly obtained representative sample. 9/ The "allowances" specifically account for biological variables that are not only unique to agricultural seed, but that also vary by seed type, as noted above.

The standards in Handbook 133 were not developed specifically for agricultural seeds labeled by count. Handbook 133 applies the same standard for products labeled by count to seed as to items where size and weight are precisely controlled in the manufacturing process. Because seed is a living biological product with variable sizes and weights for individual seeds in a single package, it differs from manufactured commodities that only have slight variation in size and weight between individual products. Environmental and storage factors can result in variations in the appearance, size, and weight of a single variety of seeds. As explained above, the need for adoption of the proposal arose only as a result of the growing prevalence of sale by count of agricultural seed.

Applying Handbook 133's standards that were developed based on uniform manufacturing production to this biological product can prove to be quite onerous in the context of modern agriculture. For example, under current test procedures, a package containing 80,000 seeds would require a manual count of 8,000 seeds by the inspector. 10/ As bags of agricultural seeds are often labeled with count declarations of over to 200,000 seeds, these requirements are impractical, if not impossible to apply in a regulatory context. Of course, neither industry nor purchasers are well-served if weights and measures officials lack a practical, effective means for conducting field package checks.

The AOSA *Rules for Testing Seeds* were thoughtfully developed to apply specifically to labeled seed count. They are used across the United States by private laboratories, official state seed testing laboratories, and state seed control officials in sampling, inspecting, analyzing, testing, and examining agricultural seeds. The AOSA *Rules for Testing Seeds* are therefore the standard most often used by state and federal regulators when enforcing the accuracy of seed count on seed labels. Many states have expressly adopted these rules into their state code. Accordingly, seed companies rely on the AOSA *Rules for Testing Seeds* as the source of the rules on the appropriate labeling of seed.

Although the AOSA *Rules for Testing Seeds* have been adopted by many states, some states are have indicated that they may be legally bound to apply the NIST Handbook 133 procedures to

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8/ Handbook 133, Table 2-7, Maximum Allowable Variations for Packages Labeled by Count. *See also* Handbook 133, § 4.4.

9/ AOSA, *Rules for Testing Seeds*, § 12. AOSA terminology differs from that used in the Weights & Measures community. That is, "tolerance" is understood to essentially specify the maximum allowable variation between labeled count and actual count contained within a package.

10/ *See* Handbook 133, § 4.4.

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agricultural seed due to a lack of clarity in their individual state regulations. 11/ While each state could certainly amend its laws to establish the AOSA *Rules for Testing Seeds* as the appropriate standard for agricultural seed labeling, it is more efficient and appropriate to amend Handbook 133 to include workable standards for agricultural seeds. This proposal is ripe for consideration and adoption because there is now uniformity in the industry and consensus among federal and state seed regulators about the appropriate approach that should be adopted. Furthermore, amending of Handbook 133 will also function to ensure the Handbook maintains its proper role as the authoritative source used by state weights and measures officials conducting net weight compliance inspections. The scope of the proposal is limited by the scientifically valid basis for the MAV values for the particular seed varieties. In the future, further amendment may be appropriate based on development of data validating values for other seed varieties.

IV. Considerations of an Accurate Seed Count

It is appropriate for NCWM to adopt the proposal, paralleling the AOSA's seed count rules, because the rules are based on comprehensive studies and will ensure accuracy. Research has 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 protocol and procedures specified in the AOSA *Rules for Testing Seeds*. The automatic seed counter also must be calibrated daily prior to use. For these reasons, detailed directions for maintaining a calibration sample and the calibration technique are included in AOSA's *Rules for Testing Seeds* and should be incorporated into Handbook 133.

Additionally, a purity analysis must be conducted on the sample so that only pure seeds will be counted. There are specific pure seed unit definitions for corn and soybeans described in the AOSA *Rules for Testing Seeds*, which would be adopted into Handbook 133 under this proposal. The rule provides a calculation for determining the number of seeds per pound based on the sample analyzed.

The final component of the AOSA's current seed count rule provides "tolerances" for comparing results between laboratories or comparing the label against a regulatory laboratory test. Because the wording of this section does not conform to the function of Handbook 133 as it was written for a different purpose (although is entirely applicable), this proposal suggests making a slight modification to this language. 12/ The variation levels were established from the research gathered during the referee projects. AOSA's rule establishes "tolerances" based on the typical variation in size and weight of different types of agricultural seed.

V. Proposed Amendment to Handbook 133

ASTA requests that Handbook 133 be amended by adding the language in Section 12 (Mechanical Seed Count) of the AOSA *Rules for Testing Seeds* as Section 4.11 of Handbook 133,

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11/ For example, Iowa's Attorney General recently determined that the state is bound to use Handbook 133's MAV standard for seed because the state Department of Agriculture lacks legal authority to use the AOSA standard.

12/ *See* Section V., below.

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to be titled "Procedure for Checking the Content of Certain Agricultural Seed Packages Labeled by Count." The language will be altered to conform the headings and section numbers.

In addition, AOSA *Rules for Testing Seeds* Section 12.6 will be changed as follows to adopt the provisions to Handbook 133's purposes (*i.e.*, packaging and labeling for sale): 13/

12.6 ~~Tolerances~~ *Maximum Allowable Variations* ~~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~~ *maximum allowable variation* (the number of seeds) to the nearest whole number. Consider the results of two tests in ~~tolerance~~ *accord with the maximum allowable variation* if the difference, expressed as the number of seeds, is equal to or less than the ~~tolerance~~ *maximum allowable variation*.

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

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

Rounded to the nearest whole number = 2248 seeds/lb

Calculate ~~tolerance~~ *maximum allowable variation* value for corn:

multiply label claim by 2%
2275 seeds/lb × 0.02 = 45.5 seeds/lb;
rounded to the nearest whole number = 46 seeds/lb

Determine the difference between label claim and lab test:

2275 seeds/lb – 2248 seeds/lb = 27 seeds/lb

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

13/ Language in italic would be added. Language crossed out would be deleted.

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In addition, Table 2-10 should be modified to add an exception to MAV for seed count. This table would be renamed to add "agricultural seed labeled by count" to the list of covered topics and a box would be added to the table explaining the specific MAVs for agricultural seeds (*i.e.*, 2.0% for corn seed, 4.0% for soybean seed, 5.0% for field bean seed, and 3.0% for wheat seed, all based on a properly calibrated mechanical seed counter). Table 1-1 would have a minor corresponding change, adopting the new name of Table 2-10.

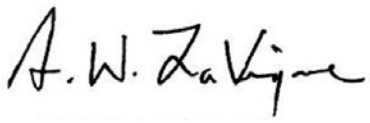
This proposal is structured so that the new MAV only applies to those seeds that fall within the scope of the new standard (*i.e.*, soybeans, corn, field beans, and wheat in packages labeled by count). Within Handbook 133, the accuracy of labeling for other seeds types and seeds labeled by weight would continue to fall under the Handbook's current provisions.

* * *

Historically, the sale of seed by weight has allowed regulatory officials to conduct accurate, uniform package checks to assess net weight compliance. Although Handbook 133 is an essential tool for checking and ensuring the accuracy of the net contents of packaged goods, Handbook 133 does not account for the unique factors that pertain to agricultural seed labeling when sold by count. In order to promote uniformity in labeling standards, ASTA requests that NWCM adopt the AOSA *Rules for Testing Seeds* provisions pertaining to mechanical seed count as part of Handbook 133.

Thank you for your consideration of this proposal. We would be pleased to make experts and technical resources available to the Conference on this matter. We look forward to working with you to ensure the accuracy of seed counts for agricultural products.

Sincerely,



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