

2021 Rule Change Proposal 2

(Renumbered)

Purpose of Proposal: To add instructions for obtaining submitted samples and working samples for seed mats and seed tapes. *This proposal will only be considered if the proposed definitions for seed mats and seed tapes is adopted by the AOSA/SCST membership.*

Present Rule and Proposed Rule:

SECTION 1: SAMPLING

1.3 Obtaining a sample for submission

- d. Seed in small containers (such as packets, tapes, mats, and small package lawn (seed)**
When it is not practical to sample seed in small containers using routine procedures, the combined contents of multiple containers or entire unopened containers in sufficient number to supply the minimum size sample as required in section 1.4 may be taken to supply the sample for testing.

1.4 Size of sample

- a. The following are minimum weights for samples of seed to be submitted for analysis, test, or examination**

- (1) Sixty (60) grams (approximately 2 ounces) of grass seed not otherwise mentioned, alsike or white clover, or seeds not larger than these.
- (2) One hundred fifty (150) grams (approximately 5 ounces) of alfalfa, crimson or red clover, flax, lespedezas, millet, rape, ryegrasses, or seeds of similar size.
- (3) Five hundred (500) grams (approximately 1 pound) of proso millet, sudangrass, or seeds of similar size.
- (4) One thousand (1,000) grams (approximately 2 pounds) of cereals, vetches, sorghums, or seeds of similar or larger size.
- (5) Vegetable and flower seed samples (as categorized by the AOSA Rules for Testing Seeds Vol. 3. Uniform Classification of Weed and Crop Seeds) shall consist of at least 400, and preferably at least 800, seeds per sample. For official samples being obtained and submitted for regulatory compliance testing, the sample size shall be a minimum of 800 seeds. If a purity analysis or a noxious weed seed examination is required, the submitted sample shall provide at least the minimum weights of working samples set forth in section 2.4.
- (6) Tree and shrub seed samples (as categorized by AOSA Rules for Testing Seeds Vol. 3. Uniform Classification of Weed and Crop Seeds) shall consist of at least 600 seeds per

sample for germination purposes (1,000 seeds for paired tests). If a purity analysis or a noxious weed seed examination is required, the submitted sample shall provide at least the minimum weights of working samples set forth in section 2.4.

- (7) Coated, encrusted, or pelleted seed (coated units: refer to 3.8a) submitted for testing shall consist of at least: 7,500 coated units for a purity analysis, 30,000 coated units for a noxious weed seed examination up to a maximum of 2,000 grams, or 1,000 coated units for a germination only test. Refer to sections 3.8 and 6.8 l for testing procedures.
- (8) Samples of seed mats or seed tapes submitted for germination testing only shall consist of at least 400, and preferably at least 800, seeds per sample. For official samples being obtained and submitted for regulatory compliance testing, the submitted sample size for germination only testing shall be a minimum of 800 seeds. If a purity analysis is required, the submitted sample shall contain at least 2,500 seeds, and if a noxious weed seed or bulk examination is required, the submitted sample shall contain at least 25,000 seeds. Samples for purity analysis, noxious weed seed examination, or bulk examination need not exceed 2,000 grams. Refer to sections 3.8 and 6.8 l for testing procedures.

SECTION 2: PREPARATION OF WORKING SAMPLES

2.2 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. Mechanical dividers are not appropriate for sampling seed mats and seed tapes. Refer to 2.2 b (4).

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).

b. Non-mechanical methods. –

(4) Random hand sampling for seed mats and seed tapes: Spread entire submitted sample in a single layer on a flat surface and remove portions from several random locations and combine together to obtain the appropriate working weight for the test to be conducted.

2.3 Size of working samples

a. **Weighing the working sample.** – The weight of the working sample shall be determined to the number of decimal places indicated below:

Weight of working sample in grams	Number of decimal places
Less than 1.000	4
1.000 to 9.999	3

10.00 to 99.99	2
100.0 to 999.9	1
1000 or more	0

b. Purity analysis, noxious weed seed examination, bulk examination. –

- (1) **Single kinds listed in Table 2A.....**
- (2) **Single kinds not listed in Table 2A....**
- (3) **For sample that are unusually small-seeded or large-seeded for the single king being tested...**
- (4) **Mixture of kinds...**
- (5) **Coated, encrusted, and pelleted seed....**
 - (a) **Single kinds:** Due to variation in weight of coating materials, the weight of the working sample shall be determined separately for each lot. The weight of the purity working sample shall be determined by weighing 100 coated units and calculating the weight of 2,500 coated units for the purity analysis. The noxious weed seed and bulk examination working weights shall be 10 times the purity working weight (approximately 25,000 coated units) or a maximum of 1,000 grams for kinds in Table 2A for which the working sample weight of raw seed is 500 grams.
 - (b) **Mixtures of kinds:...**
- (6) Seed mats and seed tapes. Due to variation in weight of mat or tape materials, the weight of the working sample shall be determined separately for each lot. The weight of the purity working sample shall be determined by weighing portions of seed mat or seed tape that are combined to obtain a total of approximately 100 seed units and calculating the weight seed mat or seed tape containing approximately 2,500 units for the purity analysis. The noxious weed seed and bulk examinations working weights shall be 10 times the purity working weight (the weight of seed mat or seed tape containing approximately 25,000 seed units) or a maximum of 1,000 grams for kinds in Table 2A for which the working sample weight of raw seed is 500 grams.**

Harmonization and Impact Statement:

The Federal Seed Act and the Canadian Methods and Procedures do not have specific directions for sampling seed mats or seed tapes. The Association of American Seed Control Officials Handbook on Seed Sampling (Guerke, 2015) provides a one sentence description for sampling seed mats or tapes (see supporting evidence). The proposed sampling method is similar to that used by the ISTA Rules (2020); however, the sizes of the submitted samples and working samples are not completely harmonized with the ISTA Rules.

Supporting Evidence:

Seed mats and seed tapes are available in the marketplace and yet the AOSA Rules do not have methods for sampling or obtaining working samples for such seed formats. The purpose of this proposal is to provide methods to standardize sampling and obtaining the working samples for seed mats and seed tapes. The AASCO Handbook on Seed Sampling (Guerke, 2015) provides the following instructions for sampling seed mats or seed tapes:

“For sampling seed tapes or mats, unopened container(s) should be obtained in a sufficient number of units (mats or tapes) or a sufficient part taken from the container in the case of a long tape to provide the minimum number of seeds for the anticipated seed tests.”

The current AOSA Rules (section 1.3.d) are similar in approach to the ISTA Rules for sampling of seed tapes and seed mats (i.e., taking of packets or pieces of tape or mat to provide sufficient amount of seed for the tests to be conducted). The proposed requirement for submission of 400 or 800 seed for germination only testing is the same as for vegetable and flower seed samples in AOSA Rules section 1.4.a(5). This proposal recommends a minimum of 2500 seeds for purity analysis (same as ISTA Rules for seed tapes and seed mats), but requires a minimum of 25,000 seeds for noxious weed seed exam (ISTA Rules require a minimum of 7500 seeds removed from seed mats and seed tapes for the other species determination). The calculation of the working weights is based on 100 seeds removed from a seed mat or seed tape and is similar to the current AOSA Rules for determining the working weight of coated or pelleted seeds [AOSA Rules section 2.3.b(5)(a)].

For comparison, below are the instructions found in the ISTA Rules (2020) for sampling and obtaining the working samples for seed mats and seed tapes (sections highlighted in yellow apply specifically to seed tapes and seed mats):

ISTA Rules (2020)
Chapter 2: Sampling

2.5 Procedures

2.5.1.2 Minimum sampling intensity

For seed lots in containers holding up to and including 100 kg, the minimum sampling intensity is the following:

- a. For containers holding between 15 kg and 100 kg (inclusive) of seed, the number of primary samples according to Table 2A.
- b. For containers holding less than 15 kg of seed, containers must be combined into sampling units not exceeding 100 kg, e.g. 20 containers of 5 kg, 33 containers of 3 kg or 100 containers of 1 kg. The sampling units must be regarded as containers as described in Table 2A.
- c. For seed pellets, seed granules, **seed tapes and seed mats**, containers of less than 300 000 seed units must be combined to sampling units not exceeding 2 000 000 seeds. The sampling units must be regarded as containers as described in Table 2A.

Table 2A. Minimum sampling intensity for seed lots in containers holding up to and including 100 kg seed

Number of containers	Minimum number of primary samples to be taken
1–4	3 primary samples from each container
5–8	2 primary samples from each container
9–15	1 primary sample from each container

16–30	15 primary samples, one each from 15 different containers
31–59	20 primary samples, one each from 20 different containers
60 or more	30 primary samples, one each from 30 different containers

When sampling seed in containers holding more than 100 kg of seed, or from streams of seed entering containers, the sampling intensity according to Table 2B must be regarded as the minimum requirement.

Table 2B. Minimum number of primary samples to be taken from seed lots in containers holding more than 100 kg of seed, or from seed streams

Seed lot size	Number of primary samples to be taken
Up to 500 kg	At least five primary samples
501–3 000 kg	One primary sample for each 300 kg, but not less than five
3 001–20 000 kg	One primary sample for each 500 kg, but not less than 10
20 001 kg and above	One primary sample for each 700 kg, but not less than 40

When sampling a seed lot of up to 15 containers, regardless of their size, the same number of primary samples must be taken from each container. Sampling intensity for coated seeds is as described in Tables 2A and 2B.

2.5.1.3 Taking primary samples

When defining the number and/or the size of primary samples, the seed sampler needs to ensure (besides meeting the minimum sampling intensity) that the minimum amount of seed required for the requested test(s) is sent to the testing laboratory and enough seed remains available for obtaining duplicate samples if requested.

Primary samples of approximately equal size must be taken from a seed lot, irrespective of where in the lot or container the primary sample is taken.

When the seed lot is in containers, the containers to be sampled must be selected at random or according to a systematic plan throughout the seed lot. Primary samples must be drawn from the top, middle and bottom of containers, but not necessarily from more than one position in any container, unless so specified in Tables 2A and 2B.

When the seed is in bulk or in large containers, the primary samples must be drawn from random positions.

Containers must be opened or pierced for abstraction of primary samples. The sampled containers must then be closed or the contents transferred to new containers.

When seed is to be packed in special types of containers (e.g. small, not penetrable, or moisture-proof containers), it should be sampled, if possible, either before or during the filling of the containers.

Sampling seed lots of seed tapes and seed mats should be done by taking packets or pieces of tape or mat.

The instruments being used must neither damage the seed nor select according to seed size, shape, density, chaffiness or any other quality trait. All sampling apparatus must be clean before use to prevent cross contaminations. Triers must be long enough so that the opening at the tip reaches at least half of the diameter of the container. When the container is not accessible from opposite sides, the trier must be long enough to reach the opposite side.

Sampling seed lots may be done by one of the methods listed below. (Note: for seed tapes and seed mats ISTA Rules subsections a-e do not apply)

- f. Sampling by hand. This method can be used for all species and may be the most suitable method for seed that may be damaged by the use of triers, seeds with wings, seeds with low moisture content, seed tapes and seed mats. For hand sampling seed in containers, all positions inside the containers must be accessible. Containers with layers which are not accessible from the regular opening may have to be cut open, sampled and repackaged. Containers may also be partially or completely emptied during the sampling process to gain access to all positions in the containers. For sampling by hand, clean the hand and roll the sleeve up if necessary, insert the open hand into the container to the required position, close and withdraw the hand, taking great care that the fingers remain tightly closed about the seeds so none may escape, and empty the hand into a receiving pan.

2.5.2 Procedures for obtaining the submitted and working sample

2.5.2.1 Minimum size of working sample

Minimum sizes of working samples are prescribed in the appropriate chapter for each test. The working sample weights for purity analyses given in Table 2C are calculated to contain at least 2500 seeds. These weights are recommended for normal use in purity tests, see 3.5.1.

The sample weights in column 5 of Table 2C, Part 1, for counts of other species are 10 times the weights in column 4, subject to a maximum of 1000 g.

Working samples of all coated seeds except those defined as treated seed in 2.2.11 must contain at least the number of pellets, seeds or granules indicated in column 3 of Table 2D, Part 1 and Part 2. If a smaller sample is used, the actual number of pellets, seeds or granules in the sample must be reported.

Table 2D. Part 2. Sample sizes (number of seeds) for seed tapes and mats.

Determinations	Minimum submitted sample	Minimum working sample
1	2	3
Verification of species	300	100
Germination	2 000	400
Purity analysis (if required)	2 500	2 500
Determination of other seeds	10 000	7 500

2.5.2.2 Sample reduction methods

If the seed sample needs to be reduced to a size equal to or greater than the size prescribed, the seed sample must first be thoroughly mixed for all dividers and methods excluding the Variable sample divider and Rotary divider, where mixing takes place during the dividing process. The

submitted/working sample must then be obtained either by repeated halving or by abstracting and subsequently combining small random portions. The apparatus and methods for sample reduction are described in 2.5.2.2.1 to 2.5.2.2.4. One, two or more of these methods may be used in one sample reduction procedure. When using one of the dividers described for seed pellets the distance of fall must not exceed 250 mm.

After obtaining a working sample the remainder must be re-mixed before a second working sample is obtained.

Except in the case of seed health, the method of hand halving must be restricted to certain genera listed in 2.5.2.2.4. Only the spoon method and the hand halving method may be used in the laboratory to obtain working samples for seed health testing where other samples or equipment may be contaminated by spores or other propagating material.

For seed tapes and mats take pieces of tape or mat at random, to provide sufficient seeds for the test.

Chapter 11: Testing coated seeds

11.1 Object

The object is to gain reproducible information as to the planting value of seeds coated in non-seed materials which have been applied in a way which makes positive identification of all individual seeds and inert matter as described in Chapter 3 impracticable without destroying the structure(s) presented for testing. For this purpose, techniques and definitions are prescribed where those described in the appropriate chapter are not directly applicable. A wide range of materials may be used to coat seeds as individuals in discrete units as in pellets or spaced in strips or sheets. However, treated seeds are not covered and should be tested according to the methods prescribed in other chapters. When specific instructions are not given, those in the appropriate chapter must be followed. Where reference is made to seed pellets the rules also apply to encrusted seed and seed granules, and where to seed tapes, to seed mats.

11.1.1 Definitions

Seed pellets More or less spherical units developed for precision sowing, usually incorporating a single seed with the size and shape of the seed no longer readily evident. The pellet, in addition to the pelleting material, may contain pesticides, dyes or other additives.

Encrusted seed Units more or less retaining the shape of the seed with the size and weight changed to a greater or lesser extent. The encrusting material may contain pesticides, fungicides, dyes or other additives.

Seed granules Units more or less cylindrical, including types with more than one seed joined together. The granule, in addition to the granulating material, may contain pesticides, dyes or other additives.

Seed tapes Narrow bands of material, such as paper or other degradable material, with seeds spaced randomly, in groups or in a single row.

Seed mats Broad sheets of material, such as paper or other degradable material, with seeds placed in rows, groups or at random throughout the sheets.

Seed treatment See 2.2.12. Seeds which have received seed treatment must still be tested according to the methods prescribed in other chapters.

Note: the numbering in this Chapter refers to the appropriate paragraphs of the other Chapters in the Rules, e.g. 11.3.2.1 cross references Chapter 11 to Chapter 3.2.1.

11.2 Sampling

11.2.5 Procedures

11.2.5.1 Procedures for sampling a seed lot

11.2.5.1.2 Sampling intensity

Sampling the lot of seed pellets should be done according to the intensity appropriate to the particular lot, as laid down in Chapter 2. Sampling the lot of seed tapes should be done by taking packets or (from reels) pieces of tape at random, analogously following the prescriptions of 2.5.1.2, provided that packets or reels containing up to 2 000 000 (20 units of 100 000) seeds may be combined as a basic unit and therefore are to be considered as one container.

11.2.5.1.3–1.6 Drawing and disposal of submitted sample

As submitted samples of coated seeds normally contain fewer seeds than corresponding samples of uncoated seeds, special care is necessary in drawing the sample to ensure that it is representative of the lot. Precautions are necessary to avoid damage to or change in the pellets or seed tape during drawing, handling and transport, and samples must be submitted in suitable containers.

11.2.5.2 Procedure for obtaining the working sample

For pelleted seeds use one of the dividers described in 2.5.2.2.1. However, the distance of fall must never exceed 250 mm. For seed tapes take pieces of tape at random, to provide sufficient seeds for the test.

11.2.5.2.1 Minimum size of working sample

Working samples must contain not less than the number of pellets or seeds indicated in column 3 of Tables 11A and 11B. If a smaller sample is used the actual number of pellets or seeds in the sample must be reported on the ISTA Certificate.

Table 11A. Sample sizes of pelleted seeds in number of pellets. Note: this table is a copy of Table 2D Part 1

Determinations	Submitted samples not less than	Working samples not less than
1	2	3
Purity analysis (including verification of species)	2 500	2 500
Thousand-seed weight	2 500	Pure pellet fraction
Germination	2 500	400
Determination of other seeds	10 000	7 500
Determination of other seeds (encrusted seeds and seed granules)	25 000	25 000
Size grading	5 000	1 000

Table 11B. Sample sizes of seed tapes in number of seeds. Note: this table is a copy of Table 2D Part 2

Determinations	Submitted samples not less than	Working samples of less than
1	2	3
Verification of species	300	100
Germination	2 000	400
Purity analysis (if required)	2 500	2 500
Determination of other seeds	10 000	7 500

References

Federal Seed Act Regulations, Part 201 – Federal Seed Act Requirements. 2020.
 Guerke, W. R. (ed.). 2015. AASCO Handbook on Seed Sampling. Association of American Seed Control Officials.
 ISTA. 2020. International Rules for Seed Testing. International Seed Testing Association.

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