

Rule Change Proposal No. 5

PURPOSE OF PROPOSAL

To add rounding and reporting specifications to the germination portion (4.7) of the AOSA Rules.

PRESENT RULE

4.7 Calculation of percentage germination

- a. When a single test is made in accordance with these rules and retesting is not required, the average of the four or two 100-seed replicates shall be reported as the percentage germination or germination and hard seeds.

PROPOSED RULE

4.7 Calculation of percentage germination

- a. When a single test is made in accordance with these rules and retesting is not required, the average of the four or two 100-seed replicates shall be reported as a whole number percentage germination or germination and hard seeds.

When rounding the calculated percentages of each germination test component to a whole number, round down to the next whole number if the fraction is less than 0.5 and round up to the next whole number if the fraction is 0.5 or higher.

The total percentage of all components (normal seedlings, abnormal seedlings, dead seed, dormant and hard seed) shall be 100%. If the total does not equal 100% (e.g. 99%, 101% or 102%) then add to or subtract from the component with the largest value (usually the normal seedling component). Only the normal seedling and hard seed (if applicable) percentages would be required as information on the report of analysis (refer to section 11.m and 11.n). If normal seedling and hard seed percentages both have a decimal of 0.5, round down the normal seedling percentage and round up the hard seed percentage. When computing ryegrass fluorescence use the raw germination percentage (to two decimal places) for determining perennial and annual species purity components, however, report the normal seedling percentage as a whole number on the report of analysis.

HARMONIZATION

Proposal would be consistent with AOSA purity reporting and rounding methods. Proposal does not completely harmonize with Canadian Methods & Procedures, ISTA Rules or the Federal Seed Act (note: Canadian, ISTA and FSA are not currently harmonized on reporting and rounding). Please refer to supporting evidence for specifics.

SUPPORTING EVIDENCE

Adding specific guidelines for whole number reporting and rounding would increase standardization among laboratories using the AOSA Rules. The AOSA purity testing rules do specify a rounding method and calculation of percentages and format for reporting percentages.

Canadian Methods and Procedures for Testing Seed specify germination rounding requirements in section 4.10.4a, which states “In reporting the percentage of germination, the average of compatible replicates, if not a whole number, should be rounded to a whole number. If the fraction is less than 0.5, it should be dropped, if it is 0.5 or greater, raise the percentage to the next whole number, except for values between 99.5 and 99.9%, which should be dropped to 99%.”

ISTA Rules specify in section 5.8 Calculation and expression of results as follows: “Results are expressed as percentage by number. When four 100-seed replicates of a test are within the maximum tolerated range (Annexe to Chapter 15, Table 5.1) the average represents the percentage germination to be reported on the ISTA International Seed Analysis Certificate. The average percentage is calculated to the nearest whole number. Annex 5.8.A Calculation and Expression of Results defines rounding further:

The result of the germination test is calculated as the average of four 100 seed replicates (sub-replicates of 50 or 25 are combined into 100 seed replicates). It is expressed as a percentage by number of normal seedlings. The percentage is calculated to the nearest whole number (0.5 is taken to higher figure). The percentage of abnormal seedlings, hard, fresh and dead seeds is calculated in the same way. The sum of the percentage of normal and abnormal seedlings and ungerminated seeds must be 100.

The percentage of normal seedlings is rounded to the nearest whole number, 0.5 is taken to the higher figure (xx.0 and xx.25 are rounded to xx; xx.50 and xx.75 are rounded to xx+1).

Calculate the integer part of the remaining percentages, sum the values obtained. If the sum is 100, the procedure ends, else continue with the following steps.

For the percentage of abnormal seedlings, hard seeds, fresh seeds and dead seeds:

1. First find the value with the greatest decimal part among the remaining percentages and round this percentage to the upper whole number, keep this value as a final result, calculate the integer part of the remaining percentages.
2. Second, sum the values obtained.
3. Third, if the sum is 100, the procedure ends, else continue with another step (1 to 3).

In case of equal decimal parts, the priority order is abnormal seedlings, hard seeds, fresh seeds and dead seeds.

The Federal Seed Act specifies the number of seeds for germination in section 201.54. Section 201.55 does contain the following note on rounding: **Note to §201.55:** To find the maximum tolerated range, compute the average percentage of all 100 seed replicates of a given test, rounding off the result to the nearest whole number.

In practice, the seed industry uses whole numbers on labels for germination and hard seeds, so adding this rule promotes uniformity in how these values are rounded. Section 11. (Report of Analysis) of the AOSA Rules, subsection n. and m. specifying reporting to the “nearest whole number”, however a standard rounding method is not stated in section 4.7.

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