NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 5519-2018

Cereals and pulses -- Determination of the mass of 1 000 grains

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1 Scope

This Standard specifies the method for the determination of the mass of 1,000 grains of cereals and pulses.

This Standard is applicable to all cereals and pulses.

This Standard does not apply to seeds for sowing.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 10362 Inspection of Grain and Oils - Determination of Moisture Content of Maize (GB/T 10362-2008, ISO 6540:1980, MOD)

GB/T 21305 Cereals and Cereal Products - Determination of Moisture Content - Routine Reference Method (GB/T 21305-2007, ISO 712:1998, IDT)

ISO 24557 Pulses - Determination of Moisture Content - Air-oven Method

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 mass of 1,000 grains as received

The mass of 1,000 specimen grains containing natural moisture.

3.2 mass of 1,000 grains on the dry basis

The mass of 1,000 specimen grains after deducting the moisture content.

4 Principle

Weigh and count the complete grains in the specimen, divide the mass of the complete grains by the number of grains, and express the result as the mass of 1,000 grains.

5.2 Grain counter: a photoelectric counter can be used. If there is no suitable counter, it can be

manually counted.

6.1 Determination of Mass of 1,000 Grains as Received

Randomly take out about 500 specimen grains from the laboratory sample, pick out the complete grains and weigh them (mt), accurate to 0.01 g; record the number of complete grains (N).

Each sample shall be tested twice in parallel.

6.2 Determination of Mass of 1,000 Grains on the Dry Basis

After removing impurities in the specimen, for cereals, in accordance with the stipulations of

GB/T 21305 or GB/T 10362, determine the moisture content of the complete grains; for pulses, in accordance with the stipulations of ISO 24557, determine the moisture content (omegaH2O) of the complete grains. Meanwhile, in accordance with 6.1, determine the mass of 1,000 grains.

7.1 The mass of 1,000 grains as received (m1) is obtained through Formula (1):

Where, m1---the mass of 1,000 grains, expressed in (g);

mt---the mass of complete grains, expressed in (g);

N---the number of complete grains in the mass of mt.

7.2 The mass of 1,000 grains on the dry basis (m0) is obtained through Formula (2):

Where, m0---the mass of 1,000 grains on the dry basis, expressed in (g);

m1---the mass of 1,000 grains as received, expressed in (g);

omegaH2O---the moisture content of the sample, expressed in (%).

7.3 If the parallel determination results comply with the repeatability requirements (8.2), take

the arithmetic mean as the result; otherwise, re-sampling is required for determination. The determination result of the mass of 1,000 grains is expressed in the unit of g. Significant digits are retained as follows:

a) If the mass of 1,000 grains is less than 10 g, retain two digits after the decimal point;

b) If the mass of 1,000 grains is equal to or greater than 10g but does not exceed 100 g, retain one digit after the decimal point;

c) If the mass of 1,000 grains is greater than 100 g, take an integer.

8.1 Interlaboratory Test

Details of the interlaboratory test precision of this Method are provided in Appendix A. For other data ranges and test objects, these test data are for reference only.

8.2 Repeatability

The situation that the absolute difference between two independent test results obtained through mutually independent tests conducted in the same laboratory, by the same operator using the same equipment and the same test method, on the same test object in a short period of time is greater than the repeatability limit r shall not exceed 5%.

The laboratory test results of wheat and barley whose mass of 1,000 grains on the dry basis is between 29.8 g ~ 48.2 g are shown in Table A.1, Table A.2 and Figure A.1.

8.3 Reproducibility

The situation that the absolute difference between two independent test results obtained through mutually independent tests conducted in different laboratories, by different operators using different equipment and the same test method, on the same test object is greater than the reproducibility limit R shall not exceed 5%.