



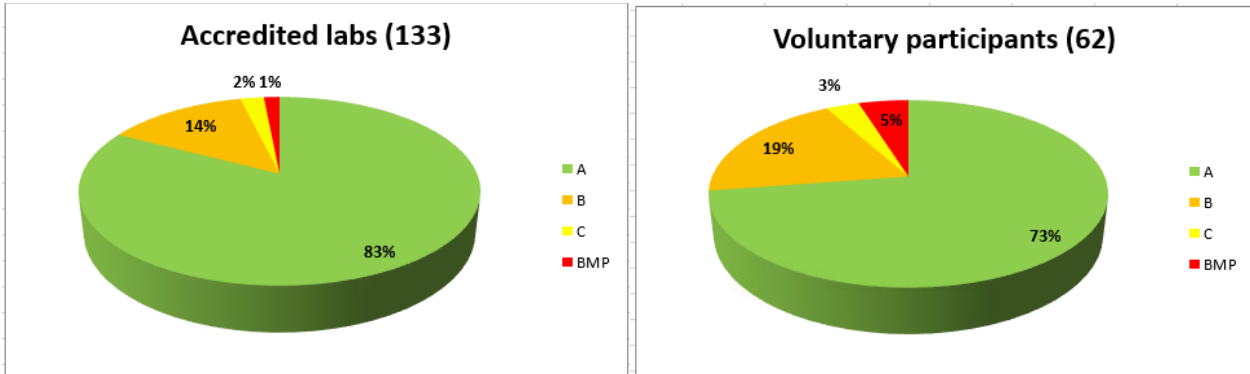
**Summary report: PT 24-1 T aes**

**Species:** *Triticum aestivum subsp aestivum*

**Scope:** PUR, OSD, GER, MOI, VIA (TZ test), VIG (RE test), TSW, OIC issuance

**PURITY Ratings**

**Total number of participants = 195**



**Means and Standard Deviation**

of the obligatory accredited participants  
calculated for the category of pure seed

Categories	Mean Values %			Standard Deviation		
	Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
Pure seed	99.2	99.4	99.3	0.18	0.17	0.17
Other seed	0.3	0.1	0.2	-	-	-
Inert matter	0.5	0.5	0.5	-	-	-

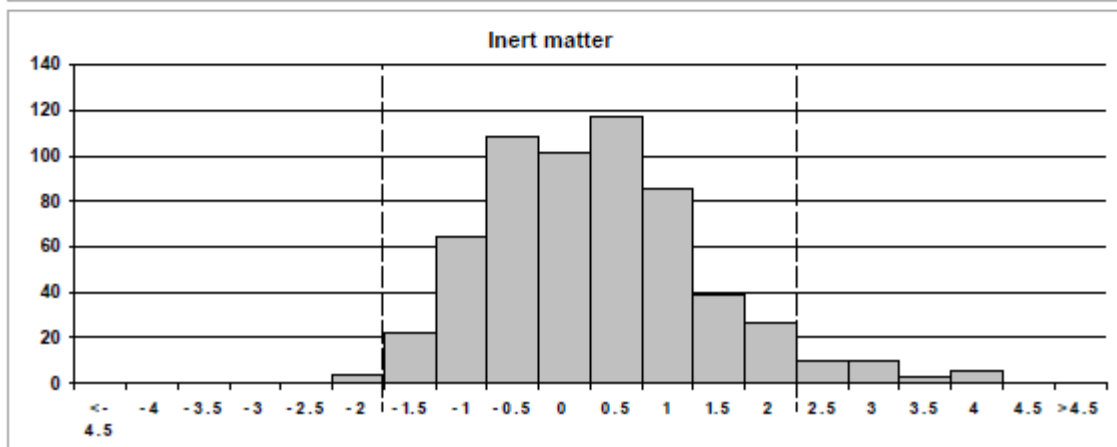
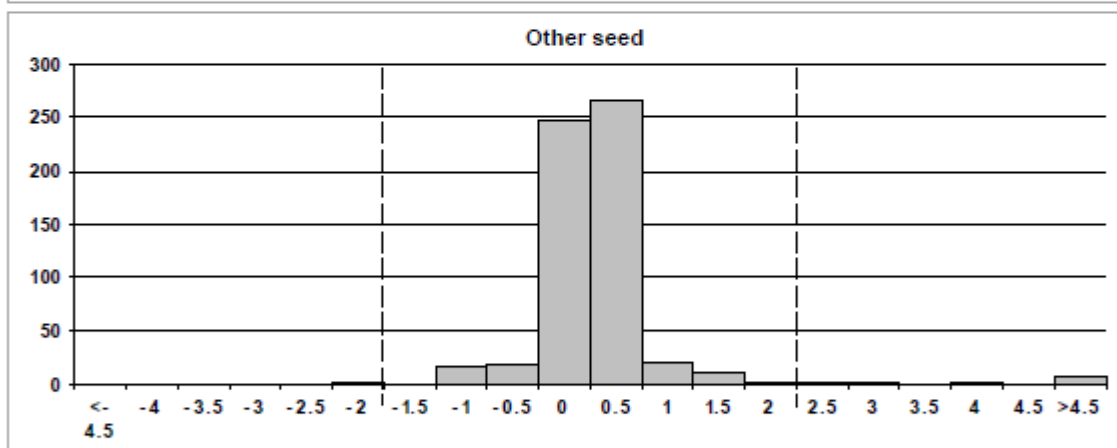
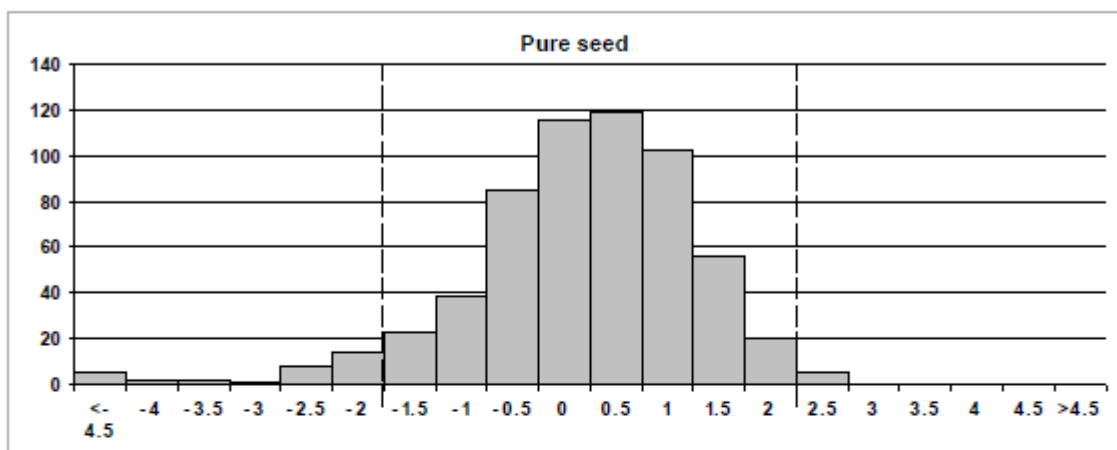
## Z-score Distribution

### Proficiency Test Report – Test Round 24-1 T.aes

**Species :** Triticum aestivum subsp aestivum

**Scope:** Purity

The following histograms show the frequency distributions of all participants Z-Scores for the relevant components, i.e. **Pure seed** and **Inert matter** and **Other seed**. The Z-Scores from all three samples are included in each histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'



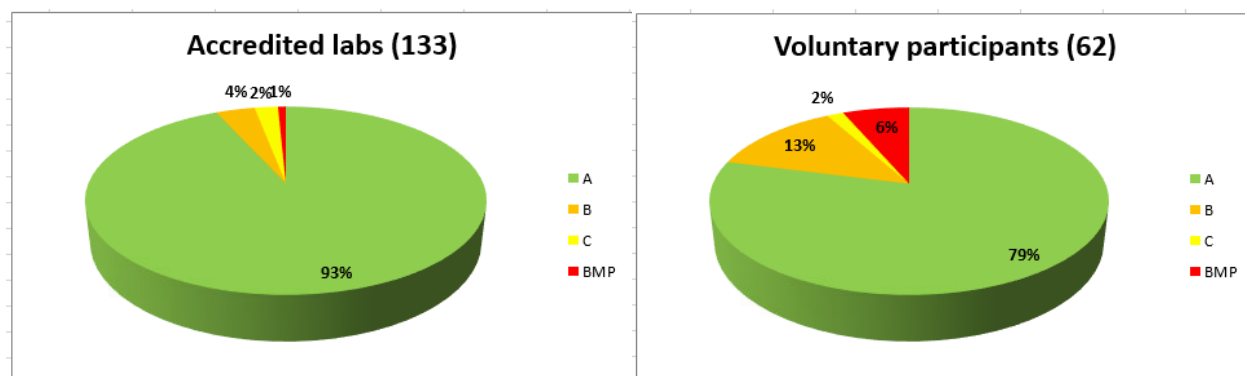
**Information for the Lot 3:**

Upon request of a participant who identified unusually high number of *X Triticosecale* seeds, the PUR Committee verification conclusion is that there is a variation in lot 3, with few seeds of *X Triticosecale* present in this lot as natural contamination, but the range of present *X Triticosecale* should not be high. For example, the seeds within the blue box at the following image are *X Triticosecale*, others are seeds variation of Lot 3 seeds.



## OSD Ratings

Total number of participants = 195



## Retrieval rates

Proficiency Test Report - Test round 24-1 T.aes

Species: *Triticum aestivum subsp aestivu*

Scope: Other Seed Determination

### Average of seeds retrieved and identified correctly

The following table shows the retrieval rates of each species added by the test leader prior to sample dispatch. Every species that was added is assigned a value based on the actual retrieval rate of all seeds added. Thresholds are as follows:

$\geq 90\%$  -> 3

$\geq 85\%$  -> 2

$< 85\%$  -> 1

This score is multiplied with the number of seeds your laboratory reported and identified correctly. The percentage of retrieved and identified seeds is then determined and does define the in-round rating. The thresholds are as follows:

$\geq 90\%$  -> A

$\geq 80\%$  -> B

$\geq 70\%$  -> C

$< 70\%$  -> BMP

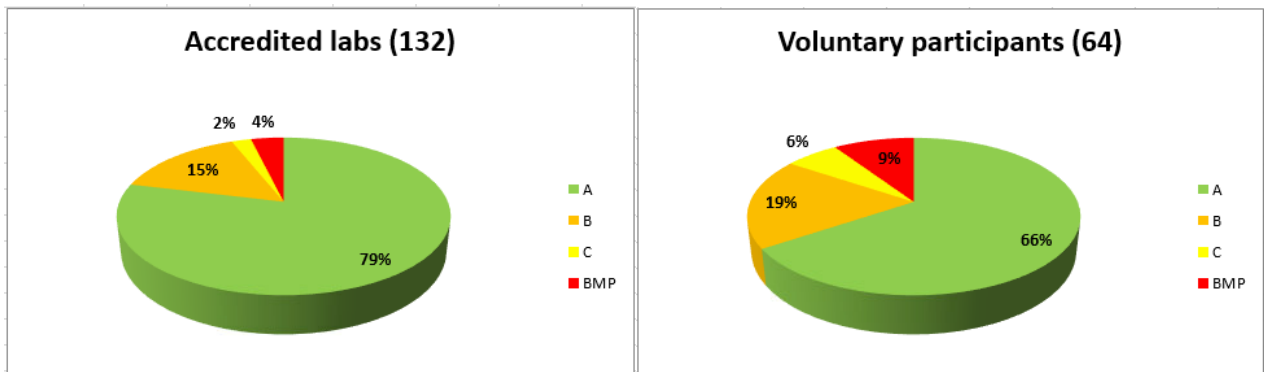
For further details please refer to the document: "The ISTA Proficiency Test Programme".

Lot #	Species name	# of seeds added	Average # of seeds found	Retrieval rate [%]	Assigned factor
Lot 1					
	1 <i>Avena fatua</i>	2	1.8	91.1	3
	2 <i>Bromus catharticus</i>	2	1.8	88.3	2
	3 <i>Hordeum vulgare subsp. Vulgar</i>	4	3.7	92.6	3
Lot 2					
	1 <i>Amaranthus spp</i>	3	2.7	90.8	3
	2 <i>Echinochloa esculenta</i>	2	1.8	91.3	3
	3 <i>Secale cereale</i>	3	2.5	84.0	1
	4 <i>Setaria viridis</i>	4	3.6	89.8	2
Lot 3					
	1 <i>Avena sativa</i>	3	2.7	90.6	3
	2 <i>Chenopodium spp.</i>	2	1.6	80.3	1
	3 <i>Pennisetum glaucum</i>	4	3.2	80.0	1

**Note:** the originally indicate *Chenopodium album* spiked in the Lot 3 sample, could have been also the seeds of *Chenopodium berlandieri*, as indicated by the Purity Committee. Therefore the preliminary reports are adjusted for the final reports for the expected identification to the genus level only. This adjustment does not influence the laboratory ratings for this test.

**GERMINATION Ratings**

Total number of participants = 196



**Means and Standard Deviation**

of the obligatory accredited participants  
calculated for the category of normal seedlings

Categories	Mean Values %			Standard Deviation		
	Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
Normal seedlings	96	95	96	1.14	1.11	1.51
Abnormal seedlings	2	3	2	-	-	-
Non-germinated seed	2	2	2	-	-	-

**Method used**

overview for all participants  
presented for the temperature, substrate and pretreatment

Temperature °C	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
20	131	61	192
20↔30*	1	1	2
15↔30*		1	1
25*		1	1

\* these temperatures are not prescribed in the ISTA Rules

Substrate	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
<b>BP</b>	<b>89</b>	<b>39</b>	<b>128</b>
<b>TP</b>	15	13	<b>28</b>
<b>Sand</b>	15	9	<b>24</b>
<b>PP</b>	12	3	<b>15</b>
<b>TP + sand</b>	1		<b>1</b>

Pretreatment	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
<b>No Treatment</b>	82	47	<b>129</b>
<b>Prechill</b>	45	13	<b>58</b>
<b>Light / no light</b>	3	1	<b>4</b>
<b>H<sub>2</sub>O</b>		1	<b>1</b>
<b>GA<sub>3</sub> and prechill + GA<sub>3</sub></b>	2	2	<b>4</b>

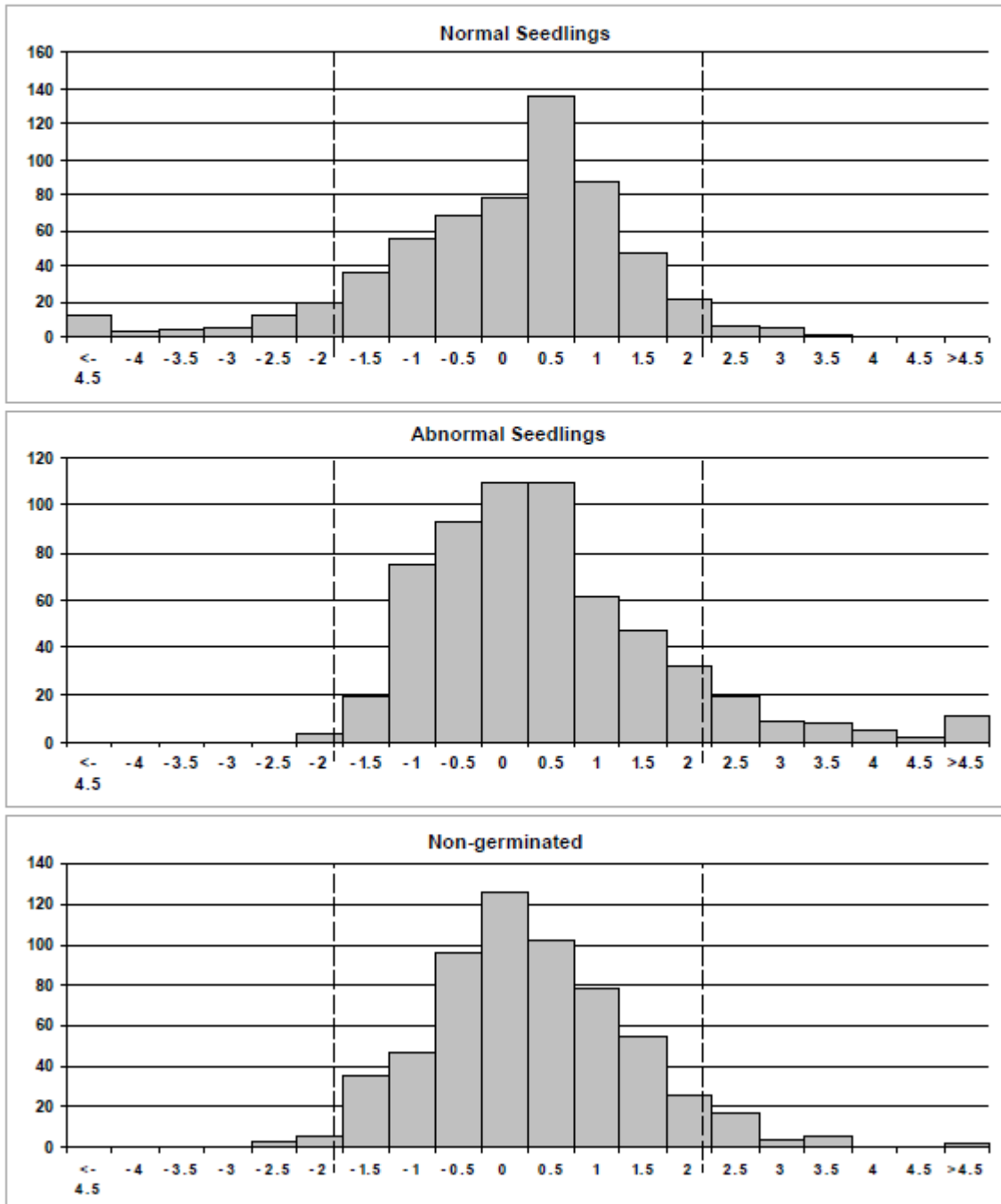
## Z-score Distribution

### Proficiency Test Report – Test Round 24-1 T.aes

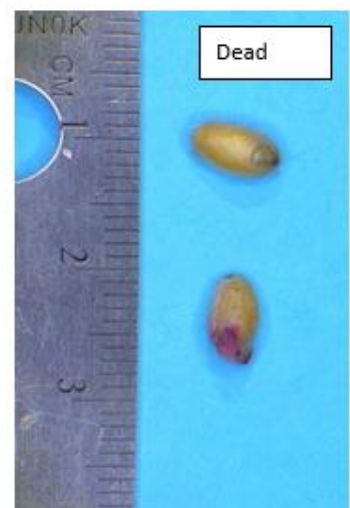
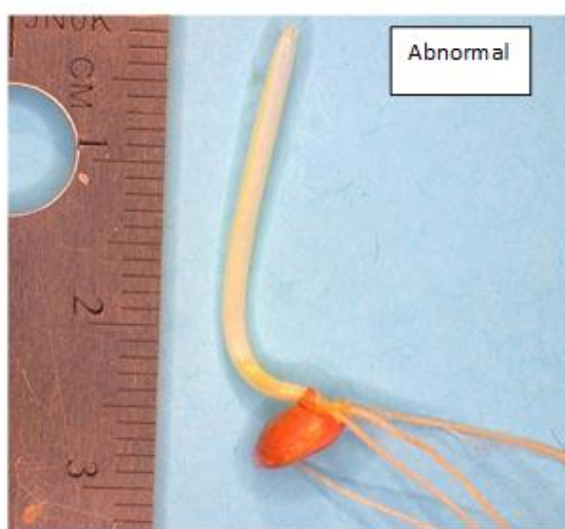
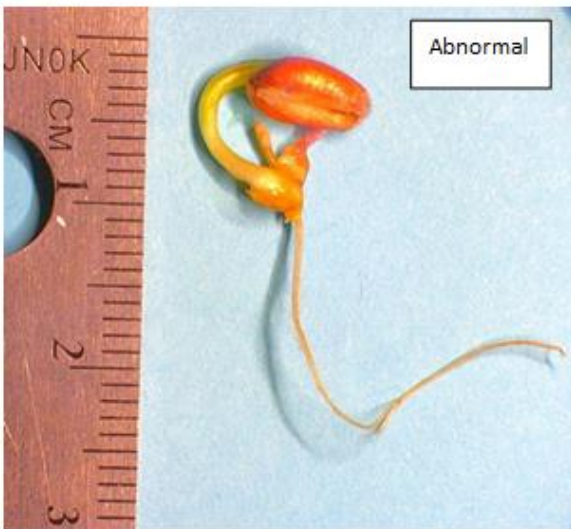
**Species :** Triticum aestivum subsp aestivum

**Scope:** Germination

The following histograms show the frequency distributions of all participants Z-Scores for the relevant components, i.e. **Normal** and **Abnormal Seedlings** and **Non-germinated Seeds**. The Z-Scores from all three samples are included in each histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'



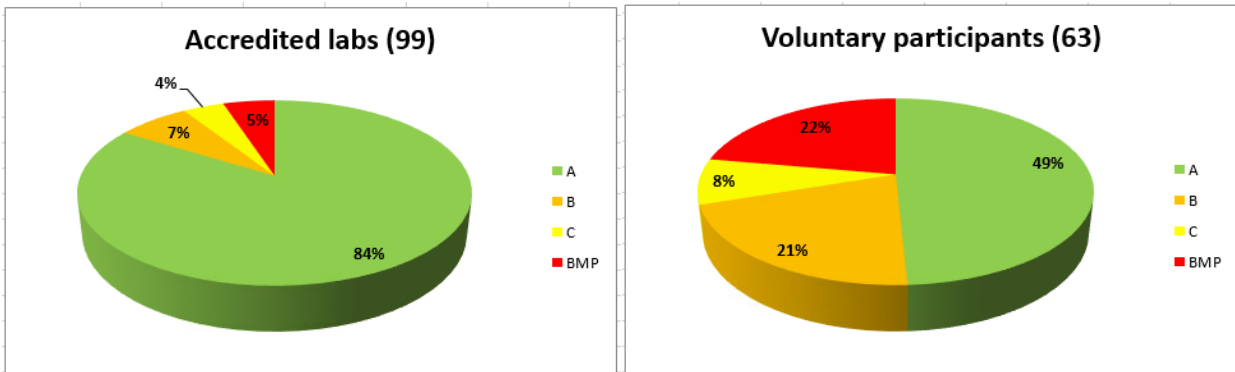
On request of participants from this PT round onwards, the PT summary report will include the images of normal and abnormal seedlings and of dead seed





**MOISTURE TEST Ratings**

Total number of participants = 162



**Means and Standard Deviation**

of the obligatory accredited participants

Categories	Mean Values %			Standard Deviation		
	Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
Moisture content	10.9	14.4	13.2	0.17	0.33	0.22

**Method used**

overview for all participants

Method	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
Oven, fine grinding 130 °C (±3 °C); 2 h ±6 min	98	58	156
Oven, fine grinding * 130 °C (±3 °C); 4 h ±12 min	1		1
Oven, no grinding * 130 °C (±3 °C); 2 h ±6 min		3	3
Oven, fine grinding * 103 °C (±2 °C); 17 h ±1 h		1	1
Method not stated		1	1

\* Not prescribed ISTA method for this species

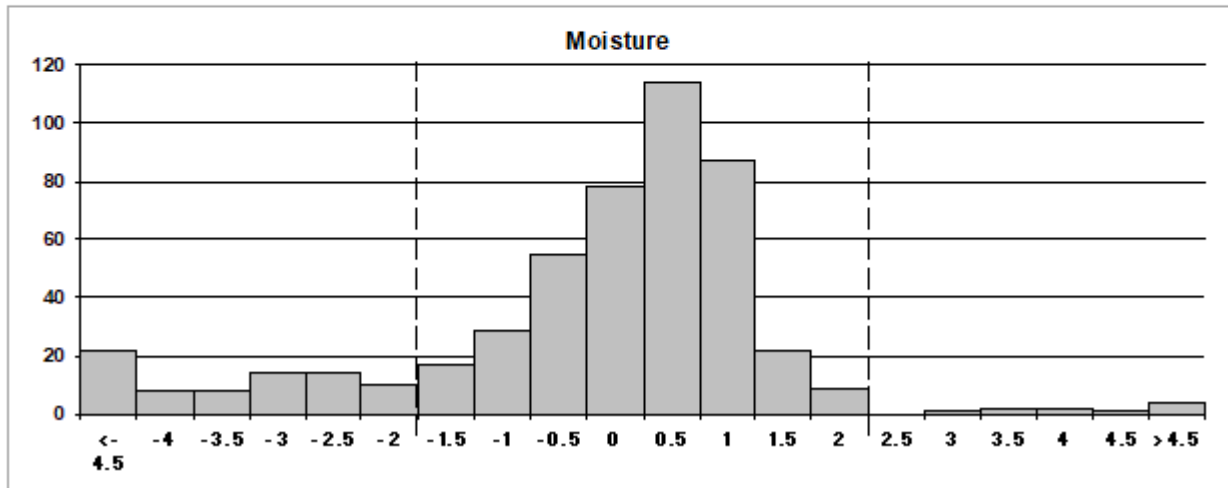
## Z-score Distribution

### Proficiency Test Report – Test Round 24-1 T.aes

**Species :** Triticum aestivum subsp aestivum

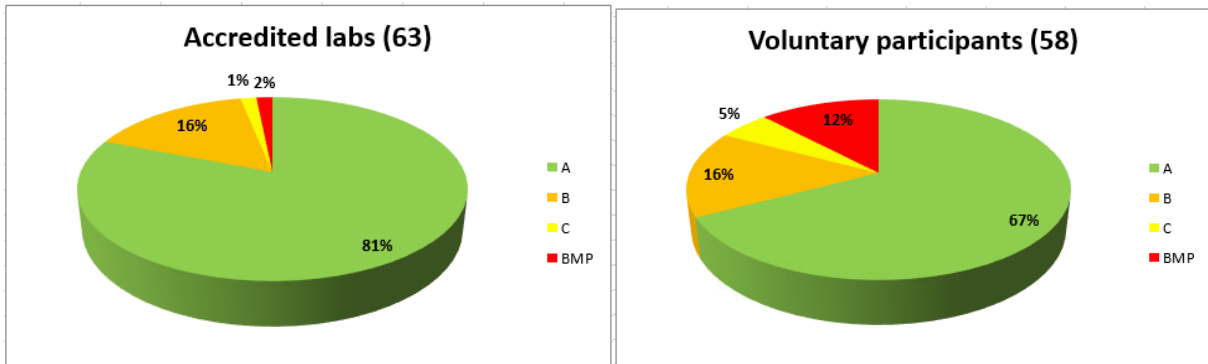
**Scope:** Moisture

The following histogram shows the frequency distributions of all participants Z-Scores for the moisture test. The Z-Scores from all three samples are included in each histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'.



**VIABILITY TEST (TZ test) Ratings**

Total number of participants = 121



**Means and Standard Deviation**  
of the obligatory accredited participants

Categories	Mean Values %			Standard Deviation		
	Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
Viable seed	96	96	97	1.57	1.53	1.49

**Method used**  
overview for all participants

Method	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
Longitudinal cut 1% solution, 30°C; 3h staining	49	45	94
Longitudinal cut Different parameters	8	8	16
Excised embryo 1% solution, 30°C; 3h staining	2	3	5
Excised embryo Different parameters	2	2	4
Method not stated	2		2

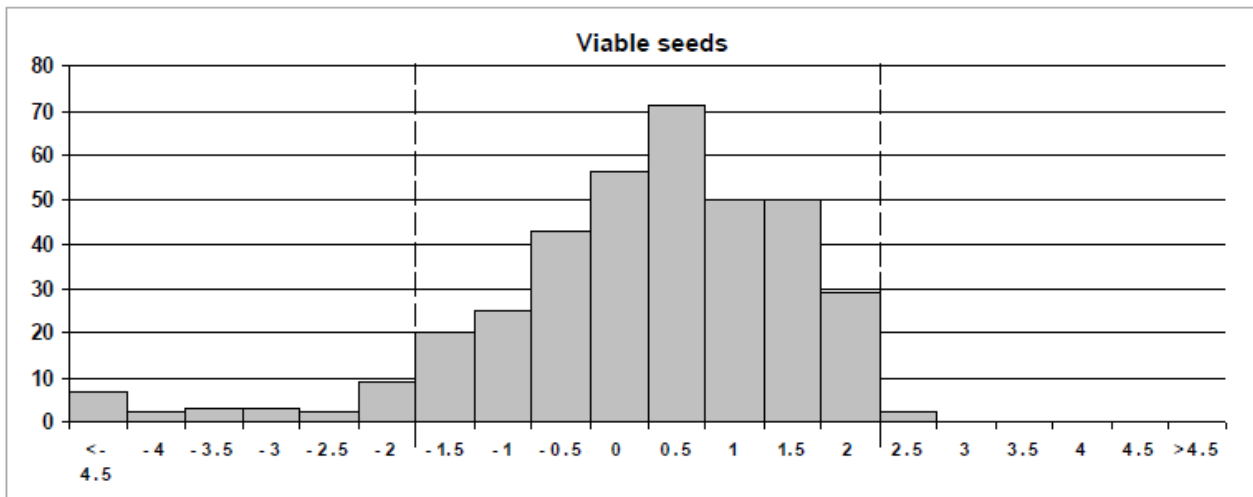
## Z-score Distribution

### Proficiency Test Report – Test Round 24-1 T.aes

**Species :** *Triticum aestivum* subsp *aestivum*

**Scope:** Tetrazolium

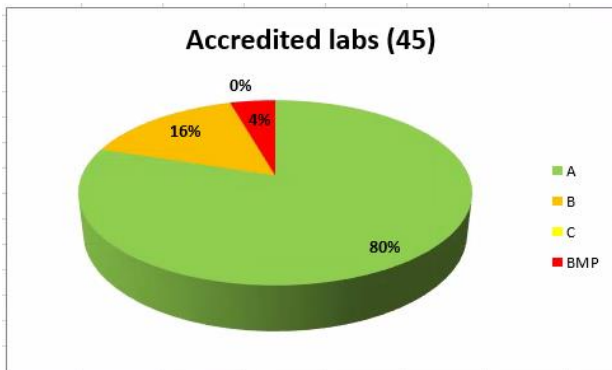
The following histogram shows the frequency distributions of all participants Z-Scores for the viability test. The Z-Scores from all three samples are included in each histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'.



**VIGOUR TEST (RADICLE EMERGENCE test) Ratings**

Total number of participants = 87

**ATTENTION: RESULTS ARE CANCELLED and are not included in the final evaluation**



**Means and Standard Deviation** of the obligatory accredited participants

Categories	Mean Values			Standard Deviation		
	Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
Radicle emergence	47.69	54.06	86.12	27.84	27.49	8.56

Method	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
Between paper, 15±1°C, 48h ± 15' (including plated paper and paper towels)	16	57	73
Non-ISTA method	2	9	11
Method not specified		3	3

**Detailed investigation**

The Vigour Committee conclusion is that the participants may have had difficulty determining 2mm as this includes the radicle within as well as outside the coleorhiza.

The Statistical Committee analysed the data from the 18 accredited laboratories. Using estimates of reproducibility variance, a coefficient of variation (CV) was computed. The table below provides the CV for the three lots:

	Lot 1	Lot 2	Lot 3
CV	58.38%	50.85%	18.35%

The CVs are very high, particularly for Lots 1 and 2, indicating high variation in results across laboratories. For this reason, **the Statistical Committee recommended not to validate this PT for Radicle Emergence test.**

Nevertheless, it should be noted that the CV of the mean within a laboratory is very low:

	Lot 1	Lot 2	Lot 3
CV	5.14%	4.17%	2.82%

These low CVs give confidence in the repeatability performance of the test. This is confirmed by comparing the residual standard deviations with the theoretical standard deviations based on the binomial distribution.

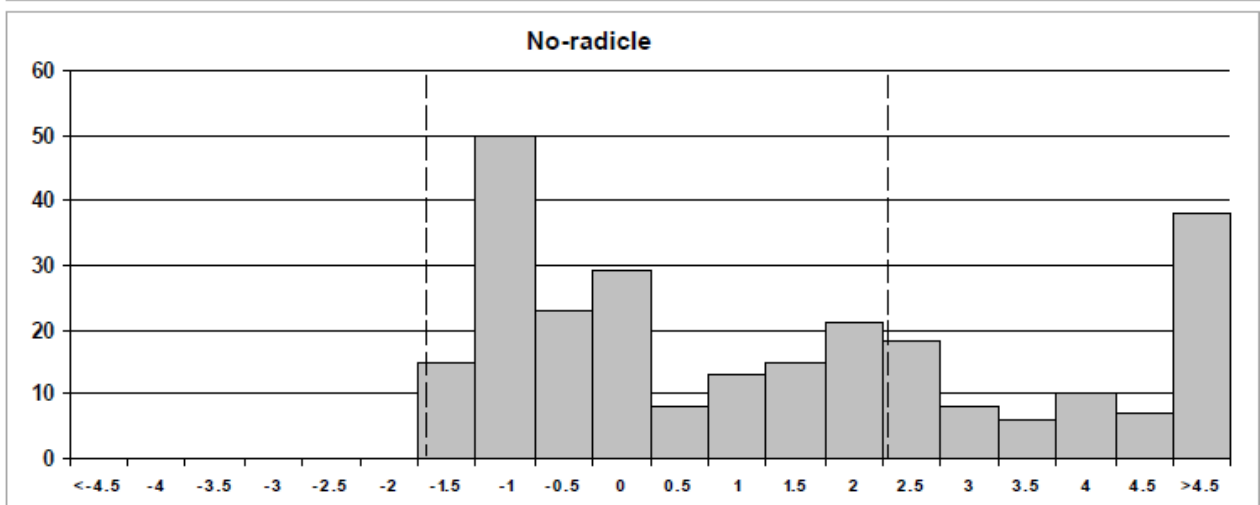
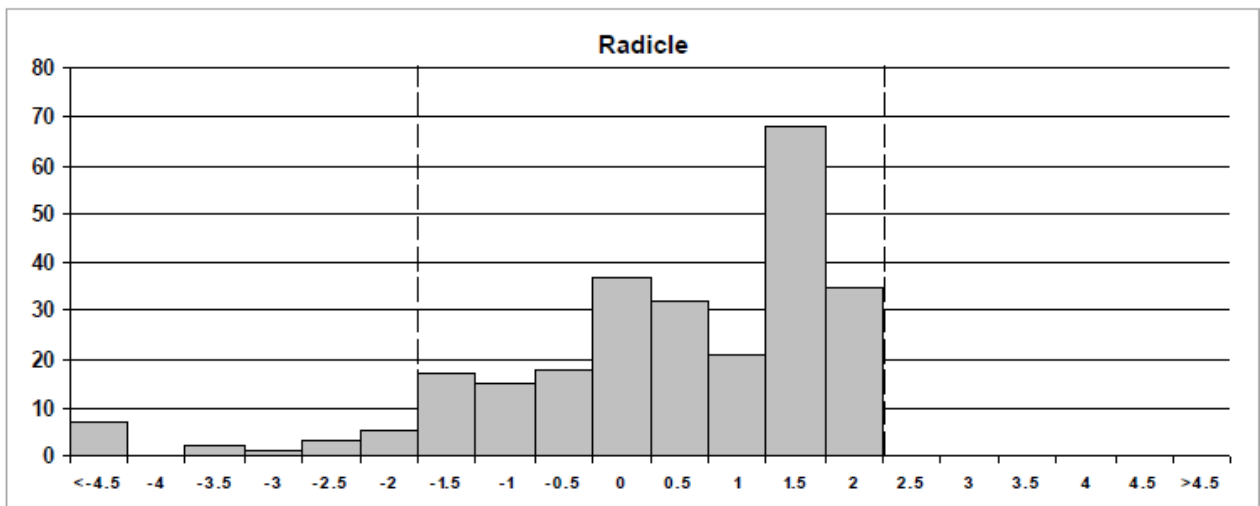
**Z-score Distribution**

**Proficiency Test Report – Test Round 24-1 T.aes**

**Species :** *Triticum aestivum subsp aestivum*

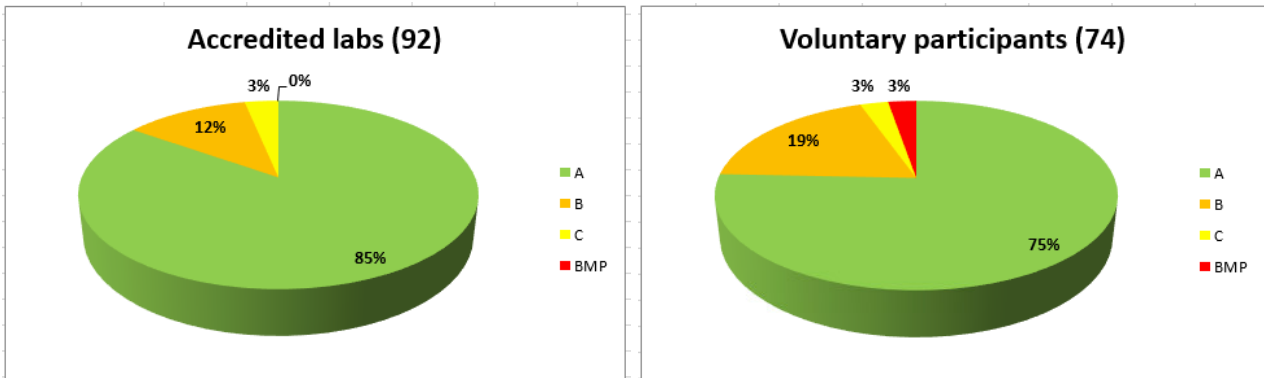
**Scope:** Vigour

The following histograms show the frequency distributions of all participants Z-Scores for the relevant components, i.e. **Radicle** and **No Radicle**. The Z-Scores from all three samples are included in each histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'



**THOUSAND SEED WEIGHT Ratings**

Total number of participants = 166



**Means and Standard Deviation**  
of the obligatory accredited participants

Mean Values g			Standard Deviation		
Lot 1	Lot 2	Lot3	Lot 1	Lot 2	Lot 3
31.55	36.34	31.20	0.56	0.59	0.61

**Method used**  
overview for all participants

Method	# Users		# Users TOTAL
	Accredited labs	Voluntary participants	
Counting replicates	59	60	119
Count the whole pure seed fraction	33	14	47

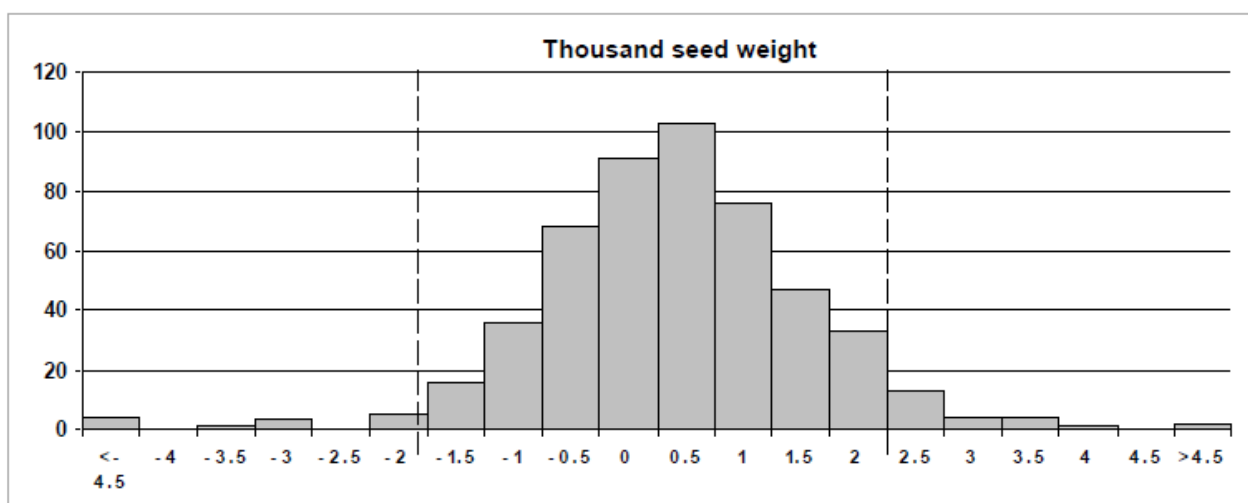
## Z-score Distribution

### Proficiency Test Report – Test Round 24-1 T.aes

**Species :** Triticum aestivum subsp. aestivum

**Scope:** Thousand seed weight

The following histogram shows the frequency distributions of all participants Z-Scores for the thousand seed weight test. The Z-Scores from all three samples are included in the histogram. For further explanations, please refer to the document 'The ISTA Proficiency Test Programme'.



### Comments for the TSW test

With the preliminary results comments were given for the results with number of decimal places some laboratories reported following the Table 10A of the ISTA Rules:

**Table 10A.** Number of decimal places for weighing, calculating and reporting

Minimum working sample for purity analysis for the species being analysed, according to Table 2C, column 4 (g)	Minimum number of decimal places for weighing and calculation		Number of decimal places for reporting both methods (10.5.2.1 and 10.5.2.2)
	Counting the whole pure seed fraction (10.5.2.1)	Counting replicates (10.5.2.2)	
1	2	3	4
Less than 1.000	4	4	4
1.000 – 9.999	3	4	3
10.00 – 99.99	2	3	2
100.0 – 999.9	1	2	1
1000 or more	0	1	0

Some laboratories reported the number of decimals as if the received samples would contain more than 100 g of seeds (according to Table 2C that the Table 10A refers to). However, in this PT round the sample size was below 100 g for each of the seed lots, and the comments were given based on Table 10A only.

The PUR Committee was consulted, and the conclusion is that the ISTA Rules need clarification on this point. Therefore, for the final results the given comment was removed.



## **REPORTING ON THE ISTA ORANGE CERTIFICATES**

This exercise was voluntary for all participants.

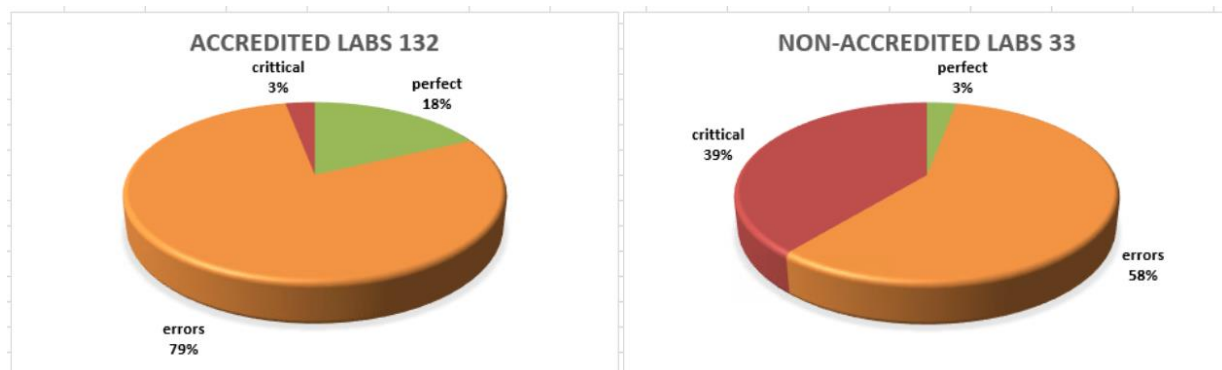
**The completion of the certificate has a training purpose only and it is not rated.**

Out of 197 participants, the completed certificate was submitted for review by 165 participants (84%).

Out of 165 submissions, 132 were from the accredited laboratories and 33 from non-accredited.

Quality of completing the certificates:

132 accredited laboratories		33 non-accredited laboratories	
NO error 24 labs	18%	No error 1 labs	3%
Minor and major errors 104 labs	79%	Minor and major errors 19 labs	58%
Critical errors 4 labs	3%	Critical errors 13 labs	39%
Critical error: certificate is invalid because of <ul style="list-style-type: none"> <li>• Handwriting or</li> <li>• Stamp missing or</li> <li>• Signature missing or</li> <li>• Date of issue missing or</li> <li>• Signs of data alternation/erasures</li> </ul>			



Each participating laboratory receives the personalised report on how the Orange Certificate was completed.