



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments

Germination Referee Study of Kentucky Bluegrass (*Poa Pratensis*)

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Referee Study Objectives

To promote uniformity, standardization, and precision among seed laboratories.

To provide data to be used as supporting evidence improvement or harmonization of seed testing rules.

To identify any research or training needs for KBG.



Germination Rule Comparison

Testing Rules	Substrata	Temperatures (°C)	First Counting day	Final Counting Day	Other Treatments
M&P	TS;TP	15-25; 10-30	10	28	Light, KNO3 Light moisture, Prechill
AOSA	P	15-25	10	21	Light, KNO3 Prechill
ISTA	TP	10-30; 15-25; 20-30	10	21	KNO3; pre chill

TS: Top of Sand
TP: Top of paper

Questions

1. Is the germination different between 28 days and 21 days?
2. Will germination result be equivalent between two temperature regimes?

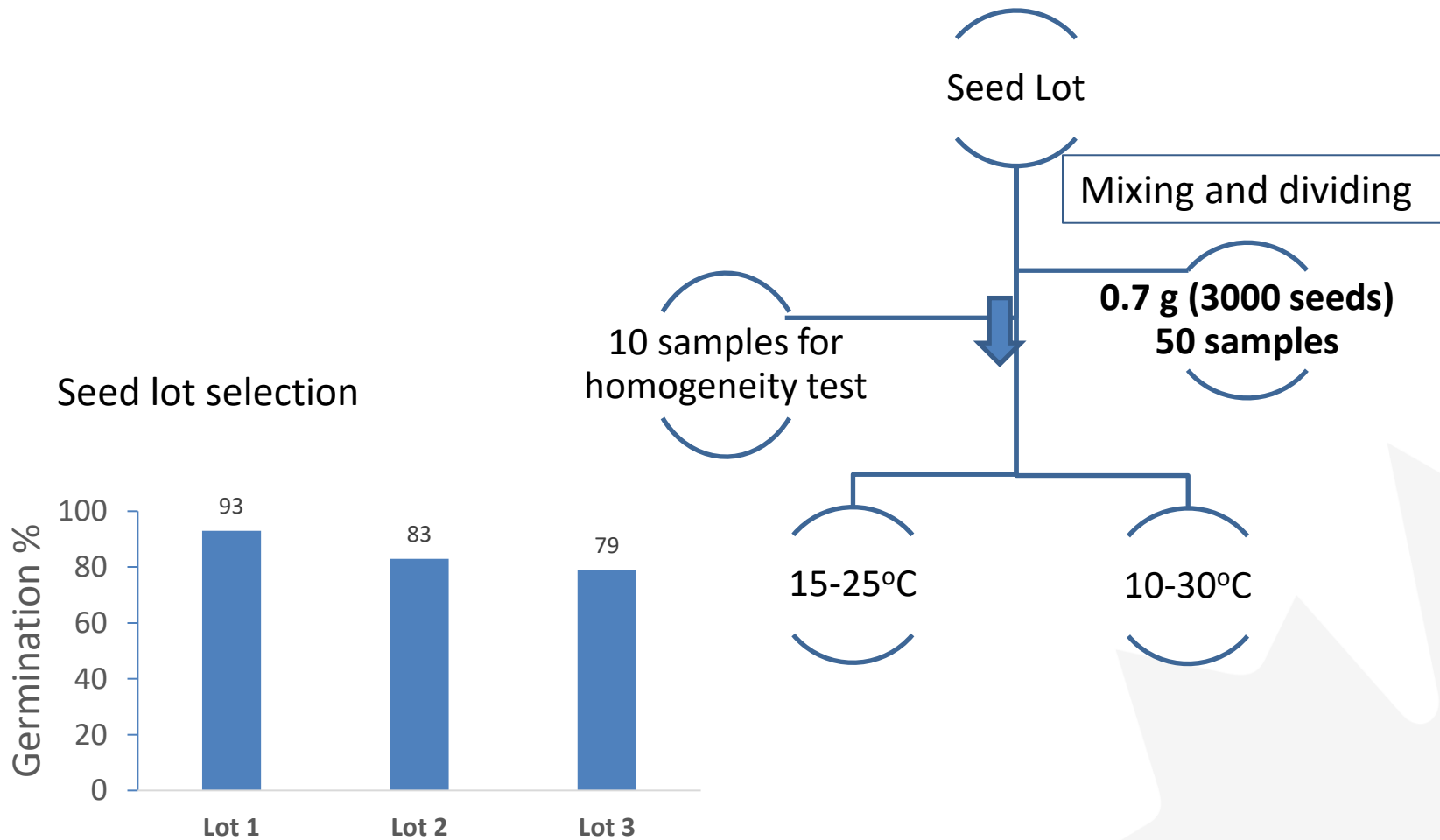
Referee Testing Method Design

Temperatures (°C)	Substrata	Seeds X Reps	Counting days	Treatments
15-25	TP/P*	100 X 4	10, 21 and 28	Light, KNO ₃
10-30	TP/P*	100 X 4	10, 21 and 28	Light, KNO ₃

TP: According to M&P

P: According to AOSA

Referee Sample Preparation

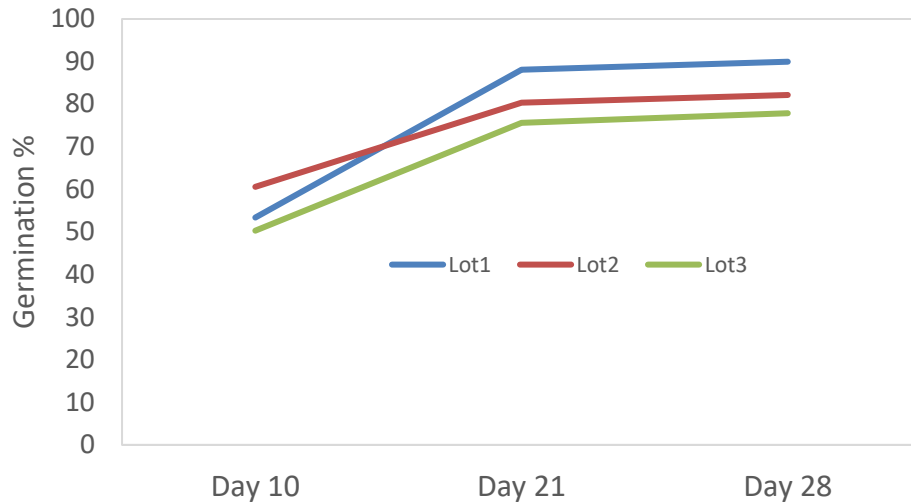


Participants

- In total, there are 29 labs intended to participate in this referee study
 - 6 from Canada
 - 23 from the USA
- Data provided
 - 27 labs provided 15-25 °C data
 - 24 labs provided 10-30 °C data

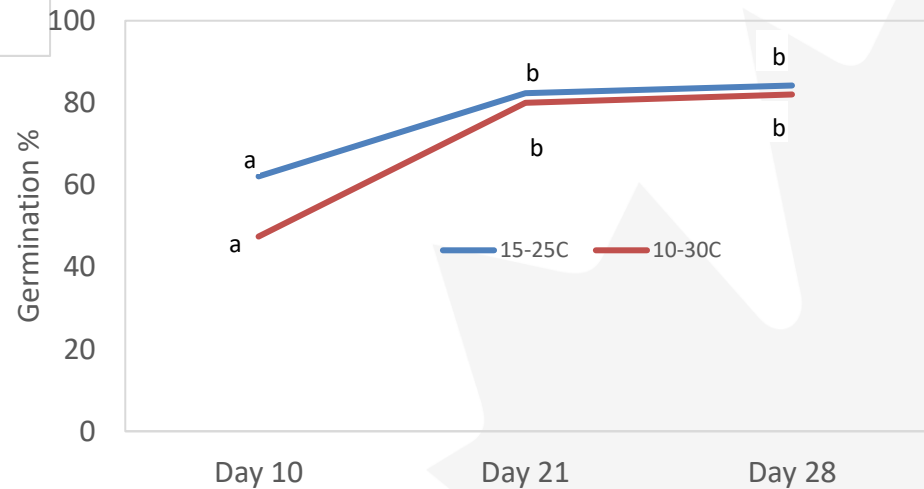
Results of Counting Days

Normal seedlings



Germination % did not significantly differ between day 21 and day 28 for both tested under different seed lots and temperatures

Normal seedlings



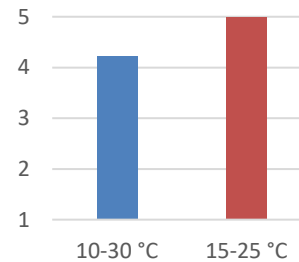
Repeatability and Reproducibility

a. SD of repeatability

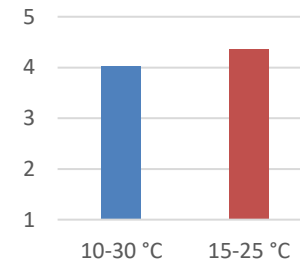
21 days has lower repeatability in 15-25°C



Normal seedling
Day 21

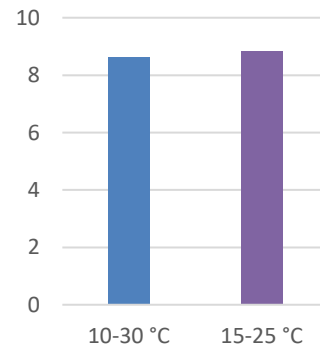


Normal seedlings
Day 28

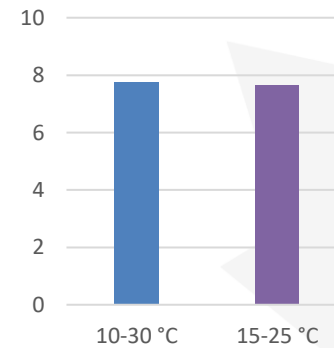


b. SD of reproducibility

Normal seedling
Day 21



Normal seedling
Day 28



Result: Lab performance rating

Result rating against mean

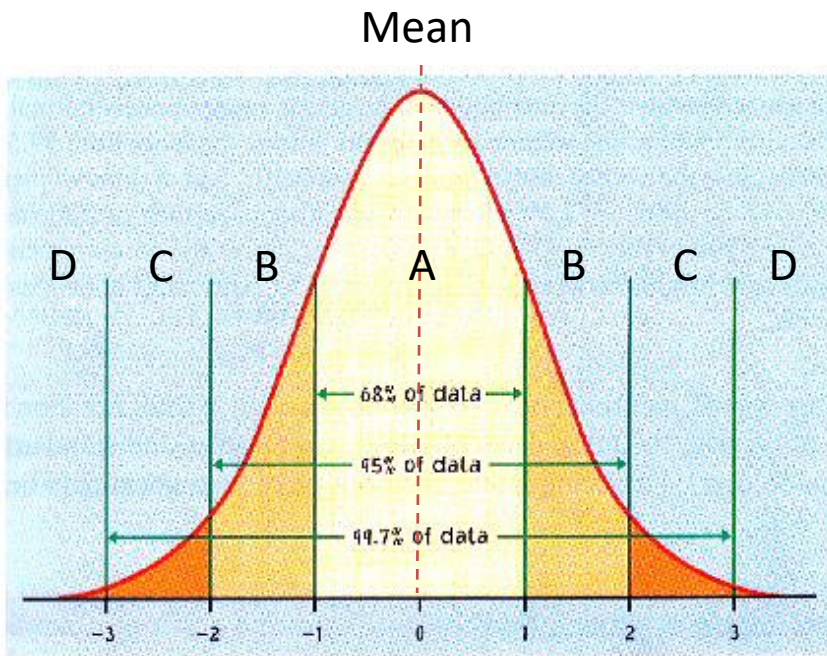
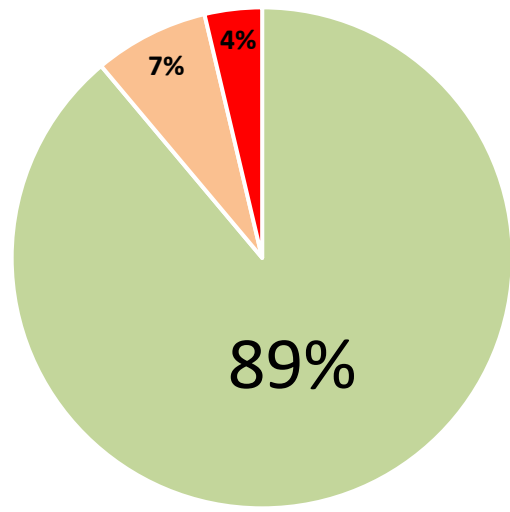


Figure 1.20 The 68–95–99.7 rule for normal distributions.

Z-score. The Z-score compares the distance of the participant's result from the overall sample mean, to the average difference from the mean of all participants. A Z-score of zero indicates the participant's result equaled the overall mean. A high number indicates the participant's result was far away from the mean.

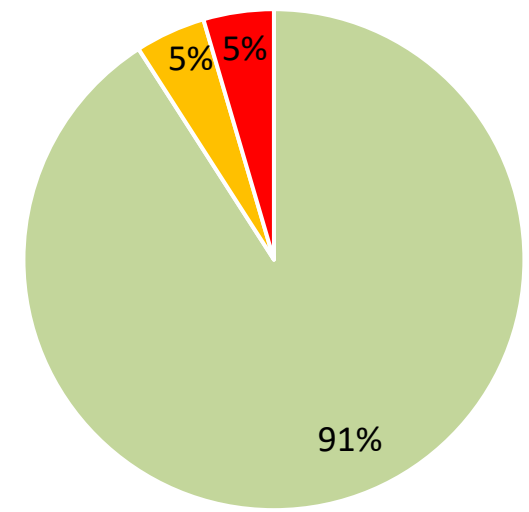
Lab performance

15-25°C



■ A ■ B ■ C

10-30°C



■ A ■ C ■ D

Conclusion & Discussion

- Counting dates
 - According to this referee study, germination of KBG does not have a significant difference between 21 and 28 days
 - Canadian M&P may need a rule change
- Germination temperature
 - Germination results are equivalent between 15-25°C and 10-30 °C



Acknowledgement

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- Jo Ann Hornseth
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Research group

- Julie Lu
- Asanka Godakanda
- Lei Ren



**Thank
You!!!**

QUESTIONS?

