Study on Influence of Substrate Water Level for Germination of *Spinacia oleracea*

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Low germination by excessive water

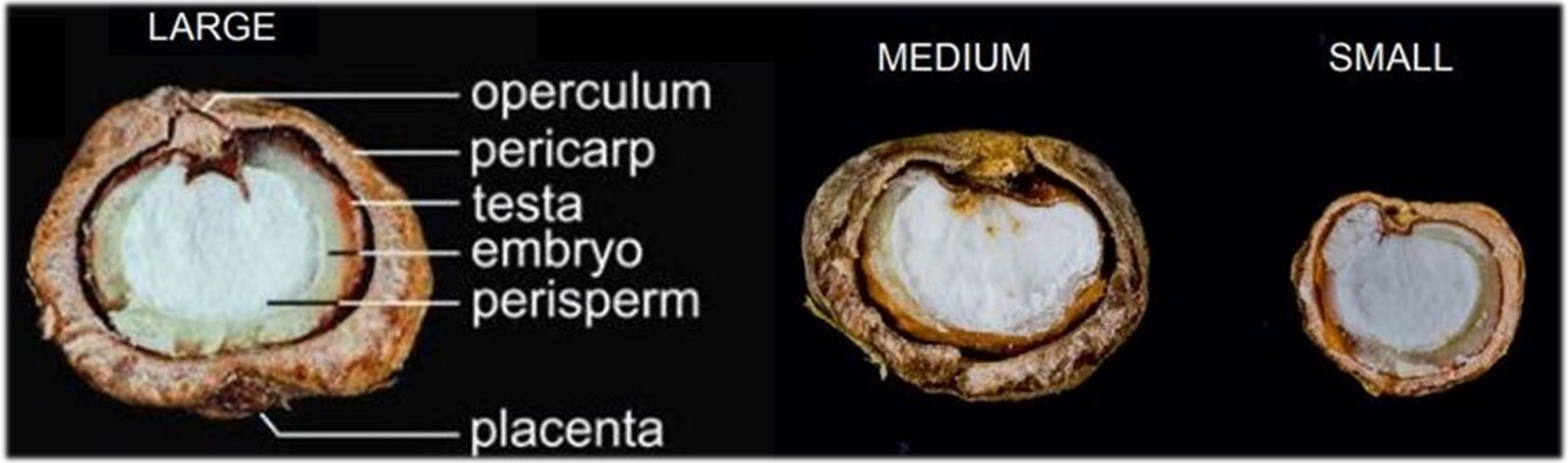
Moderate moisture

Excessive moisture

Seeds in excessive moisture condition

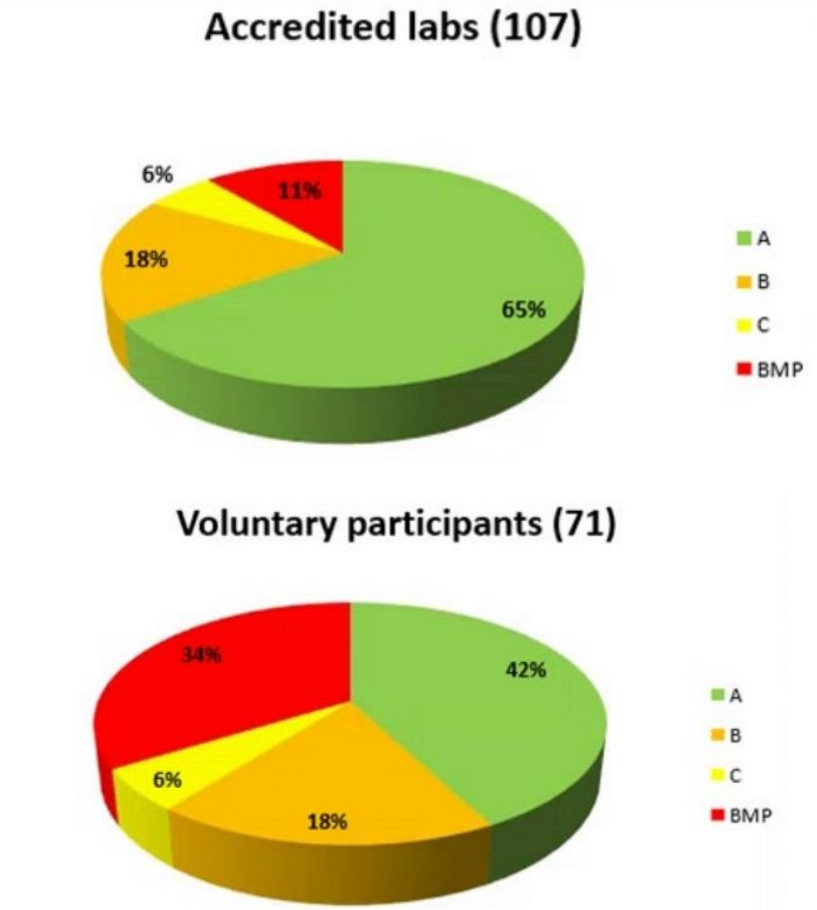
Structure of Spinach seed

Cross-section of large, medium and small seed



(From Magnée, 2022.)

ISTA PT22-2 ; *Spinacia oleracea*



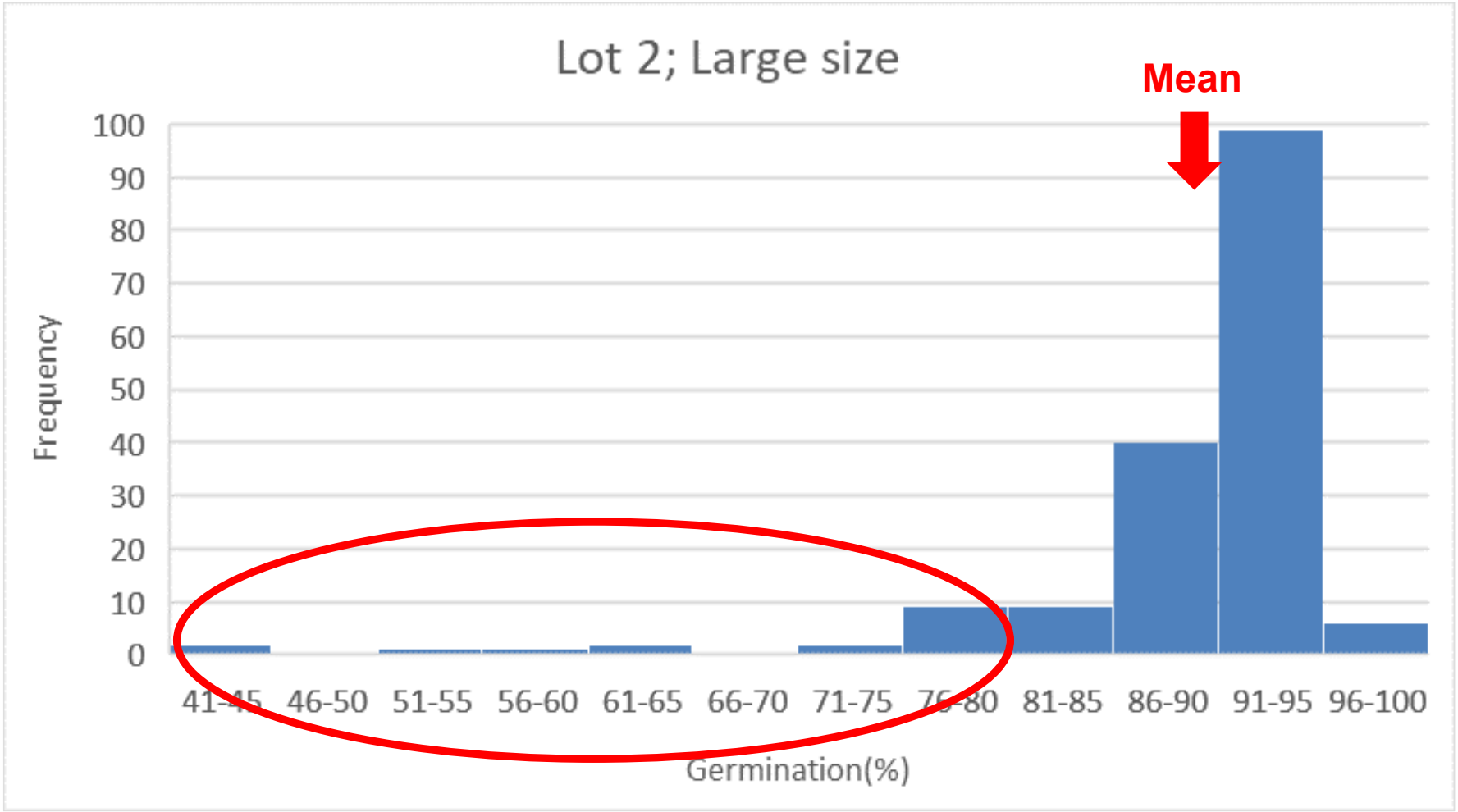
2nd worse for voluntary participants

Means and Standard Deviation

Categories	Mean values %			Standard Deviation		
	Lot 1	Lot 2	Lot 3	Lot 1	Lot 2	Lot 3
Normal seedlings	94	89	95	7.11	8.27	4.97

Lot 1	Medium	2.75-3.5mm
Lot 2	Large	>3.5mm
Lot 3	Small	<2.75mm

Lot 2; Large size : Dispersion



Comparative study

Seed material

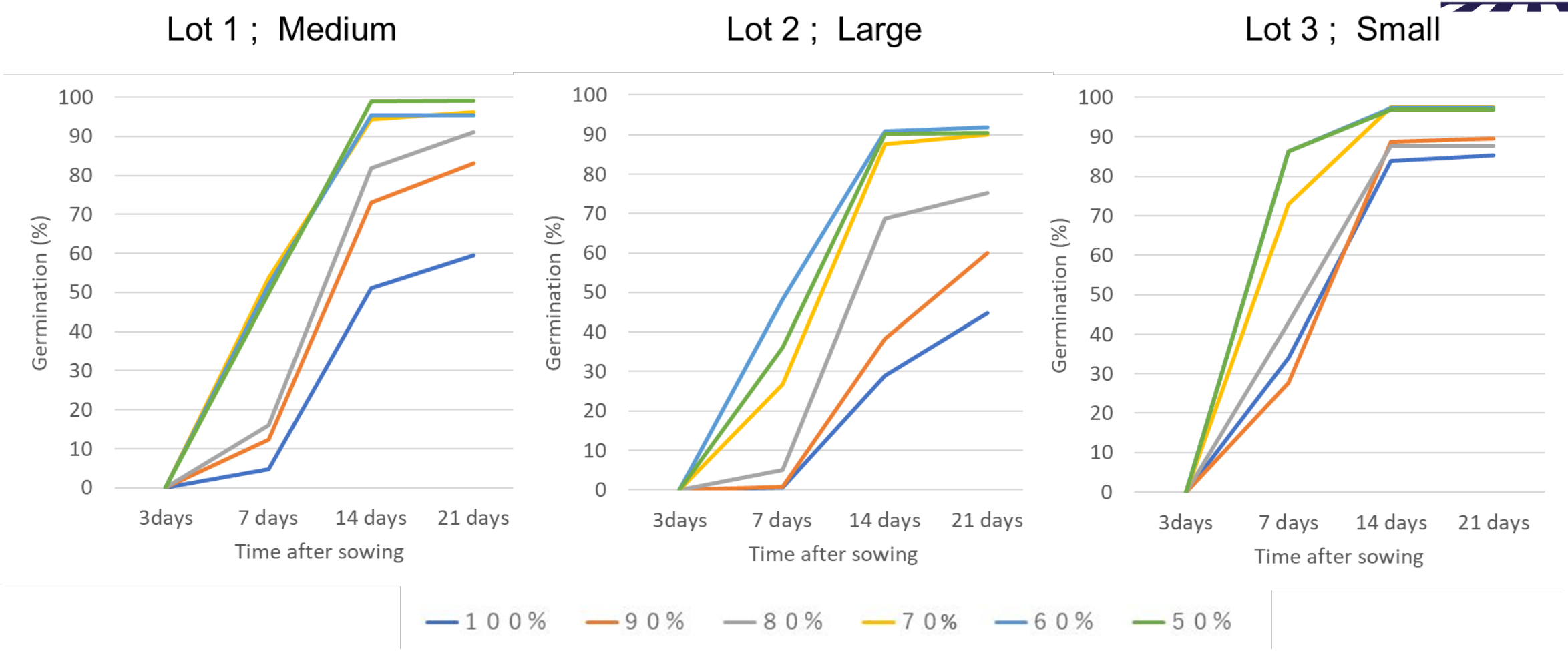
- ISTA PT sample (Secretariat storage)
  - Lot 1: Medium
  - Lot 2: Large
  - Lot 3: Small

Test method

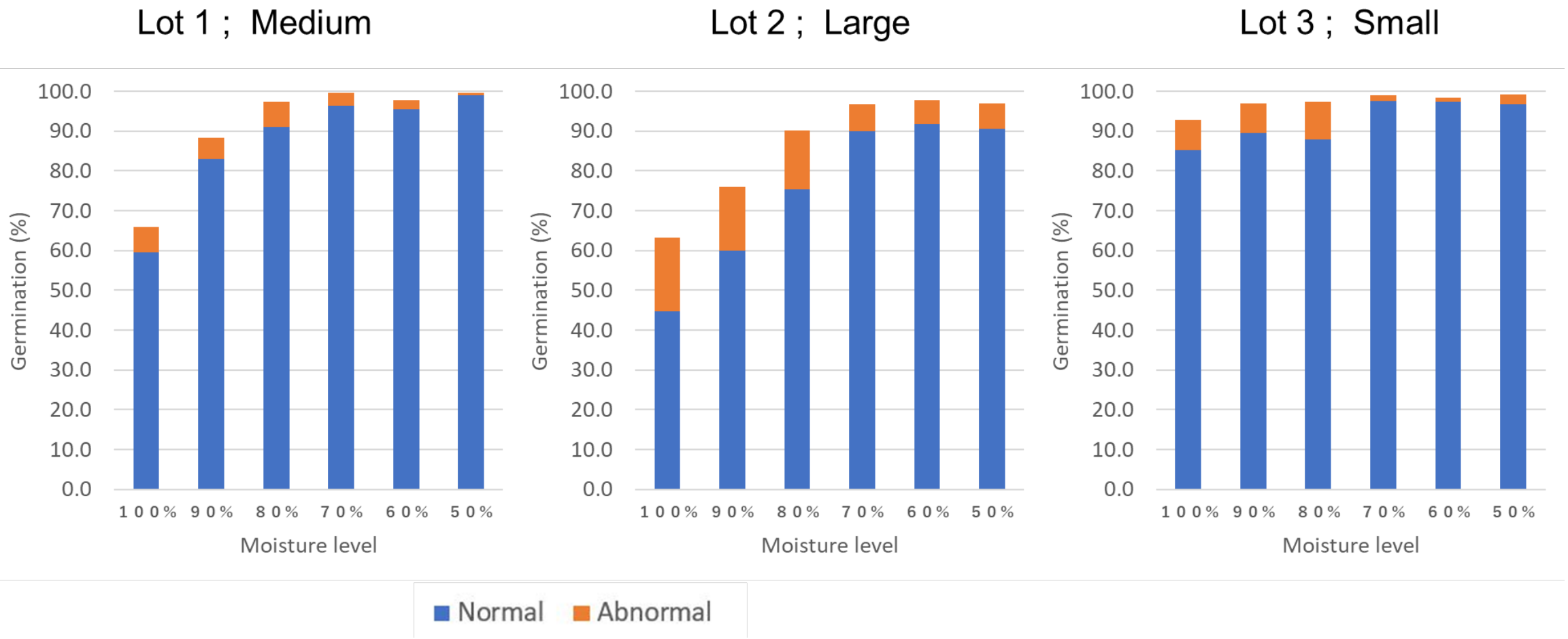
- Pleated paper; 15℃
- Water added

  100%, 90%, 80%, 70%, 60%, 50% (Water holding capacity)

Test result ; Time course of normal seedlings

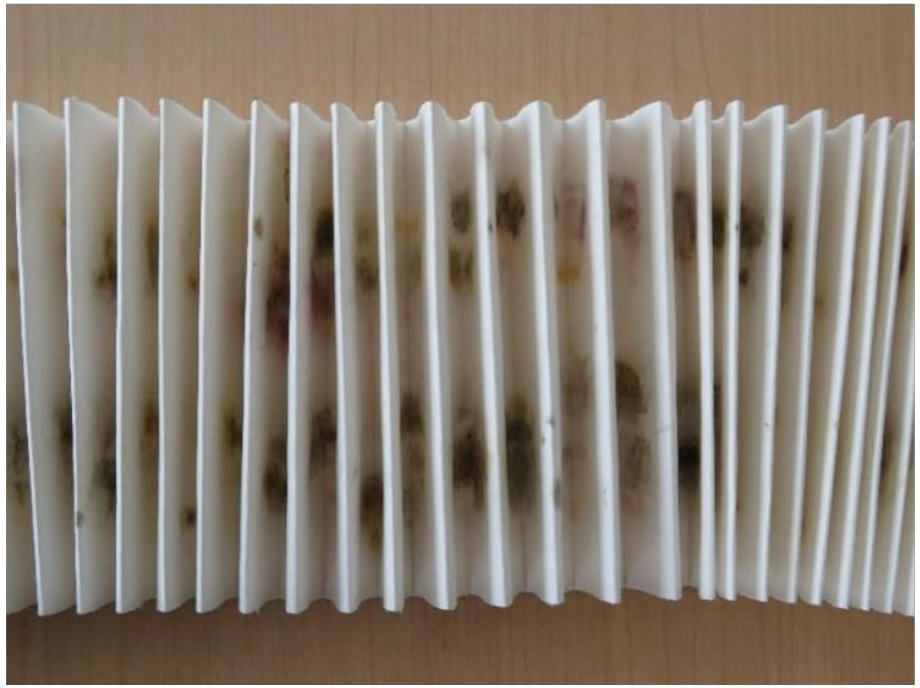


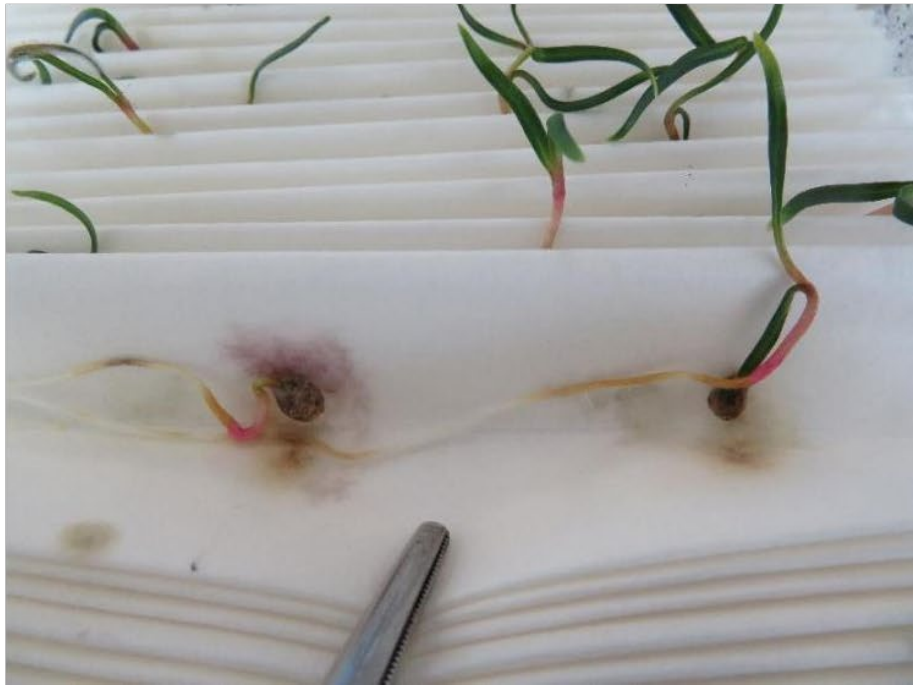
Test result ; Final germination rate



Test result

Water level: 50%





Conclusion

- *Spinacia oleracea* seed is **sensitive to moisture** in germination
- Large seed is more sensitive than small seed
- Water content of the substrate greatly influenced the germination test result
- It is recommended **using lower moisture levels in substrates for *Spinacia oleracea* germination**

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Thank you