

# Do seed weight and germination timing of grass species relate to pre-harvest weather?



Nityananda Khanal\*, Noabur Rahman and Pat Gansevles  
Beaverlodge Research Farm, Agriculture and Agri-Food Canada, Beaverlodge, AB, T0H 0C0  
\*nityananda.khanal@canada.ca

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## Introduction

- Seed harvest of forage grasses starts from mid-July (creeping red fescue) through late-July (bromegrasses) to mid-August (timothy) in the Peace region.
- Various management factors may affect seed quality attributes such as 1000-seed weight and germination.
- Pervading weather conditions especially during reproductive stage may also affect these seed quality attributes.

## Material and Methods

- Species studied:** creeping red fescue, timothy and meadow bromegrass
- Seed weight:** From clean seed samples, 1000 seeds were counted and weighed
- Germination:** A sample of 100 seeds were placed on rows on a tray overlaid by moist blue blotting paper and put in a cold ( $4^{\circ}\text{ C}$ )-chamber for stratification for 72-120 hours. Then, the trays were transferred to seed germination chamber maintained at  $25^{\circ}\text{ C}$  with 8 hours light and  $15^{\circ}\text{ C}$  with 16 hour dark for germination. Seed germination was monitored in a standardized routine as follows:
  - Creeping red fescue: 7<sup>th</sup>, 14<sup>th</sup> and 21<sup>st</sup> day under germinating condition
  - Bromegrass: 7<sup>th</sup> and 14<sup>th</sup> day under germinating condition
  - Timothy: 7<sup>th</sup> and 10<sup>th</sup> day under germinating conditions



## Results

Table 1. Seed weight (1000 seed/g) and germination (%) of different forage grass species grown from 2011 to 2017 at Beaverlodge.

| Values  | 1000 seed weight (g) |      |         | Germination (%) |      |         |
|---------|----------------------|------|---------|-----------------|------|---------|
|         | CRF                  | MB   | Timothy | CRF             | MB   | Timothy |
| Min     | 1.09                 | 5.34 | 0.40    | 92.0            | 92.0 | 95.0    |
| Max     | 1.59                 | 5.99 | 0.67    | 98.0            | 98.0 | 99.0    |
| Average | 1.30                 | 5.67 | 0.47    | 94.8            | 95.8 | 97.0    |

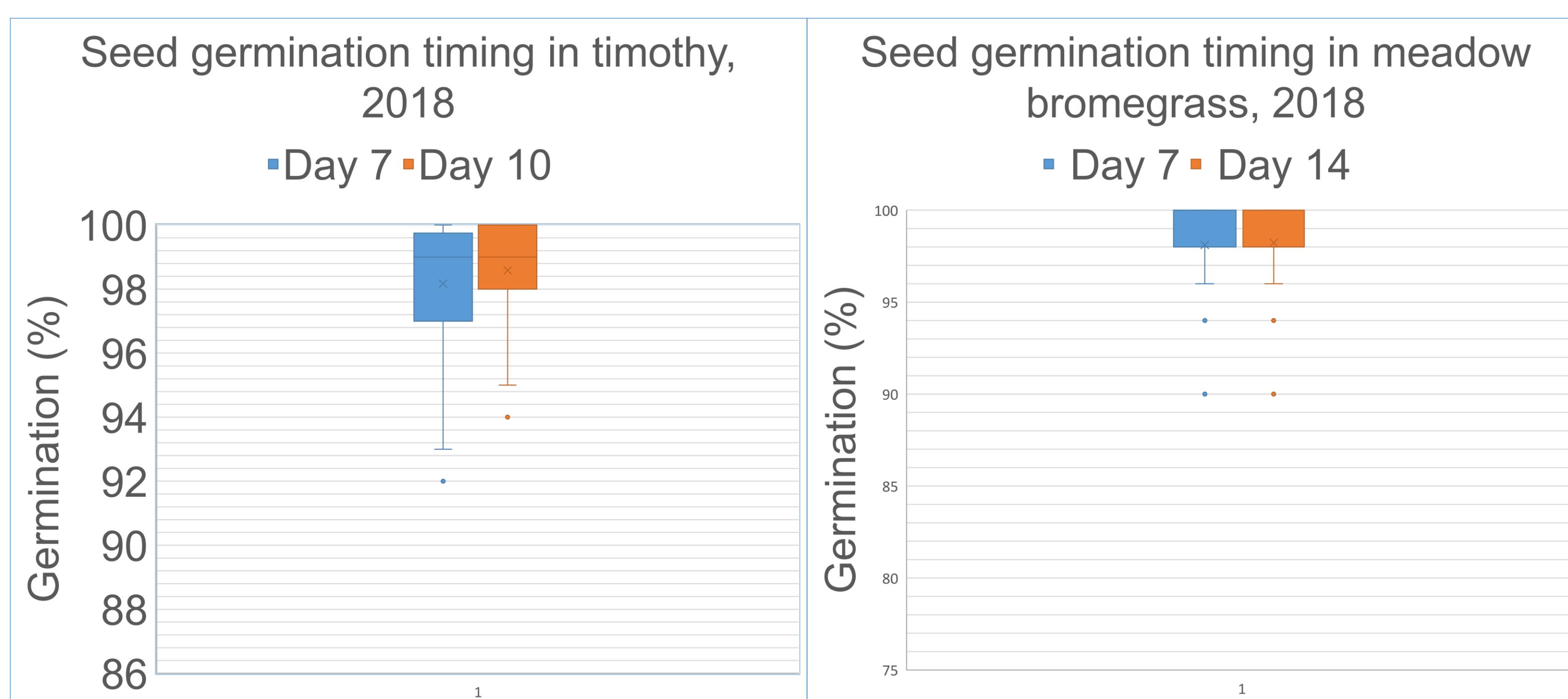
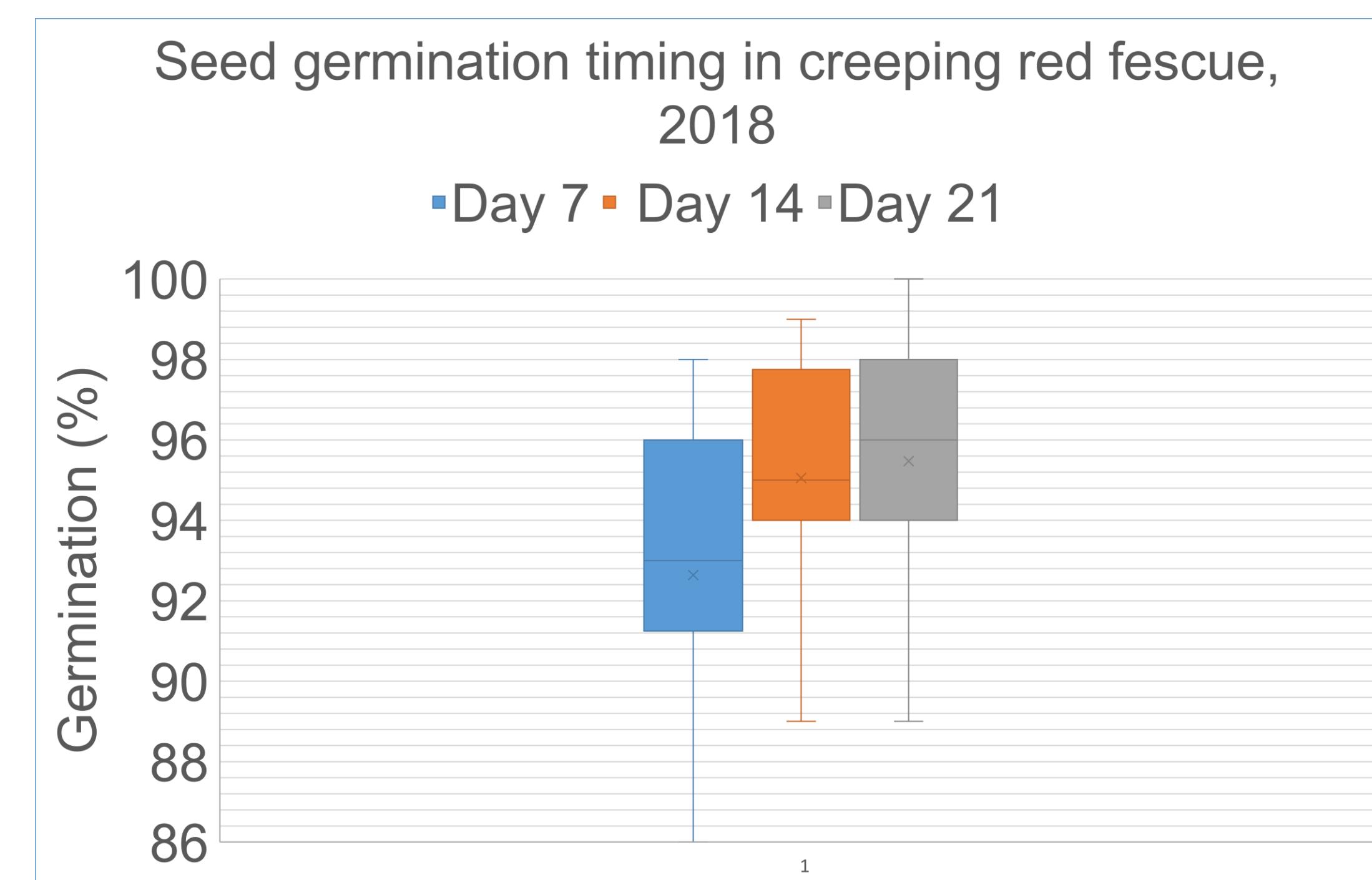
CRF = Creeping red fescue

MB = Meadow bromegrass

Table 2. Pearson correlation coefficients of 1000-seed weight (g) and germination (%) with number of days with less than  $8^{\circ}\text{ C}$  and total precipitation in the month of July from 2011 to 2017

| Forage Species | 1000-seed weight (g) |          | Germination (%) |          |
|----------------|----------------------|----------|-----------------|----------|
|                | Temperature          | Rainfall | Temperature     | Rainfall |
| CRF            | -0.217               | -0.100   | <b>0.681*</b>   | 0.448    |
| MB             | -0.510               | -0.656   | -0.362          | 0.474    |
| Timothy        | 0.077                | 0.352    | -0.524          | 0.512    |

\* significant at 10% level of significance ( $P \leq 0.10$ )



## Conclusions

- 1000 seed weights of grass species vary between the samples within and over the years.
- Mean germination after 7 days at  $20^{\circ}\text{ C}$  is 93% for creeping red fescue, and 98% in both timothy and meadow bromegrass.
- Number of cold days ( $< 8^{\circ}\text{ C}$ ) and total precipitation in the month of July have differential effects on seed weights and germination of grass species.

### Acknowledgements:

The Peace River Region Forage Seed Association and Canadian Agricultural Partnership for funding; Rahman Azooz, Mike Leighton and Nathan Logan for their technical support.



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