



Induction of Flowering and Seed Production in Ecotypes of *Festuca hallii*

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Overview

- ❑ Introduction
- ❑ Objective and Hypothesis
- ❑ Materials and Methods
- ❑ Results
- ❑ Conclusions & Future work

Festuca hallii and Fescue Prairie in Western Canada

- ❑ Important forage
- ❑ Habitat loss due cultivation
- ❑ Biodiversity, Forage breeding and reclamation
- ❑ Increasing demand of seeds
- ❑ Inconsistent seed producer

Festuca hallii and Fescue Prairie in Western Canada

- ❑ Grasslands located on black chernozemic, fine clay-loams
- ❑ Densely tufted, weakly rhizomatous, perennial grass
- ❑ Flowering between late-May and June
- ❑ Seeds shatter in July-August
- ❑ Flowering requires vernalization

Objective and Hypothesis

Objective:

To determine the morphological and phenological diversity among ecotypes of *Festuca hallii* from Western Canada.

Hypothesis:

Under similar environmental conditions, the morphological and physiological features are different among ecotypes.

Seed Collections

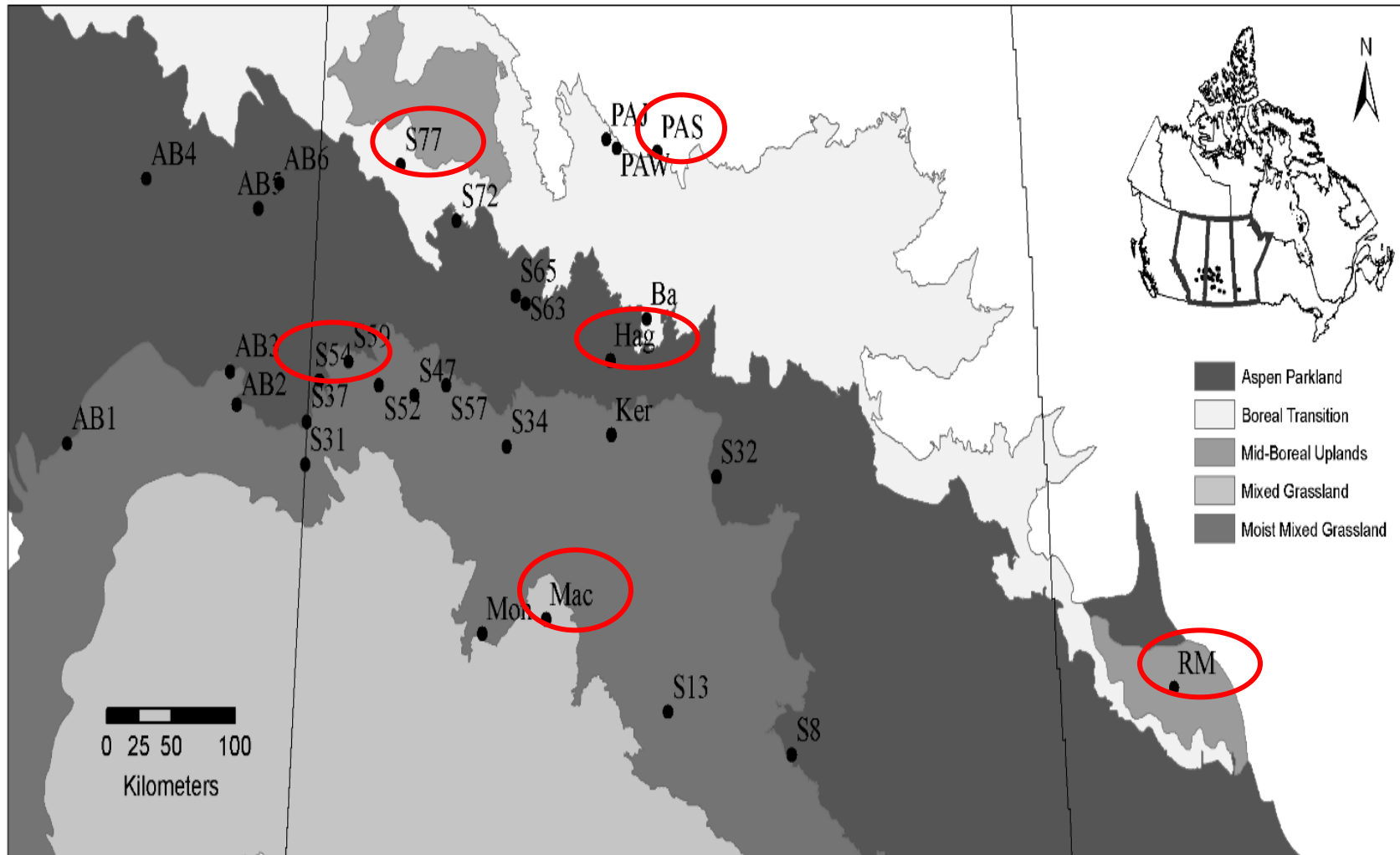


Fig 1. Geographic locations of 6 sites

Major Site Characteristics

Sites	Ecozone	Ecoregion	Latitude(N)	Longitude(W)	MAT(°C)	MAP(mm)
Riding Mountains (RM)	B	MB	50°48'35''	100°14'42''	1.2	503.5
Macrorie (Mac)	P	MG	51°13'48''	107°13'48''	3.2	322.4
PA-Southend (PAS)	B	BT	53°35'16''	106°02'26''	0.5	441.0
Hague (Hag)	P	AP	52°32'22''	106°33'17''	1.1	397.5
Macklin(S54)	P	AP	52°20'56''	109°53'02''	2.1	407.6
Turtleford (S77)	B	BT	53°27'38''	109°03'12''	1.2	421.6

MAP= Mean annual temperature; MAT= Mean annual precipitation

Eco-zone: B= Boreal forest; P=Prairie

Eco-region: AP= Aspen Parkland; BT= Boreal Transition; MB=Mid-Boreal upland;
MG=Mixed Grassland

Seedling Establishment

May, 2008, AAFC, Saskatoon Research Centre

Randomized complete block design (RCBD)

Plot size is 1 m². Five replications for each ecotype

Second week of November, seedlings moved to greenhouse

No flowering in the field grown seedlings

Artificial Vernalization (Wang et al, 2003)

18°C/12h light period ->3 days

12°C/10h light period ->3 days

5°C/8h light period ->11 weeks

12°C/10h light period ->3 days

18°C/12h light period ->3 days

Variables and Parameters for Measuring Phenology and Seed Production



Fig 2. A rough fescue plant grown in greenhouse

- Average number of flowering tillers/plant
- Average height of flowering tillers
- Flowering time
- Number of seeds/ tiller
- Seed mass

- Average number of Vegetative tillers/plant
- Average height of plant
- Above ground biomass
- Belowground biomass

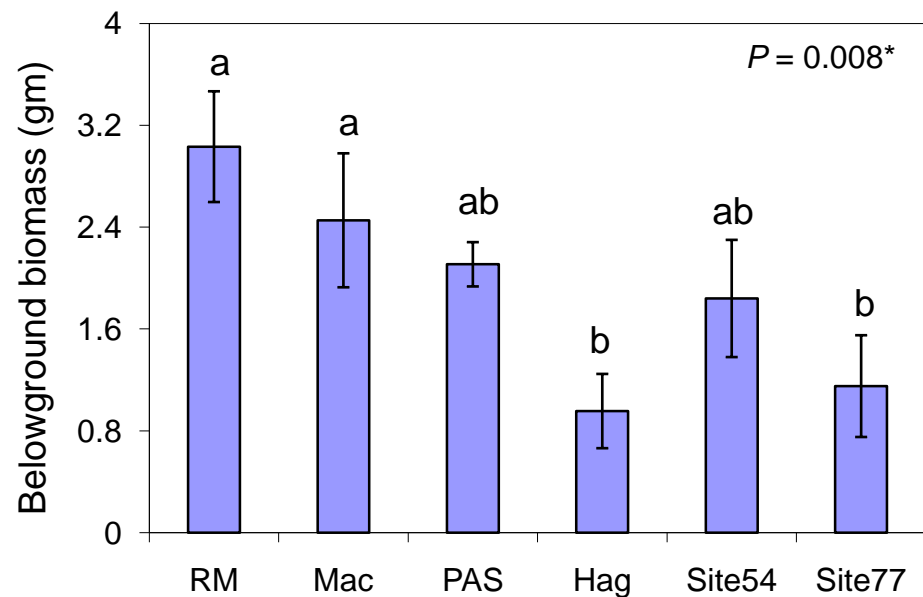
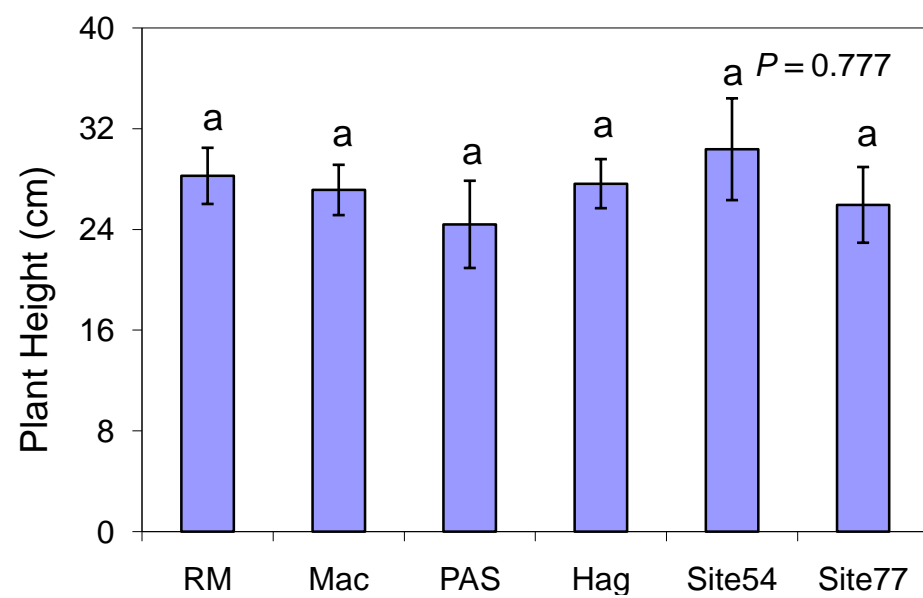
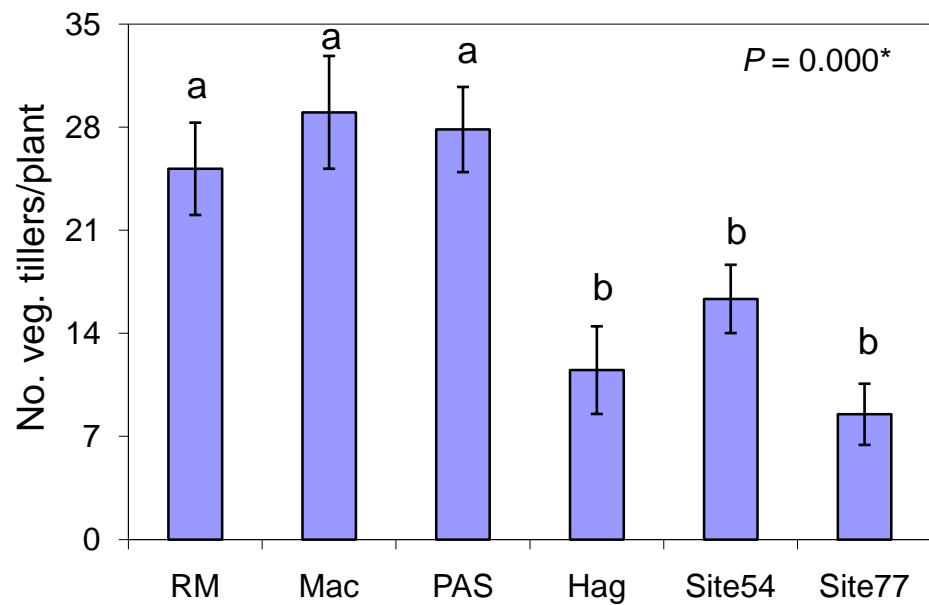


Fig 3. Morphological characteristics of the studied ecotypes of *Festuca hallii* (n = 30)

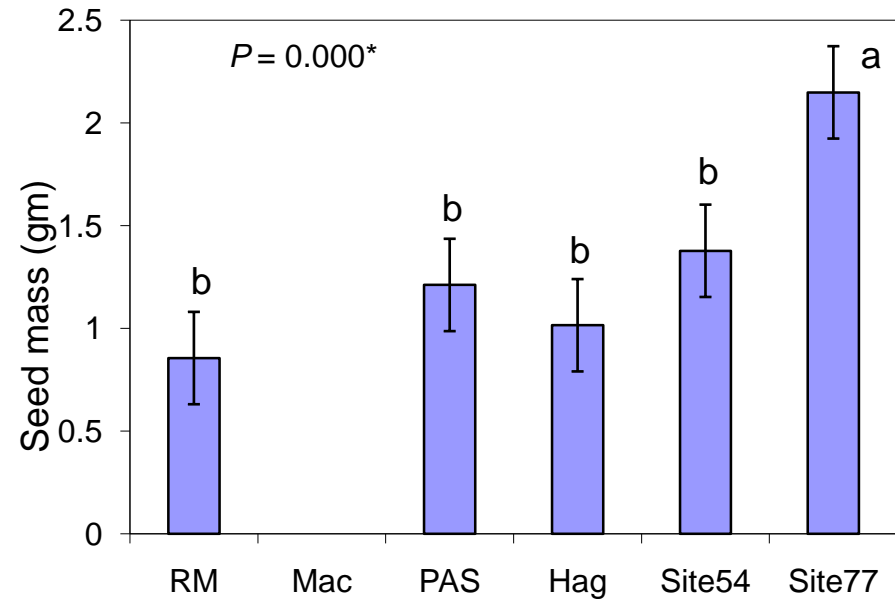
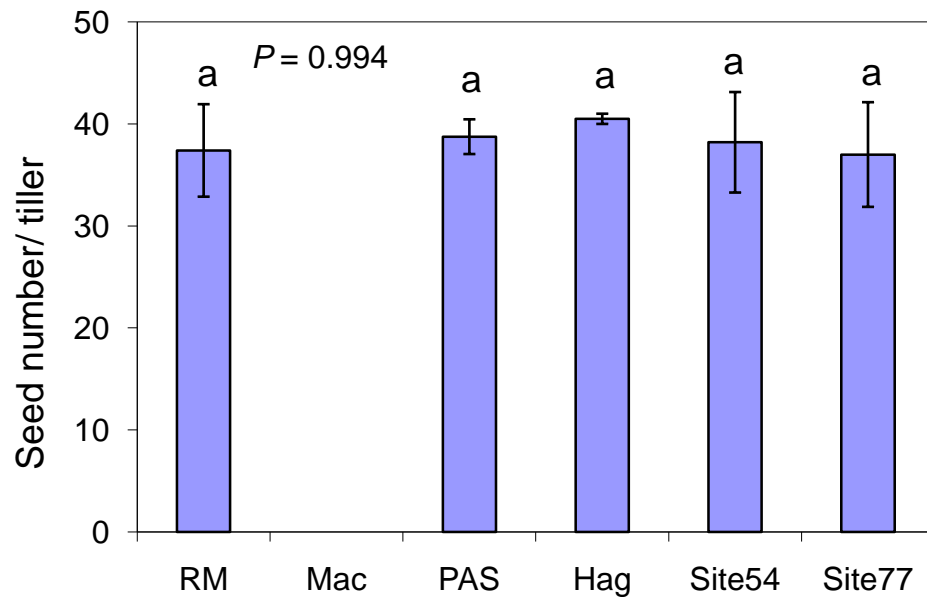
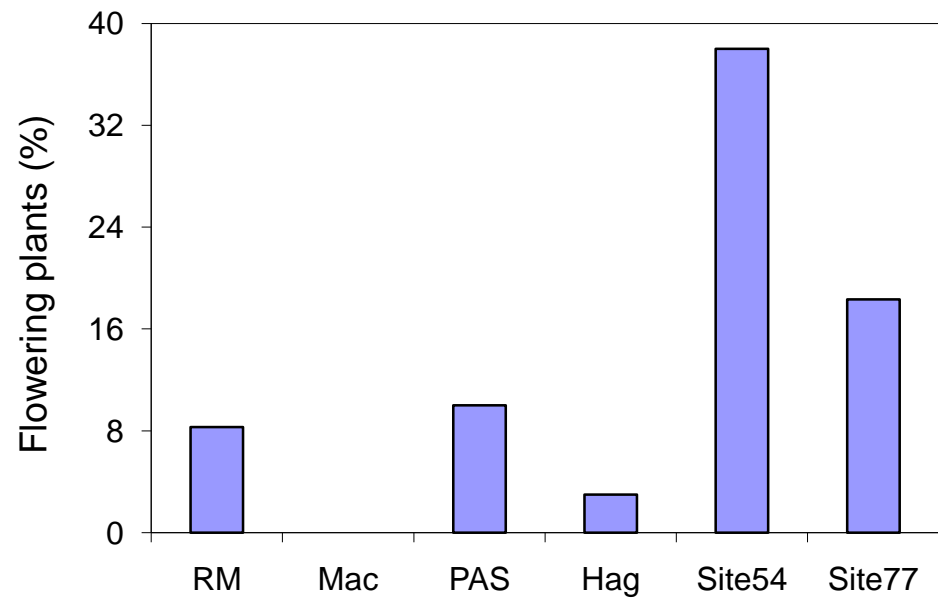
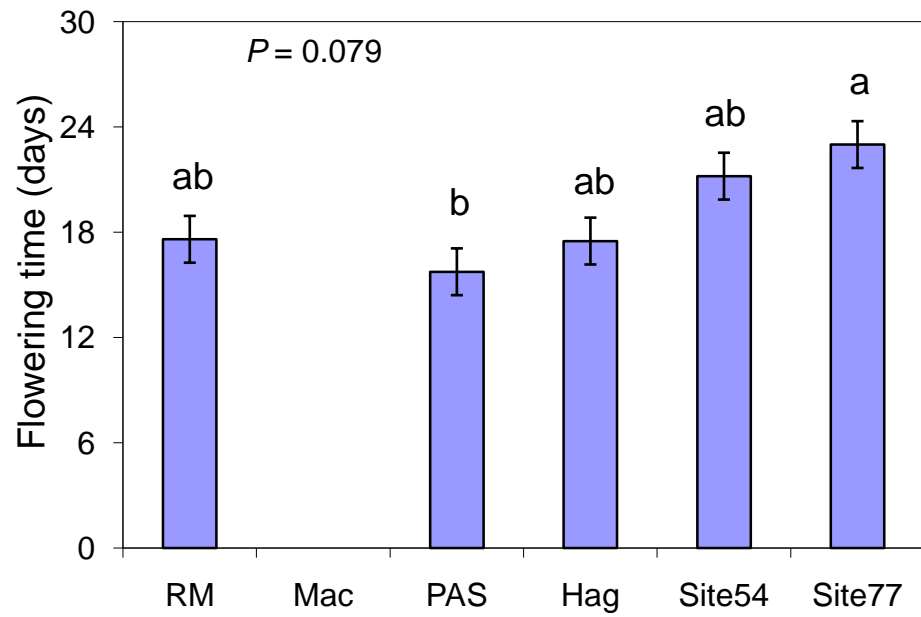


Fig 3. Reproductive characteristics of the studied ecotypes of *Festuca hallii* (n = 30)

Correlation Results

Parameters	<i>r</i> -value
No of vegetative tillers and seed mass	-0.472*
Aboveground biomass and seed mass	-0.640**

Conclusions and Future Work

- ❑ Parental environment has a strong influence on the morphological and phenological development
- ❑ No seeds from Macrorie collection. Highest mean annual temperature, growing season, growing degree days above 5°C and lowest precipitation
- ❑ Study on the influence of different environmental factors on reproduction

Acknowledgement

Plant Gene Resources of Canada
Agriculture Development Fund

Supervisors

Dr. Yuguang Bai (U of S)

Dr Richard St-Pierre (AAFC)

Advisory Committee members

Drs Karen Tanino, Jim Romo, Bruce Coulman

Lab members

Jie Qiu, Jin Li, Dr Yongsheng Wei, Lixue Wang, Jushan Liu

Nancy Melnychuck (AAFC)



Thank you all!

A photograph of a lush green field of tall grass, likely a meadow or prairie. The grass is in focus, with several stalks in the foreground and many more in the background. A central text box with a blue border and rounded corners is overlaid on the image. The text 'Thank you all!' is written in a black, serif font. The background of the slide is a light beige color with a subtle pattern of overlapping circles in the top left corner.