

The Effect of Stratification and Ethephon on *Liatris novae-angliae* Seed Germination

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Objective

Comparing germination rates of ethephon and stratification treatments of *Liatris novae-angliae*.

Introduction

- *Liatris novae-angliae* is commonly known as New England Blazing Star (Massachusetts Division of Fisheries and Wildlife 2019).
- It is listed as a species of Special Concern under the Massachusetts Endangered Species Act and is rare throughout its range (Massachusetts Division of Fisheries & Wildlife 2019).
- Its threats include development, exclusion of disturbance, use of herbicides, mowing, deer browse, and trampling (Massachusetts Division of Fisheries & Wildlife 2019).
- *Liatris* species typically require at least 60-day stratification, or cold treatment, in order to germinate (Baskin & Baskin 1989).
- Ethephon, a plant growth regulator, has been proven effective in improving seed germination in other Asteraceae species (Sari et al 2001).

References

Baskin, J. M., & Baskin, C. C. (1989). Ecophysiology of Seed Germination and Flowering in *Liatris squarrosa*. *Bulletin of the Torrey Botanical Club*, 116(1), 45–51. Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program. (2019). *New England Blazing Star* *Liatris novae-angliae* [Fact sheet].



Liatris novae-angliae (northern blazing star), Dartmouth, MA. Doug McGrady

Materials and Methods

Seeds were obtained from Dr. Bryan Windmiller at Zoo New England. All experiments used the population from Foss Farms in Massachusetts.

Stratification

- Seeds were planted in peat-based soil
- Pots were left in a cold room for 30, 60, or 90 days
- Once removed from stratification, the number of seeds germinated was counted after 14 days

Ethephon

- 1 mM ethephon solution was made by diluting 0.185 mL of ethephon with 40.815 mL of water
- Seeds were placed into petri dishes lined with two pieces of filter paper
- Filter paper and seeds were saturated with diluted ethephon solution
- The petri dishes sat at room temperature and the number of seeds germinated was counted after 14 days

Results

- A one-way ANOVA showed that the 30-day, 60-day, and both ethephon trails were all equivalently effective.
- It also showed that these four trails were significantly different from the control.

Trial	Percent germination
Control	4 a
30-day	55 b
60-day	64 b
Ethephon #1	71 b
Ethephon #2	64 b

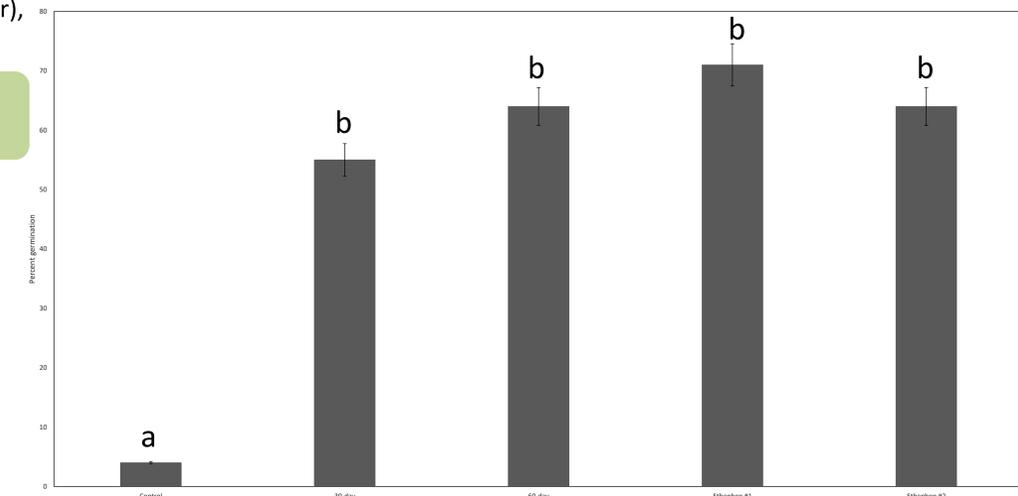


Figure 1. Percent germination after 14 days.

Conclusions/Future Directions

- The plants grown during this experiment will be used for restoration.
- Sixty-day stratification is the most common method for germination of *Liatris novae-angliae*, but ethephon treatment may be able to replace this after displaying the same amount of effectiveness.
- The 90-day stratification trail is still in cold treatment and those results will be compared once obtained.
- The ethephon treatment will be used on another population of *Liatris novae-angliae* and many different *Liatris* species to see if it proves just as effective.