

Success of Wildflowers: Pollination, Stratification, Germination



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INTRODUCTION

Do you want a more productive vegetable garden this year? The best way to promote a fruitful garden is by planting a wildflower garden next to it to attract pollinators. Some of our favorite fruits and veggies that rely on pollinators are tomatoes, blueberries, avocados, apples, cherries, grapefruit, pumpkin and strawberries (1).

A pollinator is an animal that assists in the fertilization of a flowering plant by moving pollen from the male anther of a flower to the female stigma of a flower (2). Pollinators are extremely important for many garden vegetables because once fertilization occurs, each ovule develops into a seed (containing the embryo) and the ovary develops into the fruit around the seed.

Also, who doesn't enjoy having colorful wildflowers by their garden? However, knowing which native wildflowers attract the most pollinators is important when planting. After completing this study I hope to answer that question.

This experiment investigated four species of native wildflowers (Jewelweed, Goldenrod, Ironweed, Wild Sunflower) in order to understand:

1. Which species attracted the most pollinators?
2. Which species is the most effective at sprouting from seed when taken from the wild?
3. Which conditions are the most beneficial for germination?

SUBJECT SPECIES



Jewelweed
Impatiens capensis



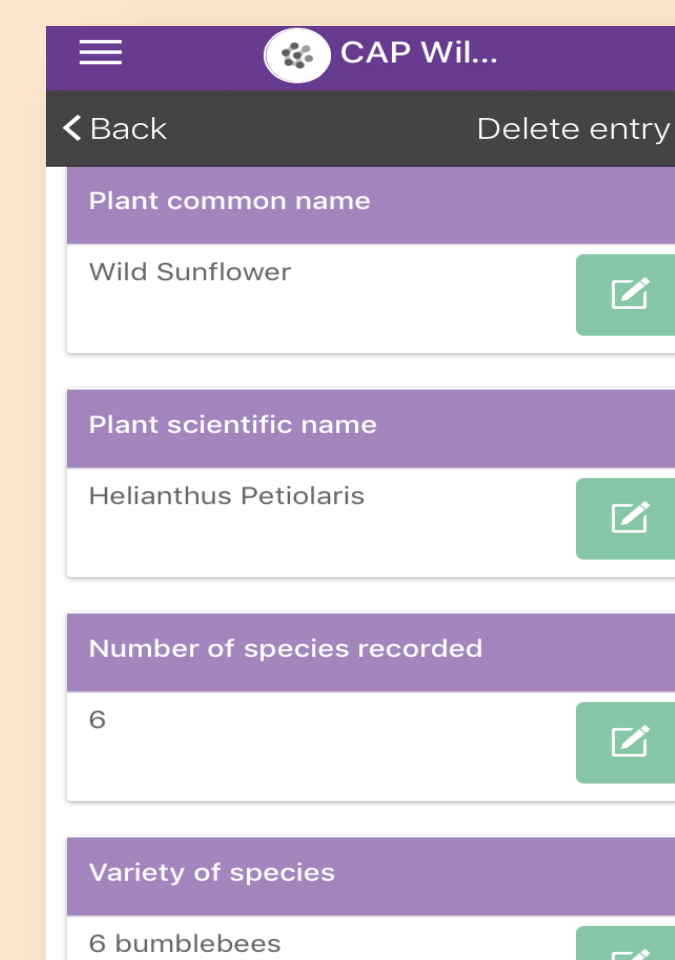
Goldenrod
Oligoneuron Spp.



Wild Sunflower
Helianthus petiolaris



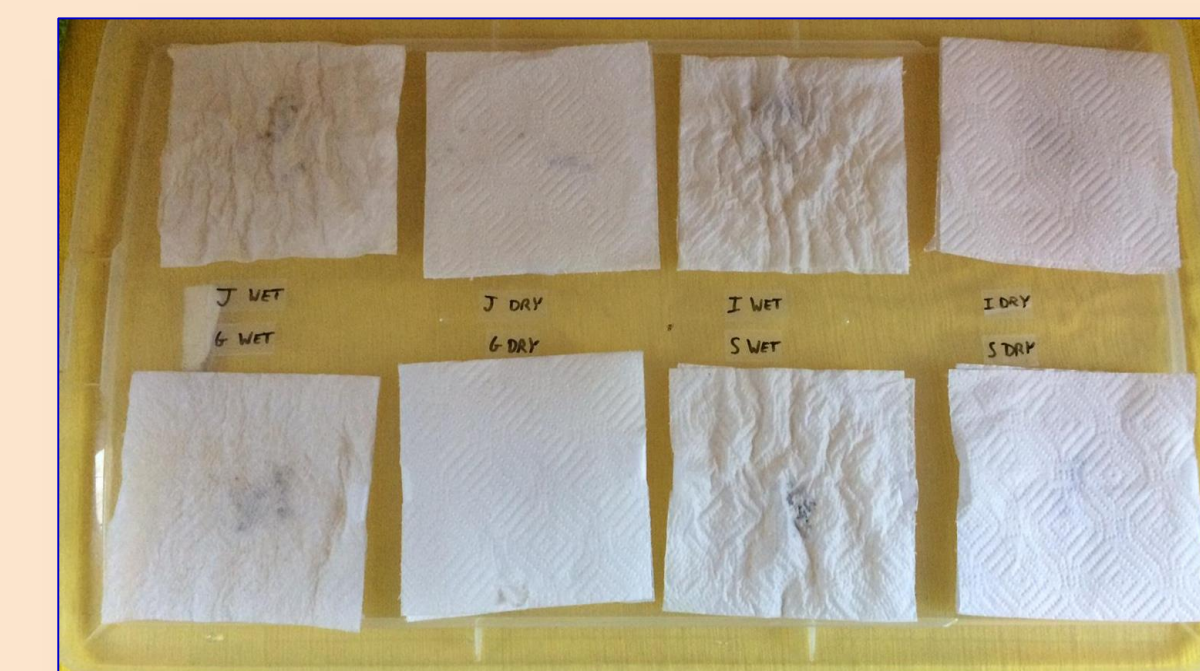
Ironweed
Vernonia Spp.



(Left) Bumblebee on a Goldenrod plant. (Middle) Example of Epicollect data form. (Right) Observing wildflower plot in BOTR.

Stratification

- ❖ Seeds were collected from all 4 subject species at BOTR.
- ❖ A portion of each of the four species seeds were split into four stratification conditions: (1) dry room temp, (2) wet room temp, (3) dry refrigerated, (4) wet refrigerated, for a duration of one month (October 14 - November 14).



The wet and dry room temp seeds during germination



Seeds planted in individual containers

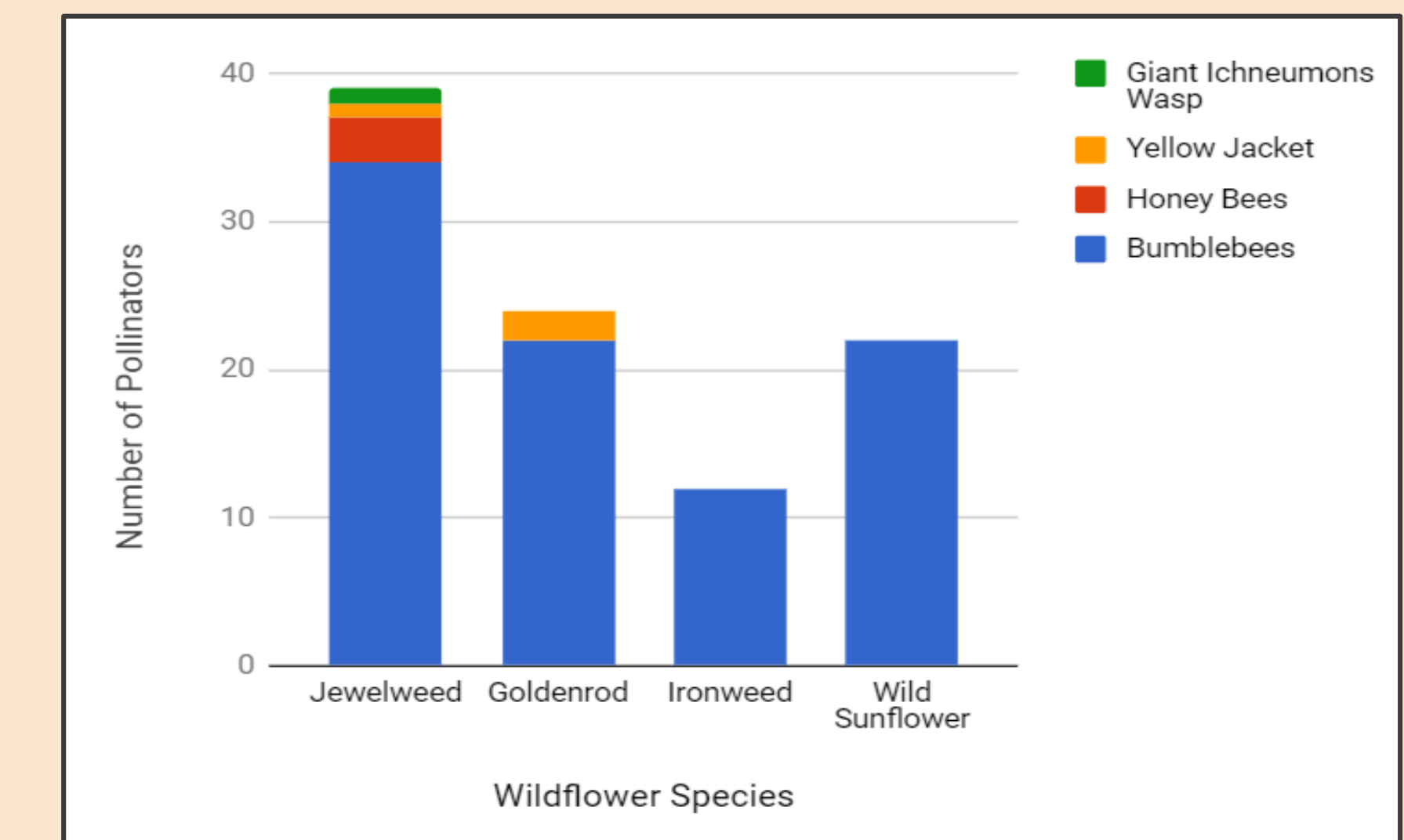
Germination

- ❖ The seeds were then planted in 16 small containers on November 16th.
- ❖ Each container held about 8 seeds with only one species per container.
- ❖ They were germinated at Newtown High School greenhouse maintained at about 80°F, and watered daily.

RESULTS

Pollination

The following graph shows the total number of each pollinator species observed during the three days to measure success of the 4 flower species in attracting pollinators.



➤ Note: the Ironweed plant was smaller and therefore had less flowers to attract pollinators

Stratification

The stratified seeds that were fit for planting included: dry room temp, dry refrigerated, and wet refrigerated conditions for all of the species. The seeds of all four species were moldy after a month in the wet room temp condition.

Germination

Weeds took over the seed containers and outcompeted the wildflower seeds, greenhouse results were inconclusive.



Weeds outcompeting the wildflower seeds

CONCLUSIONS & TAKE HOME LESSONS

- ❖ Jewelweed was the most successful in attracting pollinators. Not only did it attract the highest number of pollinators (39), but it also attracted the highest diversity of pollinators (4 different species).
- ❖ Based on these results, we recommend considering planting Jewelweed seeds nearby to attract numbers and variety of pollinators.
- ❖ Stratified seeds in all conditions except wet room temp, resulted in non-moldy seeds, ready to germinate.
- ❖ If the experiment could be conducted again, fresh uncontaminated soil would be used to eliminate the unwanted weeds and allow for the wildflower seeds to grow.

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1. "Pollinator." *Biology Online*, 9 Oct. 2006, www.biology-online.org/dictionary/Pollinator.
2. "List of Pollinated Food." *Pollinator.org*, pollinator.org/list-of-pollinated-food.