

# Late, Isolated Plants Display Differing Reproductive Success in *Echinacea angustifolia*

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## INTRODUCTION

Once spanning the central United States, many communities of *E. angustifolia* have experienced drastic habitat fragmentation. In order to maintain population sizes and growth rates, we must consider factors that are limiting plants from receiving enough pollen and producing seeds.

I looked at plants at extreme phenological and spatial locations in order to see how dependent the seed set of *angustifolia* is on these factors. We expect spatial location to be a significant factor in seed set.

Additionally, pollen limitation and seed set can be determined by flowering phenology, or when and how long the *E. angustifolia* blooms in order to attract pollinators.

## METHODS

-Geospatial data from 1400 plants from 14 remnant prairies were used to determine the plants spatial and temporal attributes

-Achenes were picked from the heads of the plants and were separated into three categories: top, middle and bottom

-Achenes in the middle were randomly selected, and were picked after the “top” and “bottom” achenes were picked. Data presented is based on “middle” achenes

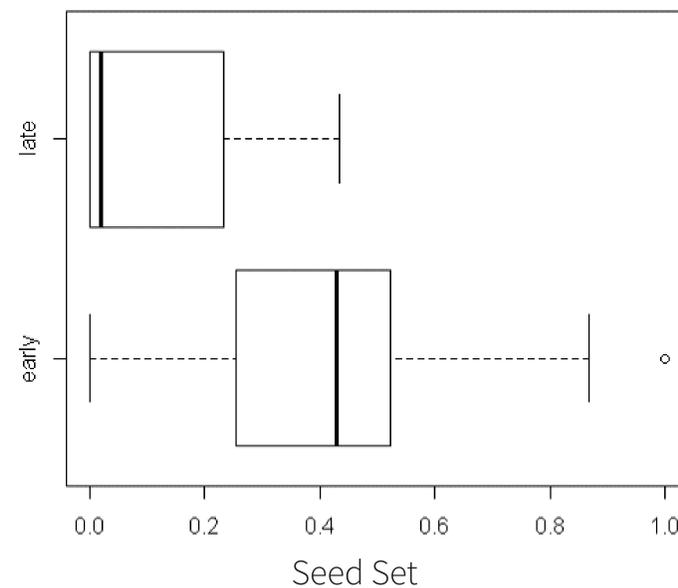
-Seed Set: (Achenes w/ Seeds) / (Total Viable Achenes)

-Closeness is a plant’s distance to its fifth nearest neighbor

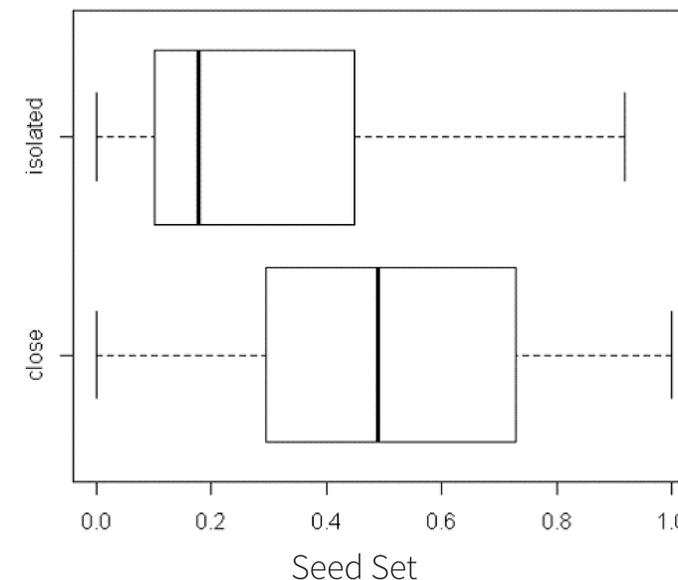
-Achenes were x-rayed in order to determine if they had seeds

## RESULTS

Early flowering plants are better pollinated than late plants



Closer plants are better pollinated than isolated plants



Seed set differed between early and late flowering plants (GLM,  $n=28$ ,  $p<0.001$ )

Seed set differed between close and isolated plants (GLM,  $n=28$ ,  $p<0.001$ )

## CONCLUSION

-Close plants and plants that flower early tend to have a higher seed set

-Data attributed to spatial location overlaps more than the data attributed to flowering phenology, and this suggests that flowering phenology is a bigger factor to pollen limitation and seed set.

-There could be a “temporal isolation” that comes with flowering phenology if they lack synchrony.

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