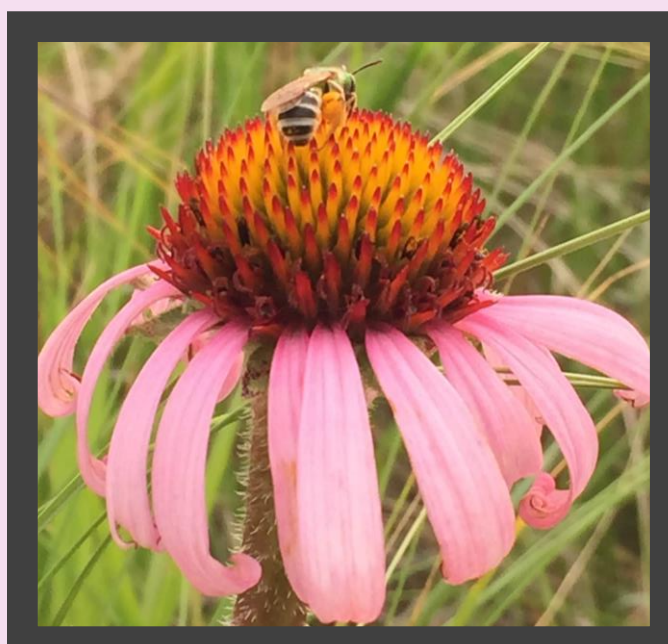


## Background

- ❑ The prairie ecosystem has been fragmented since European settlement, primarily due to agriculture
- ❑ Fragmentation limits the reproductive success of many native prairie species, including *Echinacea angustifolia*.
- ❑ The duration of flowering and the timing of flowering in *E. angustifolia* strongly influence reproduction as they determine mate availability (Wagenius and Lyon 2010).
- ❑ Parental plants flowered in 2005 and were open pollinated in a prairie restoration (Ison et al 2014)
- ❑ Offspring flowered in 2015 in a nearby prairie restoration

## *Echinacea angustifolia*



- ❑ Long-Lived
- ❑ Self incompatible
- ❑ Pollinated by generalist pollinators
- ❑ Mate-limited reproduction

## Hypothesis

Traits that contribute to the reproductive success of an *E. angustifolia* individual will exhibit heritability.

## Methods



## Results

- ❑ Both flowering time and duration of parental *E. angustifolia* contributed substantially to the traits of their offspring.
- ❑ Single parent regressions showed that maternal plants contributed to the offspring's phenotype much more than the paternal plants did.

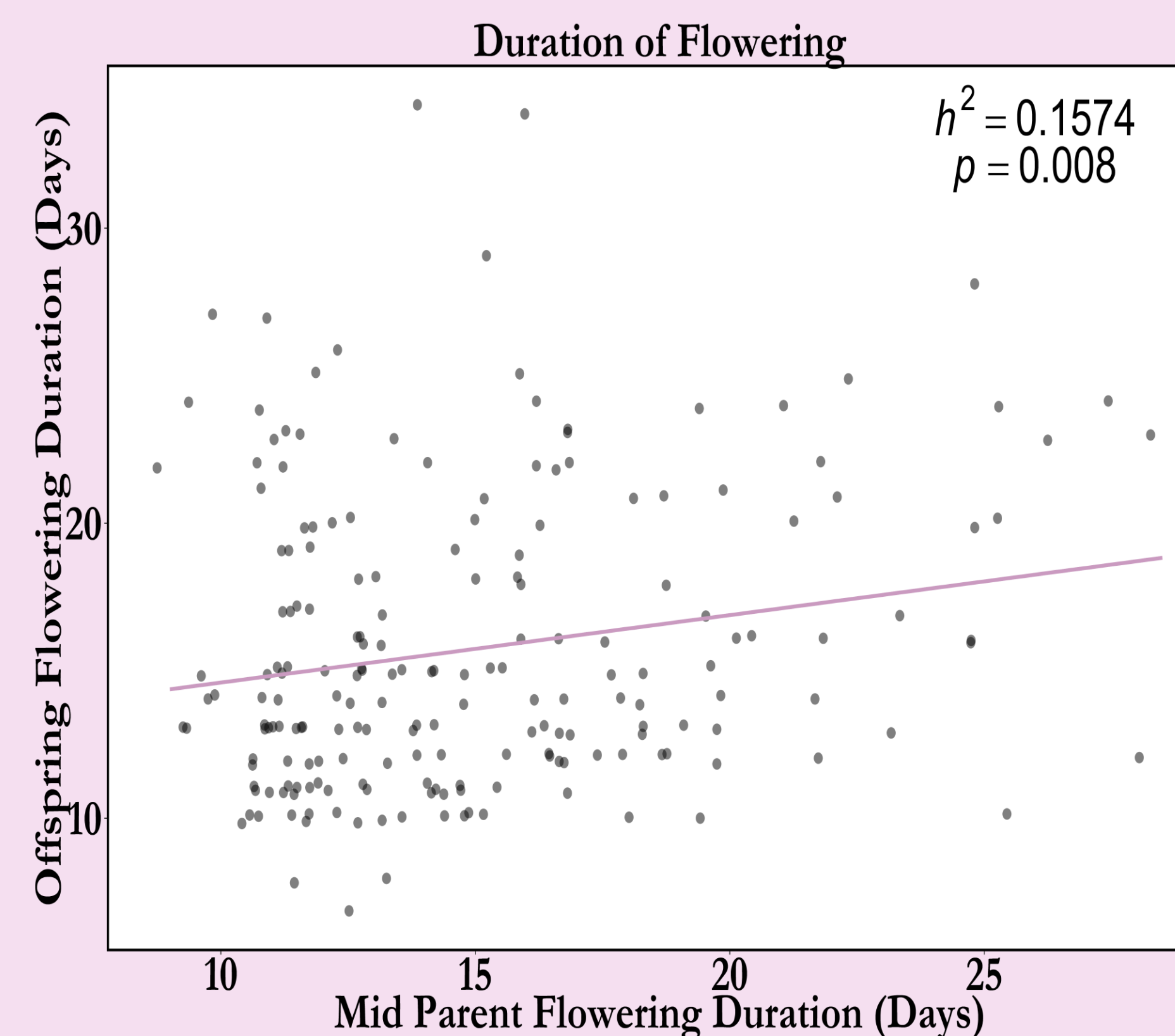


Figure 1: The heritability of flowering duration ( $h^2$ ) was obtained by plotting a regression of the mid parent trait and the offspring trait. Flowering duration was measured as the first day an individual produced pollen to the last day it produced pollen

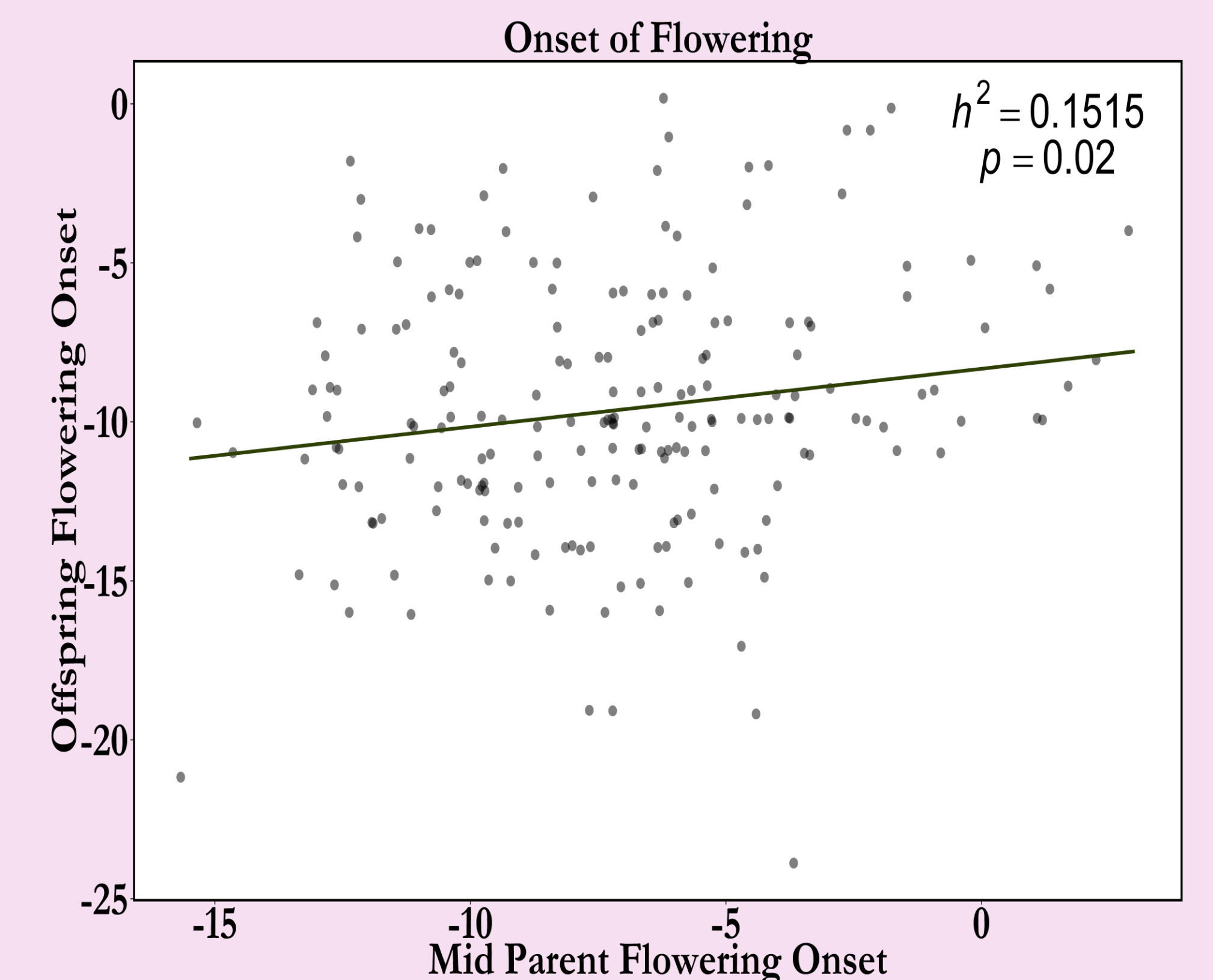


Figure 2: Flowering onset was the first day pollen was presented by an individual relative to peak flowering, the day when the highest number of *E. angustifolia* individuals were flowering.

## Discussion

- ❑ Heritability of flowering time and flowering duration indicate that small fragmented populations of *E. angustifolia* could be susceptible to the effects of assortative mating and inbreeding which could be harmful to the overall fitness of a population, especially small populations where there are few potential mates.
- ❑ While flowering onset and duration both vary highly from year to year, probably due to environmental factors, these traits both demonstrate a high heritable component. These traits are critical in the reproductive success of an individual.

## Citations & Acknowledgments

Wagenius, S., and S. P. Lyon. 2010. Reproduction of *Echinacea angustifolia* in fragmented prairie is pollen-limited but not pollinator-limited. *Ecology* 91:733-742

Ison, J.L., S. Wagenius, D. Reitz., M.V. Ashley. 2014. Mating between *Echinacea angustifolia* (Asteraceae) individuals increases with their flowering synchrony and spatial proximity. *American Journal of Botany* 101: 180-189

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