W.K. Kellogg Biological Station
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The effects of varying vernalization periods on *Arabidopsis thaliana* from different climates

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Introduction

Arabidopsis thaliana is a plant that is alive for only one year. This project studies how plants of different altitude and latitude extremes react to different lengths of winter. The plants from higher extremes were hypothesized to be more successful when vernalized longer because they are used to longer harsh winters.

Vernalization: The process by which plants or seeds are exposed to low temperatures to stimulate flowering

Partial Results

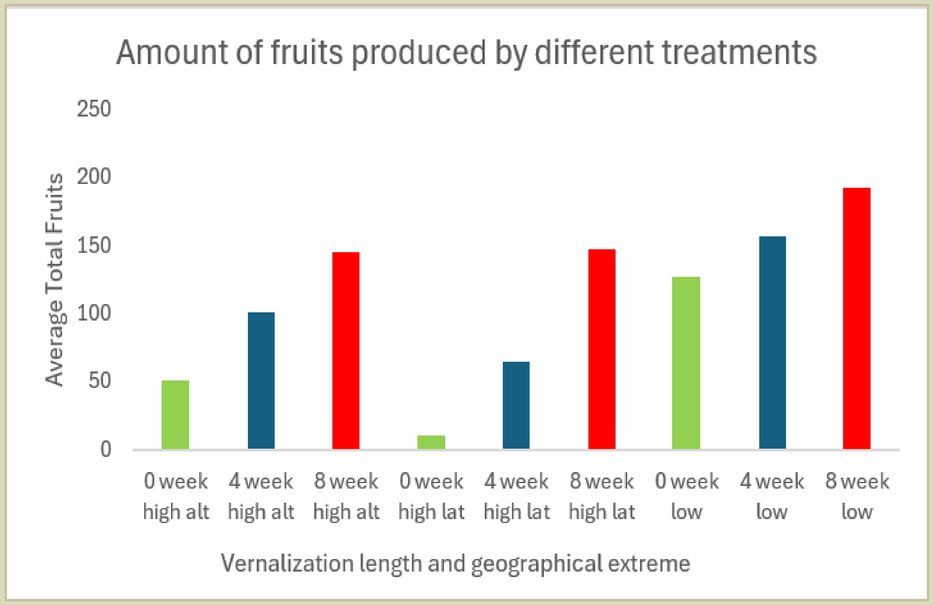

Figure 2: This graph shows the success of plants to produce fruits based on their treatment length and geographical extreme.

Figure 1: Plants growing in the growth chamber; the empty parts of the trays represent plants that are done flowering.

Methods

- 132 genetic lines were chosen based on geographical extreme
- Each line was germinated and exposed to 0 weeks, 4 weeks, 8 weeks, and 16 weeks of vernalization at 4 degrees Celsius and low lighting
- Total number of fruits were counted after plants were done growing
- Plants that still have not bolted after 3-4 months have had their fruit counts entered as 0.

Discussion

- Partial results indicate that plants of lower extremes produce more fruits
- Plants of higher extremes show less reproductive success in shorter vernalizations
- Longer vernalization (to 8 weeks) generally promotes fitness
- Results from 16 week vernalizations are still to be collected

References

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2. Suter, L., Rüegg, M., Zemp, N., Hennig, L., & Widmer, A. (2014). Gene regulatory variation mediates flowering responses to vernalization along an altitudinal gradient in Arabidopsis. *Plant physiology*, *166*(4), 1928-1942.

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