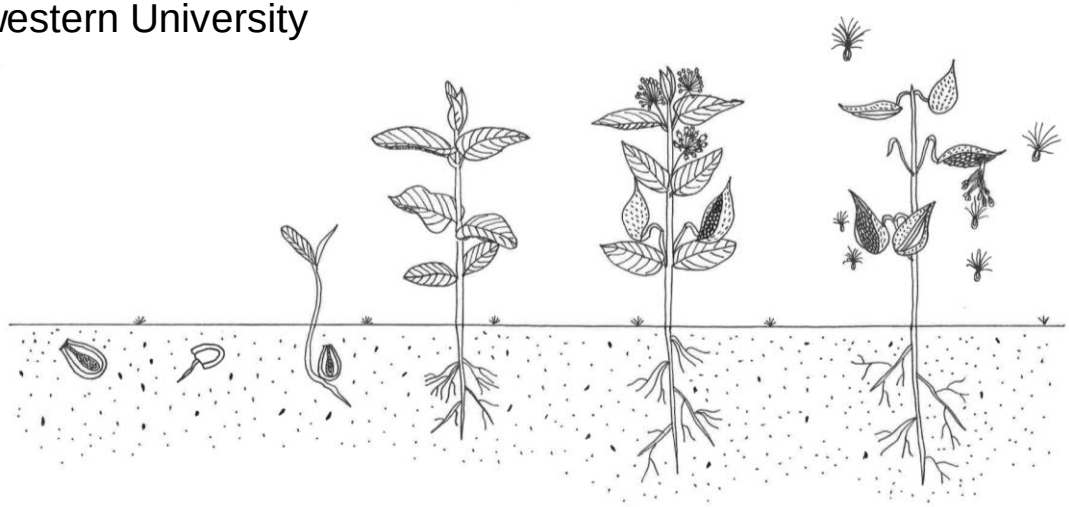
INTRASPECIFIC VARIATION IN GERMINATION RESPONSES OF MILKWEEDS: INVESTIGATING CLIMATIC SENSITIVITY AMONG THREE CONGENERS

Jessa Finch and Kay Havens-Young

Plant Biology and Conservation

Chicago Botanic Garden and Northwestern University



National Native Seed Conference

February 14, 2017

Interspecific

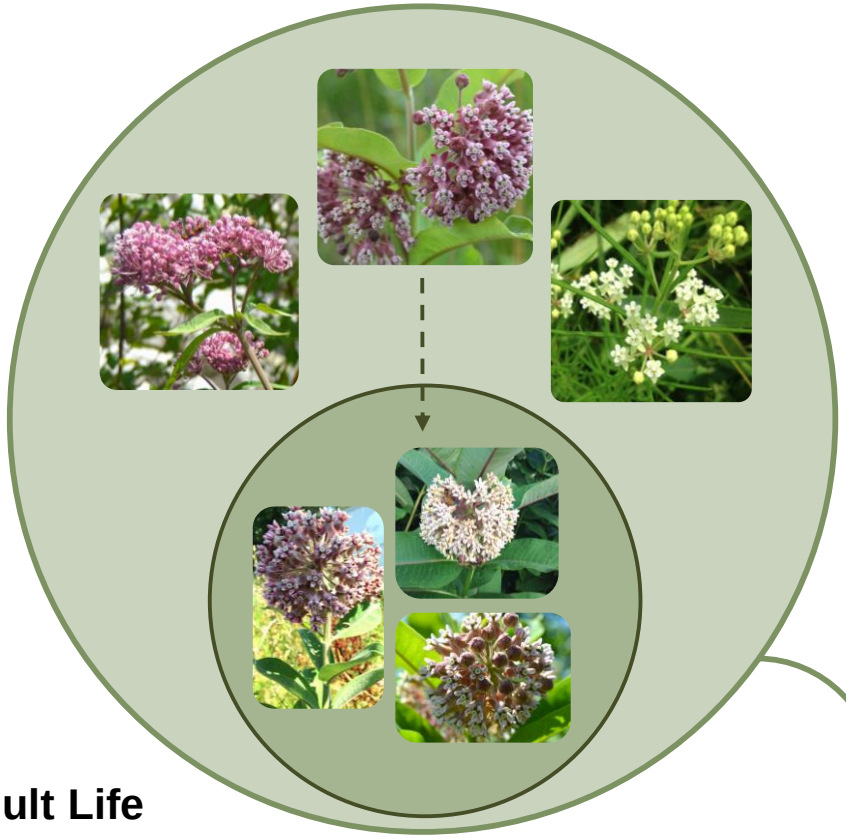
between species

Intraspecific

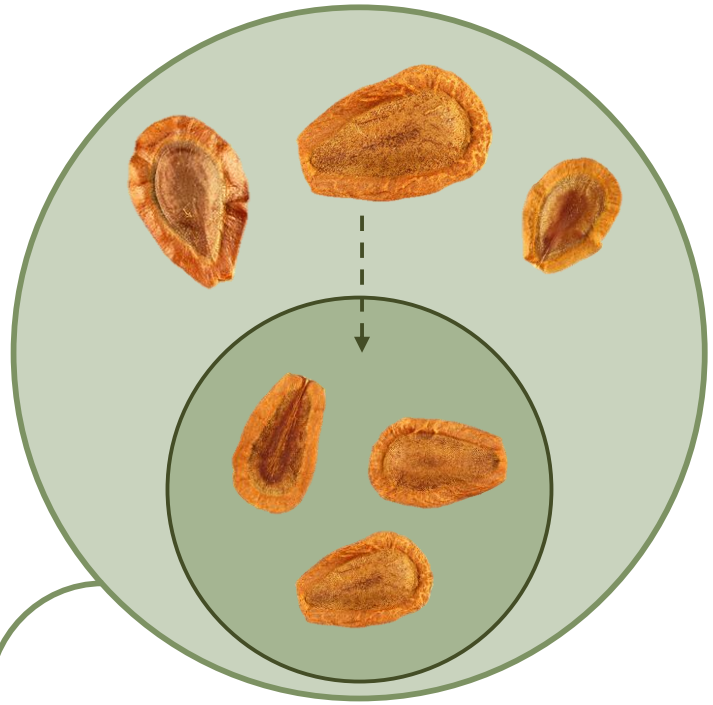
within species

(Alex Seglias)

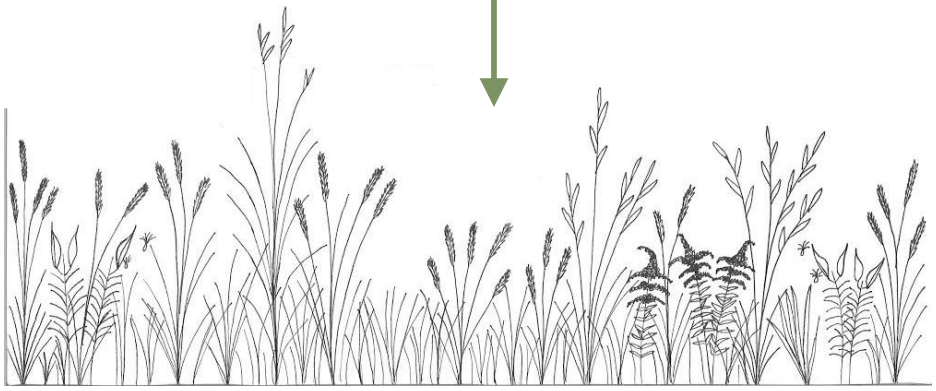
Restoration



Adult Life Stages

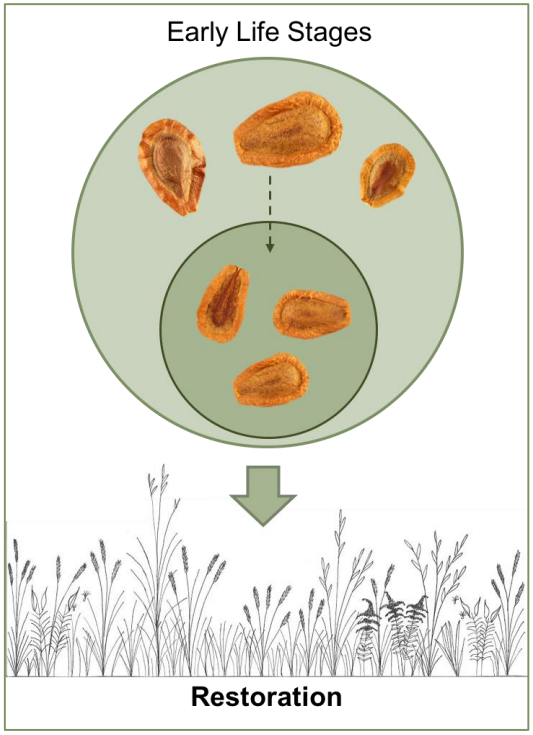


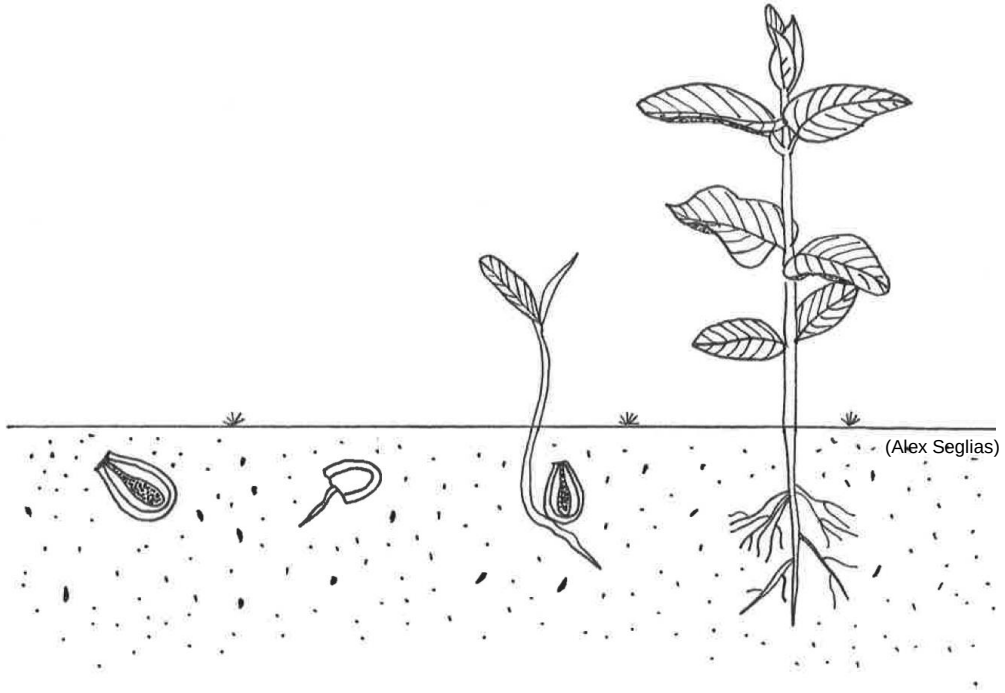
Early Life Stages



Restoration

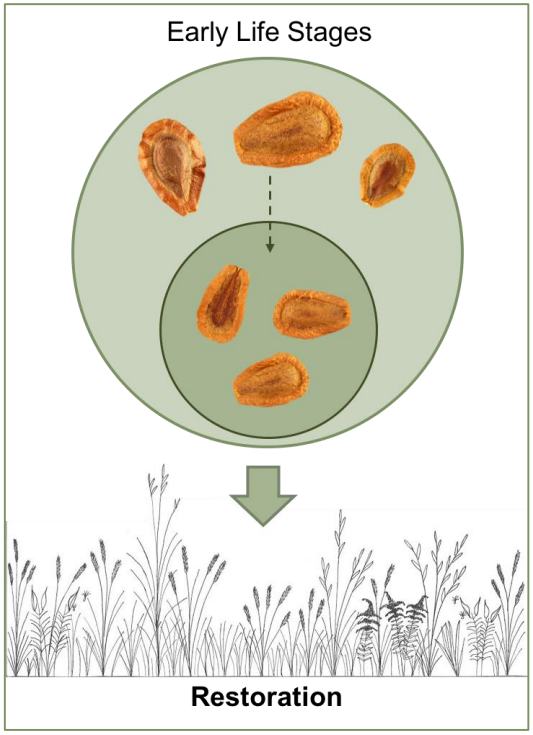
Seeds: Steve Hurst, USDA-NRCS PLANTS Database

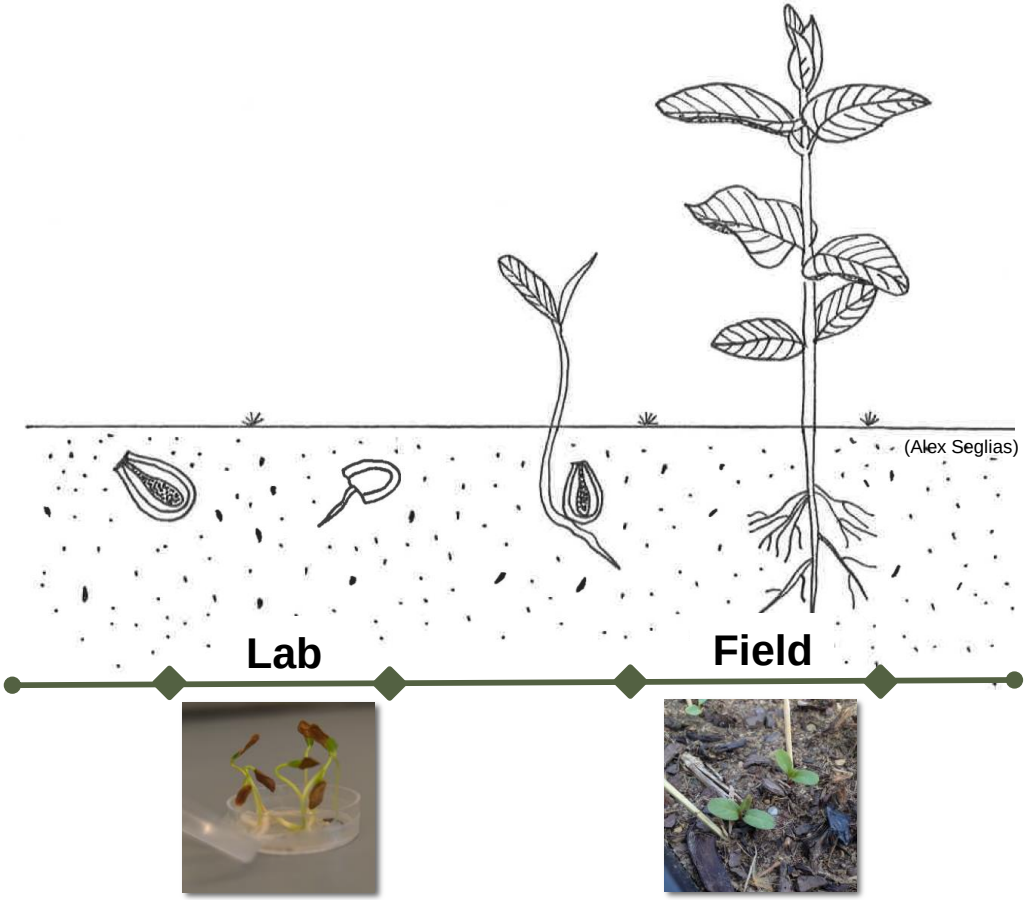




National Seed Strategy Objective 2.2:

Conduct species-specific research to provide seed technology, storage, and production protocols for restoration species





Research Aim:

Investigate interspecific and intraspecific variation of early life stages of three milkweeds

Study Species (Family: Apocynaceae, Sub-Family: Asclepiadoideae)

Species	*Asclepias syriaca*	*Asclepias verticillata*	*Asclepias incarnata*
Common Name	**Common milkweed**	**Whorled milkweed**	**Swamp milkweed**
Flower	Pink, mauve	White	Deep pink
Breeding	Primarily self-incompatible	Self-incompatible	Primarily self-compatible
Pollination	Large bees, butterflies	Small bees, wasps	Large bees, butterflies, wasps
Clonal	High	Medium	No
Habitat	Roadsides, old fields, forest edges	Roadside, dry prairies, open hillsides	Wetlands, wet prairies

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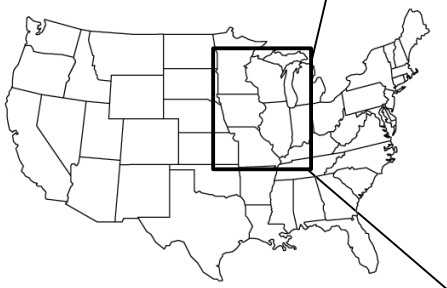
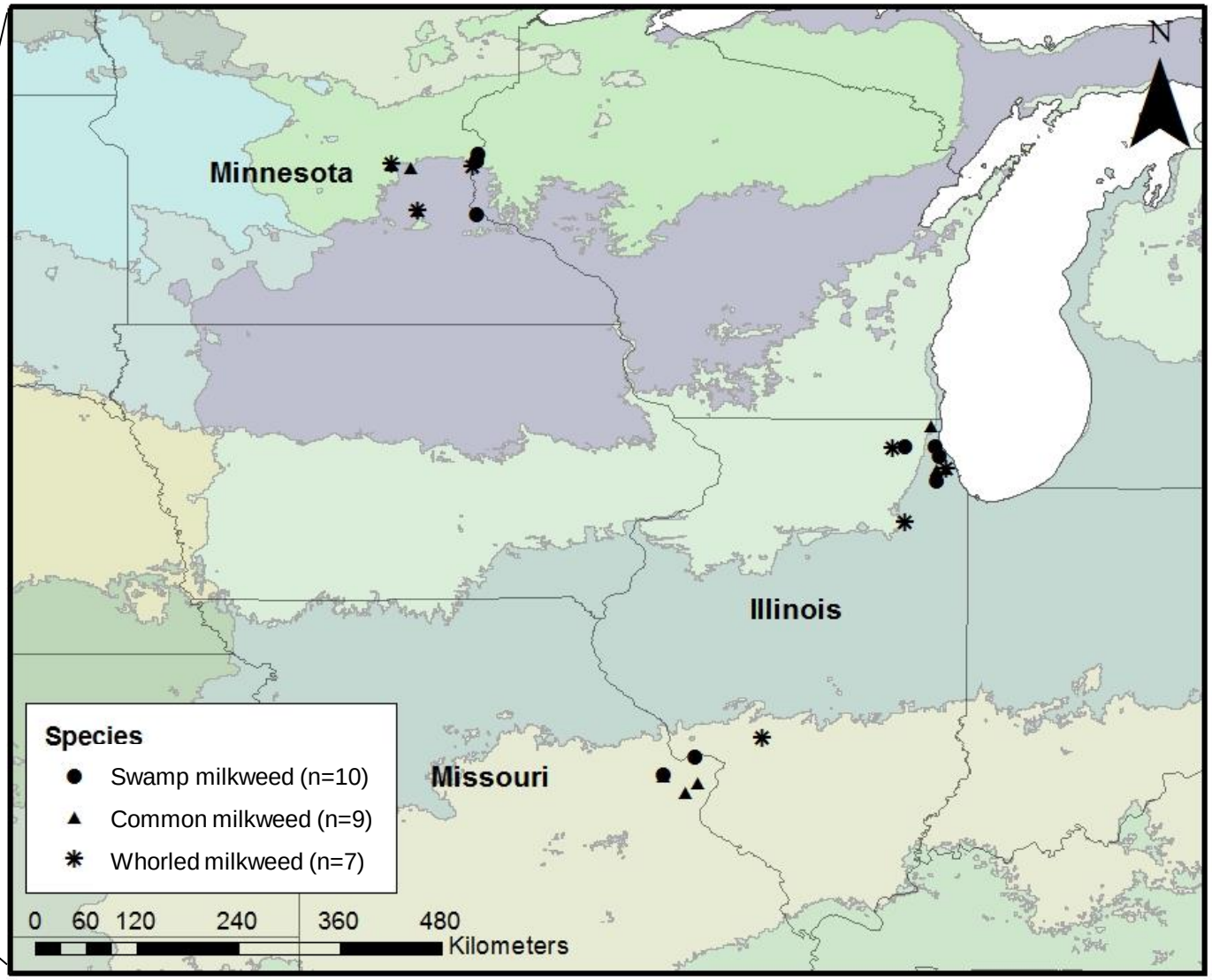
* *Asclepias* seeds have physiological dormancy broken by cold-moist stratification

Seed Collections (Fall 2015)

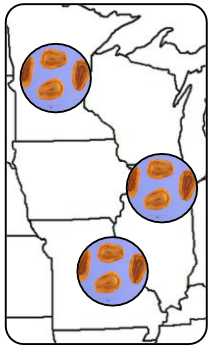
Monarch Butterfly
(*Danaus plexippus*)





Methods

Collection



Viability testing

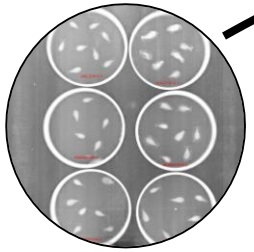
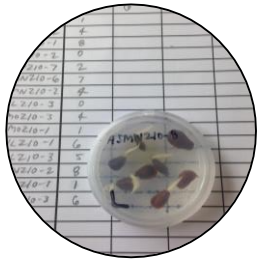


Plate on agar

Cold Stratify

Thermo-gradient table or incubator

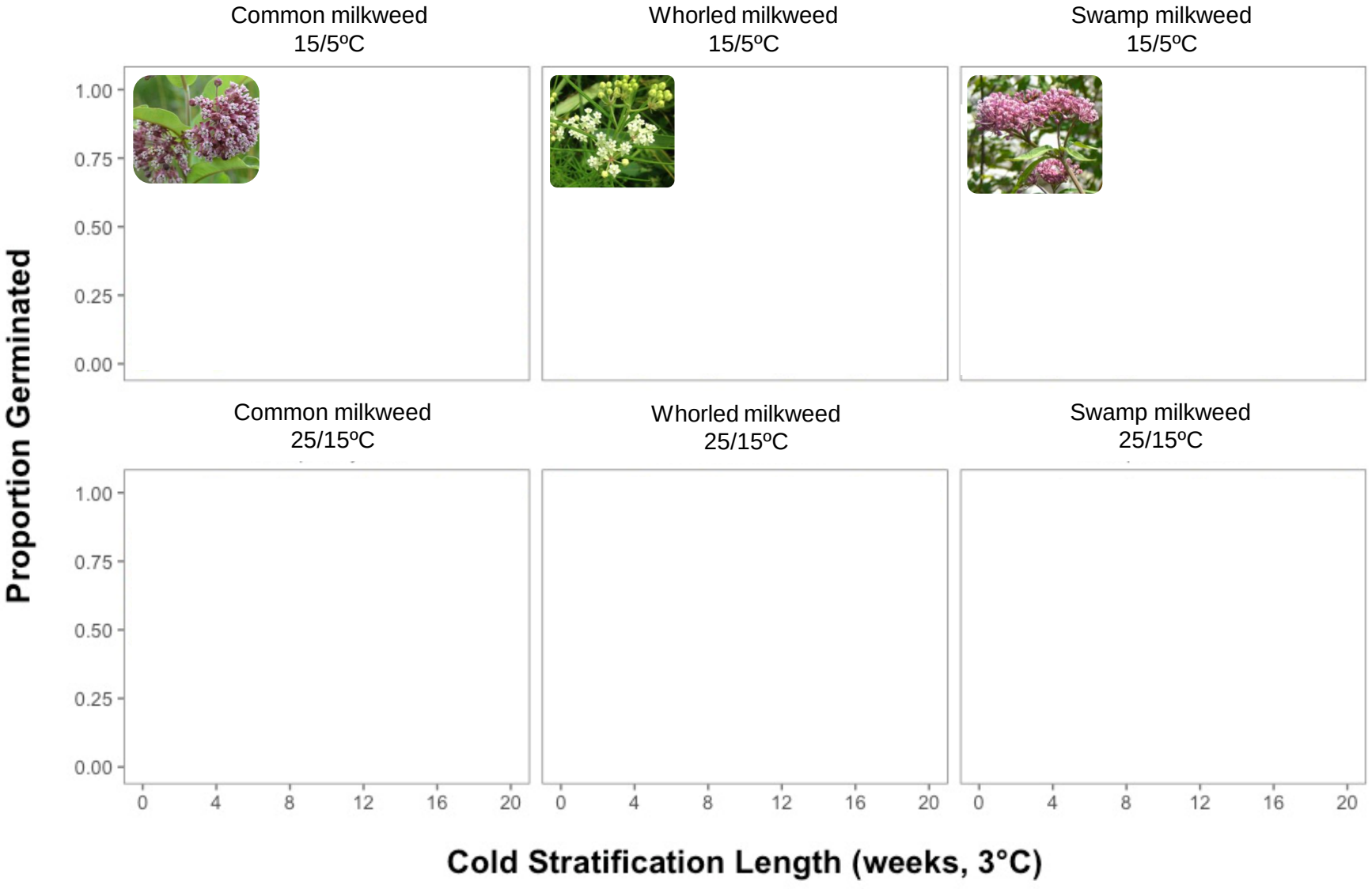
Score germination



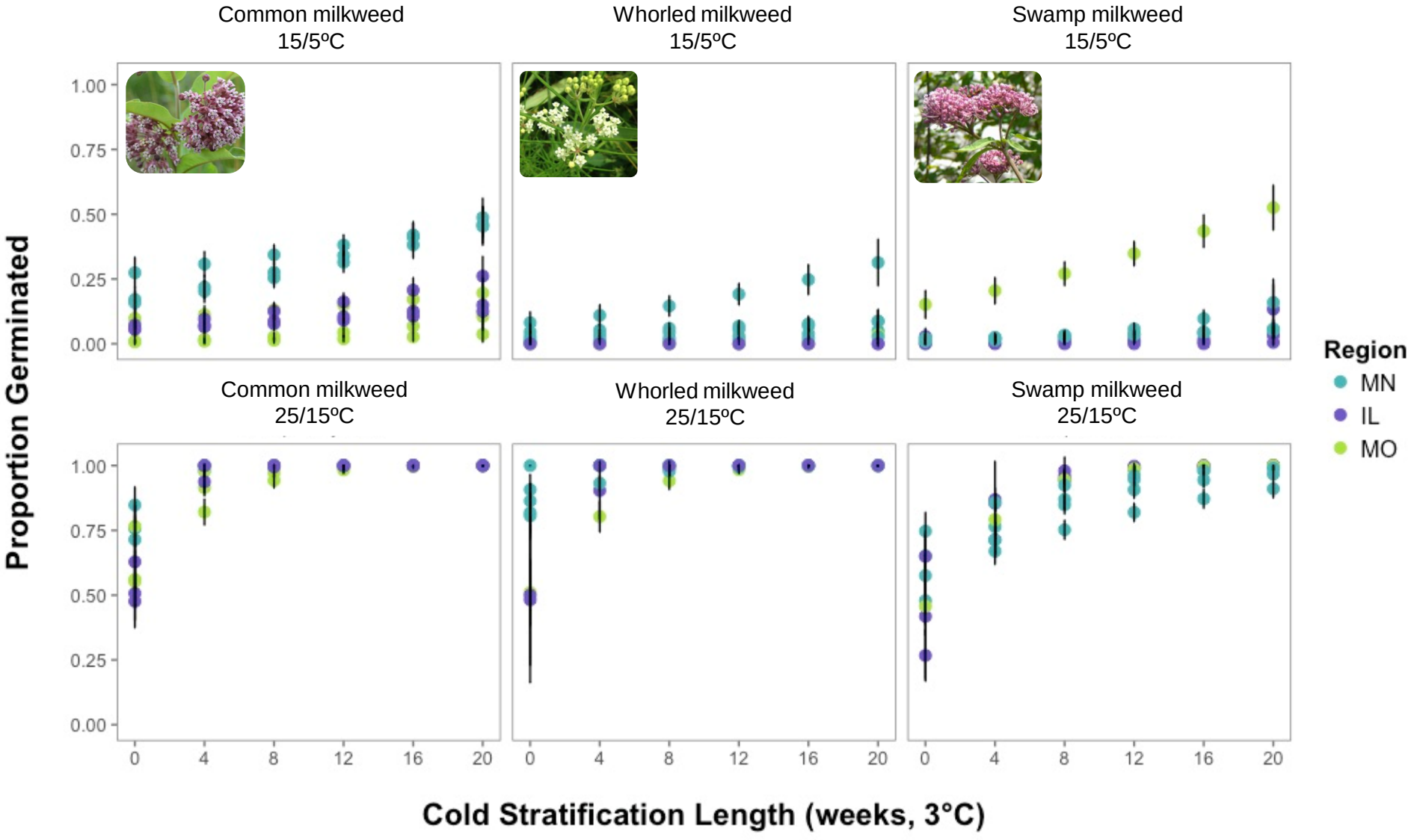
Viability testing

Experiment	Cold Stratification	Incubation
1. Cold Stratification Length	0, 4, 8, 12, 16, 20 weeks (3˚C)	15/6˚C
2. Germination Temperature	0, 12 weeks (3˚C)	15/6 - 20/10˚C

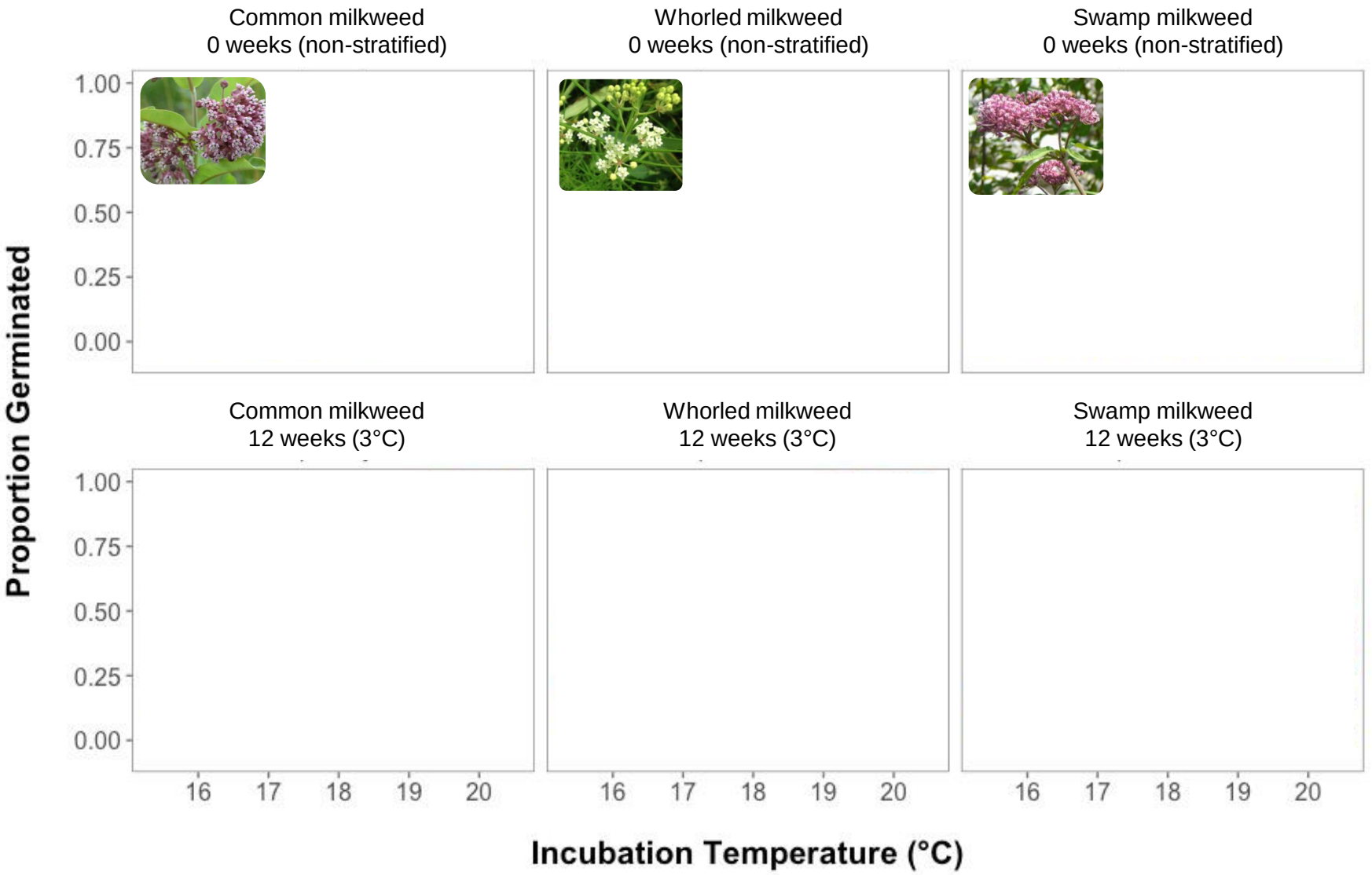
Cold Stratification Length



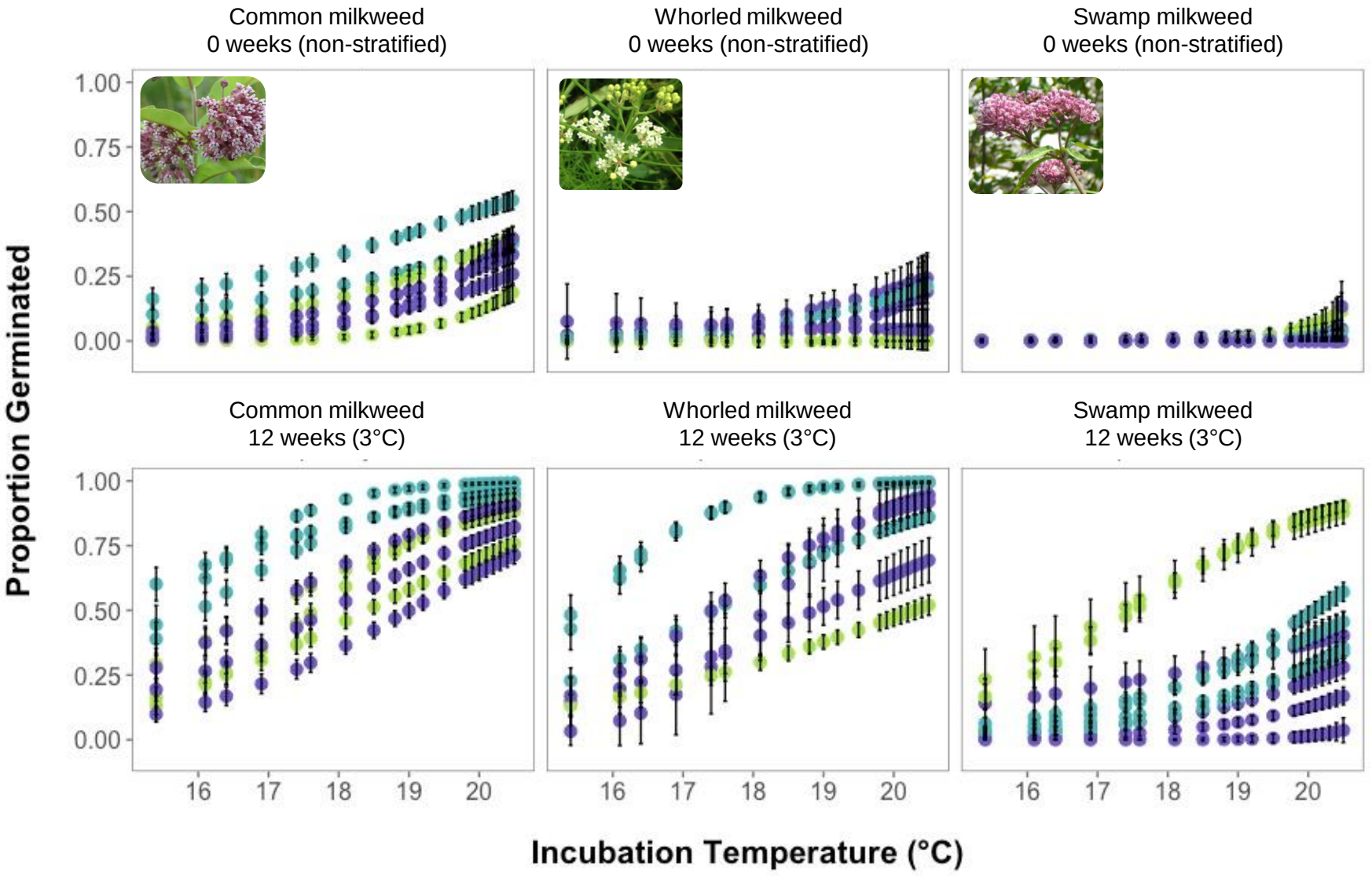
Cold Stratification Length



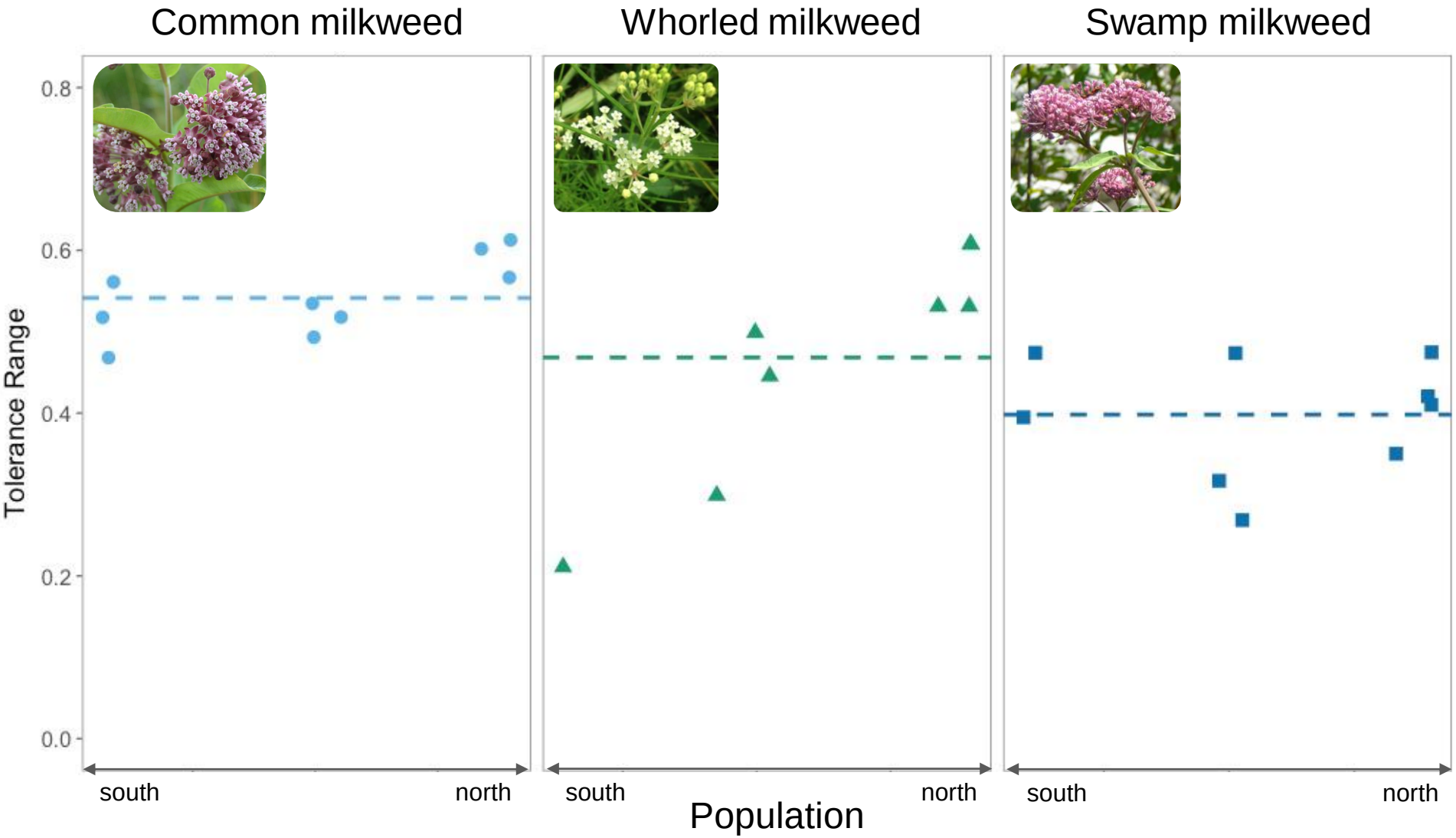
Incubation Temperature



Incubation Temperature

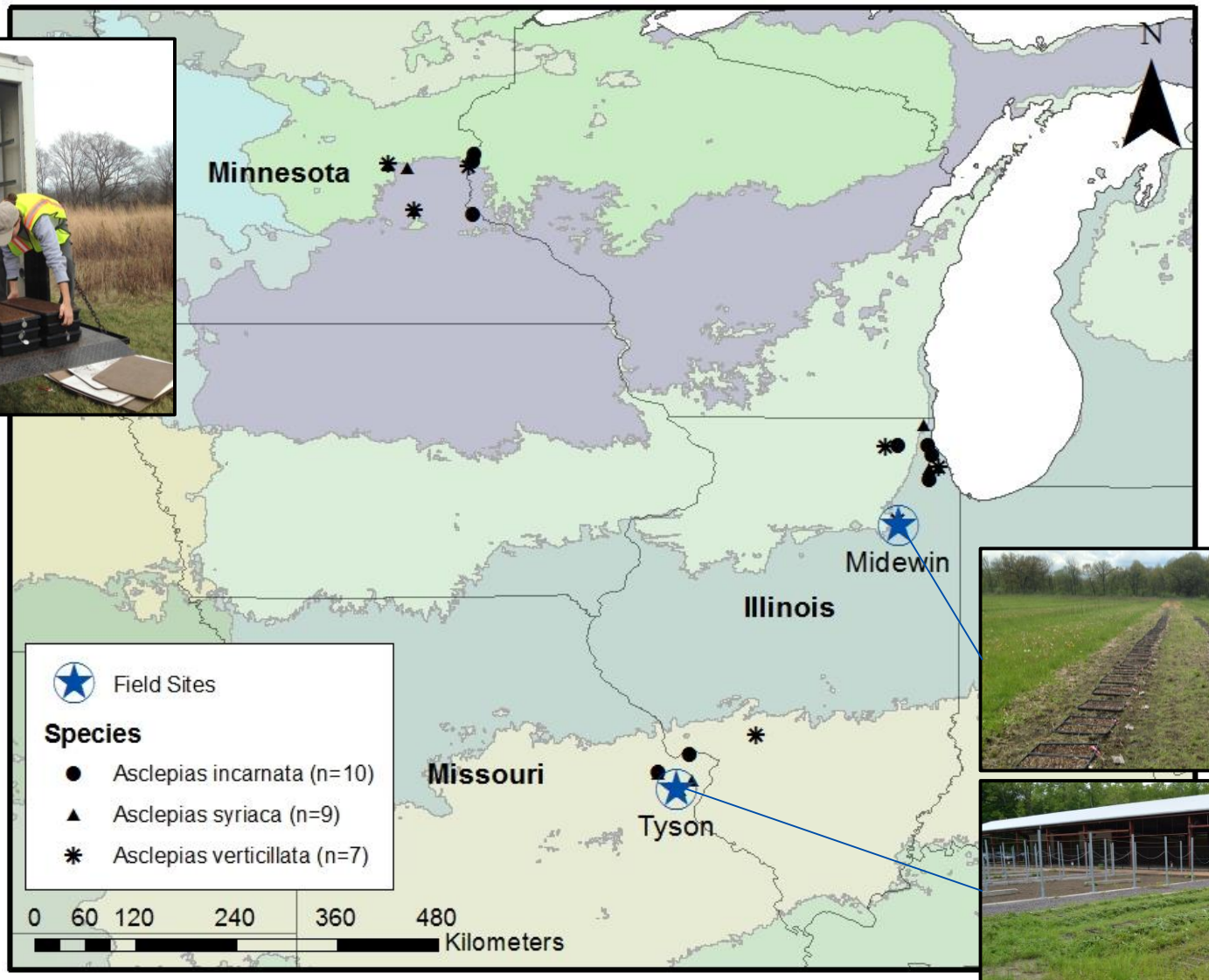


Germination Tolerance Range

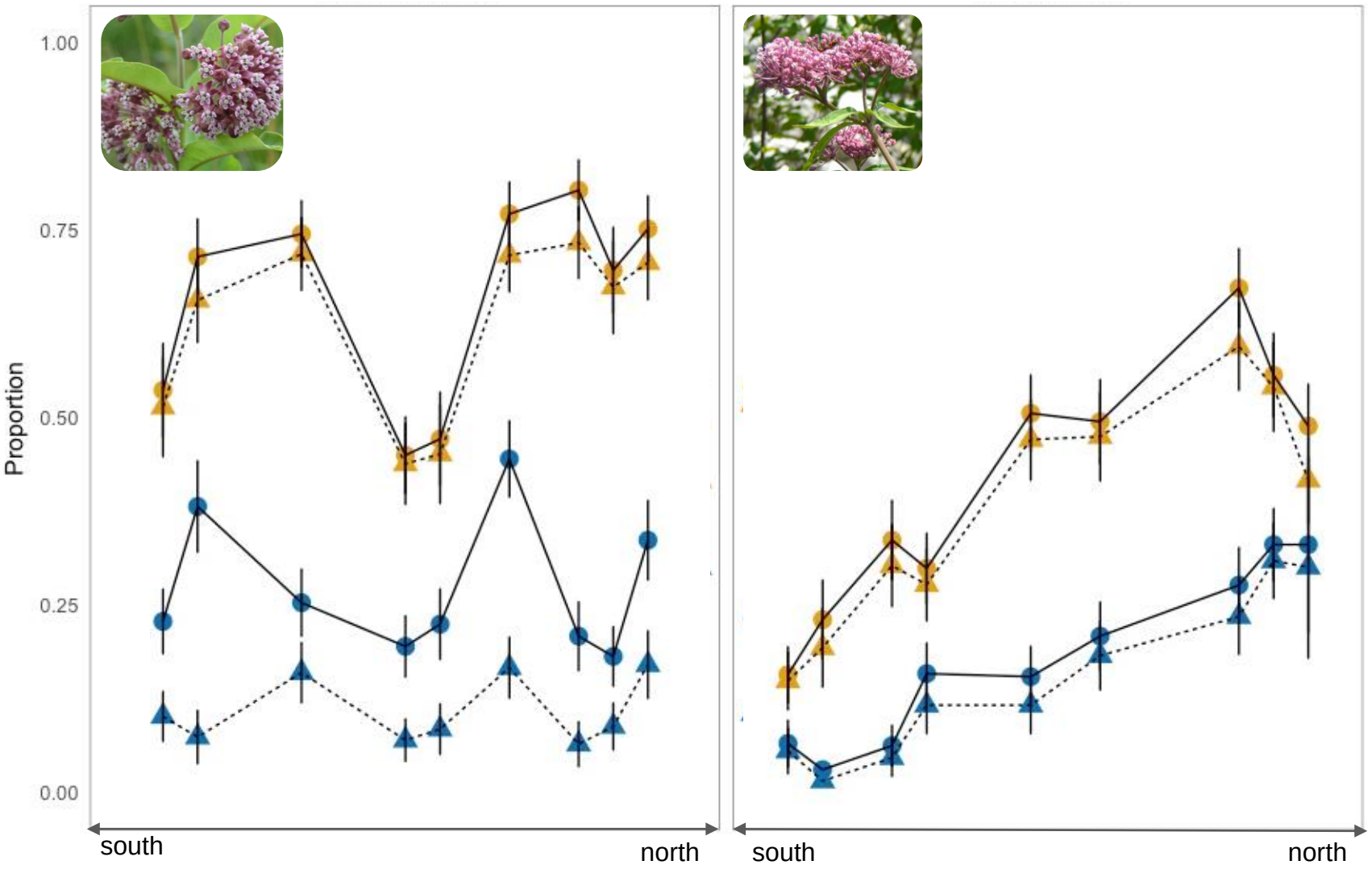


(Levins, 1968; Feinsinger et al., 1981; Barak et al. 2015)

Field Germination Study (2015-16)



Field Emergence & Establishment



Implications for Milkweed Production

PLANT PRODUCTION CONSIDERATIONS

RULE 6. Diversify seed germination conditions. Seeds that do not germinate may represent a loss of genetic diversity.

REFEREED RESEARCH

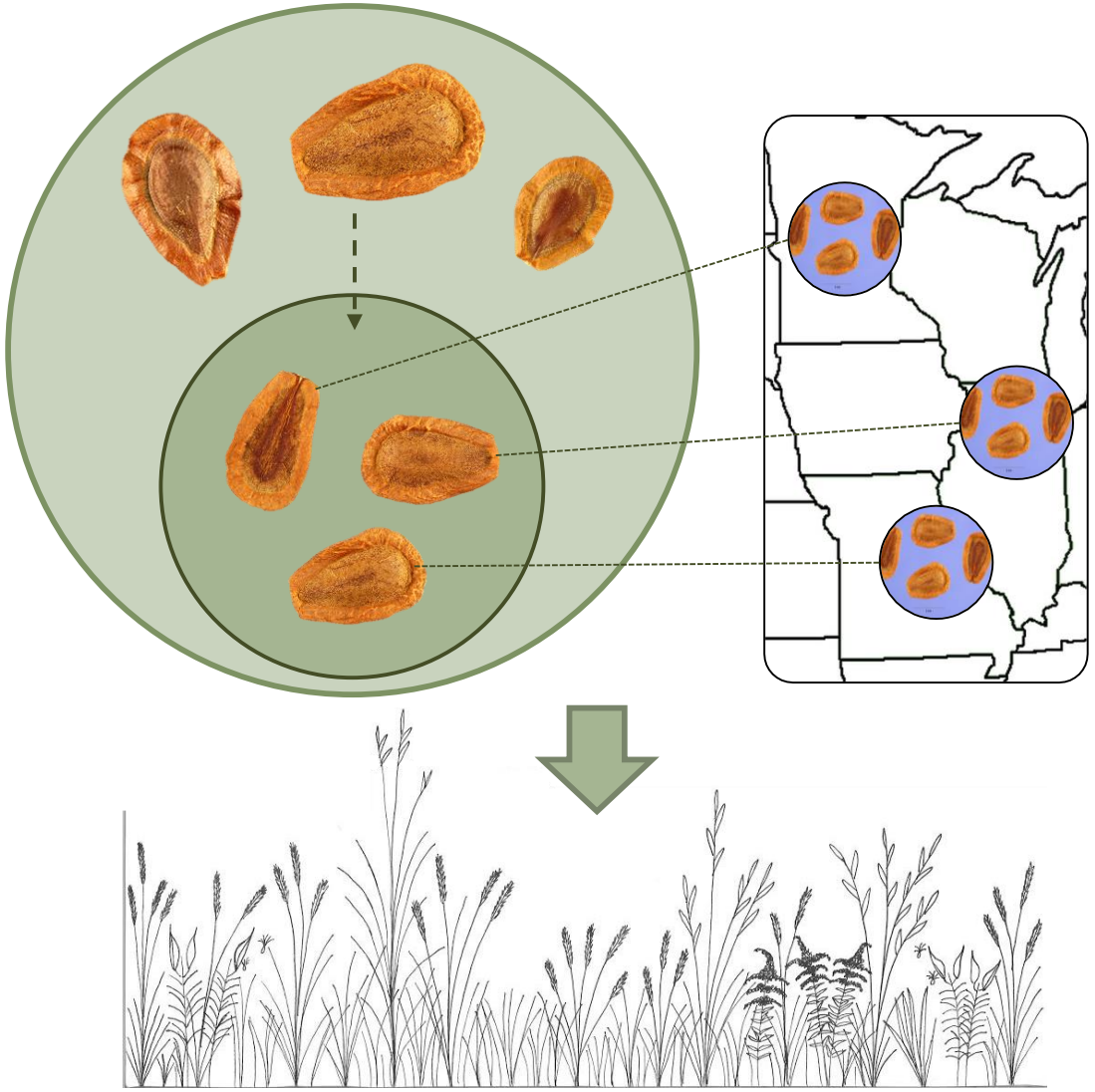
Producing native plant materials for restoration: 10 rules to collect and maintain genetic diversity

Adrienne C Basey, Jeremie B Fant, and Andrea T Kramer

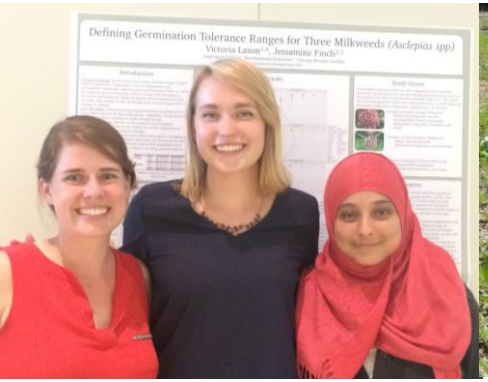
Native Plants Journal 16(1):37–52
Spring 2015

Implications for Seed Sourcing

- Lab-based TR was not a good predictor of field response
- Greater variation among populations than species or regions → refine seed zones with site matching



Acknowledgements





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Questions?

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The preceding presentation was delivered at the

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This and additional presentations available at http://nativeseed.info

NATIVE SEED NETWORK

Institute for Applied Ecology