VEGETATION RECOVERY IN SLASH PILE SCARS FOLLOWING RESTORATION OF AN OZARK WOODLAND

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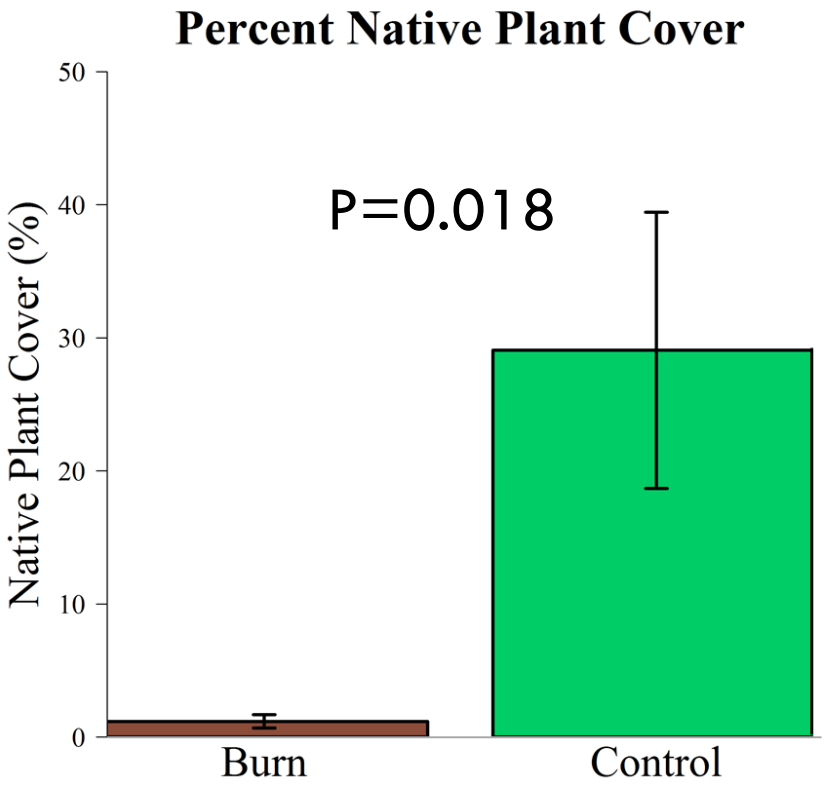
Slash Pile Scars

Photo by Quinn Long

- Land Management Technique
- Goals:
  - Removal of woody Debris
  - Fire Suppression (Western US)
  - Prescribed Burns (Shaw)

Vegetation Recovery in Burn Piles



Passive recovery burn plot 6 months after burn

Experimental Questions

- How does pile burning alter soil nutrient, moisture, and compaction compared to unburned areas?
- Are some native species superior than others at colonizing burn-scars during the first-growing season?
- What is the relative importance of the soil biotic and abiotic environment in determining initial germination and establishment rates in slash pile scars?

Species Used in Field and Lab Experiment

Grasses

Bromus pubescens

Chasmanthium latifolium

Composites

Symphyotrichum drummondii

Solidago ulmifolia

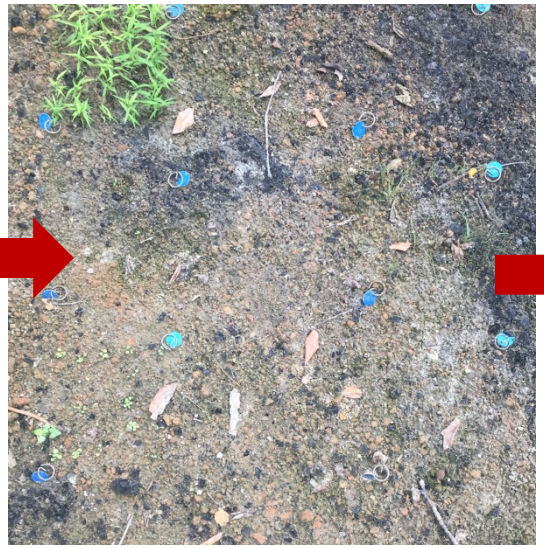
Legumes

Lespedeza violacea

Senna marilandica

Field Study

- Goal: Determine what species are best able to colonize a burn scar



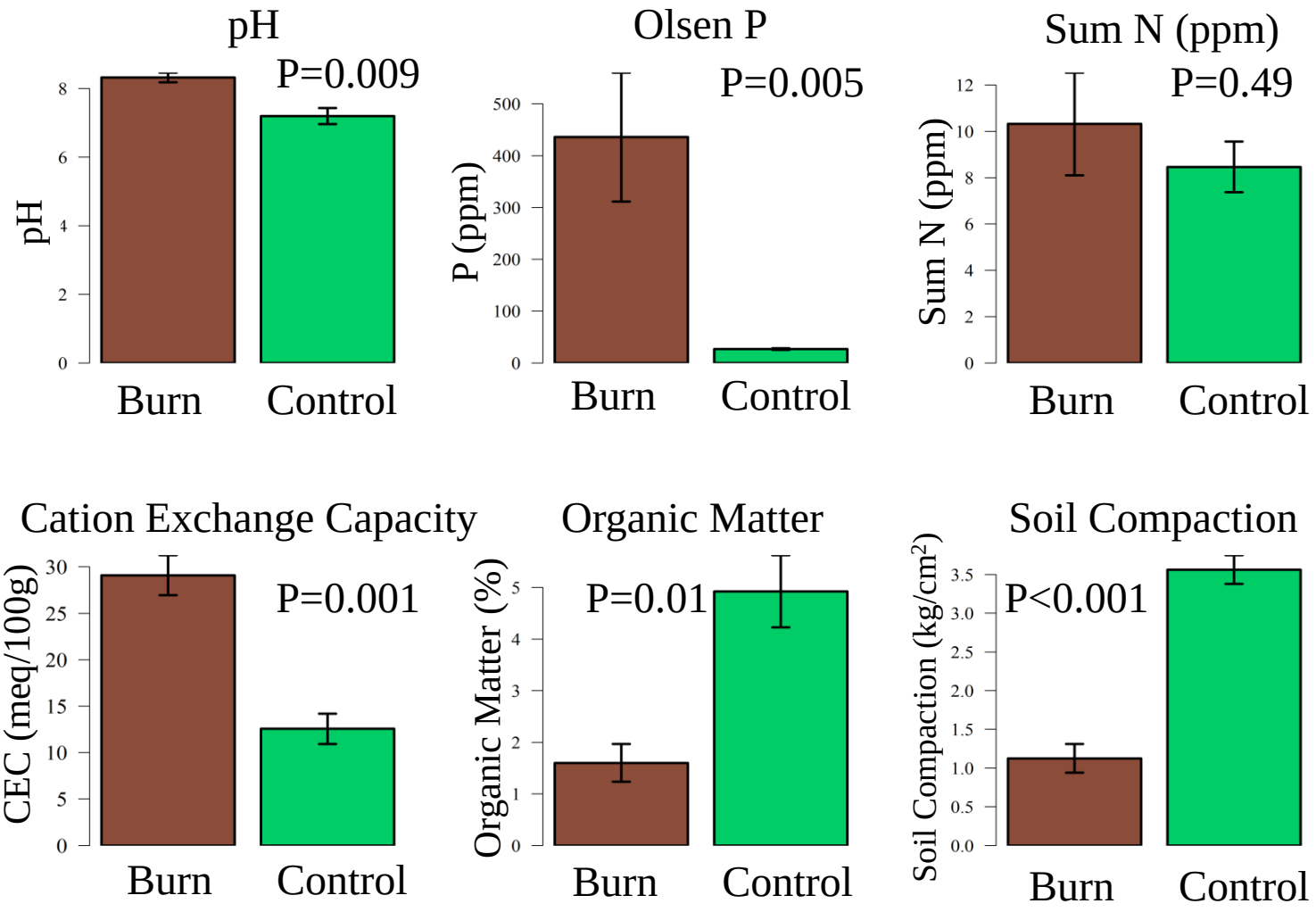
Grass

Composite

Legume

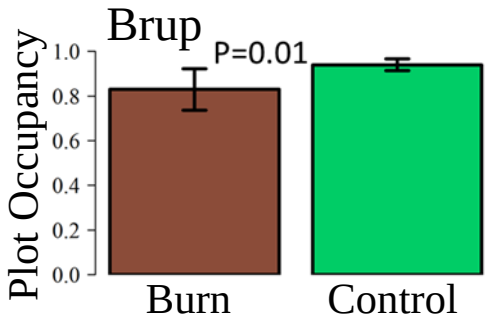
Photo by Leighton Reid

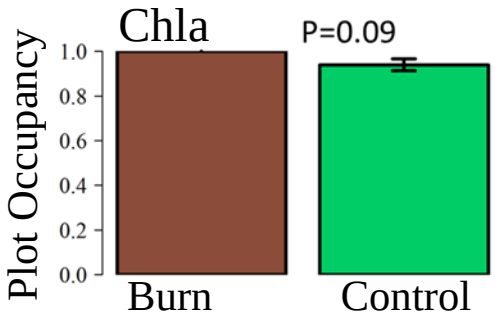
Field Study: Soil Results



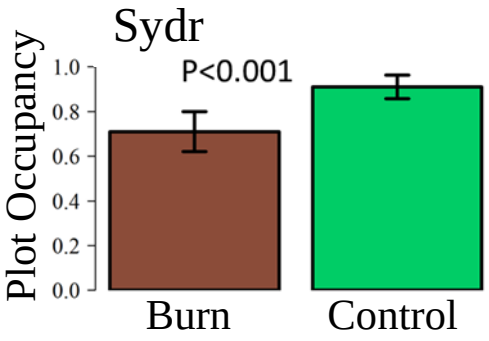
Field Study: Species Establishment

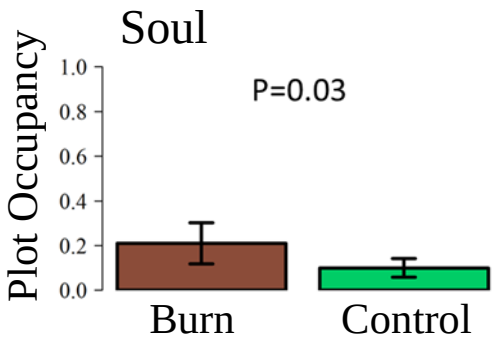
Grasses



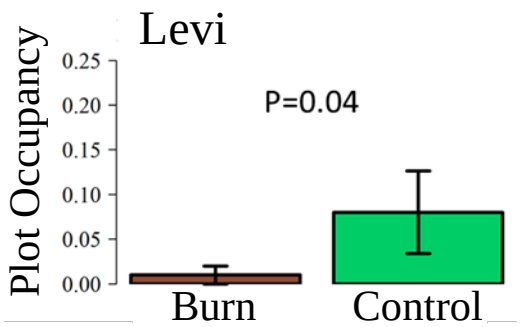


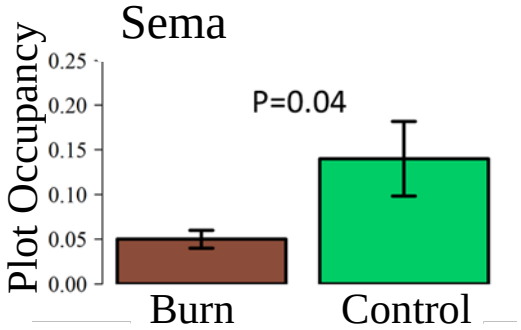
Composites





Legumes





Lab Experimental Design

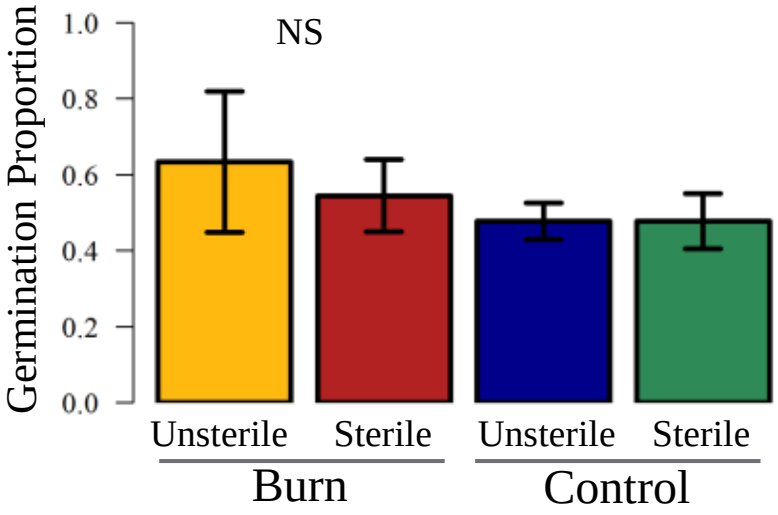
- Germination and seedling growth experiments
- Goal:
  - Determine importance of abiotic and biotic factors in germination and establishment rates in slash pile scars

Germination Experiment

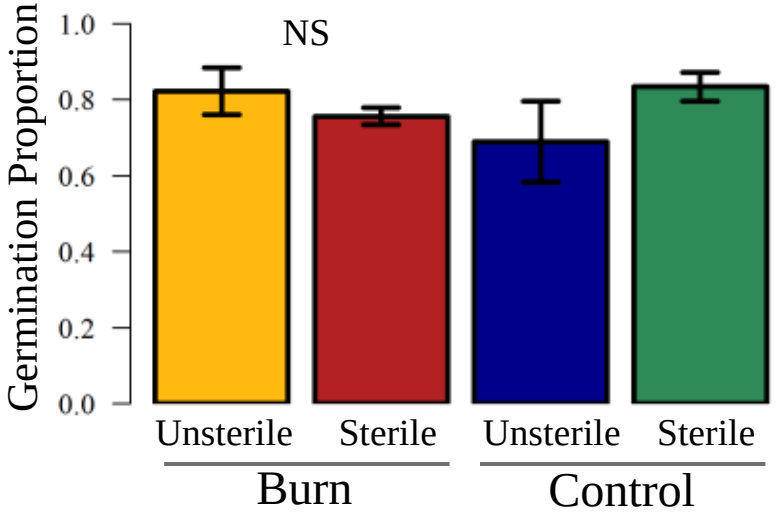
- Monitored germination over 30 days
- Four treatments:
  - Control
  - Sterilized Control
  - Burn
  - Sterilized Burn

Germination Results: Grasses

Bromus pubescens

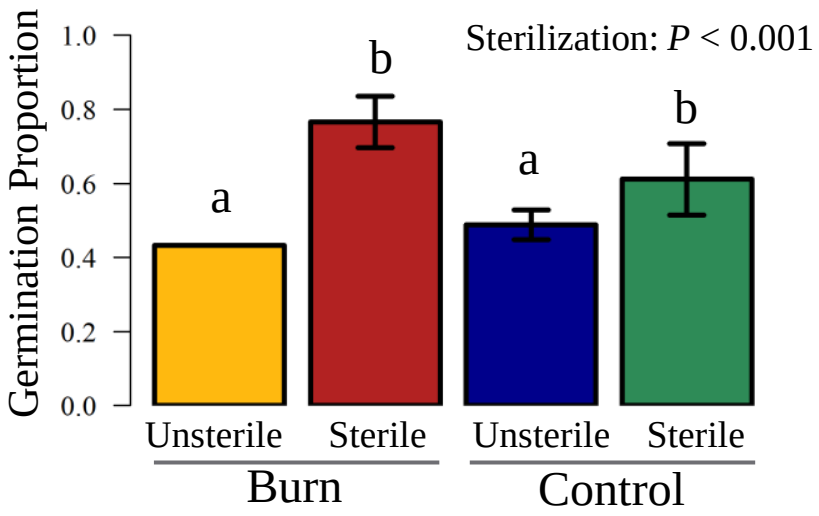


Chasmanthium latifolium

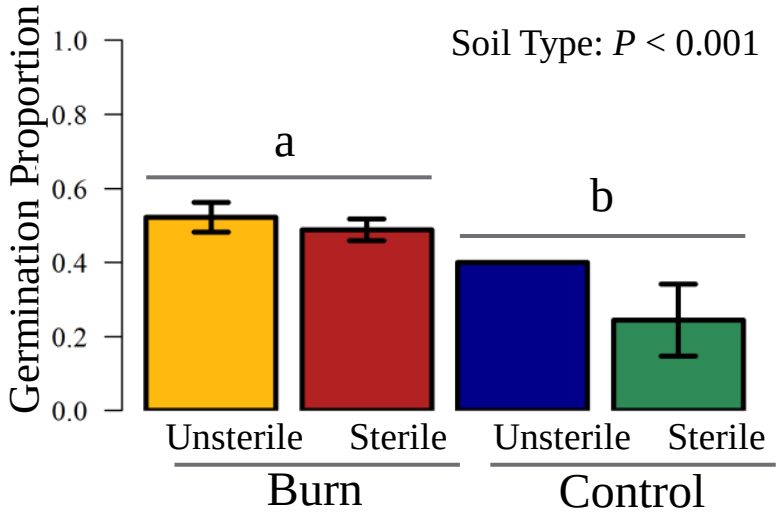


Germination Results: Composites

Symphyotrichum drummondii

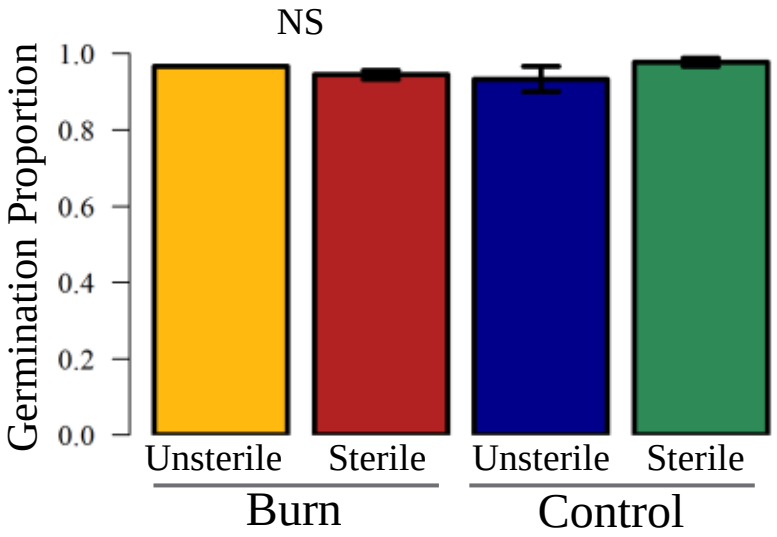


Solidago ulmifolia

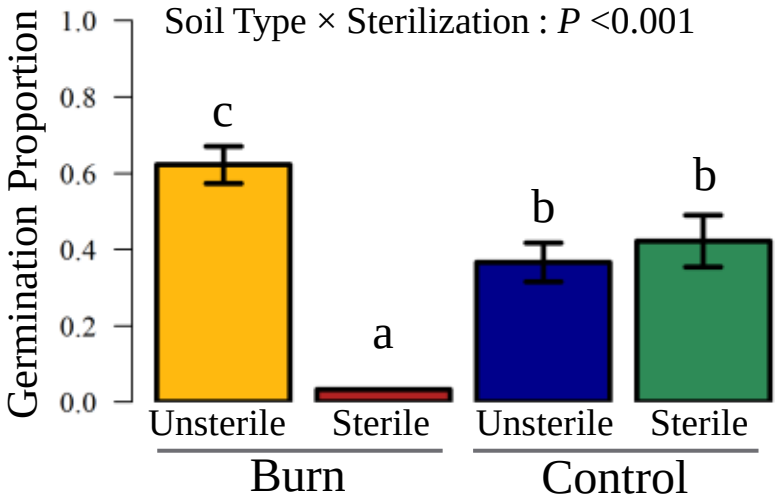


Germination Results: Legumes

Lespedeza violacea

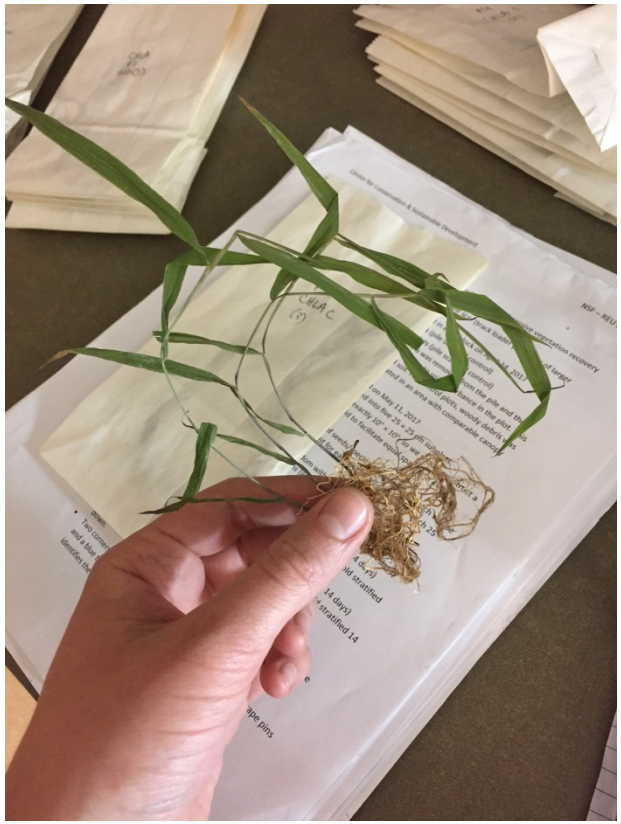


Senna marilandica

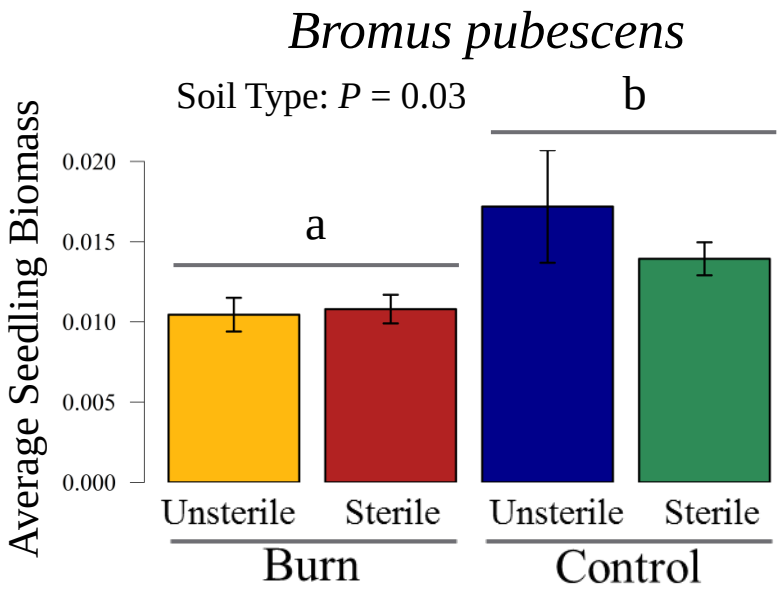


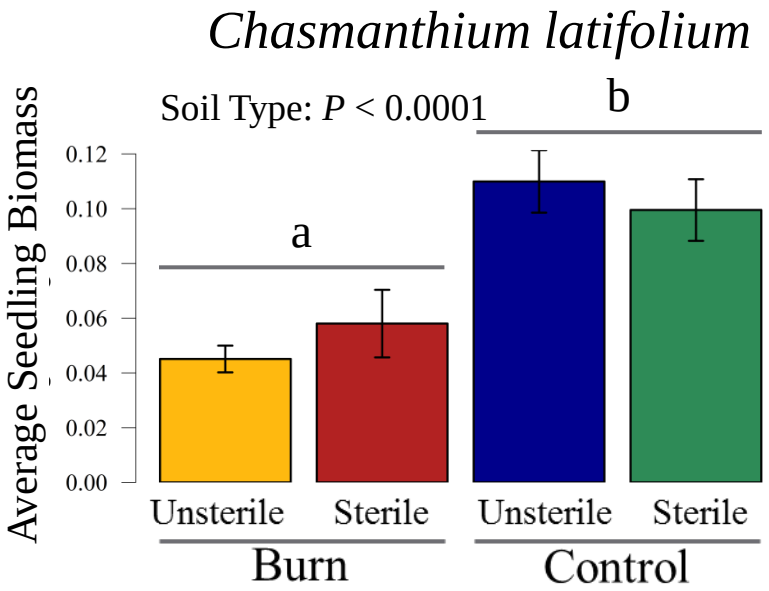
Seedling Growth and Biomass

- Same four soil types/treatments as germination experiment
- Seedling growth monitored in pots



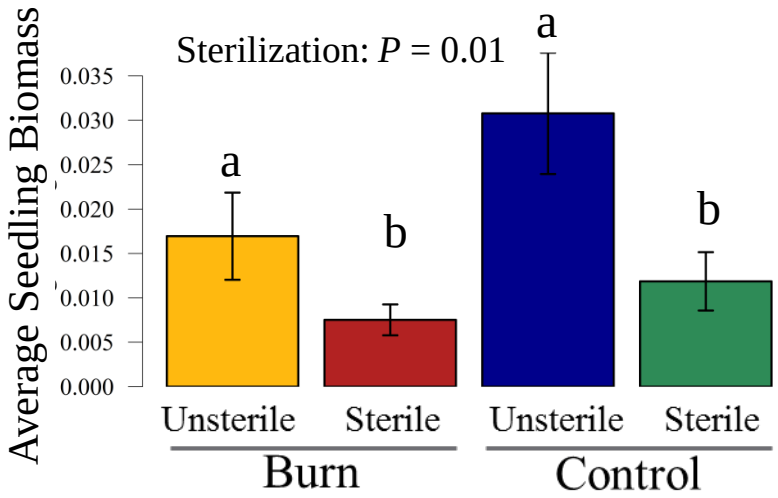
Biomass Results: Grasses



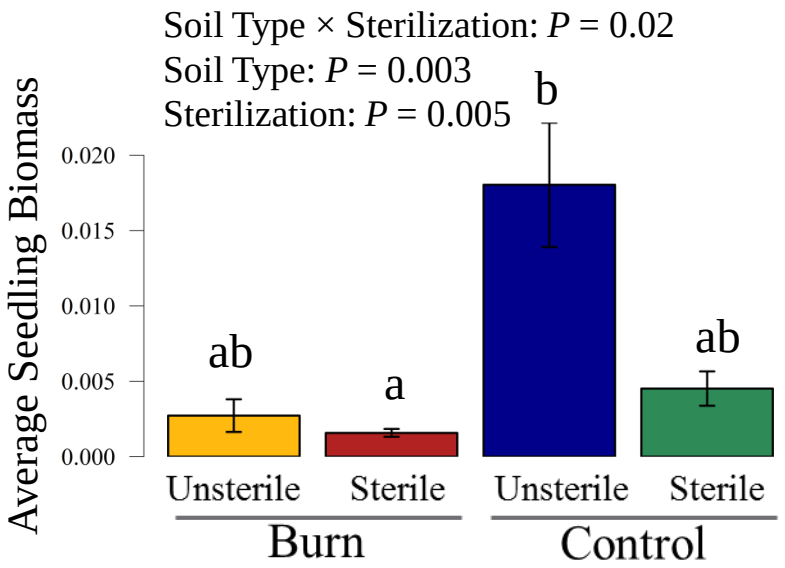


Biomass Results: Composites

Symphyotrichum drummondii

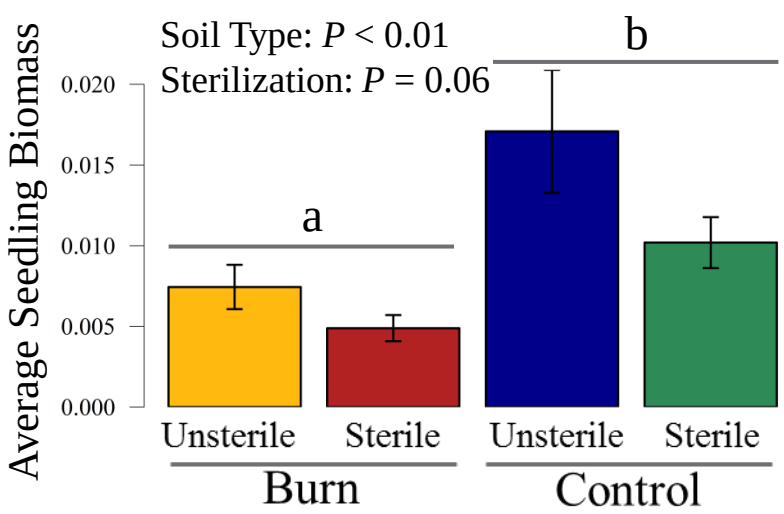


Solidago ulmifolia

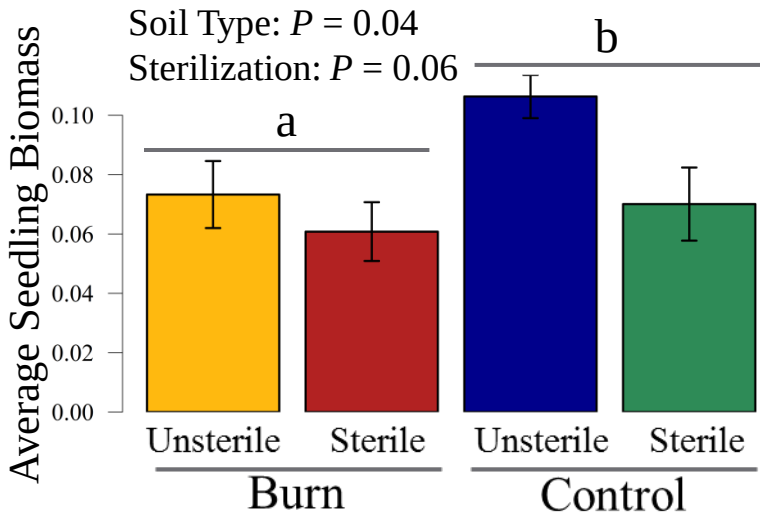


Biomass Results: Legumes

Lespedeza violacea



Senna marilandica



Conclusions

- Burn pile scars alter soil chemistry, nutrients, moisture, and compaction
- Most species showed lower occupancy and biomass in burn scars relative to the controls
- Mechanisms for reduced establishment are not due to lower germination capacity in burn scars
- Several species achieved greatest biomass in unsterilized soil suggesting positive soil feedbacks
- Vegetation recovery in burn piles can be expedited by seed additions

Acknowledgments

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