

A close-up photograph of a yellow plastic strip tied around a green grass stem in a field of dry and green grass. The strip is a bright yellow color and is wrapped around the stem of a single green grass blade. The background is a mix of dry, brownish grass and some green blades, slightly out of focus. The overall scene suggests a field study or experiment.

Effects of defoliation and habitat type on Medusahead demography

Elise S. Gornish & Jeremy J. James
October 9, 2014



Taeniatherum caput-medusae (Medusahead)

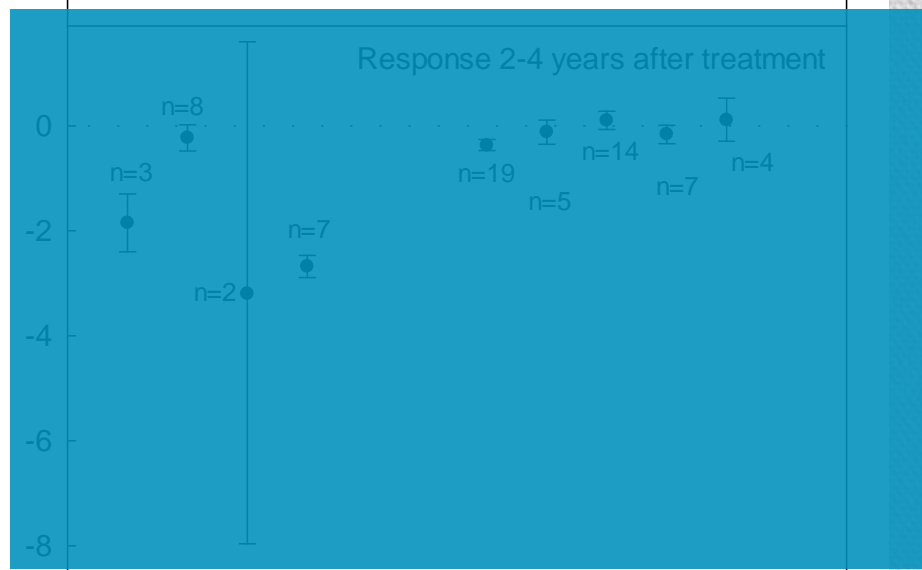
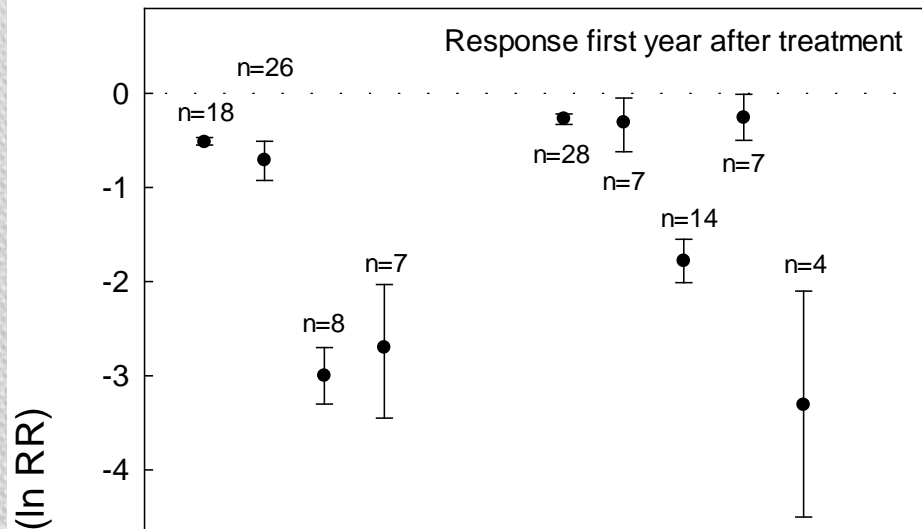


Invaded 17 western US states

Spreads at a rate of 12% per year

Can grow to 2,000 plants per square ft

Livestock grazing losses can reach \$20/acre



Annual rangeland Intermountain rangeland

Herbicide Grazing Burning Herbicide + seeding

Herbicide Burning Herbicide + seeding Burning + seeding Herbicide + burning+ seeding

How does defoliation and habitat type mediate medusahead dominance?



Methods



5 Medusahead densities

seeding rates of:

0, 100, 1000, 10000, and 50000 seeds

2 Habitats

Open grassland

Oak woodland

2 Clipping

Clipped in the boot stage

Not clipped

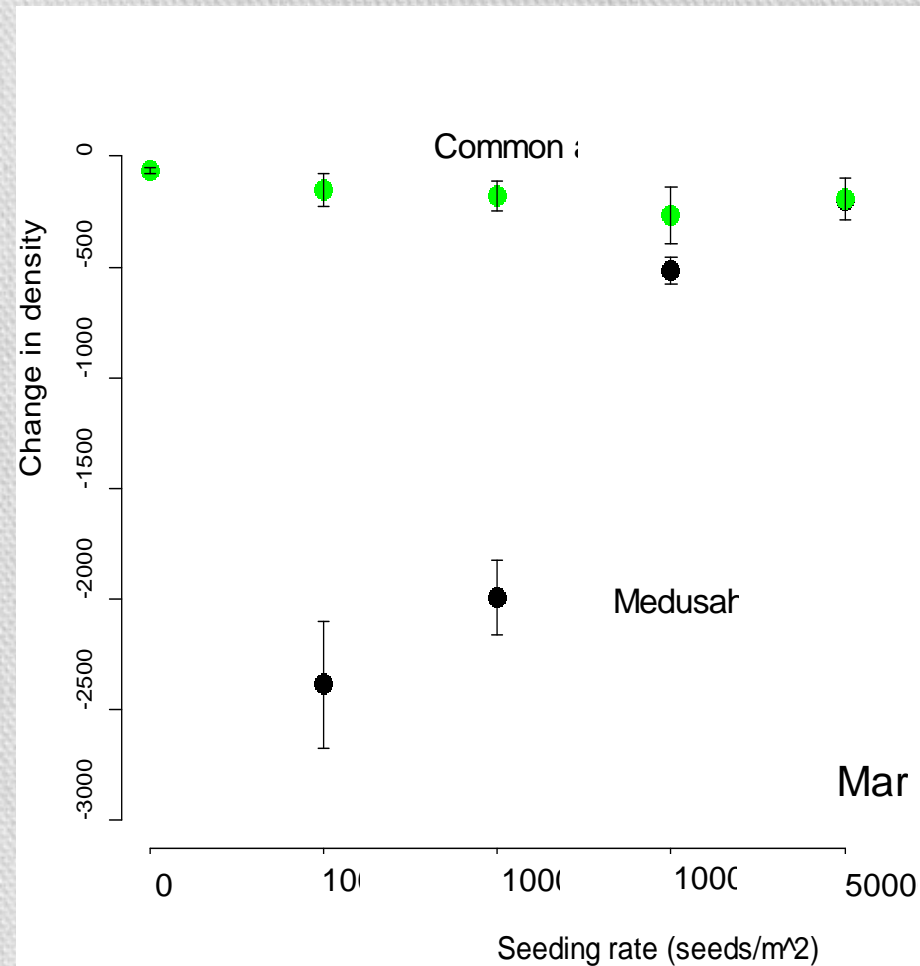
20 plots x 4 reps = 80 plots total



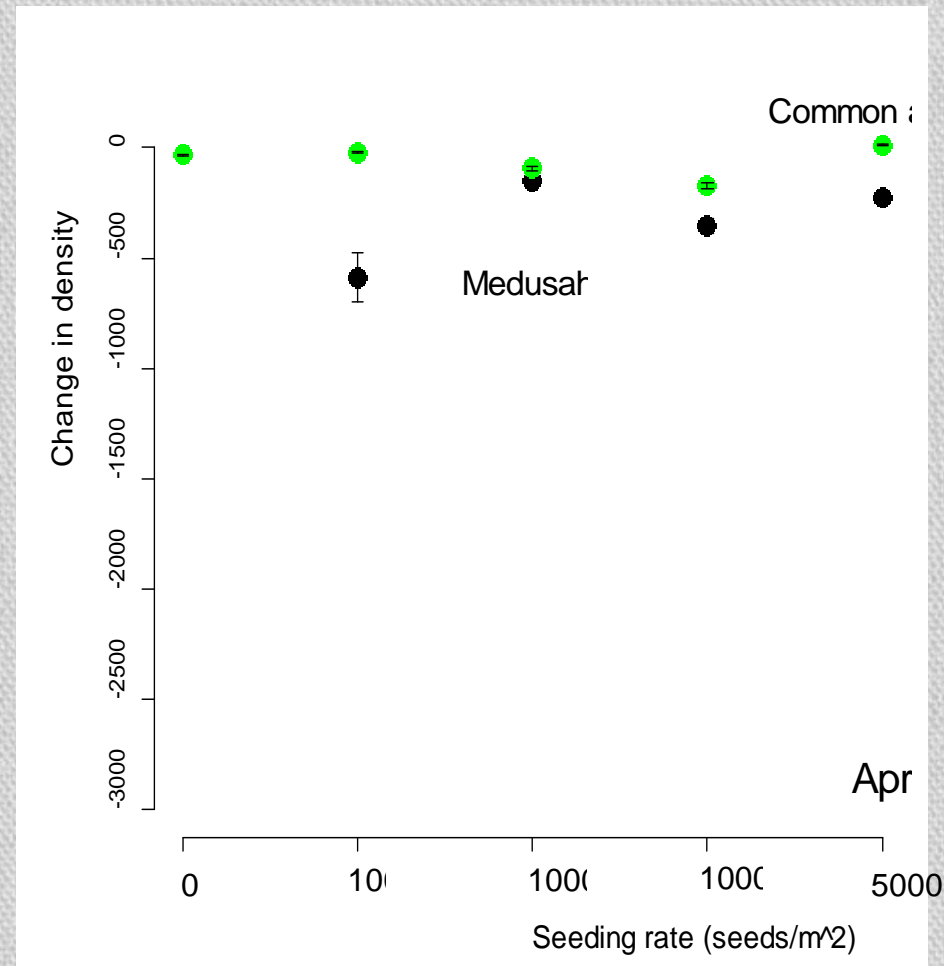
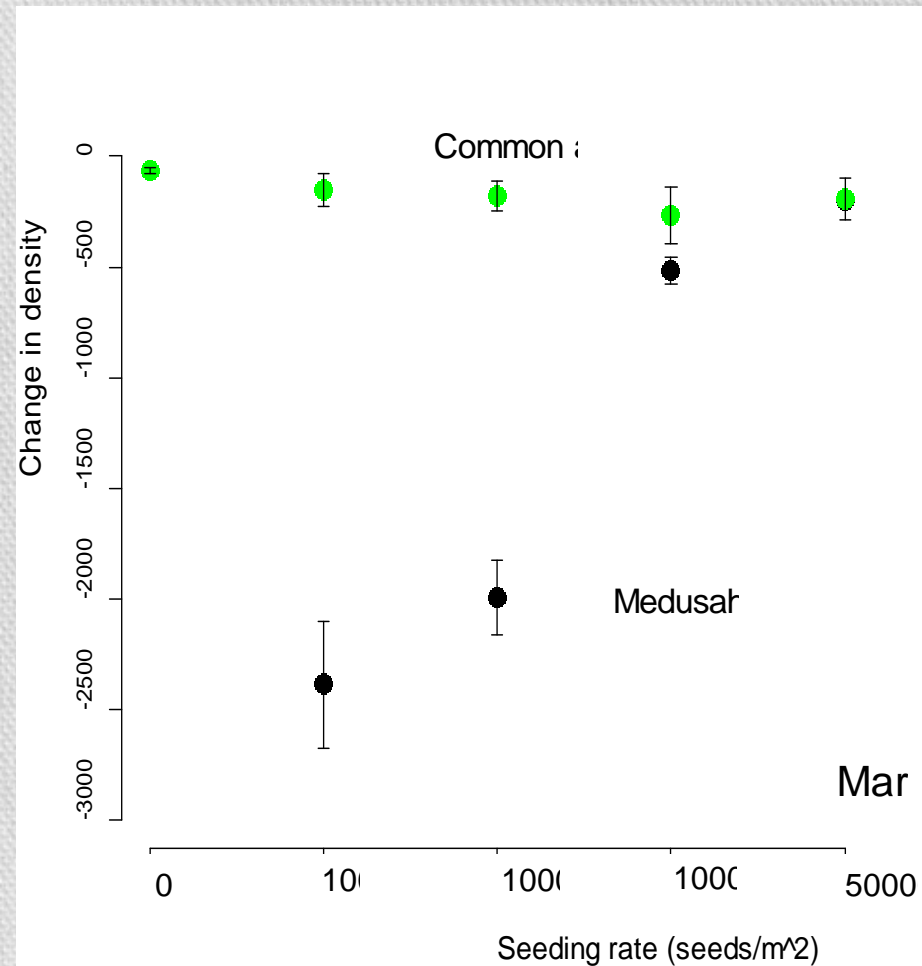
Habitat effects



Habitat effects

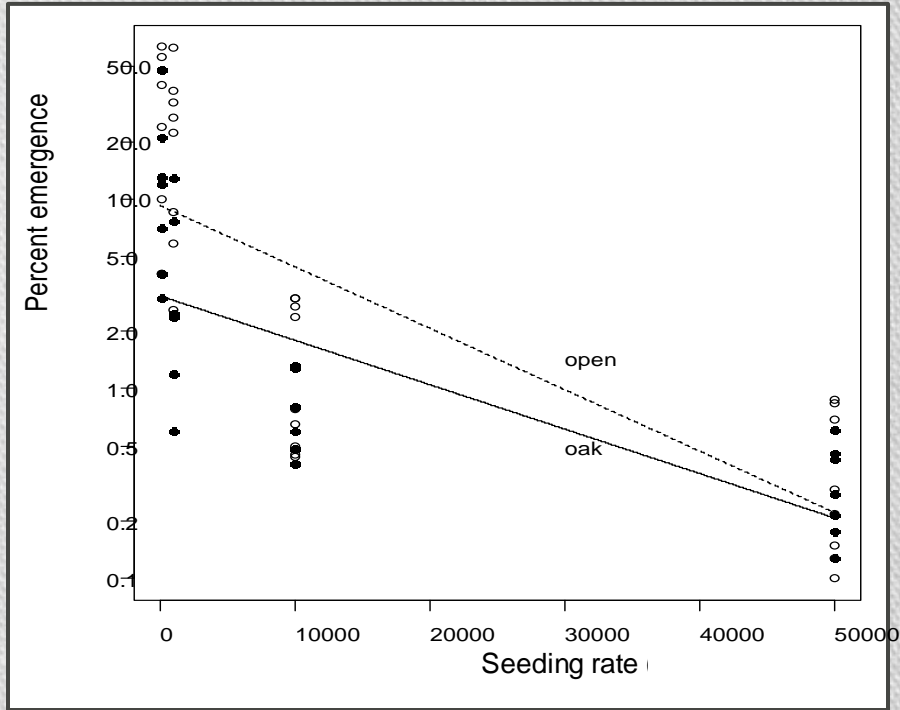


Habitat effects

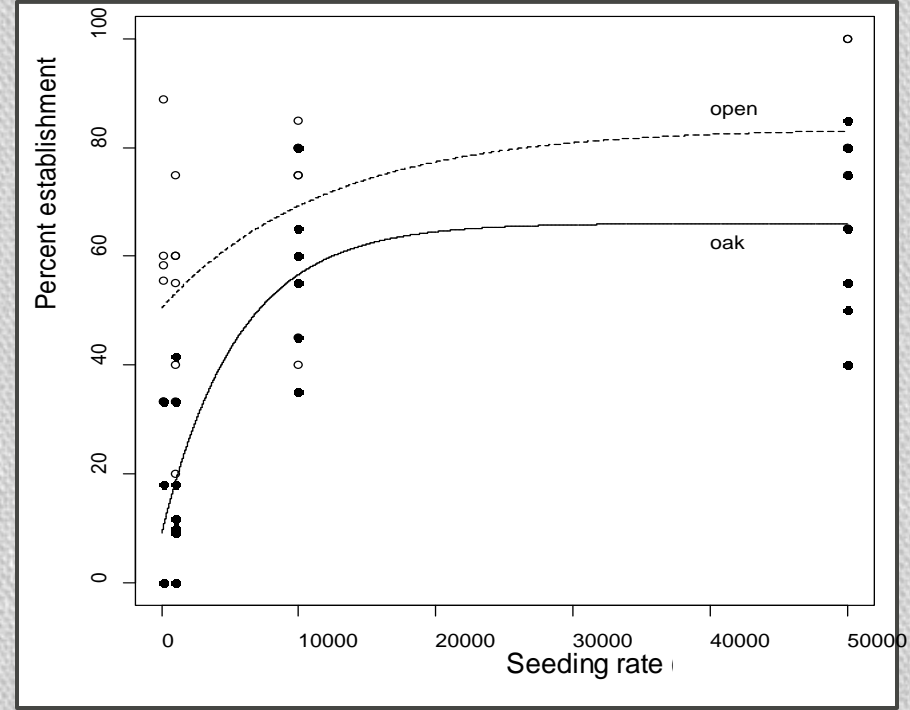


Prior to clipping

emergence

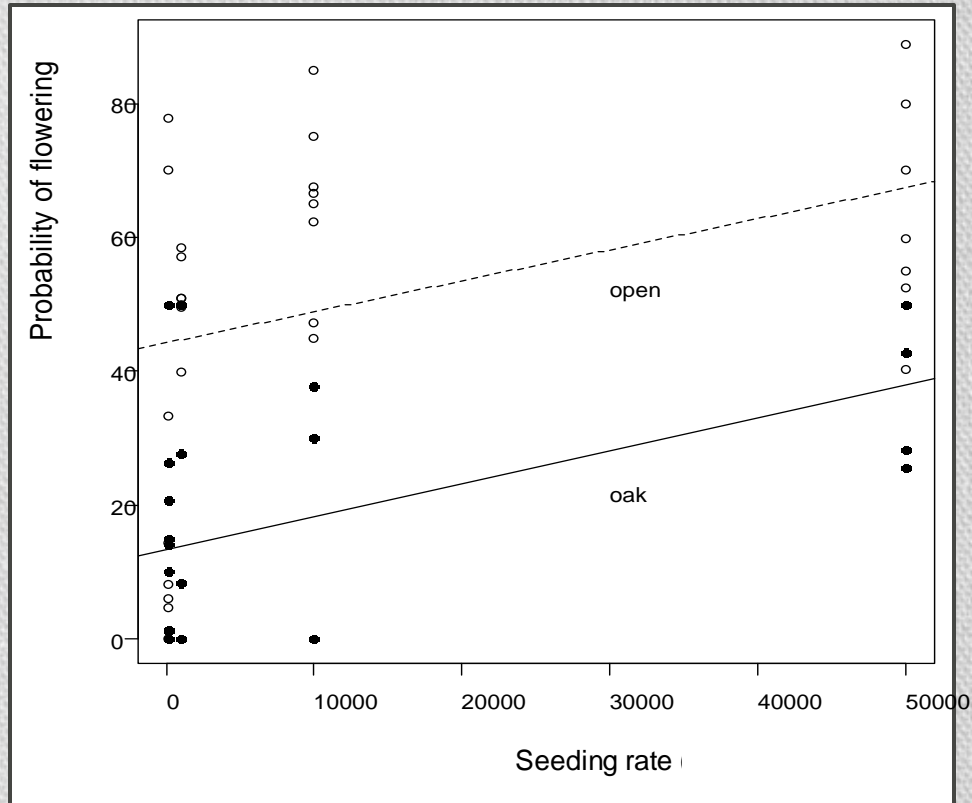


establishment



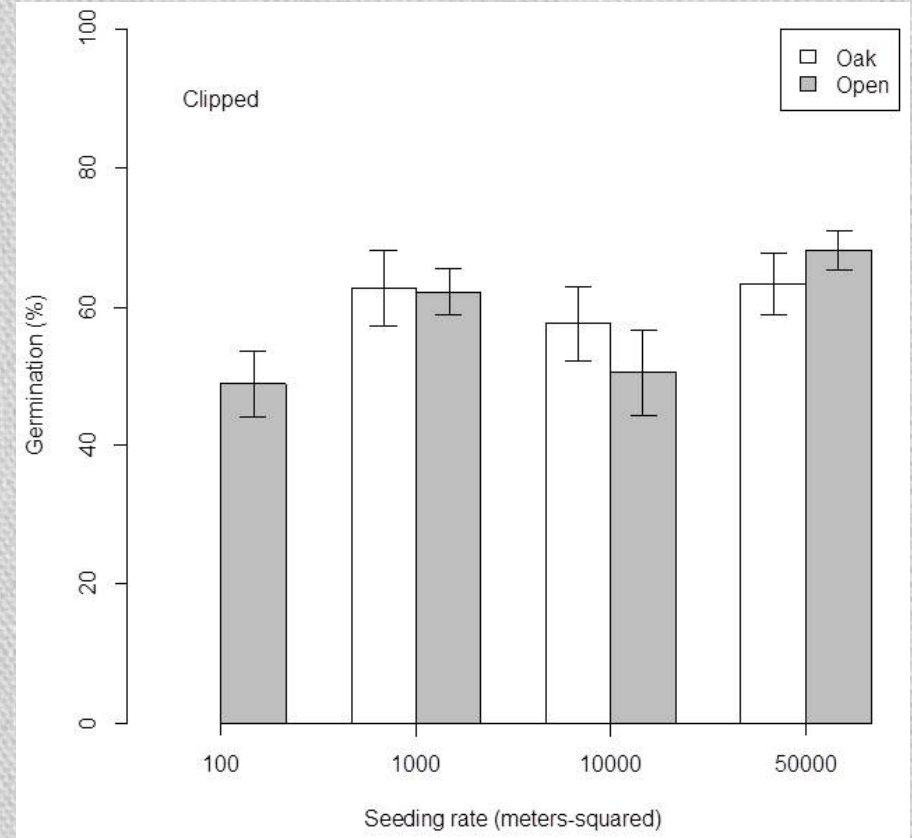
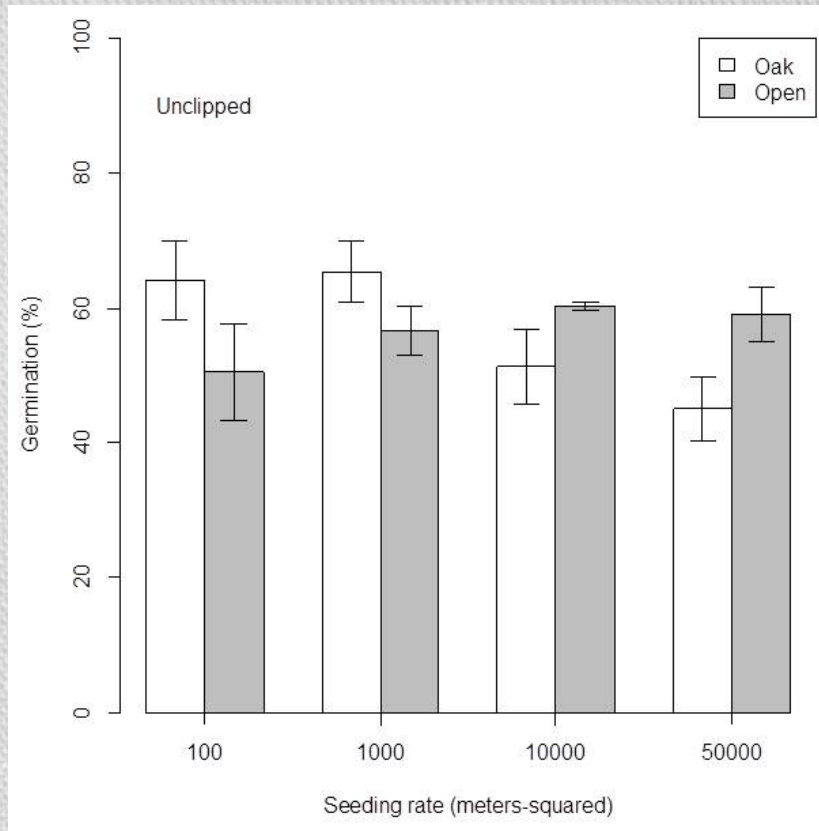
Prior to clipping

probability of flowering



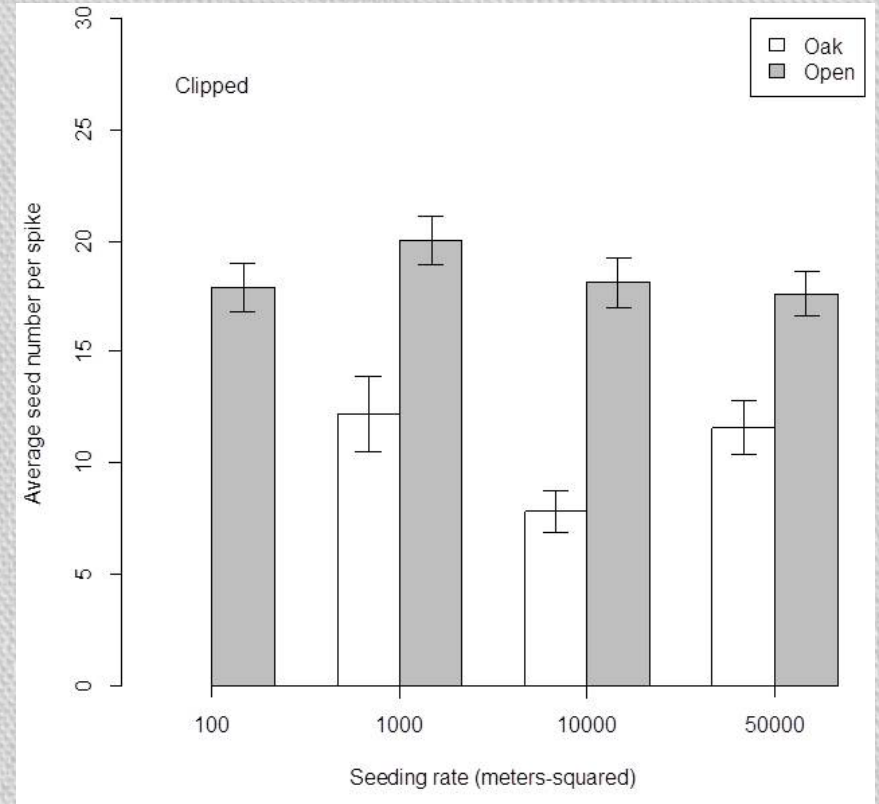
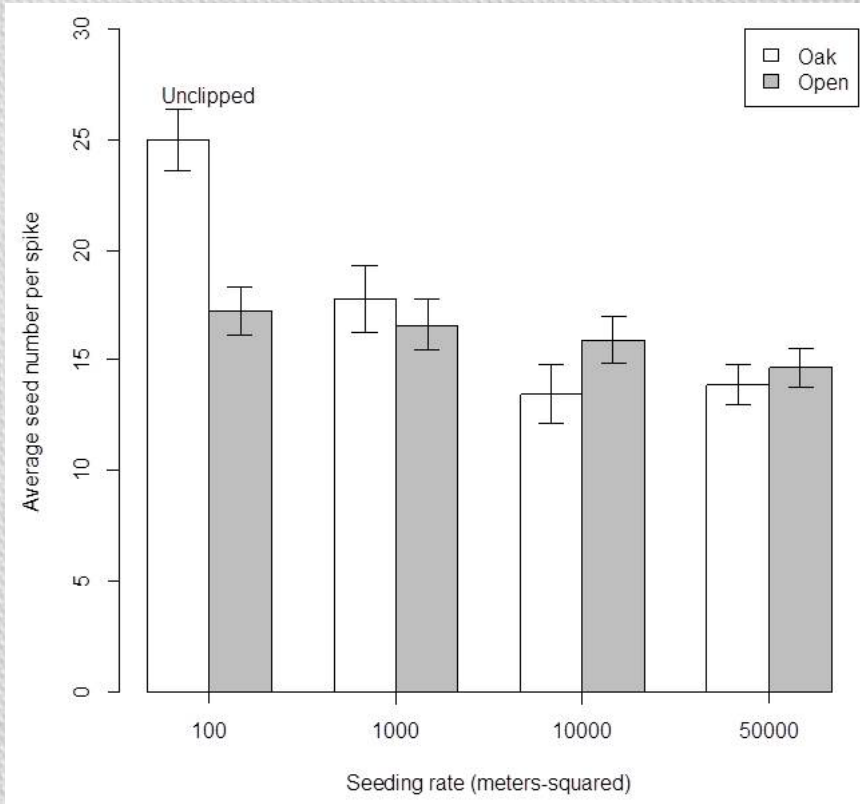
After clipping

germination



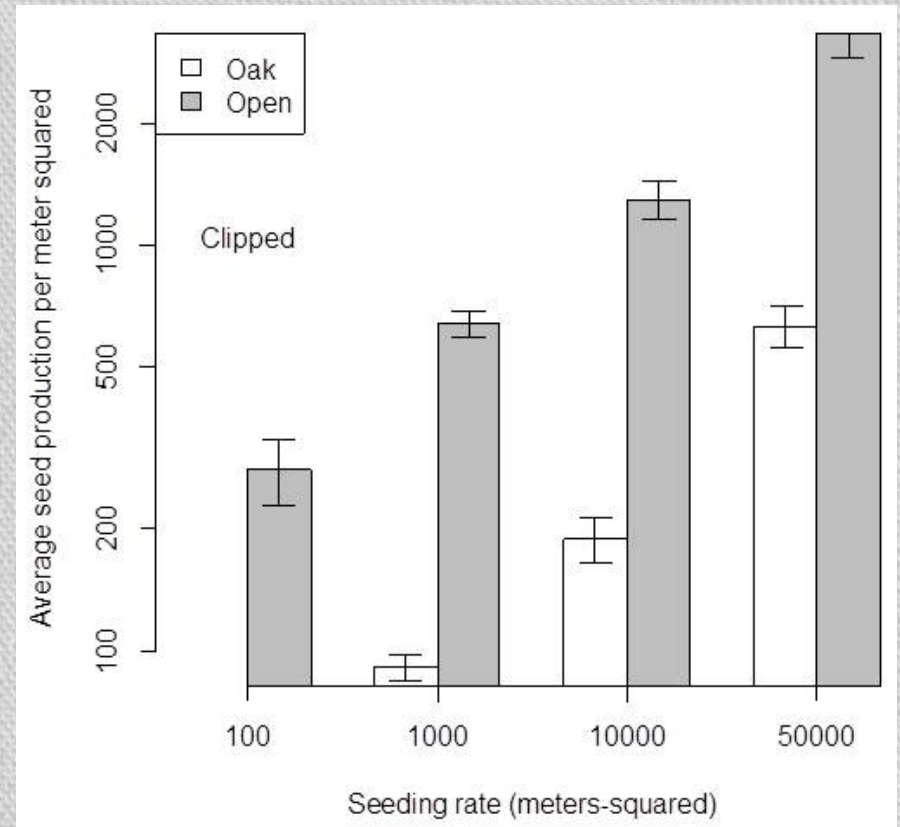
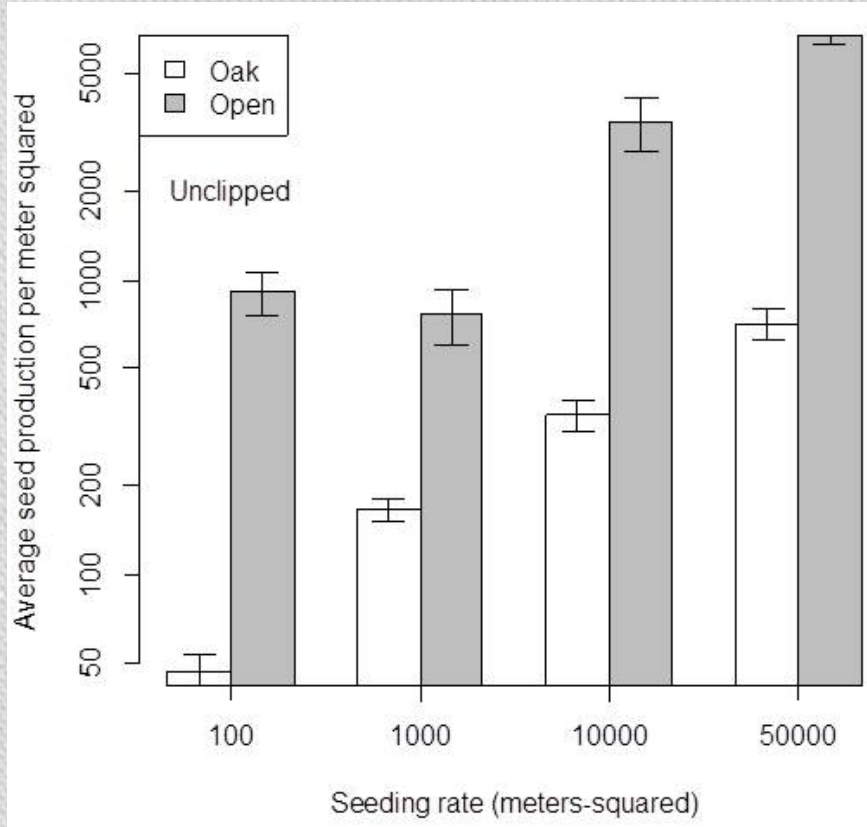
After clipping

seed number



After clipping

total seed output



Summary

Seed density matters

Habitat matters

Habitat x seed density interaction affects first year survival

Habitat x clipping interaction affects germination

Clipping encourages increased seed production per plant

Isolate mechanisms driving medusahead cover difference between habitats

Create periodic matrix models

Quantify role of soil microbiome in medusahead invasion

Develop more effective control methods



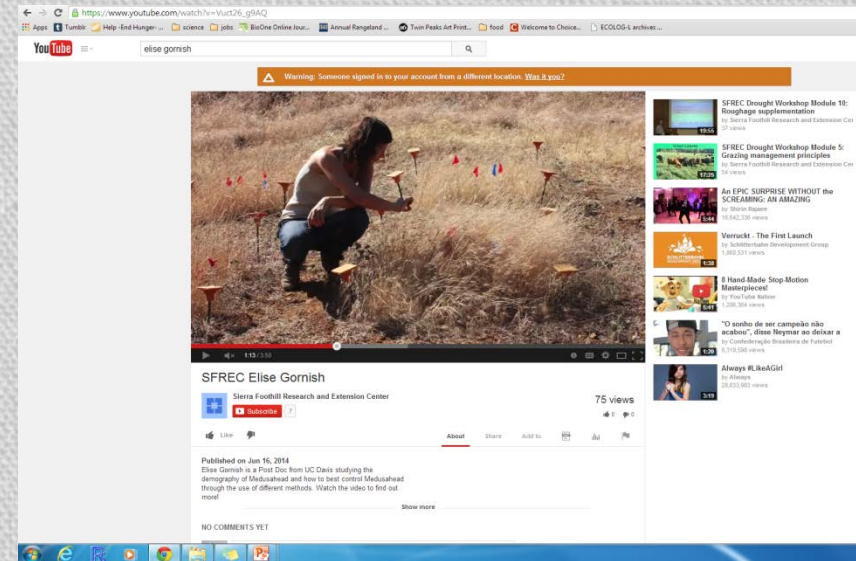
Outreach

Medusahead and Barbed Goatgrass forum

Invasive Annual Grass Collaborative

Presentations at CNPS, Oak Society, and vegetation managers workgroup annual meeting

Blog posts and youtube videos



Acknowledgments

Collaborators

Emilio Laca, Hal Caswell

Field Assistance

Lauren Connell, Brittany Forer, Albert Barberan, Tate lab, Rice lab, SFREC





Questions?

egornish@ucdavis.edu
elisegornish.webs.com