

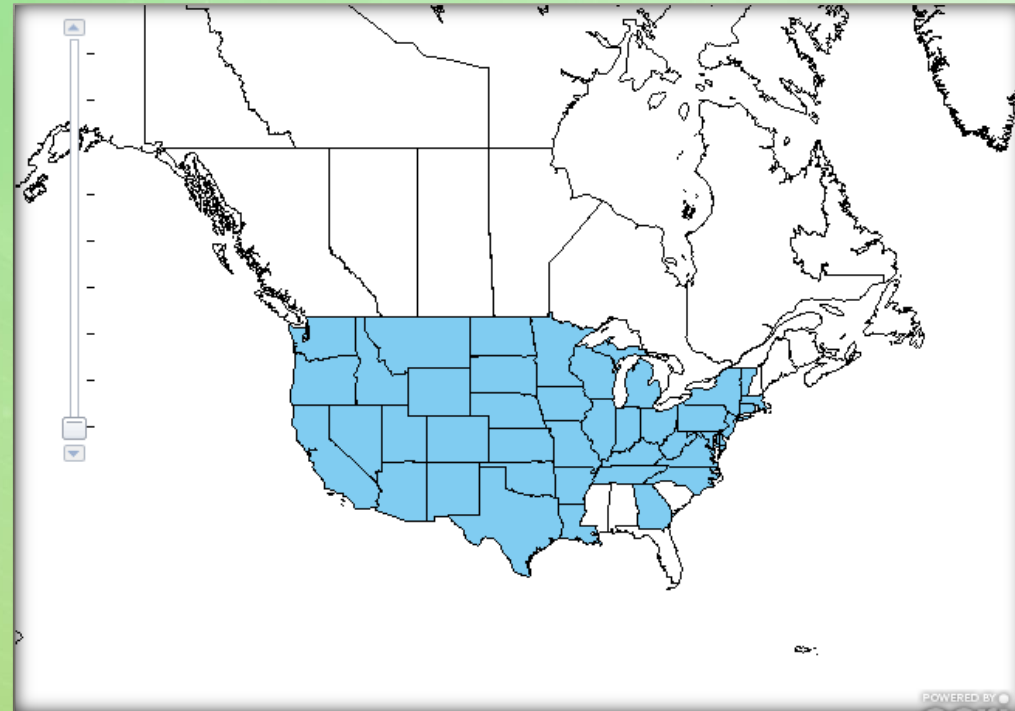
JORDAN SKOVGARD

**BULBOUS  
BLUEGRASS  
ECOLOGY AND  
MANAGEMENT**



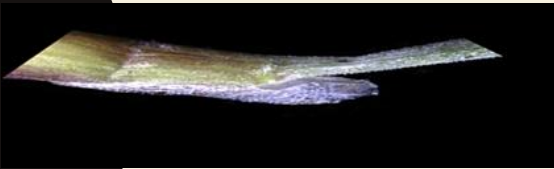
# WHO WE'RE DEALING WITH?

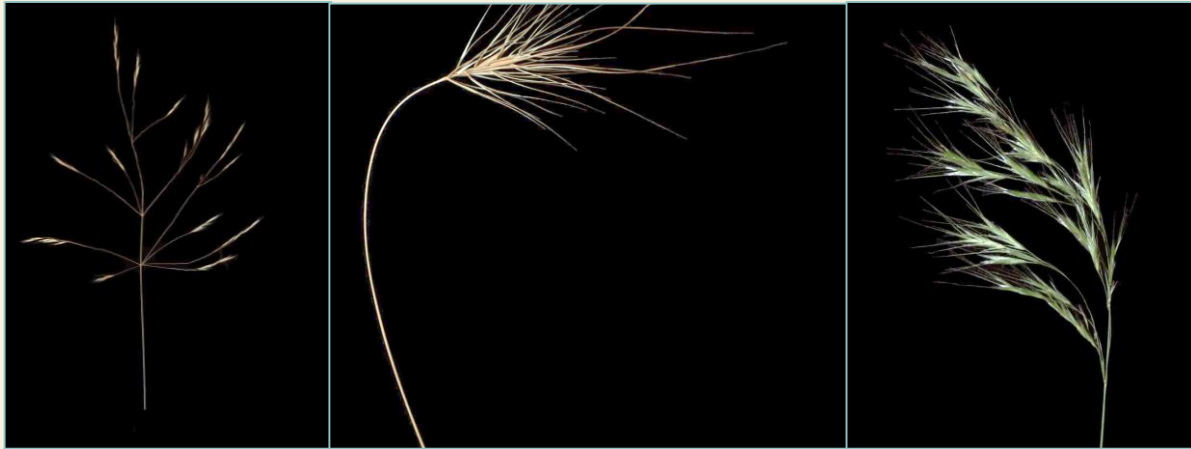
- Eurasian grass
- Introduced as turf grass
  - Alfalfa contaminant
- Invasive perennial



# BULBOUS IDENTIFICATION

- Spring & fall active growth
- Bunch grass
- Shallow rooted
- Bulblets
  - Seeds and bulbs on single inflorescence
- All soil textures
- 6-24” tall
- 12-40” Precip.





# DIFFERENCES AND SIMILARITIES TO OTHER INVASIVE GRASSES

- Palatability
- Silica content
- Competitive ability
  
- Invasive traits
- Winter growth
  - Resource consumption
- Negatively impact desirable veg.

# WHAT DO WE KNOW ABOUT BULBOUS BLUEGRASS

- Common physical traits
- Wide distribution
- Facilitated by disturbance
- Control is difficult
- Impactful





# **WHAT WE DON'T KNOW ABOUT BULBOUS BLUEGRASS**

- Distribution
- Invasion severity
- Population dynamics
- Economic impacts
- Restoration implications
- Effective control
- Interspecific interactions
- More!

# QUESTIONS



How does bulbous impact some of our desirable perennial grass?



How does bulbous bluegrass persist from year to year?



How do we control bulbous bluegrass?



# **QUESTION 1**

**HOW DOES BULBOUS IMPACT  
SOME OF OUR DESIRABLE  
PERENNIAL GRASSES?**

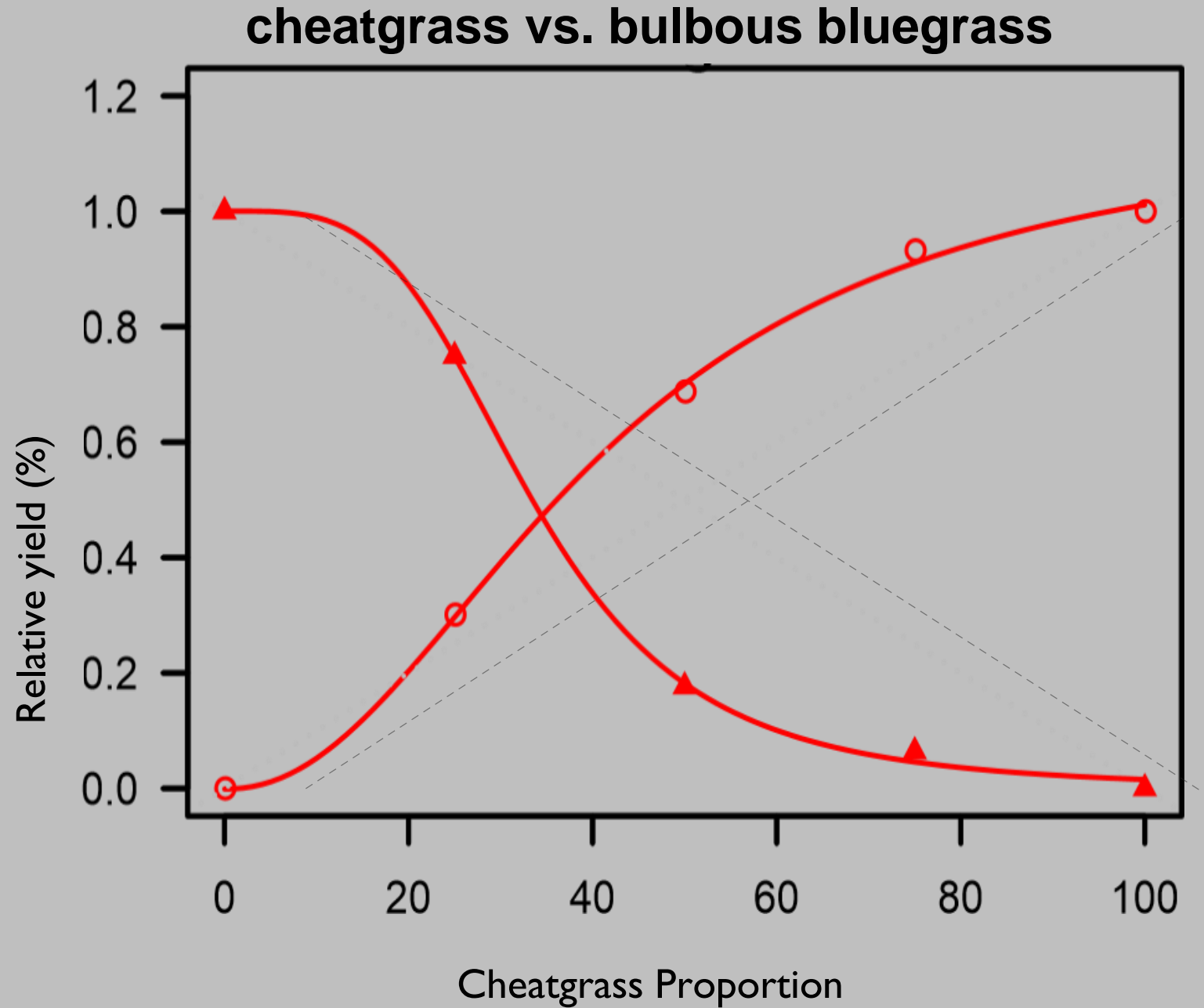






# METHODS

- Seedling-seedling competition similar to restoration seeding situation
- Replacement series greenhouse study
  - 12 weeks; 5 replicates
  - Clay-loam field soil 6 inch pots
  - Invader : desirable perennial ratios
    - 0:8, 2:6, 4:4, 6:2, 8:0
  - Constant density: 8 plants per pot
- Harvested aboveground biomass and calculated relative yield (Keddy et al. 1994)
- Non-linear regression (Burnett & Meador 2015)

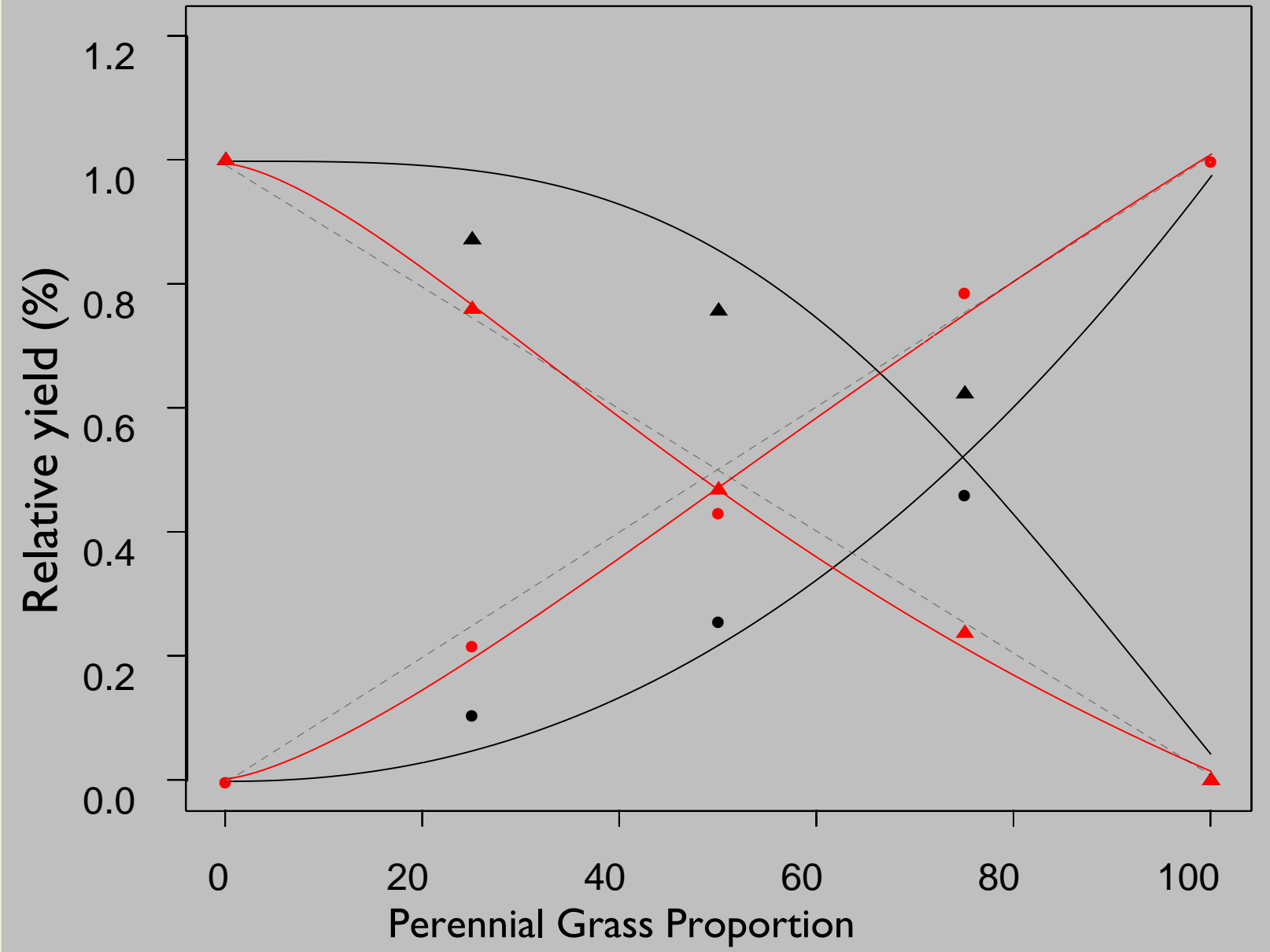


- ▲ bulbous bluegrass
- cheatgrass



-  Bulbous bluegrass
-  Perennial with bulbous
-  Cheatgrass
-  Perennial with cheatgrass

### pooled perennial grass response



# CONCLUSION



- Generally, cheatgrass more competitive than bulbous bluegrass
- Species-specific responses
  - Idaho fescue
  - Squirreltail
  - May inform decisions in restoration settings

# **QUESTION 2**

**HOW DOES BULBOUS PERSIST  
FROM YEAR TO YEAR?**

# IMPORTANCE

- How do populations grow and change over time
- Implications
  - Control
  - Spread
  - Impacts



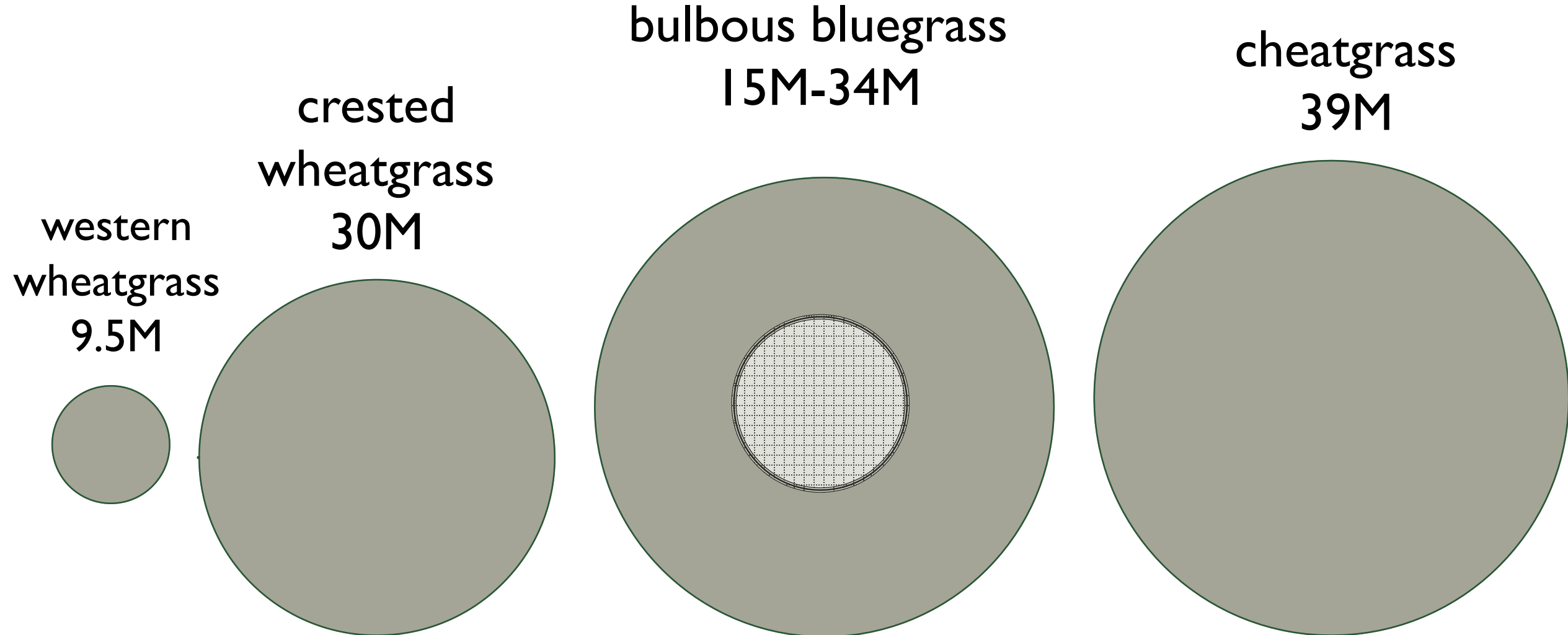
# METHODS

- Four 1/4 m squares, 3 treatments and 1 control
- 4 replicates
- Treatments
  - All bulblets removed from inflorescence, adults left
  - All bulbous removed (adults and bulblets), bulblets replaced
  - All vegetation removed, bulblets replaced
- Data collection
  - Cover by spp.
  - 3% then 10% increments



# Seed Production Comparison

Seeds / Acre





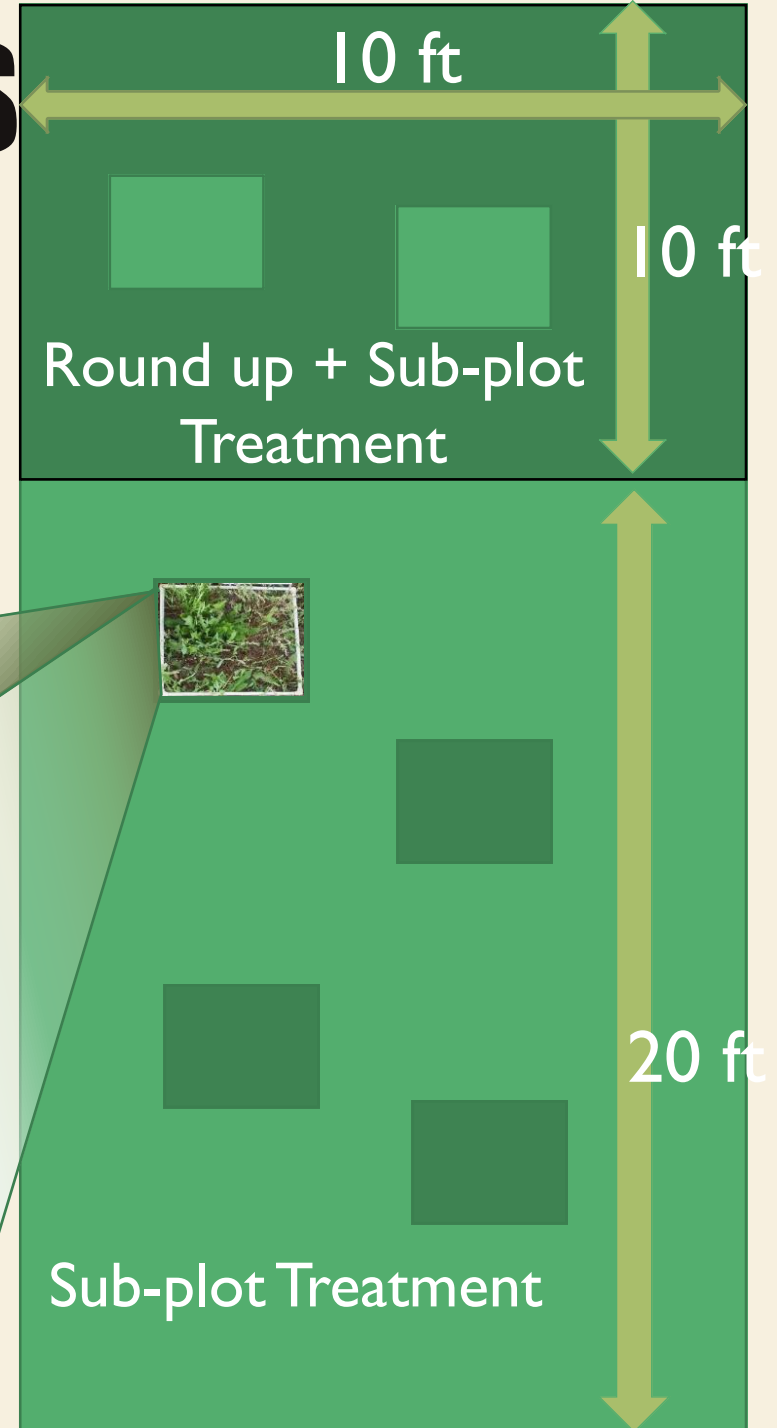
# **QUESTION 3**

**HOW DO WE CONTROL  
BULBOUS BLUEGRASS?**

# MATERIALS AND METHODS



- 10 x 30ft plots
- 11 treatments
- 2 sites
- 6 0.25m<sup>2</sup> cover quadrats
  - 1<sup>st</sup> yr: Cover classes 1-6
  - 2<sup>nd</sup> yr: Cover 10% increments
- 2 within Roundup 4 outside Roundup



# HERBICIDE DETAILS

- 10oz/ac Roundup Weathermax for main plot treatments
- CO<sub>2</sub> powered broadcast sprayer
  - 187 L/ha
  - Six 8002 nozzles

Trt	Sub-plot Treatment	Rate (oz/ac)
1	Untreated	--
2	Plateau	7
3	Matrix 25 DF	3
4	Landmark	1.33, 3.55
5	Esplanade	5
6	Esplanade	7
7	Plateau + Esplanade	7, 5
8	Plateau + Esplanade	7, 7
9	Matrix 25DF + Esplanade	3, 5
10	Matrix 25 DF + Esplanade	3, 7
11	Landmark + Esplanade	1.33, 3.55, 5
12	Landmark + Esplanade	1.33, 3.55, 5

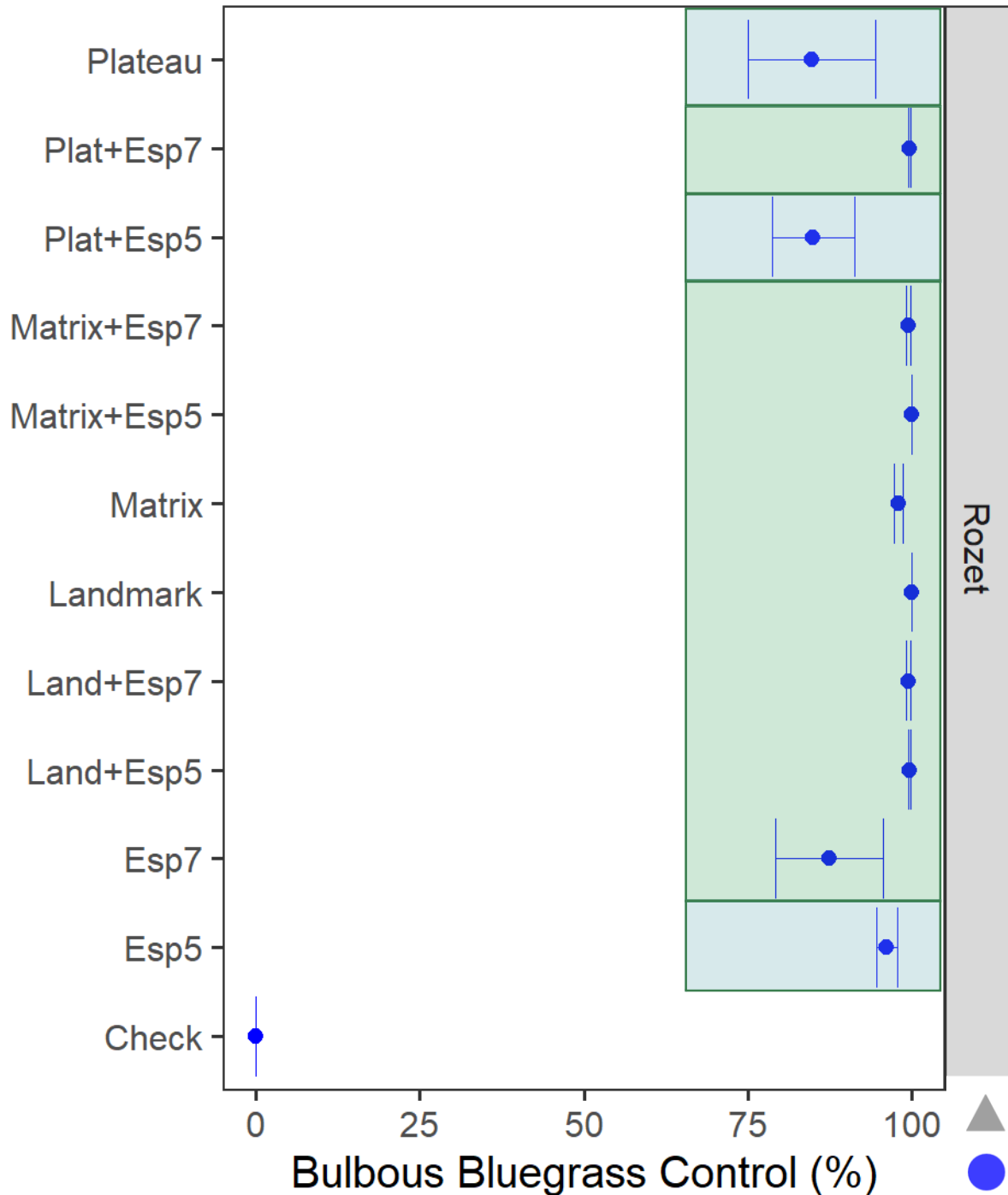


**Rozet site:**  
Applied 25 April 2018  
Relative humidity 23%  
Air temperature 70 F  
Soil temperature 65 F

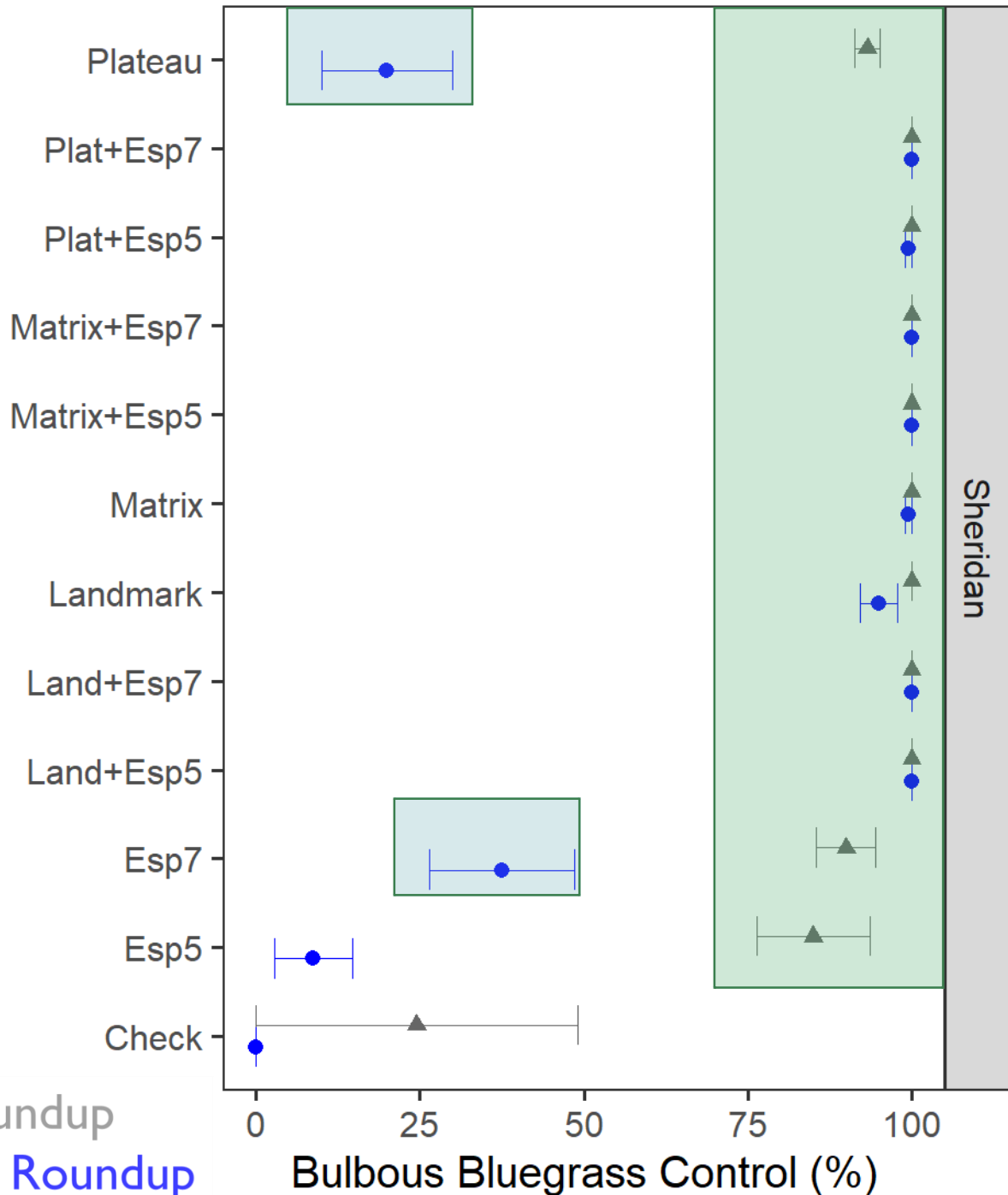


**Sheridan site:**  
Applied 16 April 2018  
Relative humidity: 63%  
Air temperature: 45 F  
Soil Temp: 40 F

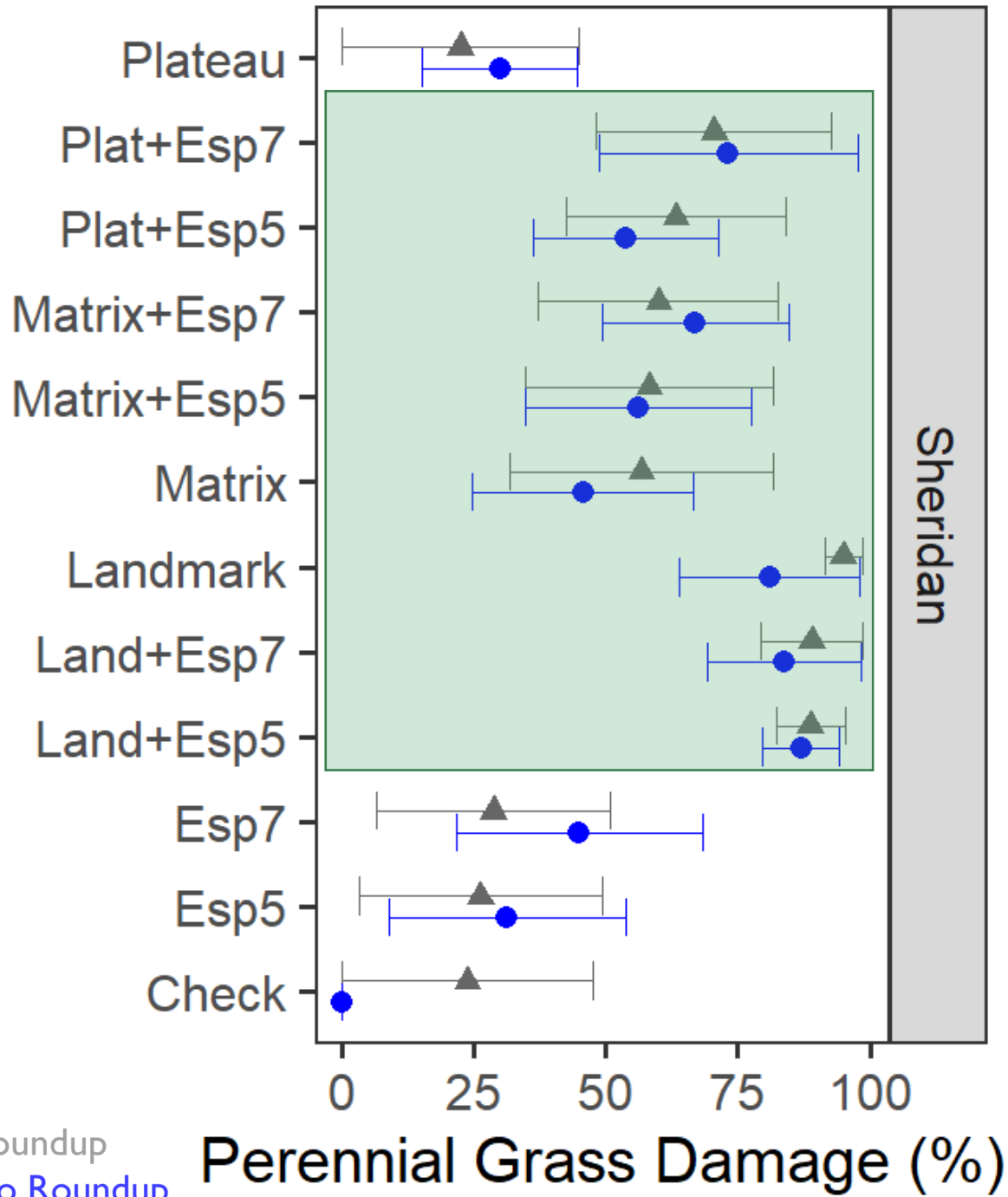
Herbicide Treatment



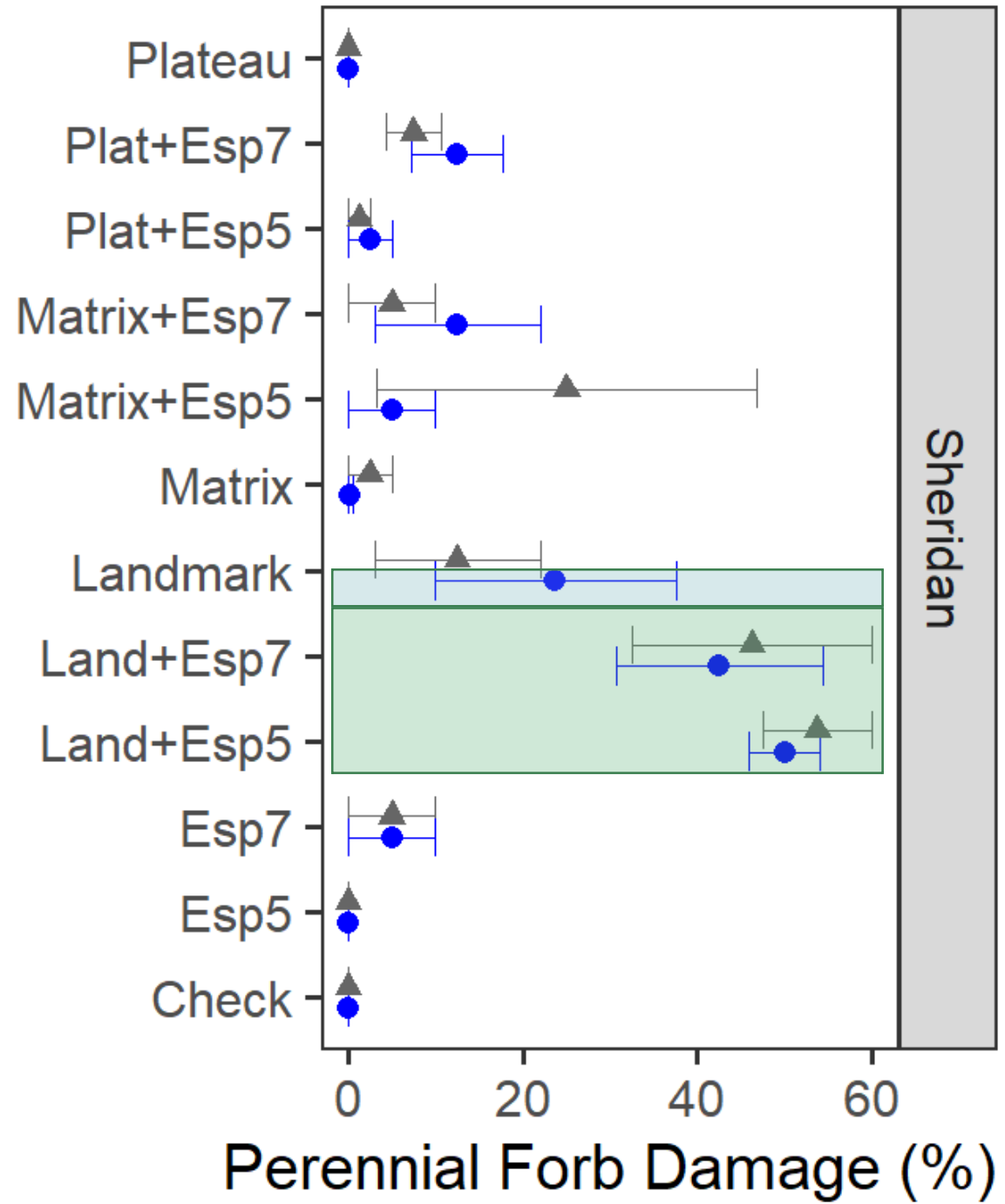
Herbicide Treatment



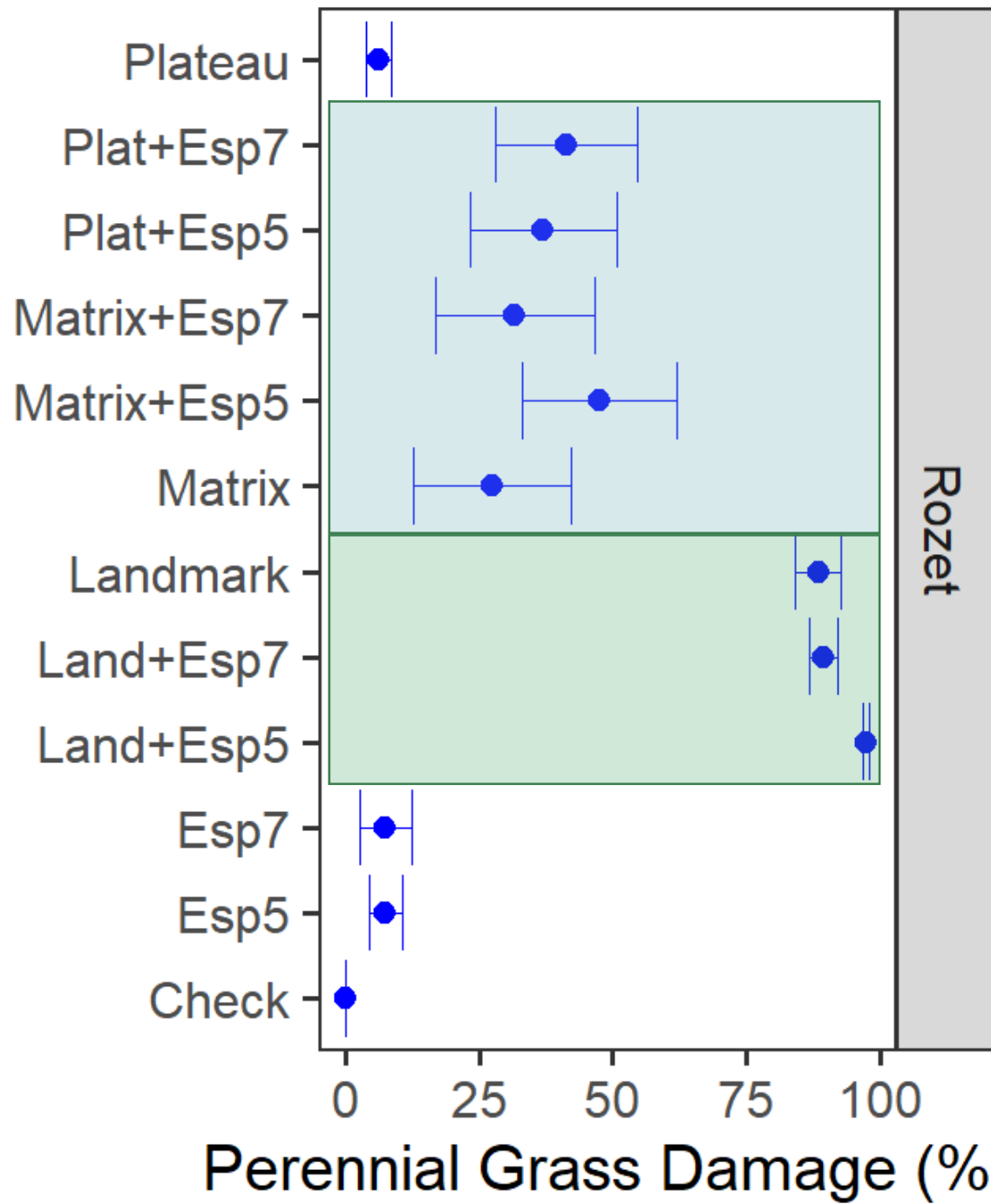
Herbicide Treatment



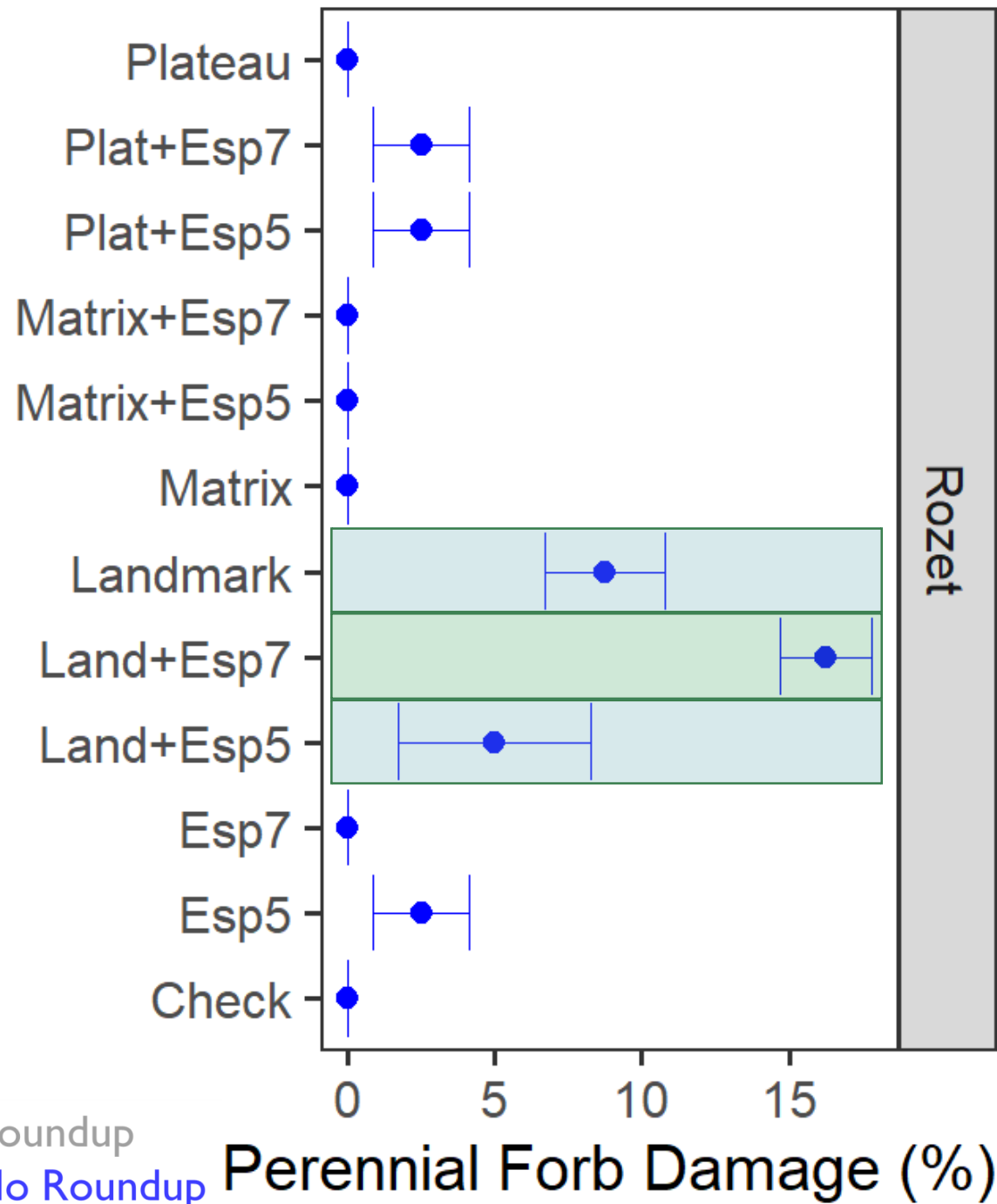
Herbicide Treatment



Herbicide Treatment



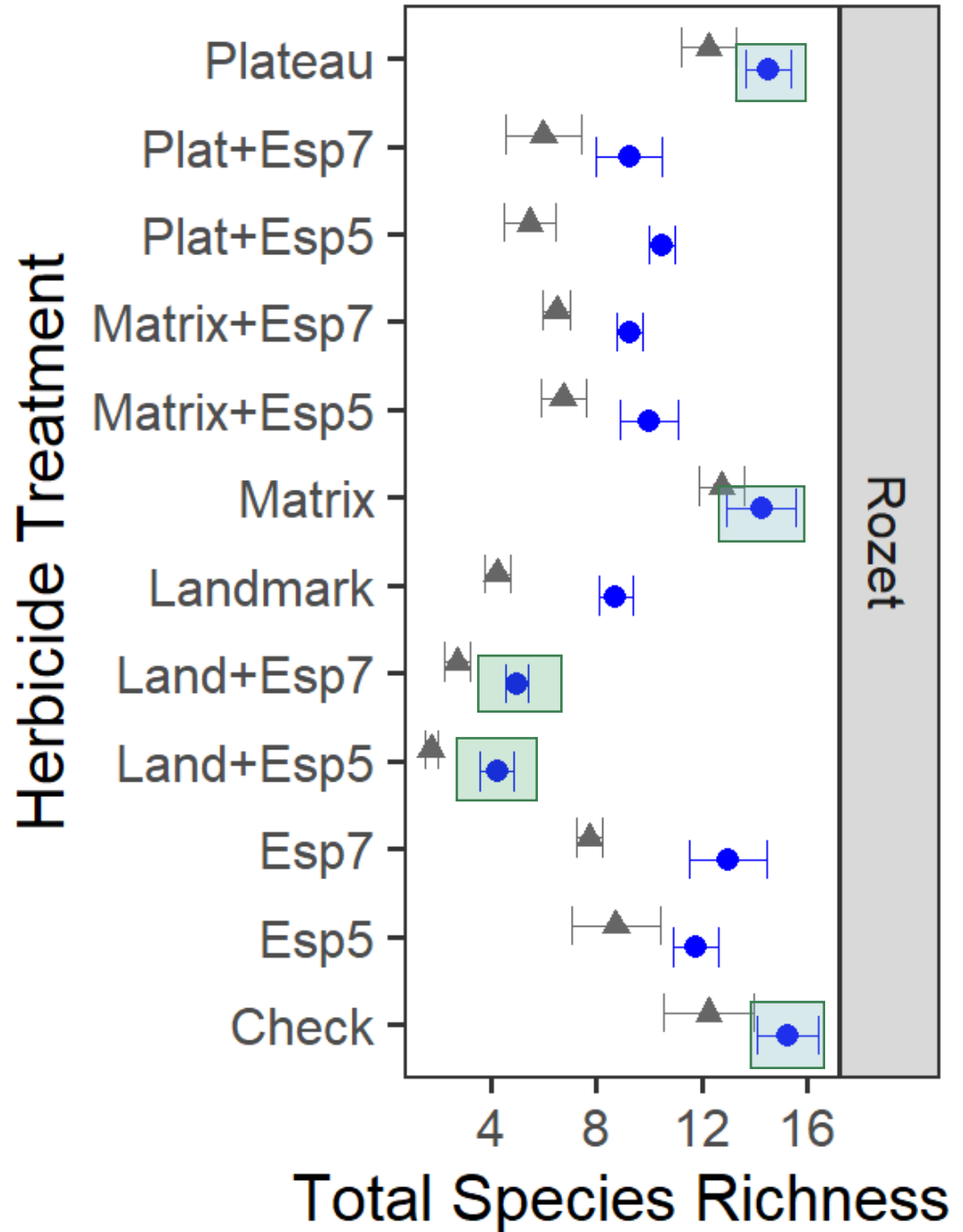
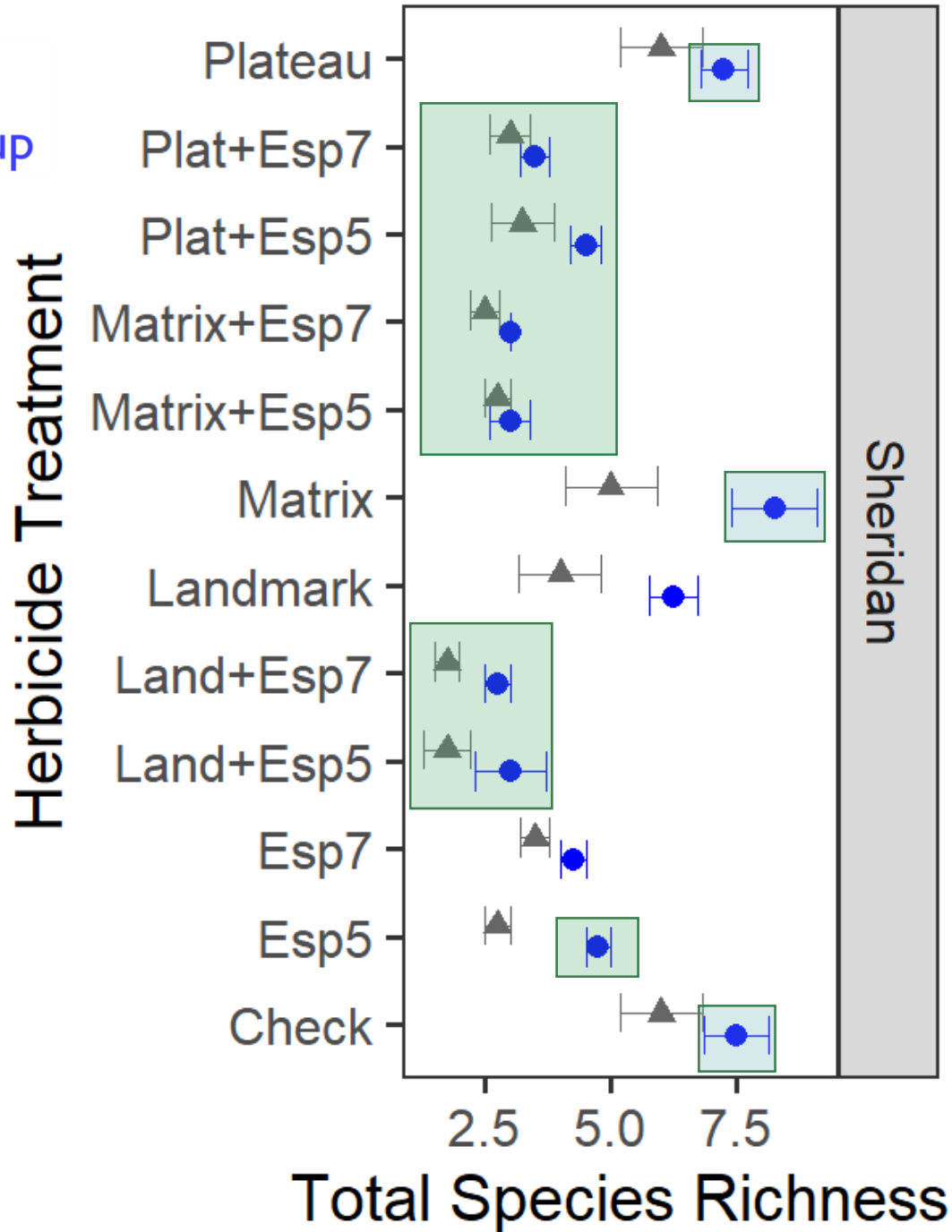
Herbicide Treatment



▲ Roundup

● No Roundup

▲ Roundup  
● No Roundup



# CONCLUSION

- Control is possible 1yr after treatment
- Some Roundup:treatment interactions exist
  - Roundup not viable option alone
- Residual herbicides needed for long term control
- Herbicides impact species richness
- Ideally: maintain/ improve perennial grass cover, and control bulbous bluegrass





# NEXT UP?

Further data analysis  
and 2YAT data

Repetition of  
competition study

Demography details

## ACKNOWLEDGEMENTS

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# QUESTIONS