

Management of Volunteer Winter Wheat in Summer Seeded Alfalfa

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Background

- Late summer seeding alfalfa is common in WI
 - Most common after wheat harvest
- Weed control is typically not recommended with late summer seedings
 - Volunteer wheat can be problematic in no-till systems
 - Winter wheat can reduce alfalfa establishment and yield
- Effective herbicides exist, but limited info on glyphosate (Roundup Ready alfalfa)



Objectives

- Compare common products used for winter wheat control to glyphosate and determine the:
 1. Efficacy
 2. Stand establishment
 3. Spring yield
 4. Milk yield per ton of forage



Materials & Methods



- Established sites in summer 2015
 - Seeded alfalfa in fields August
 - Replicated across 3 locations
- 4 treatments at 2 different timings
- Data collected:
 - Fall control rating (28 DAT)
 - Spring stand counts
 - First cut yield



Methods: Treatments

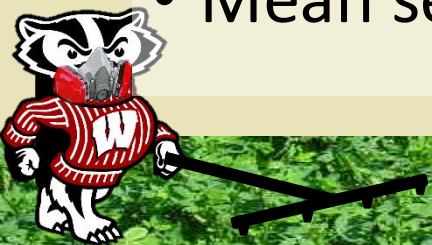
Treatment	Rate
Control	-
Glyphosate	0.86 kg ae ha ⁻¹
AMS	0.02 kg/L
Sethoxydim	0.31 kg ae ha ⁻¹
AMS	0.02 kg/L
COC	1.7% v/v
Imazamox	0.03 kg ae ha ⁻¹
AMS	0.02 kg/L
MSO	1% v/v

Timing	Alfalfa Stage/Ht.	Wheat Height
Early	2-3 TL	10-15cm
Late	10-17cm	15-30cm

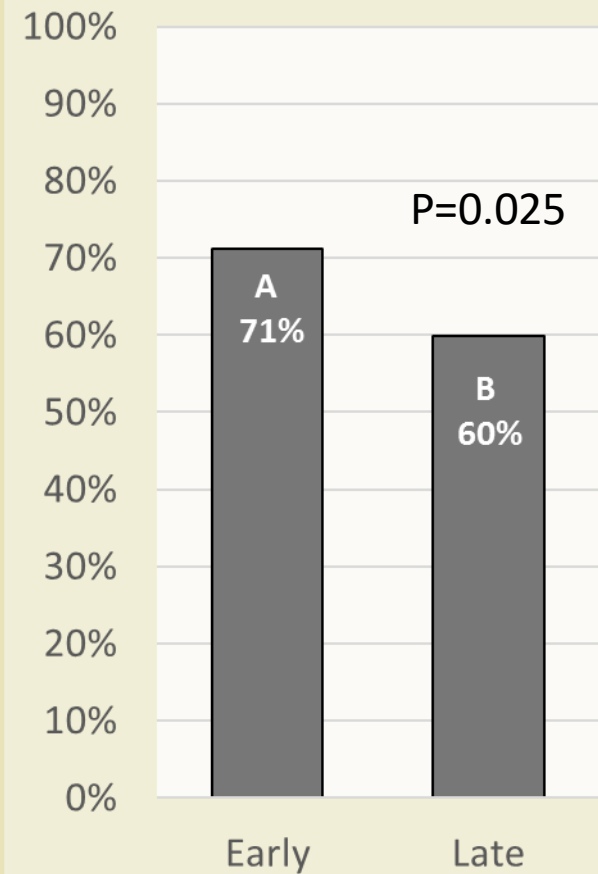
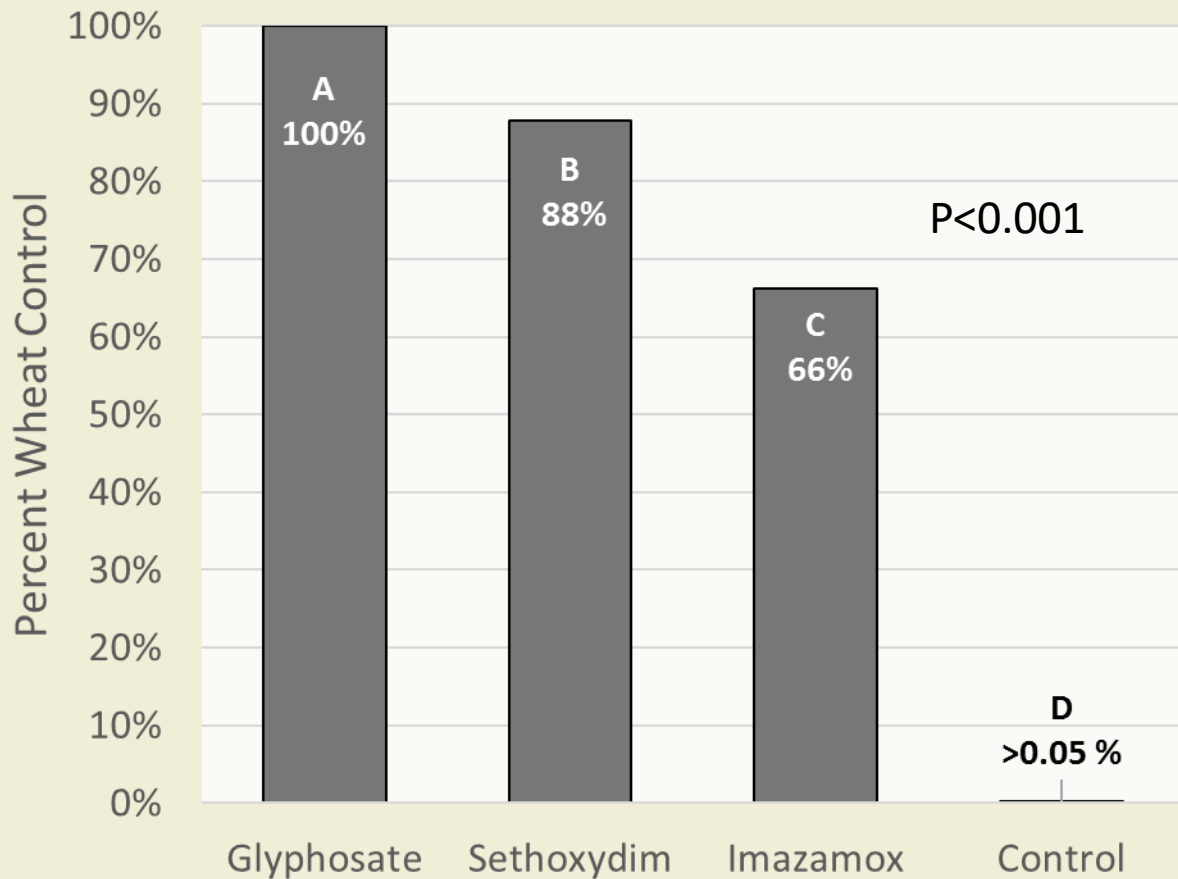


Materials & Methods: Stats

- Randomized complete block design at all locations
 - 4 blocks at Lancaster & Sheboygan
 - 3 blocks at Arlington
- ANOVA via SAS Proc Mixed
 - Factors were herbicide, timing and herbicide*timing
 - Site and block were random variables
 - Data transformed if needed
 - 28 DAT control data arcsine-square root transformed
- Mean separation using Fisher's LSD ($\alpha=0.05$)



Results: Fall Control Rating (28 DAT)



Glyphosate



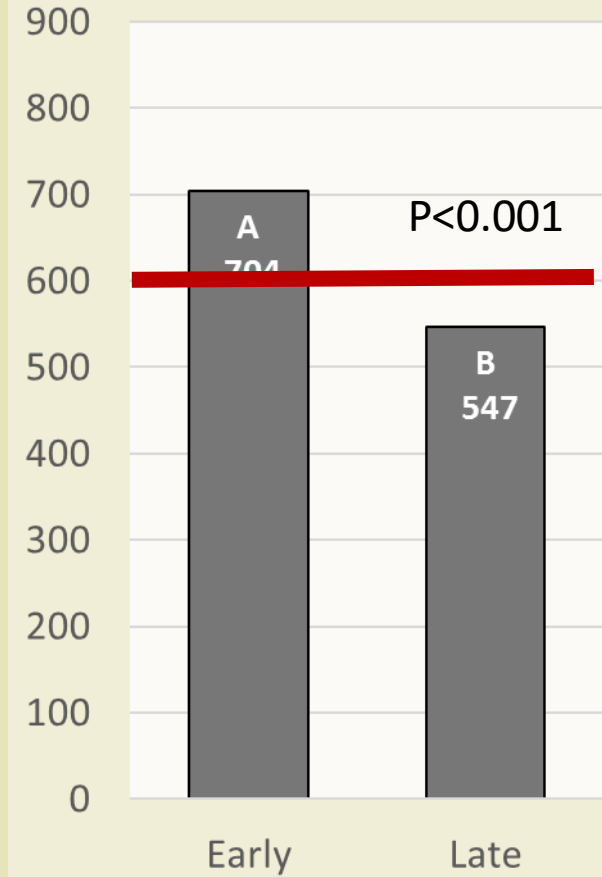
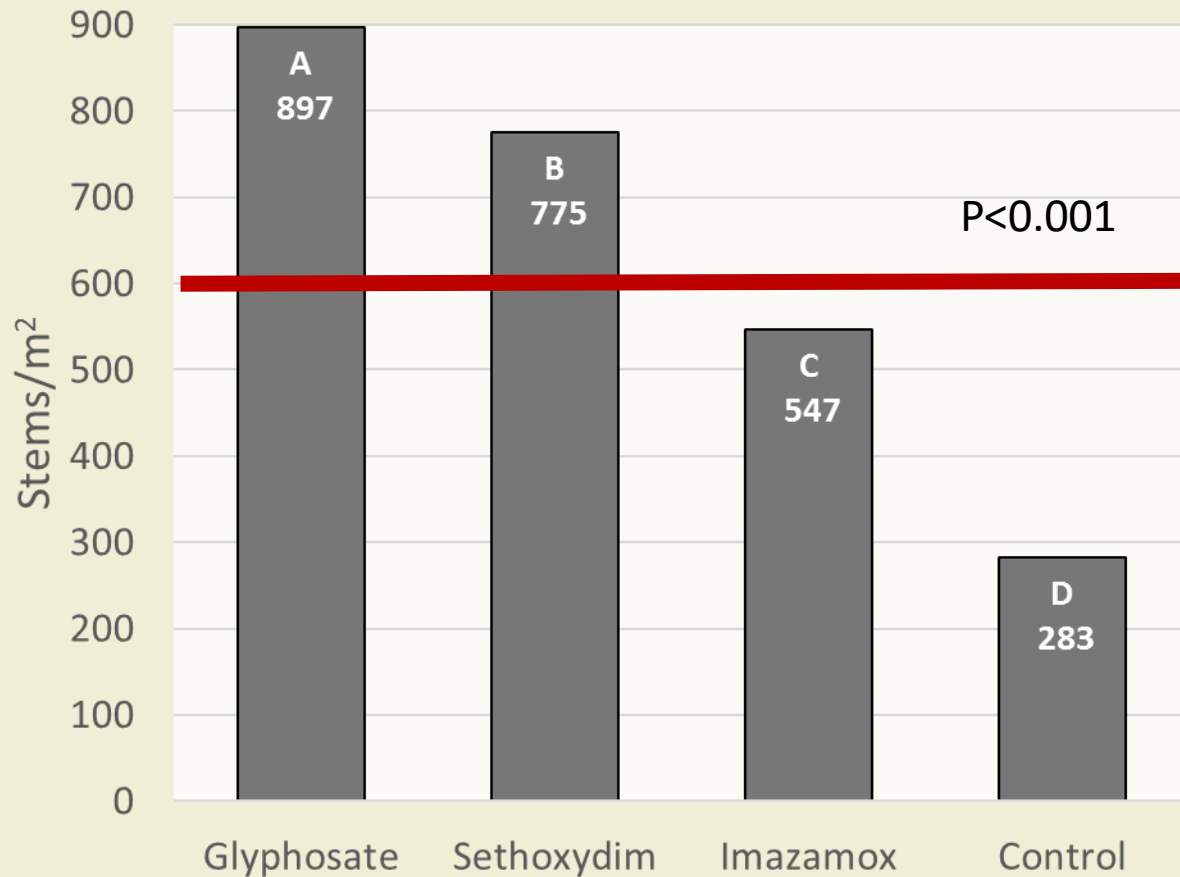
Sethoxydim



Imazamox

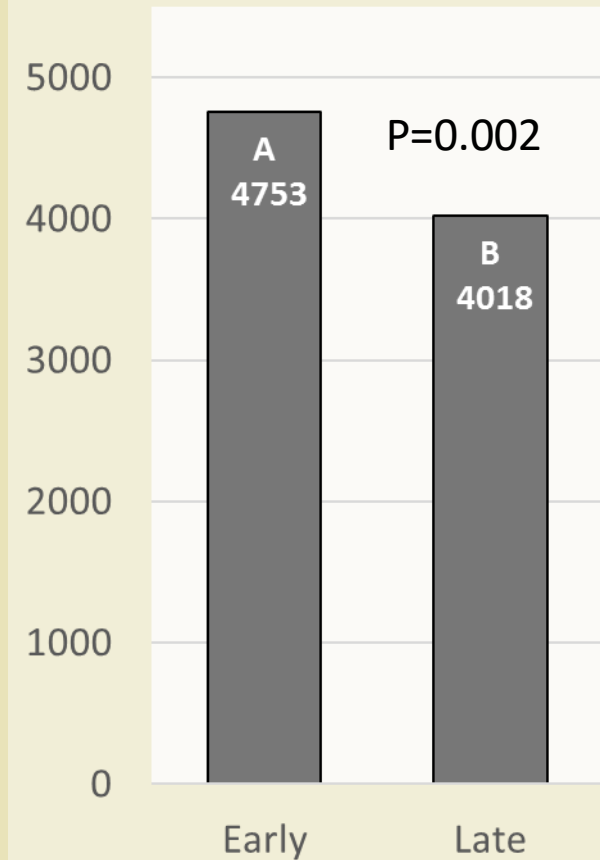
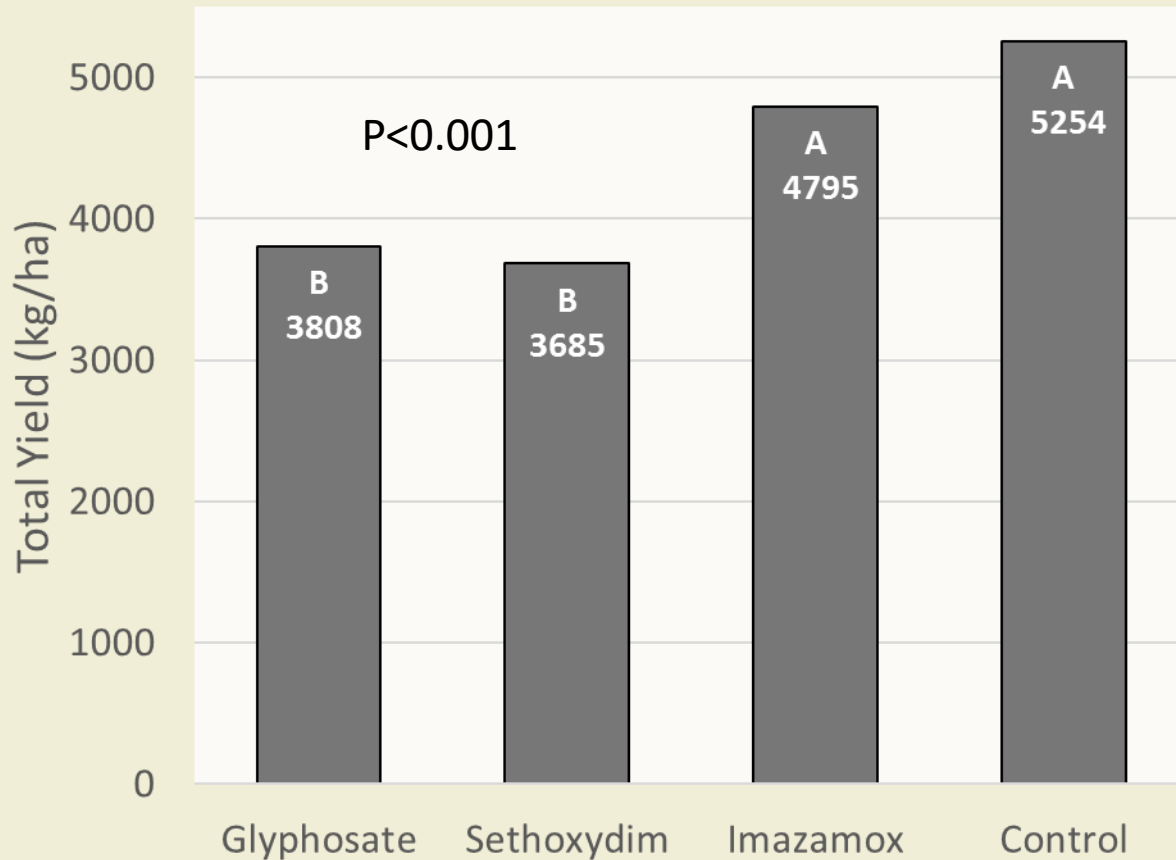


Results: Stand Establishment

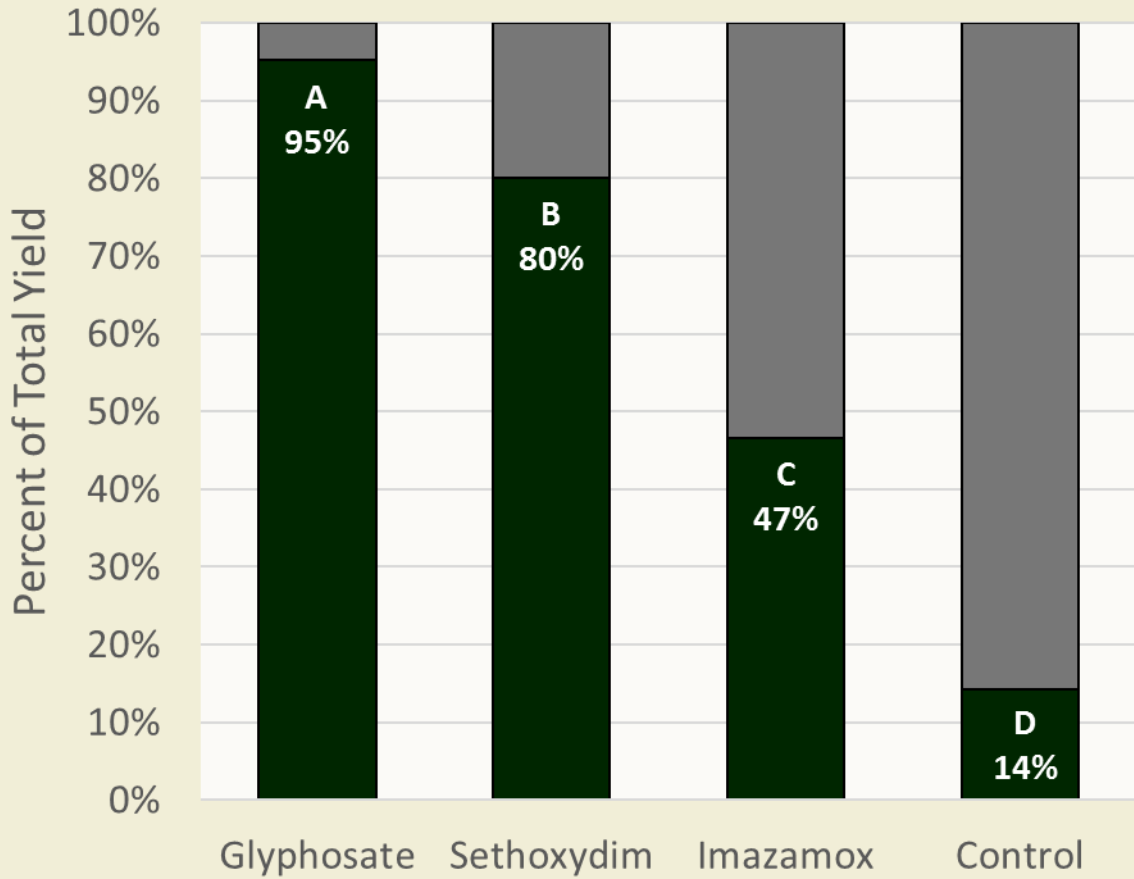




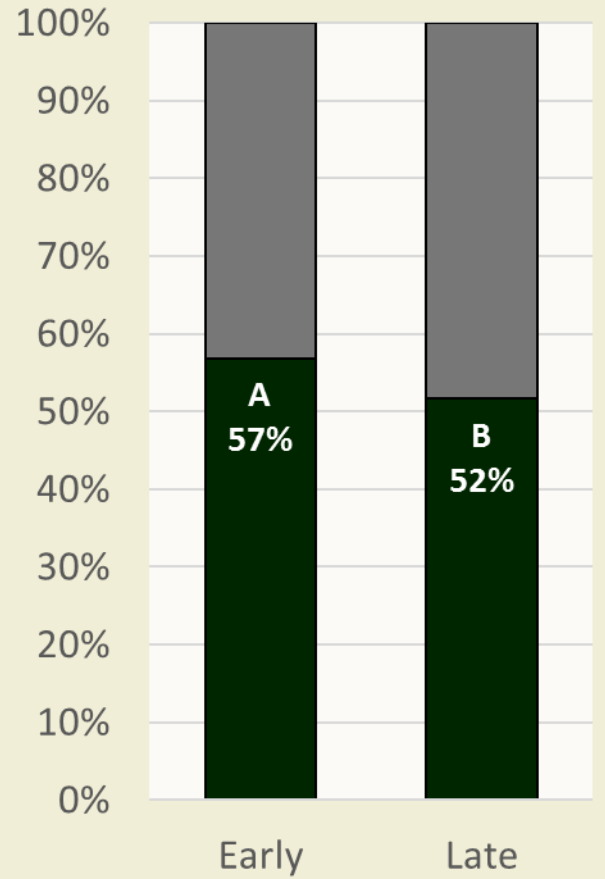
Results: First Cut Yield



Results: First Cut Alfalfa Yield



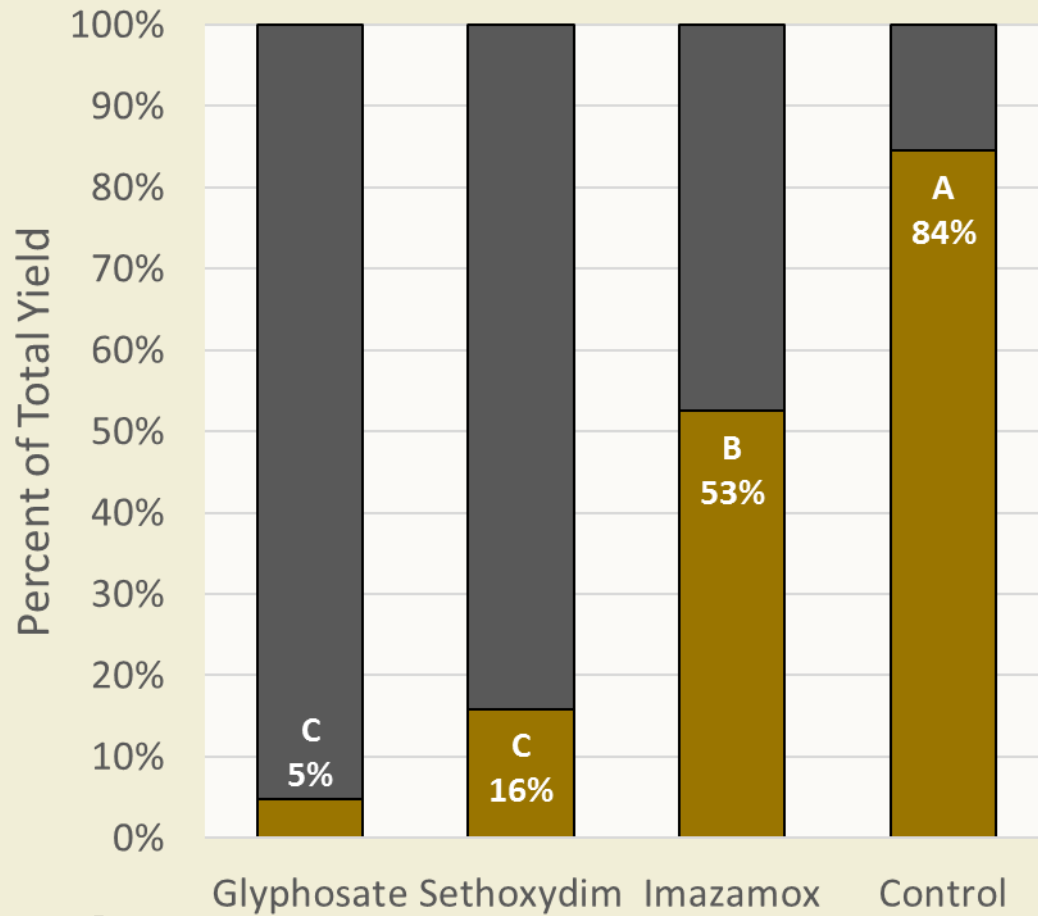
P<0.001



P=0.001



Results: First Cut Wheat Yield

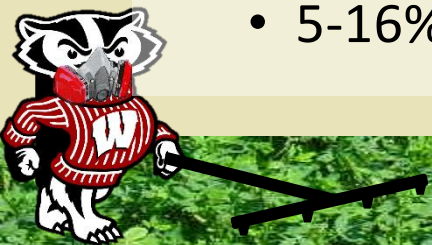


$P < 0.001$



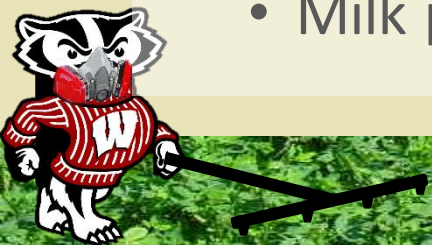
Conclusions

- 28 DAT glyphosate provided the best wheat control
 - Early timing gave minimal improvements in control
- Glyphosate & sethoxydim exceeded 600 stems/m² threshold
 - Late applications had 25% reduction in stand densities
- Total yield greatest in non-treated and imazamox
 - Imazamox 53% wheat
 - Non-treated 84% wheat
- Glyphosate and sethoxydim total yield up to 30% lower
 - 5-16% wheat

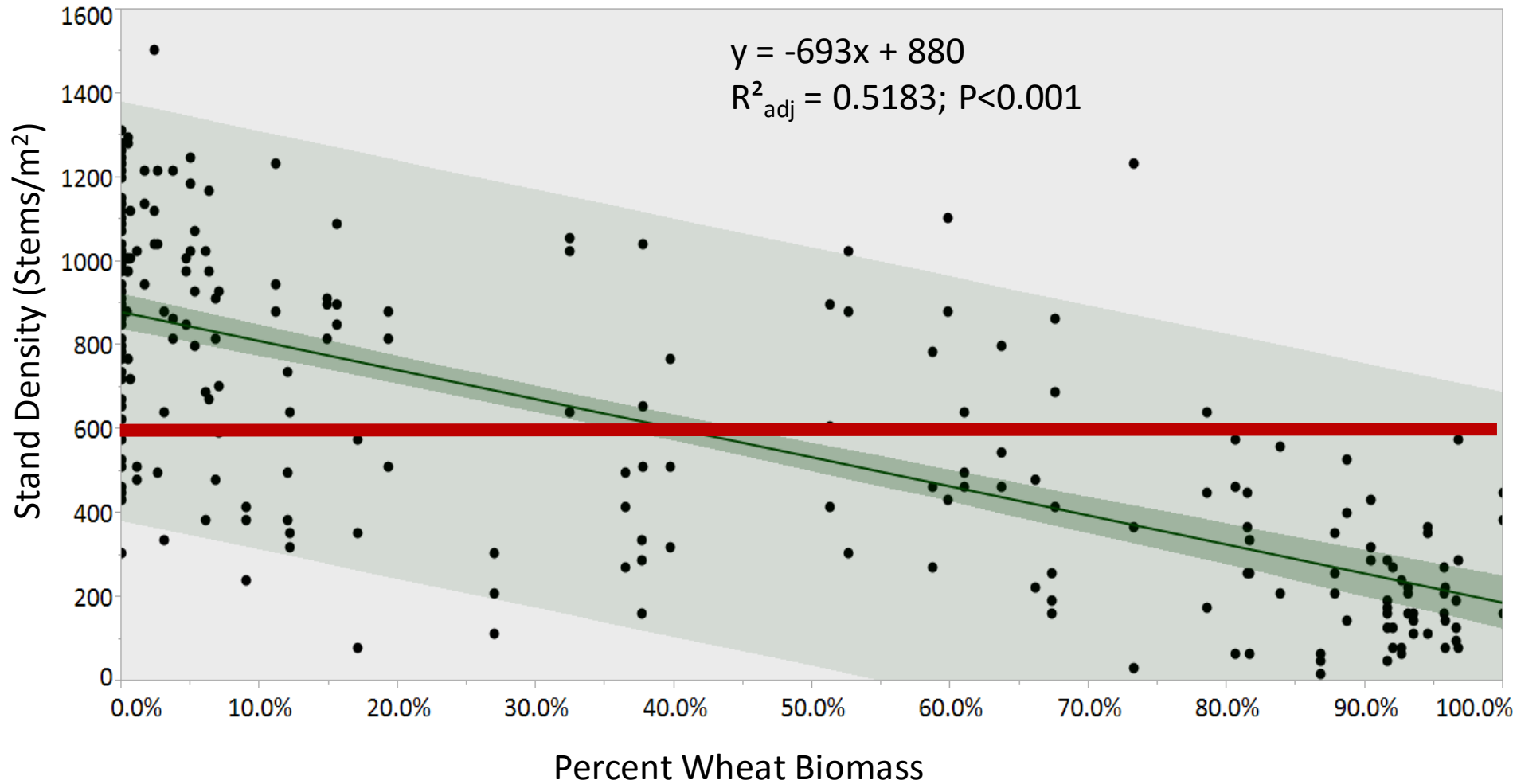


Developing Decision Support Tools

- Volunteer wheat has value as a forage
 - Dependent on growth stage
 - Potential to improve/reduce milk production
- Alfalfa establishment is critical for long term success of stand
 - Minimize stand loss
- Developing models
 - Alfalfa stand density vs wheat
 - Milk production vs wheat



Results: Stand Density Model





Questions?