



Department of
Agronomy

COLLEGE OF AGRICULTURAL & LIFE SCIENCES - UNIVERSITY OF WISCONSIN

Weed suppression in dual-use IWG cropping systems

Joe Zimbric, Dave Stoltenberg, Valentin Picasso

Water quality in Madison, WI



UW-SSEC



UW-Limnology

Dual-use IWG: changing selection pressures

- Reduced soil disturbance
- Increased aboveground disturbance
- High levels of aboveground and belowground competition from IWG
- Factors affecting weed community composition
 - Forage harvest cutting height
 - Forage harvest cutting frequency
 - Weed size at the time of harvest
 - Weed species morphology

Experimental design

- RCBD w 3 replicates
- Forage harvest management
 - No harvest
 - Summer only
 - Summer and fall
 - Spring, summer, and fall
- Nitrogen fertilization
 - 90 kg N ha⁻¹
 - 135 kg N ha⁻¹

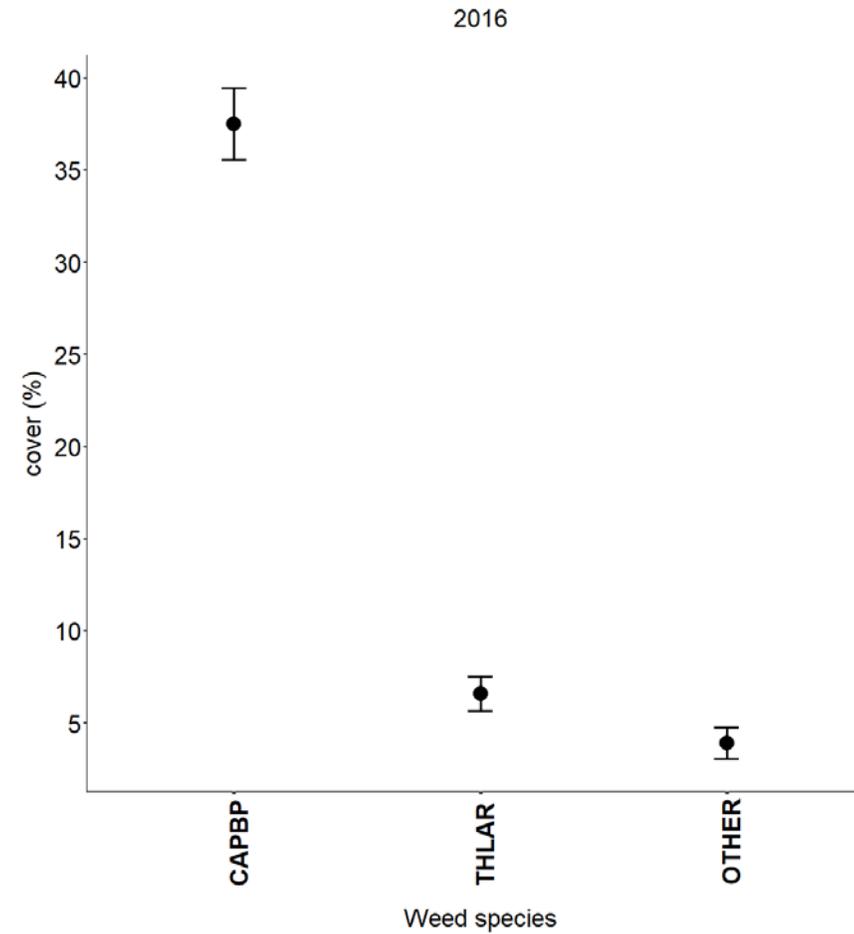
Data collection

- Weed density
- Weed biomass
- IWG grain yield
- IWG forage yield

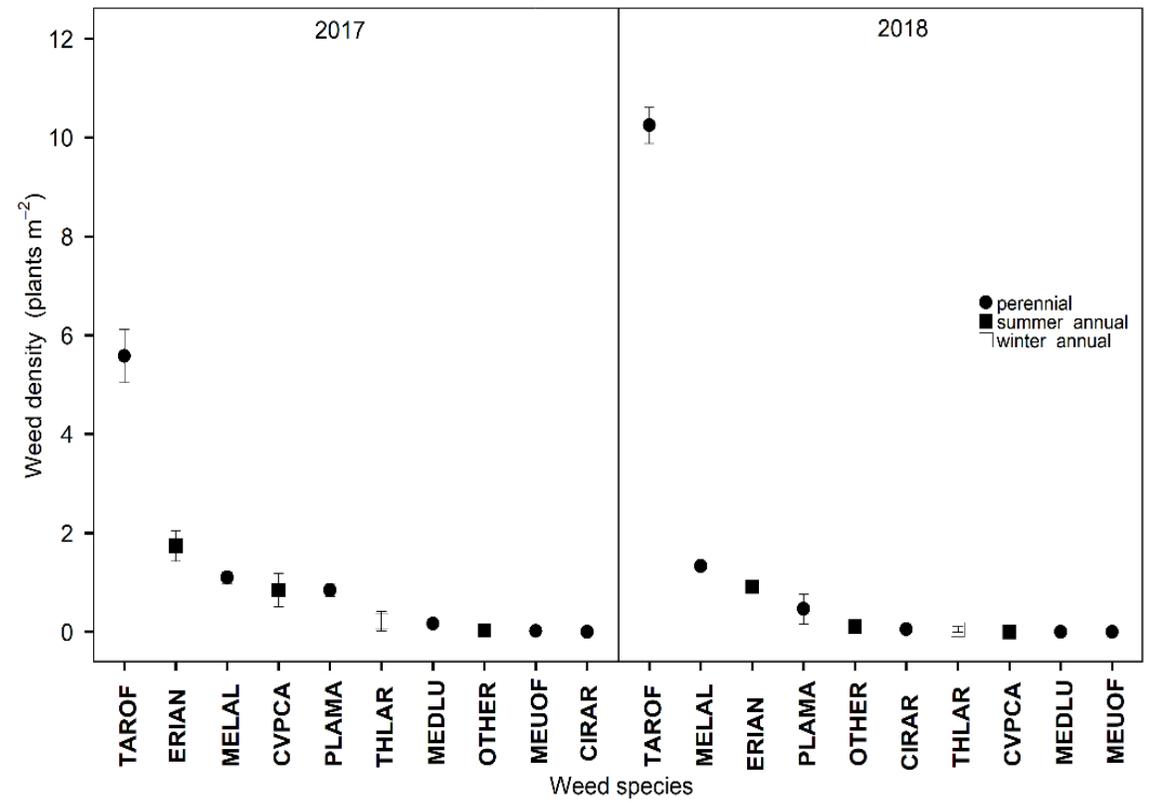


Results: Weed community composition

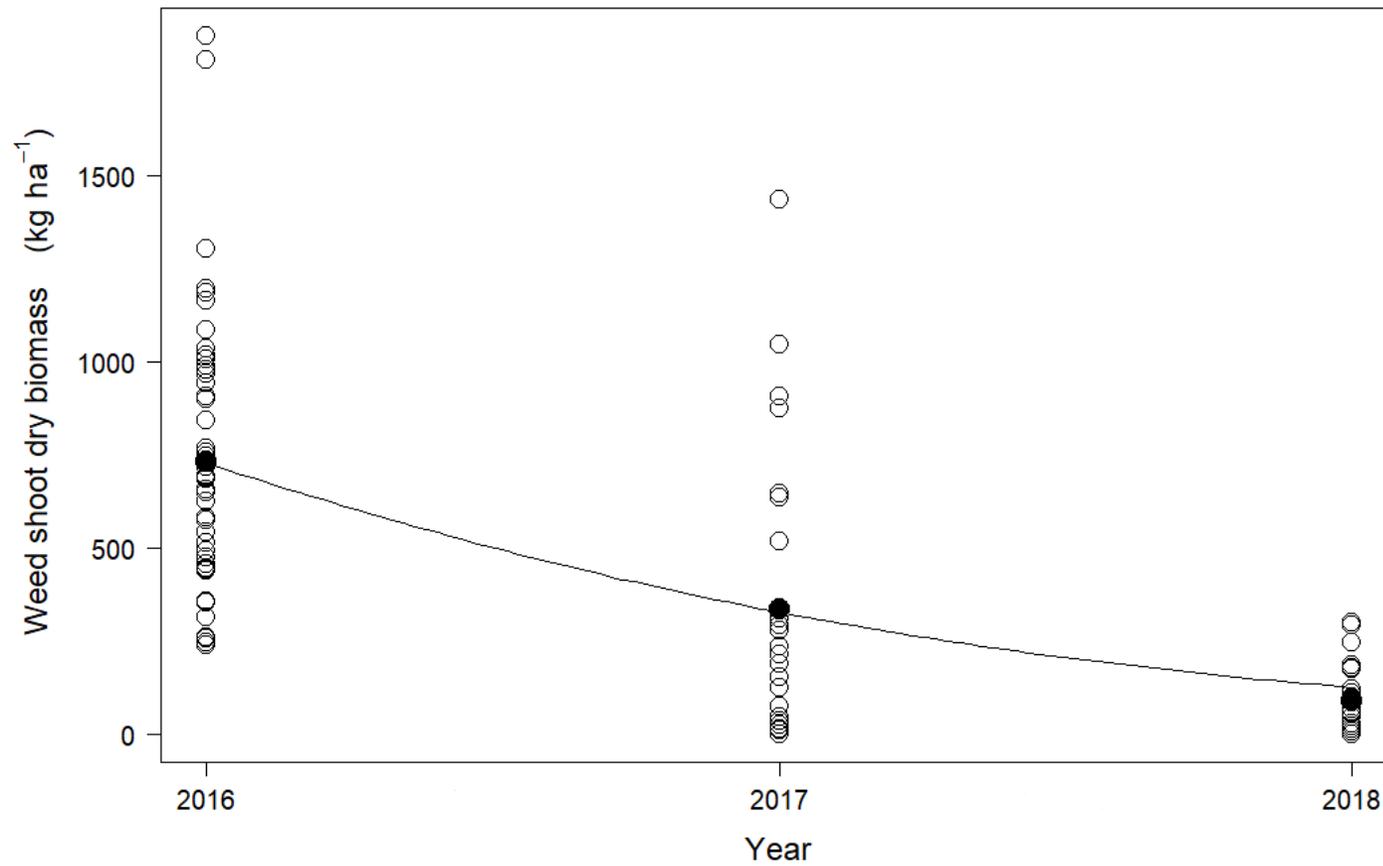
2016



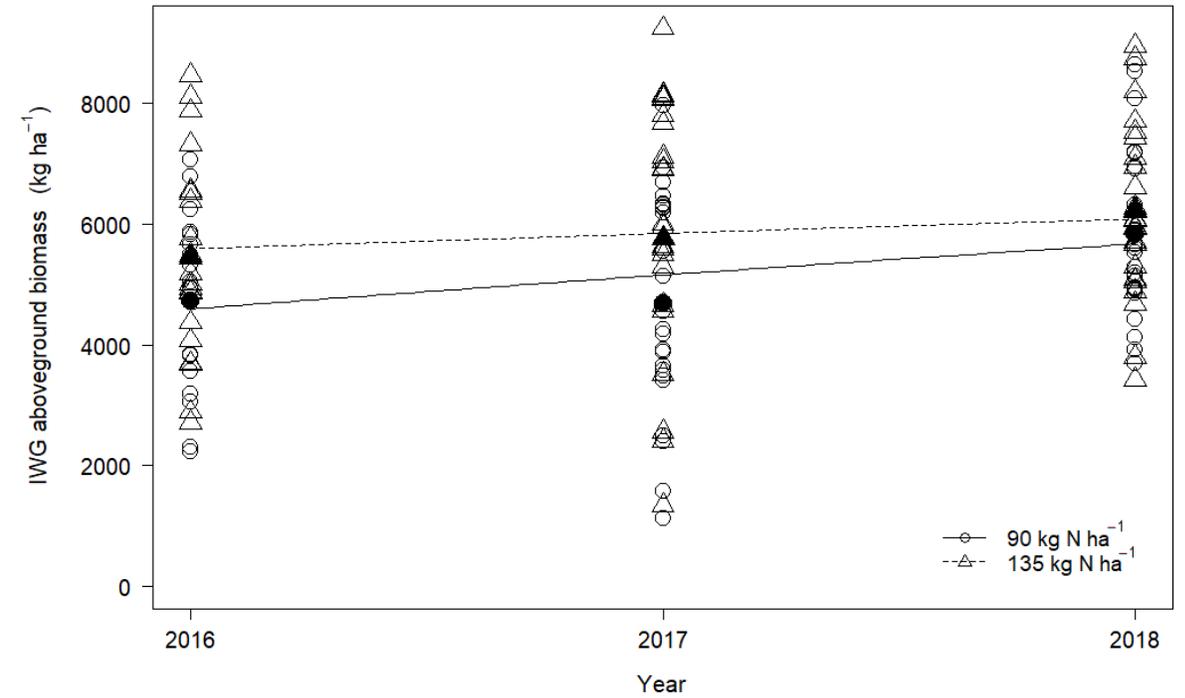
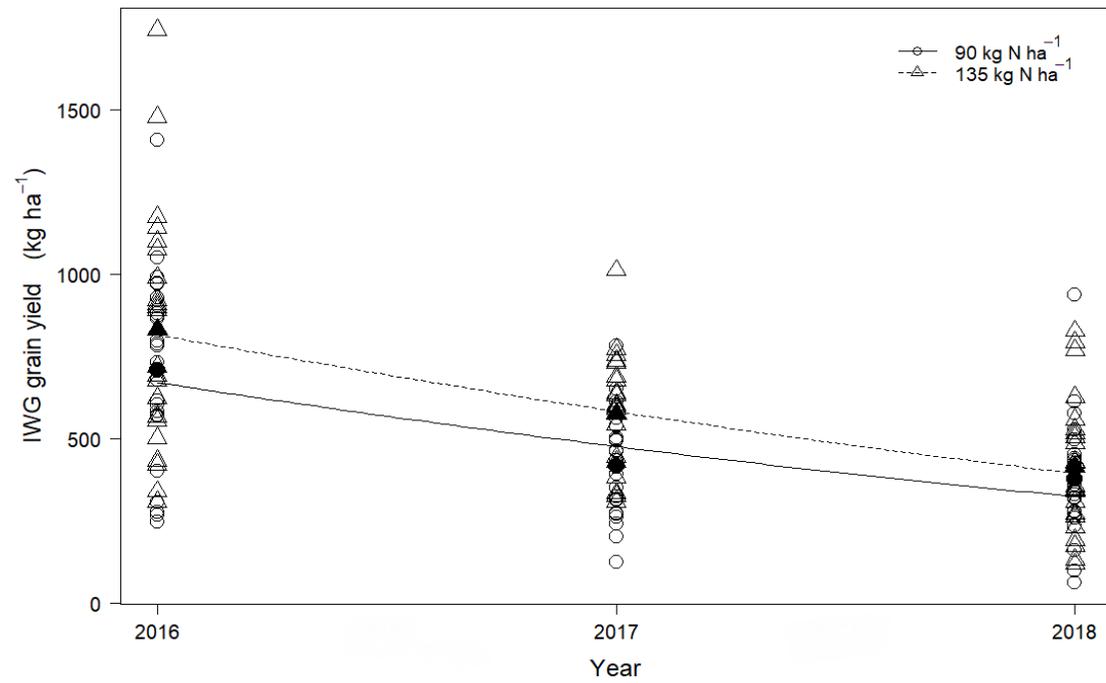
Results: weed community composition



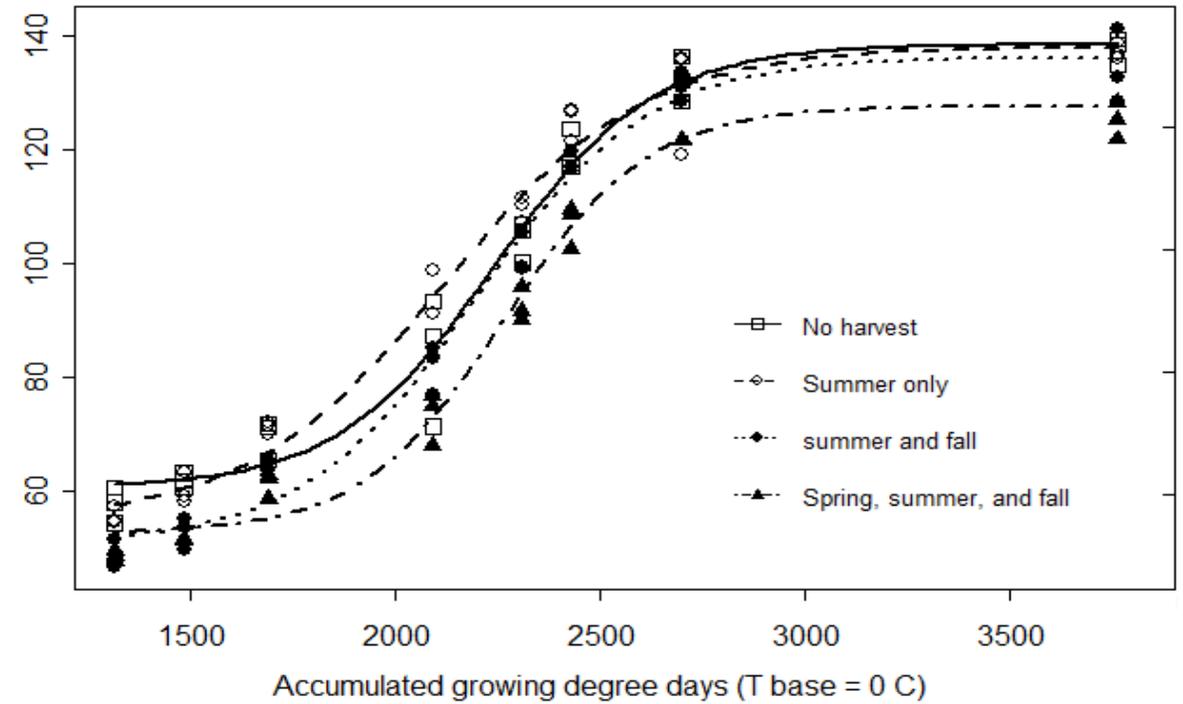
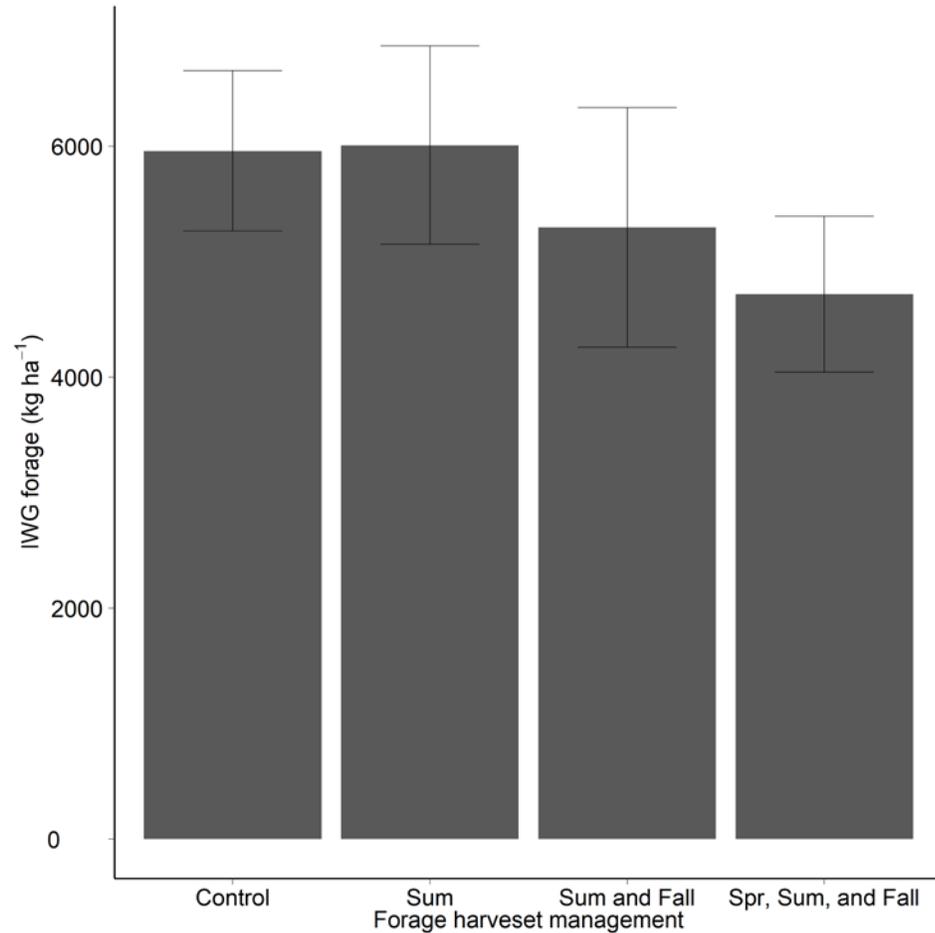
Results: Weed shoot dry biomass



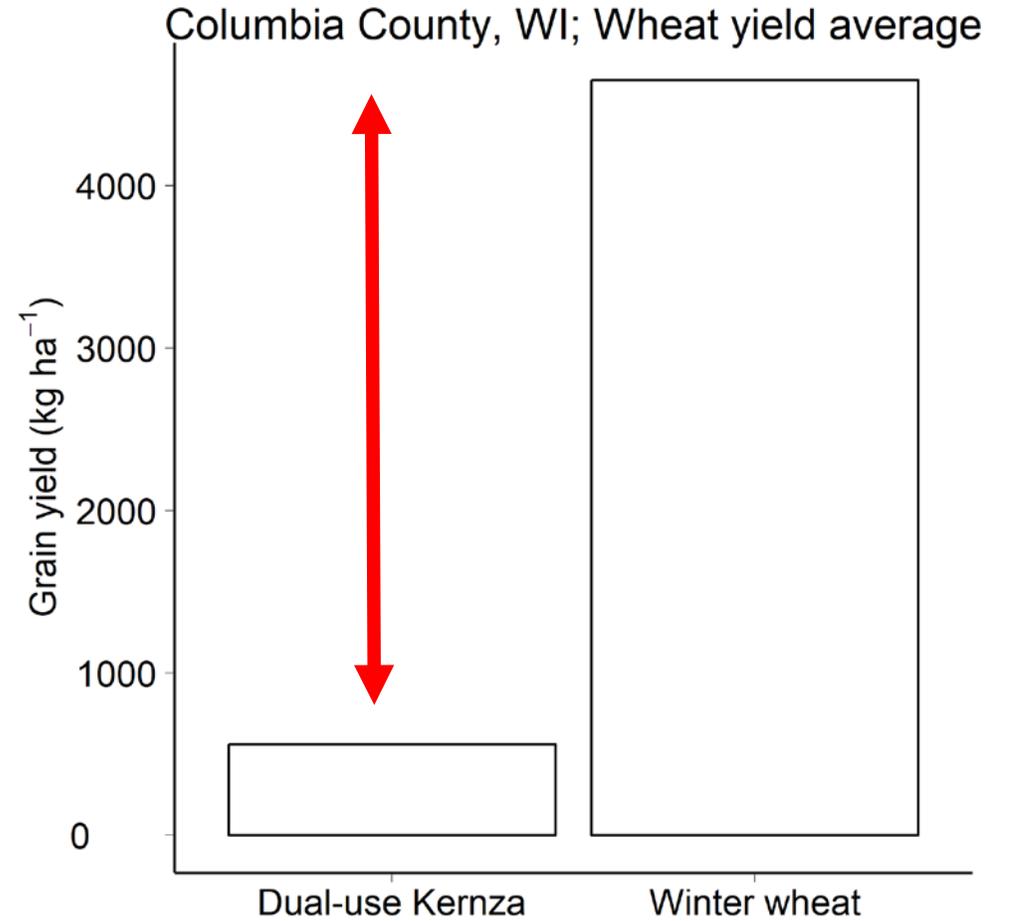
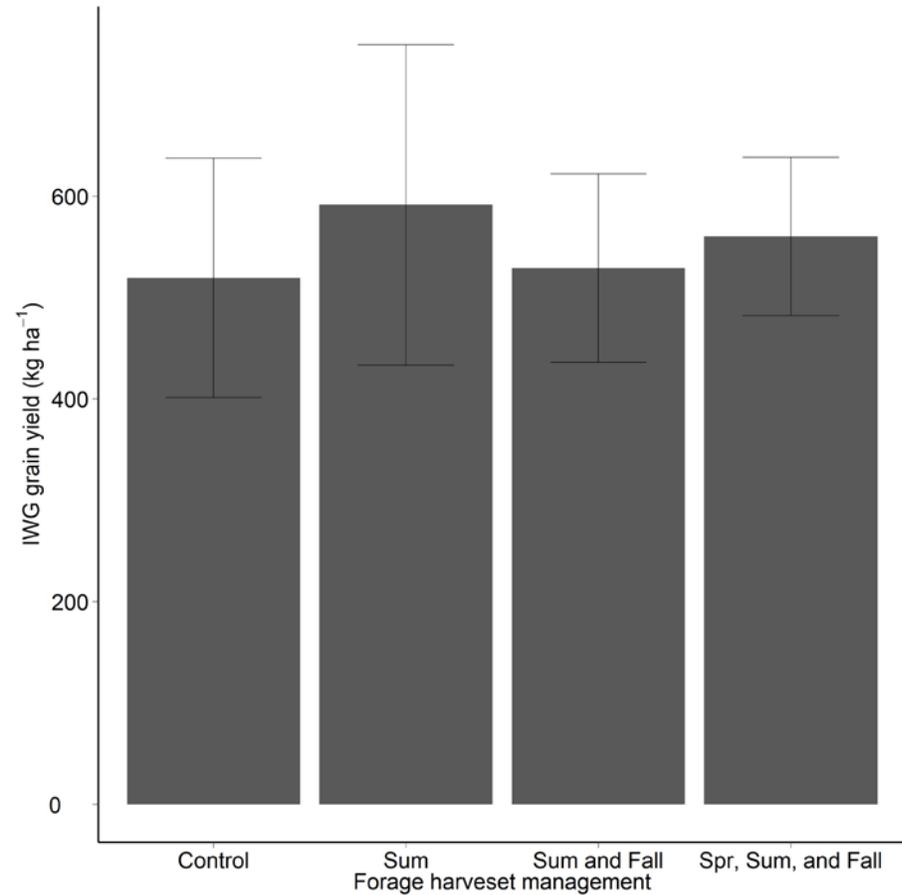
Results: IWG grain and biomass



3-year IWG rotation: IWG forage



3-year rotation: IWG grain yield



Conclusions

- Weed community composition shifted from annuals to perennials
- Weed biomass decreased by 88% over 3 production years
- Grain yield decreased over time
 - 3-year average dual purpose grain yields ranged from 530-590 kg ha⁻¹
- IWG forage remained stable over time
 - 5000-7000 kg ha⁻¹ biomass following grain harvest
 - 1000-2000 kg ha⁻¹ additional biomass if harvested in the spring and fall