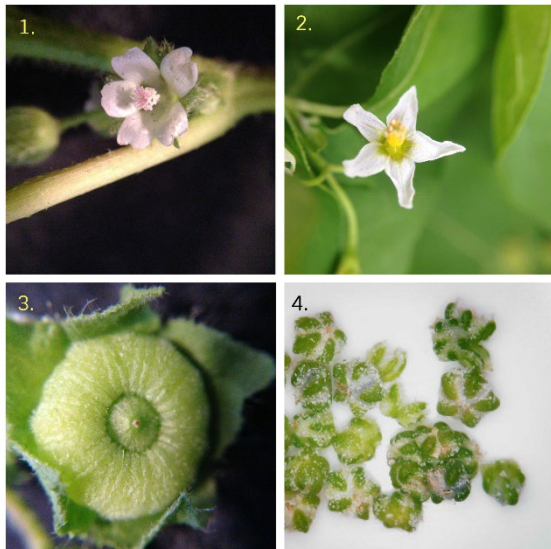
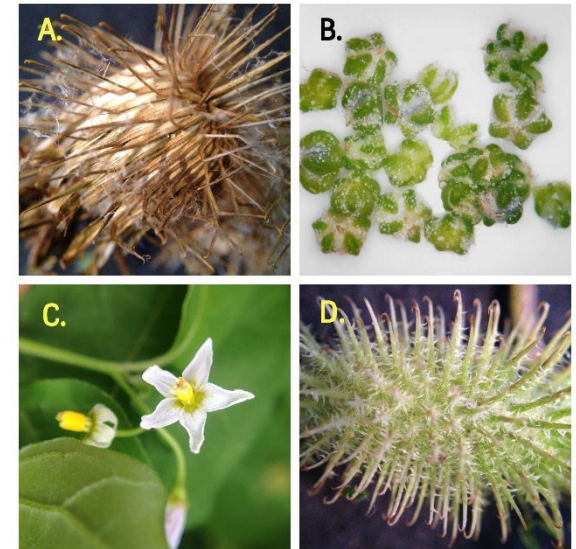


# NDSU Non-Chemical Weed Management



Wild World of Weeds Workshop  
January 16, 2024  
Research Update  
Dr. Greta Gramig



# Current Projects

- **‘Perennial Flax’** *Sustainable Agriculture Research and Education, USDA*
  - Working with Burton Johnson (NDSU) and Brent Hulke (USDA-ARS, Fargo)
  - First steps to develop native Lewis flax as a perennial crop
- **‘H<sub>2</sub>O Mulch’** *Organic Research and Extension Initiative, USDA-NIFA*
  - In partnership with USDA-ARS, Morris, MSU, WSA, OSU
  - Working to develop alternatives to plastic mulch for organic horticulture
- **‘Biodegradable mulches for environmentally responsible pest management in fruit and vegetable crops’** *USDA/ND Specialty Crop Block Grant Program*
  - In partnership with Dr. Deirdre Prischmann-Voldseth, NDSU Entomology
  - Evaluating hydromulch impacts on weeds and crop/insect interactions

# MulcH<sub>2</sub>O: Biodegradable Composite Hydromulches

## Waqas Ahmad, PhD Graduate Student



- Onion trial at two sites: Absaraka and Fargo
- RCBD, 4 reps, 7 treatments
  - W/B PE mulch, 3% camelina meal, 3% guar gum, 6% camelina, 6% guar gum, weedy check, weed-free check
- Mulches applied (two passes) at 5,765 kg ha<sup>-1</sup>; Absaraka received 3/10" rain directly afterward
- 'Highlander' onion sets planted into mulch on 6/6 at Absaraka and 6/13 at Fargo
- Granular fertilizer 100 lbs N; Drip fertigation

*Research funded by USDA Organic Research and Extension Initiative*



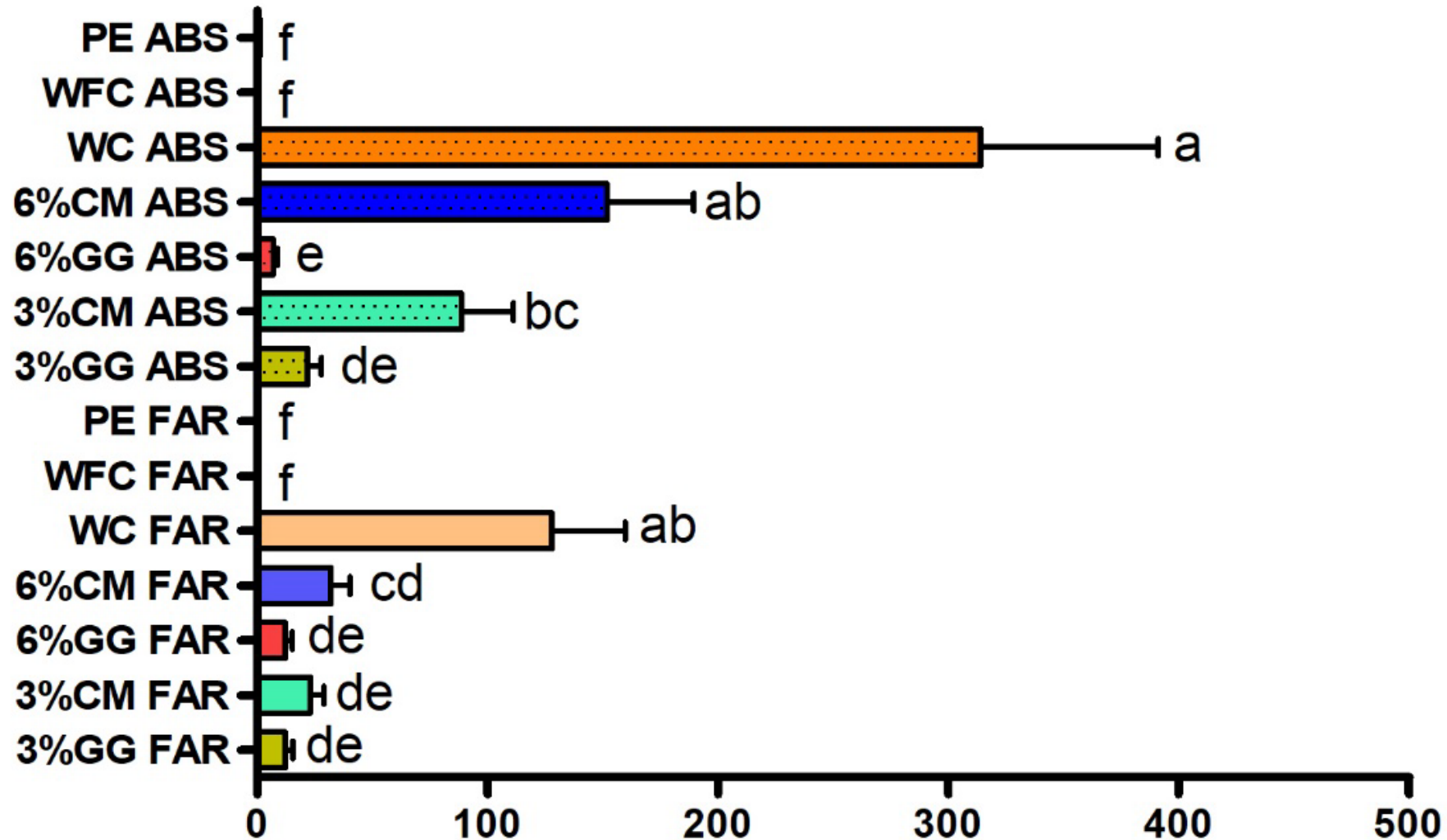
# ONION HYDROMULCH TRIAL FARGO



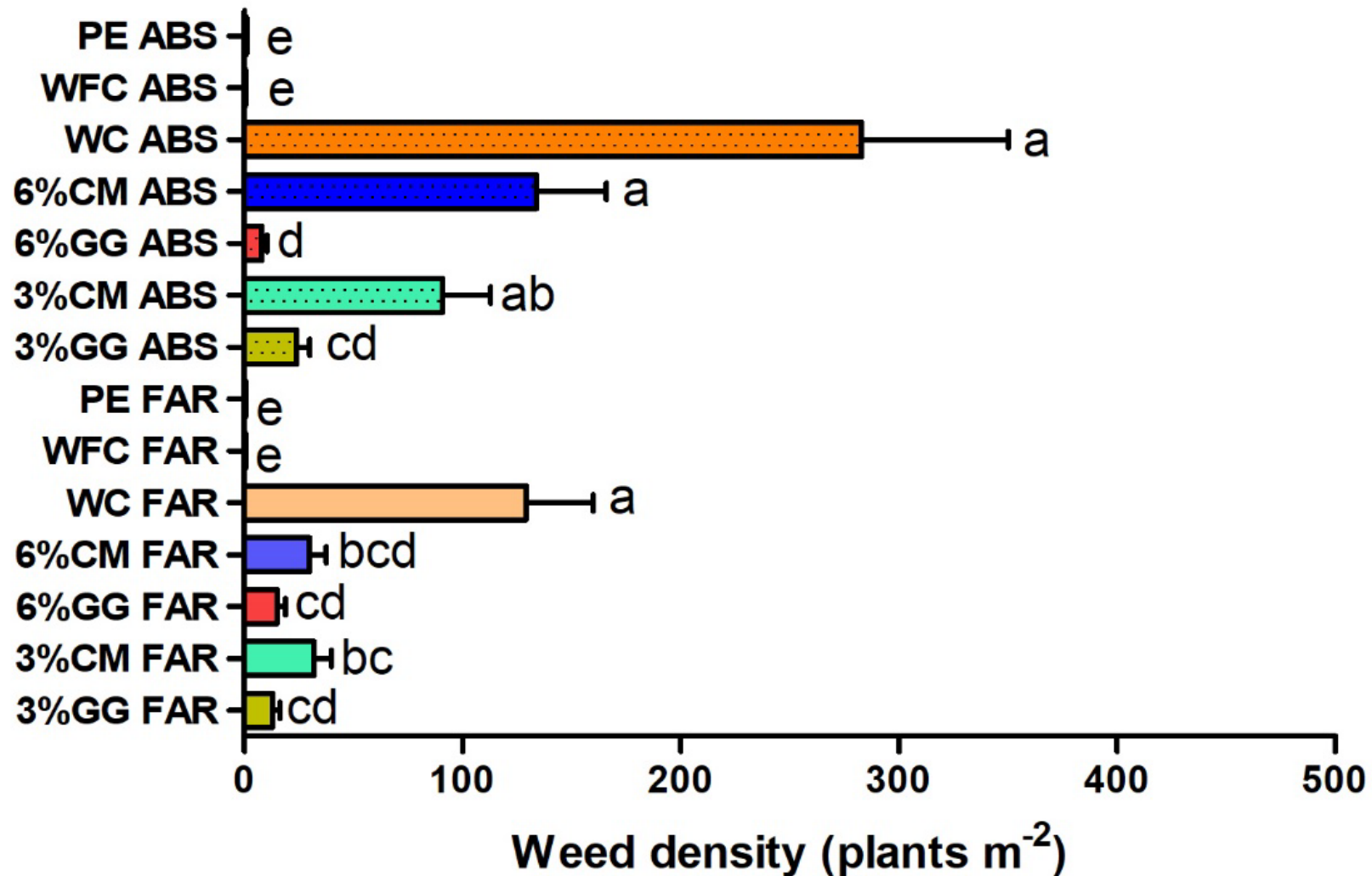
# Hydromulch with 6% (L) and 3% guar gum (R)



# Weed density at peak emergence

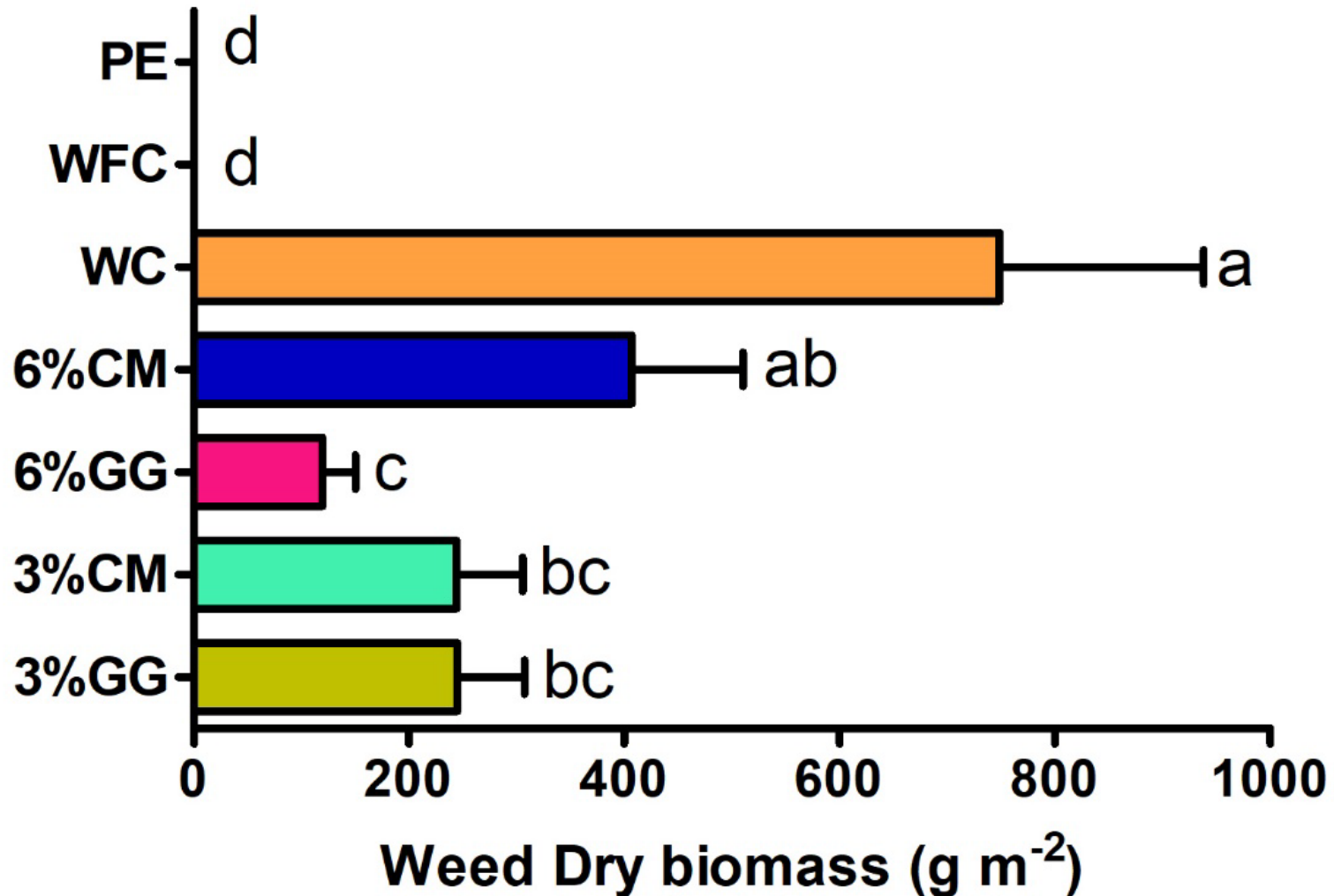


# Weed density at peak vegetative growth

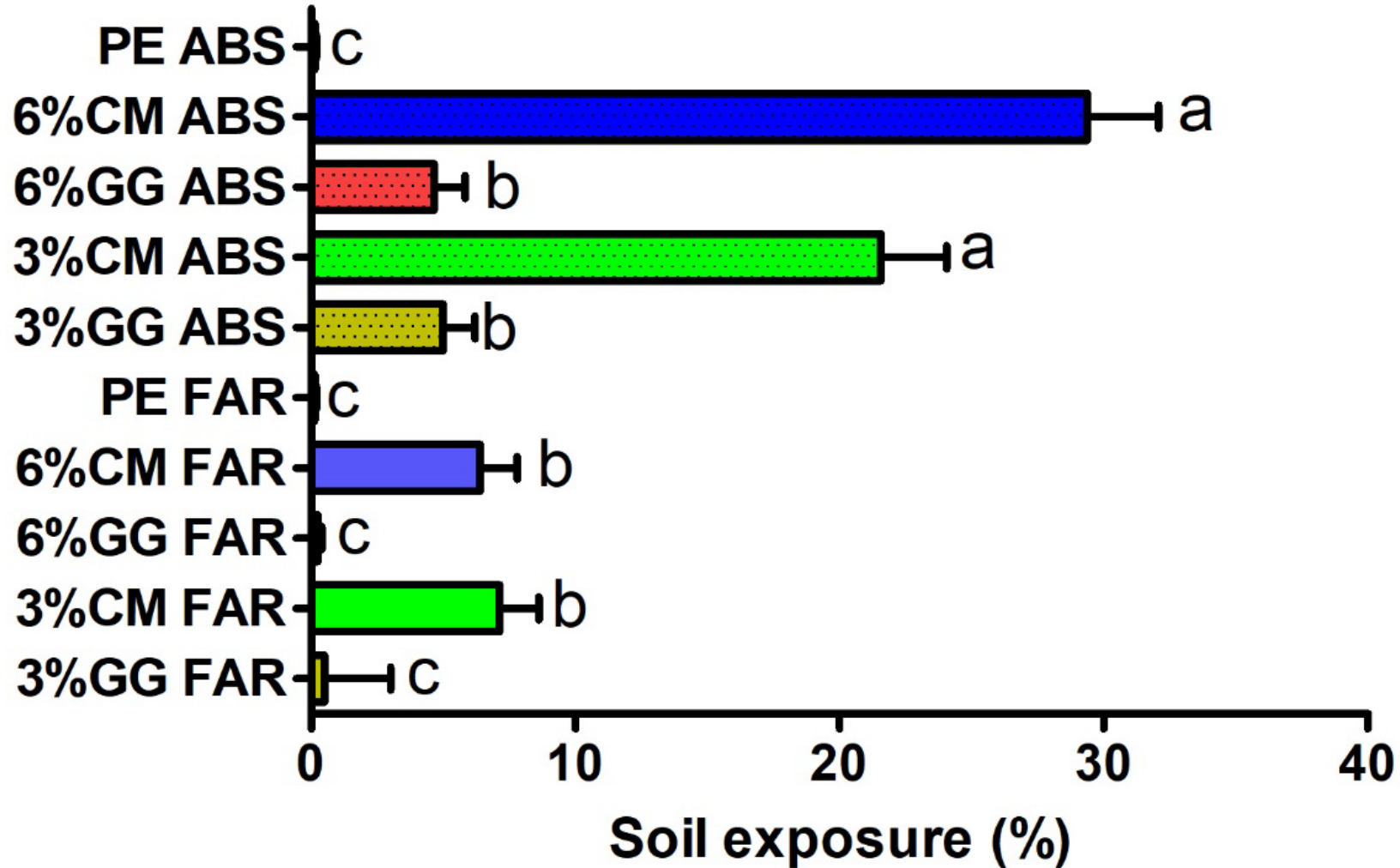




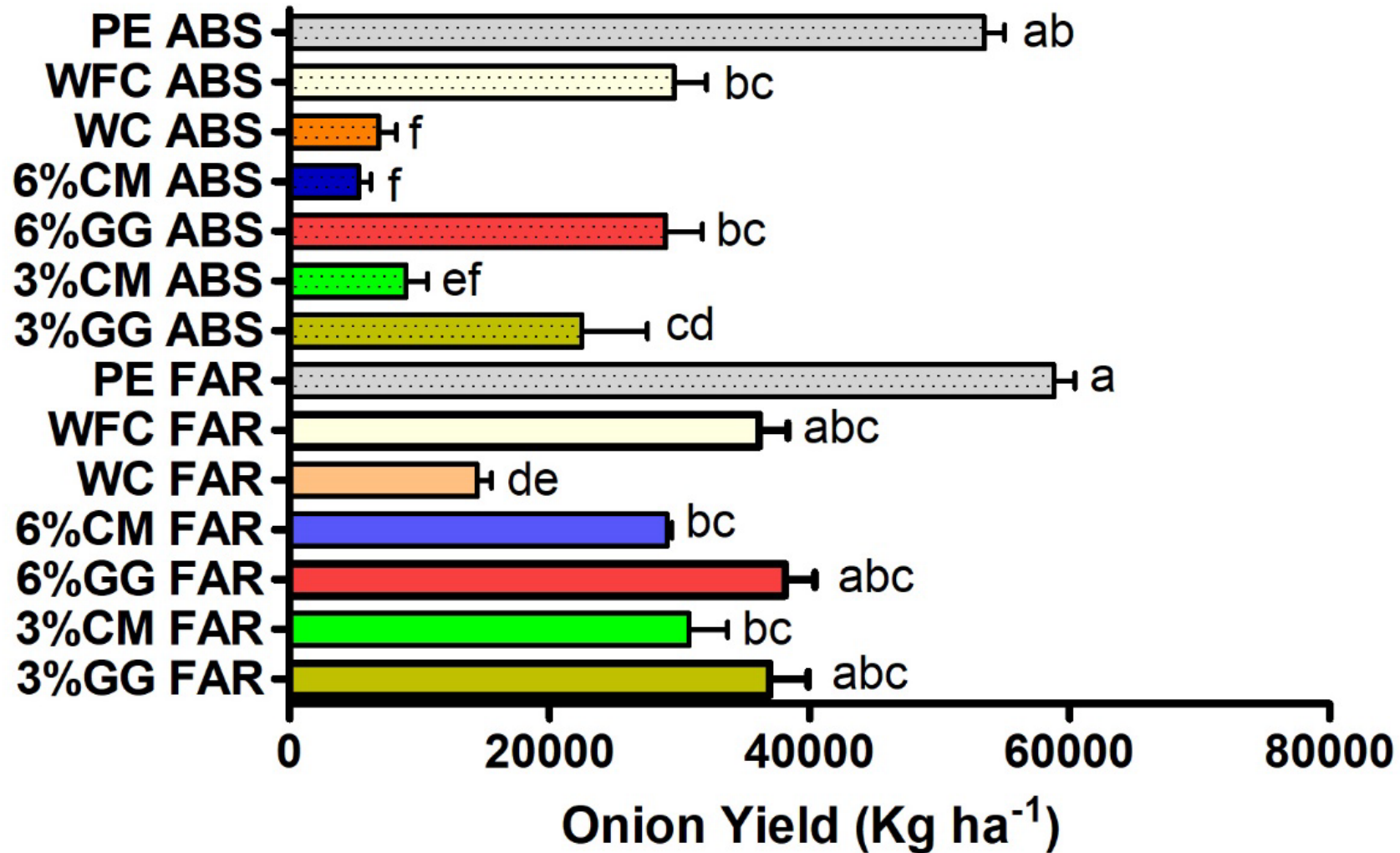
# Weed biomass peak vegetative growth



# Mulch deterioration



# Onion yield



# Hydromulch trial in strawberry

## Andres Torres, MS Student



- Two sites: Absaraka and Fargo
- RCBD, 4 reps, 8 treatments
  - Commercial paper mulch, W/B PE mulch, 'white' HM 2 passes, 'black; HM 2 passes, 'white' HM 3 passes, 'black; HM 3 passes, weedy check, weed-free check
- HM 2 passes = 5,800 kg ha<sup>-1</sup>
- HM 3 passes = 8,700 kg ha<sup>-1</sup>
- 'Albion' day neutral strawberry bare root transplanted at ~6 plants m<sup>-2</sup>; 6/4 ABS, 6/8 FAR
- Drip fertigation

HYDROMULCH TRIAL  
IN DAY NEUTRAL STRAWBERRY  
2023 ABSARAKA



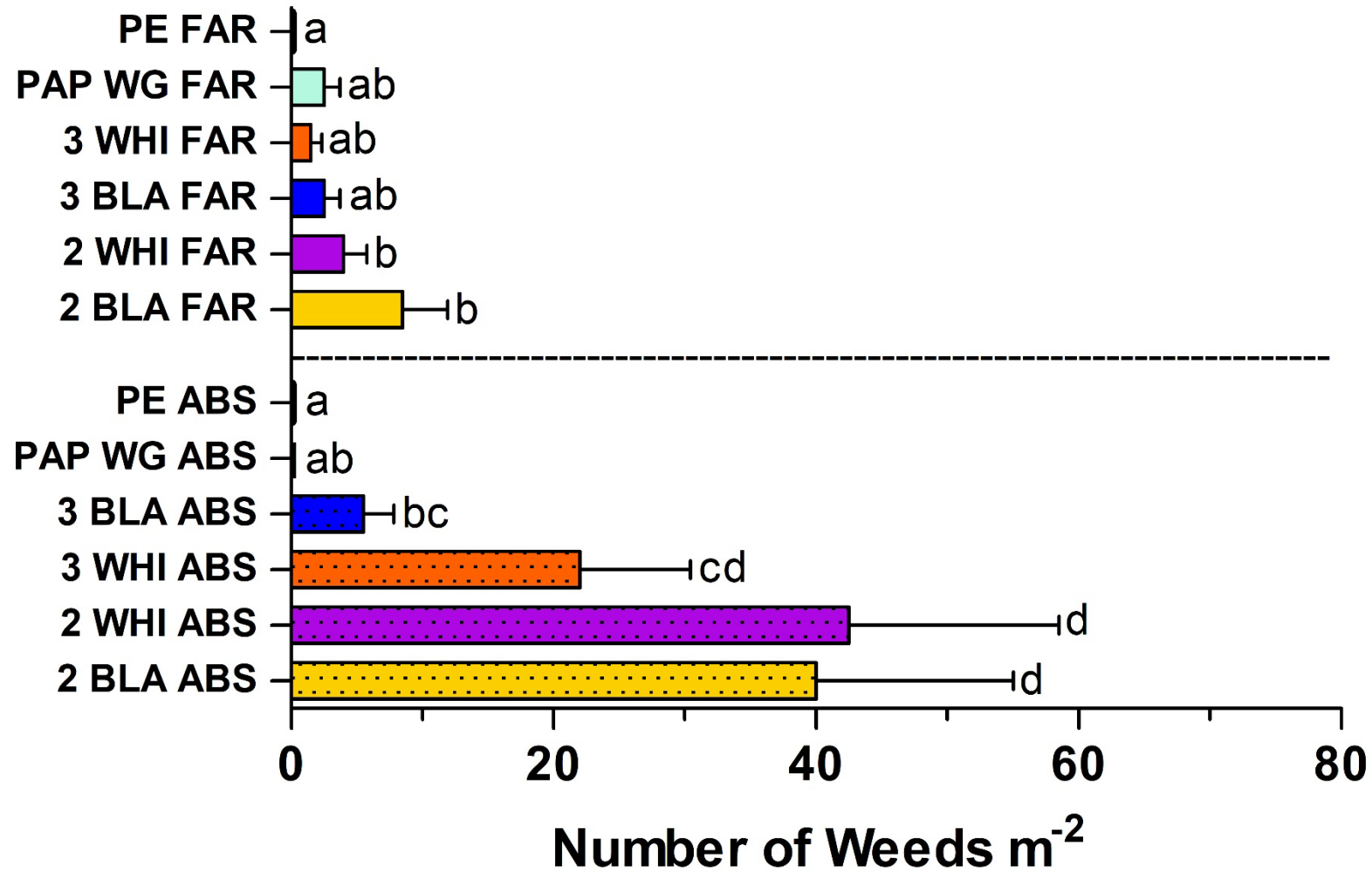


**'WHITE'**  
←

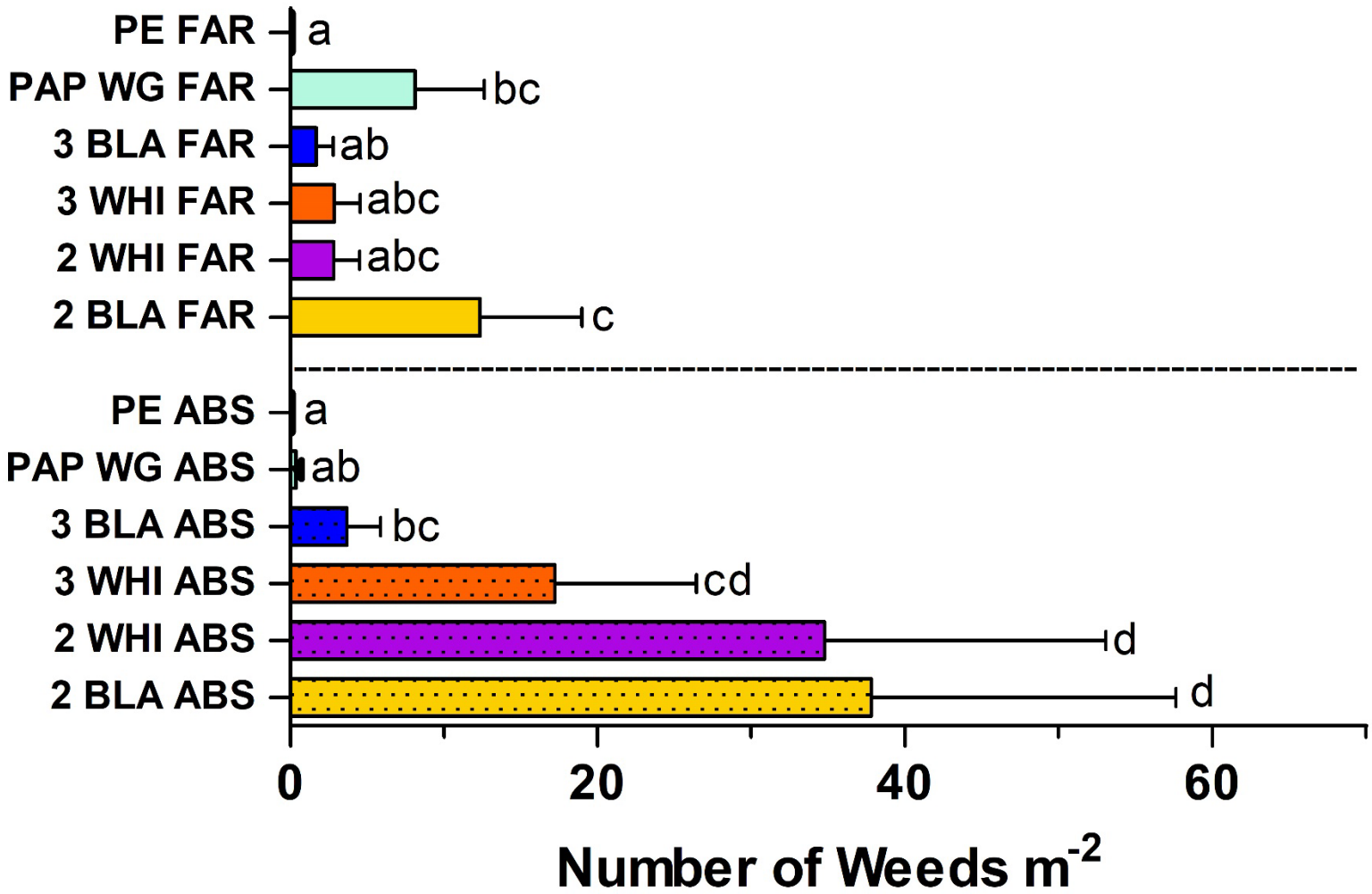


**'BLACK'**  
→

# Weed density at peak emergence

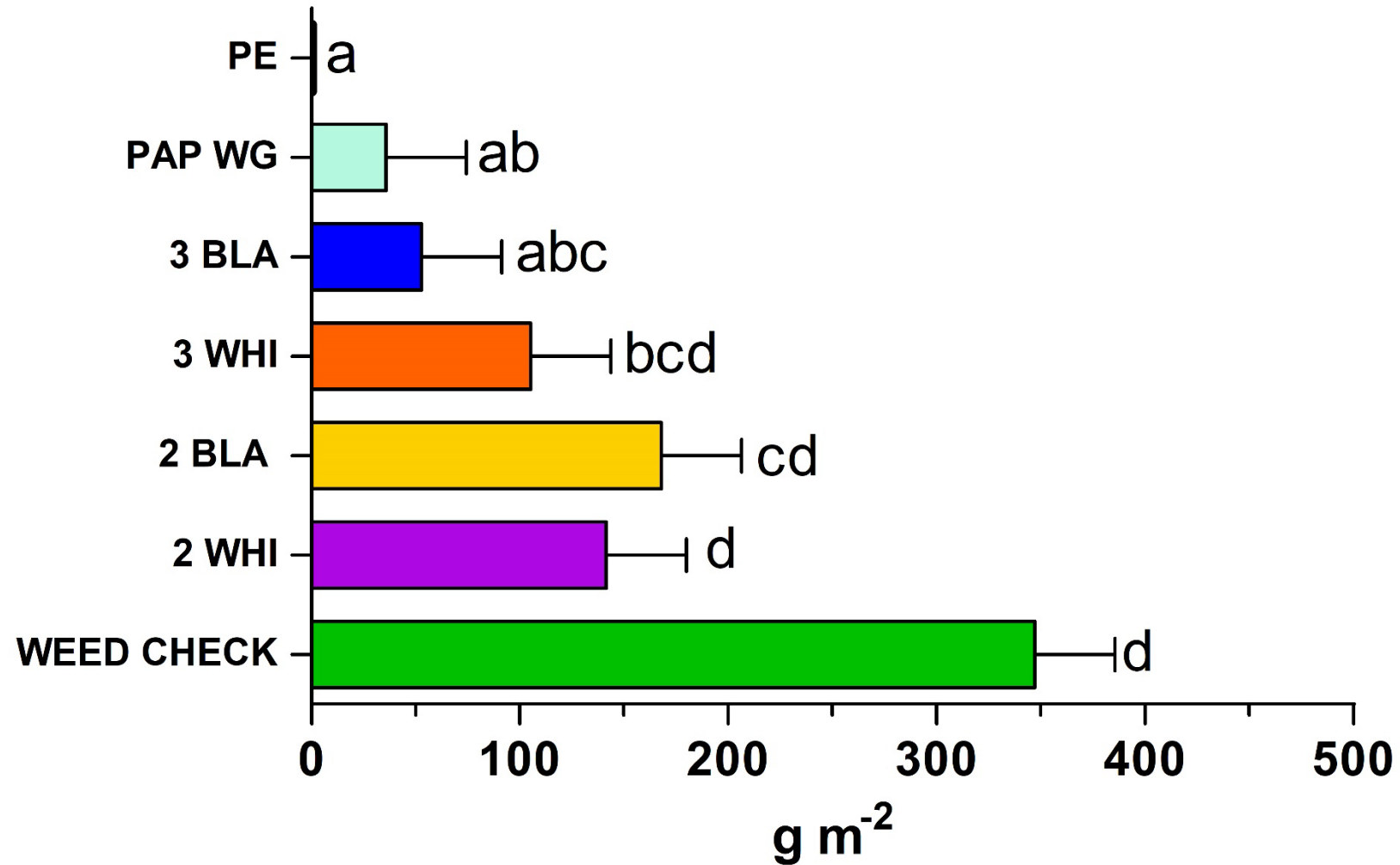


# Weed density at peak vegetative growth

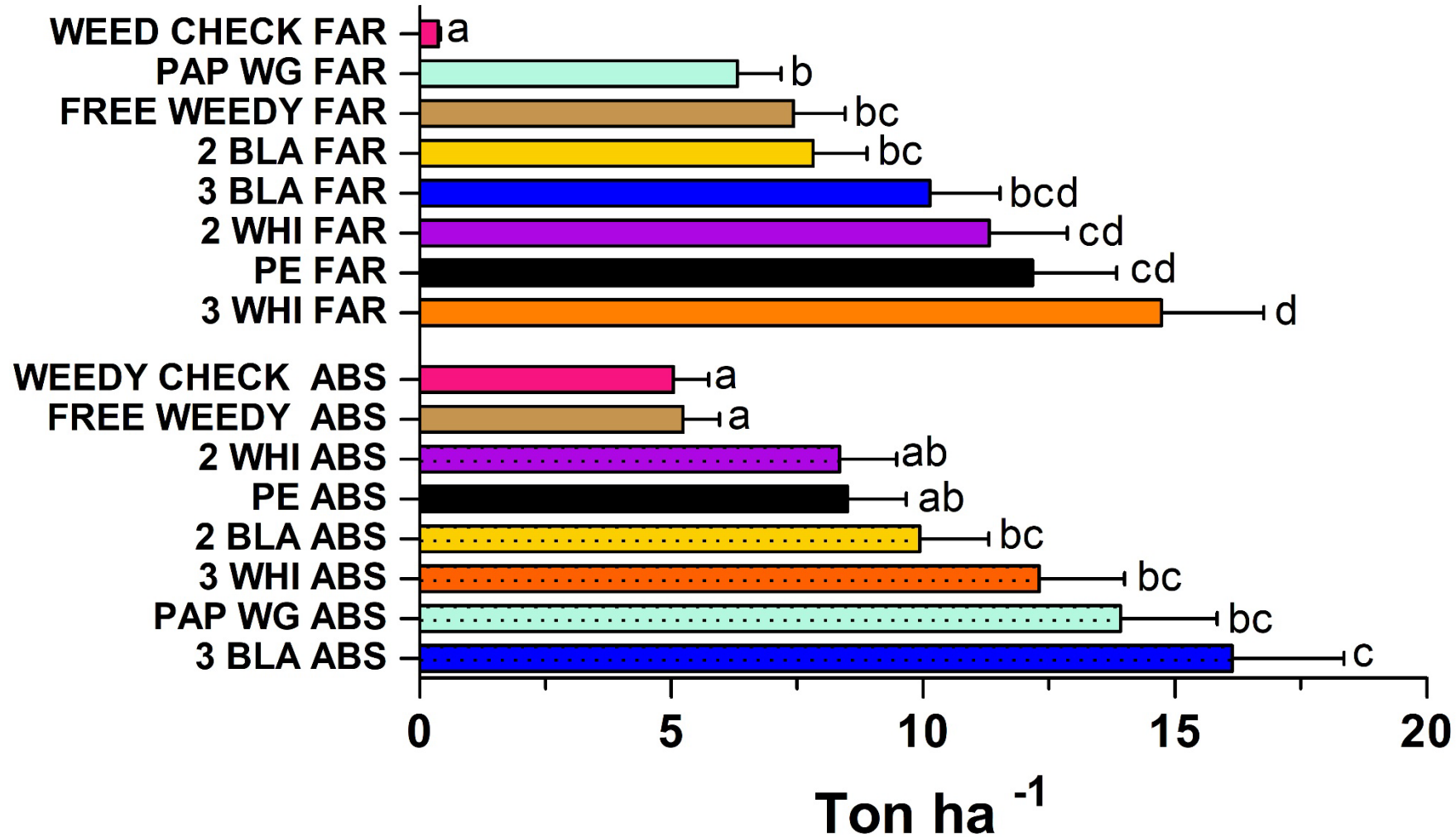




# Weed biomass at peak vegetative growth



# Strawberry fruit yield



# Acknowledgments, OREI Hydromulch Project



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  - Brian Maupin (WSU)