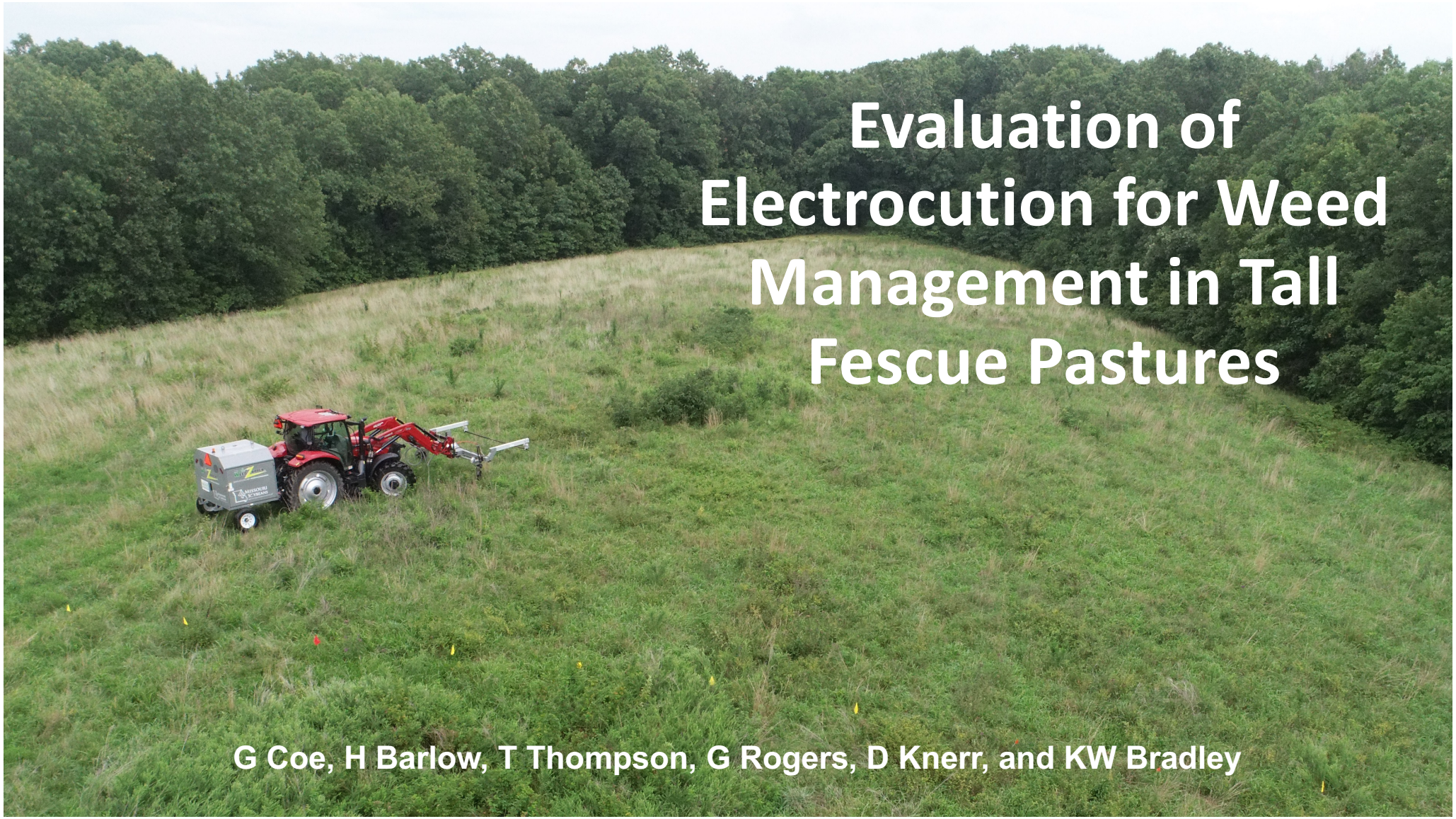


Evaluation of Electrocution for Weed Management in Tall Fescue Pastures

G Coe, H Barlow, T Thompson, G Rogers, D Knerr, and KW Bradley

Introduction

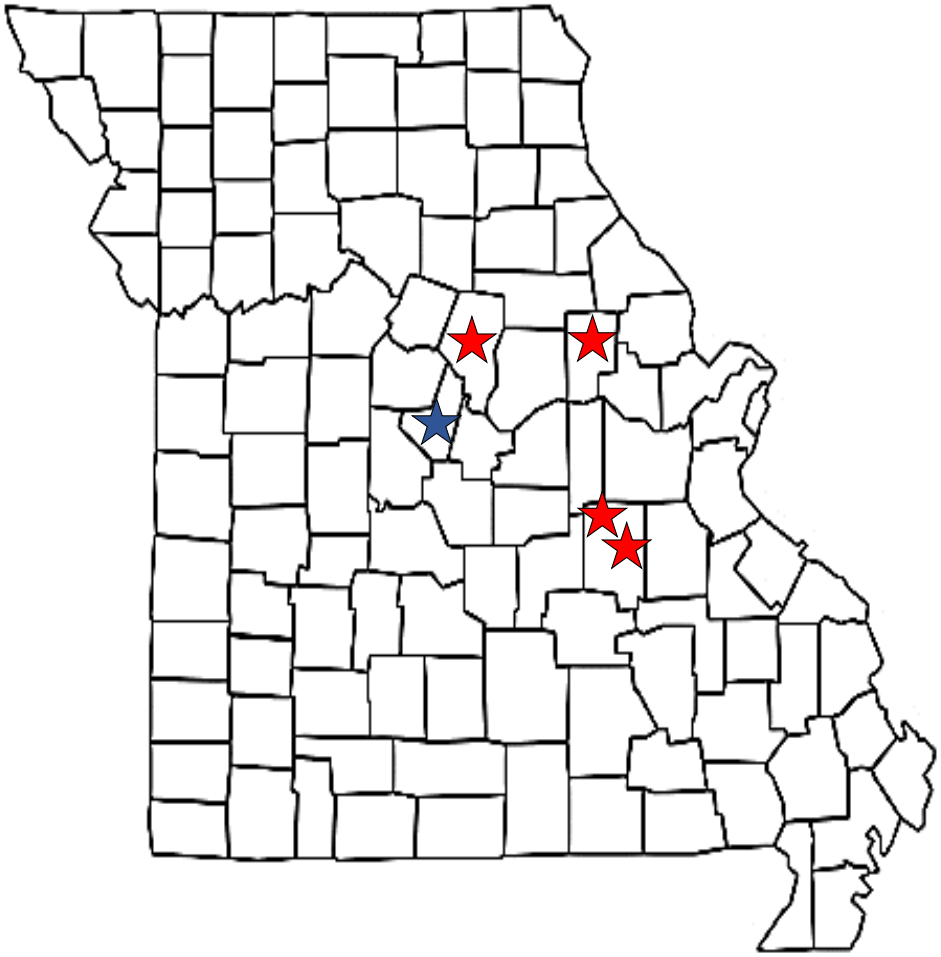
- Mixed tall fescue/legume pastures account for > 4 million ha in Missouri
- Weeds directly compete with desired forages for resources and can reduce forage yield and quality
- Many producers are unwilling to apply herbicides due to the likelihood of eliminating desirable legume species

Objectives

To compare the weed control and forage injury following electrocution and wiping treatments to that achieved with standard pasture herbicide treatments.

Materials & Methods

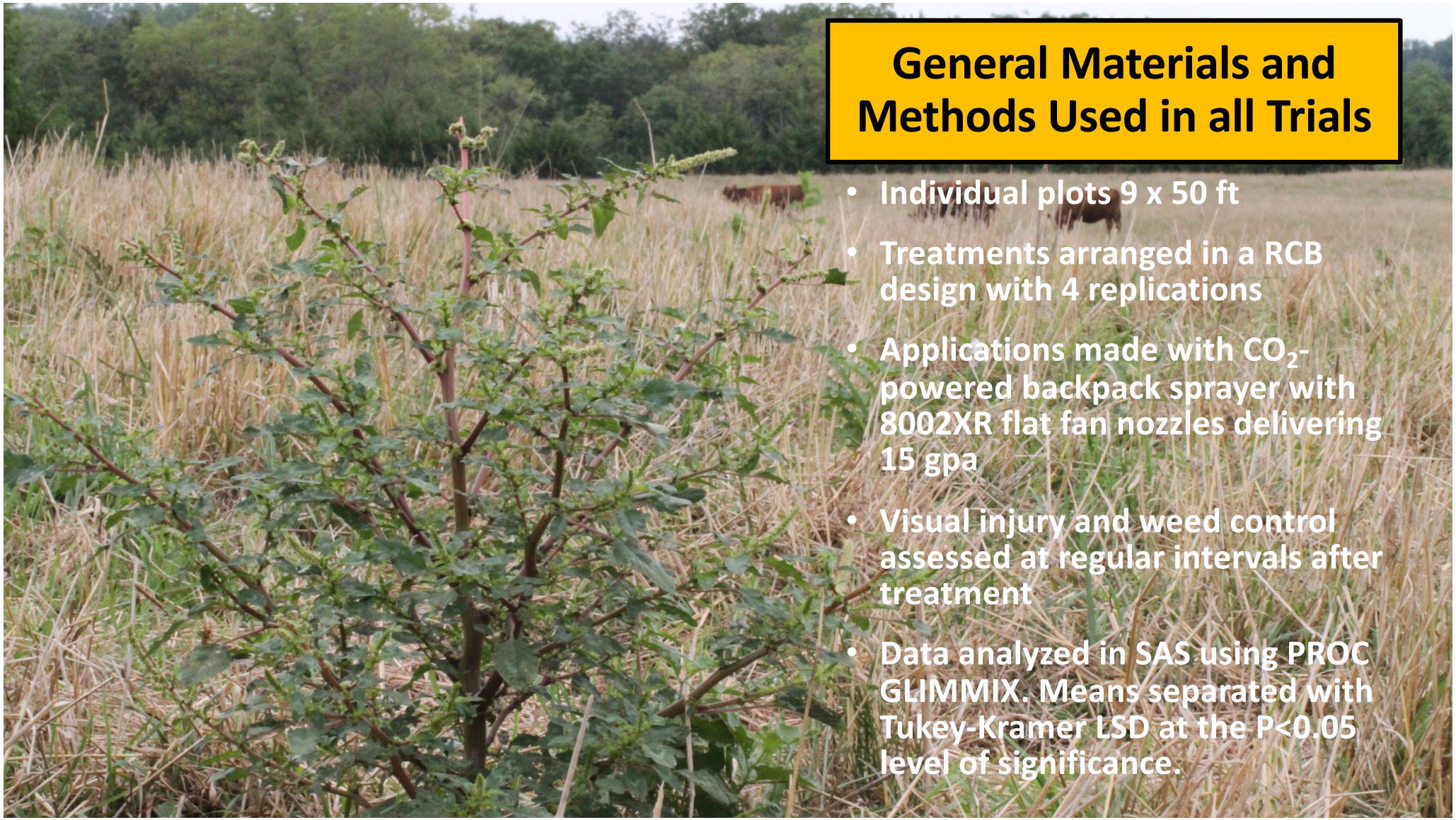
- A common set of electrocution, wiping, and herbicide treatments for the control of a variety of common annual and perennial broadleaf weeds were evaluated in four pastures (★)
- A second experiment with slightly different electrocution, wiping, and herbicide treatments was conducted in a pasture with a dense infestation of johnsongrass (★)




How the Weed Zapper™ Works:
• Copper boom attached to front boom that electrocutes any plant it contacts.
• PTO-driven generator attached to back of tractor
• Up to 15,000 volts translocating through plants contacted

Smucker Weed Wiper™:

- **Herbicide-soaked, pump-fed sponges wipe a herbicide solution onto any weeds that are contacted.**



General Materials and Methods Used in all Trials

- Individual plots 9 x 50 ft
- Treatments arranged in a RCB design with 4 replications
- Applications made with CO_2-powered backpack sprayer with 8002XR flat fan nozzles delivering 15 gpa
- Visual injury and weed control assessed at regular intervals after treatment
- Data analyzed in SAS using PROC GLIMMIX. Means separated with Tukey-Kramer LSD at the $P<0.05$ level of significance.

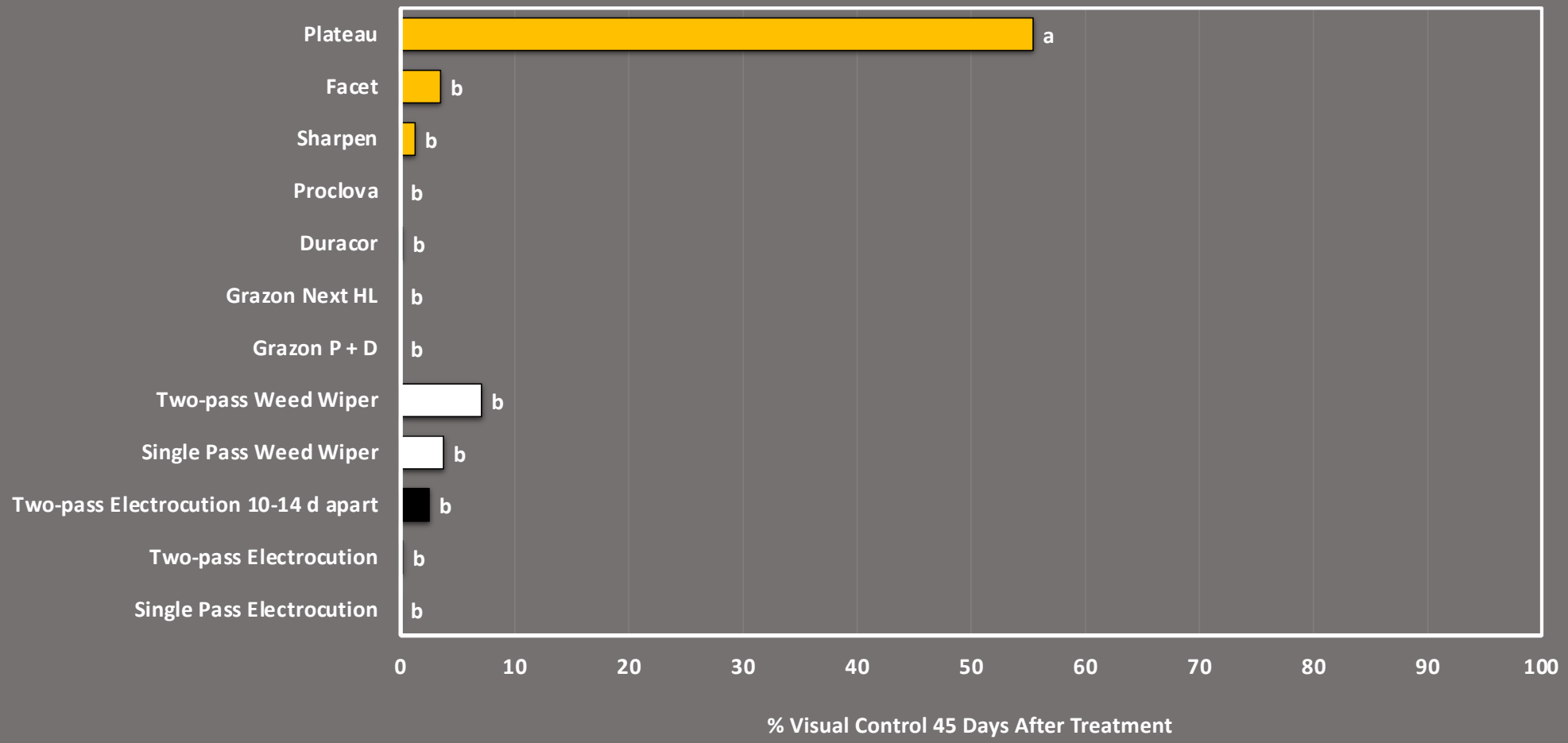
Herbicide Treatments Evaluated in the Experiments

Active Ingredient(s)	Rate (lb ai/ac)	Trade Name	Rate (product/A)	Broadleaf Weed Experiment	Johnsongrass Experiment
Picloram + 2,4-D	0.21 + 0.83	Grazon P+D	2 pts	✓	
Aminopyralid + 2,4-D	0.12 + 0.62	GrazonNext HL	24 fl ozs	✓	
Aminopyralid + florpyrauxifen	0.07 + 0.005	Duracor	12 fl ozs	✓	
2,4-D + florpyrauxifen	0.53 + 0.007	Proclova	24 fl ozs	✓	
Saflufenacil	0.036	Sharpen	2 fl ozs	✓	
Quinclorac	0.37	Facet	32 fl ozs	✓	
Imazapic	0.06	Plateau	4 fl ozs	✓	
Imazapic	0.12	Plateau	8 fl ozs		✓
Imazapic	0.18	Plateau	12 fl ozs		✓
Sulfosulfuron	0.036	Outrider	0.75 oz		✓
Sulfosulfuron	0.045	Outrider	1 oz		✓

*All treatments applied with recommended adjuvants.

Results

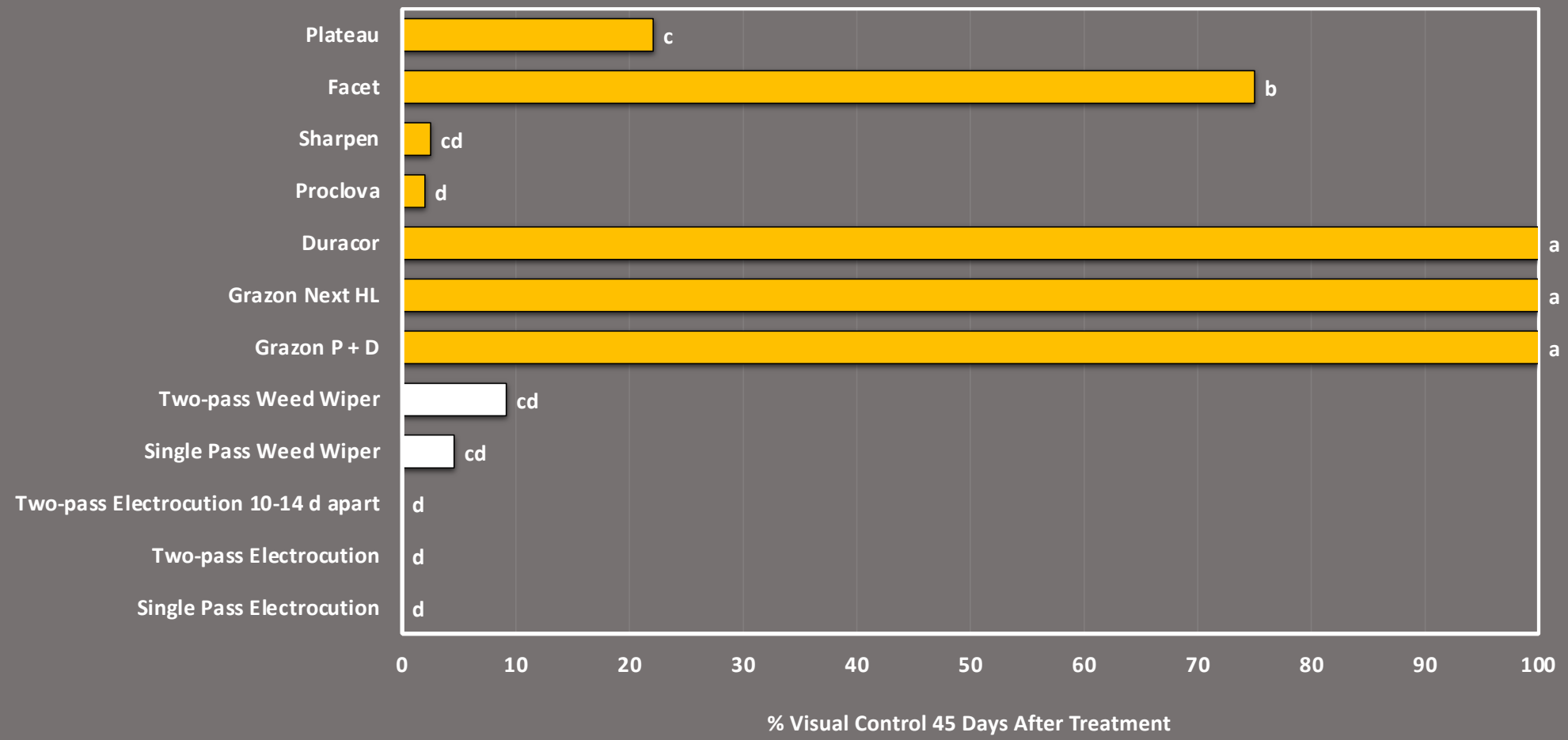
Tall Fescue Injury Following some Pasture Weed Management Treatments
(data combined across 3 pasture locations in Missouri in 2023)



*Bars followed by the same letter are not different, LSD=0.05.

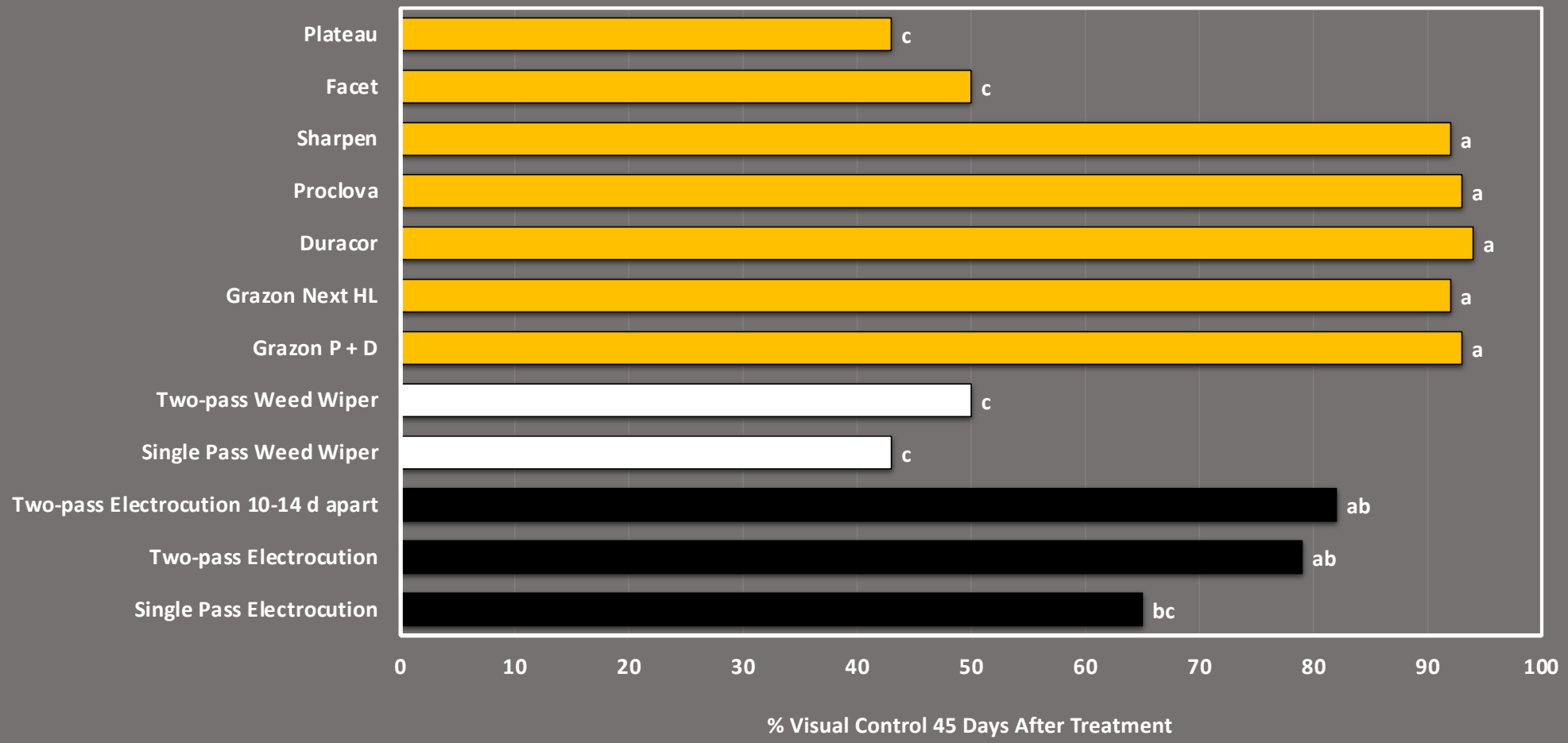
Legume Injury Following some Pasture Weed Management Treatments

(data combined across 3 pasture locations in Missouri in 2023)



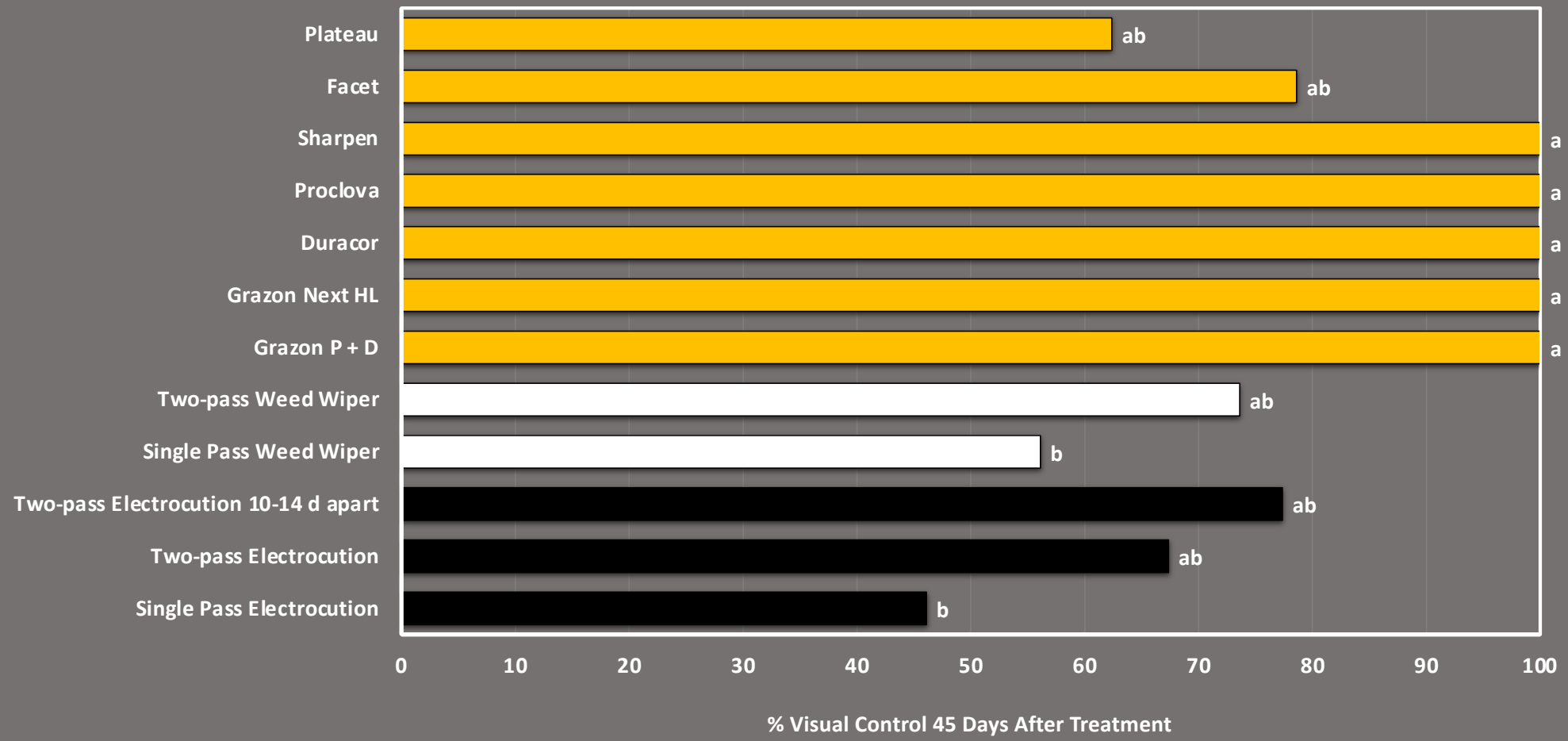
*Bars followed by the same letter are not different, LSD=0.05.

Common Ragweed Control Following some Pasture Weed Management Treatments
(data combined across 4 pasture locations in Missouri in 2023)



*Bars followed by the same letter are not different, LSD=0.05.

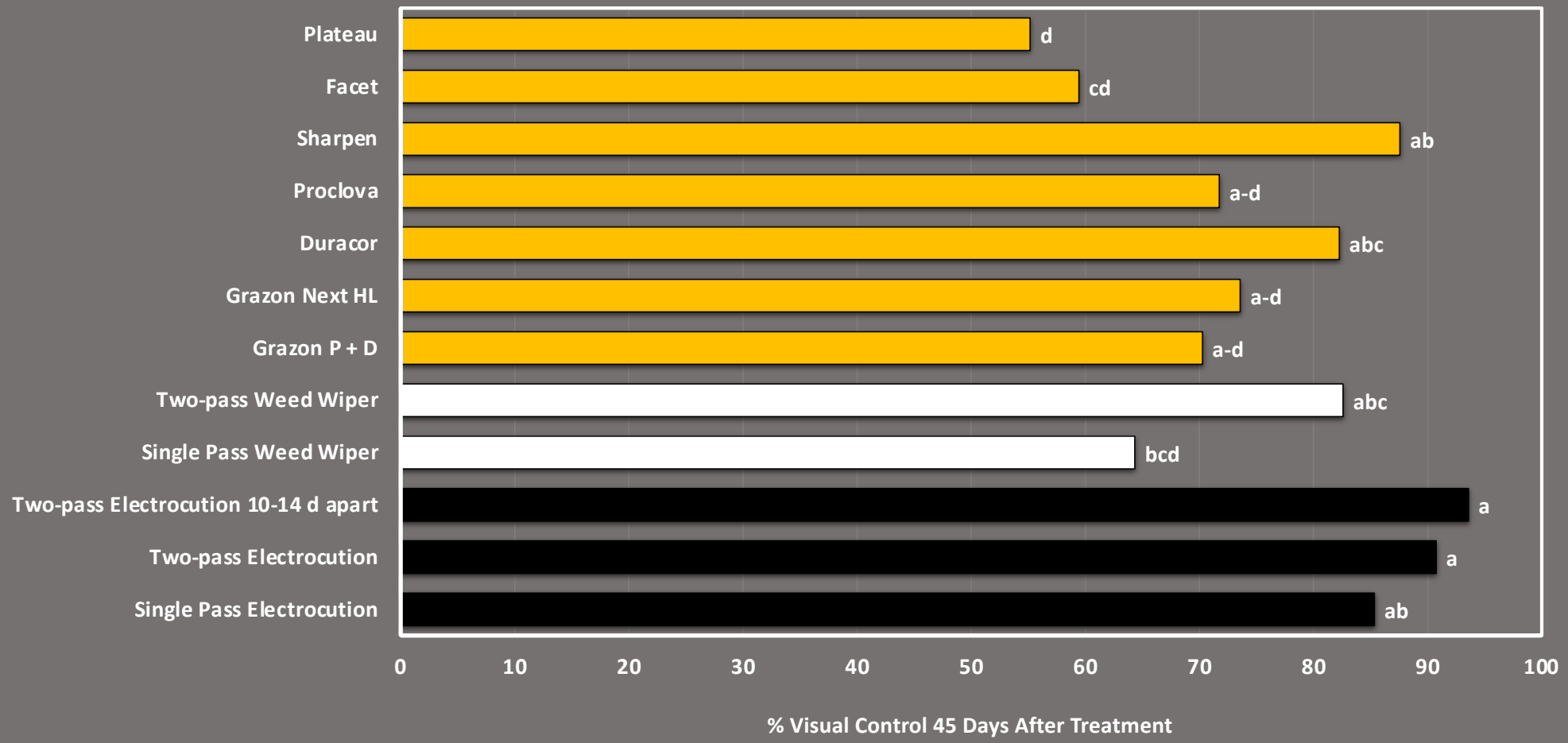
Common Cocklebur Control Following some Pasture Weed Management Treatments
(Boone County, Missouri 2023)



*Bars followed by the same letter are not different, LSD=0.05.

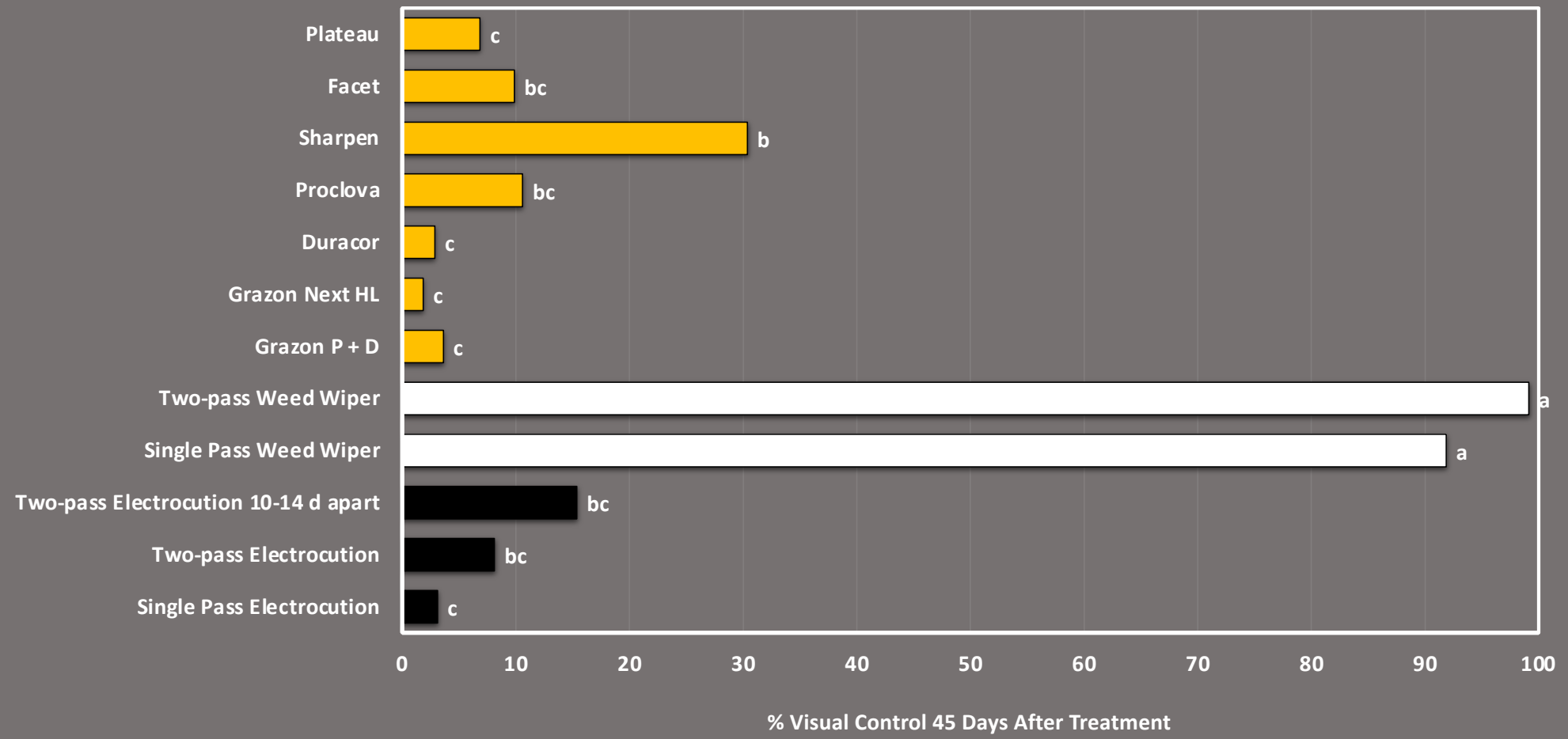
Ironweed Species Control Following some Pasture Weed Management Treatments

(data combined across 3 pasture locations in Missouri in 2023)



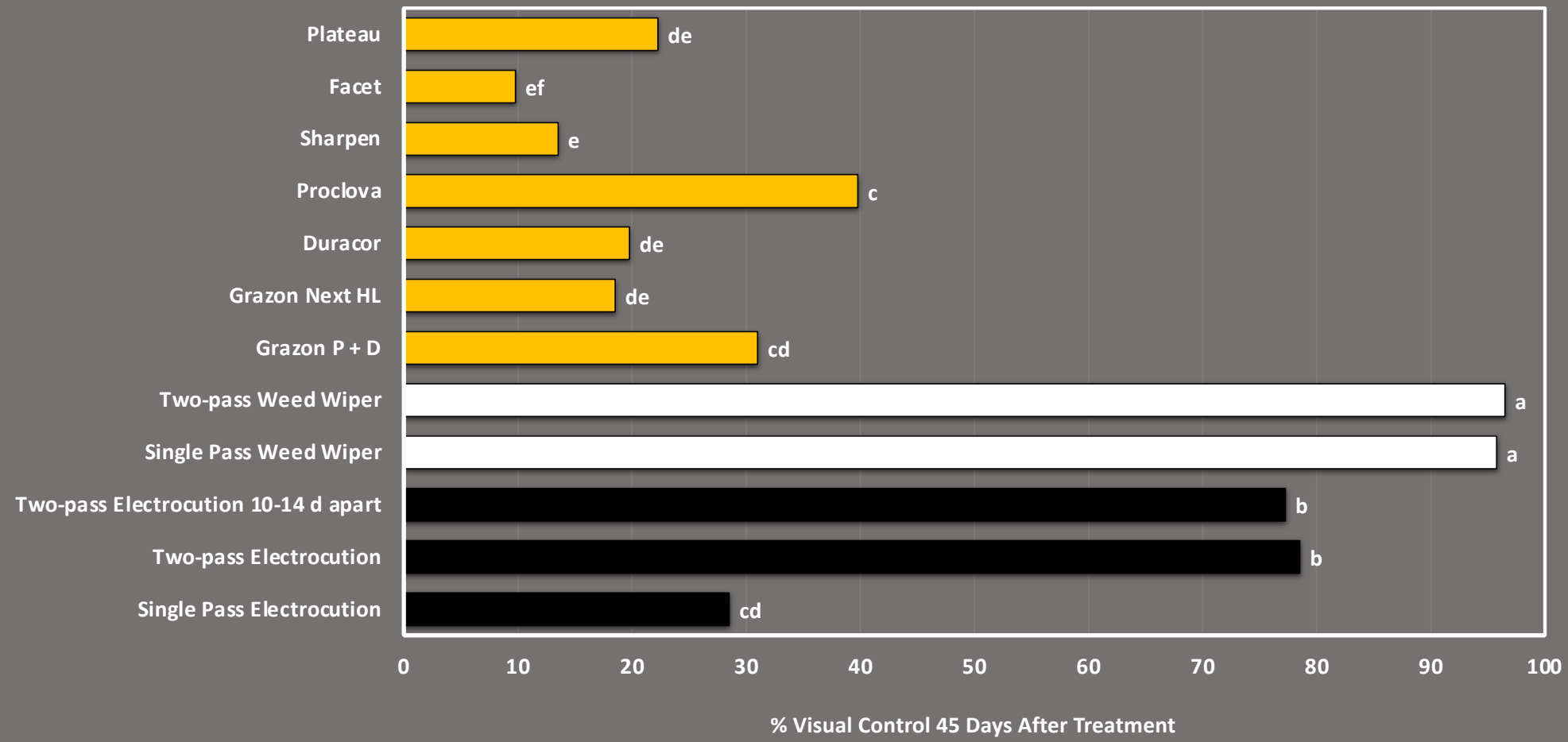
*Bars followed by the same letter are not different, LSD=0.05.

Sericea Lespedeza Control Following some Pasture Weed Management Treatments
(Crawford County, Missouri 2023)



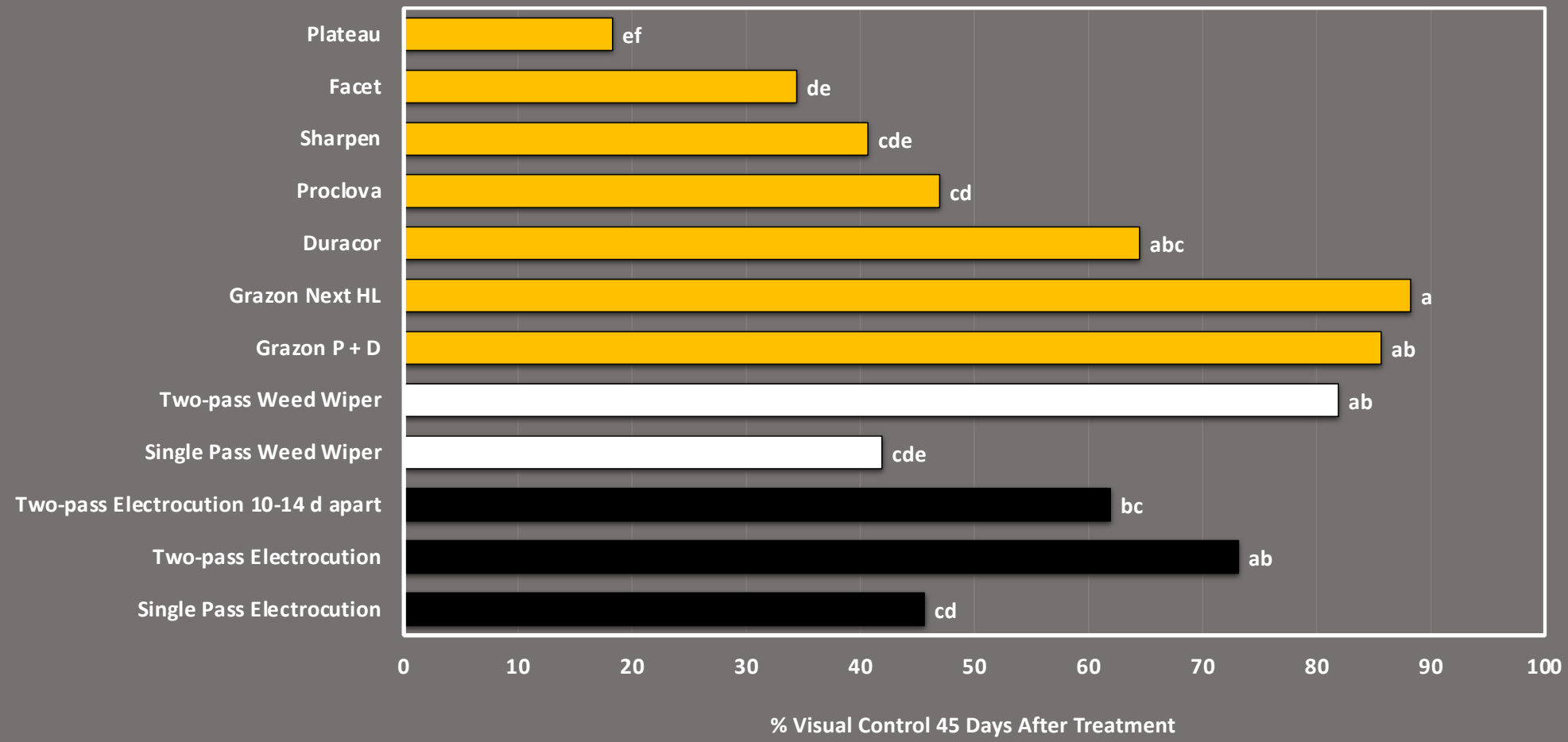
*Bars followed by the same letter are not different, LSD=0.05.

Buckbrush Control Following some Pasture Weed Management Treatments
(Crawford County, Missouri 2023)



*Bars followed by the same letter are not different, LSD=0.05.

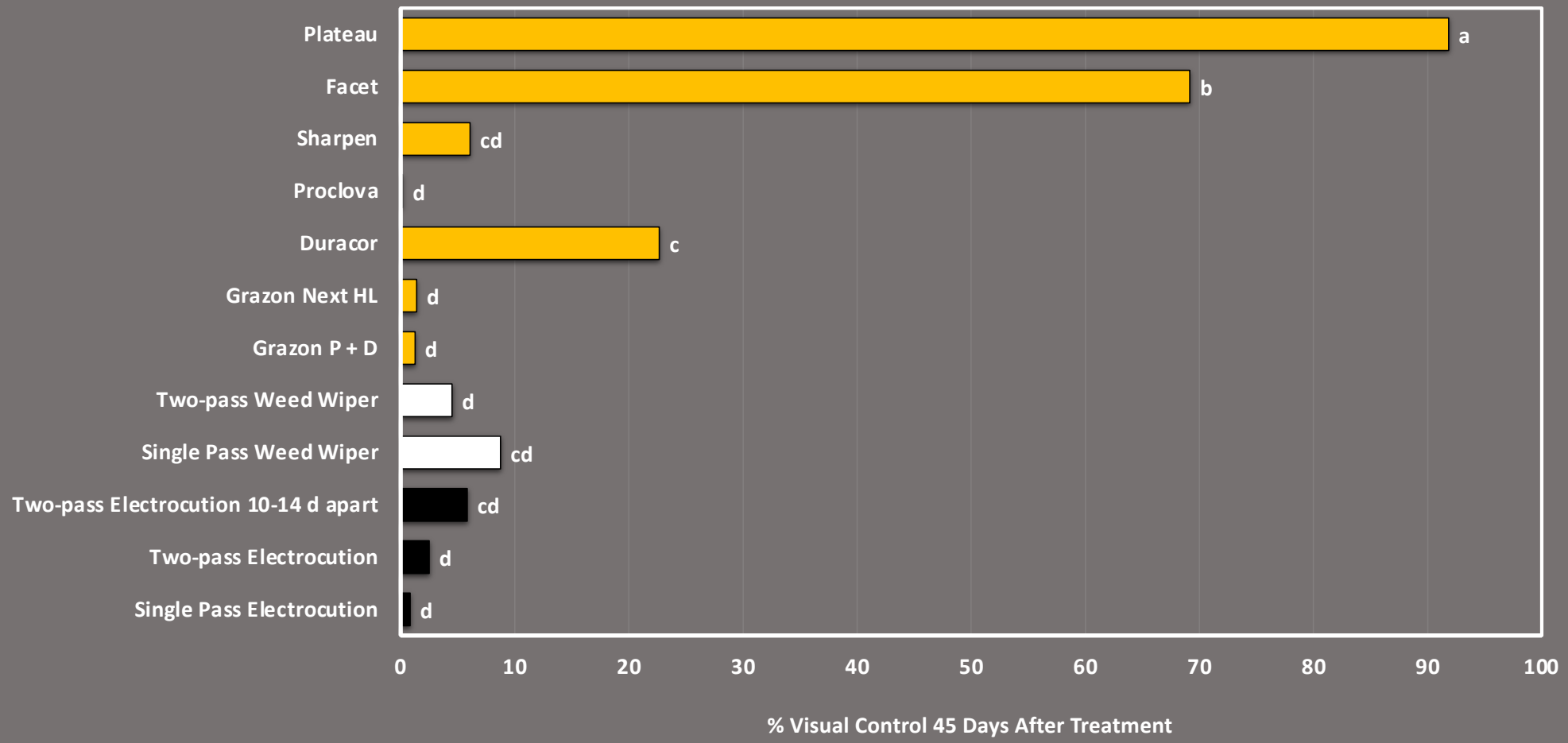
Honey Locust Control Following some Pasture Weed Management Treatments
(Boone County, Missouri 2023)



*Bars followed by the same letter are not different, LSD=0.05.

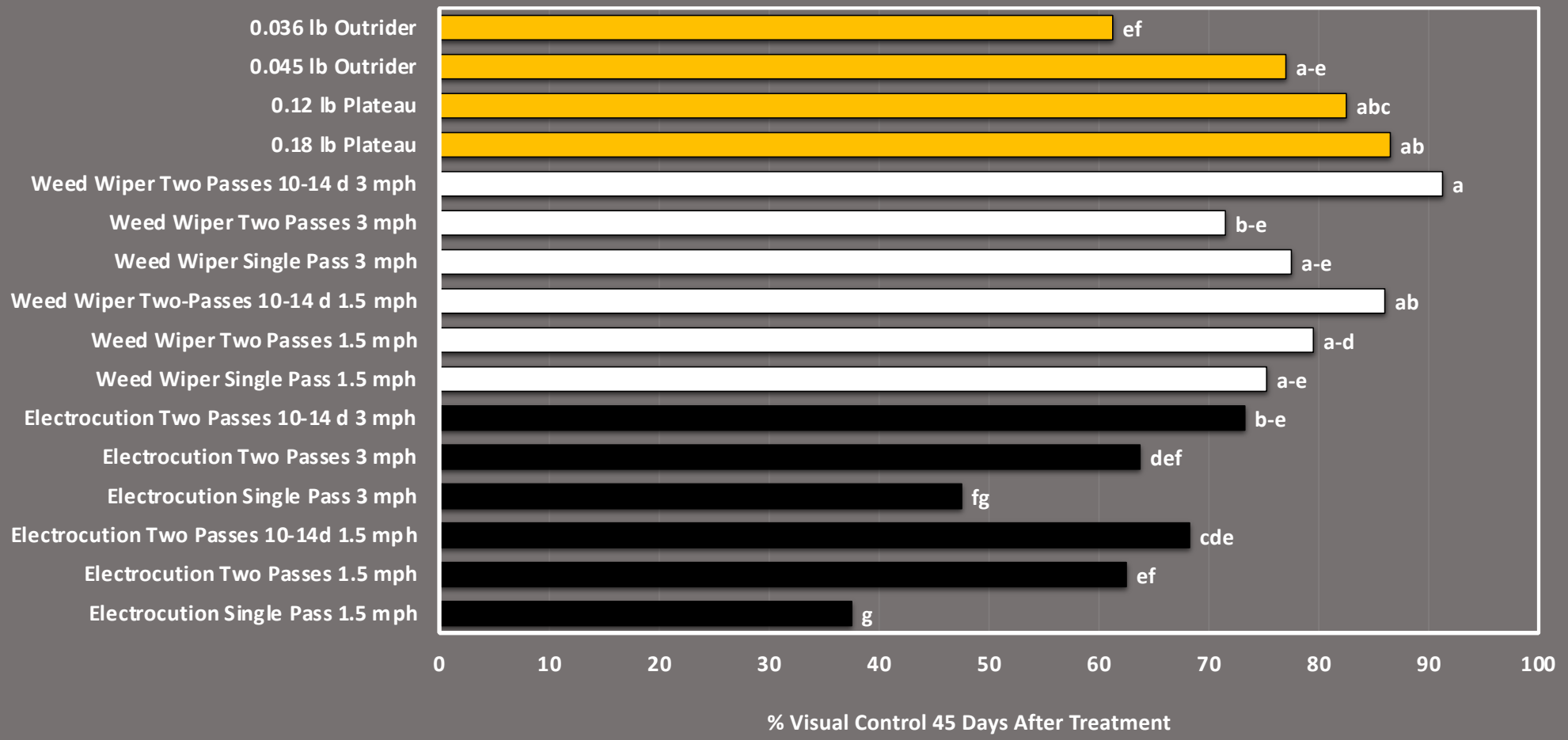
Yellow Foxtail Control Following some Pasture Weed Management Treatments

(data combined across 3 pasture locations in Missouri in 2023)



*Bars followed by the same letter are not different, LSD=0.05.

Johnsongrass Control Following some Pasture Weed Management Treatments
(Moniteau County, Missouri 2023)



*Bars followed by the same letter are not different, LSD=0.05.

Conclusions:
Forage Injury

- Less than 8% tall fescue injury from any wiping or electrocution treatment
- 0 - 9% legume injury from all wiping and electrocution treatments (lower than all herbicide treatments except Proclova, Sharpen, and Plateau)

Conclusions: Weed Control

Table 1. Weed control relative to the best broadcast herbicide treatment(s) evaluated.

Alternative Treatment Type	Common Ragweed	Common Cocklebur	Yellow Foxtail	Ironweed Species	Sericea Lesp.	Buck-brush	Honey-locust
Single pass electrocution	↓	↓	↓	=	↓	=	↓
Two-pass electrocution same day	=	=	↓	=	=	↑	=
Two-pass electrocution 14-d apart	=	=	↓	=	=	↑	↓
Single pass weed wiper	↓	=	↓	=	↑	↑	↓
Two-pass weed wiper	↓	=	↓	=	↑	↑	=

↑, ↓, and = indicates higher, lower, and similar control than the best broadcast herbicide treatment(s), respectively

Conclusions:
Johnsongrass Control

- Speed of wiping or electrocution did not influence johnsongrass control
- Two passes of electrocution on the same day or spaced 10-14 d apart provided better control than single pass
- Single passes were as effective as two passes with weed wiping
- Best electrocution and wiping treatments provided as good or better johnsongrass control than Plateau or Outrider

Acknowledgements

- Haylee Barlow
- Trace Thompson
- Grady Rogers
- Josh Bradley
- Del Knerr
- Dr. Kevin Bradley

Mizzou weed science

SMUCKER MANUFACTURING, INC.

THE WEED ZAPPER™

CROWN Power & Equipment