

Kochia Control with Combinations of Pre- Emergence Herbicides

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Brian Jenks	Minot
Caleb Dalley	Hettinger



Kochia Management with Spartan

- Sulfentrazone very effective
- Safe for use in several crops
- Readily available to weeds through soil
 - high water solubility
 - low adsorption



Photo by Dr. Quincy Law

PPO-Resistant Kochia

- 2020-2022 revealed several lack of control sites
- Genetic testing has confirmed broad geographic spread

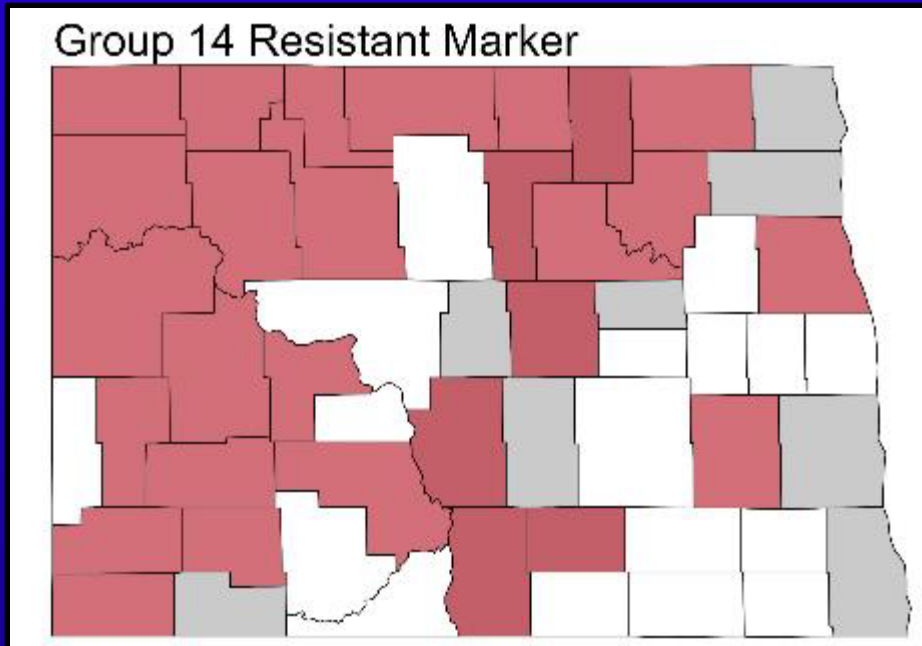


Image from Zack Bateson, National Genotyping Center, Fargo



Application

- **Locations: Ardoch, Hettinger, and Minot**
- **15-20 gpa spray volume**
- **Pre-emergence**
 - Except for Zidua applied 2 weeks before seeding
- **Herbicides**

– Spartan 4F	6 fl oz/A	3 oz ai/A
– Prowl H2O	3 pt/A	24 oz ai/A
– Dual Magnum	2 pt/A	30 oz ai/A
– Zidua SC	3.8 fl oz/A	2 oz ai/A

Evaluation

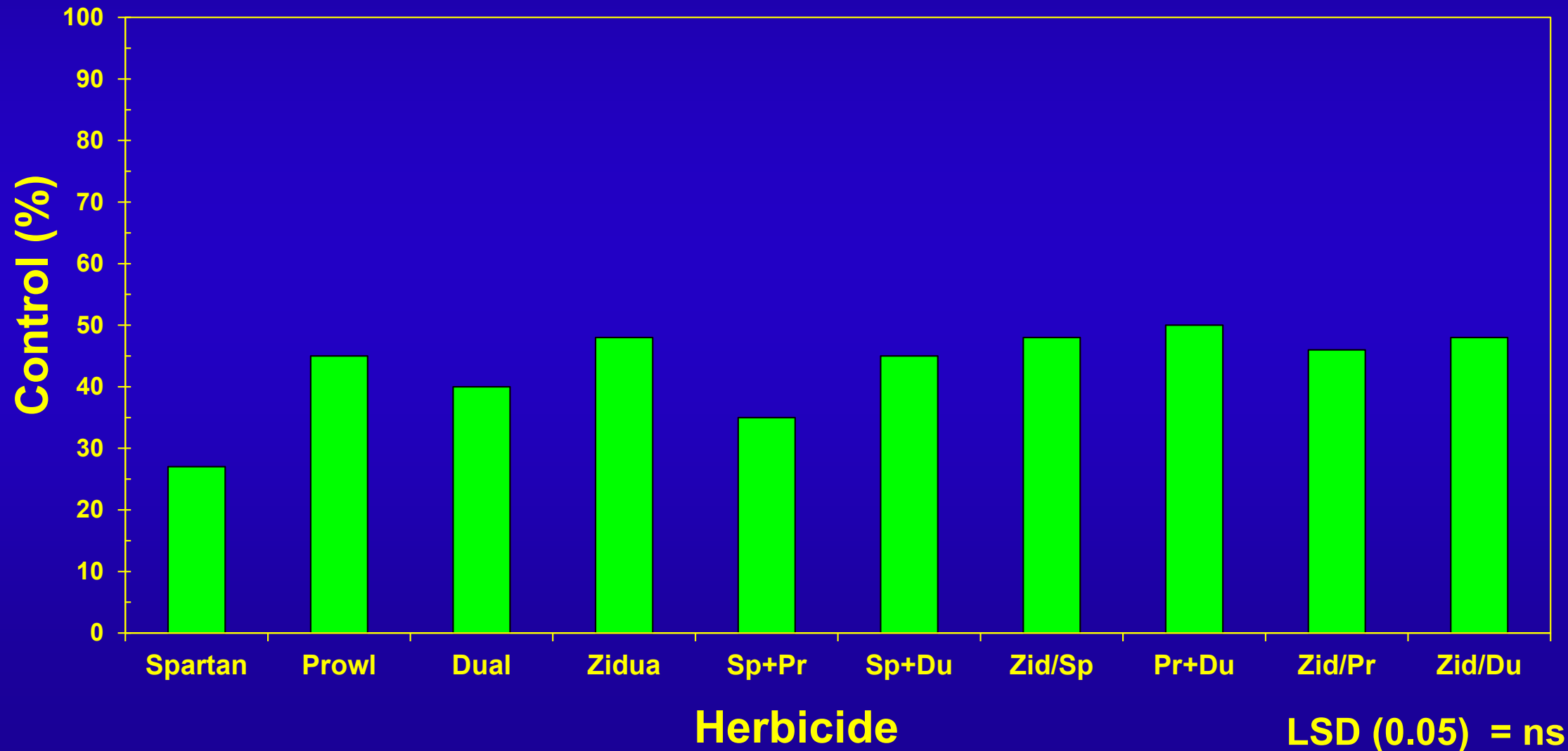
- Crop response
- Weed control
 - Visible biomass reduction on whole plot
 - Number of kochia per m²
 - Dry weight of kochia per m² at termination
- Evaluations at 2, 4, and 6 weeks after treatment (WAT)
- ANOVA and means separation at $\alpha=0.05$ in ARM

Treatments did not affect Sunflower



Visible Kochia Control 2 WAT

Ardoch, 35-60 plants per m²



Spartan



Prowl H2O



Kochia vigor inhibited by Groups 3 and 15



Hettinger

Spartan



Prowl H2O



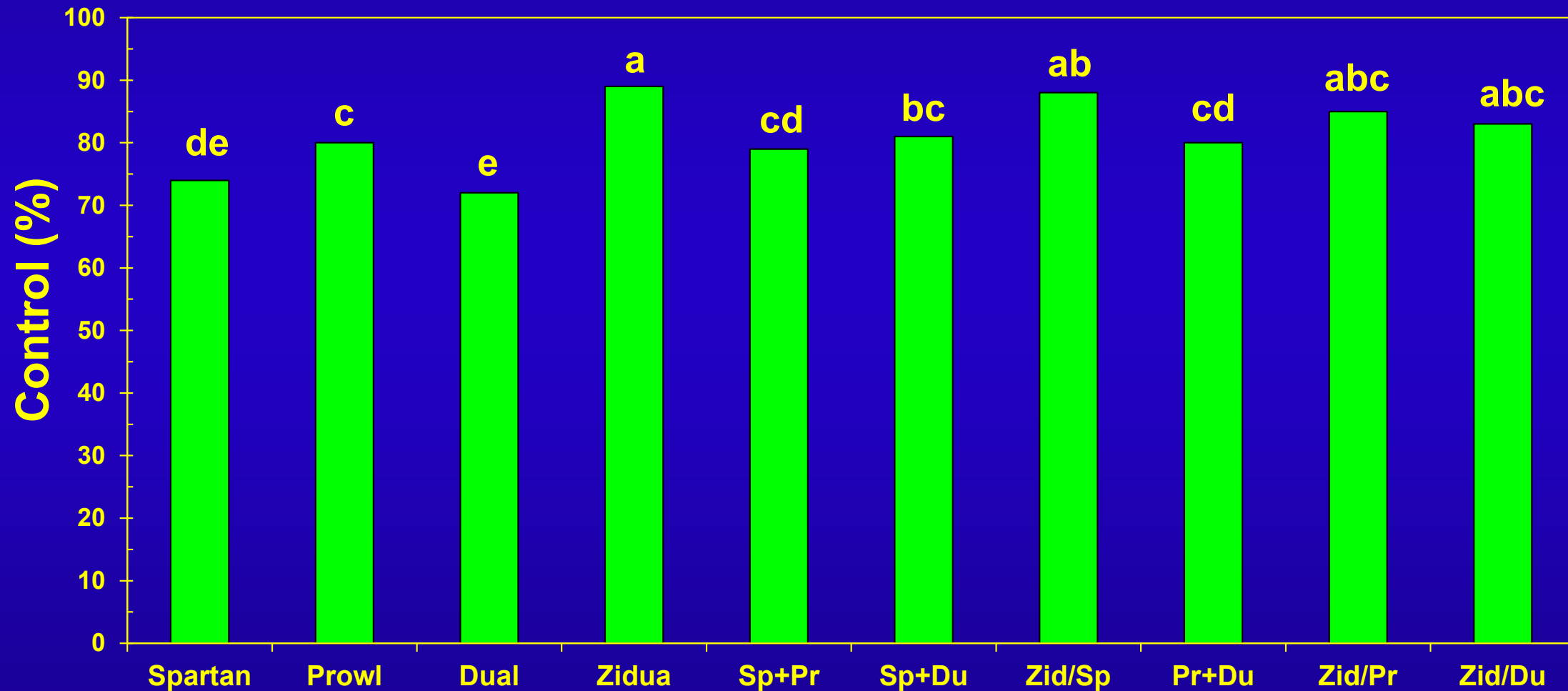
Zidua SC



Dual Magnum

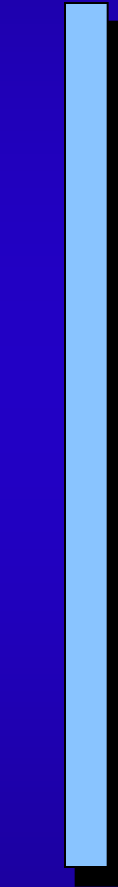


Visible Kochia Control 6 WAT Hettinger

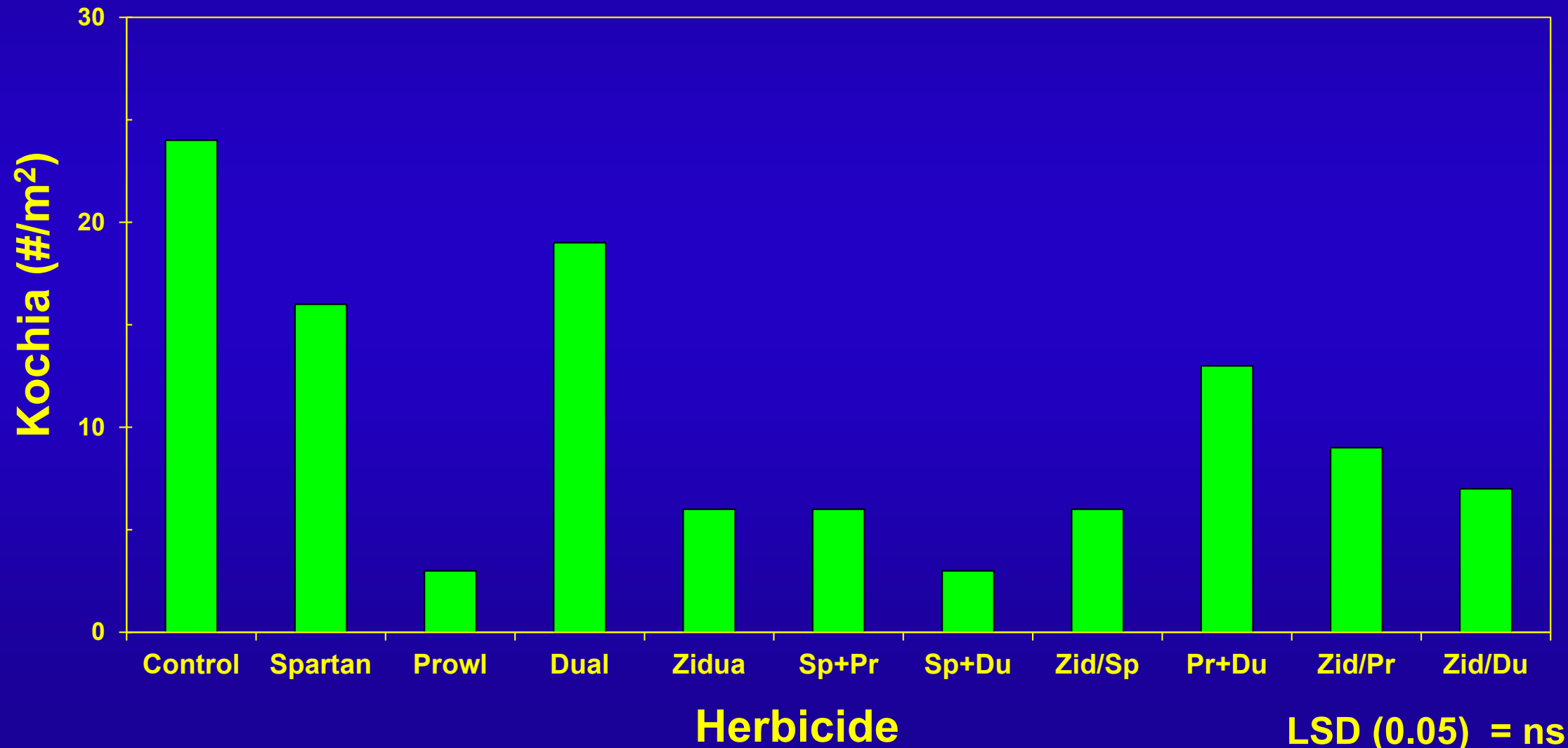


Herbicide

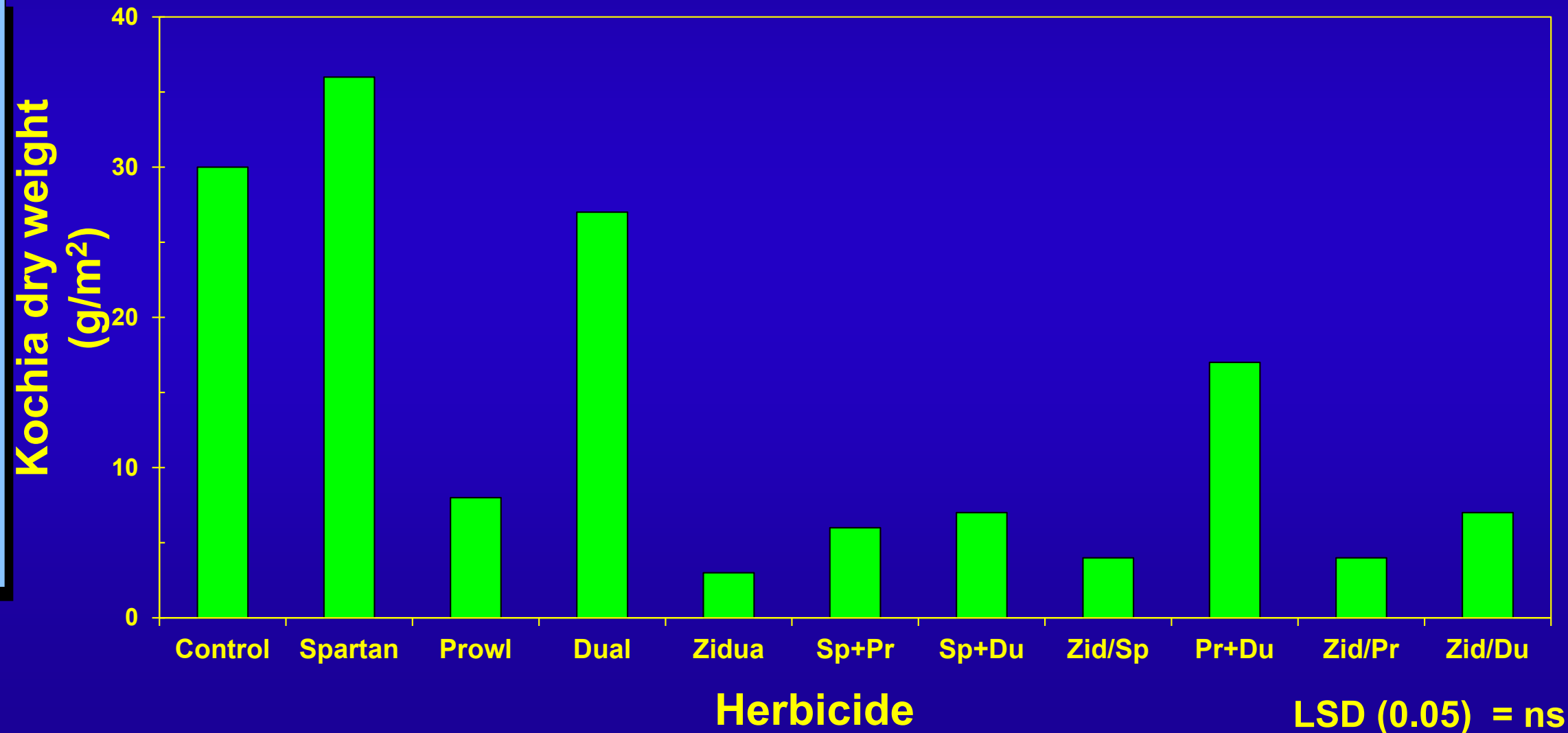
LSD (0.05) = 7

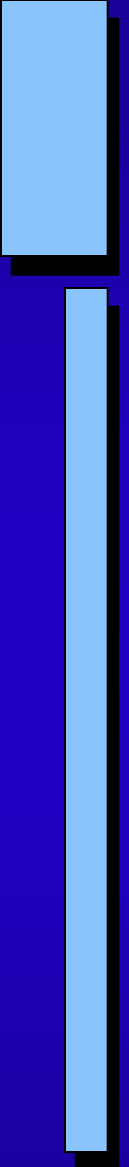


Kochia Density at Termination Hettinger



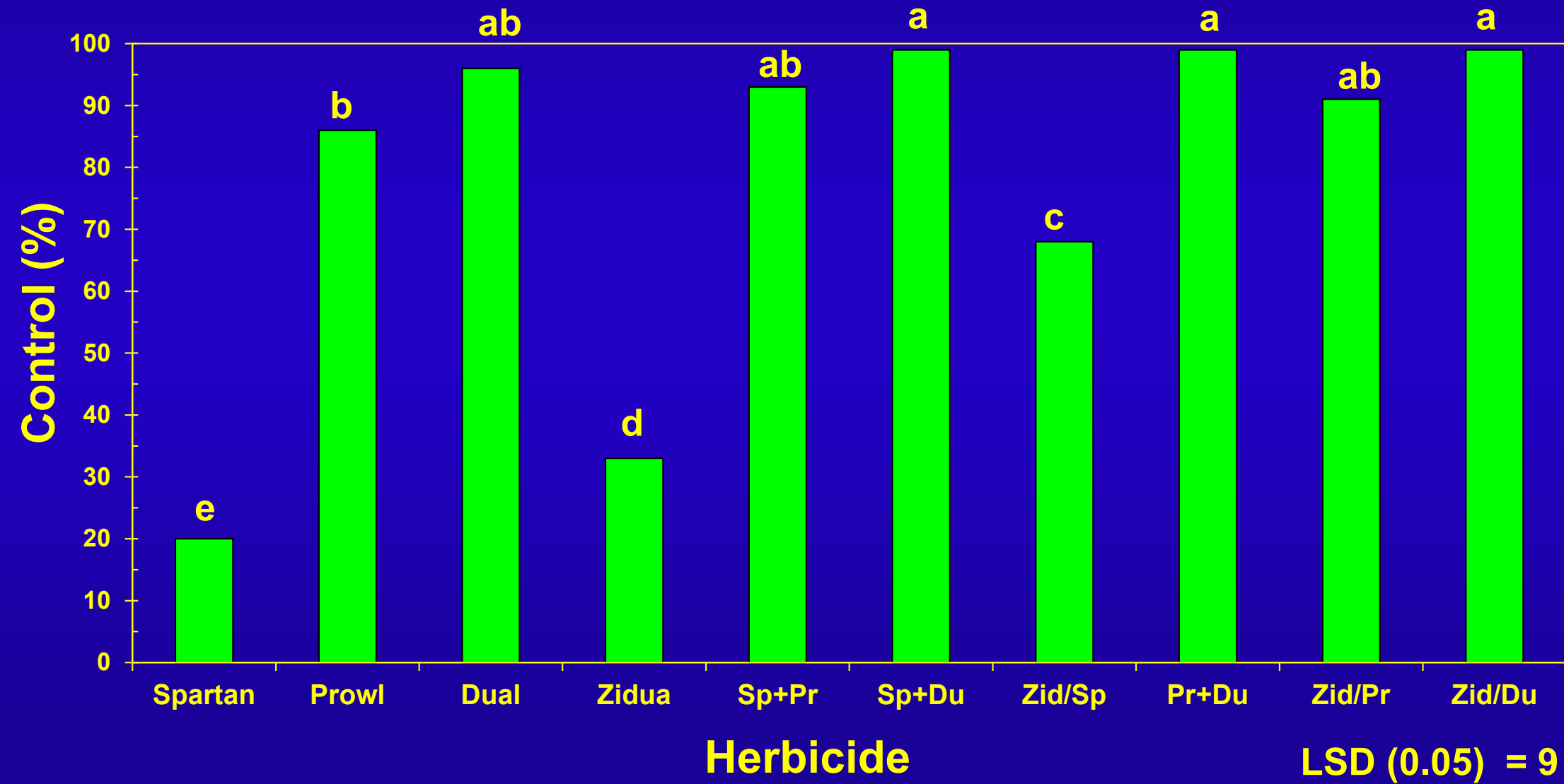
Kochia Biomass at Termination Hettinger

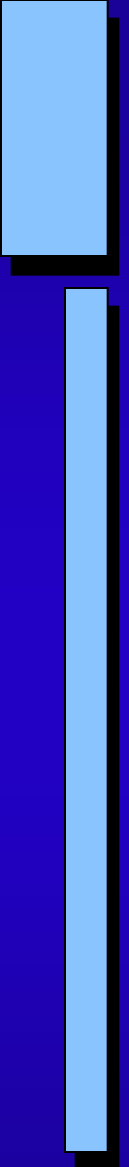




Visible Green Foxtail Control 2 WAT

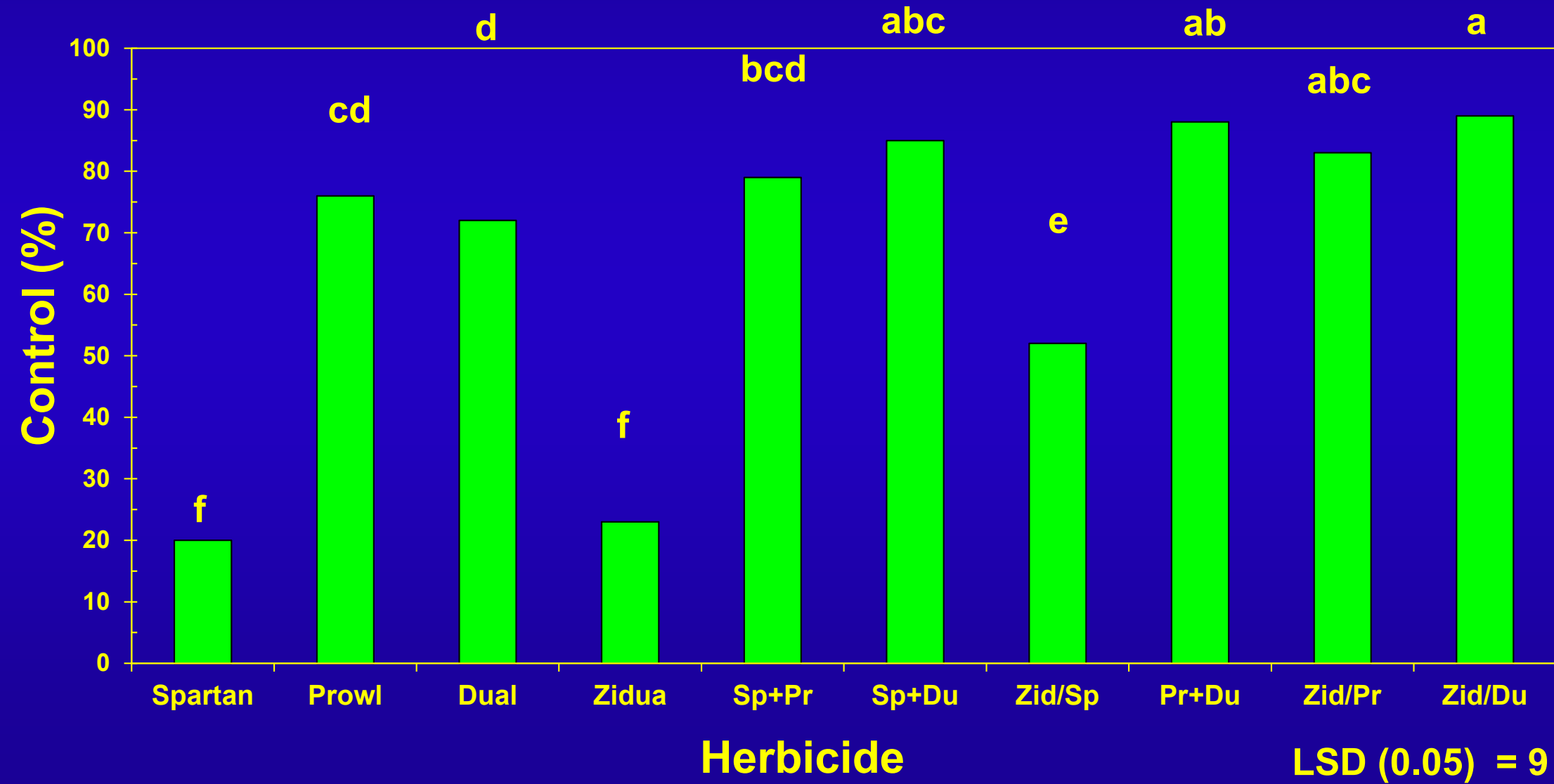
Minot



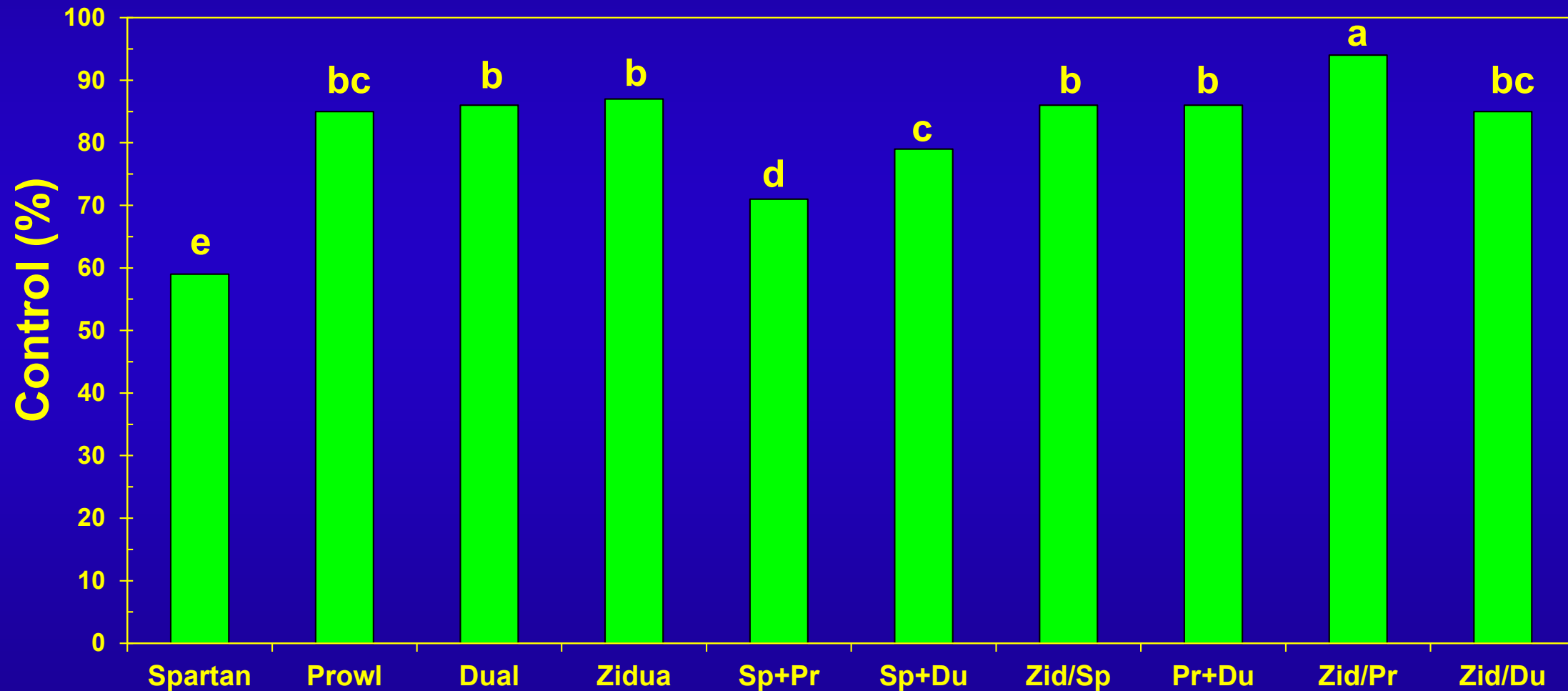


Visible Green Foxtail Control 6 WAT

Minot



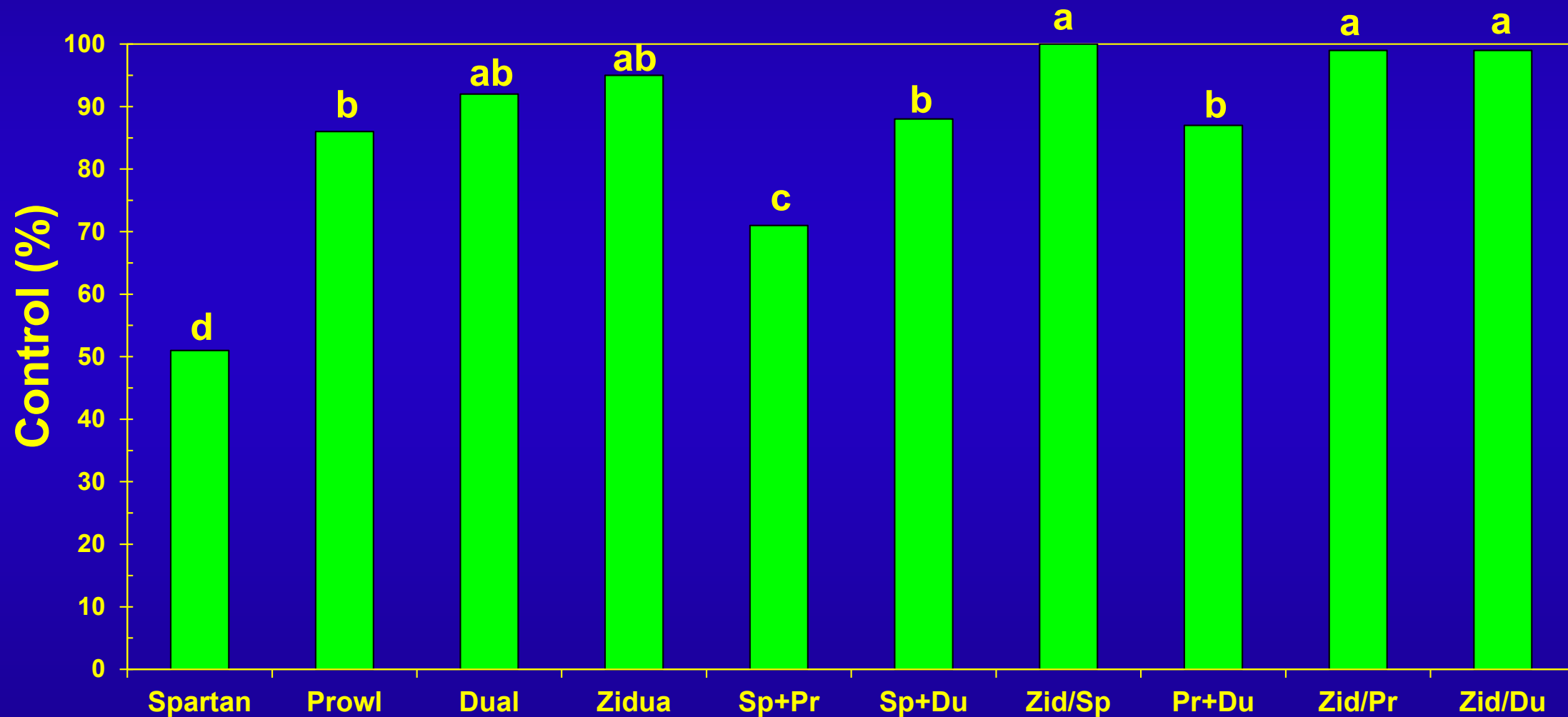
Visible Green Foxtail Control 6 WAT Hettinger



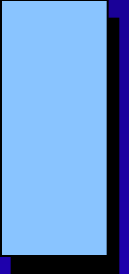
Herbicide

LSD (0.10) = 6

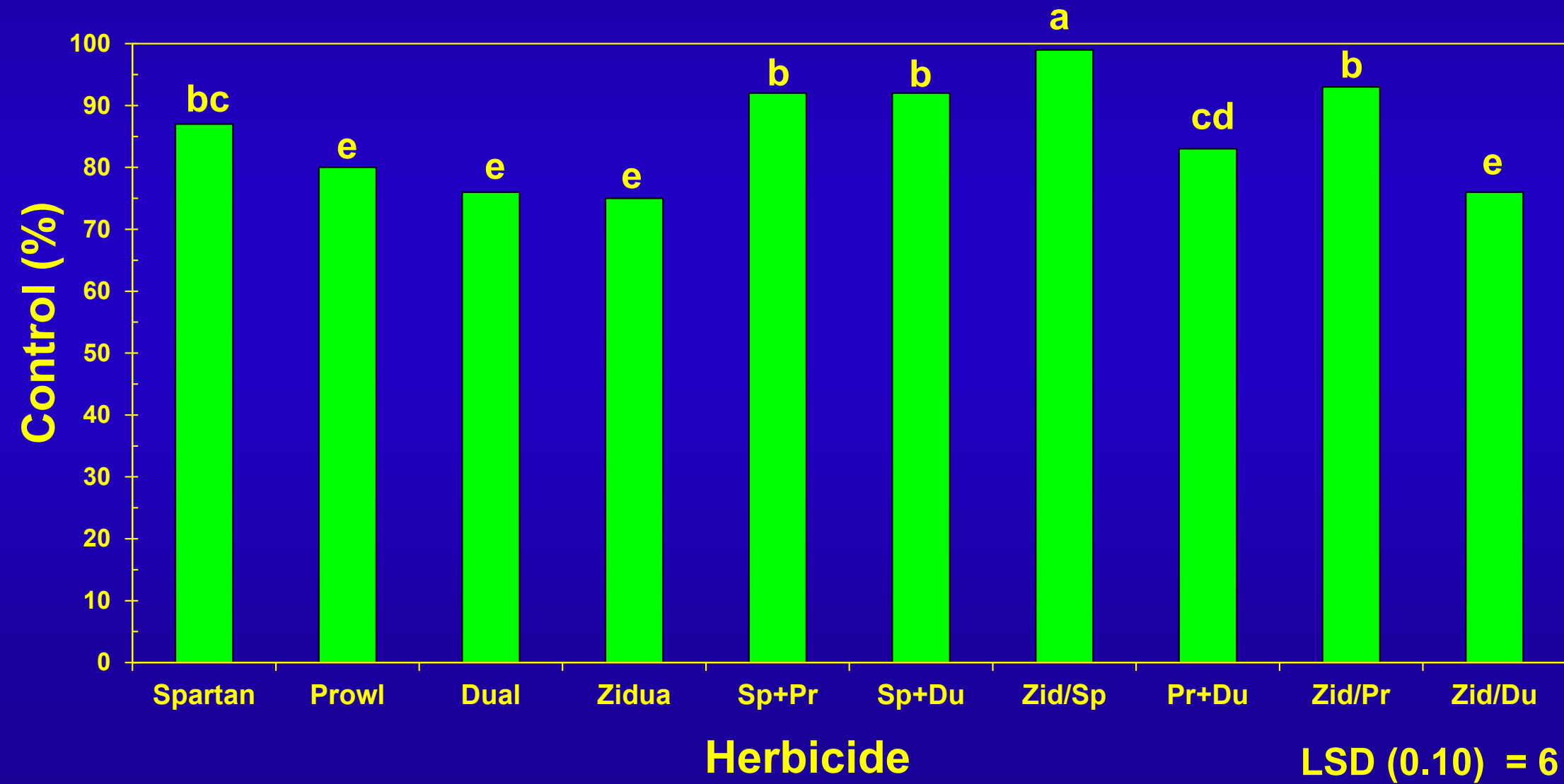
Visible Wild Oat Control 6 WAT Hettinger



LSD (0.10) = 9



Visible Lambsquarters Control 6 WAT Hettinger



Best Options ≠ 100% Control

	Koch	GFxtl	WiOa	CLam
Spartan	?			✓
Prowl H2O	✓	✓	✓	✓
Dual Magnum		✓	✓	✓
Zidua SC	✓	✓	✓	✓

Tank mix initial control was often similar to best individual product.

Some combinations were additive for duration of control.



Continuing Research

- Evaluate Zidua in fall application
- Sequential treatments to extend control



Thank You – this research was supported by funding from the National Sunflower Association