Weed Control Impacts on Indiangrass Establishment and Persistence

Alexa Johnson[1], Rob Mitchell[2], Daren Redfearn[1], and Marty Schmer[3]

[1]University of Nebraska-Lincoln, Lincoln, NE; [2]USDA -ARS Wheat, Sorghum and Forage Research Unit, Lincoln, NE;

[3]USDA-ARS Agroecosystem Management Research Unit, Lincoln, NE

Objective

To evaluate two weed control methods and seeding rate and on indiangrass establishment and persistence.

Introduction

Applying herbicides and mowing are two common weed control methods used in perennial grasses. Previous research has shown that weed competition can reduce indiangrass seedlings and forage yield by 33% (Martin et al., 1982). Indiangrass use was historically limited by lack of seedling tolerance to atrazine, but herbicide advancements provide new tools, such as Plateau for weed management in indiangrass seedings. This will likely increase interest in establishing indiangrass for forage, bioenergy, and conservation purposes (Mitchell and Vogel, 2004).

Methods

- Mead, NE in 2003-2007.
- Plots were no-till drilled on May 15, 2003
- Cultivars (NE 54 and Oto) were seeded at 100, 200, 300, 400, and 500 PLS m^{-2}.
- Plateau[(±)-2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridinecarboxylic acid] was applied at 1.6 mL ha^{-1} as pre-emergent weed control on herbicide-treated plots.
- Vegetation mowed to 15-cm stubble height to open the canopy on non-Plateau treated plots.
- Plots fertilized with 112 kg N ha^{-1} during spring of 2nd growing season and each subsequent growing season.
- Indiangrass frequencies were determined using a 75 cm x 75 cm frequency grid (Vogel and Masters, 2001).

Figure 3. Measuring stand frequency.

Results

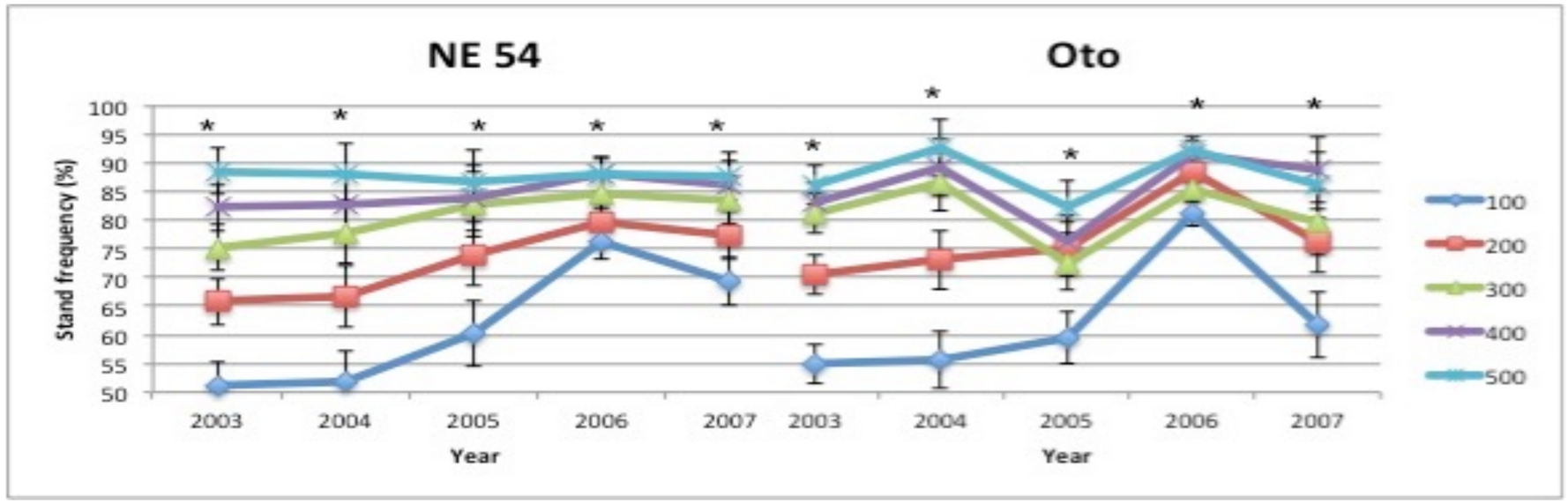

Figure 1. Seeding rate effects on stand frequency by cultivar averaged across weed control treatments.

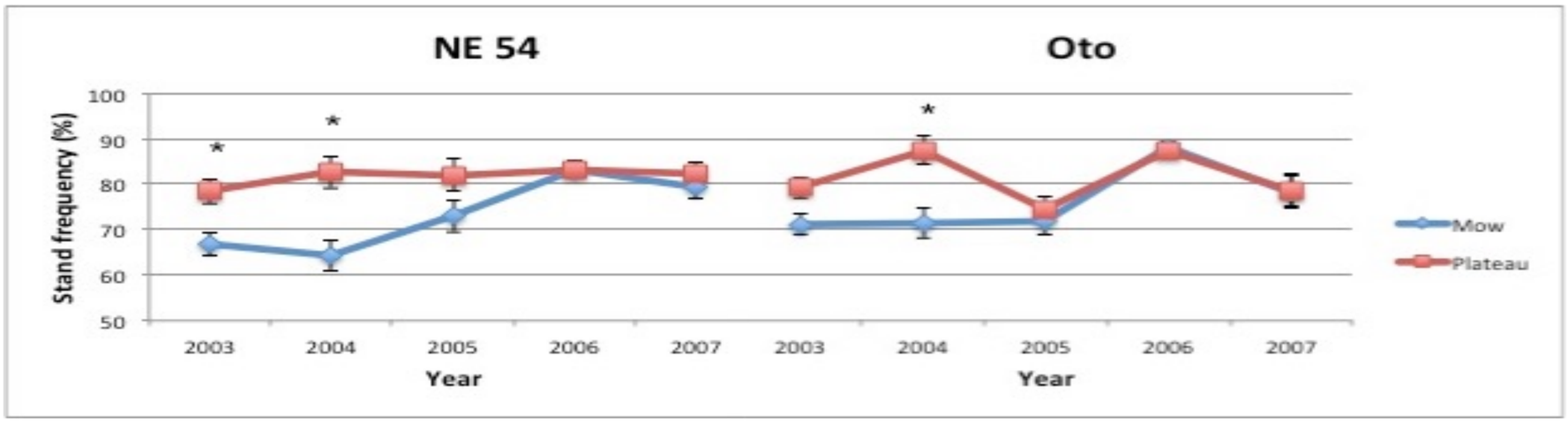

Figure 2. Weed control effects on stand frequency by cultivar averaged across seeding rates.

Summary

- Stand frequency increased with increasing seeding rate for both cultivars (Fig. 1).
- Stand frequency for Oto was more variable across years than NE 54 (Fig. 1).
- During early establishment (2003 and 2004), stand frequency was lowest for the 100 PLS m^{-2} seeding rate for both cultivars (Fig. 1).
- At the end of the study, the 100 PLS m^{-2} was the only seeding rate with less than 75% stand frequency (Fig. 1).
- Stand frequency was similar for both weed control treatments after the second year of the study (Fig. 2).
- With the exception of the first year for Oto, stand frequency was greater for the herbicide treatment during early stand establishment (Fig. 2).

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Conclusions

- With Plateau application, seeding rates as low as 200 PLS m^{-2} can result in functional, persistent indiangrass stands.
- Application of Plateau resulted in greater stand frequency than mowing during early stand establishment.
- All seeding rates had greater than 75% stand frequency with the exception of the 100 PLS m^{-2} seeding rate.
- After 5-years, there were no stand frequency differences regardless of weed control method.

References

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