The Effects of Various Scalping Timings on Tall Fescue Control with Glyphosate

Cole Thompson[1], Jared Hoyle[2], Nicholas Mitchell[2], and Benjamin Van Ryzin[1]

[1]University of Nebraska-Lincoln, Lincoln, NE, [2]Kansas State University, Manhattan, KS

BACKGROUND

Herbicides containing glyphosate are commonly used during renovations, or to control difficult weeds such as tall fescue (*Schedonorus arundinaceus* [Schred.] Dumort.). Users commonly scalp treated areas to sow desirable species following treatment, and most product labels recommend withholding mowing for several days before or after an application for maximum efficacy. If possible, more flexibility in scalping timing would benefit end users.

OBJECTIVE

Determine the effects of various scalping timings on tall fescue control with glyphosate.

MATERIALS AND METHODS

Design:

- Conducted on tall fescue maintained at 7.6 cm in 2016 and 2017 in Mead, NE and Manhattan, KS. Split-plot treatment structure in a randomized, complete-block design in each location with three blocks in NE and four blocks in KS. Seasonal timing (spring or fall) was the whole-plot treatment factor, and scalping timing (below) was the sub-plot treatment factor. Individual plots were 1.5 m × 1.5 m.
- Glyphosate was misapplied for the spring timing in NE. Therefore, preliminary data were analyzed as three separate experiments: fall applications in NE, fall applications in KS, and spring applications in KS.

Glyphosate Application and Scalping Timings:

- Glyphosate (GlyphoMate 41, PBI/Gordon Corporation, Kansas City, MO) was applied at 3.4 kg a.i. ha^{-1} using a CO_2-pressurized sprayer equipped with *TeeJet* 8002VS nozzles. Application dates were 11 October 2016 (fall timing) in NE, and 18 October 2016 (fall timing) and 5 May 2017 (spring timing) in KS.
- Scalping treatments were deployed 1 day before treatment (DBT) with glyphosate, 1 hour before treatment with glyphosate (IBT), 1 hour after treatment with glyphosate (IAT), or 1, 2, 3, 4 or 5 days after treatment (DAT) with glyphosate.

Data Collection and Analysis:

- Percent green cover of tall fescue was visually estimated 0, 1, 2, 4, 8, 24, and 32 weeks after treatment (WAT) with glyphosate.
- Data were log (y+1) transformed prior to analysis. Analysis of variance was conducted using the MIXED PROC of version 9.4 of the Statistical Analysis System (SAS). Block was considered a random effect, and all data were back transformed for presentation.

RESULTS

Nebraska Study:

- With the exception of scalping immediately following glyphosate application, all scalping treatments reduced tall fescue cover to 0% by 32 WAT (Figures 1 and 2).
- Scalping immediately following treatment with glyphosate resulted in 67% green cover of tall fescue by 32 WAT, not different from untreated tall fescue (97% green cover of tall fescue).

Kansas Studies:

Fall

- Untreated tall fescue and tall fescue scalped one day or one hour before treatment, or one hour after treatment had similar tall fescue cover at 32 WAT (Figure 1). All other scalping timings reduced tall fescue cover compared to untreated tall fescue by 32 WAT.
- Scalping four or five days after treatment with glyphosate resulted in complete control of tall fescue 32 WAT, and scalping two or three days after treatment were not significantly different (1 or 3% green cover of tall fescue, respectively). Scalping one day following treatment with glyphosate resulted in 8% green cover of tall fescue 32 WAT, similar to scalping three days after treatment with glyphosate.

Spring

- With the exception of scalping one hour before or one hour following treatment with glyphosate, all scalping treatments reduced green cover of tall fescue to <7.5% by 8 WAT, significantly less than untreated tall fescue (100% green cover of tall fescue) (Figure 1). Plots scalped two to five days following treatment with glyphosate had 0% green cover at this time.
- Plots scalped one hour before or after treatment with glyphosate had 50 and 60% green cover of tall fescue at this time, respectively, not different from untreated tall fescue.

RESULTS CONTINUED

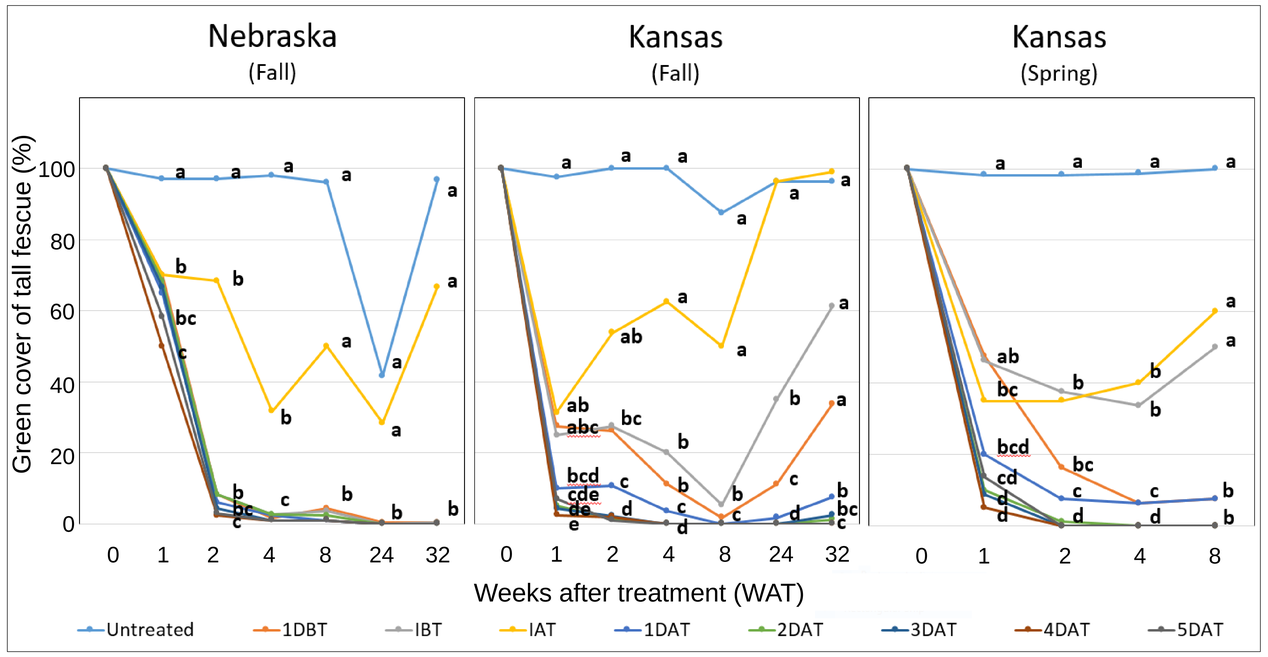

Figure 1. Effects of scalping treatments on tall fescue control with glyphosate in studies in Mead, NE in fall (*left*), Manhattan, KS in fall (*middle*), and Manhattan, KS in spring (*right)* in 2016-2017. Within dates and studies, means with the same letter are not significantly different according to Tukey's HSD test (α_{FER} = 0.05).

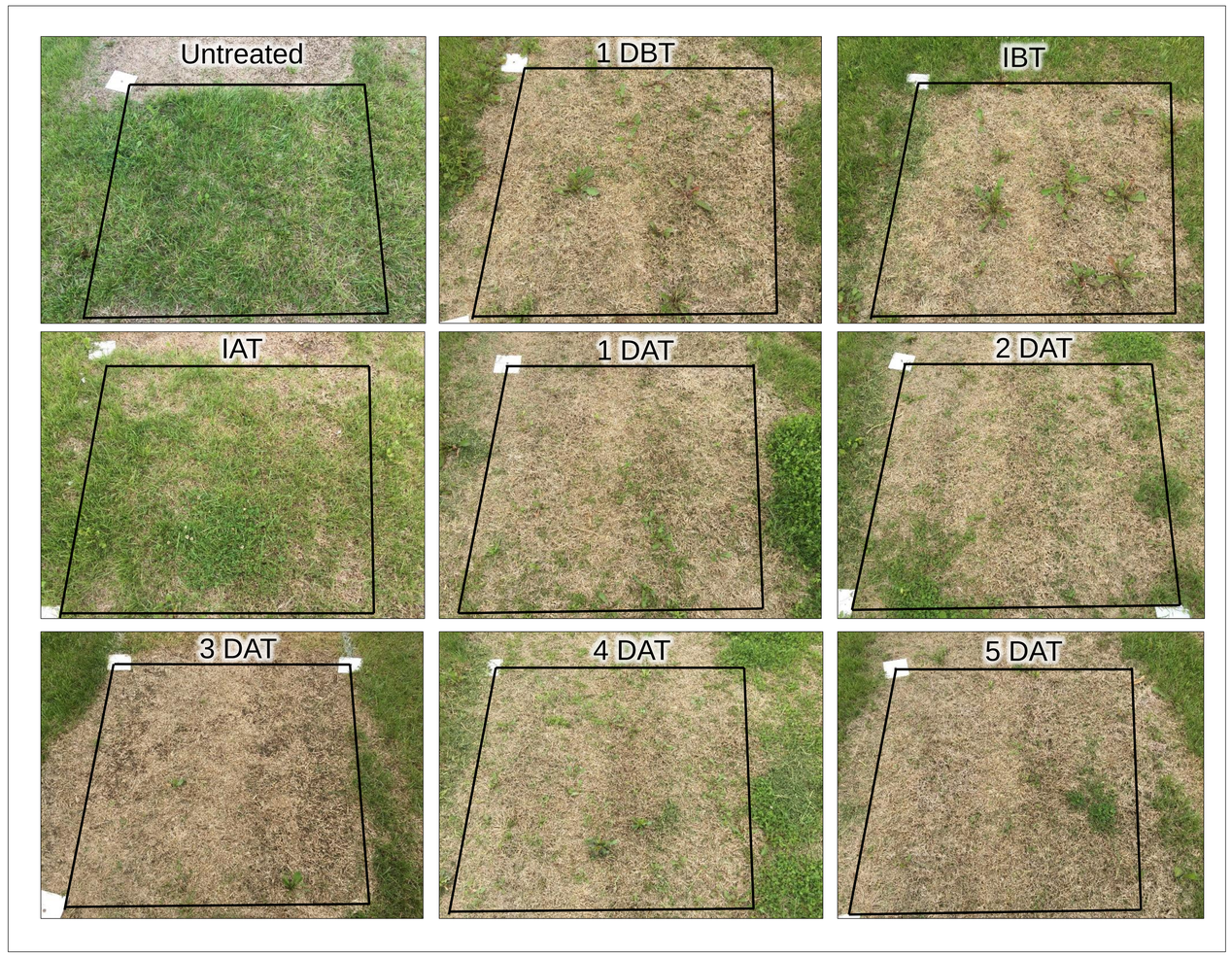

Figure 2. Effects of fall scalping treatments on tall fescue control 32 WAT (23 May 2017) with glyphosate in Mead, NE.

CONCLUSIONS

- Preliminary data indicate that scalping tall fescue as soon as one day following treatment with glyphosate (in spring or fall) will not reduce efficacy compared to delaying scalping until at least three days after treatment as is often recommended.
- Scalping turf immediately after an accidental application of glyphosate may be a good strategy to mitigate injury.
- Spring applications are planned in 2018 to complete the experiment in NE.