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## Emergence and Growth of Tall Fescue Seedlings after Postemergence Broadleaf Herbicide Application

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### Cover Page Footnote

The authors are grateful for support of this research supported by the Kansas Turfgrass Foundation. We also appreciate that herbicides were donated by Corteva USA and PBI-Gordon, and grass seed provided by Grass Pad.

# TURFGRASS RESEARCH 2021



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## Emergence and Growth of Tall Fescue Seedlings after Postemergence Broadleaf Herbicide Application

*Dani McFadden, Jack Fry, and Steve Keeley*

### Summary

Effective weed control prior to seeding is essential for proper turfgrass establishment since competition from weeds can cause sward establishment to fail. Herbicides with multiple active ingredients from different chemical families could increase weed control efficacy, but hinder the establishment of newly seeded turf. Research trials were initiated in the fall of 2020 in Olathe and Manhattan, KS, to determine if tall fescue (*Schedonorus arundinaceus*) could be seeded earlier after application than stated on the herbicide labels. Overall, this study demonstrated that seeding between 0 to 14 days after an application of carfentrazone-ethyl + MCP + 2,4-D + dicamba (SpeedZone), fluroxypyr + halauxifen-methyl + 2,4-D Choline (GameOn); or triclopyr + pyraflufen-ethyl + 2,4-D + dicamba (4-Speed XT) had little or no effect on tall fescue growth under the conditions evaluated in these experiments. In general, herbicide manufacturers must consider altering label reseeding intervals before using the results reported herein as guidelines.

### Rationale

Herbicides are a vital component to weed management in turfgrass; however, limited research exists on chemical weed control at the seedling stage despite the common practice of reseeding immediately after herbicide application. The introduction of new combination products raises concerns regarding the delay in seeding required after application.

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## Objective

The objective of this research was to determine the influence of combination products used for postemergence control of broadleaf weeds on emergence and growth of tall fescue seeded between 0 and 14 days after application.

## Study Description

Field experiments were initiated in the fall of 2020 in Olathe and Manhattan, KS, to determine if tall fescue could be seeded into a stand between 0 to 14 days after herbicide application. The experiments were arranged in a two-way factorial, randomized complete block design with four replicates. Treatments were five herbicides (noted below) and four seeding intervals (0, 3, 7, and 14 days after herbicide application). Herbicides consisted of a nontreated control; SpeedZone; GameOn; 4-Speed XT; and penoxsulam + sulfentrazone + 2,4-D + dicamba (Avenue South). Each herbicide was applied to the trial area at its highest label rate recommended for cool-season turfgrasses. All treatments were applied using a CO<sub>2</sub>-pressurized, hand-held spray boom sprayer equipped with four TeeJet8003 flat-fan nozzles on 9.8-inch spacing calibrated to delivery 43 gal/a. Coverage of all plots was visually rated weekly using a scale of 0 to 100% cover (0% = no visible coverage; 100% = full coverage of plot). A handheld normalized difference vegetation index (NDVI) meter was used to record measurements at 21, 28, 42, and 56 days after seeding. Turf canopy height (inches) was measured 42 DAT (days after herbicide treatment). All data for each of the ratings were subjected to ANOVA in SAS (v. 9.4, SAS Institute Inc., Cary, NC) using the GLIMMIX procedure and means were separated according to Fisher's Protected LSD.

## Results

The herbicide treatment main effect was significant for tall fescue cover, NDVI, and canopy height, but seeding interval was not impactful. At the Manhattan site, tall fescue visual cover was reduced in Avenue South-treated plots compared to nontreated soil. No other herbicide treatment reduced cover compared to the nontreated; all had ≥ 94% visual cover. At the Olathe site, no herbicide treatment affected tall fescue cover compared to nontreated tall fescue. Canopy height and NDVI measurements were significantly lower in Avenue South-treated plots at both study sites when compared to nontreated turf. At either site, no other herbicide treatment reduced canopy height or NDVI measurements compared to nontreated tall fescue.

## Acknowledgment

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**Table 1. Effect of herbicides on tall fescue cover eight weeks after planting when seeded at 0 to 14 days after treatment (DAT)**

Treatment <sup>b</sup>	Cover (%) <sup>a</sup>	
	Olathe	Manhattan
Nontreated	92a <sup>c</sup>	95a
SpeedZone	92a	95a
GameOn	93a	95a
4-Speed XT	92a	94a
Avenue South	90a	88b

<sup>a</sup> Coverage was rated visually on a 0 to 100% scale on which 0 = no coverage, and 100 = complete coverage.

<sup>b</sup> Herbicides were applied on August 24, 2020 (Olathe, KS) and September 2, 2020 (Manhattan, KS). Tall fescue was seeded at 0, 3, 7, and 14 DAT.

<sup>c</sup> Means followed by the same lowercase letter in a column are not significantly different according to Fisher's LSD ( $P \leq 0.05$ ). Means are averages over seeding intervals, n = 16.

**Table 2. Main effect of herbicides on tall fescue seedling canopy height six weeks after seeding 0 to 14 days after treatment (DAT) in Olathe and Manhattan, KS**

Treatment <sup>a</sup>	Canopy height (inches)	
	Olathe	Manhattan
Nontreated	3.3a <sup>b</sup>	5.0a
SpeedZone	3.4a	5.1a
GameOn	3.4a	5.2a
4-Speed XT	3.2a	5.4a
Avenue South	2.6b	2.7b

<sup>a</sup> Herbicides were applied on August 24, 2020 (Olathe, KS) and September 2, 2020 (Manhattan, KS). Tall fescue was seeded at 0, 3, 7, and 14 DAT.

<sup>b</sup> Means followed by the same lowercase letter in a column are not significantly different according to Fisher's LSD ( $P \leq 0.05$ ). Means are averages over seeding intervals, n = 16.

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**Table 3. Main effect of herbicides on tall fescue NDVI eight weeks after seeding 0 to 14 days after treatment (DAT) in Olathe and Manhattan, KS**

Treatment <sup>b</sup>	NDVI <sup>a</sup>	
	Olathe	Manhattan
Nontreated	0.86a <sup>c</sup>	0.91a
SpeedZone	0.86a	0.90a
GameOn	0.87a	0.90a
4-Speed XT	0.87a	0.89a
Avenue South	0.81b	0.81b

<sup>a</sup> Normalized difference vegetation index (NDVI) measurements range from -1 to 1, with higher values indicating greater plant health.

<sup>b</sup> Herbicides were applied on August 24, 2020 (Olathe, KS) and September 2, 2020 (Manhattan, KS). Tall fescue was seeded at 0, 3, 7, and 14 DAT.

<sup>c</sup> Means followed by the same lowercase letter in a column are not significantly different according to Fisher's LSD ( $P \leq 0.05$ ). Means are averages over seeding intervals,  $n = 16$ .

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