

Effect of Growth Regulators and Hard Fescue Cultivar on Fine Fescue Maintained as a Naturalized Area

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Introduction

Low input areas on the golf course mowed once or twice annually are often referred to as naturalized areas. Where cool-season grasses predominate, these naturalized areas are primarily of fine leaf fescue (*Festuca* spp.) species.

Due to infrequent mowing, maintaining these areas so that golfers can still find and play the golf ball is a major challenge.

Previous work found glyphosate and various plant growth regulators including trinexapac-ethyl, ethephon, and mefluidide decreased stand density, but did not improve playability¹. Mefluidide was the most promising option, but it is no longer being manufactured².

Other work found indaziflam decreased fine fescue cover and improved playability.³

Objective

Evaluate the effect of various growth regulators and herbicides in combination with two different fine fescue mixtures on playability and associated factors in naturalized areas.

Materials and Methods

Replicate experiments were conducted during the 2021, 2022, and 2023 growing season on the same site in North Brunswick, NJ.

Whole plots were seeded in May 2020 with 50/50 (v/v) mix of 'Quatro' sheeps fescue (*F. ovina* L.) and either 'Beudin' or 'Gladiator' hard fescue (*F. brevipila* Tracey). The two hard fescue varieties were chosen to see if their density (low vs. high) affected playability. The selection was based on a three-year average of turf cover from the 2015 Rutgers University Fine Fescue Test.

- Beudin (low density treatment) had one of the lowest turf cover ratings.
- Gladiator (high density treatment) had one of the highest turf cover ratings.

The two whole plots were split with **PGR treatments**. Treatments were applied singly, shortly after fine fescue seedhead emergence between May 11 and 23 in 2021, 2022, and 2023 using standard small plot spray equipment at 410 L ha⁻¹.

PGR treatments

1. Indaziflam (33 g ha⁻¹; Specticle FLO),
2. Ethofumesate (2.2 kg ha⁻¹; Prograss EC)
3. Trinexapac-ethyl (220 g ha⁻¹; Primo Maxx) + ethephon (3.8 kg ha⁻¹; Proxy)
4. Triclopyr (1.12 kg ha⁻¹; Turflon Ester Ultra)
5. Non-treated control

Site Management

Fungicides were applied preventatively in the summer during establishment only. The site was mowed once annually to 15 cm in late fall or early winter after clipping collection. Pendimethalin was applied each May for preemergence annual grass control. To encourage biomass production in 2022, N was applied in April and May at 65 kg ha⁻¹. The site was not irrigated after establishment.

Treatment Evaluation

Playability was visually estimated on a 1 (extremely difficult to find and play golf ball) to 10 (extremely playable, similar to a mowed rough) scale in late June and October.

Yield was collected from each plot using a rotary push mower bench set to 15 cm height with a bag attachment.

Data were subjected to ANOVA in SAS (v9.4) as a split-plot RCB with four replications. Fisher's Protected LSD ($\alpha = 0.05$) was used to separate means.

Results

Main Effect Interactions

Fine fescue mixture interactions with plant growth regulator treatments were not significant for any evaluation over the three-year trial period and will not be presented.

Beudin vs Gladiator

Cultivar mixture	Playability						Yield		
	2021		2022		2023		2021	2022	2023
	June	Oct	June	Oct	June	Oct	-----grams-----		
Beudin + Quatro	5.5	5.7	5.5	4.9	6.4	4.1	128	284	208
Gladiator + Quatro	5.4	5.0	5.4	5.1	5.2	3.7	193	388	275
P-value	NS	***	NS	NS	NS	NS	NS	*	**

PGR Treatments

PGR	Playability						Yield		
	2021		2022		2023		2021	2022	2023
	June	Oct	June	Oct	June	Oct	-----grams-----		
Ethofumesate	5.4 bc	5.6 ab	5.3 b	5.3	6.0	4.4	160	365	244
Indaziflam	5.1 bc	5.1 b	3.7 c	4.6	5.3	3.6	156	365	223
Ethephon + trinexapac-ethyl	6.3 a	5.9 a	7.5 a	5.3	6.3	4.0	152	305	255
Triclopyr	5.6 b	5.3 b	7.4 a	5.4	5.9	4.0	172	293	238
Non-treated	4.9 c	5.1 b	3.4 c	4.4	5.5	3.5	161	350	250
P-value	*	*	***	NS	NS	NS	NS	NS	NS

Abbreviations: NS, not significant; *, **, ***, P-values < 0.05, 0.01, 0.001, respectively. Means followed by the same letter are not significantly different according to the Fisher's Protected LSD test (P = 0.05).

Beudin vs Gladiator

Using Beudin resulted in improved playability on only one rating date during the three-year evaluation, although there was a non-significant trend for improved playability on all but one rating date.

Using Beudin resulted in less yield at the end-of-season mowing in two of the three years.

PGR Treatments

Ethephon + trinexapac-ethyl was in the top statistical category for playability in 2021 and in June 2022. Triclopyr improved playability compared to the non-treated in June 2021 and 2022.

Despite improving playability, PGR treatments did not affect yield at the end-of-season mowing.

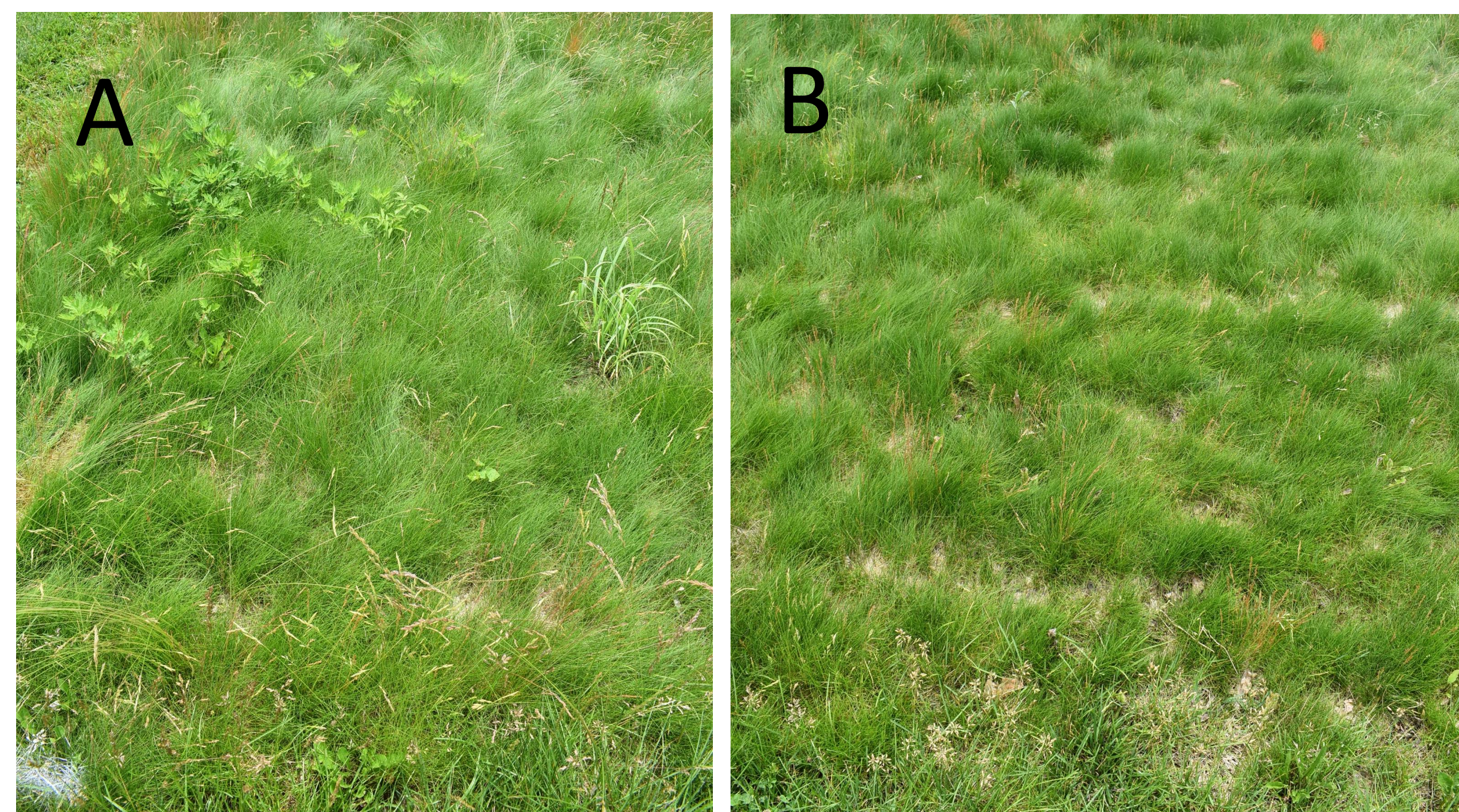


Figure 1. The non-treated control (A) compared to ethephon + trinexapac-ethyl (B) on 13 June 2022.

Conclusions

Using a low density hard fescue cultivar reduced clipping yield but generally did not improve playability

A single application of ethephon + trinexapac-ethyl in spring improved playability but did not affect clipping yield

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