



Bermudagrass
Off-type
Assessment



WEED DIAGNOSTICS CENTER
UTIA INSTITUTE OF
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THE UNIVERSITY OF TENNESSEE

Introduction

XXXXX COUNTRY CLUB (ANYTOWN, USA)

Two ultradwarf bermudagrass samples from XXXX Country Club (Anytown, USA) were submitted to the University of Tennessee Weed Diagnostics Center (WDC) for off-type assessment. Samples were harvested directly from putting surfaces using a standard cup cutter and received by WDC personnel on July 28th, 2016. Upon receipt, samples were transplanted into greenhouse pots filled with peat-based growing media and maintained under controlled conditions optimized for ultradwarf bermudagrass growth. Samples were not mowed after receipt but did receive 0.5 lb nitrogen (N) per 1000 ft² per week from a complete fertilizer (20-20-20) and were treated with insecticide as needed.

BERMUDAGRASS OFF-TYPE ASSESSMENT

Submitted samples were allowed to grow until producing a minimum of at least ten stolons with four nodes. Once this benchmark was reached, diagnosticians at the WDC assessed morphology of both samples by measuring internode length, stolon diameter, leaf length, and leaf width with digital calipers. Measurements were made at the third visible node from the bud and replicated ten times using ten different stolons. All samples were photographed after measurement.



GRASS A



Figure 1. Two grasses (Grass A & Grass B) were submitted from **XXXX Country Club** for off-type assessment. Grasses were cultured to produce a minimum of ten stolons with at least four nodes prior to being morphologically characterized on September 15th, 2016. Image taken after morphological data were collected.

GRASS B

GRASS B

GRASS A



Figure 2. Visual differences in leaf length among two grasses (Grass A & Grass B) submitted from **XXXX Country Club** for off-type assessment. Measurements were made September 15th, 2016 using digital calipers

Table 1. Differences in morphological parameters of two grasses (Grass A & Grass B) submitted from **XXXX Country Club** for off-type assessment. Measurements were made September 15th, 2016 using digital calipers and replicated ten times

	GRASS A	GRASS B	Significantly Different†
Internode Length (mm)	28.66	30.66	NO
Stolon Diameter (mm)	0.78	0.75	NO
Leaf Length (mm)	9.41	18.34	YES
Leaf Width (mm)	2.10	1.89	NO

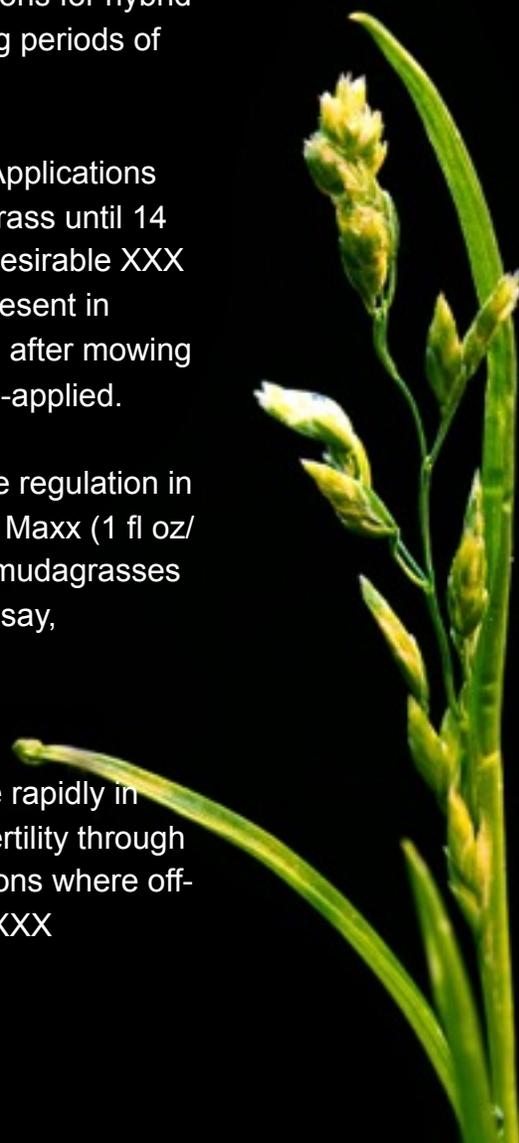
†Differences between Grass A and Grass B statistically compared using a Welch Two Sample T-Test in R-Studio at $\alpha = 0.05$

RESULTS

Grasses submitted for off-type assessment significantly differed in leaf length (Figure 2, Table 1), with Grass A having leaves nearly 50% shorter than Grass B. This variability in morphology suggests that off-type grasses are likely present in putting surfaces at XXXX Country Club. However, the origin of these off-types cannot be determined from this diagnostic assay.

RECOMENDATIONS

- On-going research at the University of Tennessee is exploring optimal strategies maintaining ultradwarf putting surfaces containing off-types. Changes to plant growth regulator and nitrogen fertility programs can help mask differences in morphology among grasses. To that end, the following management changes should be considered at XXXX Country Club:
 - Do not apply more than 3 fl oz/A of the plant growth regulator trinexapac-ethyl (Primo Maxx) at any time. Applications at the 3 fl oz/A rate (the maximum labeled use rate for ultradwarf putting greens) should only be used during optimal environmental conditions for hybrid bermudagrass growth. Lower rates should be used during periods of sub-optimal weather.
 - Do not apply plant growth regulators on a weekly basis. Applications do not reach peak growth regulation on XXXX bermudagrass until 14 DAT. Applying on shorter intervals will over regulate the desirable XXX bermudagrass creating an advantage for any off-types present in putting surfaces. Measuring the volume of fresh clippings after mowing can determine when plant growth regulators should be re-applied.
 - Prohexadione-Ca (Anuew) has shown efficacy for off-type regulation in preliminary trials. Applications of Anuew (6 oz/A) + Primo Maxx (1 fl oz/A) have been shown to reduce leaf length of off-type bermudagrasses in putting greens. Given the morphology results of this assay, incorporation of Anuew would be recommended at XXXX Country Club.
 - Increases in clipping yield due to nitrogen (N) occur more rapidly in XXX than off-types. Therefore, maintaining balanced N fertility through weekly spoon-feeding is recommended to prevent situations where off-type grasses are at a higher N status than the desirable XXX bermudagrass.





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