

Title: Off-Type Grasses of Ultradwarf Bermudagrass Putting Greens: A New Weed Management Problem?

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Objective: Determine the response of off-type grasses and commercially available ultradwarf bermudagrass cultivars to increasing rates of trinexapac-ethyl and nitrogen

Summary Text: Use of ultradwarf bermudagrass on putting greens in the transition zone is rapidly increasing. As use has increased, the presence of off-type grasses in ultradwarf bermudagrass putting greens has become an issue for golf course superintendents.

These weedy, off-type grasses vary in color and texture from commercial ultradwarf cultivars such as 'TifEagle', 'Champion', and 'MiniVerde'. Moreover, anecdotal observations by golf course superintendents suggest that these off-type grasses respond differently to nitrogen applications and are less tolerant of commonly used plant growth regulators. The objective of this research was to determine the response of off-type grasses and commercially available ultradwarf bermudagrass cultivars to increasing rates of trinexapac-ethyl and nitrogen.

Research was initiated during summer 2015 at the University of Tennessee. Bermudagrass cultivars TifEagle, Champion, and MiniVerde were compared to three off-type selections from golf course putting greens. Plants were established and maintained in greenhouse culture at a mowing height of ~0.4 in. Plants were treated with increasing rates of the plant growth regulator trinexapac-ethyl (e.g. Primo Maxx) at rates of 0, 0.1875, 0.375, 0.75, 1.5, 3, 6, or 12 fl oz/acre using a spray chamber calibrated to deliver 23 gal/acre at 40 PSI using an 8002EVS nozzle. These rates represent 0, 0.0625, 0.125, 0.250, 0.50, 1, 2, or 4 times the highest labeled rate of Primo Maxx for use on ultradwarf bermudagrass putting greens (3 fl oz/acre). A separate set of plants was subjected to 0.125, 0.25, 0.375, 0.5, or 1 lb N/1000ft²/week from urea. Nitrogen was dissolved in distilled water and applied to the soil surface of each pot using a pipette.

Clipping was suspended after initial trinexapac-ethyl and nitrogen application for seven days. Growth above 0.4 in was harvested every seven days after treatment (DAT), oven dried at 100 °C for 4 d, and weighed.

When treated with the maximum labeled rate of trinexapac-ethyl, clipping production of MiniVerde was reduced more than TifEagle with Champion ranking intermediate (Figure 1). Clipping production of the off-types tended to be greater than MiniVerde or Champion but was only statistically significant in one case (off-type #7). Few differences were observed between commercial cultivars and off-types with trinexapac-ethyl at 12 fl oz/acre; however, off-type 48 did yield more clippings than Champion (Figure 1).

Few statistically significant differences were detected among ultradwarf cultivars and off-types with treated with either 0.25 or 0.5 lb N/1000ft²/week (Figure 2). However, when treated with 0.5 lb N/1000 ft²/week there was a trend for off-type grasses to produce greater clipping yields than commercial cultivars.

Additional research is needed to better understand responses of commercial ultradwarf and off-type bermudagrass to rate titrations of trinexapac-ethyl and nitrogen. *Data presented herein are preliminary.* This research will be repeated several times during 2016 to reduce the variability within treatment means.

Summary Points

- Select differences were observed between commercial ultradwarf bermudagrass cultivars and off-type grasses in response to increasing rates of trinexapac-ethyl. However, more research is needed in 2016 to better understand these differences.
- There was a trend for off-type grasses to produce greater clipping yields than commercial ultradwarf bermudagrass cultivars when treated with 0.5 lb N/1000 ft²/week. At lower nitrogen rates these differences were less pronounced. However, more research is needed in 2016 to better understand these responses.
- Additional data to be collected in 2016 will help golf course superintendents better understand how to manage off-type infestations in ultradwarf bermudagrass putting greens.

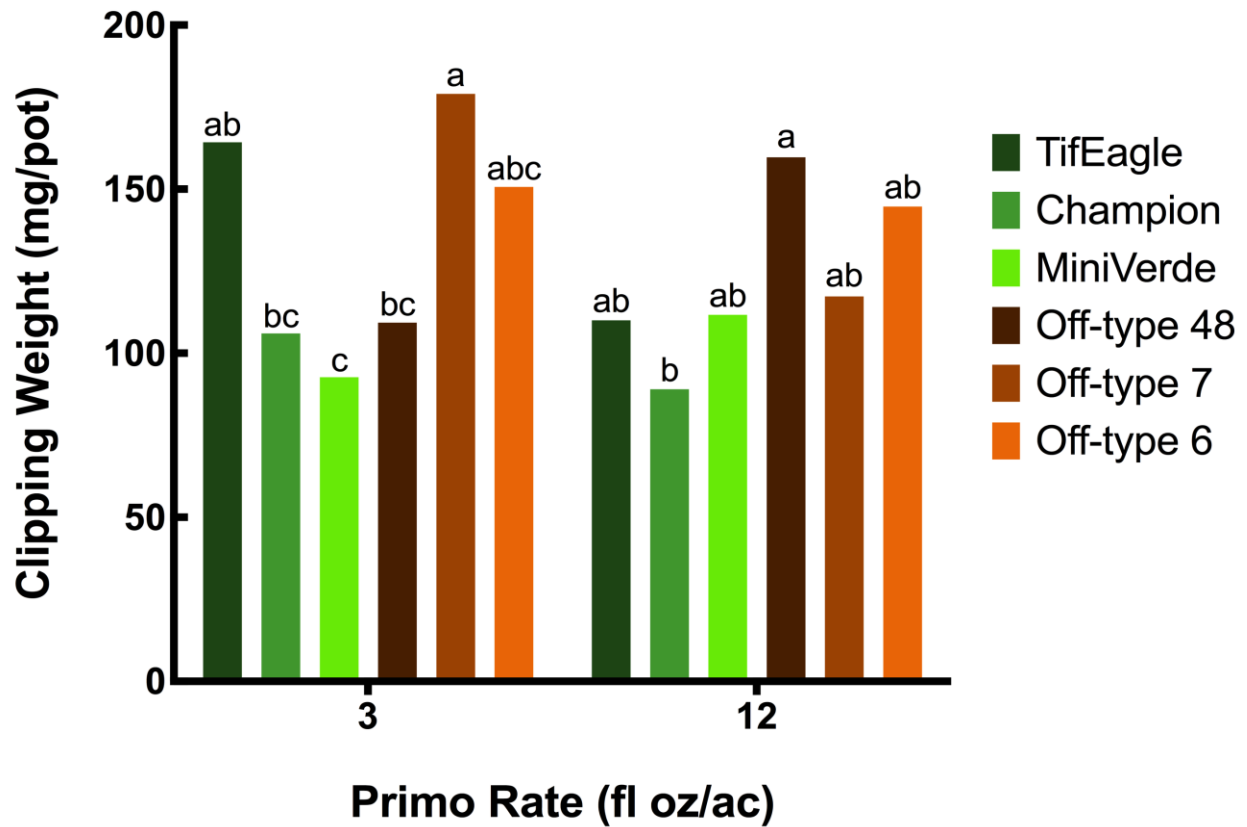


Figure 1. Response of ultradwarf bermudagrass cultivars and off-type grasses to 3 and 12 fl oz/acre of trinexapac-ethyl (Primo Maxx) 28 days after treatment. Uldradwarf bermudagrass cultivars TifEagle, Champion, and MiniVerde (green bars) were compared with three off-type selections (brown bars) from golf course putting greens in the southeastern United States. Response to trinexapac-ethyl treatment was quantified by measuring clipping weights (mg/pot). Means were separated using Fisher’s Protected Least Significant Difference at $\alpha = 0.05$. Grasses labeled with the same letter for each rate are not significantly different.

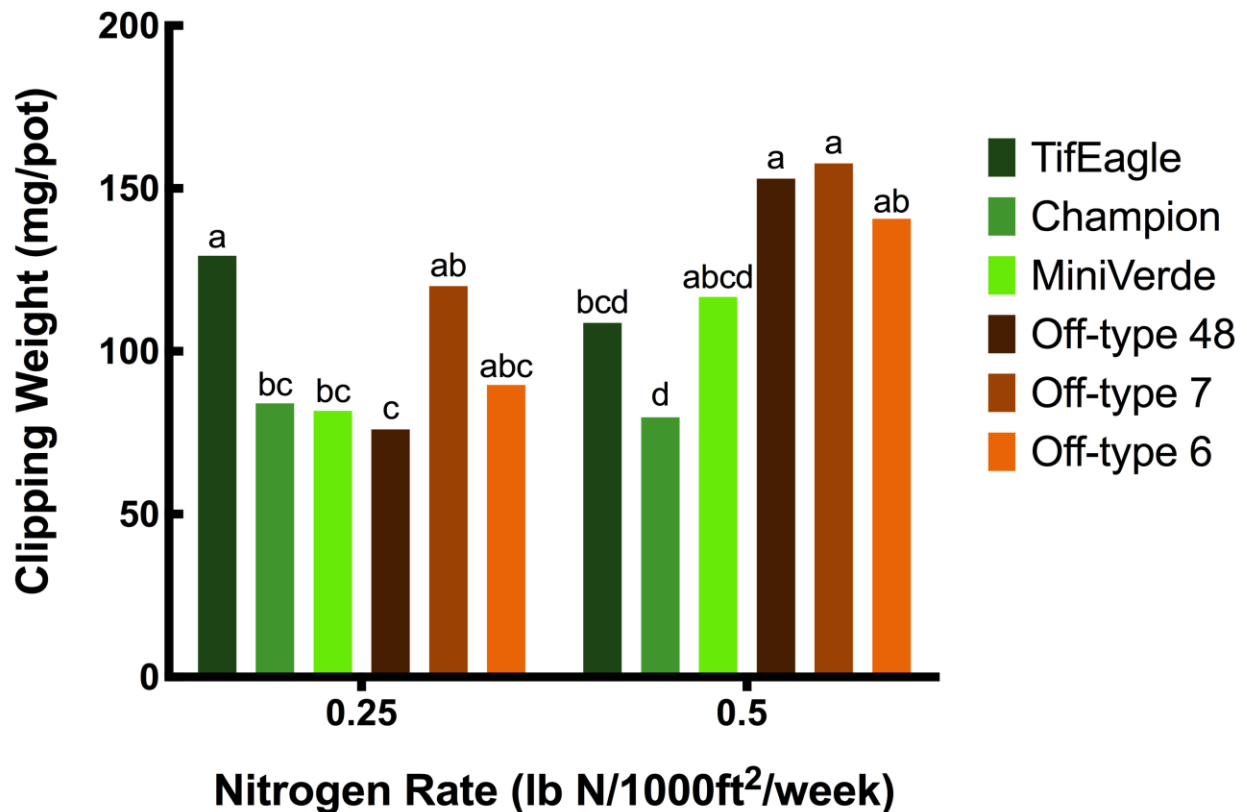


Figure 2. Response of ultradwarf bermudagrass cultivars and off-type grasses to 0.25 and 0.5 lb N/1000ft²/week 28 days after initial nitrogen treatment. Uldradwarf bermudagrass cultivars TifEagle, Champion, and MiniVerde (green bars) were compared with three off-type selections (brown bars) from golf course putting greens in the southeastern United States. Response to nitrogen treatment was quantified by measuring clipping weights (mg/pot). Means were separated using Fisher's Protected Least Significant Difference at $\alpha = 0.05$. Grasses labeled with the same letter for each rate are not significantly different.

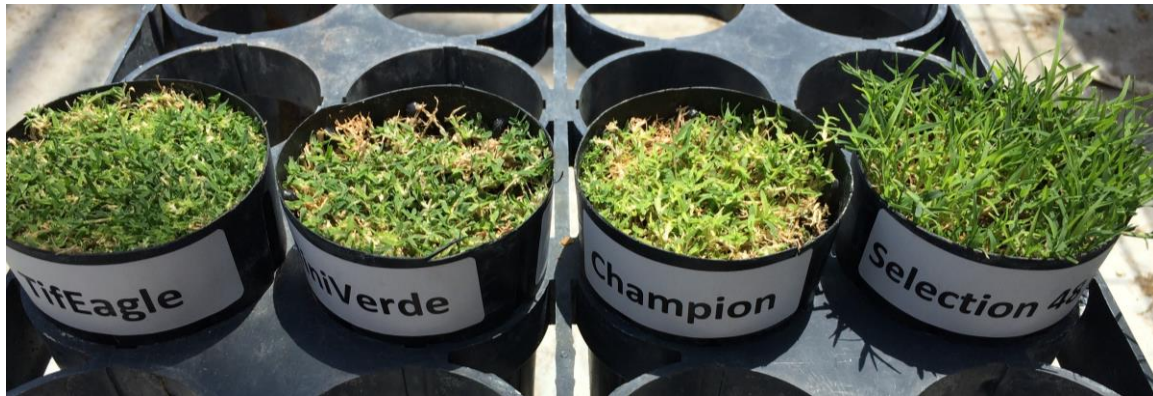


Figure 3. Response of ultradwarf bermudagrass cultivars TifEagle, MiniVerde, and Champion and an off-type selection 48 to 12 fl oz/acre of Primo Maxx 28 days after treatment.