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Cold and Traffic Tolerance of Hybrid Bermudagrass and Kentucky Bluegrass in a Cool Season, Arid Climate

Caden J. Seely

Brigham Young University - Provo, seelyc@byu.edu

H. Burgin

Brigham Young University - Provo

N. Hansen

Brigham Young University - Provo

G. Wear

Brigham Young University - Provo

Bryan G. Hopkins

Brigham Young University - Provo, hopkins@byu.edu

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Cold and Traffic Tolerance of Hybrid Bermudagrass and Kentucky Bluegrass in a Cool Season, Arid Climate

C.J. Seely, H. Burgin, A.J. Beazer, N. Hansen, G. Wear, and B.G. Hopkins
Brigham Young University, Provo, UT, USA
*Hopkins@byu.edu



INTRODUCTION

- Due to climate change, warm-season Hybrid Bermudagrass (HBG) is beginning to be grown in northern climates.
- This is potentially desirable because it may use less water than traditional species.
- However, there is concern regarding winter kill and excessively long dormant periods.
- There is particular interest in HBG with regards to sports turf, but there is concern with its ability to withstand heavy traffic damage when grown in a cool-season climate.

Objective: Assess the cold and traffic tolerance of common Bermudagrass [CBG; *Cynodon dactylon* (L) Pers.] and seven triploid interspecific hybrids (HBG; *Cynodon dactylon* × *C. transvaalensis* Burt Davy) in comparison to Kentucky bluegrass (KBG; *Poa pratensis* L.).

Drone Imagery of the Study



MATERIALS AND METHODS

- Field study at BYU at Provo, UT (April to October)
- Grasses:
 - 7 HBG (IC = Iron Cutter, L36 = Latitude 36, NB = NorthBridge, O63= OKC1163, O66 = OKC1666, Pat = Patriot, and T31 =Tahoma 31)
 - 1 KBG (blend of several varieties)
 - 1 CBG
- Traffic simulation (Toro ProCore 648) was passed 3 times across all varieties to simulate traffic and compare with control. Simulator was run every 2-4 weeks.
- Weekly Measurements:
 - Normalized Difference Vegetative Index (NDVI; Trimble GreenSeeker)
 - Canopy temperature by Forward Looking Infrared (FLIR; FLIR E6 thermal imaging camera)
 - Canopy visual quality ratings for verdure and percent cover were ranked using a scale from 1 (poor) to 9 (excellent)
- Statistical analysis by ANOVA with Student's t-tests (JMP statistical software)

RESULTS

- Traffic simulation resulted in a decrease percent cover for three of the HBG, but not for KBG or CBG (Fig. 1).
- Not surprisingly, KBG had a much longer growing season (~80 days) than all HBG varieties. KBG came out of dormancy slightly ahead and went into dormancy far ahead of the HBG (Fig. 2).
- However, the CBG had a shorter active growing season than HBG or KBG (Fig. 2).

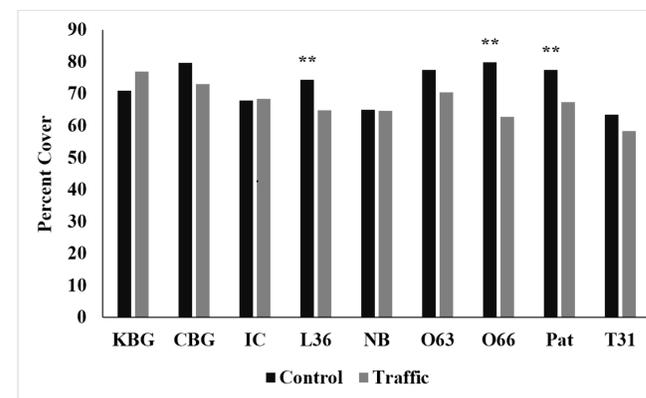


Fig. 1. Percent Cover on 1 September for all for KBG, CBG, and 7 HBG grasses. Double asterisks (**) indicate a highly significant statistical difference between the control and traffic treatments of that grass type.

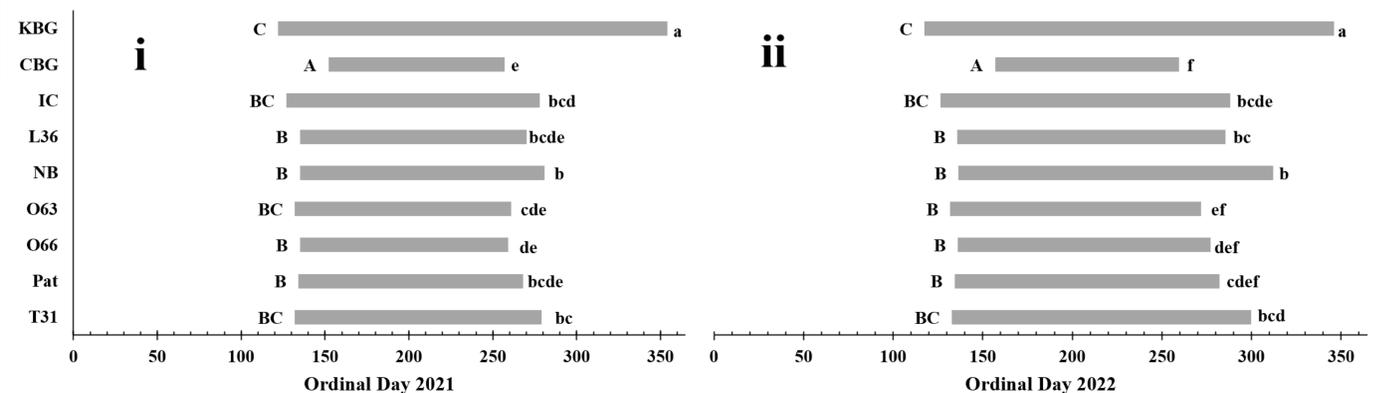


Fig. 2. Growth periods for KBG, CBG, and 7 HBG grasses based on Normalized Difference Vegetative Index (NDVI). Values sharing the same letter are not statistically equivalent within the beginning (upper case letters) and ending (lower case letters) of each growing season (i = year 1 and ii = year 2).

SUMMARY

The HBG did not show any signs of winter kill, although it did have a shorter growing season. The L36, O66, and Pat varieties were negatively impacted by traffic more than KBG or CBG. Based on this, and other data, HBG is a viable option in a cool-season climate, potentially resulting in less maintenance (e.g., mowing, irrigation, fertilization, etc.) due to ~80 days shorter growing season and less water demand.

GLOBAL OBJECTIVES



MAINTAIN SOIL HEALTH



RECREATIONAL BENEFITS



CONSERVE WATER



HEALTHY ECOSYSTEMS