Performance of Kentucky Bluegrass and Bermudagrass Mixtures in a Transition Zone Environment

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INTRODUCTION

The use of warm-season turf species, such as bermudagrass [*Cynodon dactylon* (L.) Pers.] and zoysiagrass (*Zoysia* spp.), has been recently promoted in the transitional zones of Europe to reduce water consumption for irrigation. However, turf managers and home lawn owners are often discouraged from using these species because they undergo dormancy during winter and lose color up to five months.
These issues may be addressed by mixing cool-season species together with warm-season turfgrasses. In the resulting mixture, cool-season species should be dominant during winter while the warm-season species should be prevalent in summer. However, there is a lack of information on performances and dynamics of species succession of cool- and warm-season grasses mixtures.

The objectives of this study were to test the turf quality and species succession of various Kentucky bluegrass (*Poa pratensis* L.) and bermudagrass mixtures in a transition zone environment.

Photo 1: Overseeding, September 2011

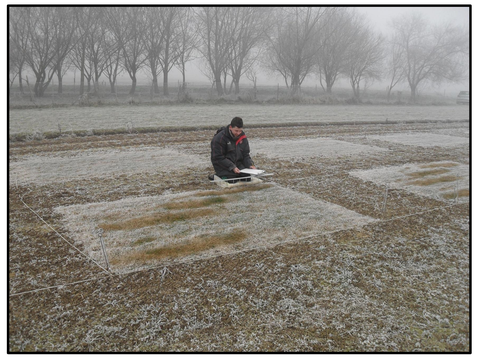

Photo 2: Recording species, January 2012

Photo 3: Recording species, March 2012

MATERIALS AND METHODS

Location: Legnaro, Padova (northeastern Italy); Plant Hardiness Zone 8a; 820 mm rainfall/yr.

Soil: Oxyaquic Eutrudept, coarse-silty, mixed, mesic (a silty loam).

Establishment: Bermudagrass cultivars were seeded in June 2011 at 5 g m^{-2}. Kentucky bluegrasses overseeded in September 2011 at 30 g m^{-2} and sand top-dressed (Photo 1).

Mowing: Weekly at 30 mm height, with clippings removed.

Fertilization: September, October, and March using urea at 20 g m^{-2} yr^{-1}

Irrigation: Provided in June and September 2011 to facilitate establishment and in July 2013 to prevent drought stress.

Bermudagrasses:
- i) VERACRUZ
- ii) YUKON

Kentucky bluegrasses:
- i) BROOKLAWN
- ii) MYSTERE
- iii) NUBLUE PLUS

Data:
- Visual turf quality estimated every other week from October 2011 to September 2013 using a 1–9 scale, with 1 = dead, 6 = acceptable, and 9 = optimal.
- Frequencies of mixture-species determined every month, using linear transects by recording species in 10-cm segments of four lines of 1 m each (Photo 2 & 3).
- Repeated measure ANOVA to compare treatments.

RESULTS AND DISCUSSION

Regardless of the Kentucky bluegrass cultivar used, mixtures including bermudagrass Yukon had higher visual quality in the summer compared to those including Veracruz (Fig. 1). During winter of the second year (2012-13), the mixtures having bermudagrass Veracruz had higher quality than those with Yukon. Species succession was mainly influenced by bermudagrass cultivars, with frequency of bermudagrass being higher for mixtures including bermudagrass Yukon (Fig. 2). Kentucky bluegrass cultivars had limited influence on the rate of change of plant composition and affected the frequency of Kentucky bluegrass during summer 2013 (Fig. 3).

CONCLUSIONS

The results of this study suggest that the choice of bermudagrass cultivar plays a key role for establishing functional Kentucky bluegrass and bermudagrass mixtures in northern Italy.

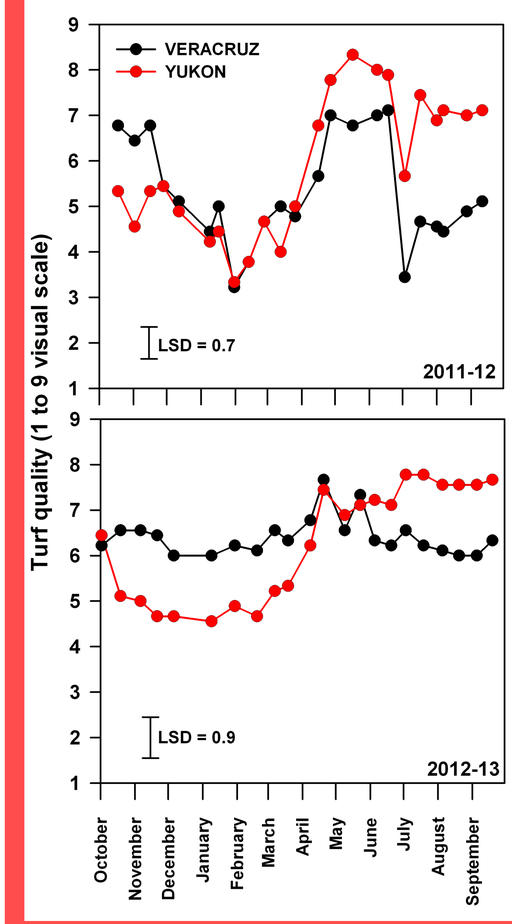

Figure 1: Turf quality of Kentucky bluegrass and bermudagrass mixtures as affected by bermudagrass cultivars. LSD bar indicates differences between treatments (α = 0.05) within any date.

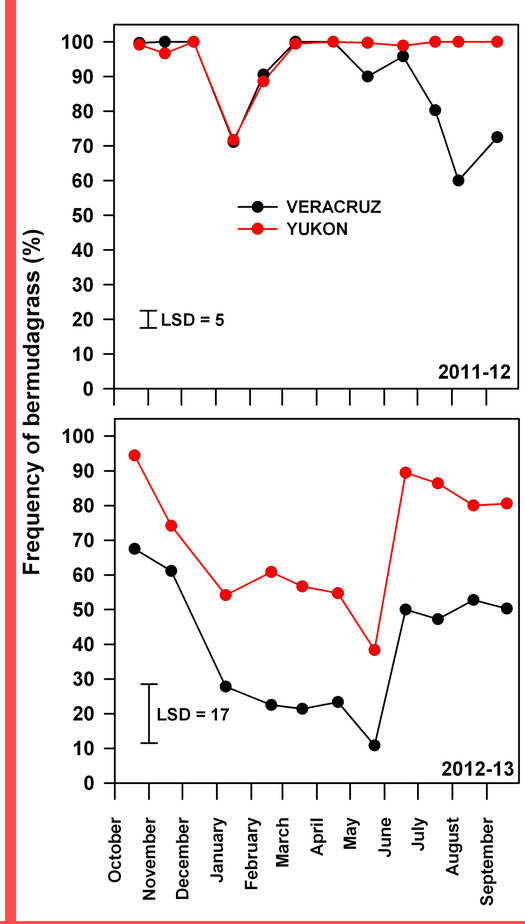

Figure 2: Specific frequnecy of bermudagrass in Kentucky bluegrass and bermudagrass mixtures as affected by bermudagrass cultivars. LSD bar indicates differences between treatments (α = 0.05) within any date.

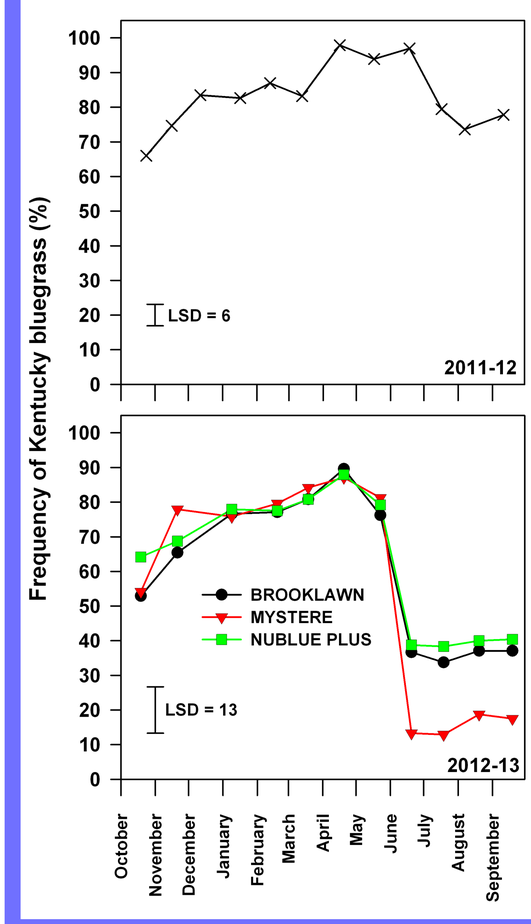

Figure 3: Specific frequnecy of Kentucky bluegrass in Kentucky bluegrass and bermudagrass mixtures as affected by Kentucky bluegrass cultivars. LSD bar indicates differences between treatments (α = 0.05) within any date.