Water Use of Kentucky Bluegrass Varieties Grown Under Greenhouse Conditions

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Introduction

- With drought so prevalent in the West, water use on urban landscapes is being closely scrutinized where up to 60% of urban water use is directed to landscape irrigation—primarily our lawns.
- Kentucky bluegrass (*Poa pratensis* L.) is widely used because of its soft texture, attractive color, and ability to recover from intensive use.
- More water-efficient varieties of Kentucky bluegrass may result in less irrigation yet maintain quality and function of the turf.

Objective:

Evaluate water use, quality, and growth characteristics and their relationships in several Kentucky bluegrass varieties.

Methods

- Nine varieties and two mixtures of Kentucky bluegrass were grown in pots (4”x4”x12”) with a soil consisting of 50% sand and 50% loam soil.
- Plants were maintained in the UAES Research Greenhouses with 20°C day and 15°C night temperatures and supplemental light. Treatments started when grasses were fully established and roots extended to the bottom of the pots.

Data Collected

- Water use was measured 3x/week and irrigated when 50% of plant available water was used.
  - Two irrigation regimes: Watered to 100% plant available water or 80% plant available water in the root zone.
- Average height of the leaves (turf) was measured every-other-week then clipped to 7.5 cm from the soil surface.
- Clippings were collected and weighed.
- This was done for 11 weeks.
- At the conclusion of the experiment, root and shoot mass was measured.

Results

- Ridgeline used the least water with an average daily water use of 66 mL/day. Chateau had the highest daily water use average with 84 mL/day
- Abbey had the fastest growth with an average growth of 17.9 cm in 2 weeks. Noble had the slowest growth with an average growth of 13.5 cm.
- Clipping weights were correlated with water use (Figure 5).
  - Ridgeline was lowest with 1.64 grams while Chateau was highest with 2.43 grams.
- Diva had the lowest root to shoot ratio of 1.22 while Chateau had the highest 1.76.

Figure 1- Daily Water Use Average measured in mL/day

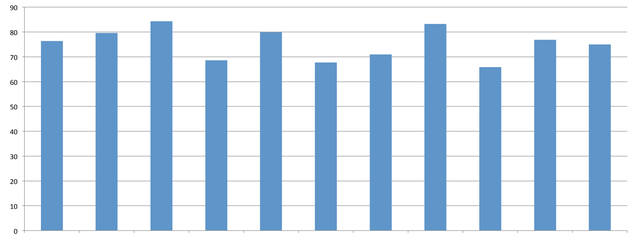


Figure 2- Overall Height Average measured in cm

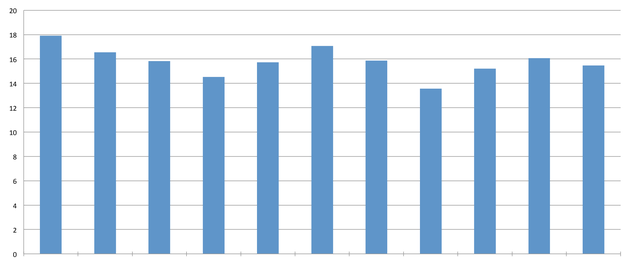


Figure 3- Overall Clipping Fresh Average measured in grams

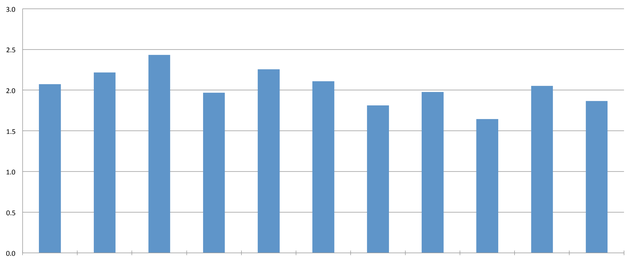
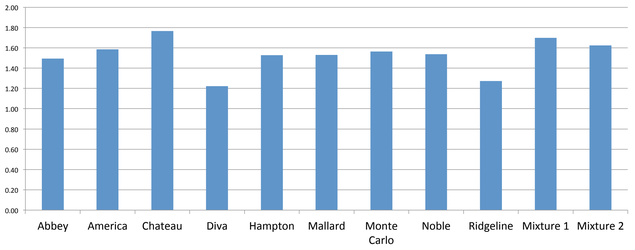


Figure 4- Root to Shoot Ratio in grams



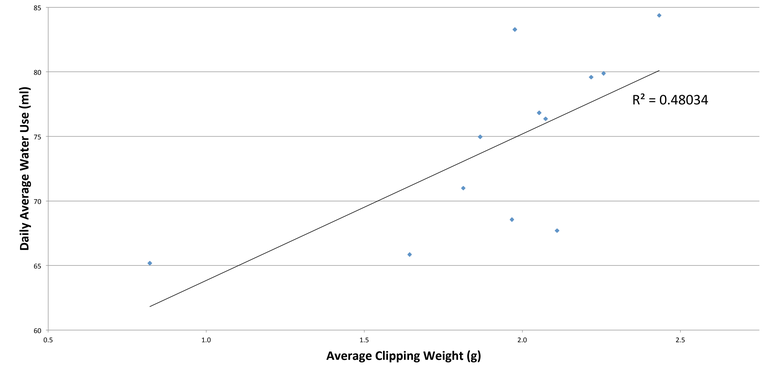


Figure 5- Daily Average Water Use/Average Clipping Weight Correlation Graph

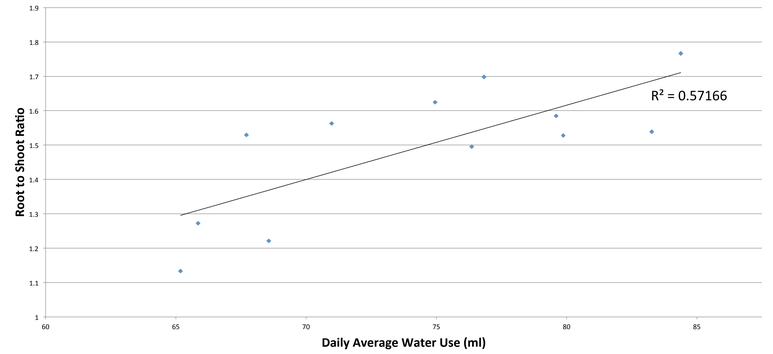


Figure 6- Root to Shoot/ Daily Average Water Use Correlation Graph

Conclusions

- Bluegrass varieties showed significant variation in water use, clipping weight, growth rate, and root to shoot ratio.
- Water use correlated with traits such as clipping weight and root to shoot ratio (see Figures 5 and 6)
- Varieties that used the most water also had a higher root/shoot ratio and clipping weight.
- No correlation between daily water use and growth rate was observed.