EFFECTS OF APEX-10 ON REDUCING IRRIGATION REQUIREMENTS

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BACKGROUND

Proper irrigation management is critical for maintaining turf growth and balancing water conservation efforts. Previous trials conducted at Virginia Tech have suggested that APEX-10, containing primarily organic substances including humic acids, promotes drought resistance by promoting root growth and antioxidant activities. The objective of this trial was to determine whether APEX-10 would help reduce water requirements by prolonging irrigation frequency.

MATERIALS AND METHODS

Plugs (10 cm wide) of Creeping Bentgrass vs. 'Penncross' and Kentucky Bluegrass vs. 'Baron' were planted into 40 cm tall pots. Plants were then placed in a greenhouse for eight weeks (23/18°C day/night). They were trimmed regularly and fertilized weekly with half strength Hoagland's nutrient solution. Plants were then moved to a climate growth chamber, (23/18°C day/night) and were able to acclimate for one week. Applications of APEX-10 occurred at the recommended rates for each species:

- Bentgrass: 1 ½ oz Per 1,000 Every 14-Days
- Bluegrass: 3 oz Per 1,000 Every 30-Days

Two groups were established for both species: half with the use of APEX-10 and half without use of APEX-10. Each group was further separated into three irrigation regimens and soil moisture content for eight weeks:

- Three Times Per Week = 25% Soil Moisture
- Once Per Week = 17% Soil Moisture
- Once Every Two Weeks = 7% Soil Moisture

RESULTS AND DISCUSSION

APEX-10 had positive effects with both species under all conditions of reduced irrigation.

Creeping Bentgrass

- At 28 days, Bentgrass treated with APEX-10 was watered once per week and had significantly improved turf quality than being watered once per week without the use of APEX-10. *(Graph 1.1)*
- At 28 days, turf quality of Bentgrass treated with APEX-10 was watered once every two weeks and was found nearly identical to plants watered once per week without the use of APEX-10. *(Graph 1.1)*
- During severe water deficit, Bentgrass treated with APEX-10 was watered every two weeks and had similar or better quality than plants watered once per week without the use of APEX-10. *(Graph 1.1)*
- Bentgrass treated with APEX-10 was watered only once per week in comparison to three times per week without the use of APEX-10. During periods of extreme soil dry down, Bentgrass treated with APEX-10 experienced less physical damage and recovered faster when water was once again applied.
- Bentgrass treated with APEX-10 was watered once every two weeks and recovered with a turf quality that was statistically similar to plants being watered once per week without the use of APEX-10.
- Bentgrass treated with APEX-10 was watered once per week and recovered with a turf quality to a similar level as plants being watered three times per week without the use of APEX-10.

Kentucky Bluegrass

- Bluegrass treated with APEX-10 displayed better recovery throughout the trial.
- In the first 33 days, Bluegrass treated with APEX-10 and watered once per week displayed better water holding capacity and turf quality compared to Bluegrass watered three times per week and no APEX-10. *(Graph 1.2)*
- Bluegrass treated with APEX-10, proved to increase shoot and root biomass compared to results without the use of APEX-10. *(Graph 2.2)*
- After eight weeks, total shoot weight was statistically higher with APEX-10.

See Back for Graphs

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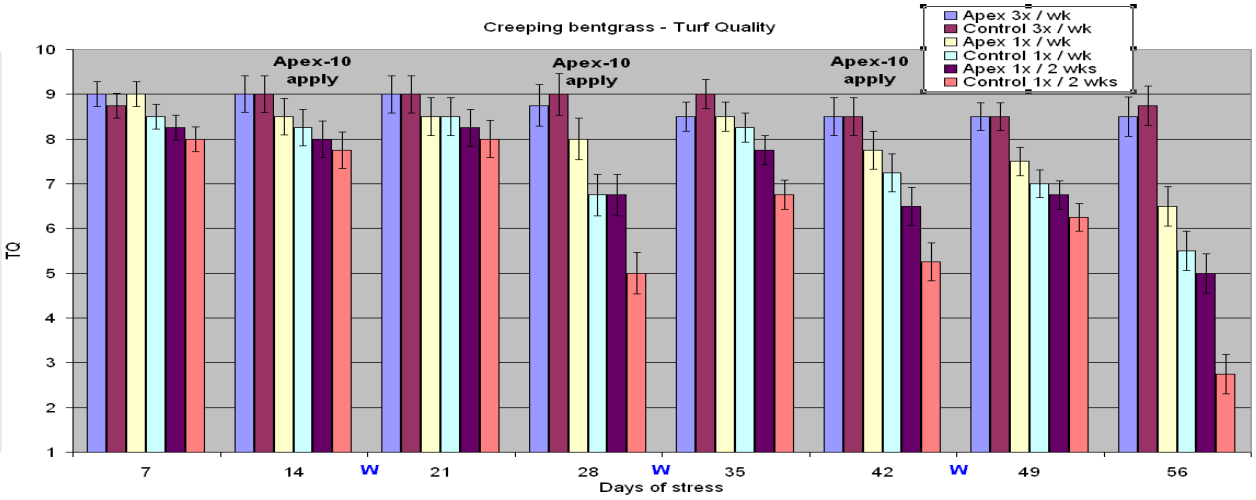
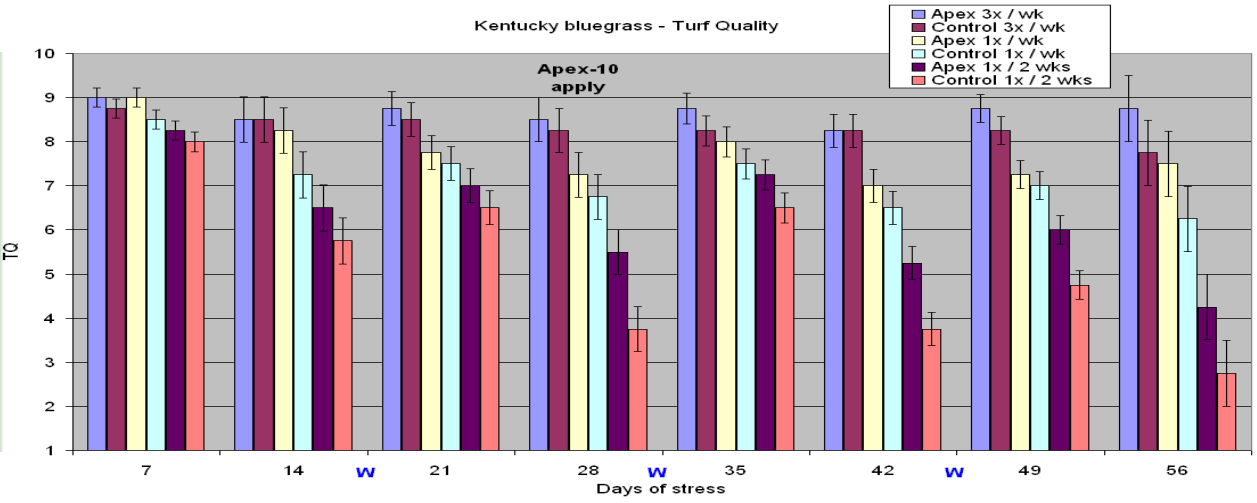
CONCLUSION

Based on this data, it can be concluded that APEX-10 promotes significantly better drought tolerance and post drought recovery when compared to turf not being treated with APEX-10. Turf quality of Bluegrass improves with APEX-10, and Bentgrass will improve to a far greater degree. Improvements during times of water deficit are attributed to increased root and shoot production, which promotes water conservation and a faster recovery when irrigation returns.

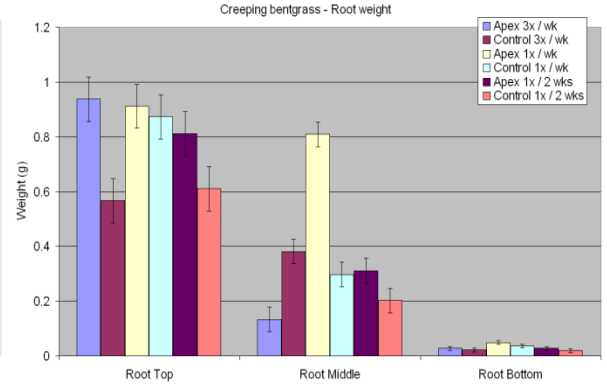
Graph 1.1



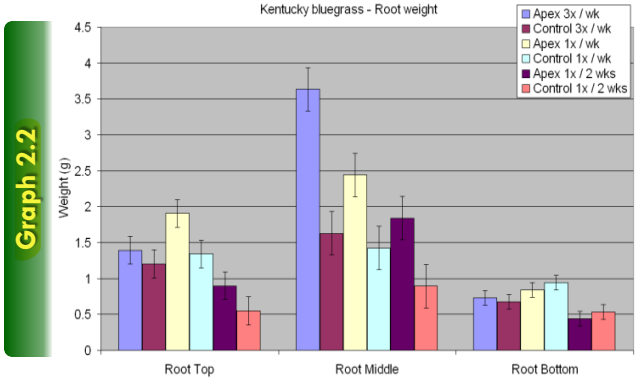
Graph 1.2



Graph 2.1



Graph 2.2



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