

# EFFECTS OF APEX-10 ON FERTILIZER EFFICIENCY

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### BACKGROUND

Turfgrass requires intensive management, particularly as it pertains to fertility. However excess chemical fertilizers may be leached or run off. Natural products such as APEX-10 have been found to effectively promote plant growth and nutrient retention in soil. The objectives of this study were: (A) determine whether APEX-10 helps maintain high quality of turf while reducing synthetic fertilizers and (B) investigate how APEX-10 affects nutrient uptake or use by promoting root growth.

### MATERIALS AND METHODS

Individual plots (4' x 5') of 'Penn' A-4 Bentgrass, and 'Baron' Kentucky Bluegrass were mowed at .170" and 2.50". During and prior to the experimental period, these plots were maintained for adequate soil moisture and disease. Low fertility regimens were also maintained prior to the experiment.

- Foliar fertilizer was applied at four different rates; (A-Full, B- $\frac{3}{4}$ , C- $\frac{1}{2}$ , D- $\frac{1}{3}$ ), with 34-0-0 to Bentgrass (.2-lb/1000 ft<sup>2</sup> Full) every two weeks, and 16-4-8 (1.0-lb/1000 ft<sup>2</sup>, Full) every four weeks.
- APEX-10 was applied at recommended rates for each species with Bentgrass every two weeks, and every four weeks for Bluegrass.
- Data was examined bi-weekly via clip count for chlorophyll and shoot vertical growth rate
- Turf Density via multispectral radiometer and visual evaluation of turf quality, weekly.
- Leaf samples were taken to determine the content of N, P, and K in plant tissues.
- At the conclusion, cores were pulled from all plots then washed and dried to evaluate root and shoot biomass.

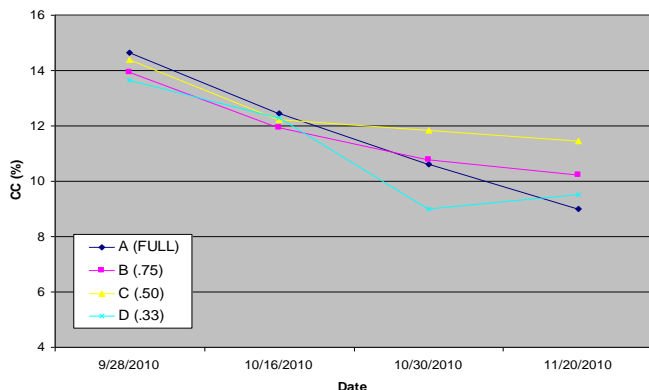
### DISCUSSION

Normalized Difference Vegetation Index (NDVI), Leaf Area Index (LAI), Turf Quality (TQ), Shoot Growth, and Clip Count results show few visible differences in Bluegrass and Bentgrass. Indicating with APEX-10, reducing fertility will not subject these areas to any measurable decline.

- **Chlorophyll:** Evaluations revealed fertilizer Rates B, C, and D with Bluegrass and Bentgrass, used in conjunction with APEX-10, resulted in elevated chlorophyll levels over Rate A. (Graphs 1 & 2)

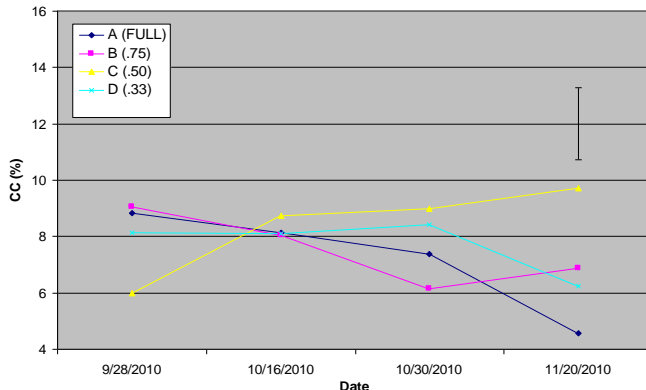
Graph 1

Chlorophyll Content - Kentucky Bluegrass



Graph 2

Chlorophyll Content - Bentgrass

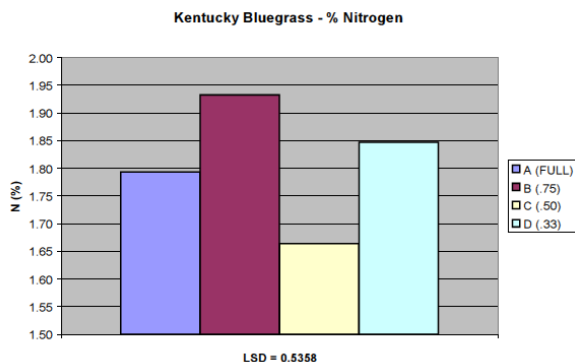


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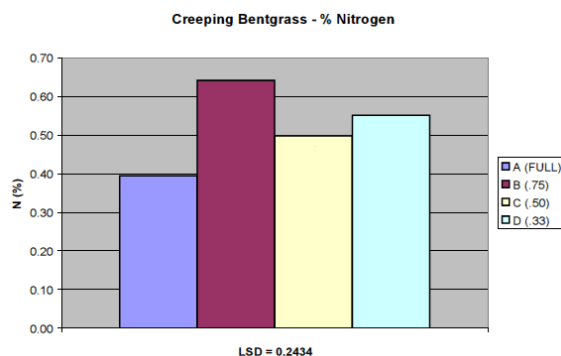
## EFFECTS OF APEX-10 ON REDUCING IRRIGATION REQUIREMENT IN TURFGRASS

- **N, P & K:** Rates B, C, and D had higher levels of N, P and K in Bluegrass and Bentgrass leaf tissue when compared to Rate A, with the exceptions of N in Rate C and K in rates B and C in Bluegrass. (Graphs 3 – 5)

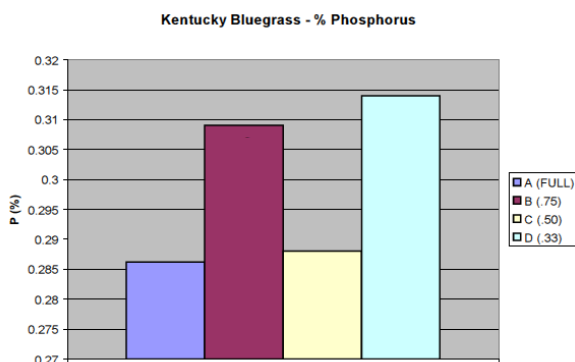
Graph 3.1



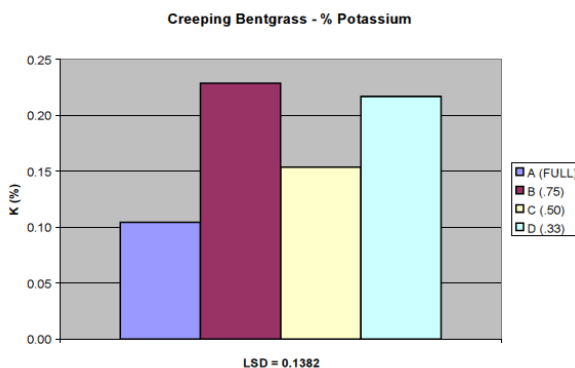
Graph 3.2



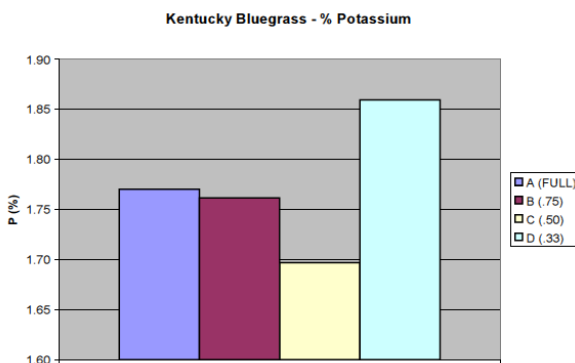
Graph 4.1



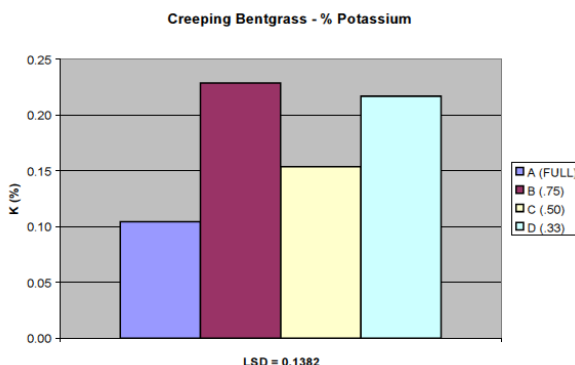
Graph 4.2



Graph 5.1



Graph 5.2



- **Root Biomass & Weight:** Measurements compiled revealed Bluegrass and Bentgrass fertilized at Rate A had greater biomass and weight than Rates B, C and D. This demonstrates reduced fertility needs were established with APEX-10 without the presence of greater root mass.

## CONCLUSION

Data from the experimental period shows that plots treated with lower fertilizer rates in combination with APEX-10 will maintain greener and denser turf.



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