

Q2 Update 2024/11/01 - AB Turfgrass Research Foundation



It's been a beautiful fall this year at the Prairie Turfgrass Research Center, unlike 2022 and 2023 we are experiencing a few frosts, slow cooling, and perfect weather for fall hardening. However, this has not been the case since 2022.

For the last two seasons, an abrupt end to the fall was experienced by many - poa annua loss was widespread from the prairies to Quebec. In multiple locations, mid twenty temps into the third week of October were followed by -17C and permanent snowfall. With less than 7 days to apply final apps and tarp, courses with mixed stands of bent/poa suffered poor acclimation, many greens being covered & insulated at +10'C. Spring conditions appeared to have experienced a fall induced anoxia condition. It has prompted an expansion of existing tarping research, with an inclusion into the effects of the rapid, forced transition of photosynthesis to respiration aka reduced hardening.

We recognize primary project sponsors Greenjacket and Brett Young for donating tarping materials and supporting testing.

Join us to will hear more about this and other projects during this conference season: Saskatchewan Turf Association on Nov. 5 in Saskatoon, the AGSA's Property Managers Conference in Canmore AB Nov. 18, Landscape Alberta on the 20th, and The Western Canada Turf Association in February 11 at their respective conferences.



Project Highlight: Drought avoidance

The subject of water conservation gained much momentum in 2024, especially in Alberta where water restrictions and wildfires in Jasper were compounded by a major water line break in the city center. This polarized a project ATRF partnered with The Sod Growers Commodity Group (AB), and the City of Calgary: ***Evaluation and comparison of "Yard Smart" Herbaceous Perennial Garden Beds to Selected turfgrasses for Drought Avoidance and Overall Water Requirement Under a Restricted Precipitation Regime***". Although this trial is only in the second year of the three year study, we feel the data collected to date will assist in the City's current water crisis and water conservation efforts, having a potentially profound impact on how all city centers view water use and infrastructure. .

Background - Relevance of drought avoidance project to city water conservation/restrictions

The aforementioned project was proposed to determine city residential watering requirements for lawns and gardens, in order to correctly calculate pipe sizing requirements (water) into residential communities. A standard opinion of "one inch per week" watering was uncovered in multiple references but no scientific data was available. To fill this water usage information gap, the ATRF project duplicated residential yards and gardens to a 300mm profile under rainout shelters, replicating the "Yard Smart" formula. In addition, 8 sod varieties were compared to evaluate typical residential watering requirements. As we approach the end of our first year of testing, we have recorded some invaluable data relating to the city's water conservation incentive.

Establishment requirements for plants/sod:

An establishment period of one complete growing season was applied to the research plots to ensure consistency among experimental units. The study parameters include standard rootzone of typical Alberta Clay loam at 300mm in depth. For establishment, the growing medium would be brought to field capacity, and maintained at field capacity for the next 10 days for adequate rooting, before continuing on a lesser maintenance (watering) regime. Testing began in June 2024.

Image below: Yard-Smart perennials, 16 plots, 4 reps



Image below: Sod: 24 plots, 8 sod entries



Watering regimes (4):

Our treatments are referred to as watering events, the first being a 1" rainfall event; equivalent to 24L/m². The second treatment, applied water regime of ¾" (18L/m²) and the third treatment, evaluating a ½" (12L/m²) per square meter treatment. The fourth treatment is our control, which after establishment receives no water.

Minimum levels of maintenance (water)

Data recorded in the first year of study:

Following establishment, sod varieties were watered under a the following regimes:

- 80% Evapotranspiration rate 24L/m² (1"/ft²/wk)
- 60% Evapotranspiration rate 18L/m² (¾"/ft²/wk)
- 40% Evapotranspiration rate (12L/m² (½"/ft²/wk)
- 0% Evapotranspiration rate (0"/wk)

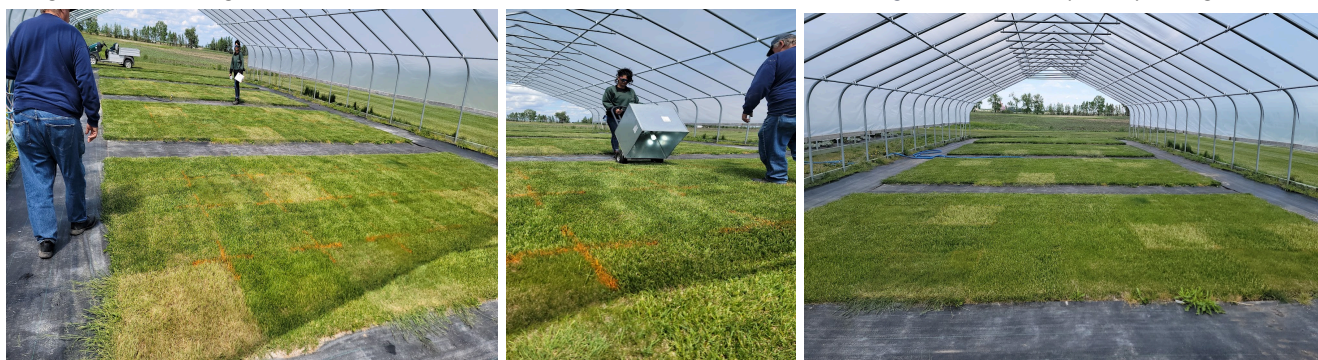
Assessment: Drought avoidance study - year 1:

Results irrigating the equivalent of 80% ET or 1"/wk, proved to negatively affect rooting, and comparatively rated lower than other treatments in density and overall turf quality.

The irrigation treatment equivalent of 60% ET or ¾"/m²/wk, produced insignificant differences in comparison to the 1.25cm or ½" weekly applications. Within this range, both treatments met quality standards as defined in the project protocol.

No irrigation, an equivalent of 0% ET, on our control plots gradually declined, rated lower than other treatments, but were still growing and met minimum standards. The control treatments did not receive irrigation after establishment, extending 25 days before showing signs of wilt, drought, and the early stages of dormancy. The decision was made to establish a baseline and was watered the ½" rate or 40% ET to avoid dormancy. Testing and moisture testing continues, unable to comment beyond this treatment of the control.

Images: Sod testing, Volumetric moisture content, Normalized difference vegetation index (NDVI) ratings



Data evaluation, end of year 1 (almost)

As it pertains to the interests of the sod growers commodity group and the City of Calgary's water restrictions, at this stage of the research trial, sod establishment requirements of 1" per week, (24L/m²) in order to reach and maintain field capacity over a period of approximately 10 days. This is indicative of Alberta clay loam soils of 300mm depth.

Calculating water requirements for establishment and approximately 34.2L/m² for typical Alberta soils to maintain field capacity throughout a 10 day establishment period.

Following establishment, from the point of soil field capacity (80% soil moisture), minimum sod irrigation requirements drop to half. Deemed adequate by ATRF as minimum standard for growth, density and color after year one, validate that 12L/m²/ or ½"/wk produced acceptable turf quality.

Drought avoidance summary at the end of year 1:

In the absence of rainfall, establishing new sod will require 34.2L/m² in the first 10 days, and 12L/m²/wk thereafter for a total of 70.2L/m² of water in its first month. Following establishment, unless turfgrass receives 12L/m²/wk, (36L/month) it risks entering dormancy in approximately 25 days. Dormancy may be reversed with minimum 40% ET replacement, 12L/m² or (½"). Where full dormancy is reached, recovery requires irrigating to field capacity once again, and similar volumes required to that during establishment. We look forward to validating these findings in year two!

On behalf of the Alberta Turfgrass Research Foundation, this report made available by project representatives: **Kyle Redfern**: Sod Growers Commodity Group, **Maggie Nelson**: City of Calgary.

Thank you!

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Brett Young™

