

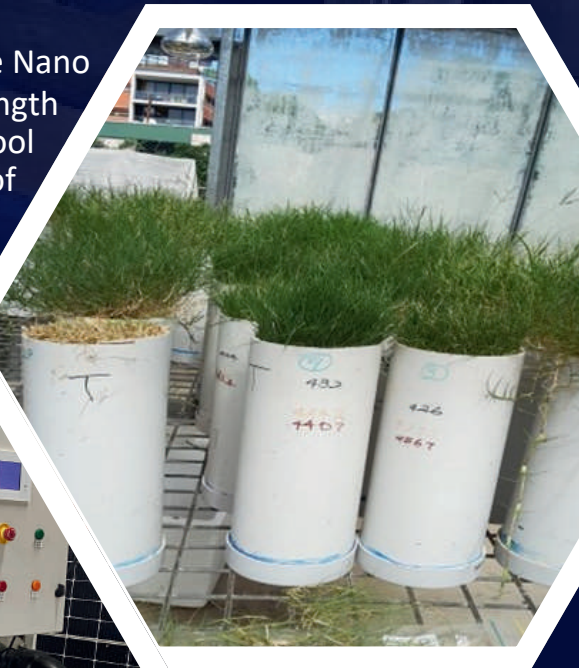
NANO BUBBLE TECHNOLOGIES

TURF RESEARCH REPORT #1

RANDOMISED TRIAL TO EVALUATE THE EFFECTS OF ELEVATED DISSOLVED OXYGEN IN IRRIGATION WATER ON TURFGRASS HEALTH

AIM OF THE STUDY

Evaluate & quantify the effect of the Nano Bubble Injector System on root length and density in both warm and cool season grasses; and the effect of irrigation frequency and fertilisation on these results.



“ When you look at the frequency interval between watering it becomes very clear that elevated levels of Oxygen allow cool season grass to stand the stress of extended intervals between watering. ”

“ What is very clear is that the elevated oxygen levels allow the plant more efficient use of Nitrogen overall. ”

TURF SOLUTION SERVICES (TSS)

In September 2018, Turf Solutions Services (TSS) launched a randomized trial with 32 replications at Royal Randwick Racecourse nursery to validate observations from Avondale Golf Club in the 2017/2018 season. At Avondale, irrigation water with elevated dissolved oxygen (DO) was linked to increased root length and density, improved water infiltration, reduced water use, and enhanced disease suppression.



RANDOMISED TRIAL TO EVALUATE THE EFFECTS OF ELEVATED DISSOLVED OXYGEN IN IRRIGATION WATER ON TURFGRASS HEALTH

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The trial evaluated two watering schedules (3-4 days and 7 days) and compared standard town water with town water enriched in DO using our patented Nano Bubble Injector Unit (NBT10). Treatments were applied to cool-season (C3 - Ryegrass) and warm-season (C4 - Couch) grasses.

The trial was concluded after nine weeks due to extreme glasshouse temperatures (over 40°C for three weeks and 50°C for one week). Upon completion, dry matter measurements were taken for both roots and shoots (tops) to evaluate growth outcomes under each treatment condition.

RESULTS

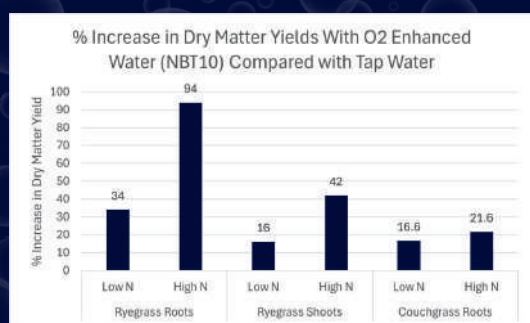


FIG 1

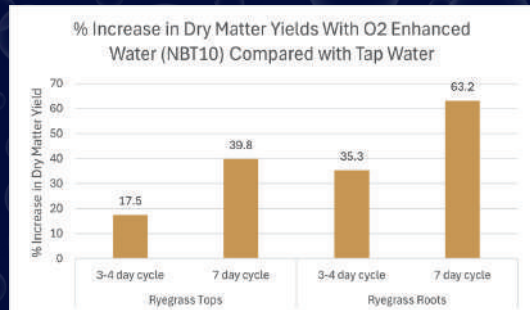


FIG 2

CONCLUSION

The results highlight the clear advantages of O²-enhanced water for turfgrass health. Growth improved significantly across all conditions, especially in high nitrogen environments and longer irrigation cycles. Root development saw the greatest gains, particularly in Ryegrass, indicating stronger turf resilience. Both Ryegrass and Couchgrass benefited, showing the technology's versatility. As noted, **“When the data was analysed, the difference between the treatments was so great that it was pointless trying to do statistical analysis on the data,”** emphasizing the clear superiority of O²-enhanced treatments.

O²-Enhanced Water Increases Growth: Yields improved across all conditions with O²-enhanced town water, especially for root development.

Stronger Impact with High Nitrogen: Higher nitrogen conditions saw the greatest gains, particularly in Ryegrass roots (94% increase), highlighting a synergistic effect (Fig 1).

Better Root Growth: O²-enhanced water significantly boosted root mass, crucial for turf stability and health.

Increased Effect Again with Longer Irrigation Cycles: The 7-day cycle with O²-enhanced water showed the highest increase, particularly for Ryegrass roots (63.2%) (Fig 2).

Applicable to Various Grass Types: Both cool-season Ryegrass and warm-season Couchgrass benefited, making the technology versatile.



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