

# NANO BUBBLE TECHNOLOGIES

## PYMBLE GOLF CLUB

IMPROVING ROOT DEVELOPMENT AND NEMATODE MANAGEMENT USING  
NANOBUBBLE TECHNOLOGY



### INSTALLATION DETAILS

Tank Size: 220,000 litres  
Unit Type: NBT 3-cell Injector  
Installed: November 2024



### BENEFITS

Enhances root development, turf resilience & effectiveness of existing chemical programs.  
Supports healthier irrigation water, improves infiltration & offers potential reductions in water, chemical & labour costs.

### RESULTS

290% increase in root growth ✓  
50% reduction in sting nematode numbers ✓

### PYMBLE GOLF CLUB

A field trial was initiated at Pymble Golf Club in November 2024 to assess the effectiveness of nanobubble technology under challenging summer growing conditions typical of the Sydney climate. The primary objectives of the trial were to evaluate improvements in root development and assess the impact on nematode populations—particularly *Belonolaimus longicaudatus* (sting nematodes), which had become a significant concern for turf health at the club.



# IMPROVING ROOT DEVELOPMENT AND NEMATODE MANAGEMENT USING NANOBUBBLE TECHNOLOGY

## PYMBLE GOLF CLUB

The trial was conducted on the club's spare green (18a), which was divided into four quadrants: two served as untreated controls, while the remaining two received nanobubble treatment. Initial baseline measurements included root length and nematode counts across all plots.

Irrigation was carried out using the club's standard protocol, drawing from the primary on-site dam located at the lower end of the property. Supplementary hand watering was performed twice weekly. The control plots were irrigated using untreated water, while the treated plots received the same water after a 20-minute nanobubble treatment incorporating both oxygen and ozone, delivered via a mobile testing unit.

Monthly measurements of root growth and nematode populations were collected throughout the duration of the trial, which concluded in April 2025.

### RESULTS

**Root Development:** Treated plots exhibited a **290% increase** in root length compared to untreated plots.

**Nematode Suppression:** A **50% reduction** in sting nematode populations was observed in treated plots relative to controls.

### CONCLUSION

The trial demonstrated that nanobubble technology, when integrated into existing irrigation practices, significantly enhances root development and contributes to biological suppression of harmful nematodes. These results supports the potential of nanobubble systems to improve turf health and resilience under environmental stress conditions.



UNTREATED at 4 weeks



TREATED at 4 weeks



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