

Nanobubble Insights – Case Study

Nanobubbles increase yield in Sunflower microgreens

Organisation: Nanobubble Insights (Microshoots Laboratory)

System: Vertical Farm

Crop: Sunflower microgreens

Location: Dundee, UK

Approximately 40% increase in harvest weight was achieved using NanobOx nanobubble-treated water. Early laboratory trials demonstrate that nanobubble-enriched water can enhance microgreens growth and yield without altering lighting, nutrients or substrate.

At a Glance:

- **Objective:** Evaluate the impact of nanobubble water on sunflower microgreens growth and yield.
- **Comparison:** Control (standard filtered water) vs. NanobOx nanobubble-treated water.
- **Observation Period:** 10 days from sowing to harvest.
- **Outcome:** Improved canopy density, stem robustness, and yield in nanobubble-treated trays.

The Challenge

Microgreens are typically grown rapidly and intensively, leaving little margin for efficiency improvements. This trial explored whether **NanobOx nanobubble water could boost growth performance** even under standard conditions, offering a simple way to increase yield and quality without altering fertiliser or lighting regimes.

Our Approach

Identical sunflower microgreens trays were grown side by side under controlled conditions. The only variable was the type of water used for soaking, irrigation, and misting – either standard filtered water (Control) or NanobOx nanobubble-enriched water.

What We Observed

- **Visible difference in growth:** Nanobubble trays showed a denser canopy and fuller coverage, though shoot height distribution remained comparable to the control. Stems appeared thicker and more robust, supporting improved turgor and overall crop mass (Figure 1).
- **Higher yield:** At harvest (Day 10), nanobubble-treated trays produced approximately 40% greater fresh weight compared with the control.
- **Healthier appearance:** Shoots displayed strong turgor and vibrant colour, with no signs of stress.

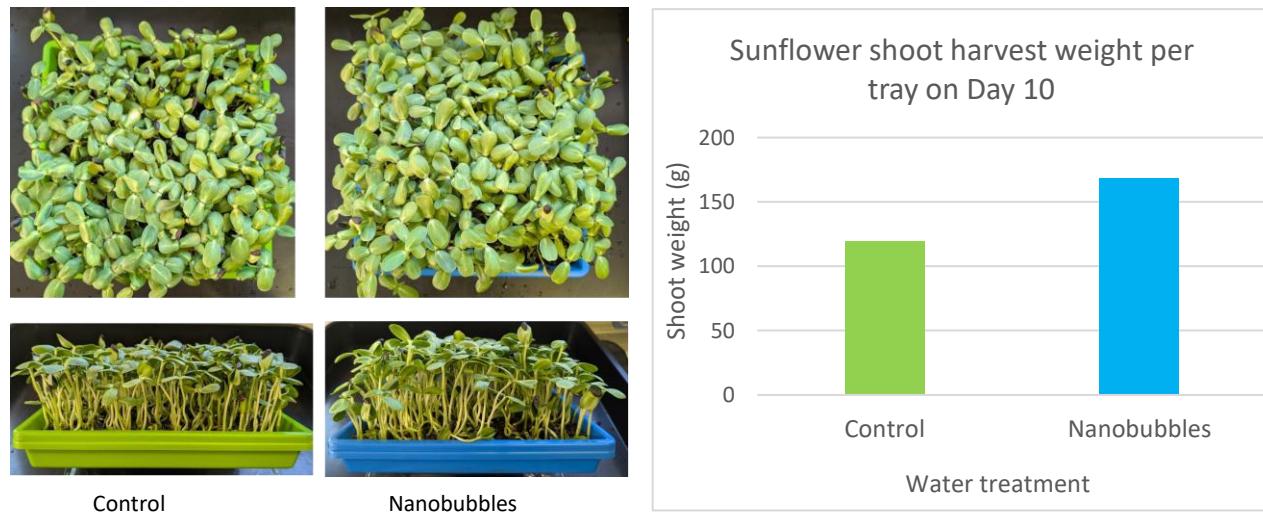


Figure 1. Left: Control vs Nanobubbles trays (top and side view) and right: Yields at harvest.

Why It Matters

This early-stage result shows that nanobubble technology can deliver measurable yield benefits in microgreens production without additional fertiliser or energy input. The improvement in canopy density and stem development suggests that nanobubbles influence both water behaviour and nutrient availability within the growing environment.

For commercial microgreens growers, these findings suggest potential to:

- Increase yields and crop quality per cycle.
- Reduce resource use while maintaining premium standards.
- Simplify integration - NanobOx nanobubble water can be used with existing irrigation or soaking routines.

Current Scope & Next Steps

The sunflower trial provides a clear proof of concept. Ongoing and upcoming trials will:

- Extend testing to other species and confirm consistency across cycles and growing conditions.
- Trials already completed in sunflower, radish, and pea show promising consistency, with future work extending to basil and kale to broaden crop coverage.

How Partners Can Engage

- **Collaborative trials:** Join upcoming studies on nanobubble applications in controlled environment agriculture.
- **R&D pilots:** Implement small-scale trials in your own systems, or in the Microshoots Laboratory.
- **Consultation:** Learn how nanobubble water can be integrated into your growing process.

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