

Nanobubble Irrigation Improved Dragon Fruit Yield, Root Health & Water Efficiency



Case Studies : Baba Dragon Fruits | Nanded, Maharashtra India

Location:

Maharashtra , India

Application:

Dragon Fruit Farm Irrigation

Unit installed:

NanoAqua N-10

Results:

- 20–25% Higher Crop Yield
- 50% Less Water Usage
- Higher DO levels
- Stronger, Healthier Root Growth
- Improved Fruit Size & Quality
- Healthy white feeder roots



Background

To improve irrigation performance and support sustainable cultivation, Baba Dragon Fruits in Nanded, Maharashtra, installed Nanokriti's nanobubble technology in their irrigation system. Maharashtra is one of India's leading producers of dragon fruit, where maintaining healthy root-zone conditions is essential for achieving high yields and premium fruit quality. However, conventional irrigation often provides limited dissolved oxygen to the root zone, which can affect nutrient uptake, plant health, and water-use efficiency.

Intervention

A NanoAqua N10 Nanobubble Generator was installed and integrated with the farm's existing irrigation tank and network, serving approximately 800 dragon fruit plants.

The system enriched irrigation water with oxygen nanobubbles over a period of 8 months, increasing dissolved oxygen from 5 mg/L to 15 mg/L before water reached the root zone. The installation was intended to enhance root health, improve crop productivity, and reduce irrigation water consumption without altering existing farming practices.

Mechanism

Unlike conventional aeration, nanobubbles remain suspended in water for extended periods, delivering oxygen efficiently throughout the irrigation cycle. Their nanoscale size and high surface area enhance the transport of dissolved oxygen and nutrients to the root zone, improving root respiration and nutrient uptake. This promotes stronger vegetative growth, improved flowering and fruit development, while maintaining a healthier rhizosphere with reduced susceptibility to root diseases.

Results & Key Findings:

Following the installation, the farm observed a 20-25% increase in overall yield while reducing irrigation water consumption by up to 50%. The root systems were noticeably more vigorous, with increased root length and healthy white feeder roots indicating improved oxygen availability and nutrient absorption. Disease incidence was lower compared to conventional irrigation, and no fungal attacks were observed during the installation period, contributing to healthier plants and more consistent crop performance.

Conclusion

The commercial installation at Baba Dragon Fruits demonstrates how nanobubble technology can be integrated into existing irrigation systems to improve farm productivity without disrupting routine operations. By increasing dissolved oxygen in irrigation water, the NanoAqua N10 enhanced root health, improved flowering and fruit development, delivered higher yields, reduced disease pressure, and achieved significant water savings. The results highlight nanobubble irrigation as a practical and scalable solution for commercial dragon fruit cultivation.



www.nanokriti.com

