

Enhancing Cucumber growth with Nanobubbles

Oxygen Nanobubbles Enhance Cucumber Yield and Fruit Quality in Aeroponic Cultivation.
Eeki Farms | Kota, Rajasthan

Location:

Kota, Rajsthan, India

Application:

Aeroponic Cucumber Cultivation

Unit installed:

NanoAqua N-10

Results:

- 13% Higher Crop Yield
- 15% Higher yield in Grade A cucumbers
- Higher Dissolved oxygen levels
- Stronger, Healthier Root Growth
- Improved Fruit Size & Quality

Background

Eeki Farms operates large-scale aeroponic greenhouses where crop performance depends on precise control of irrigation, nutrients, and growing conditions. While these parameters are carefully optimized, dissolved oxygen in the irrigation water remains an important factor influencing root health, nutrient uptake, and crop productivity. To assess the impact of oxygen nanobubbles under commercial growing conditions, Nanokriti conducted a controlled trial using its NanoAqua N10 Oxygen Nanobubble Generator on cucumber cultivation at Eeki Farms, Kota, Rajasthan. The objective was to evaluate improvements in yield, fruit quality, and overall plant performance without altering the existing cultivation practices.



The NanoAqua N10 Oxygen Nanobubble Generator was integrated into the existing aeroponic irrigation system for a 6-month trial. The study compared 600 cucumber plants irrigated with nanobubble-enriched water against 600 control plants under identical greenhouse conditions. Both groups received the same nutrient formulation, irrigation schedule, and cultivation practices, ensuring that dissolved oxygen was the only variable.

Mechanism

The NanoAqua N10 increased the dissolved oxygen concentration in the irrigation water from 6 mg/L to 15 mg/L. The oxygen-rich irrigation solution improved the root-zone environment, supporting more active roots, better nutrient uptake, and stronger vegetative growth. This translated into faster crop development and improved fruit formation throughout the growing cycle.

Results & Key Findings:

The nanobubble-treated plants recorded an overall yield increase of 13% compared to the control. In addition, the proportion of premium-grade A cucumbers increased by 15%, with fruits showing better size, uniformity, and overall marketable quality. The crop also exhibited earlier flowering and earlier harvest, allowing faster production cycles. Throughout the trial, plants irrigated with nanobubble-enriched water remained visibly more vigorous, with healthier growth and improved canopy development.



Conclusion

The commercial trial at Eeki Farms demonstrates that oxygen nanobubble technology can enhance crop performance even in advanced aeroponic cultivation systems. Without altering nutrients, irrigation schedules, or greenhouse conditions, the NanoAqua N10 delivered higher yields, improved fruit quality, and earlier harvests by simply increasing dissolved oxygen in the irrigation water. The results highlight nanobubble irrigation as a practical solution for growers seeking greater productivity and higher-value produce from controlled-environment agriculture.

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