



AGRICULTURE

Improve Irrigation Water Quality and Optimize Plant Growth with Nanobubbles



Nanobubbles in Agriculture

Moleaer nanobubble generators rapidly increase and maintain optimal dissolved oxygen (DO) levels in irrigation water with maximum efficiency. Oxygen nanobubbles improve the quality of water and deliver higher levels of oxygen directly to the root surface to increase the energy production and development of plants, and suppress root diseases.

Water Quality Improvement & Biofilm Control

Treating contained source water such as reservoirs and ponds with nanobubbles can dramatically improve irrigation water quality. By increasing dissolved oxygen and ORP levels, algae, iron, pathogens and organic loading in irrigation water is reduced. Nanobubbles are also an effective treatment for controlling algae and biofilm that can cause irrigation line blockages.



Healthier Roots, Healthier Soil, & Disease Suppression

Increasing the oxygen availability in wetted substrate prevents root asphyxiation and promotes new root development. Maintaining a stable aerobic environment stimulates beneficial bacteria growth that helps support the mineralization of nutrients and suppress pathogenic organisms like Pythium from proliferating.

Enhanced Growth & Less Plant Stress

Improving water and soil quality leads to enhanced growth and health of plants. Healthy, well-oxygenated roots absorb nutrients more efficiently to better support the photosynthesis process, leading to more vigorous vegetative growth. Oxygen helps promote plant cell strength, improving environmental stress tolerance. Better plant vigor can lead to earlier fruit setting and harvests.



Proven Results

Moleaer's nanobubble technology has proven its effectiveness in over 450 installations in 32 different countries, in a wide range of cultivation methods and crops. Benefits may include:

- Increased water clarity
- Reduced Pythium levels
- Algae reduction in source water
- Increased water retention in the soil
- Increased nutrient uptake
- Improved vegetative growth
- Increase in fruit size and yield
- Increased chlorophyll content
- Healthier root development

Case Studies

18% Blueberry Yield Increase at Chilean Blueberry Farm

- Nanobubble irrigation increased the average equatorial berry size by over 11% at a Chilean berry farm
- 9.5% increase in chlorophyll accumulation with a much higher root density in the substrate of plants treated with nanobubbles



14% Strawberry Yield Increase at Delphy, Netherlands

- Healthier root development
- Pythium and Phytophthora suppression

Products

Source Water Treatment – Ponds & Reservoirs

CLEAR 2.0



Benefits:

- Increase dissolved oxygen
- Eliminate and control algae
- Reduce pathogens
- Decrease total suspended solids
- Reduce iron and iron fouling issues

Features:

- 85% standard oxygen transfer efficiency
- Quiet, <65 dB
- 120 nm-sized bubbles
- >1 billion nanobubbles / mL
- Easy to install, plug & play
- Small footprint & lightweight
- Shore mounted

Options:

- Integrated enriched-air generation (doubles oxygen supply)
- Integrated ozone generation

Drip Irrigation & Reservoir Treatment

NEO



Benefits:

- Increase do levels, up to 400% dissolved oxygen levels
- Improved water quality
- Increase orp
- Enhance sanitation treatments
- Reduce biofilm
- Optimize nutrient conversion & uptake
- Promotion of beneficial bacteria, suppression of pathogens
- Healthier root development
- No crop residues, chemical free

Features:

- >85% standard oxygen transfer efficiency
- <200 nm-sized bubbles produced in excess of 1 billion nanobubbles / mL
- Oxygenation of any tank and any depth of water
- Easy integration with fertigation systems and climate control systems
- PLC Controller for programmable and remote access operation
- Auto gas shut off if loss of prime feed
- Low feed gas pressure sensor and alarm
- Integrated real-time DO monitoring
- Corrosion resistant stainless-steel frame and components

Options:

- Remote Equipment Monitoring
- Remote Water Quality Monitoring

EPA Establishment Number 94231-CA-1

The Moleaer Clear™ optional onboard ozone generation device incorporates a low dose of ozone into the nanobubbles. Ozone can be harmful to the environment, and inhalation or other exposure to ozone can be hazardous to human health. The ozone dose incorporated by the device, while low, can be dangerous if the device is used incorrectly. Follow all applicable laws, regulations and recommendations on ozone dosage rates, sizing guidelines and environmental impact, and DO NOT install on waterbodies smaller than recommended by the Moleaer Sizing guide. Moleaer disclaims any responsibility for harm that may result from use or maintenance of the device in contravention of such laws, regulations, recommendations and guidelines, or otherwise resulting from the release of or exposure to ozone from the device. Use of the device is at the user's risk.

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