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Reducing Watering Frequency and Crop Losses with Agrona Nanobubble Technology

LOCATION
Sicily, Italy

INSTALLATION
February 2023

AREA
12 hectares under foil greenhouses

UNIT TYPE
Agrona Nanobubble Generator 20m3/h

CROP
Ornamental, Cut Flowers, (Dahlia, Statice, Gypsophila)

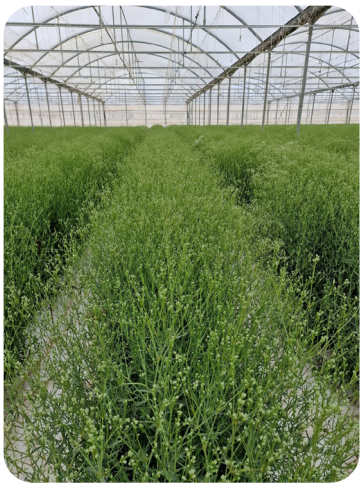
RESULTS

- Dissolved oxygen increased from **6 to 27 ppm**
- **80% reduction** in crop loss
- **50% fewer** irrigation cycles
- Stopped regular use of **hydrogen peroxide**
- **Improved root vitality** and crop uniformity
- **ROI** in approximately two years

Ferrera Flowers, a leading ornamental grower in Sicily, struggled with poor oxygen levels in irrigation water that caused up to 20% crop loss during hot summers. After installing an Agrona Nanobubble Generator in February 2023, dissolved oxygen (DO) levels increased from 6 ppm to 26-27 ppm, watering frequency was cut by half, and plant losses dropped to below 4%. The system also removed the need for hydrogen peroxide, keeping irrigation lines clean naturally. Within one season, the grower saw stronger plants, reduced stress, and a projected ROI in less than two years.

Ferrera Flowers is a third-generation family business cultivating over 12 hectares of Dahlia, Statice, and Gypsophila under foil greenhouses in Sicily. With summer temperatures often above 35°C, groundwater containing only 3-6 ppm dissolved oxygen led to weak roots and severe crop losses.

Grower Andrea Ferrera struggled to keep plants alive, watering every 30 minutes to prevent to prevent heat stress. The system consumed excessive water, energy, and required hydrogen peroxide dosing to control biofilm and algae increasing operational costs and inefficiency.



Challenges:

- Extremely low dissolved oxygen in groundwater (3-6 ppm)
- High irrigation frequency required to maintain plant vitality
- Root asphyxiation and waterlogging during hot months
- 20% crop loss, leading to reduced yield and revenue
- Regular hydrogen peroxide use for system cleaning

Solution

In February 2023, Agrona installed a Nanobubble Generator System connected directly to the irrigation silo. The system continuously injects oxygen nanobubbles into the storage tank, ensuring stable, oxygen-rich water across the entire irrigation network.

Water Aeration O2

The Agrona Nanobubble Generator is a plug-and-play system that super-saturates water with nanobubbles, average diameter of 75 nanometers. These ultra-stable bubbles deliver long-lasting oxygen, inhibit biofilm formation, and promote beneficial aerobic microbes in both soil and substrate.

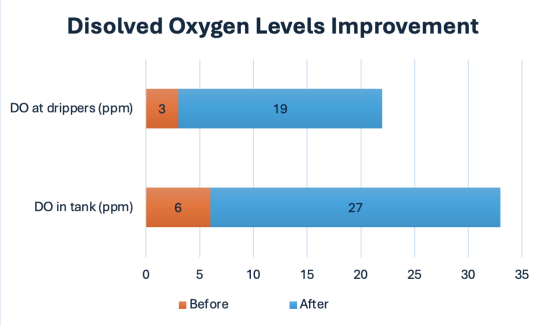
Operational Integration

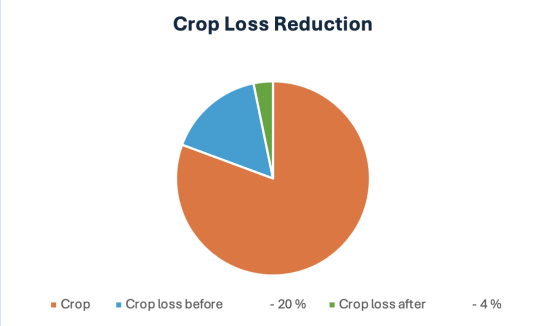
The system was seamlessly integrated into the existing irrigation setup without major modifications. Daily operations continued uninterrupted. Measurements confirmed a significant rise in dissolved oxygen up to 27 ppm in the tank and 19 ppm at the drippers.

Maintenance and Operation

The generator requires minimal maintenance. Since installation, no cleaning chemicals were needed. Irrigation lines remained clean, and DO levels stayed consistently high even during the hottest periods.

Methodology and Data





All readings were taken using standard DO meters during comparable temperature and growth stages.

RESULTS

- **Dissolved oxygen increased from 6 to 27 ppm**
- **Reduced watering frequency**
  - *Before: every 30 minutes on hot days*
  - *After Agrona installation: every 1.5 hours*
  - *Larger, deeper watering cycles, better moisture balance*
- **Crop loss reduced by 80%**
  - *From 20% down to just 3–4% losses*
- **No more hydrogen peroxide needed**
  - *Nanobubbles keep irrigation lines clean naturally*
  - *No visible algae or organic buildup*
- **Improved root oxygenation and plant vitality**
  - *Stronger, more uniform growth*
  - *Reduced stress during high temperatures*
- **Fast return on investment**
  - *Estimated payback within 2 years due to improved yield and savings*

Qualified Results

Agrona's nanobubble technology transformed both water quality and plant performance. Enhanced oxygenation stimulated aerobic microbial activity, reduced anaerobic stress, and supported vigorous root development. This led to higher plant density, improved flower quality, and consistent yields across all 12 hectares.

Agrona team visiting Ferrera Flowers in Sicily where nanobubble irrigation reduced crop losses by over 80%.

Grower's Perspective:

"Before Agrona, my crops suffered every summer - roots were suffocating, and I had to water constantly. Now, I irrigate less often, the plants grow stronger, and losses dropped from 20% to only 3-4%. The system paid for itself in about two years."

Andrea Ferrera, Ferrera Flowers, Sicily

Best Practices

- Conduct baseline DO measurements before installation.
- Maintain consistent nanobubble dosing to ensure uniform oxygenation.
- Inspect drippers periodically to verify long-distance DO retention.
- Avoid unnecessary chemical additives, let nanobubbles clean naturally.
- Monitor DO levels seasonally to optimize irrigation schedules.

Ferrera Flowers' success shows how Agrona Nanobubble Generators help growers overcome oxygen deficiencies, reduce inputs, and improve sustainability. By turning irrigation water into a living, oxygen-rich medium, Agrona enables healthier plants, cleaner systems, and lower operational costs even under extreme Mediterranean heat.

Ready to experience the Agrona difference?

Contact us today for a trial installation or join our Nanobubble Rental Program to see real results before purchase.

Experience measurable improvement within the first growth cycle with no operational downtime.

- Free on-site water analysis and consultation
- Trial systems for short-term validation
- Flexible Rental Program for seasonal or pilot use

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Visit our website for more information about Nanobubbles.