

## MOLEAER'S nanoBoost™ NANOBUBBLE GENERATOR INCREASES CROP YIELD BY 20-50%

New addition to Moleaer product line is ideal for clean water applications

Hort Americas recently conducted a test to validate the effectiveness and benefit claims of three aeration systems at their hydroponic facility in Dallas, Texas. One of the most difficult factors faced by hydroponic and greenhouse farmers is the ability to maintain proper dissolved oxygen (DO) levels during warmer seasons - the higher the temperature, the more challenging it is to maintain elevated dissolved oxygen. To further exacerbate this problem, root infections and stunted growth are also more likely to occur in warmer waters.

Naturally, oxygen plays a vital role in plant respiration - a process used to generate energy and growth. Maximizing the oxygen saturation in water helps improve (feeder) root structure and activate beneficial microbes in the rhizosphere. More feeder roots result in better nutrient uptake, increased growth and overall improvement in plant health.

**Location:** Hort Americas (Dallas, Texas)  
**Type:** "Leafy Green" Floating Raft / Deepwater Hydroponic Greenhouse  
**Water Temp.:** 87° - 90° F (30.5° - 32° C)  
**Unit Type:** 50 gpm nanoBoost w/2 HP CF pump  
**Installed:** July 2017



Left to right: nanoBoost, Venturi, Air Stone

To validate Moleaer's nanoBoost Generator, the unit was tested alongside two other commercially available aeration systems: a Venturi and an Air Stone. The test conditions were carefully controlled for all three systems:

- Water temp: 87° - 90° F (30.5° - 32° C)
- Light Source: Natural sunlight
- Nutrients: Standard NPK w/ micro-nutrient blend

The results were clear. The picture on the left shows the difference in root structure and head growth. The largest plant and most developed root system, shown on the far left, is the result of the nanoBoost Generator. Despite the warm water temperature, the nanobubbles from Moleaer's nanoBoost remained stable and suspended in the water, effectively delivering a steady flow of oxygen from the root to the head of the plant. Table 1 below illustrates the dissolved oxygen (DO) content:



| Unit               | DO content |
|--------------------|------------|
| Moleaer nanoBoost* | 29 ppm     |
| Venturi            | 7.5 ppm    |
| Air Stone          | 2 ppm      |

\*nanoBoost transferred only **0.25 SCFH** of pure oxygen

Moleaer's nanoBoost has been proven to increase production and root development even under the most challenging conditions. The unit is easy to install and includes no moving parts to ensure durability and reliability. The nanoBoost can be retrofitted with existing pumps to maximize efficiency, or can be configured with an integrated pump.

Table 2 below shows the empirical data for various plants included in the test. The difference is clear.

| Crop                   | Transplant to Harvest (Days) | Seed to Harvest (Days) | Avg. Daily Light Integral | Avg. Weight Diffuser | Avg. Weight Venturi | Avg. Weight nanoBoost | Yield Increase (nanoBoost over Venturi) |
|------------------------|------------------------------|------------------------|---------------------------|----------------------|---------------------|-----------------------|---|
| Arugula                | 31                           | 49                     | 6 - 9                     | 0.39 oz              | 2.18 oz             | 3.4 oz                | <b>56%</b>                              |
| Italian Basil          | 39                           | 44                     | 6 - 9                     | N/A                  | 1.5 oz              | 2.25 oz               | <b>50%</b>                              |
| Red Butterhead Lettuce | 21                           | 38                     | 6 - 9                     | 1.86 oz              | 3.31 oz             | 4.66 oz               | <b>41%</b>                              |
| Red Rubin Basil        | 17                           | 31                     | 6 - 9                     | 0.4 oz               | 0.5 oz              | 0.69 oz               | <b>38%</b>                              |
| Italian Basil          | 17                           | 31                     | 6 - 9                     | 0.76 oz              | 1.62 oz             | 1.98 oz               | <b>22%</b>                              |

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