
Improving the Cultivation Efficiency of Tomatoes Using Nanobubble Technology

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The use of a Nanobubble technology by Nanobubble Energy (NBE) in a hydroponic greenhouse has resulted in a 20% increase in the efficiency of tomato production.

The Iranian Nanobubble Energy (NBE) company has succeeded in devising and manufacturing nanobubble production devices for gases such as air, oxygen, ozone, chlorine, nitrogen and carbon dioxide, intended for use in various industries such as water and wastewater, agriculture and aquaculture.

Aref Dadgostar, the CEO and founder of Nanobubble Energy, says: "The introduction of the Vatox Nano-Oxygen Generator to enhance tomato cultivation efficiency in hydroponic greenhouses has boosted yields by 20%. The technology can also be employed for other produce such as peppers, cucumbers, strawberries and lettuce."

Commenting on the reason for the effectiveness of this technology in hydroponic greenhouses, the CEO and founder of Nanobubble Energy adds: "In a hydroponic or aquaculture system, where no soil is used, the role of water quality and irrigation is more prominent than in conventional agriculture; thus, an increment in the quality of water could directly affect the productivity of the greenhouse. The water used in most greenhouses is supplied from wells or groundwater which is not of high quality in terms of oxygen. Using the new system, we have managed to augment the amount of oxygen, hence a significant improvement in the quality of water. Experiments indicate that using this technology increases the nutritional value of the product by 25% to 30%, which is of paramount significance in terms of product exports as currently there exists the problem of not meeting the standard requirements in exported products, which gives rise to complications in the agricultural sector."

He deems improving the quality of the water used for irrigation, reducing water consumption, improving root structures and increasing plants' physical strength, increasing plants' resistance to fungal diseases, increasing crop yield and improving the nutritional value of the crops as the most significant merits of using Vatox Nano-Oxygen Generator in hydroponic cultivation.

The Vatox Nano-Oxygen Generator produced by Nanobubble Energy is a highly effective supplement for any hydroponic system as it can simultaneously improve water quality and intensify the amount of dissolved oxygen in irrigation water. By producing a huge volume of nano-oxygen bubbles, Vatox Nano-Oxygen Generator swiftly saturates the irrigation water with oxygen and by converting and modifying the composition of the irrigation water into a special two-phase oxygen transfer process, it enhances water quality, increases nutrient uptake and controls pathogens.

Hydroponic cultivation or aquaculture, whereby the nutrients required by the plant are provided through a nutrient solution, is a novel technology in the production of agricultural products, which is performed without the need for a soil bed. In a hydroponic system, the quality of water used is of special importance and has a direct impact on the root structure of plants and nutrient uptake. Plant roots also need oxygen for their normal functioning, and thus increasing the percentage of saturated oxygen in water enables plants to absorb more oxygen by their roots, especially at night when they need more oxygen.

"Nanobubble technology has been utilized in one treatment plant thus far and its application has been approved by the Water and Sewerage Organization. Currently, we are negotiating a contract to use this technology in several treatment plants. This technology has also been used to grow caviar fish and trout," Mr. Dadgostar added.