

RainBox

by  AgriWater

**RainBox: Get the
Best Out of Your
Bubbles**



RainBox: Get the Best Out of Your Bubbles

Microbubble and nanobubble water treatment technologies offer significant advantages. That's why, in the AgriWater RainBox unit, we specifically utilize **microbubble (rather than nanobubble) generation** to efficiently disperse our energy-loaded air into the treated water.

Advanced Oxidation with the AgriWater RainBox AOP

Unlike traditional nanobubble technologies, which rely on the **randomized collapse of high-oxygen concentration nanobubbles** to generate radicals, the RainBox system employs a **peroxide-catalysed radical generation process**. This process utilizes ozone derived from atmospheric air, significantly increasing the likelihood of radical formation upon contact with impurities in the water. Additionally, the **RainBox system allows for controlled radical generation** through adjustable input flows and other design parameters, ensuring a more **targeted and efficient** treatment process.

The RainBox system is particularly effective for **agricultural water treatment**, as it not only enhances water quality but also actively interacts with **salts, minerals, and metals** present in the water and throughout irrigation systems. By preventing the accumulation of these compounds, the system improves irrigation efficiency and prevents blockages in distribution networks.

Aeration & Water Quality Enhancement

Both **nanobubble and microbubble technologies** are highly effective in aerating water, but the RainBox system goes beyond simple aeration. By leveraging **Advanced Oxidation Processes (AOPs) under controlled pressure and flow conditions**, it actively addresses:

- **High mineral, salt, and contaminant loads**
- **Water hardness and viscosity**
- **Surface tension reduction**
- **Breakdown of reaction byproducts into readily available oxygen and carbon dioxide**, which integrate seamlessly into the soil or growing medium.

Why AgriWater Uses Venturi-Based Microbubble Injection

The RainBox system employs **venturi-based microbubble injection** for its ability to strike the perfect balance between **maximum gas transfer efficiency and bubble instability**. This instability ensures that oxygen, ozone, and carbon dioxide quickly dissolve into the treated water, **enhancing reactivity and dissolution**.

Conversely, while **nanobubbles excel in storing high concentrations of oxygen**, the gas trapped within them remains **unavailable until the nanobubbles collapse**, delaying its effectiveness in reacting with components in the water. Moreover, the controlled radical generation in the AgriWater

RainBox AOP only occurs **under pressure and flow**, preventing the formation of harmful residues that could impact plant roots.

With nanobubble-treated water, however, there is a risk of **uncontrolled radical generation** when nanobubbles collapse **within the soil or growing medium**, potentially harming plant surfaces and soil microbiota. This makes the RainBox system a more **targeted and reliable** solution for advanced water treatment in agriculture.