KAIROSPACE TECHNOLOGIES

Application of innovative water tech for combatting food deserts: measuring impact in vertical farming operations

Increase in Fresh Weight	Increase in Brix Levels	Increase in Dissolved Oxygen	Reduction of time to harvest
+ 35%	+15%	250%	10%

Intro:

Food deserts are geographical areas where access to affordable, healthy food is scarce due to grocery stores, farmer's markets, or community gardens being further than a 1-mile radius or nonexistent. Usually associated with low-income communities, these regions have little access to nutritious foods and rely on fast food or convenience stores for their access to foods. In Nevada, 154,623 citizens qualify as living in a food desert. The USDA has identified 40 of 687 census tracts as food deserts.

Figure 1 Alaric Overbey and Chef Mitch Earl of Green Side Up Farms, lead a diverse team ranging from chefs to agricultural experts.

Green Side Up Vertical Farms work with local community, Nevada Partners and Culinary Academy, Las Vegas to combat inner-City food deserts. Community leaders Alaric Overbey and Chef Mitch Earl started Green Side Up to focus on providing local produce to consumers & businesses that do not have access to a consistent supply of fresh & healthy vegetables.

Figure 2 Setup at Green Side Up Experimental Farm

As Vertical farms can be scaled, they can be established in food desert areas to provide fresh and healthy food locally, at a reduced cost to consumers. Growing produce locally reduces nutrient loss during transport and reduces contamination risk. Vertical farming, if done correctly, can be a healthy and sustainable solution to those that live in food desert areas. Vertical farming tackles inefficiency in production by growing healthy food with less water, near to where it's sold. Reducing "Food

Miles", along with the greenhouse gas emissions related to long-distance distribution.

Our initial focus for this collaboration was to transfer innovative water equipment and knowledge for advancing regenerative infrastructure in indoor vertical farming within Southern Nevada communities.

Results:

The use of the Kairospace Ag PACK Mini in the pilot program led to noticeable improvements in water quality, which in turn resulted in enhanced crop growth, increased nutritional quality, and reduced time to harvest leading to optimized water usage.

The testing was conducted with leafy green lettuce planted in recirculating vertical farm towers. We conducted two separate validation series performed over a full plant growth cycle of approx. 45 days (about 1 and a half months). The actual treatment of test groups started at the transplanting and vegetation stages and lasted approximately 28 days (about 4 weeks). All experiment groups were routinely monitored and adjusted for consistent nutrient solution profiles using standard EC, pH and DO probe equipment. Photoperiods and water cycles were timed and synchronized amongst all experiment groups. Test groups were provided with treated water

Figure 3 AG PACK Mini installed at Green Side Up Farms

"The system is very unique to our vertical application and really displayed excellent results." Alaric Overbey, Co-Founder Green Side Up Farms

produced with sonicated oxygen ultra-fine bubbles; and the control groups were left untreated.

To assess crop performance and yield in both test and control groups, we examined various characteristics, including size, shape, Brix levels, leaf area, flavor, texture, and fresh weight.

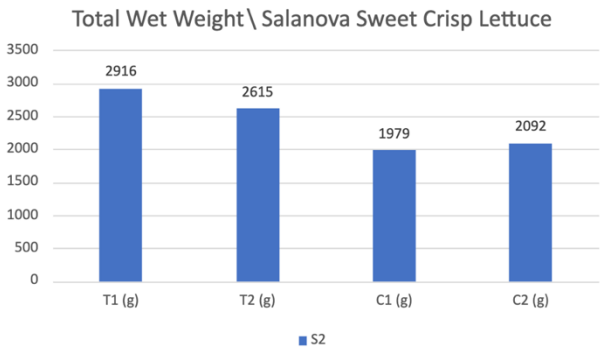
Increase in Fresh Weight
+ 35%
Increase in Brix Levels
+15%
Increase in Dissolved Oxygen
250%
Reduction of time to harvest
10%

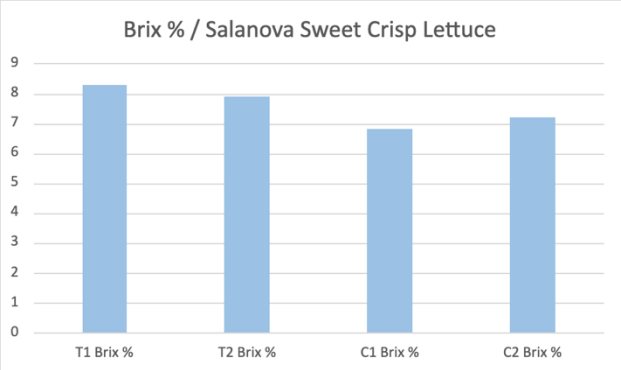
Glossary

Fresh weight refers to the weight measured immediately upon harvesting leafy green product, including the water content present. This measurement is valuable in assessing yield outcomes prior to selling our product, as growers typically receive payment based on the weight of their fresh produce. Therefore, fresh weight serves as the primary variable used to evaluate crop results due to its direct correlation with financial returns.

Brix levels serve as an indicator of the sweetness and overall quality of leafy greens. Brix levels in leafy greens are important because they provide information about taste, nutritional value, and plant health. By monitoring and managing Brix levels, growers can strive to produce leafy greens with superior flavor, enhanced nutrition, and optimal growth conditions.

Dissolved oxygen, in the context of leafy green production, refers to the amount of oxygen dissolved in the water or nutrient solution used to irrigate or hydroponically grow leafy greens. It is a key factor to consider as it directly affects the growth and overall health of the plants. Dissolved oxygen in leafy green production influences root health, nutrient absorption, and overall growth of the plants. By nsuring sufficient and stabilized oxygen levels in the irrigation water or nutrient solution, growers can avoid root diseases, plant stress, and help maintain healthy and productive leafy green crops.





We believe that the success of this pilot program at Green Side Up Farms demonstrates the transformative potential of our technology. We invite you to explore how Kairospace's water enhancement platforms can benefit your own agricultural or industrial processes. Help us work towards a world where water is not just a resource, but a well-managed asset that contributes to a sustainable and prosperous future for everyone. For more information, visit https://kairospacetech.com/. Together, let's raise water quality and consciousness around the world.