



Living Greens Farm



Luiza Rabelo
Chemical Engineering
University of Minnesota Twin Cities

Organization Background



Living Greens Farm was founded in 2012 by Dana Anderson, who wished to develop a commercial facility with aeroponics technology, in which crops are grown in vertical stacks without the use of soil. This technology uses 95% less water and 99% less land than conventional agriculture methods, and allows harvest to occur all year round, even during the harsh Midwestern winter. The 42,200 ft² facility, located in Faribault, MN, now employs 48 people and produces a variety of ready-to-eat lettuce, salad kits and microgreens.

“During the summer in Living Greens Farm, I learned a lot about many interesting processes I didn’t even know existed. It was also a great way to gain experience I’ll need for my career in the future.” ~LR

Project Background

Living Greens Farm’s facility in Faribault, MN, uses roughly 4.5 million gallons of water per year. The water is used for irrigation, cleaning and domestic purposes. As the company works on expanding by opening a new facility, it was interested in a detailed overview of its water usage, as well as in possibilities for reducing any needless waste. As such, the project consisted of two parts: mapping and identifying water intensive processes in the facility and recommending and implementing water reduction strategies. Goals of the project also included improving the facility’s energy efficiency.

Incentives To Change

In addition to continually seeking cost-saving measures, Living Greens Farm (LGF) is a company that prides itself in the environmentally conscious approach offered by its aeroponics technology, and is always looking for ways to reduce its impact. The company is also in the process of constructing a larger facility in the Upper Midwest. Identifying strategies that save water and energy at the Faribault location will be amplified within the new location, due to its greater size.

SOLUTIONS

Replace Nozzle Tips in Processing Room

Hoses in the facility’s processing room, which are frequently used for long cleaning processes, had nozzles of 10 gpm. By exchanging the nozzle tips from standard to low flow, the flow rate was changed to 7 gpm. This change will save 170,000 gpy.

Fix Compressed Air Leaks

A compressed air leak audit was conducted with an ultrasonic leak detector, and various leaks were found throughout the facility. One was identified to be due to a broken piece of equipment, for which a replacement valve was ordered. All others are currently being fixed by the company’s maintenance team. In total, fixing the air leaks will save 127,000 kWh a year.

“Our experience with the MnTAP Program was great as our intern made recommendations for our compressed air, water and building lighting that will have an estimated annual cost savings of \$12,000 per year. The knowledge gained from these recommendations will have a significant impact on our expansion projects over the next two years. We appreciate the level of professionalism, curiosity, and productivity our Intern, Luiza, brought each day. We were fortunate to have her on the team over the summer.

~ Ken Sourbeck, Vice President and General Manager

Solutions

Install Lower flow Aerators

The employees at the Living Greens Farm are required to wash their hands frequently, prior to entering the facility's internal rooms. Currently, the handwashing sink stations outside the processing room and grow rooms have 1.5 gpm flow aerators. The aerators in the bathroom sinks are 1.2 gpm, as is the sink in the breakroom. It is recommended that the faucets in the handwashing stations and bathrooms be replaced with 0.5 gpm aerators.

Reuse Condensate from Air Handlers

As the global water crisis worsens and droughts become more frequent, many companies have taken to reclaiming and reusing air conditioning condensate for non-potable purposes. At Living Greens Farm, condensate from three air handlers is currently being sent to the drain. A simple rerouting of the system's piping could allow the condensate to be sent to the facility's pre-RO city water tank. This would save approximately 350,000 gallons of water per year.

Install LED Lights

The facility had recently changed most of its lights to LED lights. However, some metal halide and fluorescent bulbs were still present. It is recommended that those be changed to low wattage LEDs, which would save 18,000 kWh annually. The facility's current LEDs also have lower wattage alternatives, and it is recommended that the company consider them in future lighting projects.



Recommendation	Annual Reduction	Annual Savings	Status
Replace nozzle tips in Processing Room	170,000 gal water	\$1,140	Implemented
Fix Compressed Air Leaks	127,000 kWh	\$11,500	Mostly Implemented
Reuse Air Handlers Condensate	350,000 gal water	\$2,400	Recommended
Change to LED Lights	13,000 kWh	\$1,200	Recommended
Install Lower Flow Aerators	51,600 gal water	\$340	Recommended
Switch from Hoses to Squeegees for Cleanup	21,800 gal water	\$350	Not planned

MnTAP Advisor: Jon Vanyo, Engineer