



Living Greens Farm Water Conservation and Energy Efficiency

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UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Company Background

- Indoor farm founded in 2012
- 42,000 ft² facility located in Faribault, MN with 48 employees
- Aeroponics technology to grow lettuce and microgreens
- Ready-to-eat salad kits and lettuce



Incentive to Change

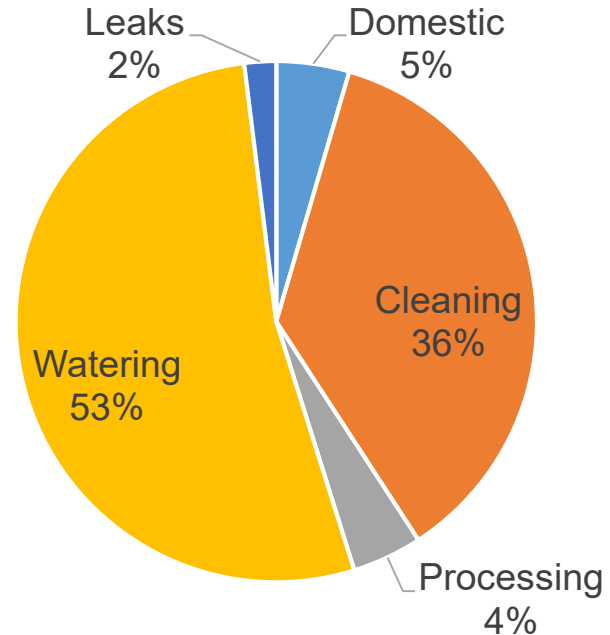
- Seeking cost saving measures and efficient procedures at Faribault facility
- Looking to also utilize solutions in new facility in Muncie, IN



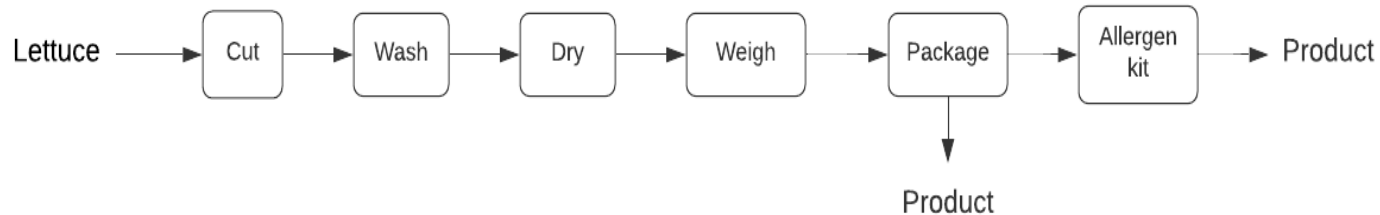
Water Balance

- Collaborated with floor workers to estimate water use
- Performed bucket and stopwatch test on hoses
- Observed and timed cleaning procedures

Living Greens Farm Water Use



Processing Room

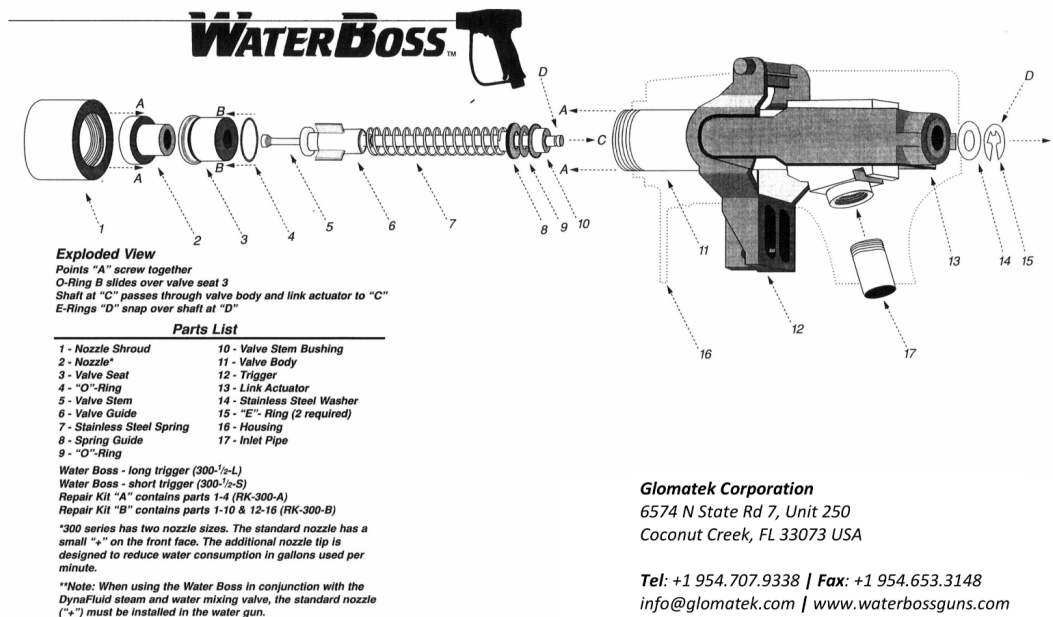


- Line operated 3 days a week
- Change-over cleaning process performed an average of 3 times/day
- Room cleaned and sanitized at end of day
- Hoses used with 10 gpm nozzles



Recommendation: Replace Nozzle Tips in Processing Room

- Replaced standard nozzle tip with low flow tip
- Reduced flow rate from 10 to 7 gpm
- Maintained efficacy and speed of cleaning process
- Achieved savings of 170,000 gallons of water per year



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WB-300-1/2-L	LOW FLOW TIP	(+) TIP	(++) TIP
PSI	GPM	GPM	GPM
50	6	7.5	8
100	7	10	11
150	10	12	13.5
200	11	14	15
250	12.5	16	17
300	14	18	19

Table taken from <waterbossguns.com/index.php/waterboss-300-flow-rates/>

Recommendation: Fix Compressed Air Leaks

- Leaks found with an ultrasonic leak detector
- Costs depend on pressure and leak size
- 12 leaks, 127,000 kWh/year



Picture taken from <www.ilapak.com/packaging-machines/horizontal/smart>

Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Replace Nozzle Tips in Processing Room	170,000 gal water	\$0	\$1,200	Immediate	Implemented
Fix Compressed Air Leaks	127,000 kWh	\$600 + labor costs	\$11,600	2 weeks	Implemented
Reuse Condensate from Air Handlers	352,000 gal water	Unknown	\$2,400	Unknown	Recommended
Switch to LED Lights	18,000 kWh	\$1,000	\$1,800	7 months	Recommended
Install Lower Flow Aerators	52,000 gal water	\$28.00	\$340	1 month	Recommended

Personal Benefits

- Data collection skills
- Communication with different teams
- Free salad

