AT&T IoT for Good Case Study:
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The Challenge: Making high-volume organic farming more efficient

You could probably guess that asparagus is good for you. Full of antioxidants, minerals and amino acids but void of fat and cholesterol,¹ asparagus is a great part of any healthy diet.

When talking with Elvia Devine, the co-founder and driving force behind Devine Organics, about this vegetable, it’s clear she’s become a leader in organic farming with an eye to the future.

And this simple mission has propelled her to be a successful organic farmer for decades. Starting in the early 1990s, Elvia has been driven to grow the finest fruits and vegetables at Devine Organics, a family, woman and minority-owned business with operations in California and Mexico. With rising wages, water limitations and pricing pressures from conventional farmers, Elvia and team are compelled to be more efficient and innovative in order to compete.

Agriculture is key to California’s economy, it employs about 3% of the state’s workforce and accounts for about 2% of the state’s gross domestic product.² It’s also a major water user: roughly 9 million acres of farmland in California are irrigated; this represents about 80% of all water used for businesses and homes.³ While the rains of 2017 brought relief from historic California droughts, more than 90% of the state was in some form of drought in 2016.⁴ So when thinking about resource efficiency, water is a logical place to focus, especially in the water-tight central valley of California.

As Jose Garcia, the Devine Organics farm manager and Elvia’s son-in-law, explains, he and his crew traditionally walked the rows of asparagus and manually probed the ground to check moisture. This process was a valiant attempt to understand when and how much to water, but it was inefficient and time-consuming, oftentimes resulting in higher costs due to overtime work.

“I’m about our kids and grandkids. If we eat well – including lots of clean fruits and vegetables grown without pesticides and other stuff – it can open doors for the next generation.”

Elvia Devine, CEO and co-founder, Devine Organics

¹ http://www.allasparagus.com/asparagus-facts/
² https://www.wired.com/2015/06/farming-and-drought/
³ http://www.ppic.org/publication/water-use-in-california/
The Solution: WaterBit and AT&T Internet of Things (IoT) create control and drive efficiency

Elvia and Jose knew that the manual moisture-sensing process wasn’t the most efficient or effective process, so Elvia started looking for a robust solution to help her improve soil moisture levels. In order to address this issue, Elvia and Jose turned to a comprehensive solution from WaterBit and AT&T.

WaterBit distributes small, solar-powered sensors across farmers’ fields, collecting information on soil moisture and field conditions. The sensors require no maintenance and are placed under the foliage so they won’t interfere with field operations and harvests. Data from the sensors is sent to a communications gateway hub that can be thousands of feet away. The gateway uses an AT&T Global SIM card and Internet of Things (IoT) Services to send highly secure data over the AT&T LTE network to the WaterBit cloud application where it is analyzed to determine if a section of the field needs more or less water. Farmers can also easily access analysis and scheduling tools through a user-friendly mobile app, allowing them to control irrigation timing and duration, fine-tuning as the soil’s needs vary.
For Jose, what differentiates WaterBit from other solutions is reliability and ease. The WaterBit Dashboard provides a comprehensive overview of his field's moisture and irrigation status. Since it’s connected via the AT&T network, he can easily access it 24/7 via computer or smartphone. This means he can make fully-informed decisions about when, where and how much to water.

“WaterBit’s soil probes tell us exactly where the crops need more or less water, all from the WaterBit Dashboard app. It helps us monitor the soil and control the valves in the field, helping us apply the right amount of water at the right time and place. It’s amazing to have such control, even on a Sunday morning when I’m rolling out of bed.”

Jose Garcia, farm manager, Devine Organics

Implementation: Less water yields more asparagus.

The Devine team first installed WaterBit on 40 acres of asparagus crops in December of 2017. In their first season to use it – on only a relatively small portion of their farm – they’re already able to estimate enough savings to make a difference. The Devine team estimates a 6% water reduction, equivalent to over 750K gallons in water savings during their first season of use.⁵ To put it in perspective, that’s like over 43,000 Americans skipping a shower for a day!⁶ And there are additional benefits including an estimated:

- 5% reduction in greenhouse gas emissions from fuel used for pumping water and truck trips to manually check the fields
- 5% drop in labor hours and cost
- decreased nutrient use because of a reduction in leaching

All of this adds up to the potential for real savings, and that’s especially important for Kevin Dees, controller at Devine.

“The benefits start to add up to substantial savings. Reducing water usage is a huge benefit, especially considering the volatility of water prices in California. Labor and fuel cost reductions also contribute to bottom line benefits, especially as we look to expand to more crops.”

- Kevin Dees, controller, Devine Organics

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⁵ Devine Organics, Estimated water savings in spring 2018 growing season.

⁶ 750,000 / 17.2 = 43,605, https://www.home-water-works.org/indoor-use/showers
Other benefits that aren’t as easy to quantify are helping the Devine crew do more with less. Without WaterBit, Devine oftentimes wouldn’t realize they had problems with the irrigation of their crops until the end of the season – when it was too late. Now they’re much more likely to see and address problems as they arise, helping to improve crop yield.

In fact, Jose reports that crop production jumped from 800 to 1500 pounds/acre across the asparagus field using the WaterBit/AT&T solution. The system is also helping to eliminate human error. An automated and dashboard-driven irrigation helps prevent a well-intentioned employee from forgetting to turn off sprinkler at the correct time.

“It’s amazing to have the visibility and control that WaterBit and AT&T enable. The crew that works those fields really likes it, and it has eliminated overtime costs.”

- Jose Garcia, farm manager, Devine Organics
Expanding the Water Savings and Efficiency Benefits

After their initial installation in the asparagus fields, the Devine team is looking to expand into other crops like pistachios and melons. These crops have dynamic water needs, so Elvia and Jose are optimistic they’ll benefit from the WaterBit system. She’s also looking to expand their use of WaterBit into Mexico, where they operate other large organic farms. And beyond her own crops, she’s hoping to share the lessons she’s learned with other farmers trying to increase their efficiency. Elvia’s enthusiasm is understandable.

“We can’t do what we do now without technology; it’s a must to stay in business. That’s why we’ve been investing in new technology like WaterBit and AT&T. People depend on us for work; kids deserve the food we grow. We’ve got to look at ways to grow more with less in a healthy way.”

Elvia Devine, CEO and co-founder, Devine Organics

Especially when you consider the savings Devine realized from their first experience on a relatively small farm plot. Imagine the beneficial impact of this technology if it were utilized more broadly. If Elvia’s success inspires 100 farmers to use the WaterBit/AT&T solution on just 40 acres, they could collectively save about 300M gallons of water a year. That amount would fill over 450 Olympic-sized swimming pools.⁷

Imagine the potential savings when more farmers like Elvia Devine realize the efficiencies and cost benefits of the technology and expand beyond 40 acre plots...

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⁷ 3M gallons annual savings * 100 farmers / 660,000 gallons in an Olympic-sized pool.

https://www.livestrong.com/article/350103-measurements-for-an-olympic-size-swimming-pool