



Activity

Success Story

- Smart agriculture -



SPARK & SENSYS

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Spark and SenSys supported by Activity enable smart agriculture in New Zealand

Armed With New LoRaWAN Sensors, NZ Dairy Farmer Doesn't Look Back

Maximize profit through sustainable pasture-based dairy farming

Dairy farmers in remote areas of New Zealand face a variety of environmental constraints and regulations. In response, Tony and Marlene Walters, owners of South Auckland's Plainvue Farms, have trialed new low-power, wide area (LPWA) technology, supported by SenSys and Spark New Zealand.

Plainvue Farms is a 93-hectare family-owned dairy farm (two co-owners and one employee) one hour south of Auckland. The farm currently raises 280 cows, which produce 109,000 milk solids per year.

Spark is a digital services company providing fixed line telephone services, a mobile network, an internet service provider, and a major ICT provider to NZ businesses. It is working with Activity to provide farmer's with access to real-time management systems through a low-power wide area network (LPWAN). SenSys produces modern, Internet-based, wireless measurement and



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Dairy farm



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Located in South
Auckland NZ



109 K
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PLAINVUE FARM KEY FIGURES

control systems with intelligence for dairy, horticulture, safety and security, and tracking. It is New Zealand's leading company in developing long-range, wide-area network (LoRaWAN) sensors.

“I'm not a computer whiz, but technology helps.”
Tony Walters, Dairy farmer and co-owner of Plainvue Farms

The primary objective of Plainvue Farms is to maximize profit through sustainable pasture-based dairy farming. Early adopters of technology on their farm, the Walters seek to trial and showcase new solutions that meet the following challenges:

Connectivity

Many farms in New Zealand are remote, sometimes surrounded by mountains, which make it difficult to connect to a strong wireless network. Those farmers, situated in these rural areas, sometimes struggle to invest in new devices with long-lasting, cost-effective batteries that can gather data remotely. Spark is delivering connectivity to farms through two new solutions: An on-farm Wi-Fi mesh network, connected to the Internet via Spark's 4G network, allowing farmers and their suppliers to be connected on-farm and a new LoRaWAN network to provide a long range, low power wide area (LPWA) network. The LoRaWAN network can connect and manage a new generation of low-power smart devices and sensors.

Regulation & resources management

Water is scarce and storage is limited, so farmers must know how much or how little water to use to avoid runoff. This requires constant monitoring of soil moisture, air temperature, etc. In addition, farmers must avoid overusing fertilizers and nutrients and prevent storage leakage. There are also high health standards, such as strict temperature control of milk throughout the supply chain. For all the above, farmers are expected to provide clear documented proof of compliance and failure to do so can result in tough penalties.

Functionality

Gathering data is extremely useful, but it is impractical for farmers to take measurements each evening and enter information into a database manually. In addition, solutions must be well-designed, adapted to the environment and have long-lasting batteries. In case of emergencies or improper occurrences, such as inadvertently opened gates, leaks or other health and security concerns, farmers must be notified and able to respond immediately.



Spark

Affordability

Last, but certainly not least, the barrier of entry to installing the latest technology can, and has been, high for dairy farmers. If farmers are expected to embrace innovative solutions, they must be affordable.

LoRaWAN is taking pasture-based farming to the next level of productivity and efficiency

The first order is addressing the challenge of connectivity. Spark, in coordination with Actility, is rolling out a low-power wireless area network for farmers to access their management systems in real-time wherever they are throughout their day. In fact, one gateway, or tower, can connect about 100 farms to the network.

Mr. and Mrs. Walters discovered the potential of LPWA technologies in 2015 and, soon after, met Warwick Jones, co-founder of SenSys. Together, they have installed LoRaWAN sensors that allow connectivity through radio frequency up to 15km radius around a base station. This is much more practical and realistic compared to trying to connect large, remote farms to 4G cellular networks.

Once the network is ready to go and the farm is connected, SenSys is ready to install a wide range of LoRa-ready products to meet the other challenges. At Plainvue Farms, Mr. Jones and the Walters have been trialing solutions, such as the following:

S3P Soil Probe - measures soil moisture & temperature

WaterMon - analyzes farm water levels, leaks & usage

RainMon - reports rain volume hourly

Octometer - monitors and reports on milk care & hygiene

Gate-State - reports on gate or door security

According to Spark, these products are all connected to a centralized system, which visibly demonstrates how the farm performs day-to-day while monitoring environmental parameters and a number of other real-time information factors that are critical to farming. Information is viewed on an online dashboard and alerts are sent via text message.

“ We don’t want too much info, which can be confusing. The dashboard is still a work in progress and we are working to get just the relevant info, such as 24-hour averages and security issues. ”
Tony Walters

As mentioned, new rules demand precise milk cooling system temperature control in order to prevent bacteria and disease. Fertilizer application and effluent must also be strictly managed. All controls must be documented and serve as proof in case of an audit. Since each SenSys product automatically enters information into a database, this can easily be used to produce compliance reports.

Of course, at the end of the day, any solution must be affordable. Four years ago, the only cellular-powered frequency was available and a sensor could cost up to 12,500 NZ dollars (9,000 USD today). But now, SenSys’ systems costs less than 25% of the old systems - the SenSys S3P Soil Probe only costs 800 NZD.

According to Mr. Walters, SenSys is “a long way ahead” in terms of connectivity, function, and cost.

Easy and cheap roll out for automatic data monitoring

The Walters describe themselves not as computer experts, but practical dairy farmers. They embrace technology in so far that it serves immediate, on-the-ground purposes.

In the beginning, the Walters applied technology to measure effluent (wastewater), but as time went by, they realized that they were accumulating a large amount of wide-ranging data, which could then be used to more efficiently manage their resources and comply with new regulations on milk storage.

They recognize the strong benefits of current sensors, as well as how rapidly they are improving. Easy to install, it only takes a few minutes insert anS3P into the ground, connect it to the LoRaWAN network, and start measuring various factors. Collecting the data is automatic and can occur over a long distance with no need for cellular or SIM cards. Mr. Jones is confident in his prediction that sensor batteries won’t need to be recharged or replaced for up to six or eight years.

“ Within 12 months, we have seen major tech improvements. The sensors are smaller and better, and in a couple years, it’s going to be amazing what they’re going to develop. There is big excitement in the ability to measure pastures. ”
Tony Walters

That is great news for all New Zealand farmers.