CUSTOMER STORY

Ukko Agro

UKKO AGRO

1000+
connected sensors

6 countries across
3 continents

20%
reduced connectivity costs

How Ukko Agro uses EMnify to help farmers grow more and sustainably

According to the United Nations Foundation, climate change and associated severe weather, pests, and diseases could reduce global yields by 30 percent by 2050.

Ensuring food security for the growing world population requires innovative farming practices that improve crop productivity while keeping the environmental footprint to a minimum. Toronto-based Ukko Agro seeks to tackle this challenge.

Ukko's predictive analytics platform analyses hyper-local weather, soil, and crop data from the fields, providing insightful suggestions for farmers to optimize crop input applications. Beyond their deep analytics and advanced machine learning software, Ukko's goal is to pull different pieces of the IoT puzzle together and deliver a single and easy-to-consume smart farming solution to customers. EMnify provides the vital communications piece to make this happen.

About:
- Headquartered in Toronto, Canada
- Industry: Agriculture
- Active in the Americas & Europe

Goal:
Making farming more profitable and sustainable.

Solution:
Predictive analytics for crop diseases, growth stage, and irrigation monitoring.

EMnify's products in use:

Connect:
- Global IoT SIM & LTE-M service: Reliable sensor data collection in remote agricultural fields.

Automate:
- REST API: Automated sensor provisioning.

Operate:
- Web Portal: Transparent cost management and proactive control of device connectivity for troubleshooting.

Secure:
- IMEI Lock: Preventing SIM and connectivity misuse.

EMnify

Augmenting crop yields with a simple, hassle-free product experience

IoT applications in agriculture are not necessarily new, but the complexity involved has been a big challenge. Various components, from hardware, to connectivity, to software need to be set up, integrated, and managed effectively, which is a daunting endeavor for farmers and agricultural companies alike.

"What we try to achieve here at Ukko is deliver an experience where our customers get the devices, push the button, and everything is up and running. They don't have to worry about any configurations as such," said Avi Bhargava, Co-founder and CTO at Ukko Agro.

To do so, Ukko works with multiple hardware manufacturers to equip sensor devices with a SIM card and preconfigured communications, allowing them to work out-of-the-box the moment they arrive at the customer's field.

The Ukko Agro platform aggregates granular data from in-field devices to monitor micro-weather and crop patterns and advise growers on irrigation activities, the best timing to spray pesticide and fungicide, as well as how much to spray.

Using prescriptive models, Ukko's solution forecasts water stress and disease risks three to seven days in advance to help farmers prevent crop losses and make best use of their resources.
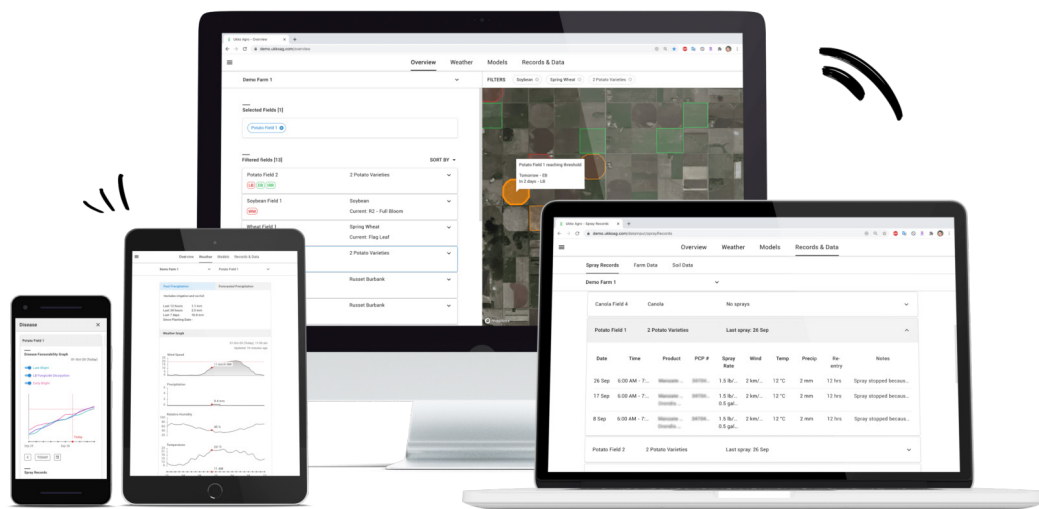
Control and transparency are decision criteria for cellular IoT

Given that connectivity is an essential part of Ukko's smart agriculture ecosystem, the team extensively tested multiple network providers.

"When using the local operator's service, we had almost no knowledge of what we paid for. It was like a black box. The lack of transparency was very hard to deal with," explained Bhargava.

"We also had to pay for a fixed amount of MB per device, which was a lot more expensive, and we ended up paying for more than what we used," added Alejandro Burneo, Software Engineer at Ukko.

Switching to EMnify allowed Ukko to save on 20% of connectivity costs, but it wasn't all about pricing.
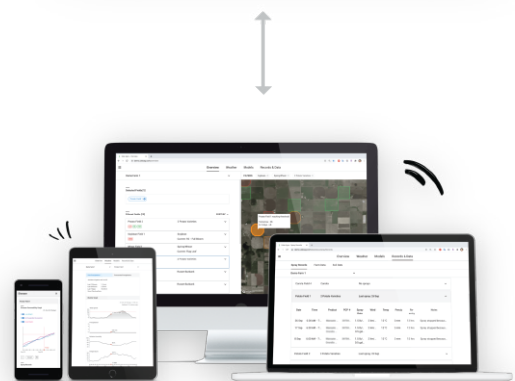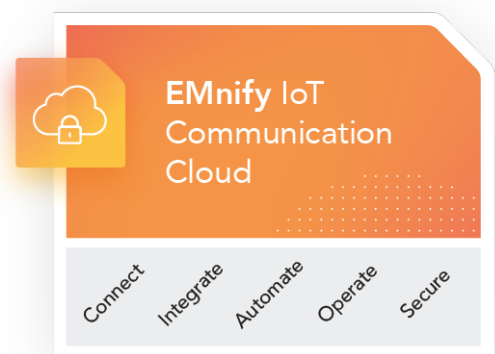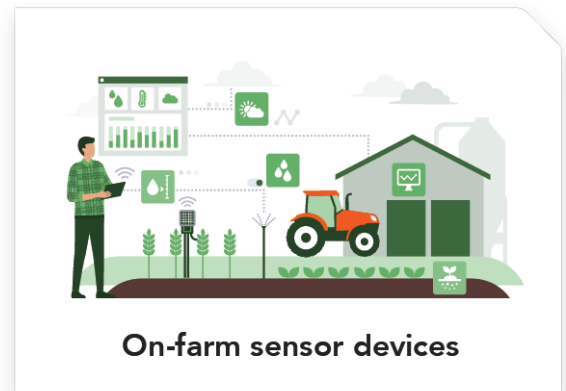
66

"Most importantly, EMnify gives us the level of device control that we need. For troubleshooting, we need to understand at what point the devices were connecting and to which network. Many times, issues are caused by the firmware of the modem, and without connectivity data, we can't even isolate the root causes."

– Avi Bhargava
CTO & Co-founder, Ukko Agro

As most crops and fields are in remote areas, another priority is that *"devices can connect to any network using any technology from 2G to 4G"*. EMnify's LTE-M service, in particular, is the ideal choice for Ukko to connect low-cost sensor devices and future-proof their solution amidst 2G and 3G sunsetting.

On-farm sensor devices

2G / 3G / LTE-M

EMnify IoT Communication Cloud

Connect   Integrate   Automate   Operate   Secure

Ukko Agro Predictive Analytics Platform

EMnify

Streamlined operations for scale

With ease-of-use at the heart of Ukko's solution, the team leverages EMnify's **extensive API set** to automate and simplify device provisioning processes.

Each sensor comes with a bar code containing all SIM information, APN configuration, together with the preset data limit and service profile. When a user scans the bar code using the Ukko mobile app, the device is registered on the Ukko platform, and the SIM card is automatically activated.

As SIM security is a major concern of their hardware partners, Ukko additionally uses EMnify's **IMEI lock** to ensure the SIM card can only work with its assigned device.

"Because agriculture is a seasonal business, we often need to disconnect and remove devices from the field during wintertime. Since we operate in different countries, the seasons are very different as well. With EMnify, we can flexibly pause SIM connectivity when and where we need to avoid wasted costs," added Alejandro Burneo.

What's next?

Beyond the existing analytical models for diseases, crop growth, and irrigation, Ukko is now focused on developing new forecasting algorithms for nutrient deficiency, crop yield, and insect risk, as well as supporting a wider range of crop types.

In parallel, security is another topic where the team will be channeling their focus.

"We plan to look deeper into EMnify's Cloud Connect, as we're very intrigued by how it allows us to securely connect sensor devices to our AWS VPC and guarantee that the data does not break out through the Internet but directly flows into our application," said Burneo.

EM*nify*