



Grand Farm Deploys Zyter Smart Agriculture for Research and Testing

>The Challenge

Farming in the U.S. has a rich history and an enduring presence in American culture. However, today's farmers face many new challenges that their pioneering ancestors, or even 20th century farm owners, wouldn't have dreamed of. A new concept of food insecurity and an emerging global hunger crisis due to population growth and climate change are compelling farmers to produce higher yields, but with a dwindling pool of farm workers to do it. While automated crop management solutions are available, many rural farming communities lack the 5G connectivity and technology infrastructure to support sustainable agriculture solutions and the modern day "smart farm".

In July 2021, the Rural Cloud Initiative (RCI) launched the FarmGrid™ precision agriculture solution at the Grand Farm research test facility in North Dakota. The RCI was formed to bring together 5G-enabled technology providers and solutions to enable smart, sustainable agriculture practices, as well as smart health and education services to rural American communities. In September 2021, Zyter, Inc. joined an RCI consortium of over 70 network, technology, and application leaders to deploy its Zyter SmartSpaces™ Internet of Things (IoT) platform and the Zyter Smart Agriculture solution at Grand Farm.

>The Approach

The Zyter SmartSpaces IoT platform is supporting multiple FarmGrid projects at Grand Farm in collaboration with companies specializing in IoT sensor technology, unmanned drone systems, 5G connectivity, and edge and cloud computing solutions. For this project, Zyter is working closely with:

- **Trilogy Networks** – Deploying its cloud-edge infrastructure and applications marketplace as part of its shared mission with RCI to bring an edge networking cloud platform to 1.5 million square miles of rural America.
- **Qualcomm Technologies, Inc.** – Providing 5G connectivity solutions and 5G-enabled devices including IoT sensors, drones, and cameras.
- **Veea, Inc.** – Providing on the farm connectivity for IOT sensors (such as LoRa on Grand Farm) while delivering the compute power to run the Zyter SmartSpaces software platform locally, at the edge, on the VeeaHub. The VeeaHub connects with Trilogy's network for on the farm connectivity to their cloud-edge solution.

At a Glance

Client

Grand Farm Research Test Facility, Fargo, ND.

Challenge

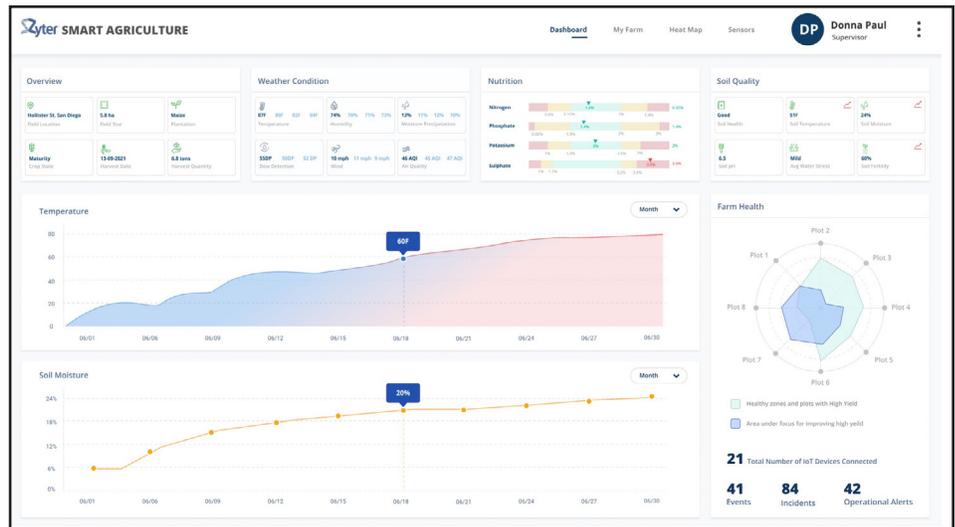
Enable smart crop management for sustainable agriculture to meet global food challenges.

Approach

Deploy Zyter Smart Agriculture running on the Zyter SmartSpaces™ IoT platform.

Results

- Improved crop yields
- Smarter, more informed crop management decisions
- More efficient farm operations



Consolidated data affecting crop yield presented in real-time on the Zyter Smart Agriculture dashboard.

In one of the current projects, Grand Farm has deployed the Zyter Smart Agriculture solution to monitor the soil and other parameters affecting yield in over 12 acres of soybean crops. Traditionally, farmers physically walk or drive out to their fields to examine the soil to help them determine the right time to plant, harvest, irrigate, or spray with pesticides. Today, IoT technology automates that process and eliminates the guesswork and extra time associated with a manual procedure.

For this project, Grand Farm has deployed IoT sensors beneath the soil in the soybean fields that accurately sense and report data on multiple soil conditions – moisture content, nutrient levels, temperature, solar radiation, and other indicators of soil health. Zyter’s consortium partner Veea has created a network hub that provides several types of connectivity to the Internet and the cloud, including Wi-Fi, 4G, and LoRa. LoRa is the ideal connectivity solution for devices that do not transmit data continually, such as the sensors in the soil. The sensors are designed to “wake up” at certain times to transmit small packets of data on soil temperature, moisture, and other various soil and atmospheric measurements.

The Veeahub platform sends data from multiple disparate sensor types to the Zyter IoT platform where it is normalized and made visible to farmers and other end users in a user-friendly, AI-driven interface on the Zyter Smart Agriculture dashboard. Then the Trilogy edge networking cloud infrastructure provides the backbone for the fast 5G connectivity to support the real-time, cloud-based availability of all data. Together, Zyter and its consortium partners have built an end-to-end framework for FarmGrid – a flexible and expandable solution that enables any number of sensor data points, from climate, soil moisture, CO₂ readings and more, to be collected, analyzed, and delivered in a single graphic interface to end users.

Zyter Smart Agriculture receives the soil data from the below-ground IoT sensors, as well as atmospheric data from weather stations and similar IoT-enabled devices, and makes it available in Zyter’s web-based graphical dashboard that is easy to understand and use. As a result, Grand Farm crop managers have a complete and accurate view of real-time data on soil conditions and atmospheric conditions across all sections of the soybean acres without having to make multiple trips to inspect the fields. Moreover, Zyter Smart Agriculture is easy to deploy.



“The Zyter IoT platform allows us to take data from all disparate sensors and apps and make them accessible to farm managers in a single pane of glass for analysis and decision making based on both current and historical data,” said Nancy Shemwell, chief operating officer, Trilogy Networks, Inc. “Zyter’s solution is an integral part of FarmGrid because it adds a layer of user friendliness both in installation and as a management tool that brings a new dimension to support precision agriculture goals at RCI.”

Zyter Smart Agriculture can also integrate data collected by unmanned drones being tested at Grand Farm, providing another way that farmers can automate crop inspections. AI imaging technology embedded in the drone cameras “learn” over time what a healthy soybean crop looks like and can identify when conditions have deteriorated. When fed into Zyter Smart Agriculture, data from AI imaging and IoT sensors are analyzed to provide farmers and agronomists alike with actionable insights and suggestions to support smarter crop management decisions – and higher yields.

>The Results

The next-generation farming methods emerging from FarmGrid research at Grand Farm will translate to important business value for farmers as the costs for fertilizer and soil nutrients continue to rise and the demand for higher yields escalates. By enabling digital transformation for rural America, RCI and its consortium partners are making it easy for farmers to achieve more accurate and efficient practices with digital technology that is advanced, yet still easy to use.

By working together with other technology companies at Grand Farm as a part of the RCI consortium, Zyter is playing a major role in making the farm of the future become a reality. By participating in additional research at Grand Farm, Zyter Smart Agriculture will continue to help farmers embrace smart farming and its many benefits, including:

- Improving crop yield with precision agriculture practices
- Enhancing farm efficiency with fewer resources by automating crop management
- Making smarter, more informed crop management decisions based on real-time soil and atmospheric data

“Grand Farm has been working with FarmGrid during the 2021 growing season,” said Grand Farm Director, Dr. William Aderholdt. “As the foundation of our signature initiative, we received two types of sensors from two different companies to use with this platform. Once on the farm, we had them installed and up-and-running in 15 minutes - seamlessly communicating with each other on the Zyter platform.”



For More Information

To learn more about Zyter Smart Agriculture or to arrange a product demonstration, please contact +1 (301) 355 7760, sales@zyter.com or visit www.zyter.com/SmartAgriculture

>About Zyter

Zyter delivers a wide range of Internet of Things (IoT) solutions spanning buildings, stadiums, campuses, and even cities. The Zyter SmartSpaces platform supports solutions for multiple markets including healthcare, education, logistics, retail, travel, and construction. By integrating and consolidating data from IoT devices and applications, organizations can gain new insights to improve efficiencies while providing end-users with an engaging digital experience. In 2021, Zyter won more than 37 global awards for its IoT products including Best Technology and Company Innovation of the Year. Founded in 2017, the privately-held company is based in Rockville, Md. For more information, please visit www.zyter.com/iot.