

RFID Tracks Produce From Field to Fork

A U.S. fruit and vegetable supplier is employing EPC tags and interrogators to track its products as they are harvested, processed and transported to retailers, and to trace them back to the source in the event of a recall.

By Claire Swedberg

Nov. 14, 2007—For the past six months, a U.S. fruit and vegetable producer has been utilizing an RFID-based system to trace the movement of its products as they are harvested and transported to distributors and retailers. The system provides the producer—which has asked to remain unnamed—with data related to farm management and food safety.

To help it turn RFID data into actionable information, the producer is using the GreenTrace Food Safety Solution software platform, developed by [InSync Software](#). InSync also provided system integration services for the deployment. GreenTrace is designed to bring visibility to farm operations, as well as help farm managers determine how long produce spends in any particular location, provide traceability in the case of a recall and analyze operational efficiency. The fresh-food producer is employing EPC Gen 2 RFID tags and interrogators from a variety of vendors.

Typically, farmers of fruits and vegetables keep detailed records of their harvesting processes. Harvesting crews generally fill out paper forms that farmers use to identify each worker, as well as record the state of that person's health and any other details that might affect the products being picked. They then track, on paper, the amount being picked, as well as the field from which the products were harvested and how long the process took.

The GreenTrace system eliminates much of the handwritten portion of that process. Instead of manually recording the time and location when a product is picked, a user can capture that data electronically. In the case of the U.S. produce company, the farm crew applies EPC Gen 2 tags to a combination of corrugated bins, cartons, reusable plastic containers and pallets—all of which can be taken to the field. Each harvester utilizes a GPS-enabled handheld RFID interrogator running InSync software to read the unique tag ID number of a particular container, initiating the picking process. The crew can also enter data into the handheld about the person picking the produce, and when it was harvested.

Once the containers are filled and the pallets loaded, the harvester scans the container tags once more, explains Ravi Panja, InSync's chief technology officer. The handheld interrogator's RFID data, along with its GPS-determined location, is then sent to the company's back-end system via a cellular or satellite communication connection.

When a product arrives at the company's centralized processing plant, it is weighed, cooled and prepared for shipping, with an RFID interrogator recording each step of the process. First, a fixed interrogator at the weigh station captures the container tag's ID number, confirming that the product has been weighed. That ID number, as well as the date, time and weight, is then recorded in the back-end system. A fixed interrogator installed at the cooler's doorway reads the tag again as the container enters and exits the building.

Batches of fruits or vegetables can be processed in a variety of ways. For example, some items might be packaged, such as bagged lettuce, while others might be frozen or sold fresh. The processed produce' packaging is printed with a batch number associated with the RFID tag of the container in which it arrived at the plant. Then, the tag of each container of processed produce is scanned one final time as it is loaded onto a vehicle for transportation to a distribution center or retailer.

To provide a product's status, location and condition, InSync's software processes the tag data, as well as information from the scales and, if applicable, data temperature sensors. While the producer is not currently employing temperature sensors, it says it intends to do so at some point in the future. In that case, the sensor can be wired to the RFID tag on a container, and the system predefined to transmit an alert if the product temperature becomes too warm or cold for its predetermined threshold. If the temperature fluctuates outside of an acceptable range, or if a product spends too much time outside the cooler, an alert can be triggered and sent to production managers via e-mail.

The system is configurable to monitor temperatures or the time a product spends waiting outside a cooler, says Yashpaul Dogra, InSync's VP of marketing, because details such as how long a product can remain in storage, or at what temperature it must be kept, vary according to the product itself. "If you're doing berries versus leafy greens," Dogra states, "there will be a differentiation between how [the system] should be configured."

In the event of contamination, the producer can use the GreenTrace system to trace an affected product down to the exact GPS-determined field location at which it was picked. For example, a contaminated bag of lettuce could be traced back to the specific container from which the lettuce was taken prior to packaging. A retail store determines the batch number of the contaminated product and notifies the producer. The producer then accesses the GreenTrace application, locates the RFID tag ID numbers of all bins and other containers that contained produce from that particular batch, and traces the contaminated product back to the first read of its bin on the field. This enables the producer to ascertain where the product may have been, and to identify any other products that might have been in the same location at the same time.

The producer can also use the system to track the volume of products being harvested, and send notification down the supply chain to better prepare transporters, distributors and retailers about the volume of product they can expect to arrive. Better preparation can help reduce the risk of spoilage that can occur due to a bottleneck in the supply chain when unexpectedly high volumes catch operators in that chain by surprise.

RELATED_ARTICLES "The overall goal is to bring visibility to activities that currently can't be captured," Dogra explains. That visibility is more critical with fresh produce than in other industries, since a product can begin to degrade as soon as it is harvested, and any unnecessary transportation delays or temperature fluctuations can destroy it.

Earlier this year, in response to reports of illness stemming from food contamination, producers created a marketing plan known as the California Leafy Green Handler Marketing Agreement, which was approved by the California Department of Food and Agriculture (CDFA). The initiative is intended to standardize leafy green vegetable production to address contamination issues. GreenTrace, says Tim Short, InSync's VP of sales, was designed to help growers follow those guidelines.

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