TRACING FOOD IN THE SUPPLY CHAIN
High-profile instances of food contamination highlight the need for better food traceability — knowing when and where fruits and vegetables were picked with the ability to trace them from field to packing center to store shelves. The issue is becoming increasingly important following significant recalls involving nuts, milk, romaine lettuce, spinach and other produce. In addition, as consumers seek more locally-grown and organic foods, retailers will be pressed to provide some way to track the origination of these in-demand perishables.

In 2009, following the salmonella contamination of peanut products linked to nine deaths and nearly 700 illnesses, an IBM consumer study found that consumer confidence in retailers, manufacturers, and growers is declining.

“Consumer interest in food safety and practices has never been greater,” says Todd Baggett, CEO of RedLine Solutions, a new LXE partner that provides mobile solutions to produce growers, shippers, packers, and processors enabling traceability down to the pallet and case level. “The industry really started shifting in 2006, when a large outbreak of e.Coli found in bagged fresh spinach which killed 3 people and sickened over 250 others.”

In addition to significant public health concerns, lack of food traceability has caused long-term effects on the food industry and individual companies. The amount of product loss, or shrinkage, resulting from a lack of food traceability integration is between 25%-50%, according to industry sources. In 2008, an Salmonella outbreak sicken over 1,300 people with over 250 cases requiring hospitalization, leading the FDA to issue a warning about tomatoes which cost the industry an estimated $250 million. After destroying the tomato market for the year, it was discovered that the actual culprit was Serrano peppers from a farm in Mexico that had been mixed with salsa and other food products.

“What was really devastating to the industry was that because there was not an efficient way to trace back from the retailers to the grower source lot, the FDA issued broad warnings that affected all tomato growers. Commodity-wide recalls hurt everyone,” notes Baggett, whose company offers a solution to track product from harvest through shipment, creating an electronic record which can easily be shared with customers, and if needed, the FDA, quickly and efficiently.
In light of these developments, Congress is considering a number of increased food regulations—including the Food Modernization Act—that will require retailers to trace the products they buy. Rather wait for a government-mandated solution, the produce industry voluntarily moved forward with developing its own standard. Three associations—United Fresh Produce Association, the Canadian Produce Marketing Association and the (US) Produce Marketing Association are sponsoring an industry-led effort to standardize industry traceability throughout the entire produce supply chain.

Leading retailers such as Kroger, Wal-Mart, Safeway and Food Lion have endorsed the Produce Traceability Initiative (PTI), which envisions supply chain-wide adoption of electronic traceability for every case of produce by the year 2012.

“It is the right strategy. The growers, retailers, and trade associations driving PTI realized they had an opportunity to define a traceability solution that fits their industry rather than having someone outside the industry dictate one,” states Baggett, a member of United Fresh, the CPMA, and the PMA.

Once the industry adopts traceability, retailers will be able to trace back to the source of food contamination quickly when it occurs, without having to endure a widespread and expensive recall. That’s not to say there are not hurdles to overcome. PTI recently moved out the timetable of some of its industry adoption milestones and is calling for industry pilots to help address industry concerns. Specifically, milestones to add human-readable information on all cases and to add a Global Trade Item Number and lot number in bar code forms have both been moved from the third quarter of this year to 2011—the same date as milestone calling for receivers (namely, retailers) to read and store information on inbound cases. Retailers are also pushing for any solution to cover not only produce, but meat, dairy, and other perishables, rather than have a different solution for every aisle.

In addition, the produce industry is extremely cost-sensitive, so adding nominal cost to their product such as “pennies on the carton” can “make a huge difference in their overall profitability,” notes Baggett, who knows that growers, facing competitive pressures, will be reluctant to implement the standard unless applied equally to all suppliers.

“The real mandate for them isn’t the government guidelines, so much as mandates from retailers,” says Baggett. Retailers will respond when concerned consumers demand this kind of visibility from them. “When retailers set the expectation that traceability is a condition of doing business, then the growers will fully adopt the standard,” Baggett says.

Other industry experts agree. “The biggest challenge will be in determining how to get the various entities to share,” says H. Donald Ratliff, Regents and UPS professor and executive director of the newly established Integrated Food Chain Center at Georgia Institute of Technology in Atlanta. The Center, established by GeorgiaTech’s Supply Chain & Logistics Institute and Memphis-based Sterling Solutions LLC, aims to assure growers, processors, retailers and logistics providers that they can deliver quality perishables via greater efficiency throughout the supply chain.

“The biggest value (from PTI) will come when the industry shares this data and applies analytics to eliminate waste in the chain, reduce inventory, and realize efficiencies that will ultimately improve profits.”
The produce industry handles an estimated 6 billion cases of produce in the U.S. each year. Most produce can be tracked from company to company through the supply chain, provided companies comply with the “one step forward and one step back” requirements of the U.S. Bioterrorism Act of 2002, passed when the federal government determined that the nation’s food supply was vulnerable to terrorist attack.

As food products move through the food chain from production to consumption, they are typically transferred between multiple entities for packing, processing, storage and transportation, creating the potential for food safety issues at each point of the chain, notes Ratliff. He adds that there are particular risks at the transfer points because the product must be handled and because knowledge of how the product needs to be treated, and its expected remaining life, is often lacking.

“The breakdown occurs because there is not adequate information at each transfer point regarding the age of the product, its expected life and how it has been treated prior to that point. Further, there are vague specs on how the product should be handled, which results in products being stored, handled and delivered at wrong temperatures creating quality issues and potentially food safety concerns,” he says.

Most customers for RedLine Solutions have “very good internal traceability systems, but they are proprietary systems with no common standard,” observes Baggett. Because the product does not go directly to the consumer, but to a retail distribution center, current systems do not efficiently trace the product once it leaves the grower’s hands. “Though the growers have traceability, the information does not flow through the supply chain down to the end user. That’s the part of traceability in our current supply chain that is broken,” he says.

That’s about to change. PTI uses a Global Trade Item Number (GTIN) to achieve external traceability. A GTIN number includes a GS1 company prefix that can be readily incorporated into a UPC barcode and works with RFID or human readable codes. It also includes a unique item reference number. The “GTIN Assignment Strategy” has been created specifically for helping suppliers ensure consistency when assigning GTIN’s to the cases by using standard product attributes to organize and categorize products for GTIN assignment. Similarly, to ensure that one label can be used for the entire industry, a standard case label template has also been created.

Technology will play a major role in this effort. Companies targeting this market include RedLine Solutions, whose RedLine Cooler system manages inventories and order fulfillment, Royal 4 Systems, which offers a WISE or Warehouse Information System Expert traceability solution, and rugged mobile computing leader LXE, an EMS Technologies company that offers cold storage, handheld, wearable and vehicle-mounted computers across the supply chain.

RedLine developed its first produce-industry backend solution for growers in 2004 integrated with Famous Software, an accounting, inventory, and management software solutions serving thousands of leading agriculture and fresh produce grower, packer, shippers in North America. The RedLine Solutions software merges financial and inventory backend systems with the output of the worker in the cold-storage area.

LXE believes that growers employing integrated logistics management will ensure critical traceability from the moment produce is field packed to when it arrives in retail stores. At the same time, the technology can significantly improve their operational efficiency and supply chain visibility.
The promise of traceability solutions for produce growers and packagers goes beyond better tracking and visibility to include operational efficiency, better inventory replenishment, and delivery of a higher quality product to retailers, and ultimately consumers.

“There’s not much visibility back up the food chain even in the best of circumstances,” stated John Bartholdi, director of research for the Integrated Food Chain Center at Georgia Tech in a June 4 news release announcing the launch of the center. “What we are really focusing on is knowing the history of food and when we receive it. If we can have much better estimations of shelf life, then we can move the product more efficiently through the supply chain.”

Early adopters of traceability start with a printer, a label and a handheld device in the field. These companies then build on that basic application to a transactional database that can track product information as it moves from field to packing facility to the retail or foodservice destination.

“Instead of doing a bunch of detective work to locate an individual case, they’ll just know,” says Bill Roeder, vice president of Business Development for LXE.

Produce is picked by the grower.

Under proposed traceability initiatives, a barcode is applied at the case level.

By 2011, each processor, shipper, and distributor will have digital means of scanning, and archiving case-level barcode data.

When a shopper wants to verify the local or organic origin of a piece of produce, the barcode data can supply that data, possibly directly to their cell phone.

In the event of reported illness, the FDA and other regulators will be able to immediately track the source. In the past, commodity-wide warnings were issued while investigators tried to determine the source.
According to Baggett, the majority of the growers who make up the bulk of the produce industry are “technology neutral.” “A lot of these companies are multi-generational family businesses and have built successful operations using manual practices. They don’t think of technology as their first solution.”

LXE is working with both large firms, such as leading apple grower Zirkle Fruit Company in Washington State, to smaller companies such as Fruit Patch, a family-owned, Central California grower of peaches and nectarines. The company operates a packing shed on its 30-acre site, as well as 20 cold-storage rooms that provide more than 150,000 square feet of storage.

“Ease of use is critical as well as expandability,” says Fred Hines, LXE channel manager based in Portland, Oregon. The produce growers he talks with are receptive to solutions that can start out small, such as label printing applications, but can grow to a complete solution.

“Companies don’t want a quick fix. They want a partner that can provide a complete solution — from voice to handheld scanning to cold storage, with software that can take care of their immediate needs and will integrate with their ERP systems down the road,” notes Hines.

“Even though the legislation is in a holding pattern, we can’t wait,” says Fruit Patch IT manager Arthur Negrete. “Our employees are learning how to use new barcoding equipment like the LXE MX7 handheld, and we’re finding opportunities to apply the data we capture with the MX7 to improve operations. We’re not there yet, but we’ve placed a long-term priority on lot- and case-level traceability, regardless of whether it is a compliance mandate or not.”

LXE mobile devices are sunlight-readable outdoors and can withstand the demanding environments encountered in the field. The company’s product range includes WWAN-enabled handhelds, voice-directed wearable computers, and cold-storage devices. Roeder says the company is applying lessons learned as a provider of cold-storage mobile rugged computers to the produce market. These lessons range from the ergonomics, to hygiene, to the job requirements of the employee doing the work. “We’ve learned it's about creating keys that are configured in such a way that someone wearing a glove can easily input data,” he says, adding that voice-enabled wearable systems are particularly attractive to growers and pickers because it can free up their hands to do the work.
The Atlanta-based Georgia Tech Integrated Food Chain Center is particularly interested in the cold chain. Launched in June, the Center is bringing together academics and industry experts together to study the challenges of food logistics and best practices for managing and monitoring the food supply chain. With the U.S. being the biggest importer and exporter of perishable food goods, “it’s vital to focus energies on the complex system of cold chain shipping and receiving that currently exists and refine, the Center stated in its launch release.

“The food supply chain is a lot more complex than any other supply chain and the cold chain is the most fragile; the quality of food is dependent on how food products are handled at every touch point throughout the food chain,” notes Ratliff.

The first step, according to Ratliff, is to be systematic in determining where better integration can improve product quality and post-harvest life, and what the economic value would be for improving integration.

“The next step is to determine how much of this improvement can be cost justified. These activities will require industry to provide knowledge and data and academics to provide analytics and a forum for cooperation,” he says.

The Center has already begun to set up models to analyze the economic value that can result from being able to better predict the remaining shelf life of products at each point in the chain and utilize this in managing inventories. “We are also working with several producers, distributors and retailers in developing predictive models in being able to monitor and control the cold chain before problems arise.”

Food traceability from “farm to fork” is going to become a reality, say industry watchers, with market forces, consumer demand and government regulation all converging to push a new level of supply chain visibility and standards-based integration in the U.S. produce industry.

“I think that within three to five years, every case of food products shipped in the U.S. will have a traceability label on it and that information will flow through the supply chain,” Baggett predicts.
Australia-based Elders: No more Stock Outages for Farm Grain Customers

Australia-based Elders is employing an integrated logistics management system to enable farmers in Australia and New Zealand to track stock consumption and automatically replenish on-farm grain supplies as needed. The solution uses LXE’s MX9 handheld computers.

Elders, recognizing that its customers need competitive pricing on inputs, have significantly improved the efficiency of its bulk-procurement practices, to deliver the best products at the best price at the right time to the right place. Clients use the MX9 to scan their stock in the on-site warehouse or depot on a weekly or monthly basis, to determine the usage and billing as required.

According to LXE vice president of Business Development Bill Roeder, “For an agriculture business, compliance with traceability regulations is a given, but what Elders’ application proves is the potential of mobile computing to improve operations and productivity.”