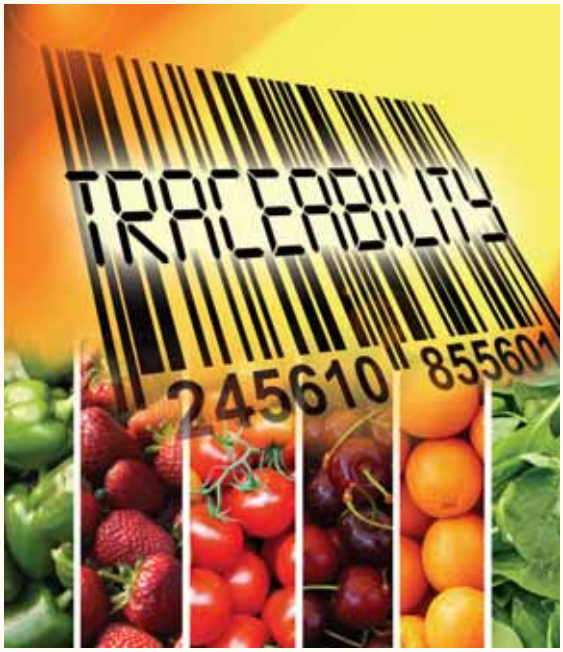
10 Questions Regarding TRACEABILITY

Sparked by multiple food-safety incidents over past years and fueled by this past summer's fiasco, traceback in produce has become an urgent yet complex issue for many.

BY JODEAN ROBBINS

To trace or not to trace is no longer the question. "You'd have to be living under a rock to not understand the increasing importance of the whole issue of the ability to trace product," remarks Jane Proctor, vice president, policy and issue management for the Canadian Produce Marketing Association (CPMA), Ottawa, ON, Canada.



"The exposure to liability and customer relationships is too risky for any forward-moving businesses not to institute traceability plans," adds David McNally, director agricultural technology for Sensor Wireless Inc., Charlottetown, PEI, Canada.

The issue of traceability has now morphed into a variety of questions and opinions, some at odds with each other, as system vendors spar to gain their share of the developing business and shippers seek to differentiate themselves through their own initiatives. "This will be an evolution, not a revolution in the industry," says Mike Nicometo, director of special projects for Franwell, Lakeland, FL. "It's great if everybody has their own internal operating system, whatever it may be, but the key for traceability really comes down to having one place where all the existing systems can interface and the whole supply chain can see where the product is."

"Improved traceability is expected to support a more focused understanding of products that may impact the consumer," states Jim Lemke, senior vice president of C.H. Robinson, Eden Prairie, MN. "It will also improve proactive retrieval of products posing potential risk in the supply chain. The urgency associated with traceability is tied to the potential risk of another food-safety incident. We know what has occurred, we have experienced the impacts, but there has not been a full set of common tools established to properly contain and remedy the next incident."

In an effort to standardize traceability in the industry, the Newark, DE-based Produce Marketing Association (PMA), CPMA and Washington, DC-based United Fresh Produce Association presented the Produce Traceability Initiative (PTI) this past October.

"The PTI was launched to build better transparency and a common framework for identifying produce cases and to streamline connectivity across the supply chain," says Dr. David Gombas, senior vice president, food safety and technology, United Fresh. "As stated in the plan, it is designed to help the industry maximize the effectiveness of current traceback procedures, while developing a standardized industry approach to enhance the speed and efficiency of traceability systems for the future."

Cathy Green, chair of the PTI steering committee and COO of Salisbury, NC-based Food Lion LLC, which operates more than 1,300 supermarkets, explains, "Members of the industry are using multiple standards, which makes data gathering difficult and tedious, and the information being captured is inconsistent, which leaves gaps in the traceability path. The PTI committee recognized the industry cannot currently track or trace product quickly and effectively."

As companies pursue the answers to key questions around traceability, they may discover it offers benefits far outweighing its seemingly daunting implementation. "Traceability within the produce industry is a critical component to containing public risks from contaminated products while at the same time significantly reducing the financial impact imposed by mass recalls as this year's experience with the tomato/pepper incident has shown," says Mark Brown, vice president of marketing, Lowry Computer Products, Brighton, MI.

Richard Ross, director of industry relations for TraceGains, Longmont, CO, adds, "Traceability, when implemented correctly, is a key component of a total quality management solution. It can ultimately assist in keeping the brand healthy and profitable, which is the ultimate long-term brand protection."

According to Michael McCartney, vice president of operations for Naturipe Farms LLC, Naples, FL, "Traceability is really about knowing

where things are, where they came from and where they're going, which is really a short definition of supply-chain management."

1. What Does Government Require?

The U.S. government already mandates some form of traceability. "Traceability is already the law," notes Walter Ram, director of food safety for The Giumarra Companies, based in Los Angeles, CA. "The Bioterrorism Act of 2002 stipulates all handlers track their products a minimum of one step forward and one step back."

Gombas adds, "The only food-handling operations expressly exempted in the Bioterrorism regulation are farms and restaurants, but handlers who receive produce from farms, distributors who deliver produce to restaurants, and everyone in between are required to keep those records. As such, virtually all of the produce supply chain is currently required by law to have some form of traceability."

However, the provisions of the Act fall short. "The federal government tried with the Bioterrorism Act to create a handoff system to require each person to maintain records but the system has been broken or was never truly implemented," explains Ross. "The pressure is coming from all directions now. It's a health concern, it's a business concern, it's a responsibility concern. There is a point in time where produce people need to defend themselves."

"You're required under the Bioterrorism Act as well as other FDA [Food and Drug Administration] mandates to demonstrate you can trace back one step in the process," states Naturipe's McCartney. "But beyond the contact information and the day of harvest or lot number to identify the source, information requirements are not more detailed. However, many customers require a phonebook's worth of information beyond what the law mandates."

As the issue continues to gain momentum in Washington, D.C., the produce industry is in a heated race to keep regulators from mandating what must be done. Steve Grinstead, president and CEO of Pro*Act, Monterey, CA, says, "When Congress reconvenes in 2009, we fully expect to see legislation introduced regarding produce traceability. We need to move forward quickly to show our lawmakers we are serious about implementing an effective traceability program ourselves. It may help us end up with less government regulation than we would otherwise."

"One of the missions of the PTI is to send a clear message to government on how industry is taking care of this issue and the great strides we've made," adds McCartney.

"A coordinated traceability solution enhancing our ability to quickly trace product through the entire supply chain is a must-have today, in terms of governmental and consumer confidence," agrees Tom Casas, vice president of information technology and mechanization at Tanimura & Antle, Salinas, CA.

2. What Is Produce Traceability?

The overriding issue contrasting internal and external traceability gets to the very core of defining what a traceability system is. "Internal traceability deals with what happens within the company," explains Gary Fleming, PMA vice president industry technology and standards. "Every company needs this and it's germane to its place in the supply chain. A grower has different information needs versus a retailer. The vendor community can handle these needs very well. Most of them incorporate the GTIN [global trade identification number] and lot number, which are the two key fields required for linkage in a standardized system."

"Internal traceability is the confidential processes followed and data collected enabling businesses to trace products," adds David Silva, vice president of information systems for Ballantine Produce Co., Inc., Reedley, CA. "Most companies have some sort of internal traceability systems in place. However, not all companies maintain the same level of granularity, creating potential gaps in traceability system."

THE VIEW FROM THE OTHER SIDE: CANADA

Reaction to the Produce Traceability Initiative (PTI) and traceability in general is different on the Canadian side of the border. "In Canada, a lot of business operators may not feel they need to change or, if they are changing, they're slow with it," says Brian Sterling, CEO of OnTrace Agri-food Traceability Inc., an industry-led not-for-profit corporation in Guelph, ON, Canada. "However, we're going to reach a tipping point within a very short period of time when the consumer market is going to demand more information and then traceability will be more urgent."

Jane Proctor, vice president, policy and issue management for the Canadian Produce Marketing Association (CPMA), Ottawa, ON, Canada, adds, "Since the Canadian industry has already implemented a tremendous amount of individual traceability, the buying community feels the traceability measures they have in place are sufficient to meet the needs at this time as opposed to coming out to actively support and implement the PTI. In the United States, the steps of the Action Plan are being committed to by the retailers."

"Canadian retailers understand the need for food safety, but it's not clear if they're all really biting on the business benefits of the traceability initiatives," says Sterling. "Their traceability systems work well where they link outside their four walls, but those links are very tenuous and tend to be vendor-based. I've had great conversations with retailers but we aren't seeing it in their actions yet."

OnTrace is working in Canada to provide a single registry for traceability. "Our vision is from farm gate to dinner plate but the first step is to break it down," explains Sterling. "You need to know what it is, where it is and when it moved. What we're focusing on initially is the where. The Ontario Agrifood Premises Registry is a system uniquely identifying all the locations that touch food in Ontario now. We started with the farmers and now are moving up the value chain. It means you can identify all locations that touch food in Ontario through our registry, and this will provide the foundation for everything else.

"OnTrace looks at traceability from an external perspective, which is how we make the information available all along the supply-chain level," continues Sterling. "We're figuring out how we get the information at the farm level to link with the retailer or foodservice operator. We provide a single view of reality to make it faster to find where a problem might be."

The biggest challenge in standardizing traceability in Canada may come down to people's opinions. "The difference is in the approach to implementation not the commitment," according to Proctor. "Our industry fully supports traceability and is fully supportive of the work being done in the United States."

"The technology side of traceability is pretty much solved," Sterling believes. "The next real issue is the people. There is a need for three things: trusting others, a conviction traceability will provide benefits along the chain in addition to food safety, and a realization of living on borrowed time causing a greater sense of urgency." **pb**

External traceability is the bigger issue currently. "External traceability deals with the information available once the produce leaves your company," continues Fleming. "Real traceability of any value must include who handled the product all the way through the chain, not just who grew it."

"External traceability refers to supply chain transactions between trading partners," adds Silva. "These transactions could include purchase orders, invoices, bills of lading and advanced ship notices. While many of these transactions occur today, most of them occur manually and few standards enable suppliers and retailers to exchange key pieces of data timely and effectively. The real need right now is for the adoption of standards to be utilized across the supply chain. This will enhance external traceability by allowing the quick and efficient exchange of key information between trading partners improving product visibility."

"The industry cannot use individual systems for whole-chain traceability, as these systems tell the buyer or consumer only where [a product] originally came from but do not reveal all of the steps between harvest and the consumer," states Food Lion's Green. "These vital steps between harvest and the point at which the consumer purchased the item are critical pieces of the traceability process currently missing."

Discussion continues on how far down or up the chain is feasible for traceability. "You'll hear the term 'farm to fork,'" reports Fleming. "However, this is an extremely difficult reality for produce. Technically, it means you can track it to the individual consumer but the reality is once the consumer throws the package away, there is no tracking anymore. Also, in produce, many things, such as loose mushrooms, green beans, etc., can't be stickered or labeled. 'Farm to store' is a better term to use. However, there are many technologies going in this direction and helping to improve the situation for items that can be stickered."

"A lot of vendors claim to have a traceability system from 'farm to fork' but this misleading," concurs Green. "No matter what information is on an individual item, unless a consumer keeps the packaging or sticker containing the information after the item has been consumed, the CDC [Centers for Disease Control] will have little to work with other than the memory of the consumer."

Item-level traceability continues to be a goal. Elliott Grant, chief marketing officer and founder of YottaMark, Redwood City, CA, explains, "Nine out of 10 produce shoppers report at least some concern about the safety of fresh produce and are looking for much more information about the produce they buy including traceability. When consumers show a preference for traceable produce, it quickly becomes a must-have in certain categories."

"I think we will see more companies move towards tracing product to the unit level where practical," says Casas. Tanimura and Antle now sells lettuce in packages closed with a product called KWIKTrak'r. It is similar to the plastic closure on a loaf of bread and can be coded with information that allows traceability.

Growers are also pursuing a level of traceability far back into the fields. "We're accomplishing tracing the package back to a picker, which gives us another level of detail and accountability," says J.C. Clinard, CFO, Wishnatzki Farms, Plant City, FL. "It can be used for recognition or for investigation in the event of a problem."

Del Campo Supreme, Nogales, AZ, is deploying the HarvestMark system from YottaMark for instant traceback and trace-forward of its tomatoes and peppers. Its Web interface even allows the consumer to actually trace via the Web back to the field and farmer who grew the product. The Del Campo system has turned traceability into an additional marketing tool. "HarvestMark will enable us to quickly comply with the PTI and allow us to extend our rigorous food-safety practices to our distributors and buyers," says Martin Ley, vice president. "In addition, we will be able to build new connections with our consumers to receive feedback from the network that will ultimately help us enhance the products we offer."

3. What Are Some Challenges?

The complicated and dynamic nature of the produce business presents challenges to traceability. "The boundaries can be unclear in produce as pertains to the one-up/one-down," says Tim D. Vivian, director of technology for Total Control Systems in Hartlebury, Worcestershire, England. "For example, a banana could be picked in the tropics, packed into branded cartons on behalf of the brand owner,

shipped by a third party to Europe, discharged into another third-party warehouse at a port in Europe, distributed to a ripening center by yet another third-party hauler, then packed for retail and distributed to a supermarket. We have several customers who have concluded if it is their name on the box, they want to be responsible for traceability from field to shelf. They use our software to track and trace their product regardless of the current 'owner' or 'service provider.'"

True visibility of the information remains an important issue. "The concepts we are working with expand the focus of traceability and move it to a concept of total supply-chain visibility (TSCV)," says Don Walborn, sales strategy, Franwell. "In our global markets, the product may have gone through multiple hands and every one of these touch-points is a possible contributor to the integrity of the product. We must eventually get to the point where the product and its handling, including cool-chain monitoring, can be visible at a moment's notice. This process mandates a layer of shared information contributed to, and accessed by, any and all parties in this supply-chain process."

Commitment to the system and management buy-in are crucial. "The most important solution is one that can be adopted quickly without major impact on workforce requirements," notes Mike Cirocco, vice president development, Matrix Systems, Sanborn, NY. "The technology is available. The challenge is industry-wide acceptance. Any standard must combine financially feasible technology that is easy to implement and strictly enforces work flow and business practices."

"You cannot achieve the benefits possible if you trace 75 percent of your goods," says Vivian. "You must aim for 100 percent, or the system is worthless. In addition to this, the correct disciplines within a warehouse and manufacturing facilities are essential, and the system should help to impose those disciplines or drive the process."

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Most retailers are long-experienced and committed to traceback and recall issues in other departments. "We get recall notices every day on grocery items, so we're used to handling recalls as a retailer," relates Dick Rissman, produce director, Dahl's Food Stores, a 12-store chain based Des Moines, IA. "This experience helps us translate what is going on to produce."

4. What Solutions Are Out There?

Not surprisingly, the increasing focus on traceability has seen the development of numerous solutions from various technology and software vendors. "The difficulty lies in the multitude and lack of compatibility of systems being used by different companies," states Gombas of United Fresh. "Consequently, traceability from the consumer point-of-purchase back to the farm has to be sequential, which takes time and is vulnerable to missing records."

Some vendor focus is on software and application development, providing a system not only for traceability but also for inventory management and other processes. Companies are adapting software and Web applications to include traceability components within other components such as shrink management, profitability analysis and optimization, and even

marketing-claim substantiation.

Other vendors are taking traditional tools and adding traceability components. Individual PLU stickers and product labels are adding barcodes for traceability, and temperature monitors and sensors are adding tracking capabilities. Even cell phones are being equipped for traceback application. [*Editor's note: Please see* Individual System Vendor Solutions *on page 26.]*

Desert Glory, San Antonio, TX, has had a complete product traceability system for more than 10 years. "We are a vertically integrated company, so the discipline of tracing product back from the consumer to the specific greenhouse where a tomato was grown can be done in a very short period of time, typically under three hours," according to Bryant Ambelang, CEO and president.

The future holds additional solutions we have yet to imagine. According to Giumarra's Ram, "New technology to apply traceback information on our packaging will greatly help the industry. Hopefully this will make it easier and cheaper to put tracking information on products. RFID [radio-frequency identification] could change the way we record our tracking information. In the short term, however, the task is to get the entire industry involved in a consolidated effort to effectively track our products."

"At some point in the future, RFID may become one of the methods of identifying this information through gateways in the supply chain," agrees C.H. Robinson's Lemke. "When the technology matures and certainty of accuracy exists, this will help automate and improve the flow of information. The infrastructure and process adoption for the current traceability initiative will make RFID an incremental step for adoption."

"Leading producers have experienced enhanced traceability by combining automated data collection [RFID] in combination with wide-area wireless and GPS technologies," says Lowry's Brown. "These investments have yielded favorable paybacks while significantly enhancing traceability and process improvements. As the technology moves forward, temperature sensing/tracking technology integration into the container labeling will have a significant and positive financial impact on logistics planning and distribution within the produce supply chain."

Future technology will also help with visibility of the information. "The Internet will play a more substantial role in traceability and data distribution to its users," suggests Moshe Dalman, vice president sales North America for ImageID, Los Angeles, CA. "Traceability portals will be set up as service for suppliers/retailers not large enough to own and implement their own system. Also with the Internet, the traceability data will become available in real-time to all the traceability data users in the supply chain."

"As the concept of full supply-chain visibility is understood and applied, it will dramatically change the way the industry does business as a whole," relates Anthony J. Totta, produce consultant, Grow My Profits, Lee's Summit, MO. "The inefficiencies in the supply chain will be addressed, the consumer will win and the industry will realize better bottom-line profits and stability from fewer liability risks."

Putting the individual internal systems together under an external platform is the current challenge. Franwell's Walborn states, "There's no one system on the market today to solve the problems as is, so everything we do is putting another building block in it. We've got to choose our building blocks carefully and make sure they're sound, fundamental and flexible enough to take into consideration other initiatives down the road."

"It will be critical for all participants within the supply chain to adopt the traceability practices identified," says C.H. Robinson's Lemke. "Failures or gaps with information management will cause a risk of breakage of knowledge in the case of a recall. Non-participants could impact the effectiveness of others who have adopted the traceability requirements."

DEFINITIONS

GS1 — Global standards organization: GS1 is a leading global organization dedicated to the design and implementation of global standards and solutions to improve efficiency and visibility in supply and demand chains globally and across sectors. Barcodes originate from them.

GTIN — Global Trade Identification Number: A 14-digit barcode; the first seven are the company information, the next six are product description, and the last is the check digit that adds up the previous 13 to make sure they're correct.

SSCC — Serial Shipping Container Code: Barcode for a pallet.

GLN — Global Location Number: tells where it came from.

GRAI — Global Returnable Asset Identifier: code used for returnable assets, like returnable containers.

"You can have a proprietary solution but the solution needs to work seamlessly with a global standard," states Naturipe's McCartney. "The GS1 standard will enable the stakeholders in the supply chain to have visibility of the product as it moves from point-of-origin to final destination. However, if you're moving from a 10-digit barcode to a 14-digit, you need to change your product catalogue. Naturipe has spent months now developing our new product catalogue. This is where the real works still needs to be done for many companies."

5. What exactly Is The PTI?

The PTI goal is to move the supply chain to a common standard for electronic produce traceability and involves adopting a standardized system of case barcoding for all produce sold in the United States to allow product to be tracked throughout the distribution chain. Adoption of GTINs makes the standard applicable worldwide.

YottaMark's Grant explains, "The PTI lays out a timeline for adoption of industry-wide case-level traceability, which requires the labeling of all the estimated 6 billion cases of produce, by the third quarter of 2010. Although the Initiative is currently a guideline, not a requirement, it is already widely endorsed by the retail and foodservice industry and would likely form the basis of any federal regulation."

The PTI uses a lot code and GTIN to achieve external traceability. "The GTIN is a specific 14-digit number based on the combination of a brand owner's unique GS1-issued company prefix and a company-assigned item reference number based on the various attributes of the case and of the produce inside," says Gombas of United Fresh. "The unique GS1-issued company prefix allows for unique identification of products, and the product reference number allows companies to incorporate their internal numbering systems. All cases shipped will be labeled with GTIN and lot codes, which, when read and stored for incoming and outgoing shipments, give us the most efficient whole-chain traceability."

"The PTI solution does not require everyone to use the same traceability system," relates Food Lion's Green. "It allows companies to augment their existing systems with industry standards serving as the linkage between companies."

PMA, CPMA and United Fresh chose to build the PTI guidelines on the globally accepted GS1 standard framework. "They chose to not require the printing of sensitive data, such as pick or pack date, on the case, instead allowing the case identifier to become a pointer to more information at the discretion of the grower/packer/shipper," says Grant. "The PTI also selected a barcode, rather than an RFID tag, as the data carrier of choice. This is pragmatic given the current cost and reliability of RFID — although it likely kept the door open to future adoption."

The most innovative element of the PTI is providing a common language for the entire supply chain. "Most of the industry has one step forward and one step back, but we have no connectivity of the information," relates Pro*Act's Grinstead. "The common language provides the backbone for various individual initiatives. Some companies will outsource the data management and some will internalize it."

"PTI gives the industry a guideline for traceability and its standardization using the GS1 format and is important because it will allow every handler in the supply chain to be able to read traceability information in a common tracking language," says Giumarra's Ram.

The PTI Action Plan addresses what to do but doesn't necessarily address how to do it. "We have subgroups working currently to identify the resources available to implement the strategies," says PMA's Fleming.

6. What is The PTI action plan?

Seven milestones make up the PTI's action plan. "First is obtaining your company prefix from GS1 with the purpose of uniquely identifying your company from any other company in the world," explains Fleming. Companies can obtain a company prefix by applying online to Lawrenceville, NJ-based GS1 US, Inc., which provides a GS1 company prefix through its Partner Connections membership

"Secondly, there is the internal exercise for companies to assign GTIN numbers to all their case configurations," Fleming continues. "Both of these have a timeline of the first quarter of 2009. Third, they need to communicate those numbers and the associated information behind those numbers to their trading partners so when those numbers are used in commerce, everyone will know what they mean. The timeline for this milestone is the third quarter of 2009."

Milestones four and five relate to making the information readable. Fleming continues, "Fourth, they must put the necessary information — which would be the GTIN number and the lot number — in human readable form on all cases of produce. Coupled with it is milestone five, which is putting the information into a barcode/machine readable form. The timeline for these is the third quarter of 2010."

Milestone six covers how every subsequent handler of the product must be able to read and store information on in-bound cases. "In this case, the subgroup has identified two best practices and both would actually speed up receiving over how it's done today," adds Fleming. "So we're actually improving practices as well as getting the information needed for the traceback."

"All buyers, receivers and subsequent handlers of cases will need to have systems in place to read barcodes and electronically store the GTIN and lot number from each case of produce received," states Gombas of United

INDIVIDUAL

The abundance of traceability measures and programs both simplify and complicate a company's decision. The commitment of various system vendors to providing workable tools specifically for produce application allows the industry a great deal of flexibility in implementing the Produce Traceability Initiative (PTI) recommendations.

Franwell, Lakeland, FL, implemented an interesting project with Lakeland, FL-based Publix supermarkets, Oviedo, FL-based Duda, Salinas, CA-based Tanimura & Antle and Miami, FL-based Del Monte about two years ago. Steve Dean, Franwell's director of business development, explains, "The purpose was to show the value of the information the RFID tag could give. We showed how posting information and gathering data at receiving, processing, storing or shipping points can be transmitted to this visibility layer and allow tracking of where the product goes at any point in the supply chain. It was a very successful project and we're building on it."

Grow My Profits, Lee's Summit, MO, works with a full supply-chain visibility (FSCV) initiative. "FSCV has immediate ROI [return on investment] and traceability is a by-product," says Anthony J. Totta, produce consultant. "I am working with clients whose products range from temperature monitoring to RFID, smart tags with barcodes, GPS tracking and vibration monitoring."

Hurst International, Chatsworth, CA, has the Versaprint Labeling System, which attempts to resolve the issue of traceability all the way to the fork. "The solutions being discussed at this time offer limited solutions to items sold in bulk," says Ari Lichtenberg, president and CEO. "All methods being discussed up to this point address the produce up to the box level. But what happens when the items are emptied onto the shelves and the traceability goes with the box?

"Our technology is capable of providing finite traceability on single items all the way to the consumer," answers Lichtenberg. "Since the label contains enough information to trace the item to a specific growing field, the exposure to the rest of the items in the category is eliminated. The key here is to educate the consumer to keep the labels as they do for all kinds of items bought in retail. Companies like Albertsons [Boise, ID] and Wal-Mart [Bentonville, AR] have already turned to Hurst to demonstrate their commitment to food safety and provide their customers a new standard for produce

identification and traceability."

Visidot system from **ImageID, Los Angeles, CA,** has been implemented by Dongen, Holland-based Polymer Logistics Ltd. at El Segundo, CA-based Fresh & Easy Neighborhood Markets providing tracking and traceability for each returnable plastic container containing produce within the Fresh & Easy supply-chain system. Visidot is fully compatible with the European traceability regulations already in place and implemented by multiple European fresh-food suppliers.

Moshe Dalman, ImageID vice president sales North America, explains the system this way. "Once implemented, Visidot provides full traceability in an automatic and cost effective way, enabling tracing of each product/item throughout the manufacturing and the supply chain, thus providing real-time data on each product and linking it to a manufacturing batch, ingredients, etc. In case of recall, a safe, selective recall can be implemented, preventing the adverse effect of a 'panic' recall."

Lowry Computer Products, Brighton, MI, designs and implements a progressive traceability solution based on GS1 standards. "Our complete project and development staff is GS1 barcode and RFID system certified," says Mark Brown, vice president of marketing. "Our system, Secure Visibility Track and Trace, will provide users with a complete record of the chain of custody of the fresh produce as it moves through the supply chain. Frequent and disciplined scanning of standardized GS1 labeling, as defined by the PTI, will serve to pinpoint issues and narrow the financial impact of potential future recalls."

Other companies are turning standard items like labels and temperature recorders into traceability tools.

Matrix Systems, Sanborn, NY, provides software solutions in product marking, data collection, RFID, inventory control and warehouse management for the food industry. "We work with various traceability measures from food manufacturing to pharmaceutical, from barcoding to RFID," says Mike Cirocco, vice president development. "The keys are common terminology, controlled product marking, validation of the data and easy access to the real-time data."

PakSense, Boise, ID, has partnered with YottaMark to offer PakSense Ultra T3 powered by HarvestMark, a labeling system that marries traceability, environmental monitoring and county-of-origin labeling (COOL) information, explains Amy Childress, marketing programs director. "We combined HarvestMark's traceability with our temperature monitoring. The reception has been beyond our expectations."

Case and product items are labeled with county-of-origin information and unique HarvestMark codes. Each code is associated with information such as harvest date, field of harvest, crew, processing/packing data and general bill-of-lading details. PakSense temperature monitoring labels are then applied at the pallet or container level and automatically linked to the case and/or item labels.

According to Brett James, PakSense traceability specialist, "Once the PakSense temperature monitor is read, it is automatically linked to the HarvestMark information. There is no additional work for the shipper or receiver — and the system is COOL and PTI compliant."

As a provider of technology with traceability aspects, **Sensor Wireless Inc., Charlottetown, PEI, Canada,** is actively involved in projects around the world assisting companies with quality improvement initiatives. "One of the most recent projects we are involved in with the United Kingdom will provide traceability and quality improving technology for the apple, potato and egg industry from the farm through packing and into the retail sector," explains David McNally, director agricultural technology. "The development of in-transit sensors for distribution is a key area of concern our technology will provide assistance with."

Total Control Systems Ltd., Hartlebury, Worcestershire, England, has developed the Wizdom and SourceID software used worldwide by produce companies both as a complete enterprise resource planning (ERP) solution and as a stand-alone traceability system respectively. "Produce companies in Europe have been working with a minimum level of traceability defined by European Law since 2002," explains Tim D. Vivian, director of technology. "This regulation operates with broadly similar requirements to the U.S. Bioterrorism Act, i.e., one-up, one-down. However, forward-thinking companies are regarding traceability as a vital requirement for many other reasons as well."

TraceGains, Longmont, CO, provides unit-level and ingredient/raw-material-level traceability as well as supply-chain compliance monitoring, and attribute and event collection. Richard Ross, director of industry relations, explains, "We build a rich pedigree and genealogy model used for recall management, recall minimizing, exception-based compliance alerting, profitability analysis and optimization, proactive brand protection, and substantiation of brand and marketing claims. Our system is standards agnostic and can therefore very easily work with all the GS1-128 data and data models. [GS1-128 is an application standard of the GS1 implementation using the Code 128 barcode specification.]

"Retailers work with very slim margins and experience a lot of inventory loss, especially with perishable goods," continues Ross. "We work with retailers in two critical areas: reducing perishable shrink — and gaining true FIFO [first-in, first-out] inventory usage — via TraceGains TempTrace service, and enhancing brand-protection for their private label brands."

The Web site of **TraceProduce.com, Nyssa, OR,** has been set up to work with the GS1, GTIN and GS1-128 barcode assignment strategy being introduced by the PTI. "Our system also works with the USDA PLI [positive lot identification] program," says Joe Farmer, owner. "TraceProduce.com works off one standard — a facility identification number. The rest of the lot code is an open coding process allowing shippers to utilize existing code standards they are already using, thus complementing their in-house software tracking systems."

YottaMark, Redwood City, CA, is doing a variety of things in traceability building on the PTI foundation. "We have item-level traceability for watermelon," reports Elliott Grant, chief marketing officer and founder. "By giving each melon a unique identity, we can resolve problems commingling causes for traceability, as well as providing a new channel to communicate with consumers. We're using low-cost pre-printed labels to avoid the need for packing sheds to deploy expensive printers. We have an on-demand solution for the restaurant industry to help it comply with the guidelines and a downloadable application to trace produce on a cell phone, using the camera."

To date, half a dozen or so companies across the United States and Mexico in a wide range of commodities and workflows are adopting YottaMark's HarvestMark system. Grant says, "We've been working diligently to equip the produce packaging ecosystem to supply HarvestMark ready labels, clamshells and cases, as well as value-added solutions." **pb**

Fresh. "This will provide readily accessible information on all produce received into each handler's inventory throughout the supply chain, allowing companies to quickly track product within their own control by GTINs and lot numbers."

Milestone seven deals with the storing of outbound information. "This is different from in-bound and the best practices identified for inbound don't necessarily apply to outbound," states Fleming. "We have another subgroup working on this and we're hoping some identified technologies will be mature by then. The timeline for this very last milestone is 2012."

Some outstanding issues and challenges are

still being addressed through PTI subgroups focused on developing best practices for other areas. "These groups are looking at commingling and repacking of product as well as focusing on miscellaneous supplier issues such as procuring product from another grower to meet demand when product is short," explains PMA's Fleming.

According to Joe Farmer, owner of TraceProduce.com, Nyssa, OR, "The requirement of the reference number as part of the GTIN may require capital investments as many shippers try to establish 'smart packing lines' that can read barcode identification on product and then label the product based on the size/brand of the container. Also, since packinghouses will have to label product with a brand owner's GTIN rather than their own GTIN, this could cause some complication for houses packing more than one brand. These may not be issues for lines that package standardized boxes but non-uniform produce containers make it very difficult to label product."

Thirty-four companies from throughout the produce supply chain, including many retailers, have endorsed the new plan. "Most of the large retailers, foodservice providers and grower/shippers have endorsed the initiative," says Casas of Tanimura & Antle. "It's critical, in terms of cost, for the solution to be consistent across the entire industry. As a grower/shipper, it would cost us significantly more money to support many different buyer initiatives. One standard solution will help all of us control cost."

"PTI's initial steps and their related suggested timelines are real, meaningful and achievable for the majority of the industry when you think of the necessary capabilities and the associated investment they will have to make," says Lemke of C.H. Robinson.

7. Is It Principally A Grower/Shipper Issue?

While grower/shippers have taken the lead in implementing their own traceback systems and retailers have long had procedures in place to deal with recalls store-wide, a truly working produce traceability system means everyone in the chain must do their part. "Everyone in the supply chain has an important role in traceability," says YottaMark's Grant. "The PTI guidelines specify retailers and foodservice operators will need to scan every case arriving at their facilities. Research shows 59 percent of consumers think the store is responsible for ensuring food safety — only slightly behind the grower/shipper. Retailers obviously also hold tremendous influence over adoption of traceability by packer/shippers."

"We are all responsible for enhancing our systems to meet the requirements of the initiative," says Casas. "As a supplier, Tanimura and

Antle must apply labels and transmit the accompanying data to our buyers. It's also critical for buyers to hold all suppliers to the same traceability standards. Many of our customers have required verification of our ability to trace product for many years. In most cases, we demonstrate our ability to do so by performing mock recalls meeting their criteria."

As the U.S. buying community focuses on the benefits of traceability, it will force the issue. "Increased risk is not acceptable to the buying community, so this will become self-regulated as buyers set up best practices and ensure their suppliers do the same," notes PMA's Fleming. "Some very large buyers have publicly voiced how they want to ensure their customers know they have the freshest and safest produce in addition to having a supply chain that can identify and remove any suspect product as quickly as possible. Traceability becomes a point of differentiation between them and the retail store that can't assure the customers it can do the same."

"Large retailers are already beginning to realize requiring traceability measures can streamline their operations by shortening lead time, minimizing inventories and eventually reducing costs, as well as facilitating recalls," explains ImageID's Dalman. "Tesco in the United Kingdom has placed new traceability requirements on its suppliers. Such requirements forced Tesco suppliers to automate their logistics processes."

More and more retailers large and small are requiring traceback measures. "We require traceability of our suppliers," reports Dahl's Rissman. "The country-of-origin labeling [COOL] made it more formal and easier to get everyone to fall in line. It's a great step for everyone in the industry. It makes the warehouse more knowledgeable now to know where the product is from and makes many of our systems more efficient."

"Many retailers have endorsed the PTI and thus are on the path toward a global traceability standard," reports Food Lion's Green. "As retailers begin setting up processes inside their distribution centers to begin scanning inbound cases for traceability information, those suppliers who are not participating in the initiative will quickly be identified by not having the necessary information shown on their cases. At that time, they will be notified accordingly, as they pose a risk to us by not giving us the ability to track one step up the supply chain."

Farmer of TraceProduce.com adds, "Some retailers have previously required packer/handlers to have tracing software systems in place. In the past year, retailers have started requiring packer/handlers have a lot code on their produce packages. In the near future, with the quarterly milestones of the PTI, some retailers will be requiring GS1-128 barcodes on case level items." GS1-128 is an application standard of the GS1 implementation using the Code 128 barcode specification. It was formerly known as UCC/EAN-128, UCC-128 and EAN-128.

Courtesy of Naturipe Farms, LLC

Close-up of an internal traceability label.

In fact, traceability may present a particular opportunity for smaller retailers. "The medium to small retailers may have a better opportunity to define some systems really making a lot of sense," says Franwell's Nicometo. "In the past, large retailers have set mandates for key vendors to follow but often it hasn't really been a symbiotic relationship to the suppliers. There have been some successes but not as many as everyone hoped for as suppliers considered it more an added cost than added value. Savvy retailers can take advantage of the window of opportunity to control their own destiny. They can sit down and meet with their suppliers and talk about true issues affecting return on investment [ROI], shifting the conversation away from added cost and instead turning it to added value."

"The difficulty is in properly designing the system to fit your business and laying out a plan including every aspect," says Matrix's Cirocco. "If you fail to include everyone in the design phase, including partners and suppliers, the system will likely fail."

8. What Are The Benefits Of PTI?

The PTI recommendations are sufficiently flexible to enable market forces to drive innovation. Grant says, "We have created on-demand solutions to help growers and packer/shippers comply with the standard without having to install databases and servers on site or put technology in the field. We have associated case identities to time-temperature tags to enable enhanced cold-chain management. We are developing business intelligence tools creating real enterprise value from traceability."

"The implementation via standards means it's not a question of having to understand what format you're going to receive the information in," explains CPMA's Proctor. "When it's a standardized approach, you start at a point so much further forward than where we are now. This is so critically important. In the absence of this, you're looking at records where information might be written one place or another and all those inconsistencies affect the ability to timely track the product through the supply chain."

Expected outcomes include efficiencies and increased confidence. "Such a system will enhance the overall supply chain speed and efficiency, improve the industry's ability to reduce the impact of potential recalls or similar problems and actually save the industry money in the long run," agrees Green. "This is a huge but necessary undertaking for our industry and is a must-have in order to continue to enhance consumer confidence and trust."

"The PTI sets a clear road map for all the stakeholders, enabling more efficient and timely recalls and therefore improving overall consumer confidence in our products," adds Ballantine's Silva. "By adopting standards clearly defining products and locations, data can be shared more easily, improving overall supply chain efficiencies, including traceability."

The overall expectation of the PTI is to allow industry and federal agencies access to information in real time. "This alone will help identify what product is out in transit, in inventory and on the shelves," relates C.H. Robinson' Lemke. "Knowing this information will allow everyone to minimize the amount of product needing quarantine. Forward recalls will be greatly improved. The ability to communicate to the receiving entities with this specificity will improve the capture and control of targeted cases/lots in question. It will help reduce cross-commodity collateral impacts."

"The long-term goal is to limit the product involved in a future recall," according to Pro*Act's Grinstead. "Specific lots from specific growers will be able to be recalled without the government agencies feeling they have to recommend the general public not eat any of the product in question."

Once the industry's initiative is fully implemented, there will be increased supply-chain visibility at the case level. "The industry will have electronic systems in place to track cases from field to store level," explains Casas.

"Today at Tanimura and Antle, we can electronically trace our products from the field to our buyer's distribution center. Generally speaking, we don't have 'electronic' visibility by lot after that. So in the event of a recall, all product going through a buyer's distribution center would be pulled from its associated stores regardless of lot. In the future, we will be able to narrow the impact by pulling specific lots all the way to the store level."

"Comprehensive initiatives reduce the incidence of recall by aiding in the assurance of a quality product going to the shelf," says Sensor's McNally. "Better temperature and humidity controls to reduce potential contamination at storage, in field and in distribution — newly developed ethylene and CO_2 sensors — will aid in the logistical timing coming from storage and improve shelf life."

Ross of TraceGains adds, "If you can prove your items are not part of the potential food-safety concern during a scare, then you can stay in commerce when others can't and if you can stay in when others can't, it makes you a top player. It allows you to really create a brand with your product and get out of the commodity business."

9. What Will It Cost?

Weighing the benefits against the cost of implementation is key to understanding the true ROI of traceability. "It is important to regard traceability systems as an integrated part of your ERP [enterprise resource planning] software and not as an extra cost of doing business," states Vivian of Total Control. "Once you do this, then any number of benefits start appearing. As is always the case, companies that have not already invested have to decide where they want to be in two years' time. Can they afford not to?"

"We're looking at not just how to do these things but how to do them in the most efficient and effective manner," notes PMA's Fleming. "By accommodating the need for traceability, companies will be able to make other processes more efficient and cost-effective. The initial investment may be high, but ROI should be high as well. Chain-wide electronic traceability will help minimize the market disruption."

"Enlightened companies realized some time ago how collecting information about their produce at every stage of the process could be relatively cost-free if fully integrated into their ERP software," adds Vivian. "The information could then be used to benefit the company to actually profit from traceability. For example reduction in waste, reduction in stock losses, improvements in quality, ensuring the correct product and quality is shipped to the correct customer, reduced claims, easier resolution of supply and distribution issues, and increased customer satisfaction and improved relationships."

Retailers will benefit from the same traceability and audit capacity with greater detail of what has happened to the product. "It will enable them to move to a first-expiry, first-out instead of a first-in, first-out system," says Ross. "They can use this information to increase their salables and decrease their unsalables and it will create the biggest bang for their buck."

"Many businesses will realize they're mitigating loss," explains CPMA's Proctor. "It is fiscally more responsible to try to alleviate more serious implications to your business by implementing something to mitigate a recall or food safety incident. The fundamentals of GS1 standards will drive the ability for all kinds of other efficiencies throughout the supply chain. Companies are going to realize, as they start implementing this, how their bottom line can be positively affected in ways they haven't even thought about."

Courtesy of YottaMark

Close-up of an external traceability label.

These systems will hopefully avert widespread loss across commodities as has been seen in the past. "It will drastically reduce the financial losses which come from product implicated for a food borne illness," says Grow My Profits' Totta. "It will save entire commodity groups from disasters such as just took place within the tomato industry."

"A traceability system keeps businesses from shipping problems to their customers, minimizes the cost and brand damage of a recall, analyzes all data for additional profit opportunities, helps turn out a higher-quality product and lets marketing departments prove true competitive differentiation," adds Ross.

Many liken traceability to an insurance policy. "Having a good traceback system is like buying insurance," says Wishnatzki's Clinard. "A grower has insurance saying it didn't come from his field. Beyond this application, it can be used to build quality control and accountability as well if you have the detail."

"If there is a problem on one field, then a supplier may have to shut down production on all fields if it can't traceback to just one," adds Guimarra's Ram. "Being able to trace back to one ranch will save economically as well as the reputation."

10. Where Can I Get Help?

Education and assistance on the complex issues of traceability and PTI implementation are crucial to success. "As an industry we need to educate and help move the remaining portion of the industry where they need to be because the chain is only as strong as its weakest link," says Lemke of C.H. Robinson. "It is therefore imperative to bring this remaining portion along. When you think of the alternative of government implementing something that doesn't work for our industry, it may leave those who don't have traceability measures with no option but to comply or partner up their supply with those who can comply."

PMA has developed a guidance document that helps companies walk through how to develop the GTIN assignment. Additionally, PMA has an outreach plan including webinars, educational sessions at trade association and regional events, and audio briefings on its Web site. "We want to reassure everyone they have the help they need," states Fleming. "We're using a lot of Web-based tools so the information is available 24/7. But we're also doing some the old-fashioned way, such as seminars and taking the message to individual commodity groups."

"This is very crucial for our shipper membership as they will be shipping to markets where this will be fully implemented," says CPMA's Proctor. "We will be fully engaged in providing our membership support to implement this new initiative. As a tri-lateral partnership between the associations, we've taken a lot of steps toward education for the industry."

United Fresh is holding PTI workshops at its annual show and convention in Las Vegas in April. "Companies interested in learning how to get started can contact any of our three associations," says Gombas. "Additionally, the PTI subgroups will identify options companies can use to overcome the issues, and we also expect the private sector solution-providers of traceability programs will be a tremendous resource for implementation."

In early 2009, a comprehensive Produce Traceability Site will be launched. "It will be a one-stop shopping site for information," says Fleming. "The three associations are very interested in making sure they do everything they can to make sure every member of the industry can implement this initiative per the timeline." **pb**