UNIVERSITY OF SOUTH FLORIDA
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WISH FARMS: FINANCING FIRETAG[1]

We believe strongly that the FireTag Unit will become a market leader for the produce industry. Given that we already have a well-developed business—outside of the software and hardware business—it makes sense to seek a partner to assist in the final development of FireTag.

Gary Wishnatzki, President and CEO of Wish Farms, was meeting with two key members of the FireTag™ business unit: Rob Ogilbee, CFO, and Bob Pitzer, Senior Engineer. The topic of discussion was the future of the FireTag project and the decision of how future development and rollout of the project was to be financed.

FireTag Laser Marking Technology was a revolutionary approach to the problem of ensuring that produce could be traced back to its point of origin. The system, which combined information technology, robotics and a high powered laser, made it possible to burn identifying bar codes on to specially treated boxes. Using this technology, a pallet holding dozens of boxes of freshly picked fruits of vegetables could be marked to identify both the crop and when/where it was picked in well under a minute. In the event that a problem—such as an E. coli outbreak—was subsequently detected, it would then become possible to localize the original source of the contamination at a degree of specificity that had never before been possible. Such detailed labeling of point of origin would soon become virtually mandatory as a consequence of the *Produce Traceability Initiative* (PTI) that was being championed by the *Produce Marketing Association* and other industry groups.

Recognizing the potential value of the FireTag technology, Wishnatzki had made a substantial investment—roughly $1 million—in developing a series of prototypes under the umbrella of the technology division of Wish Farms, VirtualOne. By late 2011, however, FireTag development was managed through its own limited liability company (LLC) and was ready for field testing. Ogilbee estimated that the funding needed to bring FireTag to market could be anywhere from $2 to $10 million, depending upon how the product was marketed (e.g., for sale or for lease) and the speed with which the technology was adopted by the industry (with substantially higher funding needed to sustain rapid growth). The time was therefore ripe to consider how such funds could be raised. Possible sources of funds included suppliers of the components and materials used in FireTag, potential customers of the FireTag system, third party investors and, of course, Wish Farms itself. Each type of potential investor had its own pros and cons. Without a decision, however, FireTag's future development could easily become stalled and the opportunity presented by PTI could be lost. All of which led to a particularly vexing question: how do you estimate the potential size of a market that does not yet exist?

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The U.S. Produce Industry

As Florida's largest shipper of strawberries, Wish Farms was a major player in the U.S. produce industry. Broadly defined, produce included fruits, vegetables and tree nut crops. According to the USDA, the average annual value of the crop from 2005-2007 was $36.5 billion. As shown in Exhibit 1, crops of particular importance included apples, oranges, strawberries and lettuce. According to a USDA study, between 1976 and 1999, per capita demand for fresh fruits and vegetables in the U.S. grew by over 30%.

Produce crops generally had characteristics that were quite different from cereal crops, such as wheat and corn, or other field crops, such as soybeans and alfalfa. To begin with, field crops tended to be grown for processing and/or animal feed, rather than being consumed fresh by humans. The meant that field crops were generally easier to store and transport. Field crops also tended to be harvested mechanically, whereas many types of produce needed to be picked by hand. Finally, field crops tended to be grown over large acreages, such as the great plains of the U.S. and Canada while most produce were grown intensively in specific areas. California was a major player in many different types of produce. Other states, including Florida, were major players for specific crops such as citrus and strawberries.

Even in areas where a particular type of produce was grown locally, it was unlikely to be available throughout the year. As a result, certain regions shipped most of their product. Exhibit 2, for example, shows how strawberry production varies throughout the year between California, Florida and Mexico. As a consequence, it was often difficult to know the source of a particular produce item that appeared on a grocery store shelf.

Produce Industry Structure

The large variety of produce types, locations and growing conditions within the industry led to complex supply chains. As illustrated in Exhibit 3, the grower/shipper component of the supply chain (itself composed of growers, shippers and consolidated grower/shippers) could sell to a variety of outlets, including:

- General grocery wholesalers, who would in turn sell to retail outlets (e.g., grocery stores) as part of a general product line
- Produce wholesalers, who would in turn sell to either grocery stores or food service operations, such as restaurants and cafeterias.
- General foodservice wholesalers, who would in turn sell produce to food service operations as part of a general product line
- Direct sales to grocery stores
- Direct sales to foodservice operations
- Directly to consumers, although this was a small fraction of the total market.
- Export market, either directly, through brokers, or through wholesalers.

Although there was some evidence that the industry was gradually growing more consolidated—particularly on the retailer/food service side—it remained relatively fragmented overall. Even this, however, varied considerably by crop. For example, according to the USDA, the California grape industry had 149 shippers in 1999 with the largest accounting for only 6% of all shipments. On the other hand, 76% of bagged salad sales were accounted for by the top two companies. The high level of industry fragmentation, particularly among grower/shippers meant that identifying the origins of a particular item of produce (e.g., on the grocer's shelf or served at a restaurant) was very difficult. According to IbisWorld industry reports, the concentration of grower/shippers remained very low in 2010, with no single company accounting for more than 2% of the market.

Produce Traceability Initiative (PTI)

With the growth in the demand for fresh produce and the desire to maintain year round supply, the complexity of the supply chain for produce necessarily increased. With this growth in complexity, identifying the source of food-borne pathogens—such as E. coli and salmonella bacteria—that could occasionally infect produce became increasingly difficult. Ironically, although today's food system was safer than it had ever been in human history, the visibility of the outbreaks that did occur had never been greater. Problems that had once been highly localized to the growing area could now become national or international in scope, as illustrated by the examples in Exhibit 4.

Because problems such as those described in the exhibit tended to provoke consumer responses that were far out of proportion to the actual food-safety risks, grower associations that accounted for the vast majority of North American produce—including the Produce Marketing Association (PMA), the Canadian Produce Marketing Association (CPMA), and UnitedFresh—and GS1-US, a nonprofit organization that manages and registers barcodes joined together to create the *Produce Traceability Initiative* (PTI). The purpose of the PTI was to develop a system whereby produce could be identified with the producer (and even the field) from which it originated. The details of the initiative are described in a PTI pamphlet included as Exhibit 5.

According to the timetable established by the PTI, growers were expected to label each produce case by 2012. While Wishnatzki expected to be in compliance with this milestone, he anticipated that many growers had yet to establish their system. Initially, he anticipated that major chain retailers—such as Publix, headquartered in nearby Lakeland, Florida—would be lenient on suppliers who were not in full compliance. There would come a time, however, when over half of all producers would be labeling their cases properly. At that point, Wishnatzki anticipated that retailers would begin insisting on PTI labeling on *all* produce. Shipments lacking such labeling might then be refused. He guessed that such demands could occur as the summer of 2012.

Wish Farms

Wish Farms evolved from a company founded by Harris Wishnatzki, a Russian immigrant who began by selling produce from a cart in in New York City during the early part of the 20th century. In 1929 he and his partners, the Nathel family, established a produce shipping operation in central Florida—one of the principal produce growing areas in the U.S. By the early 1980s, Gary Wishnatzki, a grandson of Harris, had become president of Wishnatzki & Nathel.

Under Wishnatzki's leadership, the firm established a farming subsidiary in 1987, G & D Farms, that originally focused on strawberries. Over time, these farming operations demanded a growing percentage of management time. By 2001, the company decided to split its distribution business—which operated mainly out of New York by descendants of the Nathel family—from its farming and shipping operations in Florida. Wishnatzki turned his attention to the Florida business, now doing business as Wishnatzki Farms. Under his leadership, the company pursued many new initiatives. As described on the company web site (http://www.wishfarms.com/about-us), these included:

> In 2003, Wishnatzki joined forces with Allen Williford to form Clear Choice Greenhouses, providing organically grown strawberries from a safe, soil-less growing medium. The operation began with a 1-acre greenhouse. The enterprise has been a platform for innovation and experimentation into new ways to grow organic strawberries. In 2006, 13 acres of outside organic strawberry production was added to help meet the demand. Another 6 acres of strawberries in high-clearance tunnels was added the next year.

Gary Wishnatzki purchased Brock Farm in late 2006, adding over 100 acres of strawberries and tomatoes. It was renamed to Trapnell Road Farms. That farming operation increased to 200 acres by 2008. G & D was adding acreage at the same time and grew to over 600 acres in cultivation.

Wishnatzki Farms has entered into the processed strawberry business in recent years. In 2007 the company opened a processing facility to supplement out-sourced production capacity.

The FreshQC quality control and traceability solution was pioneered by Wishnatzki in 2008. The patent pending system allows for a consumer unit to be traced back to the picker that picked it. It has been proven to increase quality through accountability.

In 2010, the Wish Farms consumer brand was established and became the new name of Wishnatzki Farms. This represented a milestone for the company and a major challenge. Traditionally, retailers such a grocery chains had been reluctant to support or emphasize branded produce. The reasons for this were twofold. First, when customers became attached to a brand, they tended to blame the retailer when it was not in stock (rather than the growing season). Thus, attempts to push a particular brand that was not available year-round were discourage. Second, brand loyalty could translate to supplier-power, making it harder for the retailer to negotiate when the same brand could be purchased elsewhere.

To address the concern of year-round availability, Wish Farms established secondary sources for its key products—strawberries, blueberries, green bell peppers and grape tomatoes—in locations with different growing seasons, such as California. With a growing amount of acreage either managed or under contract with 3rd party growers, the challenge of managing the logistics of the operation demanded increasingly sophisticated IT solutions. These were largely addressed through the company's VirtualOne division, which was responsible for the company's technology initiatives.

VirtualOne Division

The VirtualOne division of Wish Farms was established in 2006 as an LLC that was intended to create technologies that could serve to support both internal operations and act as independent sources of revenue. The first three initiatives of this division were the FreshQC solution, VirtualOne ERP software and FireTag. All three contributed to the company's PTI-compliance efforts, and supported its branding initiatives as well.

The *FreshQC* project was built around a software module intended to link produce to its source. It was originally developed for strawberries, where pickers actually placed berries into a consumer package. At the time of picking, a label with a 16-digit code was applied to each of these packages. The consumer could then go to the company's web site and enter a 4-digit pick code, as illustrated in Exhibit 6. Based on the code, the consumer could find out more about the product that he or she had purchased. In addition, the consumer could provide feedback that would be returned to Wish Farms and the grower. During its first full year of operation, 1,300 feedback forms were received. In the second year, that number more than doubled, to 3,100. Not only did this initiative establish the type of virtuous cycle that could cement brand loyalty, it also provided precisely the type of product traceability that would be required by the upcoming PTI.

The *VirtualOne* ERP system was a custom developed package supporting the company's sales, finance, human resources and inventory processes. It was intended not only for internal use, but also as a product that could be sold to other produce growers and shippers. With its built-in traceability functionality, it was better-positioned to meet the needs of these types of companies than the generic ERP packages that were normally sold for small and medium sized companies. By 2011, the ERP software was in use at Wish Farms and was in the final stages prior to product release.

The *FireTag* system was intended to automate the labeling of individual produce cases. Combining IT, robotics and laser technology, it represented the company's most ambitious technology development project to-date.

FireTag: Laser Marking Technology

Central to the PTI process was an identifying label applied to individual produce cases. The main component of each label was a GS1-registered bar code identifying the produce type, the producer and the specific source. The originators of the PTI standards envisioned that these labels would be printed locally then manually applied to each box on a pallet that would typically hold a stack of 30 to 60 produce boxes. There were, however, a number of challenges associated with this process. These included the following:

1. Applying labels manually could take considerable time. This was of particular concern at large operations where all the trucks from the individual farms tended to arrive at the receiving area around the same time, when the day's picking was done. Delays in processing the incoming pallets could keep trucks near the end of the queue waiting for hours, an expensive proposition.
2. Label printing required quite a few consumables (e.g., label stock, ink), generated considerable waste (e.g., label backing), and there were limits to how far in advance labels could be prepared, since the number of pallets arriving from a particular grower would not necessarily be known until the truck arrived.
3. Labels often needed to be applied under conditions that made it likely the occasional label would not adhere properly. For example, some producers might apply them near the field—where it was frequently hot and humid—whereas others might apply them in a cooler where temperatures were kept just above freezing to maintain produce freshness and reduce spoilage. Once PTI became the de facto standard, Wishnatzki anticipated that a missing label might cause an entire case to be rejected by the retailer or—in the worst case—might cause the retailer to refuse delivery on an entire pallet.

Originally, to address the first of these items, Wishnatzki had anticipated developing an automatic labeling system. Bob Pitzer, a senior engineer who worked for the company, was an expert in robotics and was asked to consider the problem. It soon became clear that there would be a number of obstacles. First, whether a label was applied mechanically or by hand, it would take some time to ensure proper adhesion. This time would be even greater where produce crates were involved, since a box could easily be deformed both by the produce inside and by the weight of boxes stacked on top of it on the pallet, meaning that application would need to accommodate any curvature of the location where the label was to be applied. Furthermore, even automating the labeling process would not address the waste and adhesion challenges previously mentioned.

There were also a couple of competing approaches that the company considered. One was using an ink jet to apply label information. Although this technique could be done quickly, it tended to be very sensitive to dirt, humidity and condensation. Unfortunately, these conditions were a daily fact of life in agriculture. Another common solution to product tracking was the use of radio-frequency ID (RFID) tags. The potential advantage of this approach was that an entire collection of objects—in other words, an entire pallet—could be scanned at once, at least in theory. The use of these tags, however, would not solve the problem of applying tags to each case. Moreover, even the most aggressive proponent of the technology—Walmart—was forced to relax a 2003 mandate that all its vendors use RFID as a result of technical issues and vendor resistance.

FireTag Technology

The alternative solution that Pitzer developed involved using a laser to "burn" the bar code and other product information on to each case that was stacked on the pallet. The technology involved a number of key components:

1. A special film coating had to be applied to the label area of each case during the box printing process.
2. A high powered laser—similar to the type used to mark product and date codes on plastic bottles on soft drink assembly lines—needed to be acquired.
3. A robotic system needed be developed that would allow the laser to move up, down and around each pallet so that each case could be marked.
4. A sensing system was required to locate the laser-sensitive film on each box in order to fine tune the laser's position—needed because label position could vary significantly between pallets as a result of shifting and case deformation.
5. A software application was needed in order to provide the operator with easy control over the information used to mark each case and set up the pallet configuration.

The resulting system is shown in Exhibit 7. A video produced by the company that shows FireTag in action is included as Exhibit 8. Selected screen captures from the FireTag software are presented in Exhibit 9.

FireTag as a Product

As the demonstrated capabilities of the FireTag system became evident, the company recognized that the technology was a valuable not only as an internal tool, but as a product in its own right. The benefits of the FireTag system over existing approaches to PTI labeling were many, as described in Exhibit 10. The "green" aspects of the technology fit very well with the organic produce initiatives of Wish Farms. The system's speed was high enough to reduce bottlenecks at the loading dock. Moreover, the company was continuing to develop techniques for increasing speed. For example, by installing a more powerful label, the company could reduce the "burn time" per case from about a second to 0.3 seconds—leading to a savings of over 30 seconds in marking a typical pallet. It was also possible to run the system with two opposing lasers, cutting the marking time in half. These savings appeared to be small in absolute terms but when multiplied by the number of cases packed yearly by a large producer such as Dole (on the order of 40 million) they represented a material contribution to supply chain efficiency.

Construction

The fabrication of FireTag system components was contracted to GEMCITY, a well-respected firm that specialized in design-and-build projects and contract manufacturing. The most expensive component of the system was the laser, purchased from another vendor, which accounted for 20-40% of the cost of a particular system. Because laser systems were heavily scrutinized by the U.S. Occupational Health and Safety Administration (OSHA), extra care had to be taken to ensure that users of the system could not accidentally become exposed to it.

The development of the FireTag software, the main component of which was built on Microsoft's .NET platform, was contracted out to third-party developers. Pitzer maintained nearly daily contact with the developers to ensure needed functionality was included and to report errors.

A key element of the FireTag design was portability. Most locations in the U.S. have only one or two harvests a year. Unfortunately, that meant that a fixed system could only be used for a few months a year, making it hard to recoup the up-front investment. By making the system easily transportable, it became possible to use the system nearly year-round in locations such as California, where the growing seasons of different crops in various micro-climates were spaced throughout the year.

Value Proposition

In fact, the value offered by the FireTag system came from a number of sources, each of which was likely to vary considerably according to the individual customer's situation. These included the following:

1. *Time savings in applying PTI markings.* As already noted, FireTag was much faster than human or mechanical application of labels. The value of this additional speed was less a matter of the per-hour cost of creating and applying labels than of the impact of labeling delays on the efficiency of other loading and unloading activities.
2. *Consumable costs:* Once again, the problem was less likely to be a matter of the direct cost of labels and waste disposal than that of timing, such as replacing label stock and print cartridges. When a line of trucks was waiting to unload, the minutes required to replace these consumables could be very costly.
3. *Costs of unreadable or missing labels*: Particularly as retailers began to adhere strictly to PTI requirements—expected to occur by the end of 2012—a missing label or smeared ink jet barcode could lead to the rejection of a particular case—whose value might range from $10 to $100, depending on the contents—at the retailer's loading dock. In the worst case scenario, an entire pallet of produce—potentially worth $4,000-$5,000 for a high-value crop such as strawberries—could be refused if too many cases lacked readable markings.

Variations in these sources of benefit meant that a "typical" value number was impossible to determine. For example, if a grower/shipper of a crop had a small operation—one that was not usually subject to tie-ups at the loading dock—that focused on a crop that having relatively low value/box and reasonable shelf life, the biggest source of value would likely be direct: the labor and consumable savings associated with printing and applying labels. On the other hand, a high volume producer of a highly perishable, high value/box crop might realize much greater indirect value: from improved efficiency and reduced retailer rejection rate.

Pricing Model

Given the variability of the value proposition for the FireTag system, Rob Ogilbee made projections using a pricing model that he felt would be attractive to most potential customers. It involved three main types of revenue:

- A per-unit fee, based upon adding a small margin (<10%) to the cost paid by FireTag, LLC to its third party equipment suppliers who actually constructed the setup. Depending on the setup (e.g., power of lasers, single or dual laser), the equipment price to the customer was expected to range from $180,000 to $300,000.
- A per-mark fee of $0.01 per case labeled. This was automatically calculated by the software and supplied to the company over the internet, so the customer could be billed
- A software licensing fee

Of these fees, nearly all contribution was expected to come from the per-mark fee, since the licensing fees and equipment margins were both expected to be low and would mainly offset the company's own expenses. FireTag, LLC also expected to pass transportation and setup costs to the customer.

An alternative approach to pricing would be to lease, rather than sell, the system. Leasing, either as a standard practice or as an option, could make the system more attractive to customers by reducing its up-front cash requirements. Naturally, this would also place heavier cash demands on FireTag LLC/Wish Farms.

Another potential source of revenue—albeit highly speculative—was the data that was generated by the system. Published estimates of produce output and value, such as those prepared by the USDA, were

highly unreliable. They were also not timely. If a substantial number of grower/shippers were to use the system, however, the mark information transmitted for billing purposes could also serve as a basis for estimating crop production in real time. This information would certainly be of value to growers and retailers. On the other hand, it might also represent a potential obstacle to the sale of FireTag systems. Large grower/shippers might be reluctant to share such information about their own activities unless appropriate safeguards were put in place.

Target Customers

Based on the characteristics of the FireTag system, there appeared to be two categories of customers for whom the product would provide particular value:

1. Large regional grower/shippers specializing in perishable, high value crops. Wish Farms, with its major presence in central Florida—where many vegetables are grown year-round—and its strong position in the strawberry market was an example of such a company.
2. Large national or multinational grower/shippers that operated in multi-season regions—such as California—that would allow the system to be transported and operated throughout most of the year.

In addition, there was the long-term potential for international sales—after the 2011 E. Coli deaths, Europe was becoming highly receptive to greater traceability. There was also the possibility that the system might be used for marking cases in entirely different industries. The challenge here was identifying the types of products that derived the greatest value from the capabilities that the FireTag system offered.

Current Situation

By late fall 2011, a number of FireTag prototypes had been completed and the company prepared for its first full-scale field test. By that time, around $1 million had been invested in the product's development. Ogilbee estimated that the additional cash requirements of bringing the FireTag system to market could range from:

- $2-3 million, assuming that customers purchase the system
- Up to $10 million, assuming that customers lease the system—meaning that the initial costs of constructing the systems would be born entirely by FireTag, LLC

Included in these costs were the costs of acquiring the key components (e.g., from GEMCITY and the laser manufacturers), the costs of marketing the product and the ongoing costs of further development.

Up to this point, Wish Farms had underwritten the entire cost of FireTag development. Now that a workable prototype was available for internal use, however, it made sense to ask if third parties were willing to invest in the costs of bringing FireTag to market. If not, would it make sense to continue viewing the system as a product?

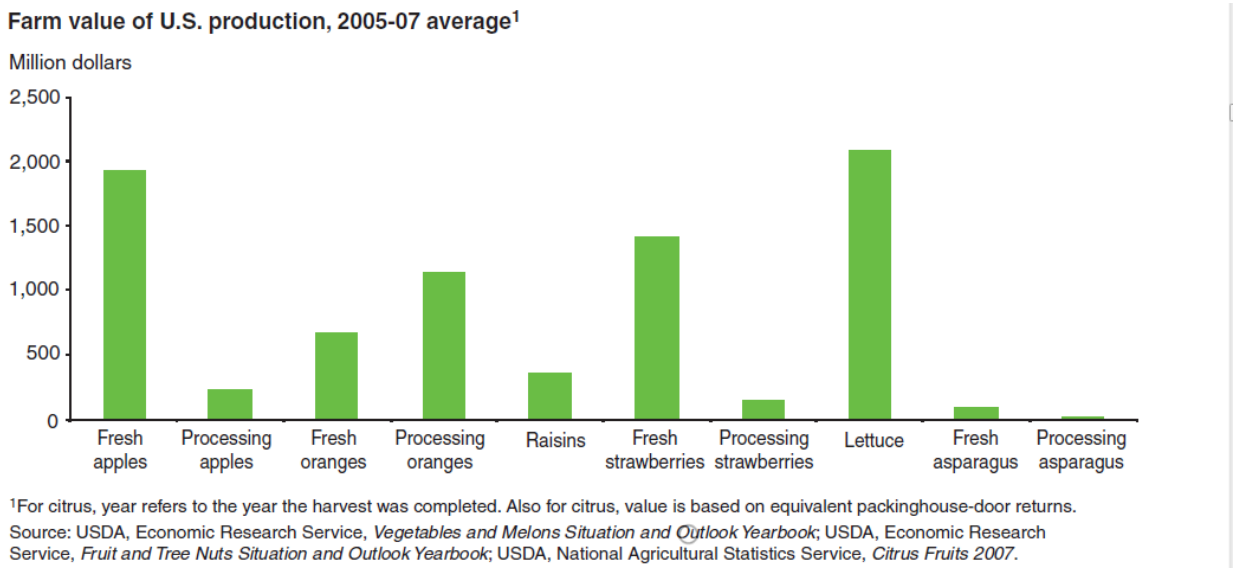
There were a number of different avenues for funding that FireTag, LCC might pursue. The most promising of these included the following:

1. *Supplier funding*: A number of the key component suppliers for FireTag—most notably GEMCITY and the laser manufacturer—would stand to gain significant business if FireTag achieved substantial market penetration. Given this synergistic benefit, would they consider investing in the company—either directly or through supplying components in exchange for equity? Another potential investor was the manufacturer of the film used for laser marketing. Not only would widespread use of the system lead to per-box revenue for that company, it would also serve as a demonstration of the product that might be applied to other industries seeking to mark their cases.

2. *Grower/Shipper funding*: Several large grower/shippers had expressed considerable interest in the FireTag system. One major player had seemed almost mesmerized by the demonstration video (Exhibit 8) which had been playing in a continuous loop at the FireTag booth at a major produce trade show. One challenge presented
3. *Retail customer funding*: For retailers, such as grocery chains, compliance with PTI requirements was seen as a particularly pressing challenge. The benefits of FireTag could give them an incentive to speed its penetration into the market. Perhaps that could be used as to make a case for an investment—although the window for this particular opportunity was likely to be short-lived.
4. *Third-party investor funding*: FireTag was a proven technology—as shown by the prototype—that was protected by patents (still under review) and met an important need—PTI compliance. For these reasons, investment in the system could be seen as a relatively safe bet, once the size of the potential market could be determined. Unfortunately, agribusiness was not normally seen as an attractive area for venture investors, who tended to prefer high-growth sectors such as information technology and medicine. Nevertheless, reasonably good returns without huge risk had proven to be elusive during the economic downturn that began in 2007 and the agricultural sector in the U.S. was currently strong.
5. *Wish Farms*: As a last resort, the company itself might consider further investment in the product. From Wishnatzki's perspective, however, a great deal of the value of the product had already been realized by virtue of its availability for his own operations. Did he need to double down by further funding its entrance into the market?

Many of the questions surrounding FireTag's future hinged on the potential size and attractiveness of the market. Ogilbee had prepared his own projections, showing a strong rate of return. It would be useful, however, to get some additional insights into the matter.

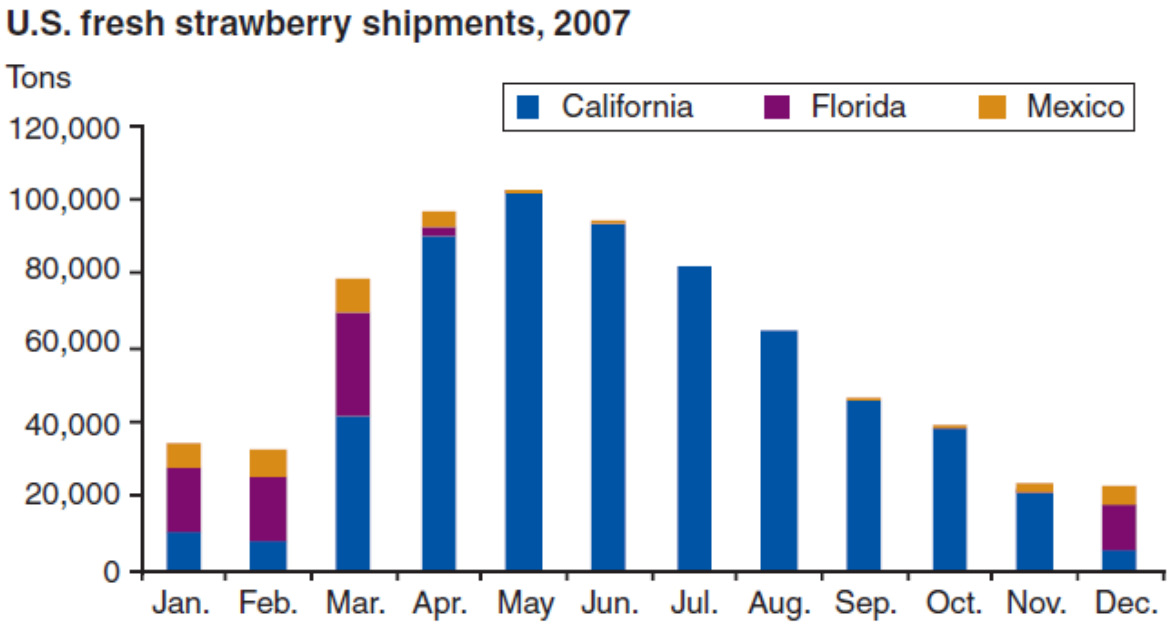
Exhibit 1: U.S. Production of Selected Produce



[1]For citrus, year refers to the year the harvest was completed. Also for citrus, value is based on equivalent packinghouse-door returns.

Source: USDA, Economic Research Service, *Vegetables and Melons Situation and Outlook Yearbook*; USDA, Economic Research Service, *Fruit and Tree Nuts Situation and Outlook Yearbook*; USDA, National Agricultural Statistics Service, *Citrus Fruits 2007*.

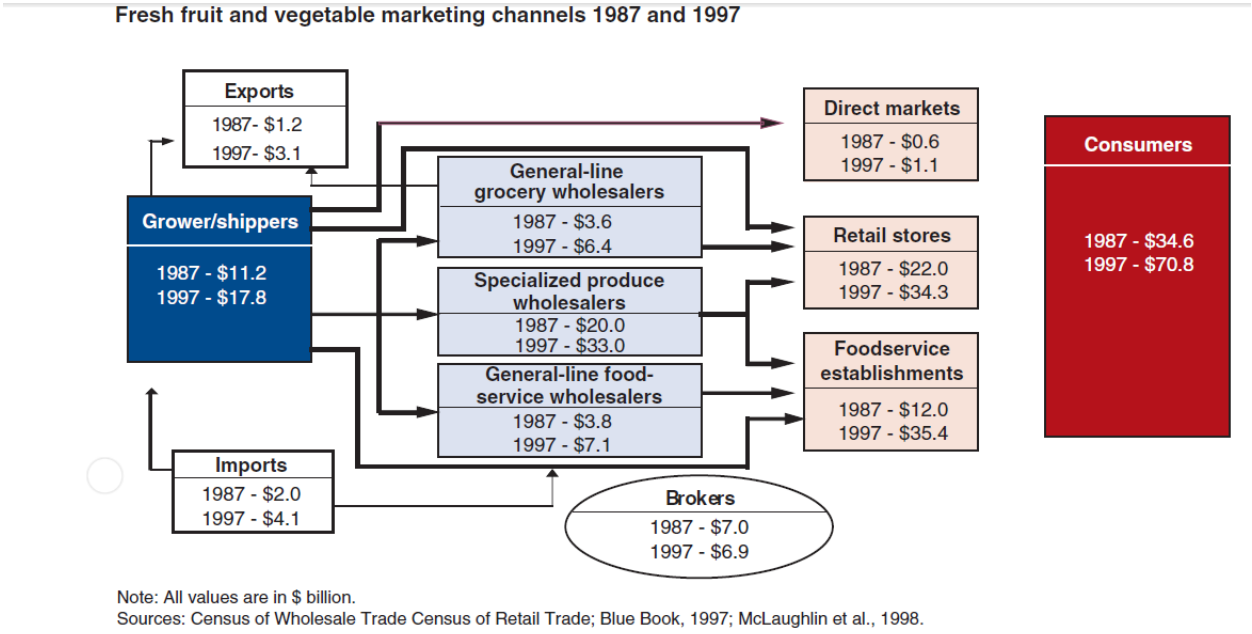
Exhibit 2: Seasonal Strawberry Shipments



Note: California, Florida, and Mexico represent virtually all fresh-market shipments reported by the Agricultural Marketing Service.

Source: USDA, Agricultural Marketing Service, Market News Service, *Fresh Fruit and Vegetable Shipments*.

Exhibit 3: U.S. Production of Selected Produce



Source: Economic Research Service/USDA (2003) *U.S. Fresh Produce Markets: Marketing Channels, Trade Practices, and Retail Pricing/AER-825*, p. 7.

Exhibit 4: Recent Examples of Produce-Related Illness

E. Coli in Spinach (2006)

In the fall of 2006 there was a major E. coli outbreak in spinach. The outbreak was first recogninized in late August and led to over 100 hospitalizations and at least one death. This major outbreak showed the inefficiencies in our food supply regarding traceability and identifying the origin of contaminated product. Over 30 suppliers of fresh spinach recalled all porduct being produced in a 6 week period. This recall not only hurt all suppliers of fresh spinach, but forced consumers to question the safety of fresh fruit and vegetables.

Supposed Salmonella in Tomatoes (2008)

In June of 2008, anotehr foodborne illness outbreak occurred; this time the suspect was tomatoes. The Center for Disease Control (CDC) first received reports that a dozen people across nine states were sickened by salmonella linked to consumption of raw tomatoes. That dozen turned into close to 200 reported cases in less than a week. Furthermore, the origin of the contaminated product was unclear, leaving millions of containers of tomatoes in question. This resulted in a devastatating impact on the industry and, once again, chipped away at consumer confidence. After months of investigations, it turned out to be jalapeno pepper that was carrying the samonella. Nevertheless, the event severely impacted tomato growers across the U.S.

E. Coli in Lettuce (2010)

In May 2010 romaine lettuce was found contaminated with E. coli. It was immediately linked to romaine lettuce being distributed by Freshway Foods with a “use by date of May 12”. They had a list of chain stores and food service companies that purchased the contaminated product to minimize the number of cases. It is estimated that 19 to 39 people from a two or three state area may have been affected by the product.

E. Coli in Europe (2011)

Most recently, the E. coli outbreak that hit Europe in the spring of 2011 highlights the need for and benefits of traceability. It took over a week once the suspect Fenugreek seeds were identified as the cause to trace them back to their source. The seeds were sold to a distributor which, in turn, sold them to 70 different companies in 12 different countries. It took weeks to track all the seeds down. Had case-level traceability been in place, days and even weeks could have been cut from the tracking process.

Source: Adapted from *FireTag: Laser marking Technology Confidential Information Memorandum.*

Exhibit 5: Produce Traceability Initiative Brochure

The Produce Traceability Initiative

Working to achieve standardized, electronic (computerized) traceability across the supply chain.

Benefits for Trading Partners

Enhances and maintains the confidence of consumers and government, supporting commitment to food safety

- Limits the scope and cost of recalls to suspect product only
- Improves traceability – quicker and more accurate recalls/product withdrawal
- Full visibility/transparency
  – Field to cooler, crop management
  – Improves inventory management
- Speeds delivery of orders to retailers and foodservice distributors/operators
- Better business intelligence regarding customer needs
- Business process improvements in the packing shed and administratively with information flow; finished case sorting; overall streamline of processes
- Reduction/Elimination of costs (pre-printed cases)

What the PTI is About:

- Use of GS1 System standards for standardized product information
- Case level tracking
- Electronic recordkeeping
- Farm to Store

The Produce Traceability Initiative is a voluntary, industry-wide effort designed to help the industry maximize the effectiveness of current track and trace procedures, while developing a standardized industry approach to enhance the speed and efficiency of traceability systems for the future. Industry participants cover every segment of the produce supply chain. The PTI is an industry-led, supply chain-wide Initiative governed by a 34-member Leadership Council. The work is carried out by volunteer-led working groups in the areas of Implementation, Master Data, Technology, and Communications and is administered by Canadian Produce Marketing Association (CPMA), GS1 US, Produce Marketing Association (PMA) and United Fresh Produce Association (UFPA).

Now is the Time to Get Involved and Participate

Are you waiting for the Food and Drug Administration (FDA) to finalize traceability regulations to implement the **Food Safety Modernization Act** before you begin implementing the Produce Traceability Initiative?

That may put you behind the curve. Michael Taylor, FDA Deputy Commissioner for Foods, recently told the PTI Leadership Council, "we know we are going to need to build on and embrace the work that industry has done." When informed that some industry members are delaying implementing the PTI until FDA regulations are finalized, Taylor discouraged that notion, responding, "When real progress is being made, we encourage that and don't want our process to be an obstacle." In other words: **Don't wait, begin implementing the PTI now.**

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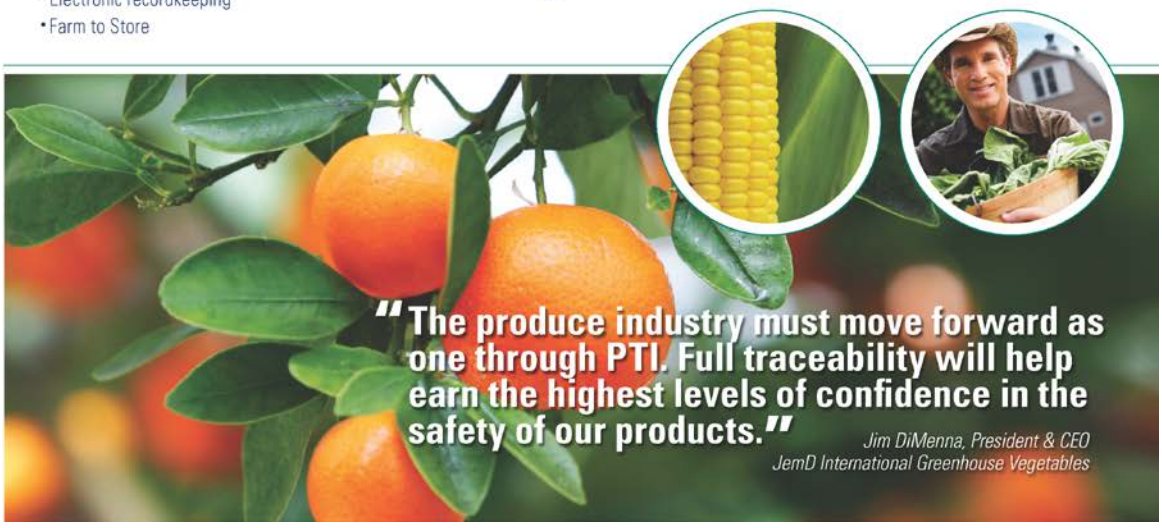

Why Do We Need the PTI?

The produce industry handles an estimated 6 billion cases of produce in the United States each year. However, industry leaders have recognized that a more systematic, industry-wide approach would enhance overall supply chain traceability in speed and efficiency. The use of standards in the supply chain across the industry will significantly enhance the ability to narrow the impact of potential recalls or similar problems, protecting both consumers and industry members.

Benefits of the GS1 System

- **GS1 Company Prefix** uniquely identifies a single company. A GS1 Company prefix is required to create GS1 identification numbers such as the GTIN, to ensure the number is globally unique.
- **Global Trade Item Number** (GTIN) is used for uniquely identifying trade items, which includes products and/or services that are sold, delivered and invoiced at any point in the supply chain. The GTIN allows organizations to identify trade items at all levels of packaging (item, case, and pallet) as well as accurate machine reading of those trade items when placed into GS1 barcodes.
- **GS1-128 Barcode** is a case level barcode that allows companies to encode additional information with the GTIN, such as lot number and best-before dates.

	PTI Milestone(s)	Date
M1:	***Obtain a GS1 Company Prefix***	Q1' 2009
M2:	***Assign GTIN Numbers*** Brand owners will assign 14-digit GTINs to every case configuration.	Q1' 2009
M3:	***Provide GTIN Information to Buyers*** Brand owners will provide their GTINs (and corresponding data) to their buyers.	Q3' 2009
M4:	***Show Human Readable Information on Cases*** Packers are responsible for providing human-readable information on each case.	***2011***
M5:	***Encode Information in a Barcode*** Packers are responsible for encoding the GTIN and Batch/Lot Number.	***2011***
M6:	***Read and Store Information on Inbound Cases*** Each subsequent handler of the case will have the systems and capability to read and store the GTIN and lot number from each case of produce received.	***2011***
M7:	***Read and Store Information on Outbound Cases***	***2012***

Produce Traceability Leaders

Dozens of visionary North American food companies, ranging from small farms and global fruit growers to international retailers and restaurant chains, are taking leadership roles by participating in working groups in the PTI. For a full list, please visit *www.producetraceability.org/companies/*

For more information, visit the PTI website at www.producetraceability.org

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9/2011

Source: http://www.producetraceability.org/documents/PTI%20Flyer_FNL_v2%202011-10-20.pdf

Exhibit 6: FreshQC Web Page

FreshQC

FreshQC™ QUALITY ON TRACK

How's My Picking?™

Go

Enter the pick number from your label.

Do You Want High-Quality Produce?

Now you can help improve the quality of your produce by telling growers exactly what you think. Whether it's good news or bad news, they want to know. FreshQC links your comments to the person that picked your produce! For the first time, exceptional pickers can be rewarded for their extra efforts to pick only the best. Not only that, FreshQC allows growers to learn which varieties were a hit and which fields produced the favored produce. With FreshQC, everyone becomes more accountable for quality – including you!

TRACE BACK FROM CONSUMER TO PICKER >>>

>>>

Exhibit 7: FireTag Process

FIRETAG
LASER MARKING TECHNOLOGY

August 15, 2011

Pallet is placed onto rollers

Camera reads the pallet tag as the pallet enters the system

Camera locates the film patch pre-applied by the box manufacturer

The laser brands each box with specific barcode information

ID TECHNOLOGY
a division of Pro Mach
GEM
engineering and manufacturing
FUJIFILM
CODEStream

Development Partners

Exhibit 8: FireTag Video

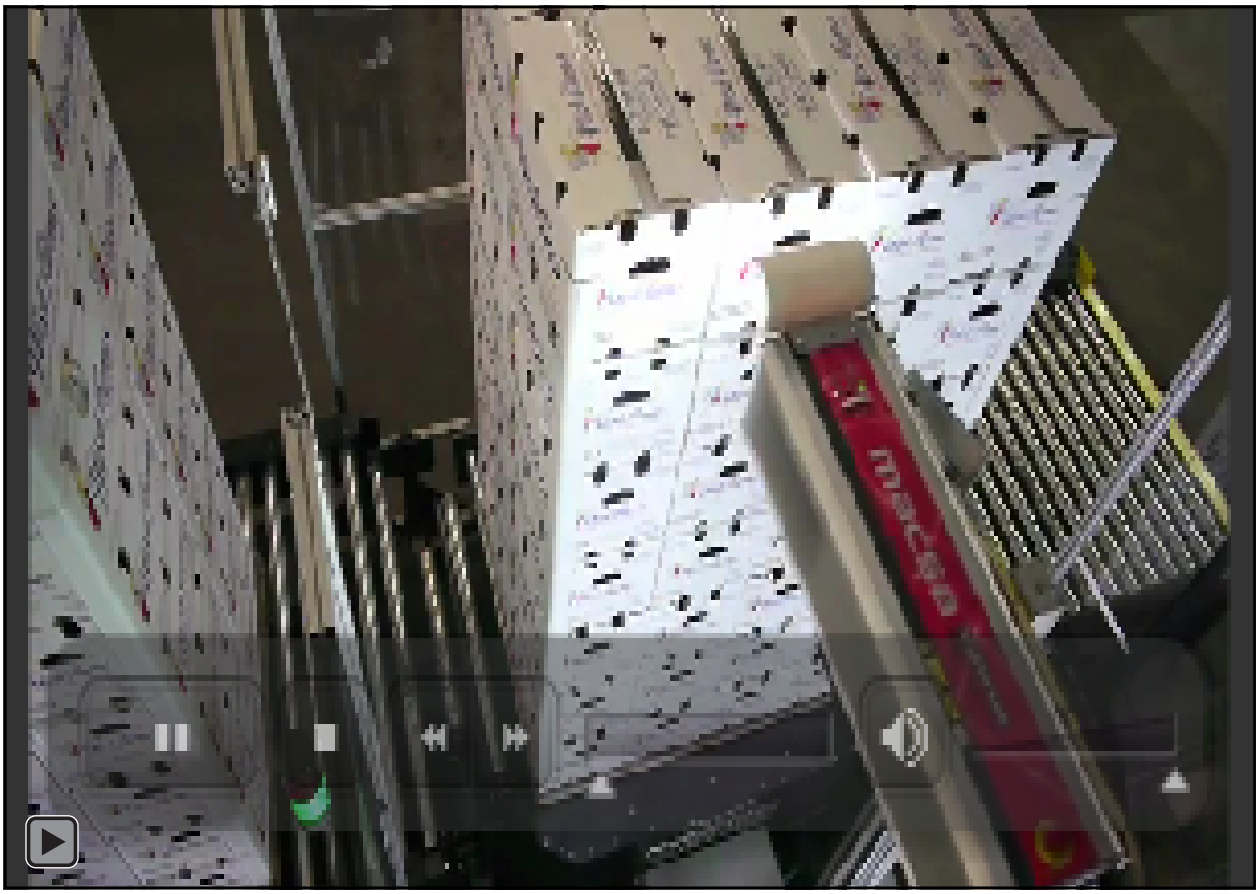
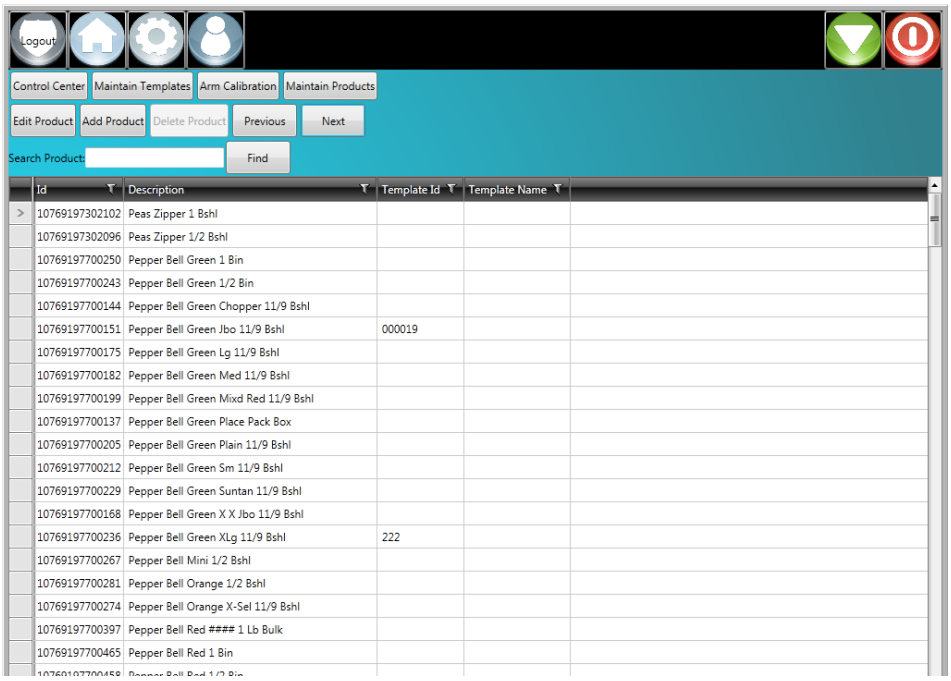


Exhibit 9: Selected FireTag Software Screen Captures



Screen used to select the produce type, used to set the barcode that will be “burned” on each case.

Screen used in the maintenance of the system, identifying where pallets are on the system and how many marks the laser has made on the pallet.

Exhibit 10: Features and Benefits of FireTag

- Green Technology (No consumables)
    - Laser head burns mark on box. This mark contains a GS1 barcode and human readable element. There are no disposables or wasted labels.
- Eliminates bottlenecks in label application
    - Marking speed of FireTag is under one second. This allows the user to handle surges in volume without increasing labor. There are no labels to print, distribute or track.
- Minimizes human element with automation
    - FireTag is fully automated and can identify and mark varying pallets of product with no human interaction. FireTag manages the full process once the product is positioned on rollers.
- Can be used in the receiving dock, the cooler, or shipping exit
    - This flexibility allows you to mark the product in the area that is best for the customer's needs.
- Heavy duty, functions in harsh environment
    - FireTag is fabricated with high quality materials. It is constructed to operate in the most demanding conditions.
    - Made of steel, FireTag is durable with an IP 65 electrical rating; resistant to water, dust and dirt.
- Easily transportable from one operation to the next
    - FireTag is constructed to be easily transported by a standard trailer. It takes up about 6 pallet spaces and requires very little assembly and breakdown from one operation to the next.
    - Designed for heavy utilization and low maintenance.
- Software is configured for rapid data collection
    - FireTag is tailored to mark and collect data quickly. It can be modified for any operation to maximize efficiency and ease of use.
- Internet enabled
    - FireTag is connected to the Internet and can stream data to any designated computer and be maintained by a remote operator.

Options:

- Custom software configuration
- Dual lasers for increased pallet marking speeds
- Future application development will be tailored to solve any PTI requirements

Source: *FireTag LLC Internal Memorandum*