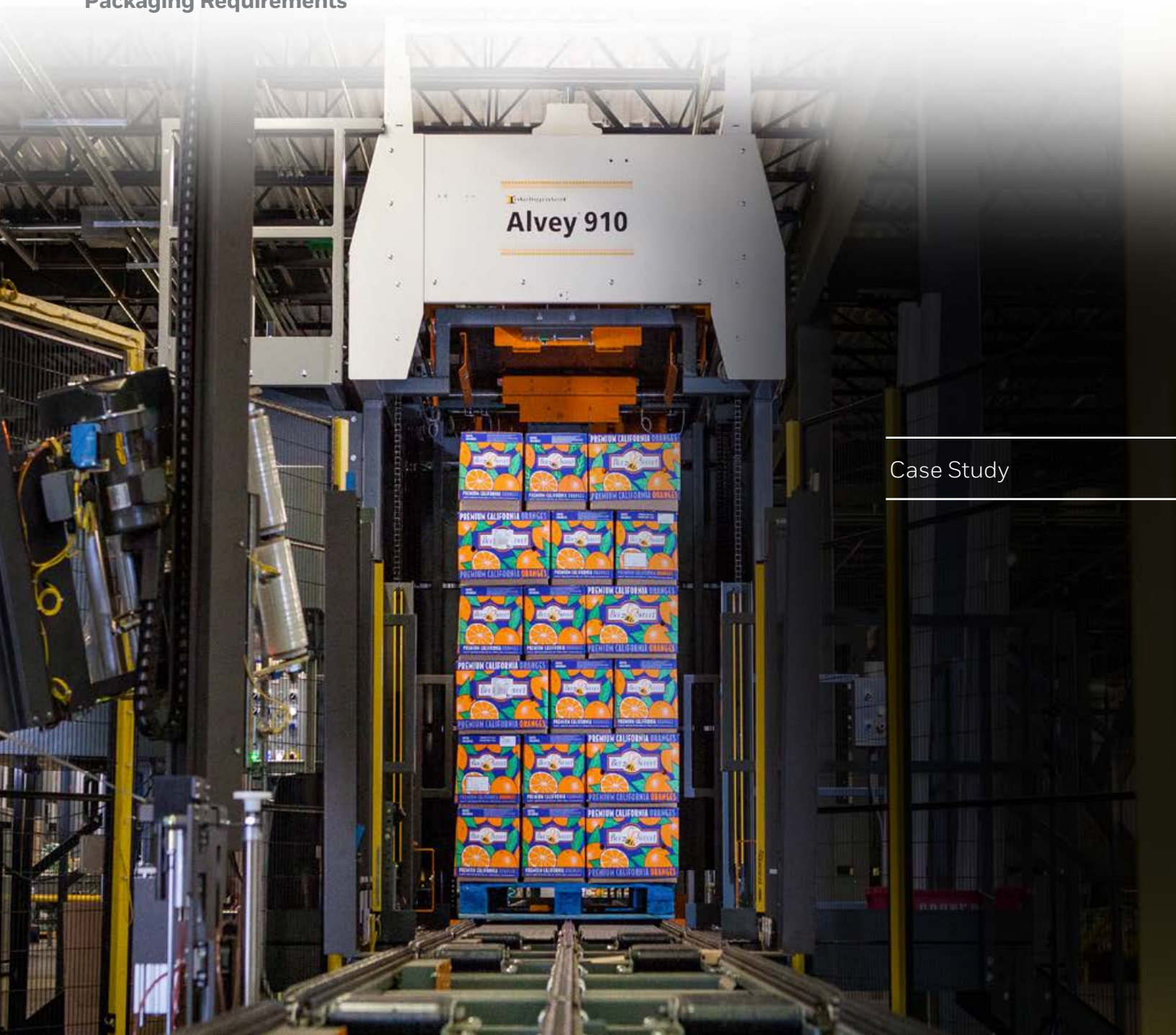


BEE SWEET CITRUS

Collaboration Results in Automated Palletizing Solution
With Flexibility to Accommodate Diverse Product,
Packaging Requirements



Case Study

Collaboration Results in Automated Palletizing Solution With Flexibility to Accommodate Diverse Product, Packaging Requirements

New System Increases Operational Efficiency and Safety, Reduces Labor Requirements

Please note: “Honeywell Intelligrated” within this case study refers to Intelligrated, which Honeywell acquired in 2016.

Bee Sweet Citrus is an independent packer and shipper of California citrus, offering year-round access to oranges, lemons, grapefruits, blood oranges, mandarins, tangelos and pomelos. The company’s 400,000 square-foot campus in Fowler, California, can process more than 3,500 bins of citrus per day and offers cold storage capacity for 280,000 cartons of citrus. On average, 125 citrus-laden trucks depart Bee Sweet each day, serving a global market that stretches from Europe to Australia. With access to so many different types of citrus, Bee Sweet enables retailers to streamline the procurement process by sourcing multiple product types from a single source, rather than using different suppliers for each.

But the Bee Sweet story starts smaller, with President Jim Marderosian’s search for a summer job during college.

“I had a roommate who I helped sell produce on the weekends at swap meets and farmer’s markets,” said Marderosian. “Produce houses paid a pretty solid

Bee Sweet ships 10 million cartons of citrus each year.





Bee Sweet has 10,000 acres of citrus groves, including partnerships.

wage, so when it came time to find work during the summer, I applied to all I could find. One gave me a chance and I started working from the ground up. It was one of the hardest jobs I've ever had, but it was a great start and I learned a lot.”

From that first exposure to the industry, Marderosian developed a route to supply local supermarkets, eventually securing Bee Sweet's first location – a barn located in the San Joaquin Valley. This location started out handling 10,000 cartons in its first year, with 5–10 seasonal workers who continue to work with Bee Sweet today. Eventually, the company grew to handle increasing volumes and opened its first packing house in Fowler.

The new location marked the advent of what has become a signature element of Marderosian's business – investments in sophisticated equipment and technology in the pursuit of greater efficiency. Continued growth blossomed into a second packing house in Fowler, and the company scaled up to serve its current volume of 10 million cartons per year, serving big-box retailers, grocery stores and export markets.

More than 4.5 acres of solar panels cover the rooftops of the Bee Sweet campus.





Bee Sweet's packing facility can run more than 3,500 cases of citrus per day.

The Pursuit of Efficiency Extends to Palletizing

Marderosian's interest in automated palletizing dates back to the early 1990s. However, one of the company's competitive strengths provided a special challenge for automated palletizing solutions – its diverse product offering. Bee Sweet supplies many types of citrus for various brands around the world, each requiring different packaging, pallets and layer patterns. This concoction of complexity led Marderosian to continue manual palletizing processes.

Eventually, rising labor costs, safety concerns, high staff turnover and potential production increases meant that remaining profitable and reaching peak efficiency required investment in an automated palletizing solution.

"With labor being as difficult and as tight as it is, it really made sense to look at automatic palletization," said Marderosian. "Thing is, the more I researched, the more complicated it seemed to me."

Vendor Selection and Collaboration

Bee Sweet required a vendor with the product offering, engineering knowledge, project management acumen and industry experience to deliver a complete end-of-line solution. Marderosian began serious research in 2014, engaging five material handling system suppliers and soliciting input from other citrus suppliers with experience from their own palletizing projects.

"Some competitive operations were just using palletizing equipment to handle the most common size cartons and packaging, but that still leaves a lot of hand labor stacking boxes," Marderosian explained. "I wanted to see how many different styles we could palletize automatically."

Therefore, Marderosian prioritized system flexibility. The solution would have to handle a multitude of product, packaging and pallet configurations to achieve the highest utilization and provide the associated labor savings and productivity increases to drive return on investment. With such complex requirements, finding the right vendor required a thorough, deliberate process.

“I was a little hesitant at first due to the degree of complexity,” said Marderosian. “Other automation vendors didn’t understand the variability of product handling, nor were they able to deliver the configurations we needed.”

But Honeywell Intelligrated was able to check all of those boxes. In addition to providing the necessary equipment, Honeywell Intelligrated also offered a process marked by clear, consistent communication, thorough operational analysis and collaborative decision making. The Honeywell Intelligrated team took the time to research and understand Bee Sweet’s unique business challenges and leverage their citrus industry expertise from previous projects to produce a superior solution concept.

“At that point, I started to have confidence that Honeywell Intelligrated knew what they were doing, and they had the manpower to do it,” said Marderosian. “The team and the process were critical for us to work through these details and get the system to work how we needed.”

Honeywell Intelligrated developed a simulation program to model the operational benefits of the proposed automated system. The program used actual production data to model daily labor savings and efficiency gains to enable the most informed decision possible and set realistic expectations.

After a competitive bid process spanning three months, Bee Sweet selected Honeywell Intelligrated for its strong track record in the citrus industry, comprehensive product offering, integration experience and robust engineering capacity.

From left to right: Thomas Marderosian from Bee Sweet; Tim Lasko from Honeywell Intelligrated; Jim Marderosian from Bee Sweet; and Dave Stinson from Honeywell Intelligrated





Software determines stacking patterns based on product, packaging and pallet composition.



Automation Streamlines Compliance

Food safety regulation is a driver for automation in the citrus industry. As product traceability initiatives become ubiquitous, automated packing and palletizing systems with unique data signatures provide a welcome aid for compliance.

The Bee Sweet palletizing system uses integrated barcode scanners to ensure the right cases make it onto the right pallets. Additional barcode identification labels are printed and applied to each pallet load before it leaves the facility to enable tracking through later stages of the supply chain.

Building a System for Tailored Performance

The Bee Sweet campus uses a 31,140 square-foot building for palletizing. The company's diverse product range means the new system has to handle six packaging types, from open-top nested trays and telescopic cases to reusable plastic containers and euro cartons. Bee Sweet's global reach also requires compatibility with three different types of pallets to meet geographic specifications and retailer preferences. This diversity of product, packaging and pallet means that no two loads are exactly the same. Therefore, software plays a critical role in determining load composition and pattern creation based on inputs from upstream scanning systems.

"In order to accommodate such a high level of complexity, we needed a multi-part system with scanners, barcodes, conveyor, sortation and palletizing," explained Marderosian. "That's why Honeywell Intelligated's expertise and collaboration with our team were so important, to get all these moving parts on the same page."

Meeting these special requirements resulted in several exclusive modifications to the Alvey® 910 series palletizers to deliver reliable high throughput while maintaining superior load quality and a high nesting percentage. Innovative controls and software enable the system to provide exceptional load stability and facilitate automatic changeover for consistently high throughput levels, even as incoming product fluctuates based on citrus and packaging type.

Bringing the system online without derailing production required a carefully planned, phased implementation process. Honeywell Intelligrated began by installing the auxiliary hand-palletizing loop, then brought the automated palletizers online. Installation took place at night to minimize interruption during normal business hours.

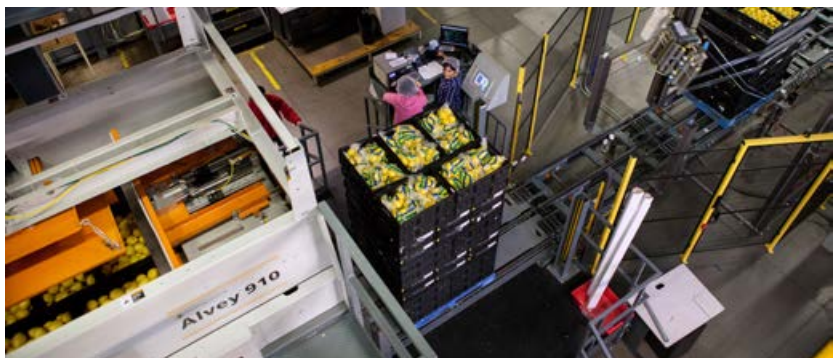
System at a Glance

The Bee Sweet palletizing operation starts with three conveyor input lanes leading from the packing building to the mezzanine area of the palletizing facility, enabling more efficient use of vertical space. The system then divides cases for automated and manual palletizing. On average, 80 percent of cases are destined for a pair of Alvey 910 series high-speed palletizers, and the remaining 20 percent head for hand-palletizing loops.

The cases destined for automation travel down a sliding shoe sorter where they are diverted to one of 28 accumulation lanes, 14 per palletizer. Once a full pallet quantity accumulates in a conveyor lane, the system releases the line of product to the palletizer.

When the pallet load is complete, employees manually apply corner boards and pallet tags for tracking purposes. The load then travels down a pallet conveyor to a stretch wrapper for banding, a special type of wrap used for produce that allows breathability while ensuring load stability. Further transport via pallet conveyor moves finished loads into position for forklift pickup.

The system can handle six packaging types and 27 stacking patterns.





The automated palletizing system frees employees to assume higher-level positions.

Bee Sweet Equipment:

- Two Alvey 910 series high-speed in-line palletizers
- 28 lanes of Accuglide™ accumulation conveyor
- 215 feet of pallet conveyor
- Two Orion stretch wrappers
- SSI mezzanine
- IntelliSort® sliding shoe sorter

Holistic, Thorough Approach Delivers Results

Honeywell Intelligrated provided a comprehensive, integrated end-of-line palletizing solution that met Bee Sweet’s business goals of high equipment utilization, reduced labor requirements and increased operational efficiency. The system is capable of handling 95 percent of Bee Sweet’s citrus varieties, with the flexibility to run 27 different stacking patterns and complicated pallet configurations.

The facility continues to meet its throughput target of 50,000 cartons per day, but does so far more efficiently with fewer and shorter shifts. Palletizing labor requirements dropped from 60 to 10 employees – an 80 percent reduction. The new system enables employees to avoid the most stressful manual work, alleviating lifting and twisting, while reducing congested forklift traffic.

“Machines don’t get tired like people do, and combined with relocating staff to higher-level positions, we have more consistent production, improved safety and reduced turnover,” said Marderosian.

Furthermore, as the minimum wage in California rises, the timetable for Bee Sweet’s return on investment continues to shrink. Rather than an initial estimate of seven years, Marderosian expects a time frame closer to five or six years. The overall solution design also provides for additional automation, with room for a third palletizing line.

“Honeywell Intelligrated understood our problems and helped us improve the efficiency of our overall process,” Marderosian explained. “Their team has great expertise, and our collaboration is what made this project a success.”

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