

## Pre-Cooling Produce: Cut-to-Cool Solution to Reduce Shrink and Maximize Shelf Life

### Situation: Need for Product Level Temperature Monitoring from Cut to Cool

It has been estimated that between 10 and 40% of produce that is grown will never be eaten. Once produce is harvested it begins to deteriorate due to the damaging effects of temperature, handling, microbial activity and the respiratory activity of ethylene production. The removal of heat from produce as soon as possible after harvesting has been proven to extend shelf life and improve the overall product quality. Produce harvested in one field where the ambient temperatures are 80 to 100F may be subjected to accelerated rates of ethylene production, water loss and decay whereas produce harvested in a field with lower ambient temperatures may see slower rates of deterioration and degradation.



Field temperature, humidity, produce temperature and the time from cut-to-cooling are all important pieces of data that are needed to make the critical decisions of selecting and sorting produce that will ultimately increase profit and reduce shrinkage.

Collecting temperature and humidity data beginning at the point of harvest has been difficult and in general has not been cost effective for most companies. When this data is collected, it is often processed and analyzed after the key decisions have been made giving the information a historical perspective instead of an immediate decision making value. DeltaTrak's radio frequency (RF) data logger technology is now available making the collection of this vital information not only possible but cost effective and practical. Data is summarized in real-time and provides information that can be used to make important postharvest handling decisions.

### Solution: FlashTrak Telematics Cut to Cool Solution

DeltaTrak's cut-to-cool solution provides monitoring of produce temperatures from harvesting in the field through the pre-cooling stage, and all the way into cold storage. When packing takes place in the field it is important to know how long the harvested produce is exposed to damaging temperatures before being cooled. Our

#### Solution Benefits

- Time, Location and Condition Information
- Cut-to-Cool Supply Chain Monitoring
- Reduce Temperature Related Shrink
- Enhance Process Evaluation
- Optimize Freshness
- Reduce Energy Costs with Improved Operations

#### FlashTrak Telematics Technology

- Easily monitors product temperature at the pallet or case level
- Monitor temperatures inside pallets or cases without unpacking

#### ColdTrak Data Central

- Access to data 24/7, from anywhere in the world
- Quick view of temperature data and graphs
- Customizable reports, alerts & alarms

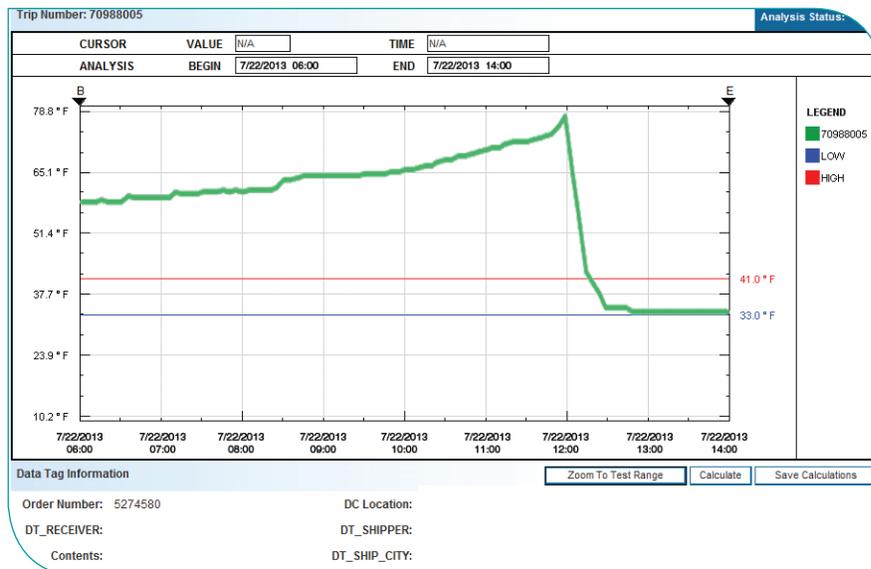
solution monitors these temperatures, beginning in the field, continues during the transportation phase from the fields, and as produce is being aggregated, sorted, cooled and stored.

FlashTrak Telematics (TM) RF temperature data loggers are used to collect data which is uploaded and correlated with other harvest data to create traceability information. Upon arrival at the pre-cooling facility, the TM Data Loggers can continue with the produce during the cooling phase and can provide temperature data as the produce is being cooled.

DeltaTrak's Telematics cut-to-cool solution provides advanced product internal temperature modeling for accurate estimates of internal product temperatures or data loggers with probes for sampling the actual internal product temperature of the product being transported.

Forced air cooling and hydrocooling are both efficient and accurate however, they don't usually cool all of the pallets and containers evenly. Having TM Data Loggers placed with the product being cooled in key locations will collect data on the different rates of cooling and provide real-time information so decisions to control and optimize the cooling equipment can be made. Following the cooling phase, TM Data Loggers can travel with the product into the cold storage area.

Maintaining even and consistent temperatures zones in cold storage is important to optimizing the shelf life of produce. Optimum temperatures must be maintained throughout the facility, however without temperature monitoring at multiple locations throughout the facility it is not possible to know the exact



temperature and humidity levels of each zone or area. Due to the size of most facilities and the air circulation patterns in these buildings, uneven cold areas can be created that may cause freeze damage or accelerated degradation. Knowing where temperatures are at their high and low points throughout the storage area provides actionable data that can be used to make immediate adjustments to cooling equipment that will help to optimize product shelf life, reduce shrinkage, minimize product damage from excessive heat or cold, and reduce operational expense in energy use.

DeltaTrak's Telematics cut-to-cool solution uses modern wireless RF data loggers that have been proven to operate in the cut-to-cool environment. The FlashTrak Telematics RF receivers are durable, reliable and can be placed in field locations, in transportation vehicles and in cold storage facilities that have been designed for produce processing and storage. As real-time temperature data is collected it is sent to ColdTrak Data Central, DeltaTrak's secure cloud application, using 3G/4G cellular data networks or through WiFi and local area networks. ColdTrak Data

Central is accessible from most modern web browsers and provides an intuitive and easy to use interface making data easy to access, analyze and understand. ColdTrak Data Central is being used by many large and small installations worldwide and has proven to be a reliable and affordable solution.

### Results: Reduced Shrinkage, Maximized Shelf Life, Improved Efficiency

Using DeltaTrak's cut-to-cool solution to monitor produce temperatures beginning in the field allows growers, packers, sales and produce suppliers to optimize shelf life and, increase revenues by more efficiently tracking temperatures as soon as produce is harvested, through pre-cooling stage and on to cold storage and distribution.

With accurate, real-time temperature information, produce suppliers can reduce energy costs and shrink by adjusting equipment and improving operational and handling practices to maintain ideal temperature conditions. FlashTrak Telematics removes the guess work and provides actionable, real-time data.

DeltaTrak® is a leading innovator of cold chain management, environment monitoring and food safety solutions for the food, pharmaceutical, life sciences and chemical industries. Contact DeltaTrak by phone at 1-800-962-6776 or by email at marketing@deltatrak.com. Additional information can be found at www.deltatrak.com.

