



# Zest Fresh | Metrics



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### Measuring and Managing Operational Efficiency for Growers and Suppliers

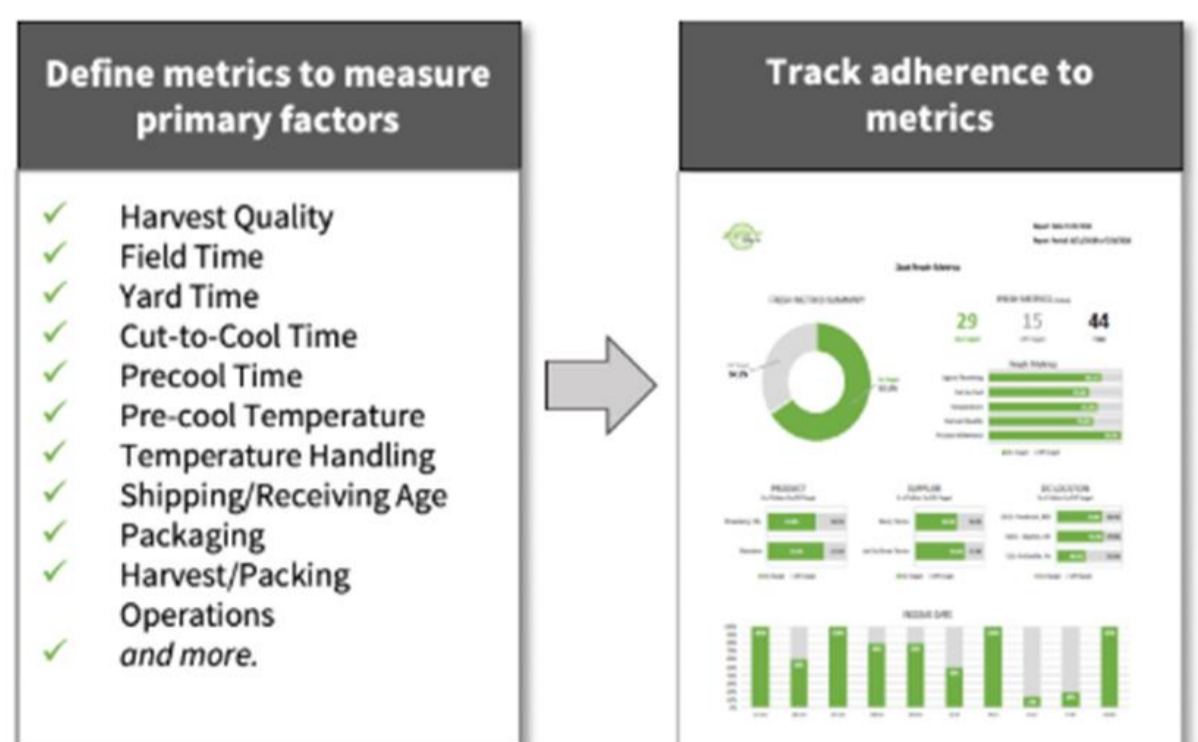
Zest Fresh | Metrics™ helps growers, shippers, suppliers and processors measure and manage post-harvest operations to improve efficiency and critical process adherence. It uses powerful SaaS-based data analytics and innovative IoT sensors to track and monitor produce in real-time, at the pallet level, from the field through the supply chain and provides the visibility to:

- Identify and reduce bottlenecks, chronic delays and process variances
- Understand how to balance operational throughput
- Confirm the produce being shipped meets or exceeds process and quality metrics
- Quantify impact of operations on product shelf life
- Reduce waste and rejections and improve profitability

Zest Fresh | Metrics is simple, scalable, low touch and easy to deploy. It requires only IoT sensors – ZIPR™ Tags – and a Tag Retrieval Bin to collect and manage vital process metrics. Options are also available that increase efficiency and provide real-time process visibility with exception-based alerting. Zest Fresh is designed for use with high-value, highly perishable produce (with less than 60 days of shelf-life) or produce that is experiencing high amounts of waste or rejection rates.

Zest Fresh | Metrics core set includes:

- Harvest Time/Temperature
- Harvest-to-Precool Start (Duration)
- Harvest-to-Precool End (Duration)
- Precool Start/End Time
- Precool Duration
- Precool Temperature
- Temperature Handling
- Precool to Shipping Duration
- Shipping Age



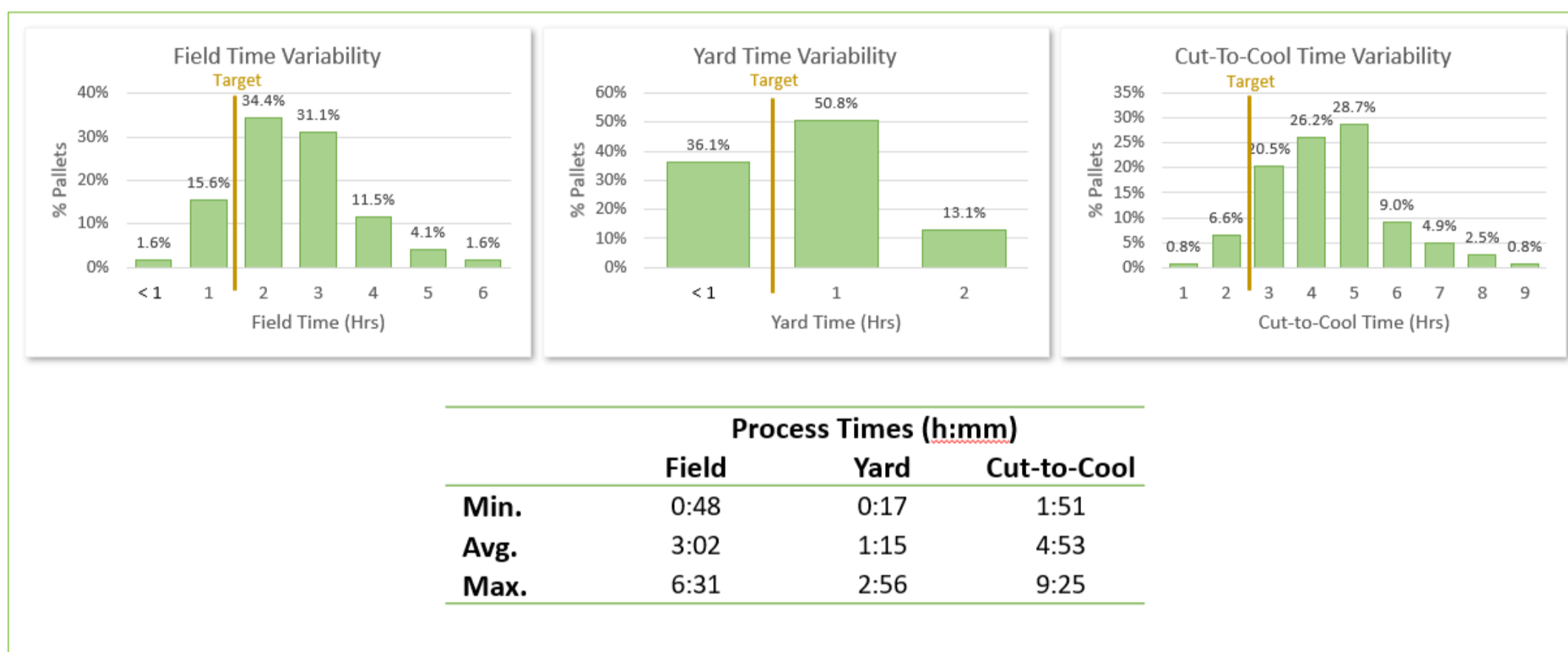
# Manage Process Variability to Improve Operations

Efficiently managing post-harvest processes can improve throughput, reduce labor and reduce costs. However, most processes are not tracked or managed, so actual process adherence and the operational impact is unknown, and corrective actions are not taken.

Zest Fresh | Metrics provides the operational visibility that monitors your critical processes. It provides managers and workers with timely and relevant information, through dashboards and real-time alerts, to improve operational efficiency and manage operations - both in real-time and over time. Dashboards show high-level process performance and trend monitoring as well as detailed process variability and operational insights. Alerts, sent by text, email or application, identify at-risk pallets and enable proactive management of issues as they occur to limit impacts on freshness and quality.

For example, the charts below provide insights into the field-to-yard time and yard dwell time for a high-value commodity product. While the grower may proscribe a field-to-yard time of less than two hours, the actual data shows that there was significant variability, ranging from less than one hour to six hours and 82.8% of the produce experienced field-to-yard times of two hours or more.

With these data insights, the grower can identify the cause of the issues and work to prevent them to improve delivered freshness and reduce costs and rejection rates and monitor for continued compliance.



The Zest Fresh | Metrics Yard Receiving application alerts yard managers to pallets at risk due to inbound delays from the field so that those pallets can be prioritized for precooling. It supports integration with ERP and warehouse management systems making it easy to associate the growers/suppliers' LPN, PTI data and process information with Zest Fresh data.

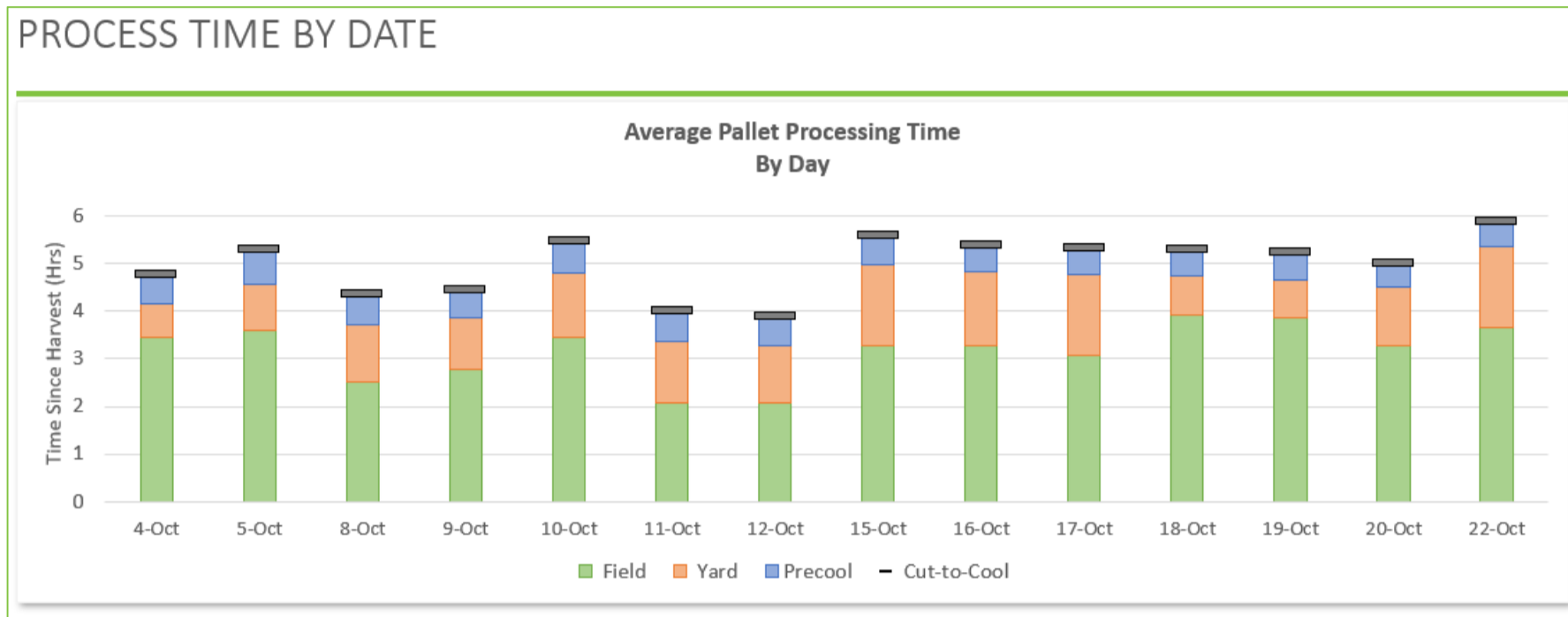
The Zest Fresh | Metrics Shipping application provides the ability to identify and prioritize produce with shelf-life that has been impacted by handling variability and intelligently route them accordingly as "good," "better," and "best" freshness. For example, a pallet with no processing issues could be identified as "best" and shipped across the country whereas a pallet that experienced processing delays that can impact shelf-life, should be shipped to a closer location. The Shipping application ensures that every pallet is delivered with sufficient shelf-life to meet the customer's requirement, reducing costly rejections or shrink claims.



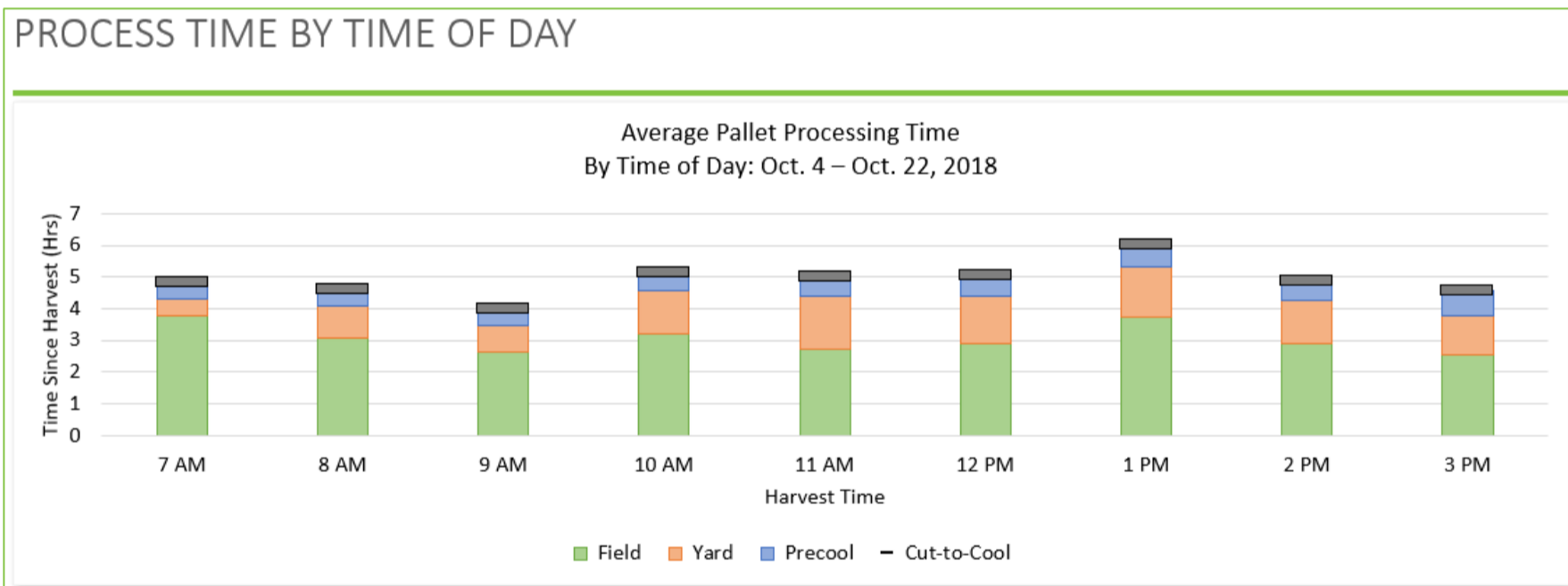
# Identify and Correct Issues Impacting Efficiency

Zest Fresh | Metrics provides you with easy-to-read insights to identify trends, bottlenecks and process adherence and variance issues.

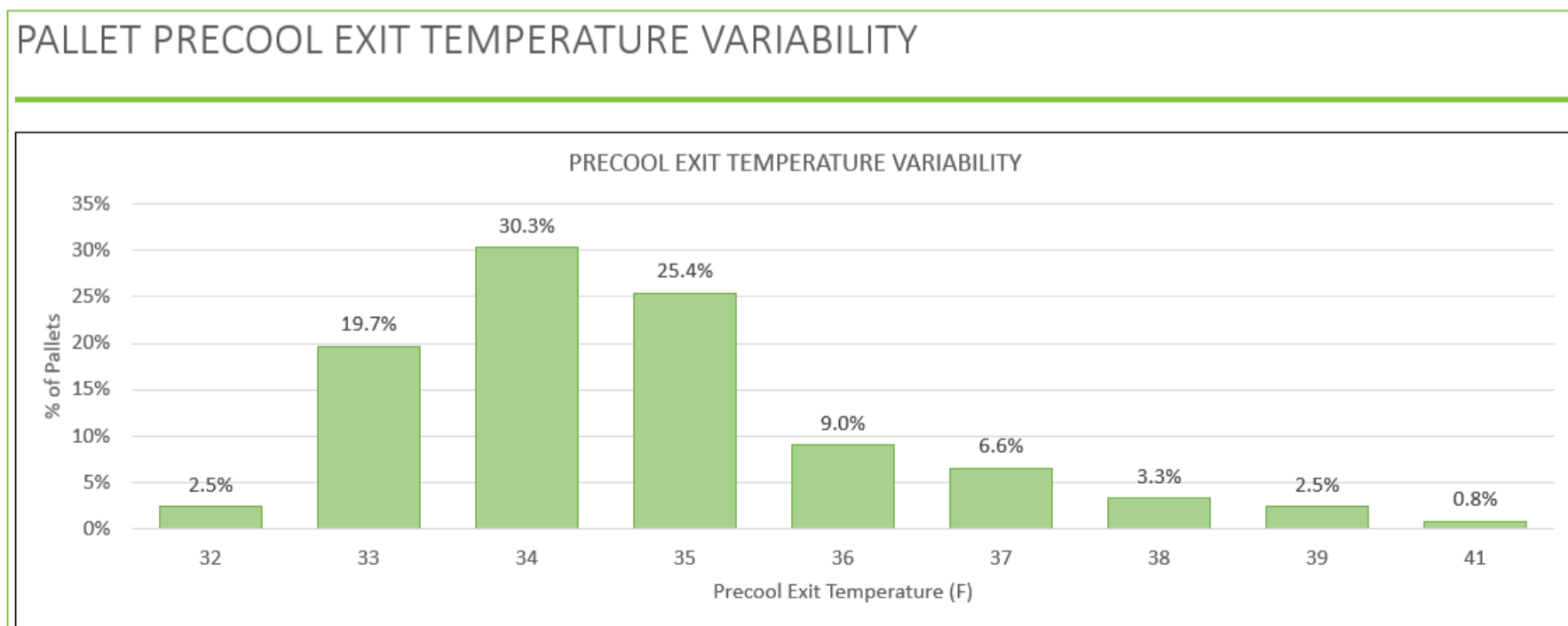
**Understand Day-to-Day Variances:** In this example, field-to-yard times were generally out-of-compliance of the 2 hours or less goal, leading to out of parameter cut-to-cool times. By identifying that the problem occurs before yard entry, corrective efforts can be properly focused.



**Understand Daily Variances:** Process bottlenecks in daily operations can be identified and corrective steps taken to smooth operations. For example, field-to-yard times were excessive in the morning and after lunch. The grower implemented a corrective action.



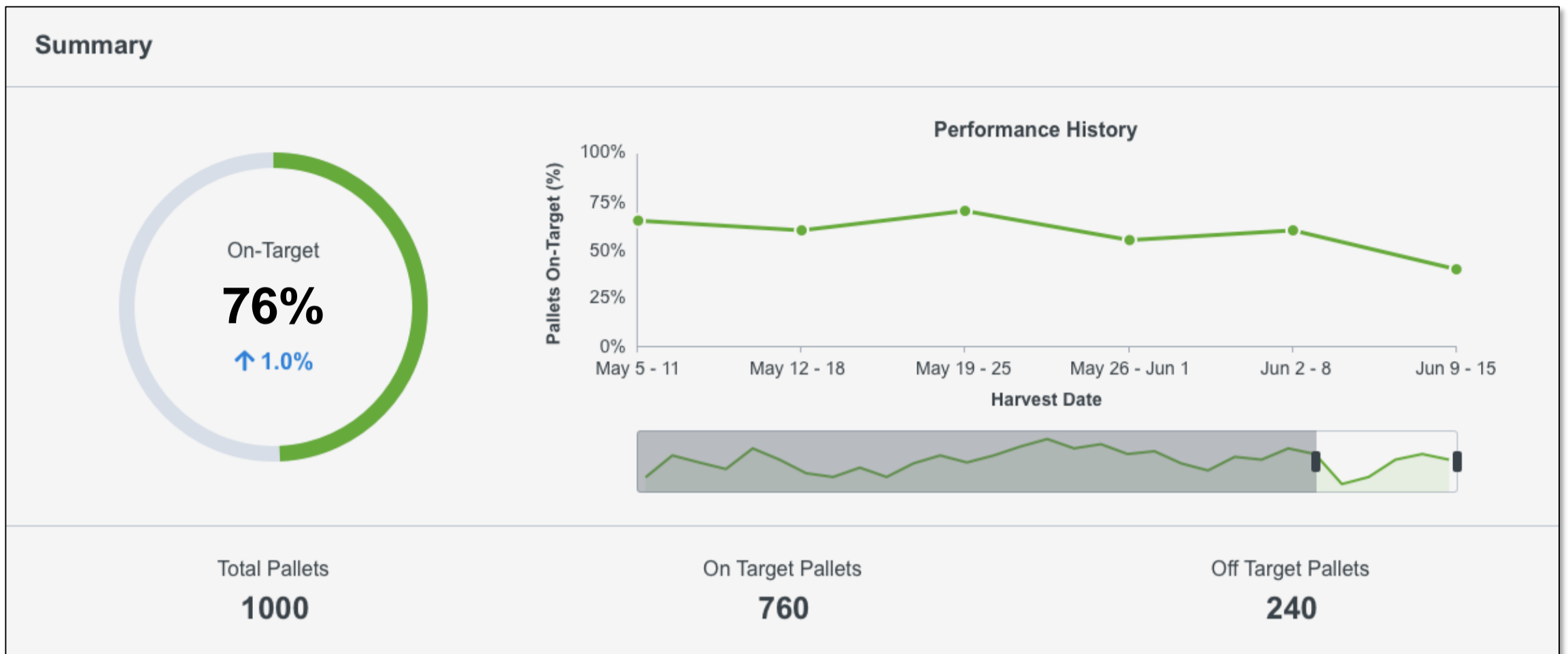
**Monitor and Manage Precooling Efficiency:** Pre-cool exit temperatures exceeded 36° (target temperature) for 22.2% of the pallets. This indicates that, while there is area for improvement, this was not the primary challenge facing the grower at the time.



# Dashboards and Alerts for Real-time Decision Making

Zest Fresh | Metrics helps measure critical processes and easily monitor performance to configured metrics and goals. Identify trends and areas where corrective actions are needed.

Easily determine if process performance goals are being met and see trends over time. View targets and variations on a day-to-day and historical basis to identify trends and potential issues.



View process performance and trending information by customer, product, pack house location, and harvest crew to identify where challenges exist and corrective actions are needed.

Products: 5

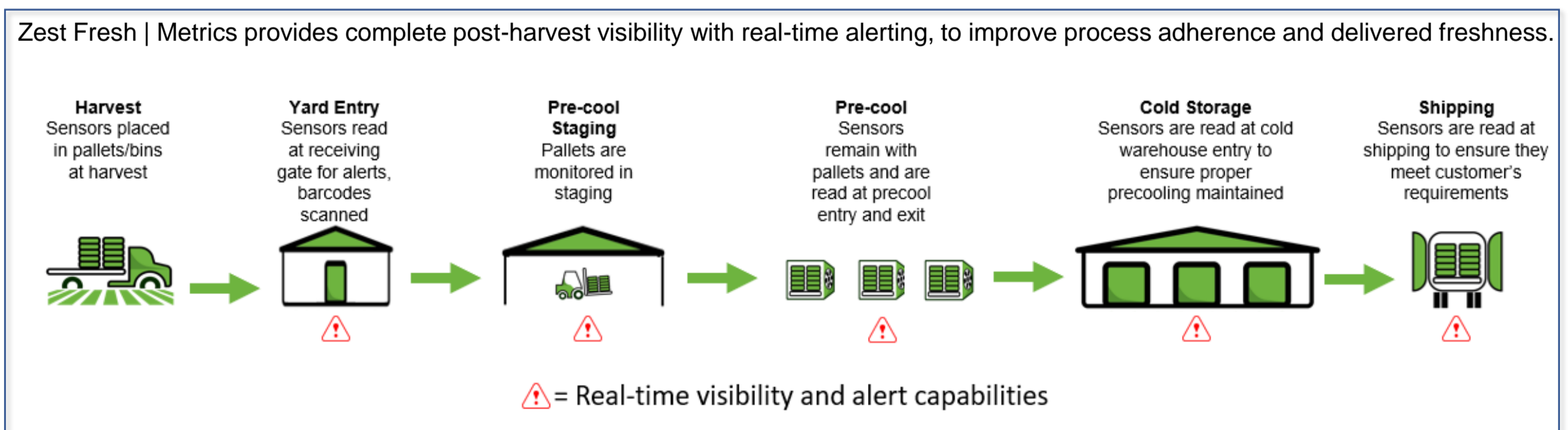
Product	% On Target	Trend	On-Target Pallets
ROMAINE	20%	↑ 6%	446
ICEBERG	24%	↓ -4%	870
BROCCOLI	42%	↑ 9%	366
SCALLIONS	59%	↓ -7%	115
RED LEAF	72%	↑ 1%	271

LOCATIONS: 2

Location	% On Target	Trend	On Target Pallets
SALINAS	19%	↑ 2.0%	889
KING CITY	27%	↓ -2.0%	1939

To manage and improve operations in real-time, Zest Fresh | Metrics pushes notifications by text-, email- and applications when out of parameter conditions are identified at key process points along the supply chain. This enables yard workers and precool operators to identify impacted pallets and immediately take corrective actions.

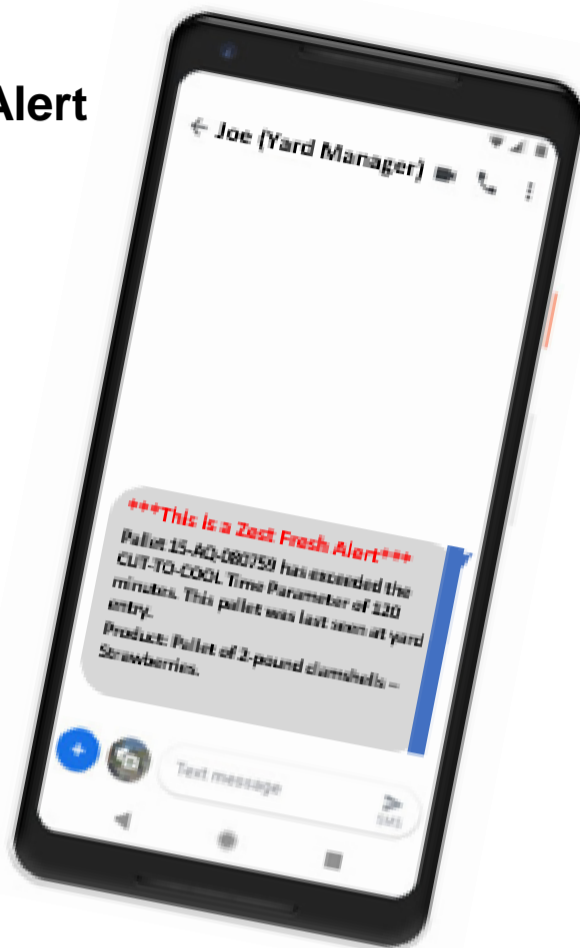
Zest Fresh | Metrics provides complete post-harvest visibility with real-time alerting, to improve process adherence and delivered freshness.



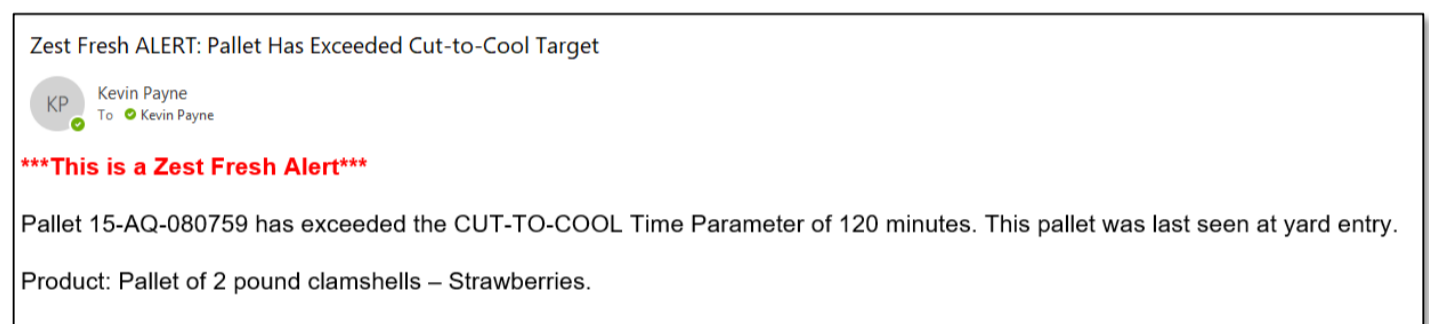
For example, as pallet sensors are autonomously read at yard entry, pallets with field times outside of the specified parameters are identified and an alert can be sent to the receiving clerk and yard manager so that the specific pallet can be prioritized for precooling. Or, a pallet may be received within parameters but then spend too much time waiting for precool. The yard manager will receive an alert notification that the pallet needs to be immediately prioritized for precooling.

With the Precool Management Option, precool operators can be notified when all pallets have achieved the desired temperature to ensure adequate and complete precooling.

### Text Alert



### Email Alert



## Getting Started

Implementing Zest Fresh | Metrics is easy, with minimal impact to operations.

Zest Labs starts by documenting compliance to your existing processes and procedures. We provide ZIPR Tags, to track pallets from harvest through shipment, for a period of approximately two weeks. All that's required is a button push when placing the ZIPR Tags in pallets at field harvest. The tags are then retrieved prior to shipping and either returned to Zest Labs or placed in a convenient Tag Retrieval Bin. Zest Labs autonomously collects the sensor data and provides reports similar to those shown in this document to identify initial compliance issues, process variances and bottlenecks. Zest Labs will then meet with you to discuss the results and identify areas where Zest Fresh Metrics can provide operational visibility to improve process adherence and efficiency.

For deployment, Zest Labs will provide ZIPR Tags and access points for installation at various process points (e.g. yard entry, pre-cool entry/exit, cold storage entry). The access points autonomously provide field and yard management with real-time alerts to help improve operations and address process adherence. Dashboard reports provide management with dynamic insights for analysis, trending and ongoing compliance and adherence.

The result is the ability to better manage to defined processes, improved visibility and operational efficiency, and reduced waste and rejection rates.