New and Emerging Technologies for Ripening Management

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Ripeness Sensors

How the ripenese sensor label colour changes over time
Clamshell Packaging –
Adding value

- Provides some protection of produce
- Avoids bruising from consumer handling
- Hygienic
- Enhances appearance
- Stackable
- Fridge-friendly

ripeSense® Consumer Value

- Consistency: delivering the same eating experience throughout the season
- Remove Confusion: new and light users about when to consume
- Quality: consume at the best stage of ripeness, stop damage on shelf
- Purchasing Planning: ripeness selection based on weekly plan
- Convenience: allows selection for use e.g. avocado salad or guacamole
What consumers say about ripeSense®

- 93% would purchase a pre-pack with ripeSense® again
- 85% would increase the frequency of their pear purchasing

"Great idea – the pears were perfect!"
"The pears were just right"
"I didn’t know pears could taste this good"

What produce managers have to say

- "Now we can sell truly ripe pears to our customers"
- Great concept
- Low wastage
- Increased transaction size
- Must be properly merchandised
- Sales build momentum over time
- Would like to see ripeSense® for other fruits
Delivered on eat me keep me

Launched in 2008 ripeSense® for avocado

Non-Invasive Colorimetric Ripeness Sensor
- Ethylene permeable substrate adhered to surface of fruit
- Colorimetric reagent changes color in contact with ethylene
- Concept proven with apples, but once ethylene detected, too late to harvest fruit
- Some issues with weather durability
- May have application for other fruit.

Additional Targets for ripeSense® in Future
- Kiwifruit
- Mango
- Melons
- Stonefruit
- Pineapple
New Product Alert: PalletPro™
Single-Pallet Fruit Conditioner for the Retail Backroom

Despite billions spent on store-to-store quality assurance programs, businesses and other firms often experience the costs of damage in the last kilometer of the supply chain—and you pay the price!

Just a short stint in a harsh backroom environment can drastically reduce the shelf-life of your in-boxed or ambient ready-to-serve products. It can lead to increased waste, reduced revenue, and a negative impact on quality and sales—caring what happens to your produce on arrival. PalletPro was designed to solve just that problem once and for all, enabling you to provide the quality product and operational efficiency your customers need and expect.

Ethylene Release Canister

- Activated when required
- Supplies ethylene at a constant rate for up to 7 days
- Ideal for conditioning small orders
- Patent pending

Covered pallet conditioning by ERC

- Activated ERC placed on top of boxes inside cover
- Standard polyethylene pallet cover
- Polyethylene "sock"
- Tape sealing cover to sock
- Standard slip sheet to protect sock from damage
Ethylene levels typically resulting from ERCs in covered pallets

Covered with (▲) or without () ERC for 7 days

Aroma after 4 days post-conditioning ripening

10.1 lb Mean firmness 4.9 lb

Firmness

Aroma
Benefits

- Enhanced aroma, Better tasting pears
  - Longer conditioning time, 5-7 days
- Standard box conditioning similar to Euro-box for pears
- Flexible and practical alternative to conditioning rooms
  - No costly capital expenditures
  - Small orders/ single pallet more cost effectively conditioned
  - Can be used anywhere in the facility, no special rooms required
- Additional capacity during peak shipping periods
- In-house system versus outsourcing for small packing houses
- Potential for In-transit and Close-to-market conditioning
  - Working on DOT approvals
  - Can treat entire container without pallet covers
  - Remote activation in future for later opening in transit
- Bacchem Corporation is sourcing the ERC technology.
  They manufacture and market the ERC.

ETH-1010 or EASI-1 Ethylene Analyzer

- Developed by Fluid Analytics in the U.S.
- Trade name: ETH-1010
- High sensitivity: ~0.01 ppm
- Portable
- Fast response: 10-s response, 1-min end-to-end measurement
- Internal data storage, Ethernet, USB
- New version: EASI-1 developed and marketed by ABSOGEK for European market
- Available summer 2009

How does it work?

**CA Chamber Tests**  
(Dr. Jim Mattheis, USDA-ARS, Wenatchee, WA)

- Braeburn Apples

- Two questions:  
  - Impact of CA conditions on sensing  
  - Other volatiles affecting sensing  

- 151 liter CA chambers, three chambers run simultaneously  
- 50 Braeburn apples and Bartlett pears from last season kept in CA chamber for over two days  
- Pears previously kept in normal refrigerated storage for 4 months (over-ripe)  
- Apples normal refrigeration (normal)  
- Recirculated "air" through FAI sensor and took samples for GC at the same time

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**CA Chamber Test Results**  
(Dr. Jim Mattheis, USDA-ARS, Wenatchee, WA)

- Braeburn Apples


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**How good is the signal?**

![Graph showing the relationship between ETH-1010 and Gas Chromatography ppm.]
