



Avocado Postharvest Handling

Key Points

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The road from the grove to the consumer

The most important thing to remember is that there is a continuum from the grower to the consumer

The steps in the continuum

Grower – Packer – Distribution – Consumer

The challenge is to maximize the positive attributes of the avocado and minimize postharvest losses





What can growers do to optimize the eating experience for the consumer?

Must consider limiting steps in both preharvest and postharvest fruit management

Considerations in the grove

- Avoid picking when temperatures are high especially with late season fruit
- Avoid picking during/shortly after a rain event – more decay
- Keep fruit in a cool place, out of the sun; high temperatures can impact ripening and increase decay
- Minimize delays from time of harvest to cooling
- Repair potholes and maintain access roads to minimize fruit damage during transport



Hass seasonality and worldwide sourcing



- The Hass avocado currently dominates the commercial marketplace
- For the key avocado markets important to recognize global sourcing – be mindful of how you fit into the market
- Within a given production area, the Hass has a long harvest season – optimize fruit maturity
- Ethylene ripening increasingly used

Outcome:

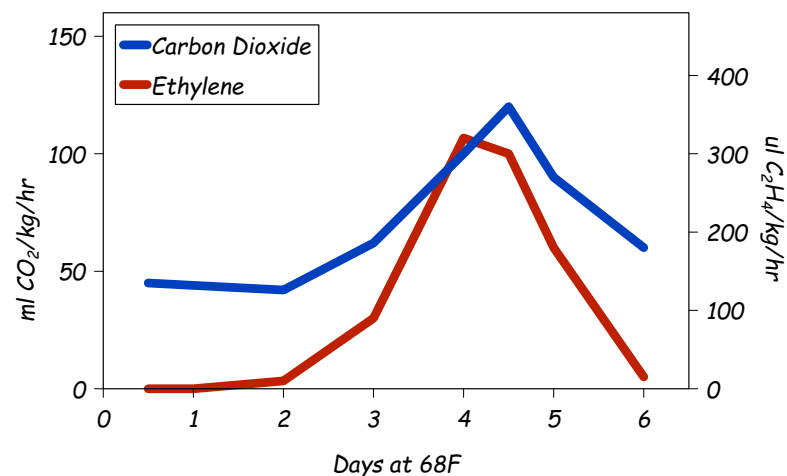
- Knowledge of sourcing positives and negatives is crucial
- Understanding of seasonality is imperative

Challenges in avocado postharvest handling

- Fruit maturity
- Fruit age – time to ship
- Cooling – within 12 hours should be below 10C
- Ethylene exclusion – important especially for long distance
- Controlled Atmosphere – should be door to door
- 1-MCP – use carefully and dose according to maturity
- Coatings – may slow ripening at destination

Avocado fruit biology from a postharvest perspective

- It is a climacteric fruit with a high rate of respiration and ethylene production compared to many fruits
- It is chilling sensitive
- It is susceptible to postharvest decay especially following ripening and/or mismanagement



Susceptibility to low storage temperatures



External Chilling Injury



Internal Chilling Injury



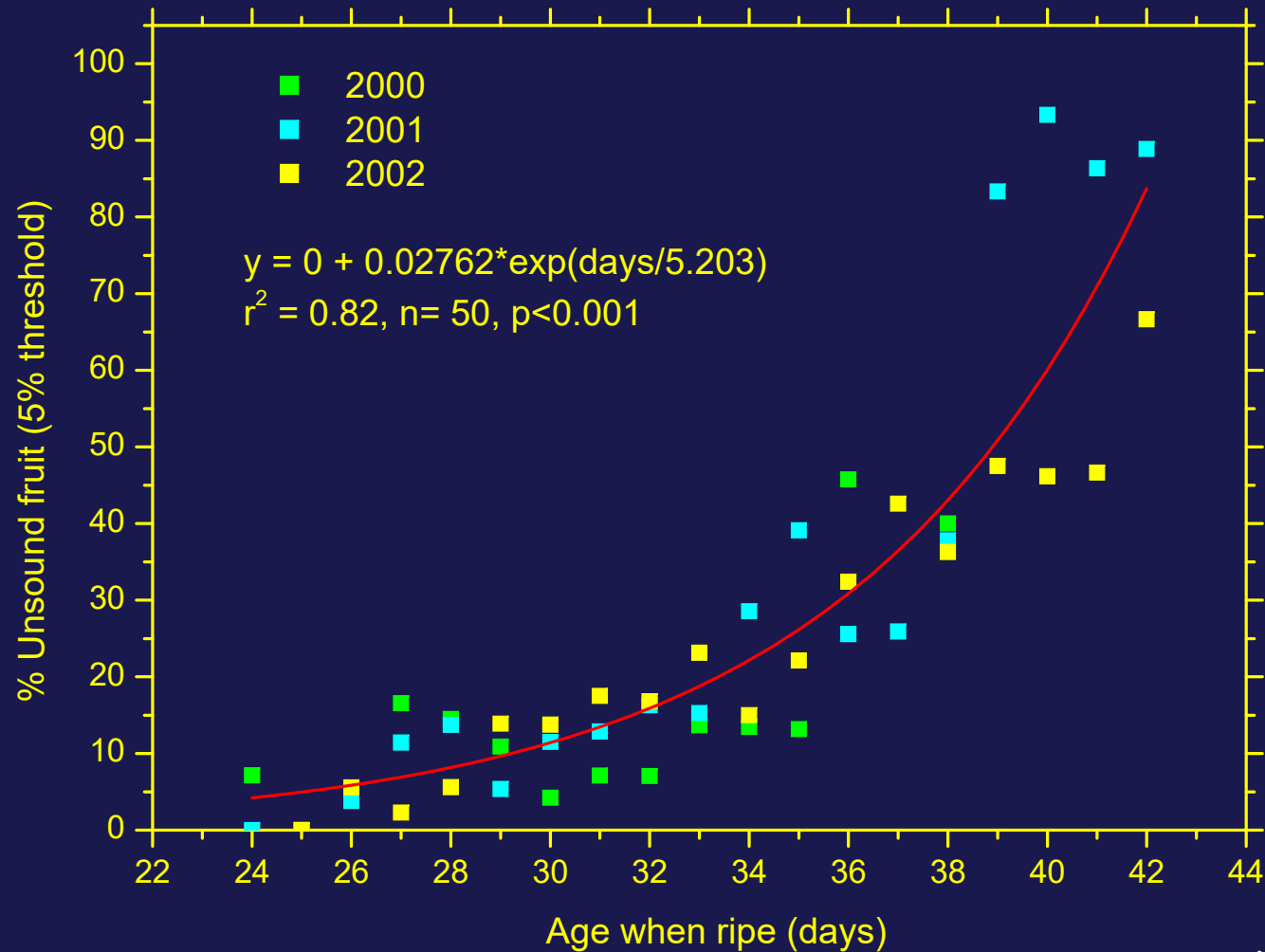
Body Rot

Postharvest Diseases

Stem End Rot



Time after harvest influences the percentage of unsound fruit – 21 to 28 days



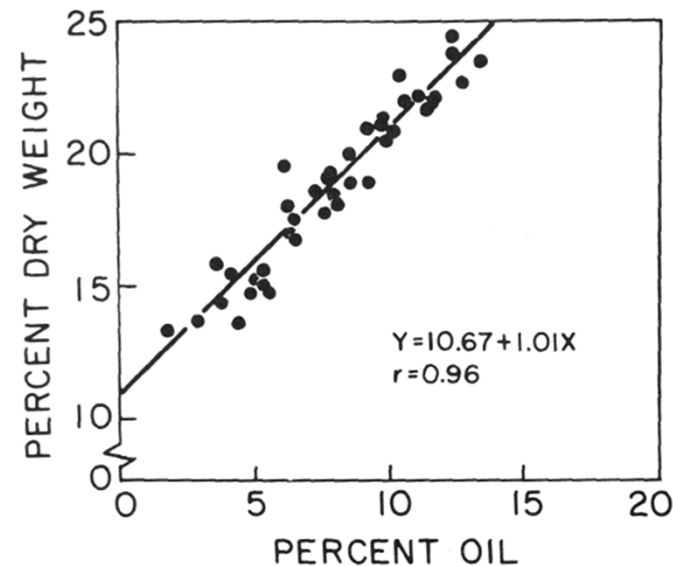
Dixon, Pak and Cutting

Minimum maturity

Current standards worldwide based on:

- Dry Matter (= Dry Weight)
- Moisture Content
- Oil Content

Relationship between
dry weight and **oil**



Work of Lee et al. (UCR)

Quality changes over the harvest season

Early Season	Mid Season	Late Season
Ethylene treatment is highly recommended	Responds well to ethylene treatment	Little or no ethylene needed
Fruit more prone to: <ul style="list-style-type: none">• Shriveling when ripe• Decay• Internal disorders• Most susceptible to low temperature	Best fruit quality: <ul style="list-style-type: none">• No shriveling• Little decay except when harvested after rain• Most tolerant of long-term storage	Fruit more prone to: <ul style="list-style-type: none">• Decay• Internal disorders• Difficult to store long term• Uneven ripening• Germinated seed
After ripe fruit may be: <ul style="list-style-type: none">• Not fully colored• Watery texture• Bland or grassy flavor	After ripe fruit will be: <ul style="list-style-type: none">• Green-black to black in color• Creamy texture• Good to excellent flavor	After ripe fruit may be: <ul style="list-style-type: none">• Black in color• Difficult to Peel• Creamy to dry texture• Full to rancid flavor

Physical damage and chilling

Damage is cumulative;
worse if turgid or wet fruit are harvested

Lenticel damage



External chilling



Source: Hofman, Cutting, Dixon, Pak

Ethylene Ripening is increasingly used at destination market – *how fruit is handled may influence response to this treatment*



*Why Ripen
Avocados?*

Increased
Ripening
Uniformity

Untreated, fruit ripening may range from a few days to even weeks within a carton

Limitations to avocado postharvest handling

Fruit is globally sourced and long-distance transit required:

- Fruit maturity
- Chilling sensitivity and fruit decay
- Ethylene ripening and interplay with maturity and use of 1-MCP and coatings
- Mismanagement at any point in the handling chain



Thank you for your attention

