

Understanding Blackberry Postharvest for Fresh Market

Alejandra A. Salgado and John R. Clark
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Ideal Blackberry Fruit

- High firmness
- High soluble solids (above 10%)
- Flavor components
- Mid to large size
- Full black color
- Small seeds
- **High postharvest potential**

UA Postharvest Protocol

- Since 2008 UA utilizes a protocol to evaluate postharvest potential
- The UA evaluates every season 40-50 advanced selections
- Shiny-black fruits are stored at 45 °F for 7 d and some are stored 14 d

Important Postharvest Traits

- Firmness
- Weight loss
- Decay
- Leakiness
- Color reversion
- Flavor
- Shininess



Weight loss

- Fruit weight loss is mainly due to dehydration during the storage process
- It is a normal physiological process that occurs in all fruits
- Ideally is to maintain the weight of loss at minimum:
 - In blackberry less than 5-6% to be marketable
- Clamshells are weighted before and after storage

Decay – postharvest diseases

- Gray mold (*Botrytis cinerea*):
 - Serious problem. It develops during storage on contaminated or injured fruit. The fungus can grow at 32 °F
- Rhizopus rot (*Rhizopus stolonifer*):
 - This fungus also can be of a problem
 - It does not grow at temperatures below 5 °C



- Fruits are rated as presence or absence of mold

Leakiness

- Cell walls and membranes break apart and juice comes out
- Each berry is gently rolled on a white paper towel and counted as leaky if juicy spots appear

Fruit Firmness

- Postharvest firmness retention cannot be judged in the field
- A firm cultivar in the field will not always be firm after harvest
- A high postharvest potential is critical to develop a successful marketing process



Measuring Firmness

- **Subjective scale:**

- In Arkansas we use a 5 point scale:

- 1:** Firm

- 2:** Slight give when squeezed

- 3:** Border line not quite squishy but not firm

- 4:** Soft and usually decayed/leaky

- 5:** Mushy, usually a little puddle of collapsed berry and always decayed

Measuring Firmness

- **Objective method:**
 - Fruit compression
 - Drupelet skin penetration
 - Receptacle penetration



Color Reversion



Cold storage



Color Reversion

- Important postharvest disorder
- It has genetic and environmental components
- Normally occurs:
 - When fruit is allowed to stay warm
 - When fruit is allow to warm after storage
 - In some incidences of shipment possibly due to uneven or extreme cooling
- Important to evaluate this critical trait during postharvest storage
- Usually, a firm cultivar express lower levels of color reversion

Some Results





A-2454

**7 d cold
storage**



APF-268



**14 d cold
storage**



Weight loss

- Weight loss of different selections after one and two weeks of storage and percentage of change

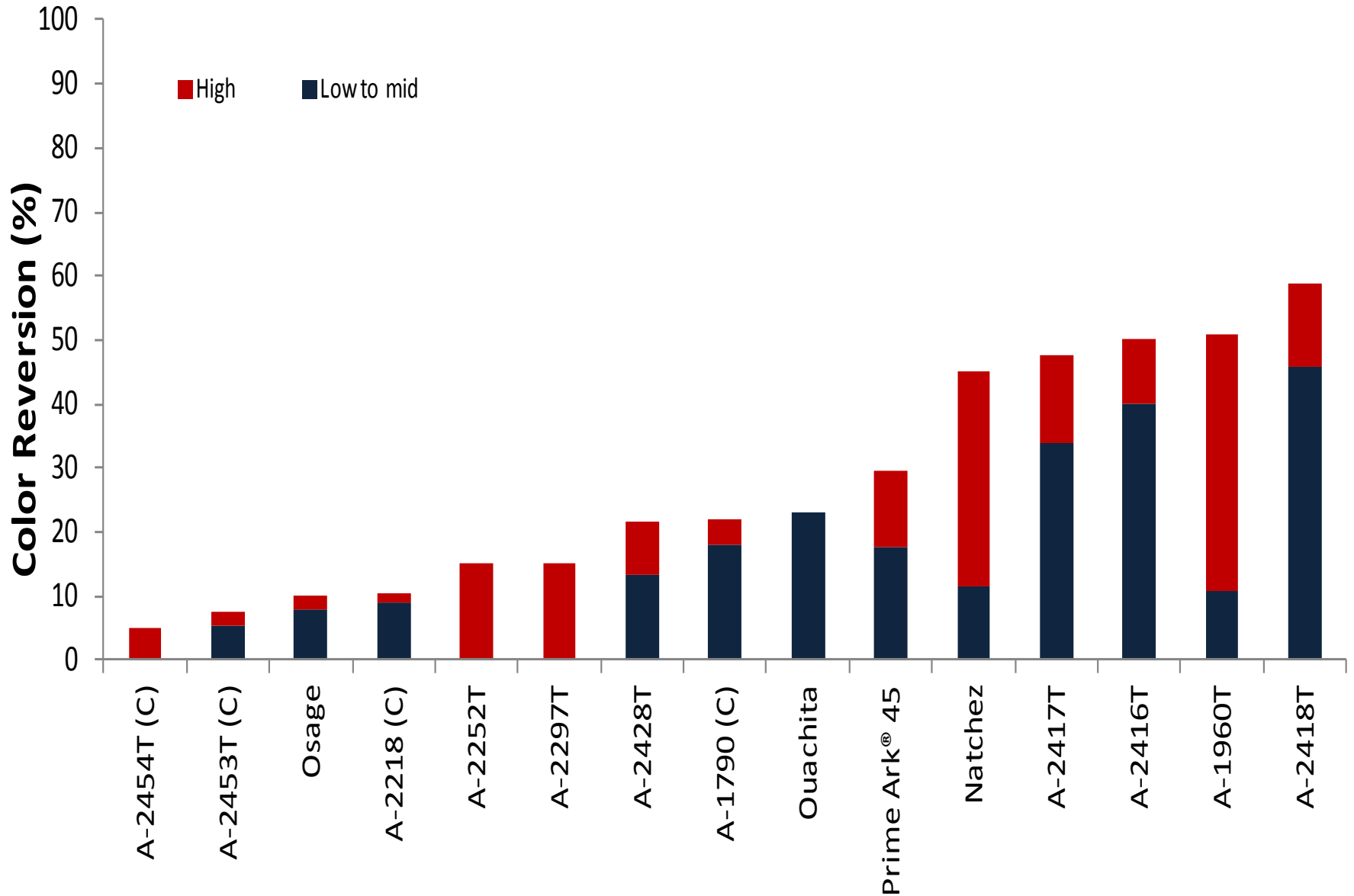
Selection	Weight loss (%)			
	Week 2	S.D	Week 1	Change (%)
A-2428	2.9 a	1.6	1.2	144 ^z
A-2453T	2.7 a	0.5	1.0	168
A-2454T	2.5 a	1.3	0.7	261
A-2450	2.3 a	1.0	1.1	111
A-2434T	2.2 a	0.9	1.2	85
Osage	2.2 a	0.6	1.1	102
A-2473	2.2 a	0.7	1.1	95
Prime-Ark [®] 45	1.8 a	0.6	1.1	66
A-2416	1.8 a	0.5	1.3	38
Ouachita	1.8 a	0.4	1.3	38
Natchez	1.7 a	0.3	0.6	188
Prime-Ark [®] Traveler	1.7 a	0.4	0.6	179
APF-268	1.7 a	0.5	1.3	27
A-2418	1.6 a	0.4	1.2	35

Overall

Overall of different selections after one and two weeks of storage and percentage of change: **100-[sum(% decayed + % soft (4, 5 berries) + % leaky)]**

Selection	Overall (%)			
	Week 2	S.D	Week 1	Change (%)
Osage	76.5 a	17.6	89.6	-14.6
A-2453T	68.0 a	13.8	87.6	-22.4
APF-268	65.0 a	29.7	93.7	-30.6
A-2450	19.6 ab	53.7	40.0	-50.9
Prime-Ark [®] 45	15.6 ab	14.9	73.4	-78.8
A-2428	13.4 ab	57.8	59.6	-77.5
A-2454T	4.2 ab	31.5	37.4	-88.8
A-2418	0.87 ab	34.6	77.2	-98.9
Ouachita	-3.8 ab	26.9	63.4	-106
A-2434T	-6.4 ab	41.9	52.6	-112
Prime-Ark [®] Traveler	-29.6 b	37.7	55.5	-153
A-2416	-46.3 b	30.6	66.9	-169
A-2473	-49.2 b	40.2	44.5	-211
Natchez	-56.3 b	31.5	67.7	-183

Color Reversion



Last comments

- Select a cultivar with high postharvest potential
- Harvest the fruit in the correct ripeness stage:
Shiny-black fruit
- Harvest healthy fruit from healthy plants
- Ideally harvest during morning to avoid hot temperatures
- Immediately transfer the fruit to cold storage
- Maintain the cold chain during postharvest handling and transport

Questions?

