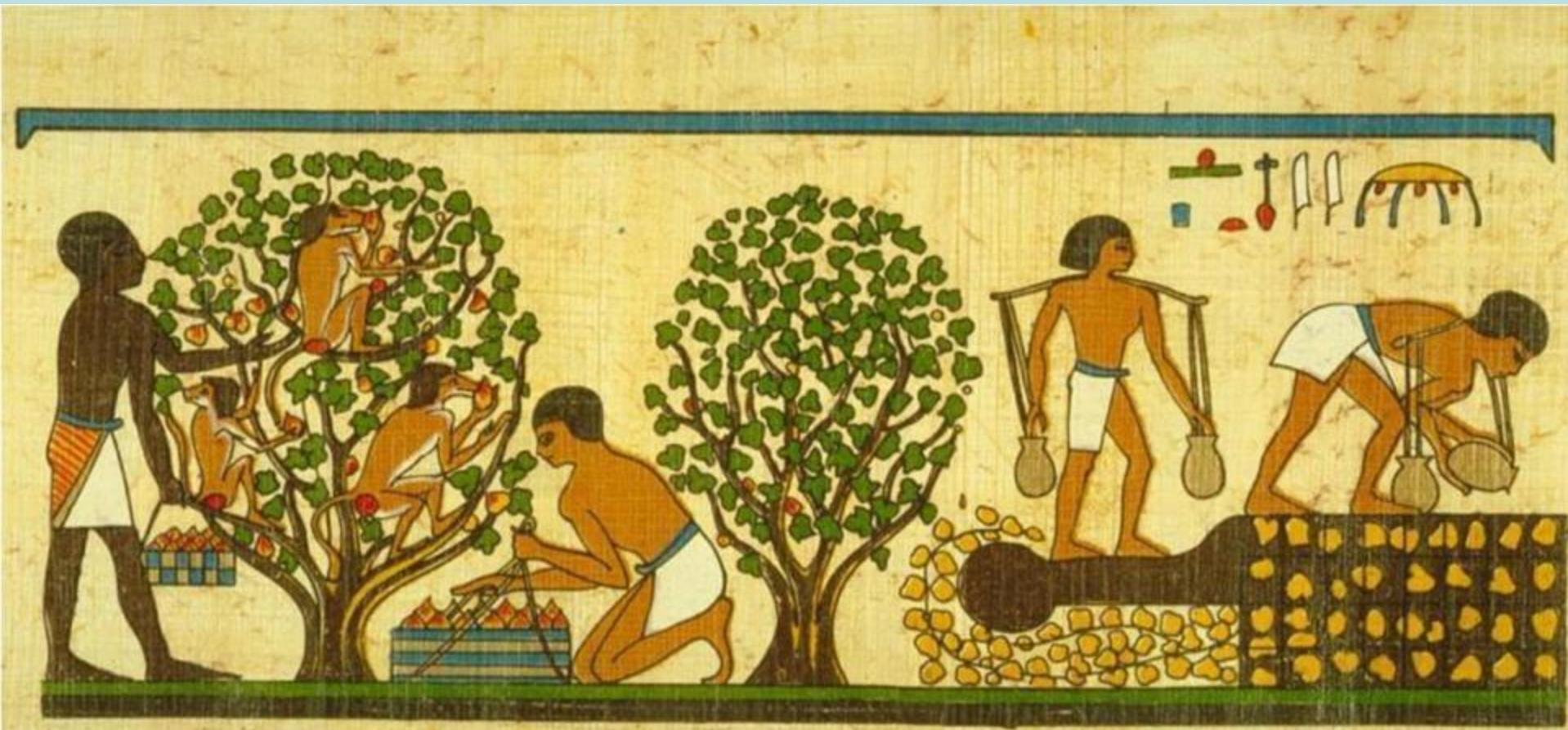


Maintaining Quality of Pomegranates



Adel Kader, UCDavis

Pomegranates Have Been Cultivated for Thousands of Years





Intercultivar Variation in Aril Color



Early Foothill

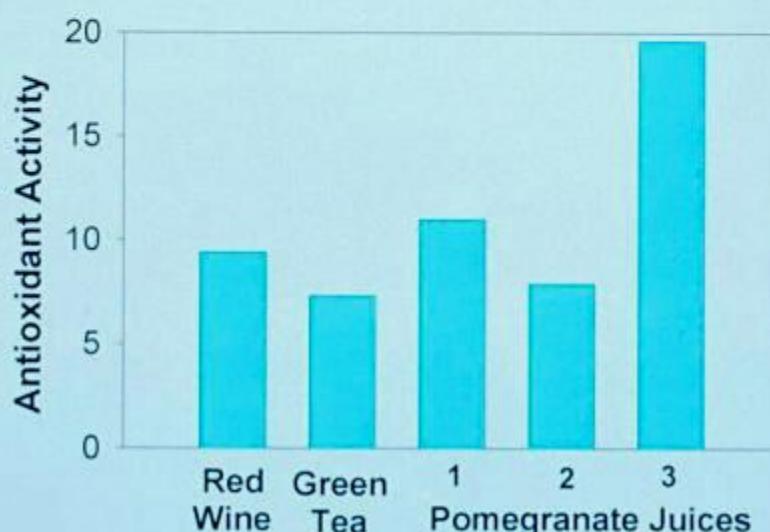
Early Wonderful

Wonderful

Pomegranates Are Rich in Antioxidants

Phenolic composition (mg/L) of pomegranate juice made from fresh arils (1), from frozen arils (2), or extracted by crushing whole pomegranates (3)

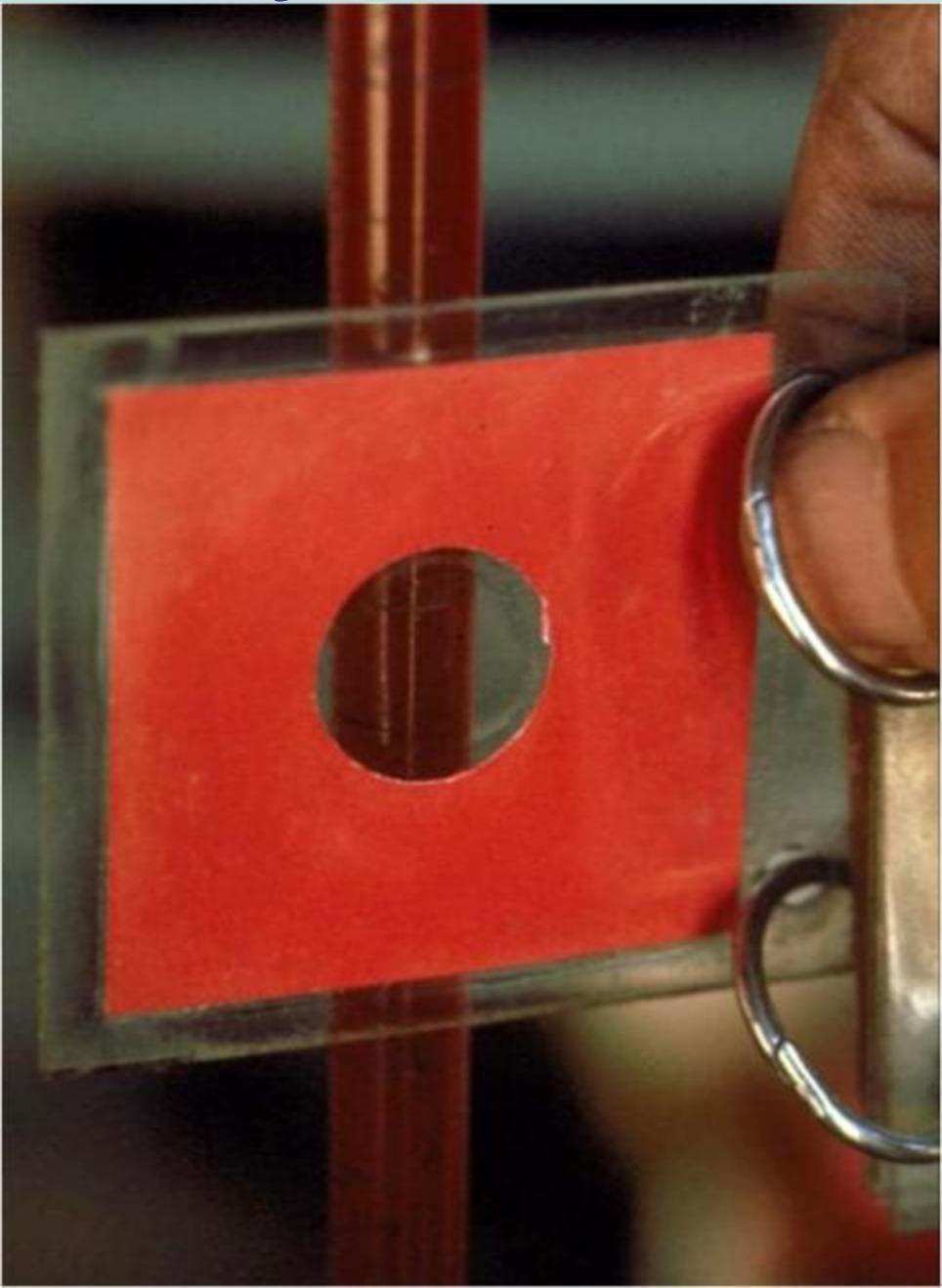
Phenolic compounds	Pomegranate juices		
	1	2	3
Total anthocyanins	306	172	387
Total gallagyl-type tannins	68	128	1561
Total ellagic derivatives	33	27	121
Total hydrolyzable tannins	539	525	417
Total phenolics	2117	1808	2566



Pomegranate Maturity Indices

**Red color of juice
equal to or darker
than Munsell color
chart 5R-5/12**

**Acidity of juice below
1.85%**



Pomegranate Quality Indices

- Freedom from growth cracks, sunburn,cuts, bruises, and decay.
- Skin color and smoothness.
- Aril color intensity and uniformity.
- Flavor depends on sugar/acid ratio, which varies among cultivars. A soluble solids content above 17% and total phenolics content below 0.25% are desirable for optimal levels of sweetness and astringency, respectively.

Preharvest Defects include Cracking and Sunburn



SUNBURN

Alternaria Rot as a Preharvest Defect

Infection begins in the orchard especially following rain during flowering and early fruit development. The fungus can grow within the fruit without external symptoms



Harvesting and Postharvest Handling Defects



Surface
Abrasions

Bruising

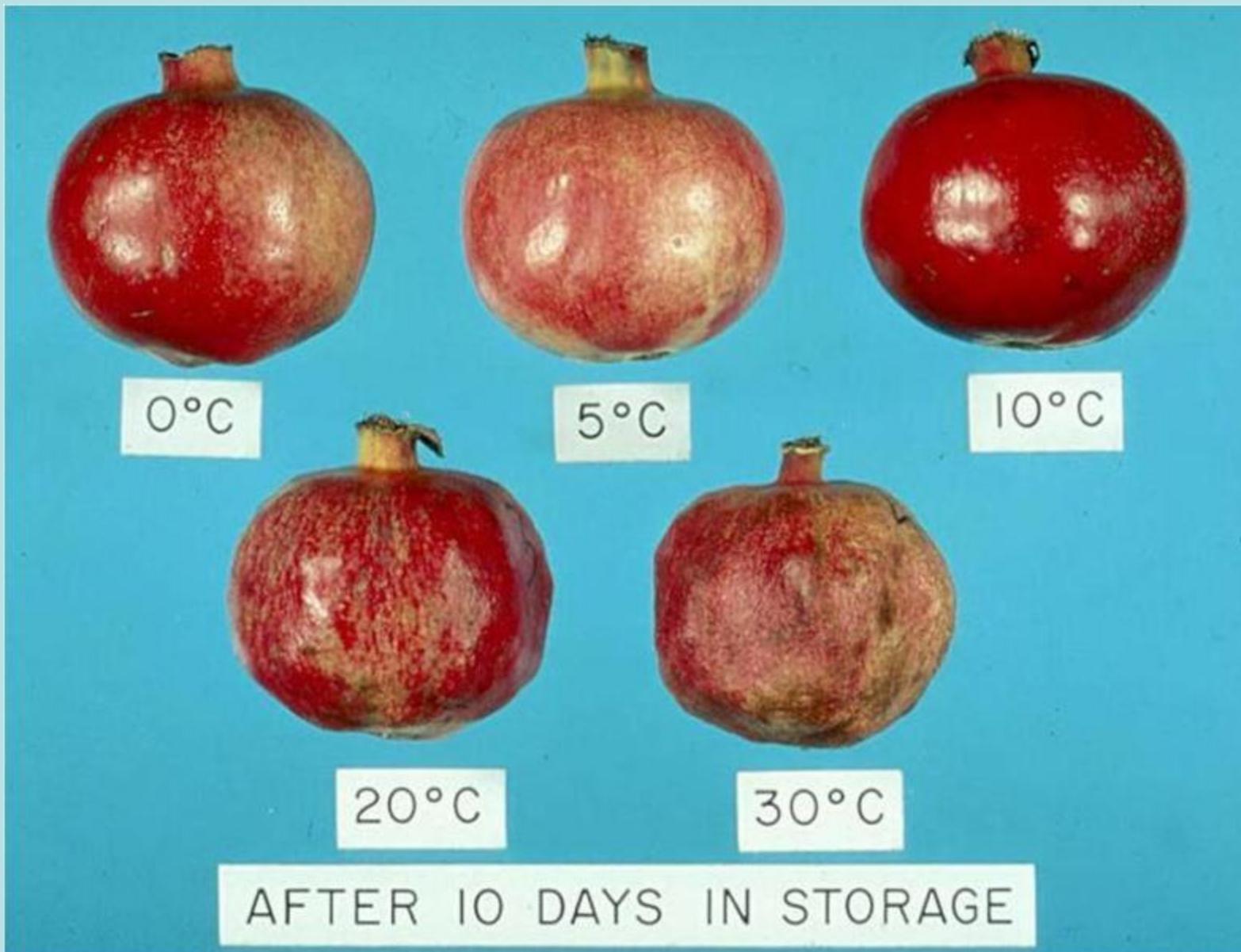




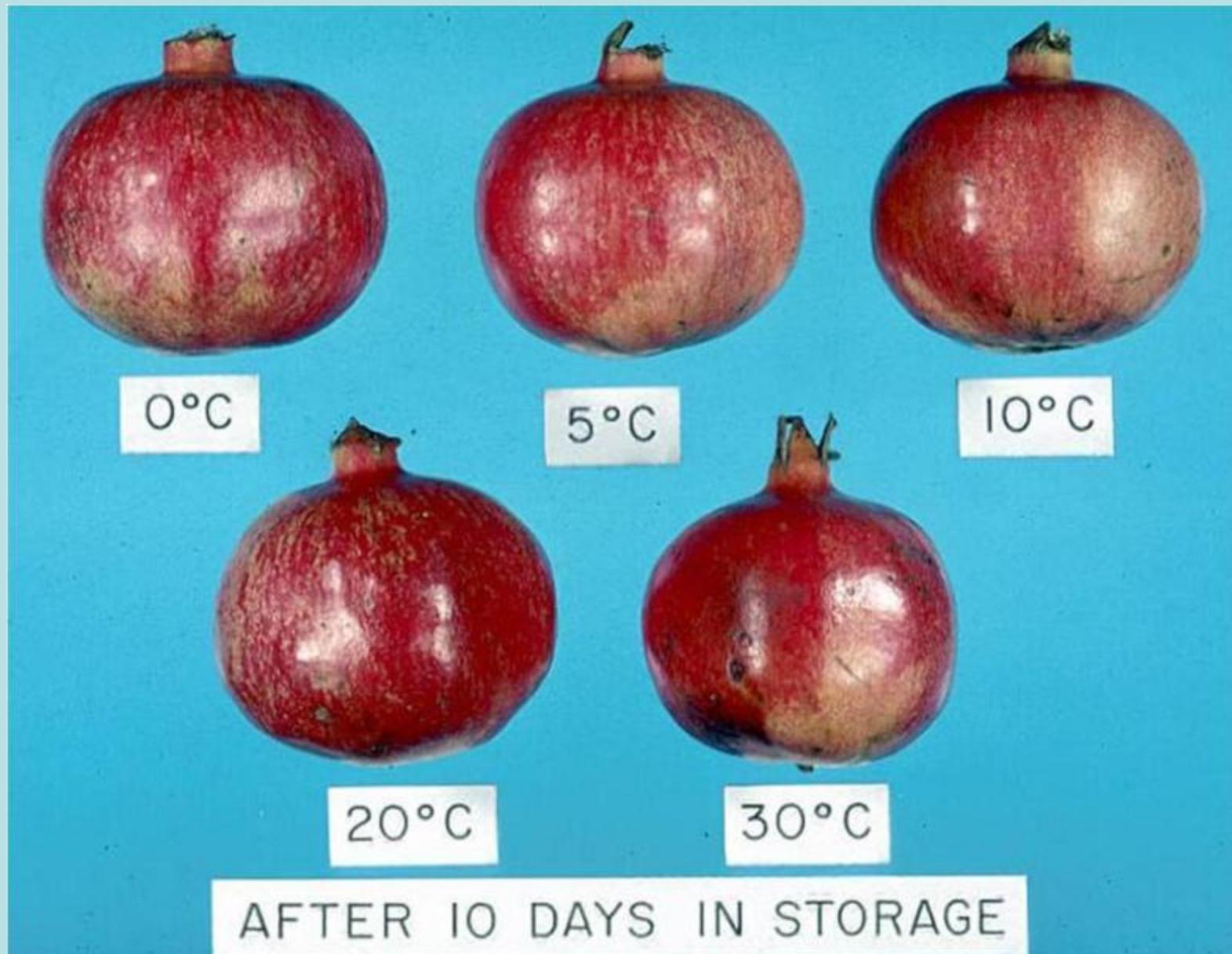
Highly-susceptible to Water Loss



The higher the temperature and the lower the relative humidity, the greater the water loss



These pomegranates were kept in containers ventilated with humidified air



Effect of temperature on Chilling Injury of Pomegranates

AFTER 12 WKS + 4 DAYS AT 20° C



0° C



2.2° C



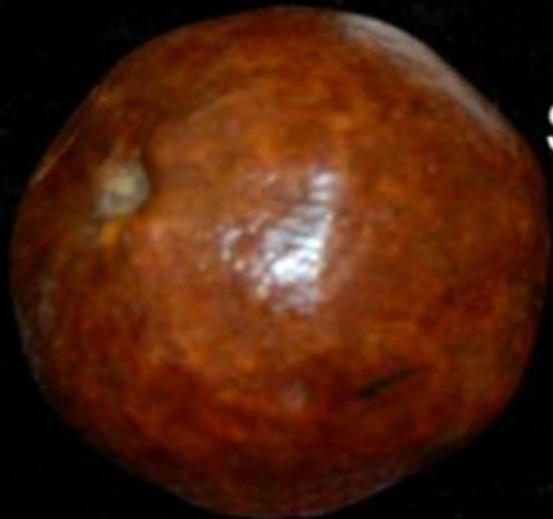
5° C



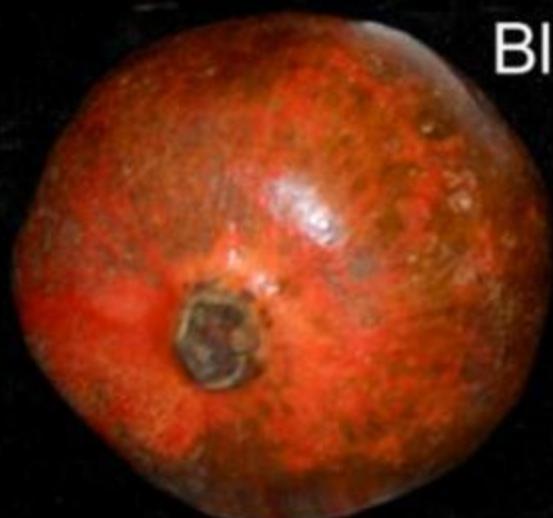
10° C



After 5 months @ 7°C and 4 days @ 20°C



Stem end



Air



Blossom end



5% O₂ + 15% CO₂

Postharvest Pathology Considerations

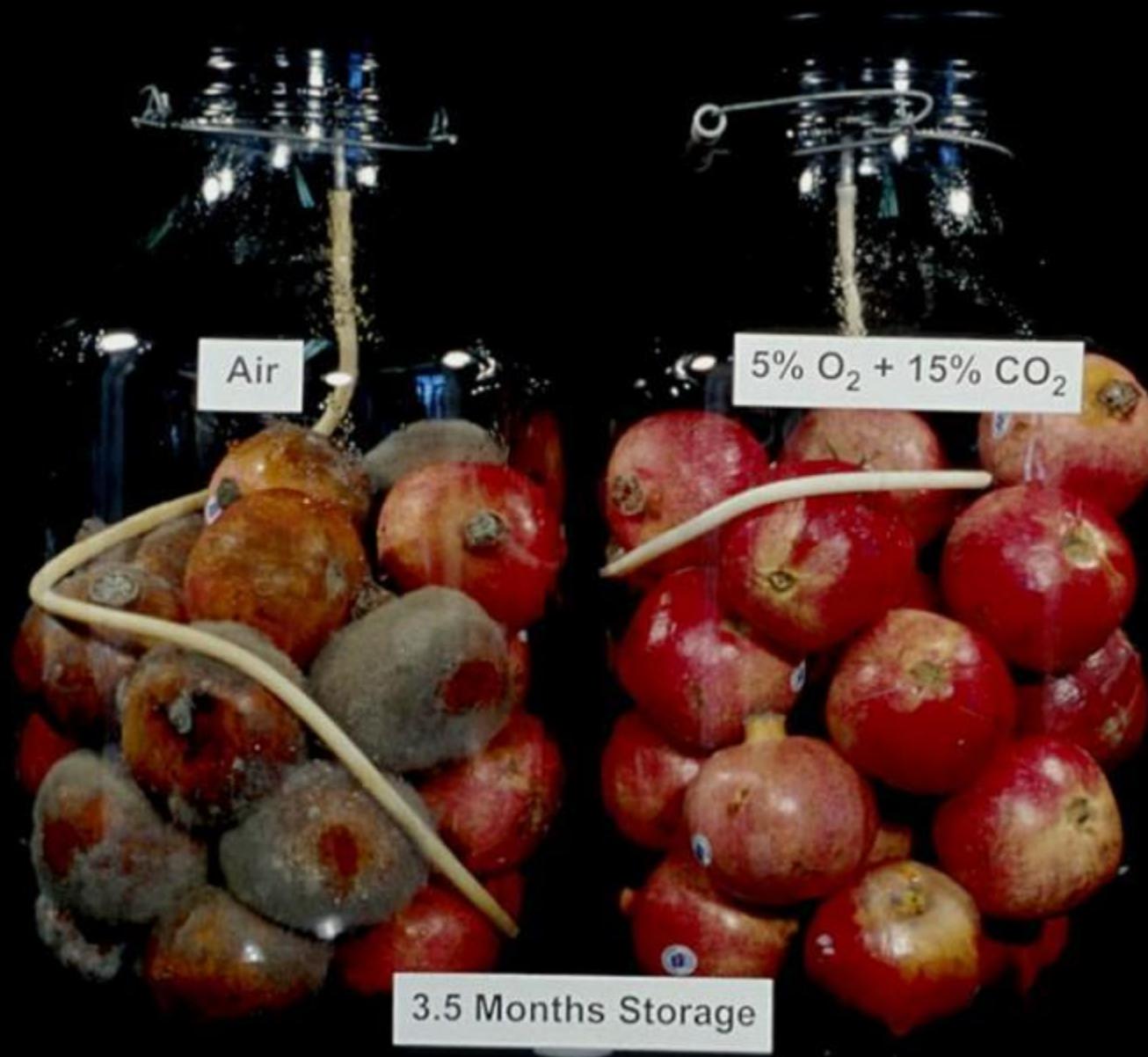
Botrytis cinerea is the major fungus that causes decay on pomegranates.

Infection begins in the orchard and fungal spores may be present in the fruit calyx at harvesting time.

Use of Fludioxonil (Scholar) as a postharvest fungicide is effective in controlling Botrytis cinerea.

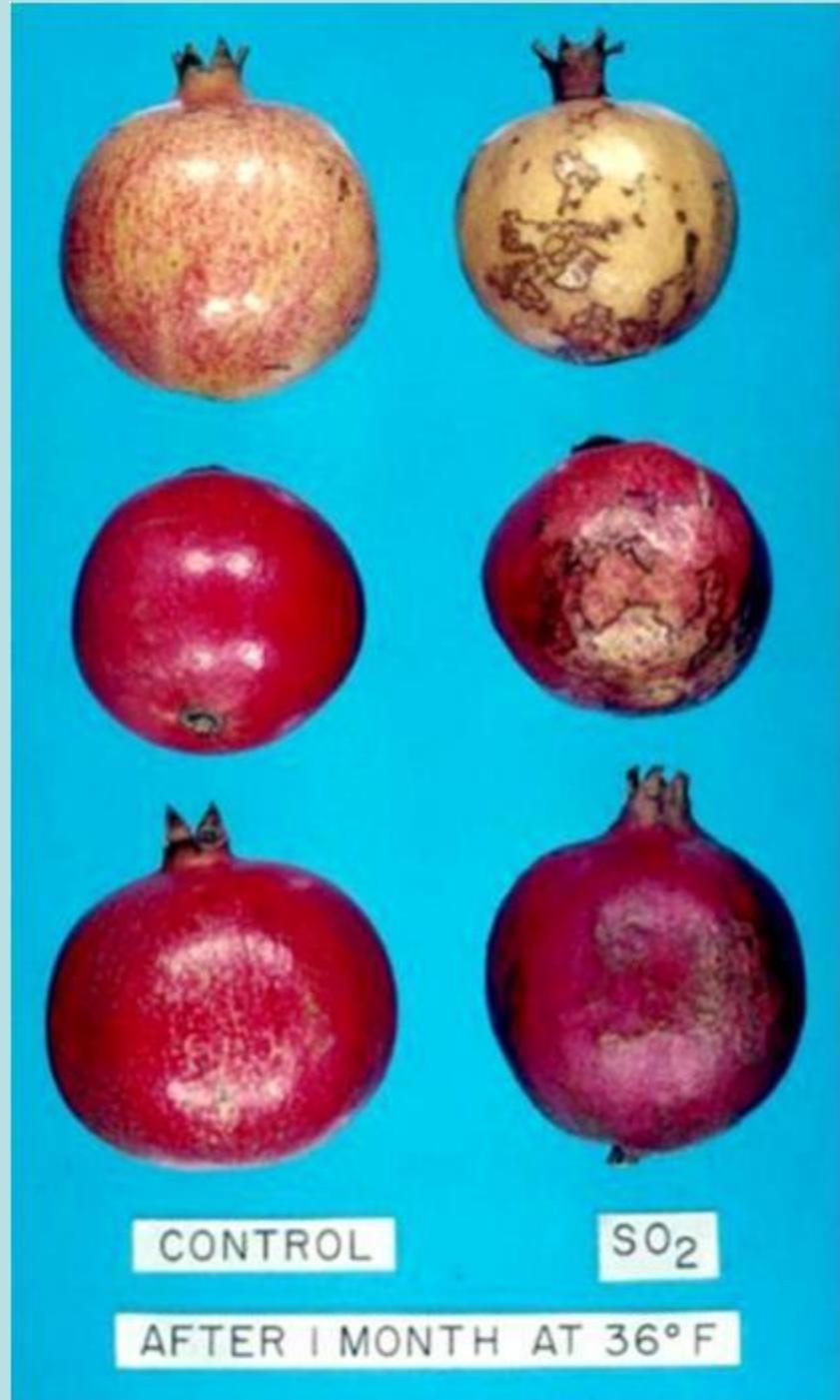
Carbon dioxide-enriched controlled atmospheres are fungistatic and inhibit growth of Botrytis during storage.

Responses to Controlled Atmosphere



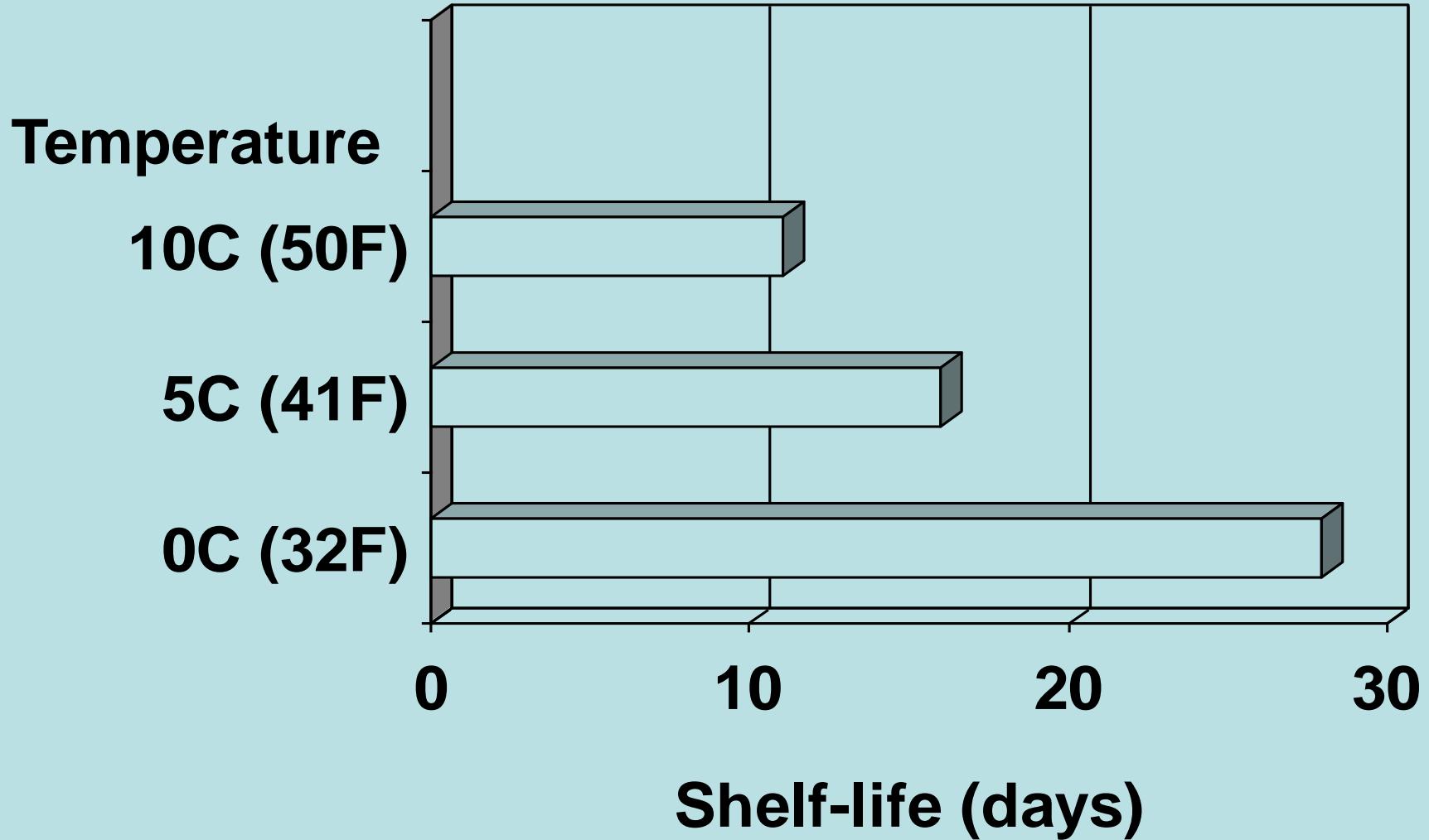
Range of Sulfur Dioxide Injury Symptoms on Pomegranates

Do not mix with grapes during storage or transport



Optimal Storage Conditions for Pomegranates

- 7°C (45°F) for longer than 2 months; 5°C (41°F) is acceptable for up to 2 months.
- 90-95% relative humidity.
- CA of 5% Oxygen + 15% Carbon dioxide, especially if storage for longer than 3 months is desired.



Temperature is the most important factor for maintaining quality and safety of pomegranate arils

Wonderful Pomegranates



Freshly-cut

5°C
41°F



Air

10%

15%

20% CO₂

10°C
50°F



17 Days

Carbon dioxide-enriched atmospheres can be used as a supplement to temperature control for delaying fungal growth on pomegranate arils

Frozen Arils can be kept for up to one year



Utilization of Pomegranates

Defects at harvest

