

Harvest and Postharvest Handling of Sweet Cherries

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Harvest Maturity

- **Based on color and soluble solids**
- **Fruit can increase in size 40% from the earliest they might be picked until fully ripe**
- **Quality does not improve after harvest, although color will change during storage**

Bing Cherry Color Categories



Sweet Cherry Maturity Index



1



2



3



4



5

Developed by Michigan State University
Agricultural Engineering Department.
Manufactured by Colorcurve Systems, Inc.

Farrall Hall, Michigan State University
E. Lansing, MI 48824 (517) 353-4517

Red



Mahogany



Dark
Mahogany



'Tulare'

Light
Red



50%
Bright
Red



Bright
Red



Dark
Red



'Brooks' 1996

3 cm.



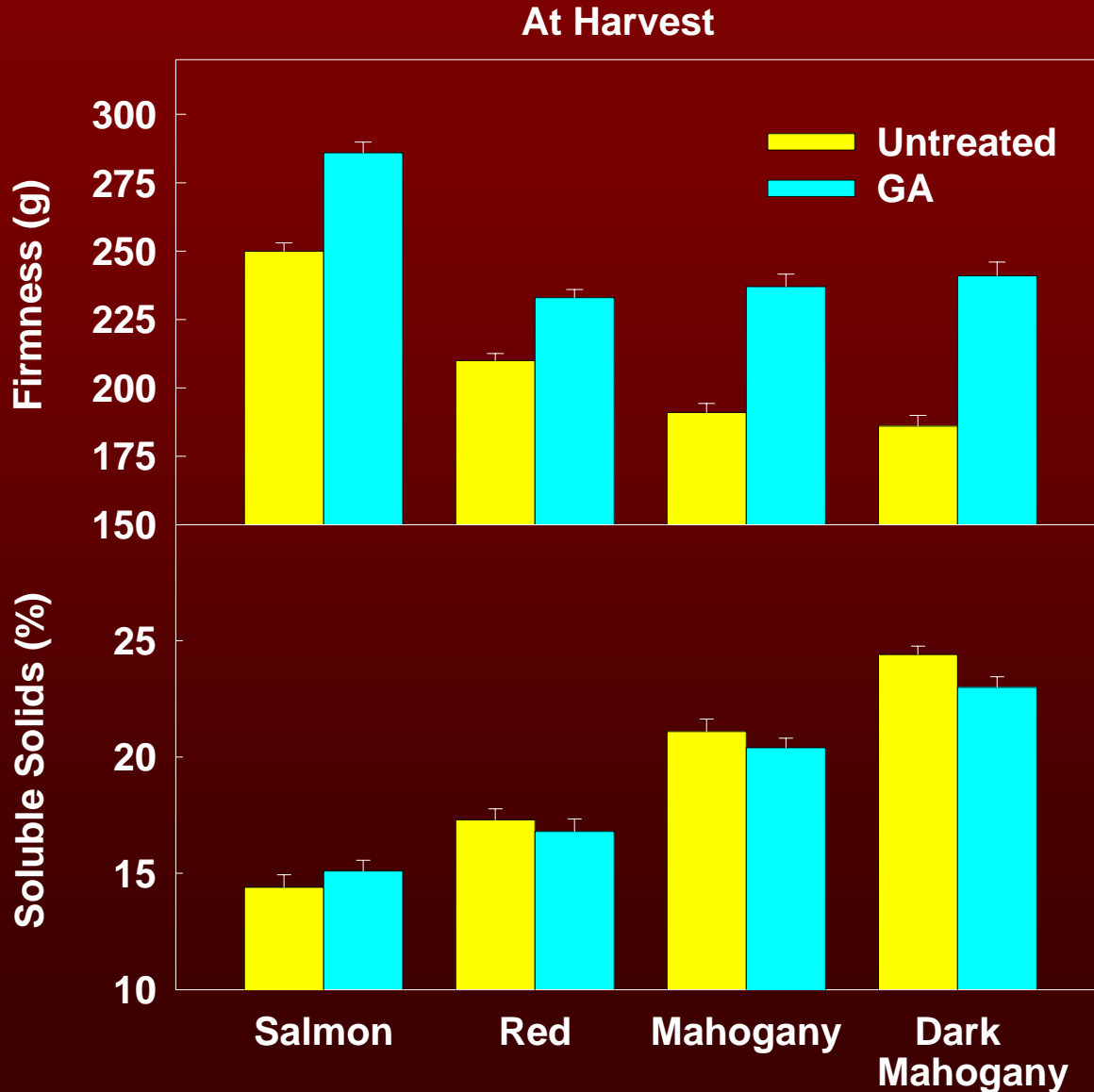
Harvest Maturity

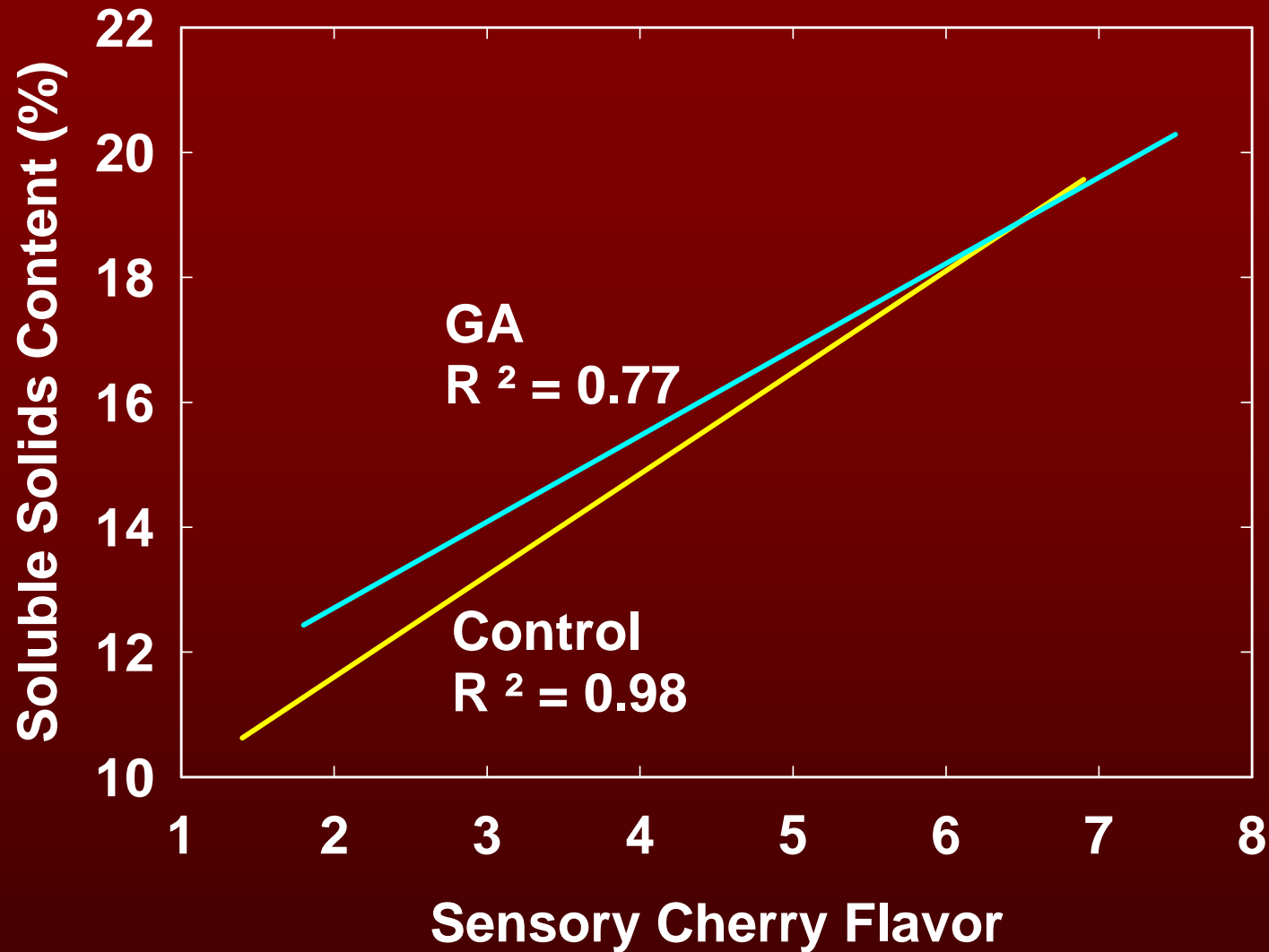
- **Harvest too early**
 - Small size
 - Poor color
 - Poor flavor
- **Harvest too late**
 - Soft fruit
 - Increased decay susceptibility
 - More shrivel, stem browning and pitting
- **If marketing is close and quick, can harvest more mature**

Minimum Maturity Standards

- **U.S. Standard**
 - Mature
 - Fairly well colored
 - 95% representing typical color for variety
- **California Standard**
 - Entire surface of cherry minimum of light red color
 - Minimum 14 to 16% soluble solids, depending on variety

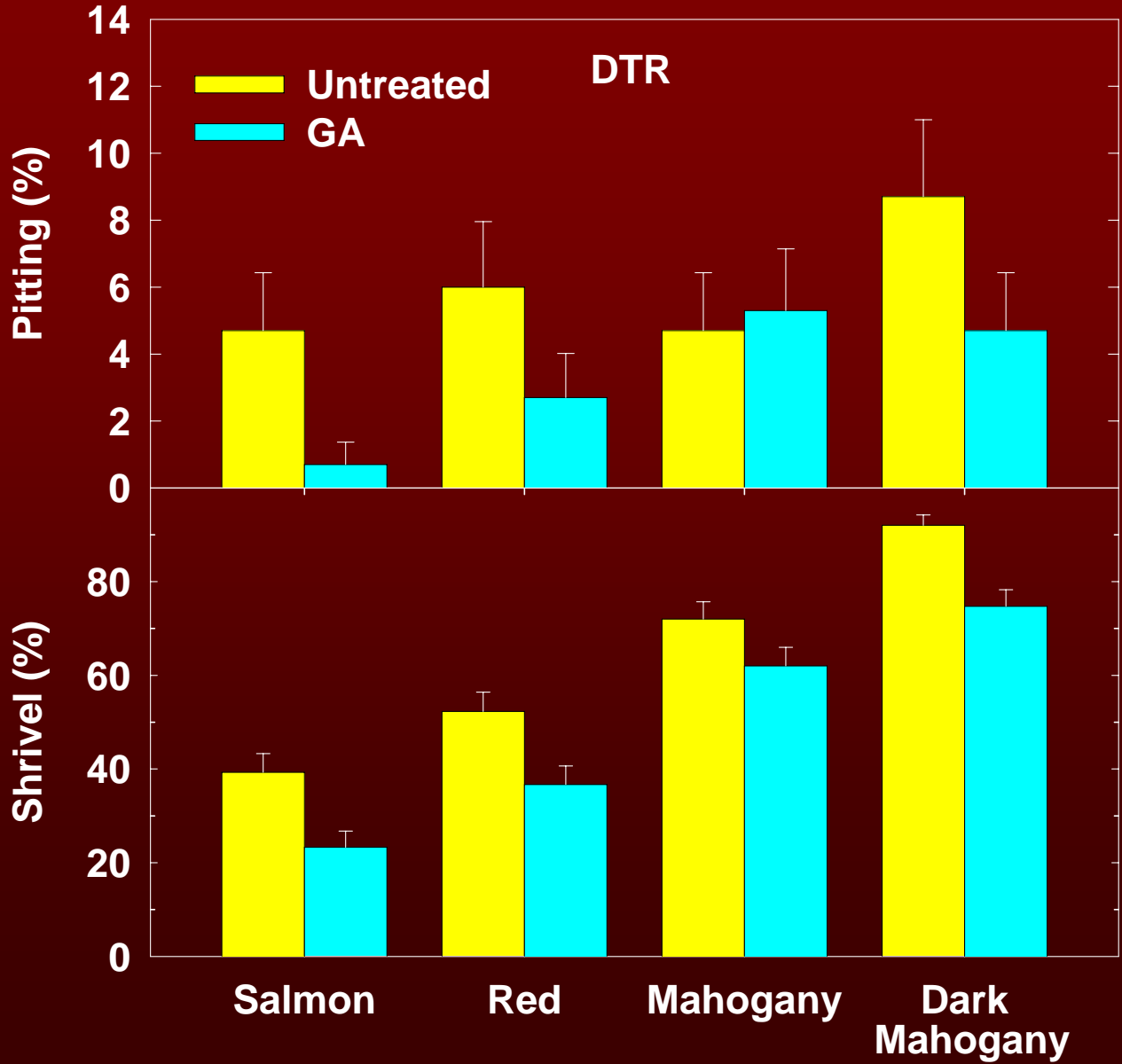
Changes in Firmness and Sugars at Each Color Stage and Effect of Gibberellic Acid Treatment



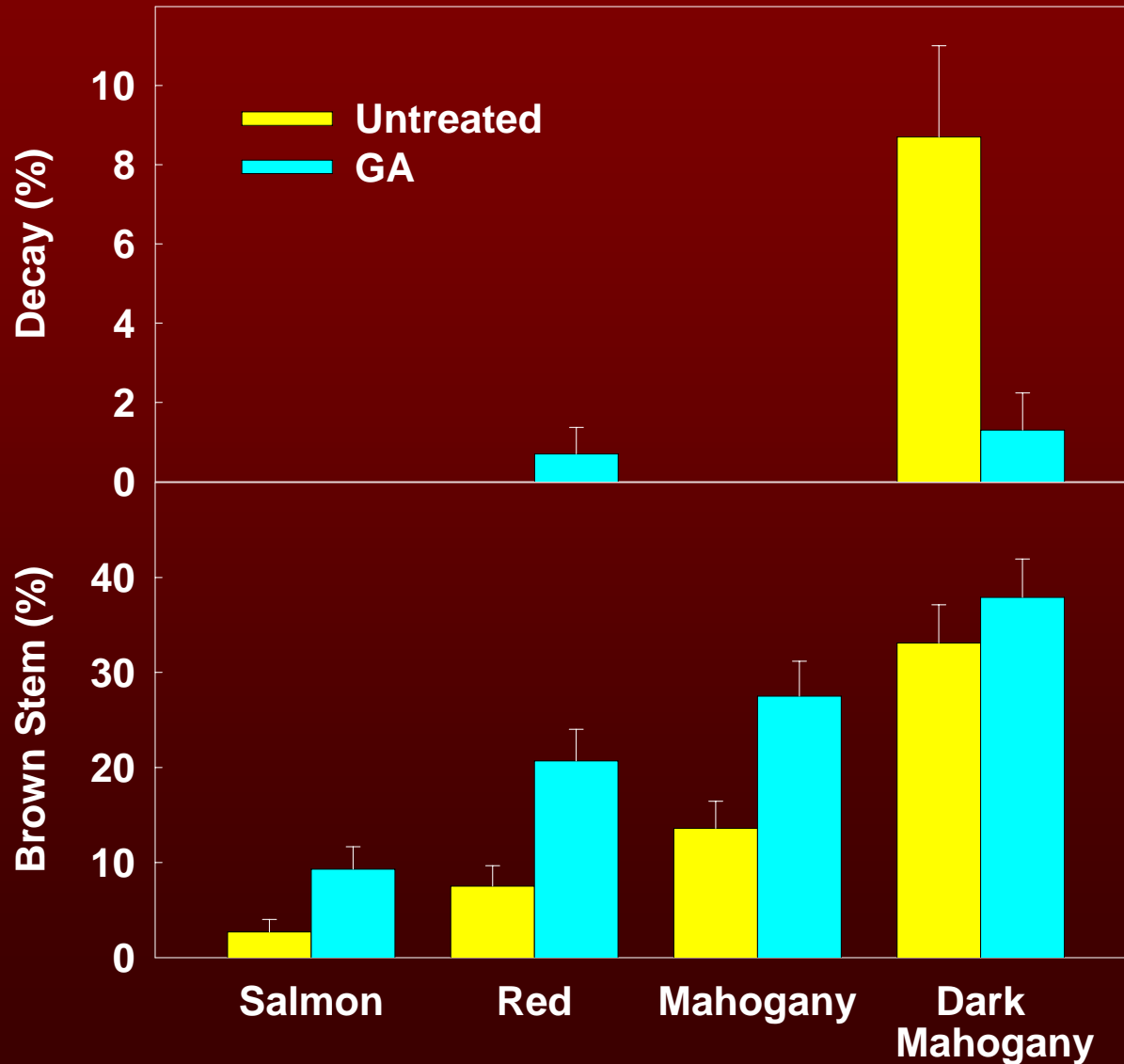


For Bing, Cherry Color is Closely Related to Sensory Cherry Flavor and Soluble Solids Content

Less Pitting and Shrivel in GA-Treated Fruit after Storage



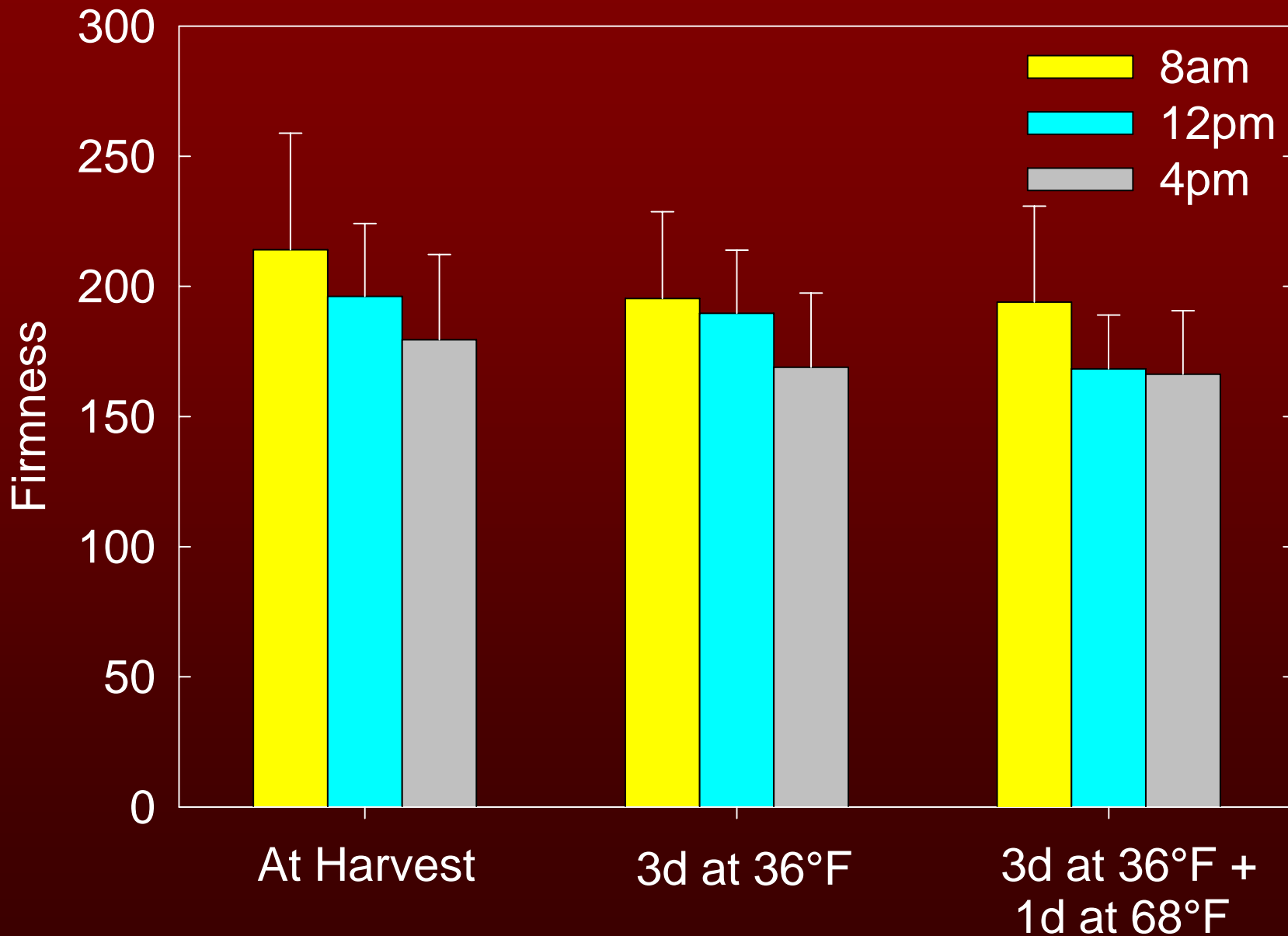
Less Decay and More Stem Browning in GA-Treated Fruit after Storage



- Harvest early in the day when cool
- Harvest cherries by their stems, lifting the cluster to remove from the spur
- Avoid impact injury during harvest operations (pads)
- Keep fruit in the shade and transport to cooler or packing as soon as possible



Harvest Time Effects on Fruit Firmness





Effect of Sun Exposure on Cherry Fruit Quality

Time in Field	Evaluation Time	<u>Fruit Temp. °F</u>		<u>Stem Browning</u>		<u>Firmness g/mm</u>	
		Sun	Shade	Sun	Shade	Sun	Shade
2	Before Storage	97.5	66.5	2.2	1.1	131	183
5		114.1	71.3	4.4	0.5	118	173
2	After Storage	-	-	3.2	1.2	178	180
5		-	-	5.0	1.9	144	195

Stem browning scale: 0 to 5

Packinghouse Operations

- **Cluster Cutter**
 - Singulates fruit to allow for sizing
- **Sorting**
 - Labor intensive
 - Removes under-ripe, damaged and decayed fruit
 - Adequate lighting is important
- **Hydro-cooling**
- **Sizing**



Packaging

- **Box with liner or bag**
 - Loosely closed, solid polybag
- **Consumer bags**
 - Various sizes
 - Clamshell
 - Semi-automatic system
- **Modified atmospheres**
 - Perforated, Lifespan, Freshbag
 - Beneficial for > 15 days storage



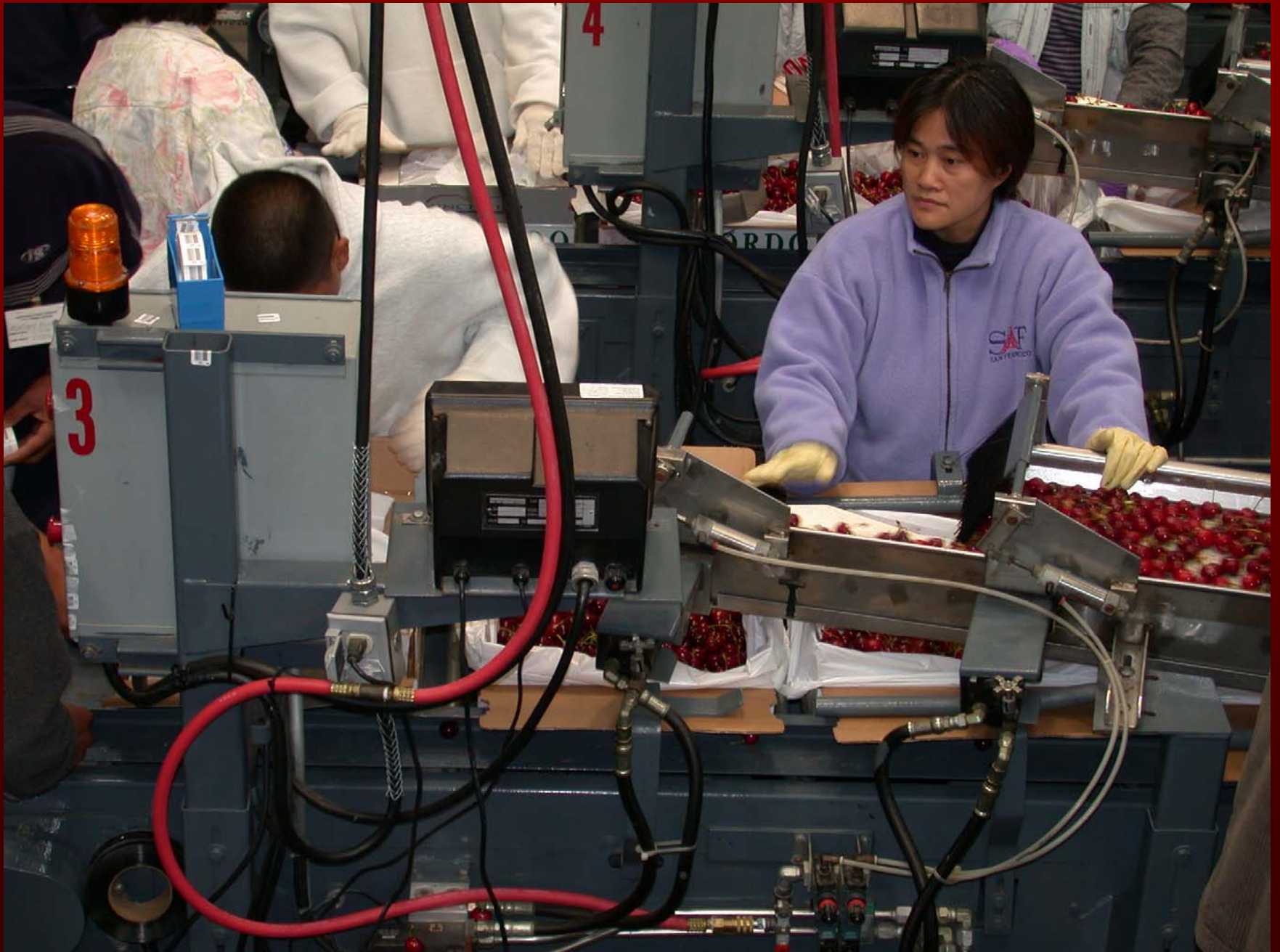
CHERRIES



CHERRIES



CHERRIES



Modified Atmosphere Packaging

- **Breathable plastic bag**
- **Introduce gas or fruit modifies atmosphere**
 - Produce CO₂ and consume O₂
 - Final concentration depends on amount of fruit and bag permeability
- **Benefits**
 - Slows fruit ripening and senescence
 - Maintains green stem color
 - Reduces growth of disease organisms

Modified Atmosphere Packaging

23 days at 41°F

Air



0.5% O₂



0.5% O₂ + 15% CO₂



Modified Atmosphere Packaging



- Injection of gas not required
- Twist-tie or zip-closing bags works fine



Cherry Pitting

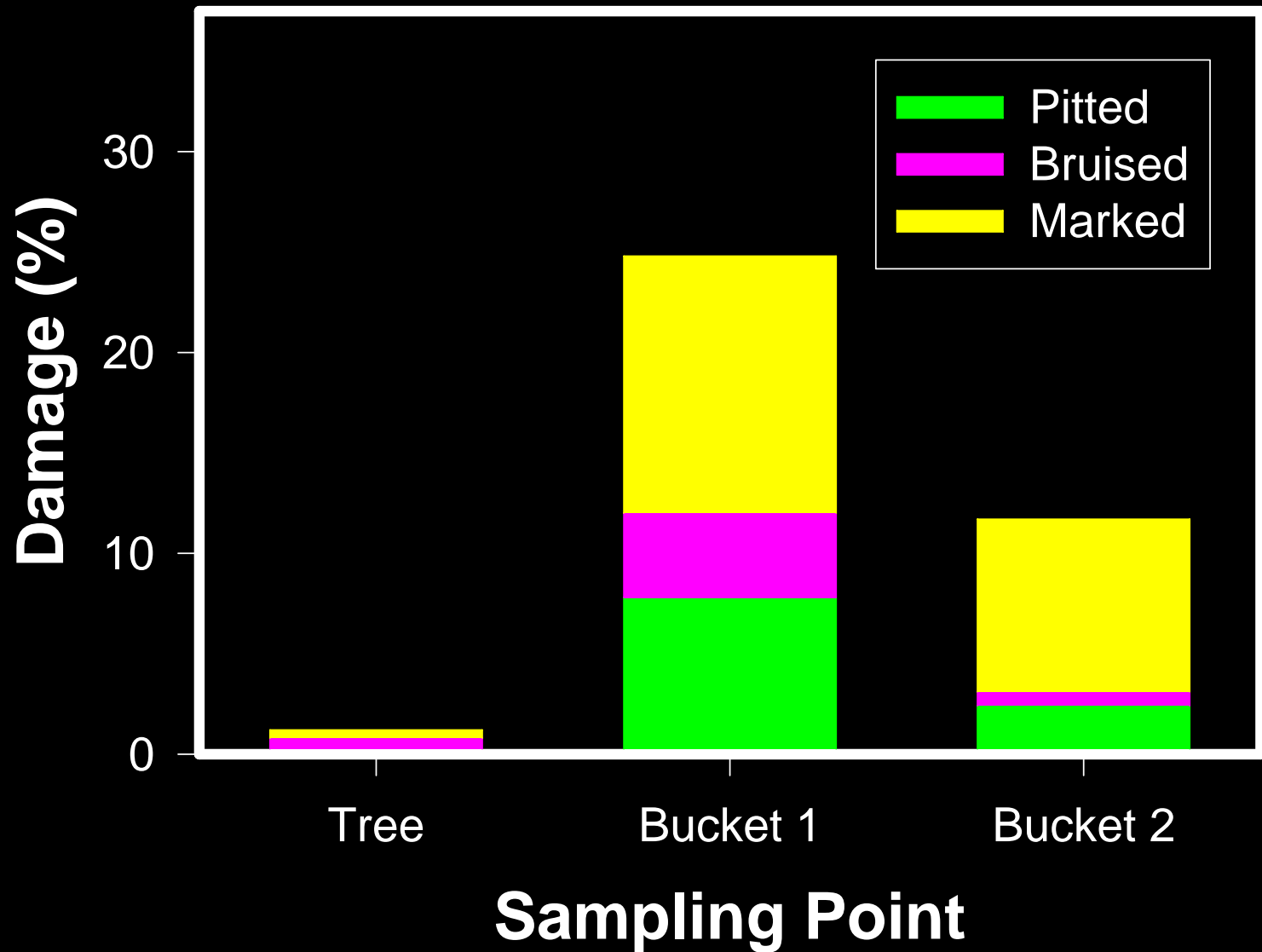


Cherry Bruising

Origin of Cherry Damage

Damage Symptom	Origin
Pitting	Pedichel, packinghouse.
Surface marking	Picking container, lug side, compression damage.
Bruising	Pickers, buckets w/out padding, long hauling, high drop on the packingline.

Picking Bucket



Decay Control Strategies for Cherry

Efficacy of selected fungicides for control of three postharvest decays of sweet cherry

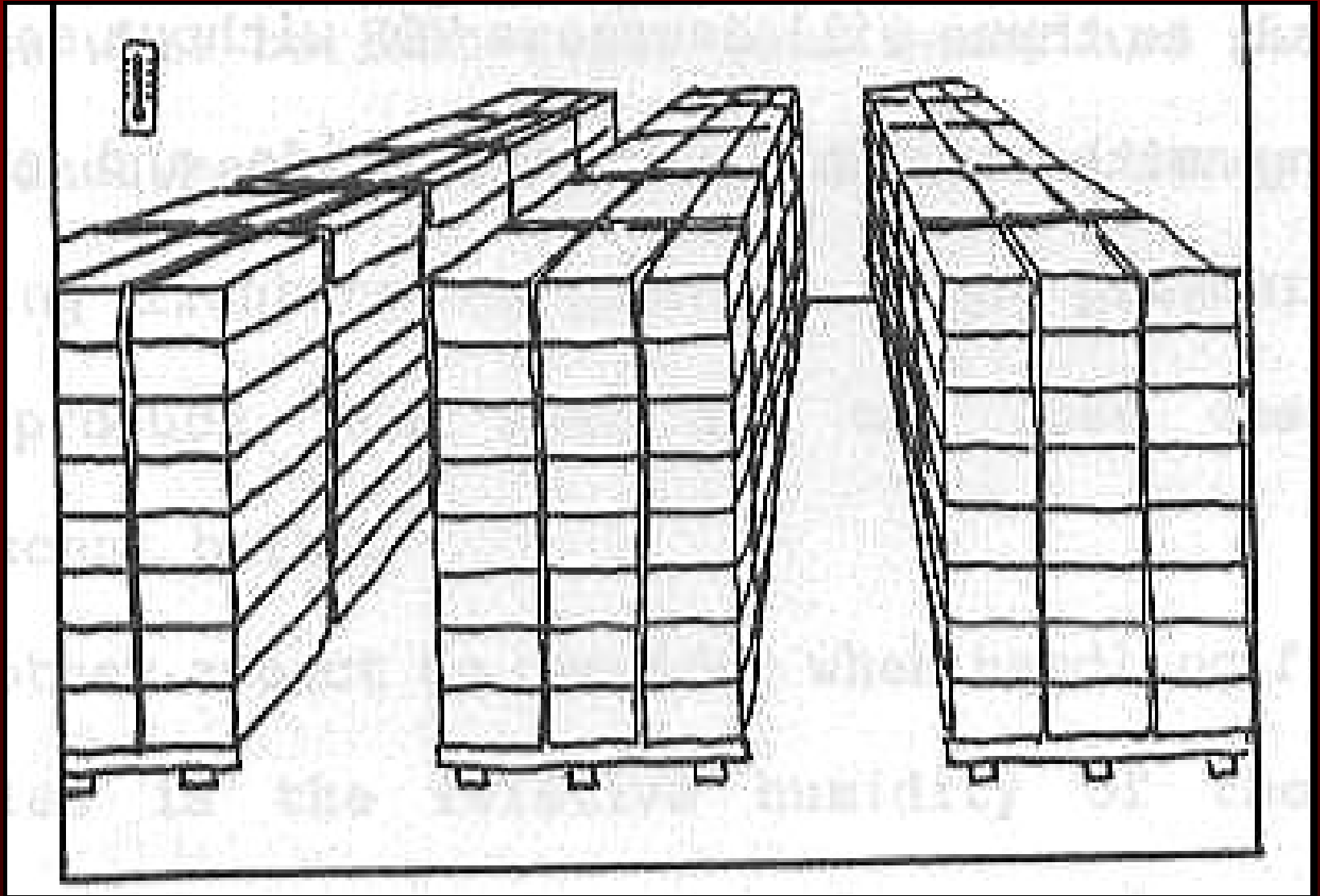
Fungicide	Common Name	Brown Rot	Gray Mold	Rhizopus Rot	Registered
Rovral 50WP	Iprodione	+++	+++	+++	Cancelled
Scholar 50WP	Fludioxonil	+++	+++	+++	Yes
Allisan	Dichloran	+	++	+++	Yes
Elite 45WP*	Tebuconazole	+++	+	++	Yes
Elevate 50WDG	Fenhexamid	++	+++	-	Soon
Pristine	Mixture	+++	+++	+++	Soon
PH-066	Pyrimethanil	++	+++	-	Soon?

* - Efficacy of Elite 45WP is rate dependent.

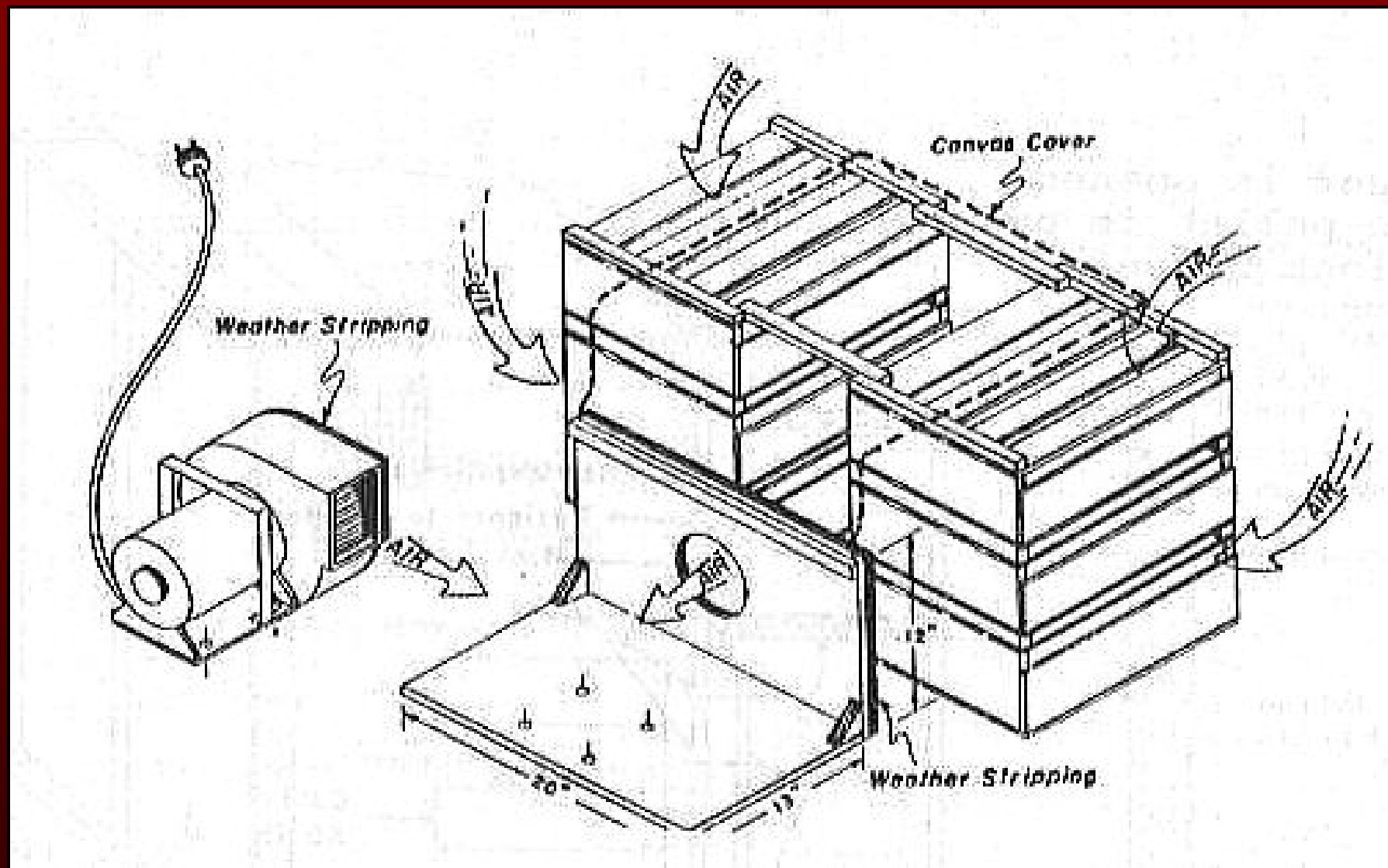
Cooling

- **Room cooling**
- **Hydrocooling (before packing)**
 - **Packagingline**
 - **Manual immersion**
 - **Sanitizer in water essential (25ppm chlorine)**
- **Forced-air cooling**
 - **Do not overcool**
 - **High RH**

ROOM COOLING SETUP



PORTABLE FORCED AIR COOLER



Storage

- **Only until fruit can be marketed**
- **Temperature 32°F; 90 to 95% RH**
- **Flavor quality usually deteriorates before appearance quality**
 - **Loss of acidity in storage**
- **Do not store more than 2 weeks**

Overview

- **Maturity**
- **Educate/supervise picking crew**
- **Evaluate your equipment**
- **Handle gently and fast**
- **Short transportation**
- **Fast cooling to 32F**
- **Keep them cool**
- **Establish a quality control system!**

www.postharvest.ucdavis.edu

