UF/IFAS Extension presents

PASSION FRUIT Field Day

Harvest Maturity Effects on Fruit Shelf Life and Pulp Quality

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Optimizing Quality of Florida-grown Passionfruit

Two focus areas of study:

1) Is fruit quality different between clipped vs. fruit picked from the ground?

2) Does high relative humidity reduce shriveling?

   A) Countertop ripening containers

   B) Application of coating and fungicide

Collaborators:

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Research Question #1

- Does clipping passionfruit from the vine affect postharvest quality and shelf life?

- Mature passionfruit can ripen after harvest (have climacteric respiration and ethylene production patterns)
- Mature fruit will yield when squeezed, indicating they have begun ripening

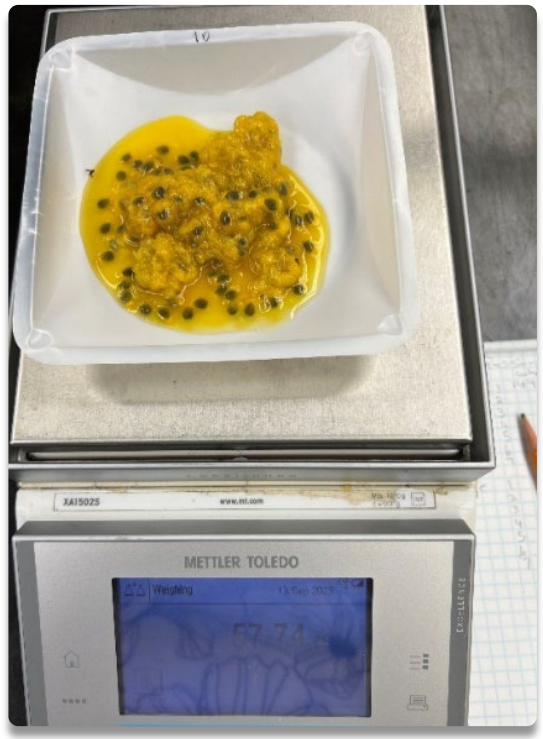
Bailey et al., 2021

Experimental Setup

- Passionfruit 'Ruby Red' grown in Homestead, FL in Dec. 2023
- Fruits clipped from the vine or collected from the ground and transported to UF Postharvest Lab
- Fruit stored for 3 weeks at 10 °C/50 °F and 90% relative humidity (RH)
- Fruit from each harvest method evaluated weekly
  - 7 fruit evaluated immediately
  - 7 fruit transferred to 20 °C/68 °F and evaluated until >25% of each fruit surface became shriveled

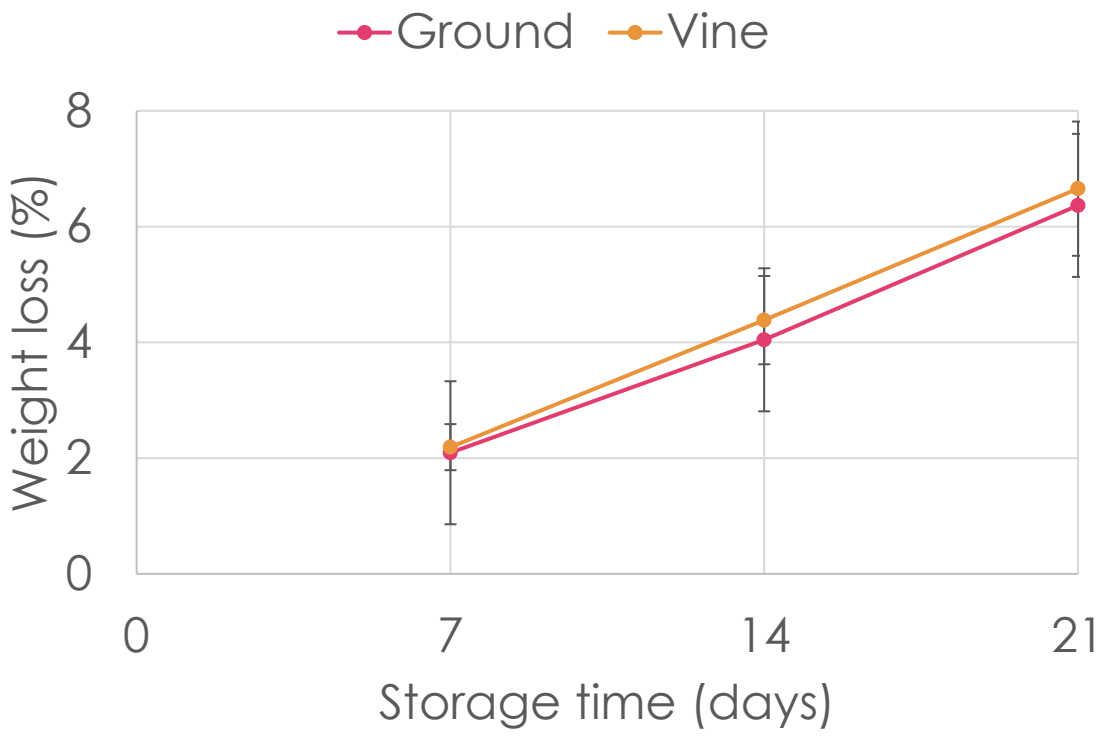
Quality Parameters Measured

- External color
- Weight loss
- Shrivel (% of surface area); decay (+/-)
- Pulp yield (% of total fruit weight)
- Soluble solids content (SSC), Total titratable acidity (TTA)



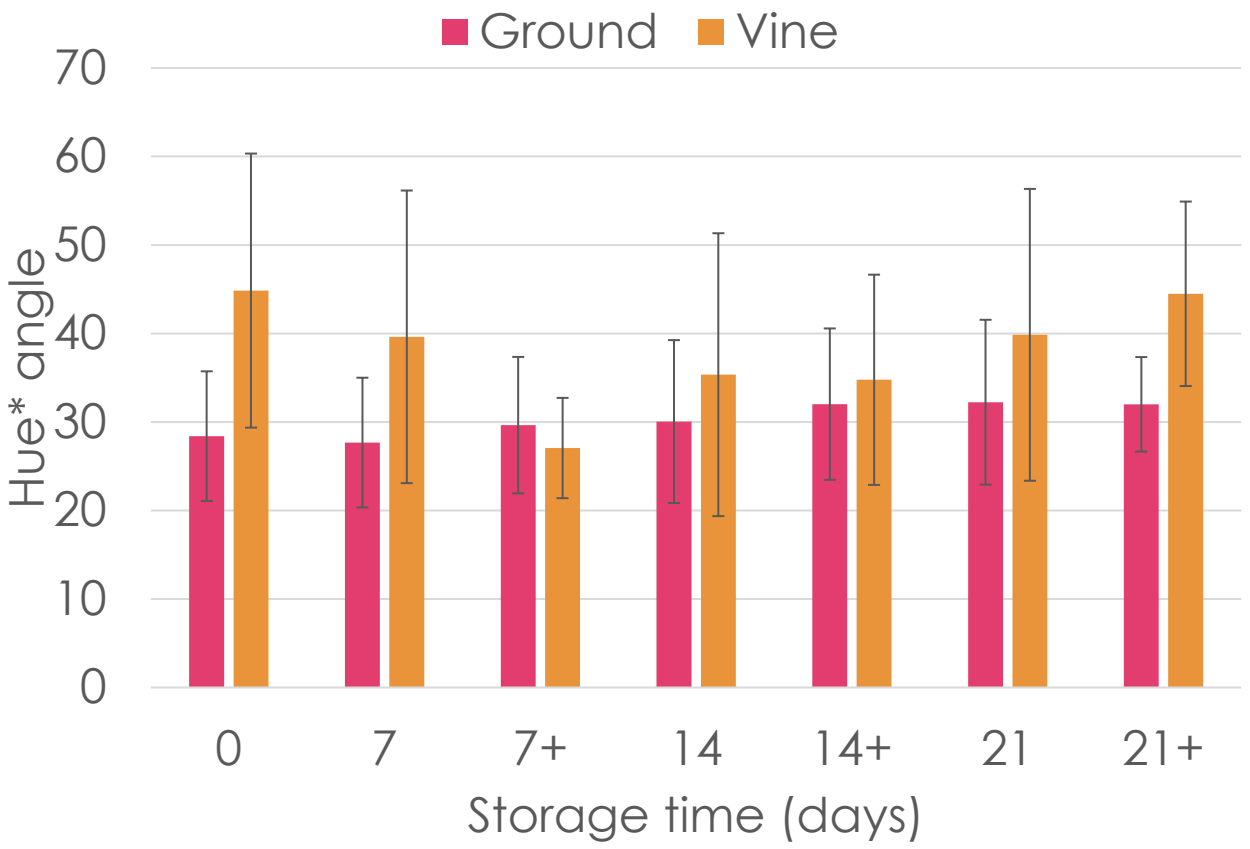
Results: weight loss

- Weight loss was similar for clipped or ground-harvested
- Values ranged from 2% after 7 days to 6.5% after 21 days
- No decay during storage or ripening



Results: peel color

- At harvest, clipped fruit were lighter red (hue*=45°); ground fruit were darker red/purple (hue*=28)
- Clipped fruit developed more color during storage; ground fruit didn't change color

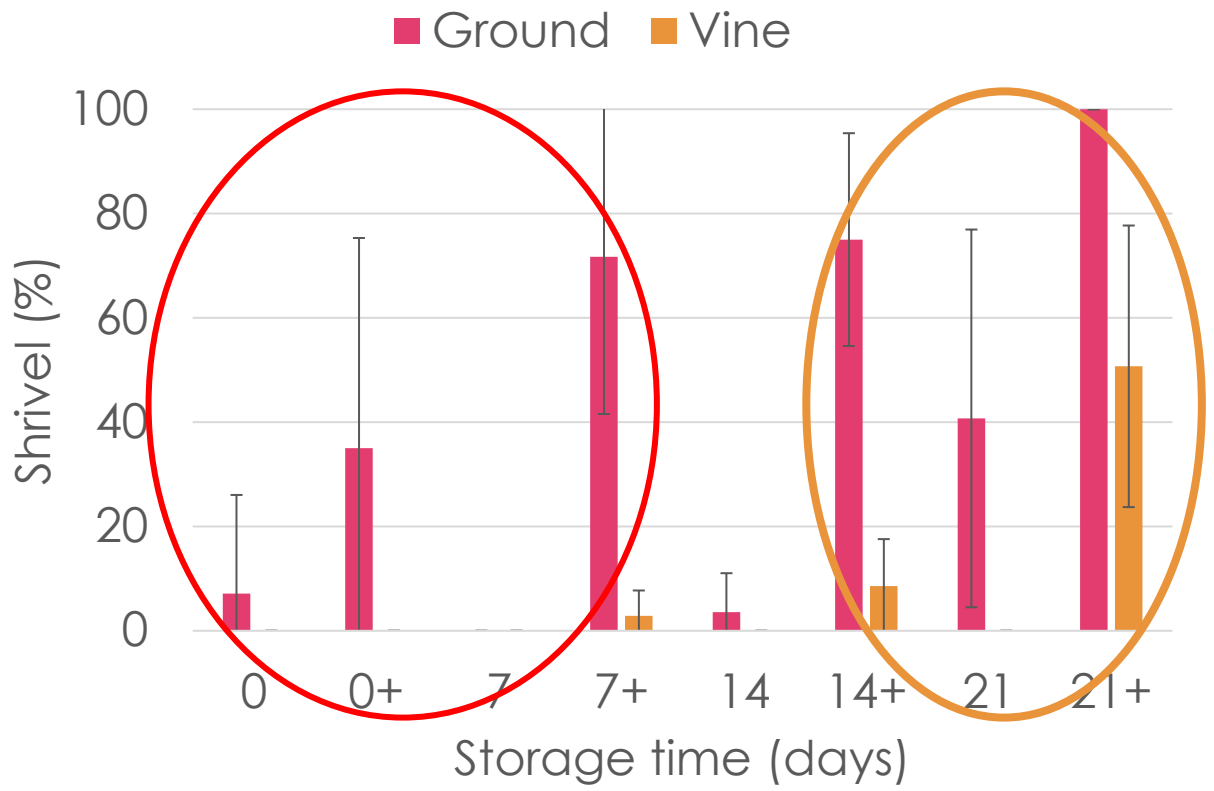


Results: shriveling

Storage at 50 °F/90% RH minimized shrivel for 14 days

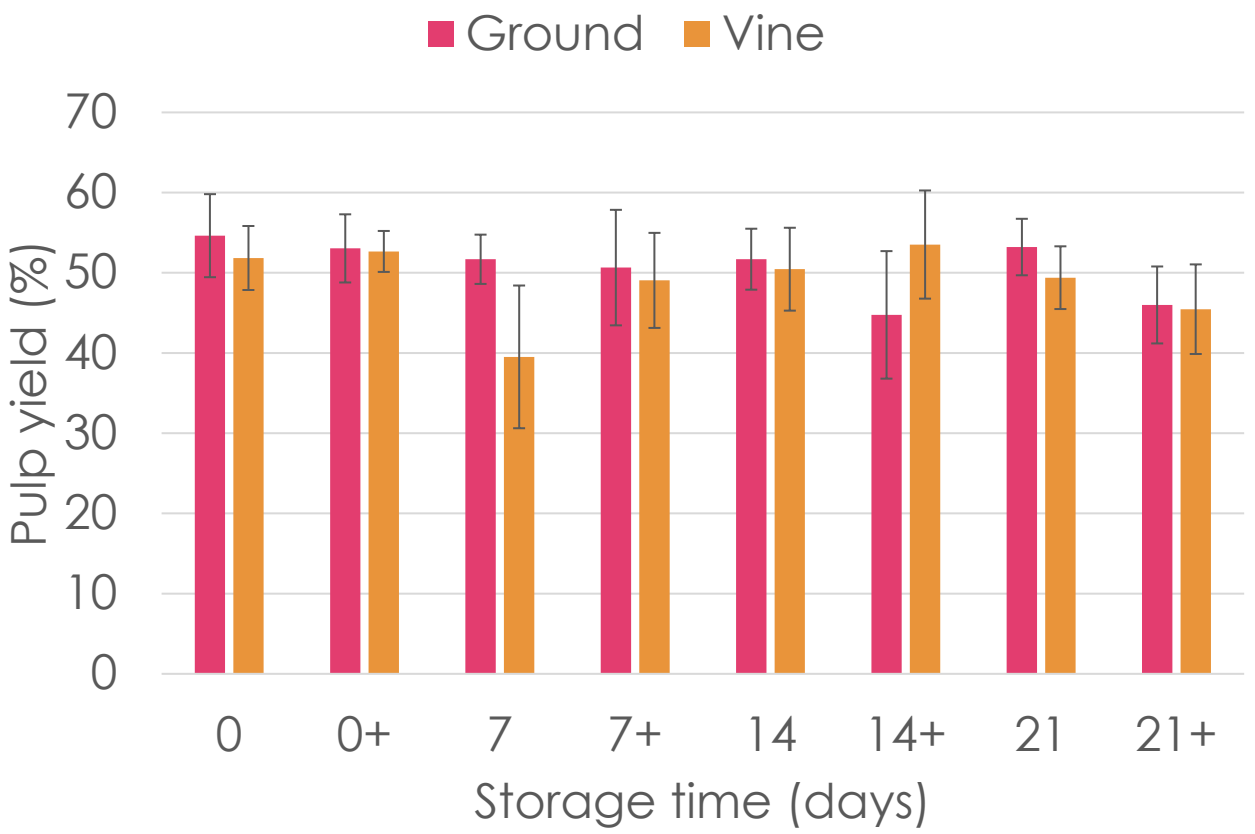
After 7 days at 68 °F, shrivel was:

- For ground-harvested
  - Day 0: 36%
  - Day 7: 72%
  - Day 21: 100%
- For clipped fruit
  - Day 14: 8%
  - Day 21: 50%



Results: pulp yield

- Pulp yield was about 50% of fruit weight until Day 21 + transfer
- Harvest method did not affect pulp yield during storage



Initial appearance

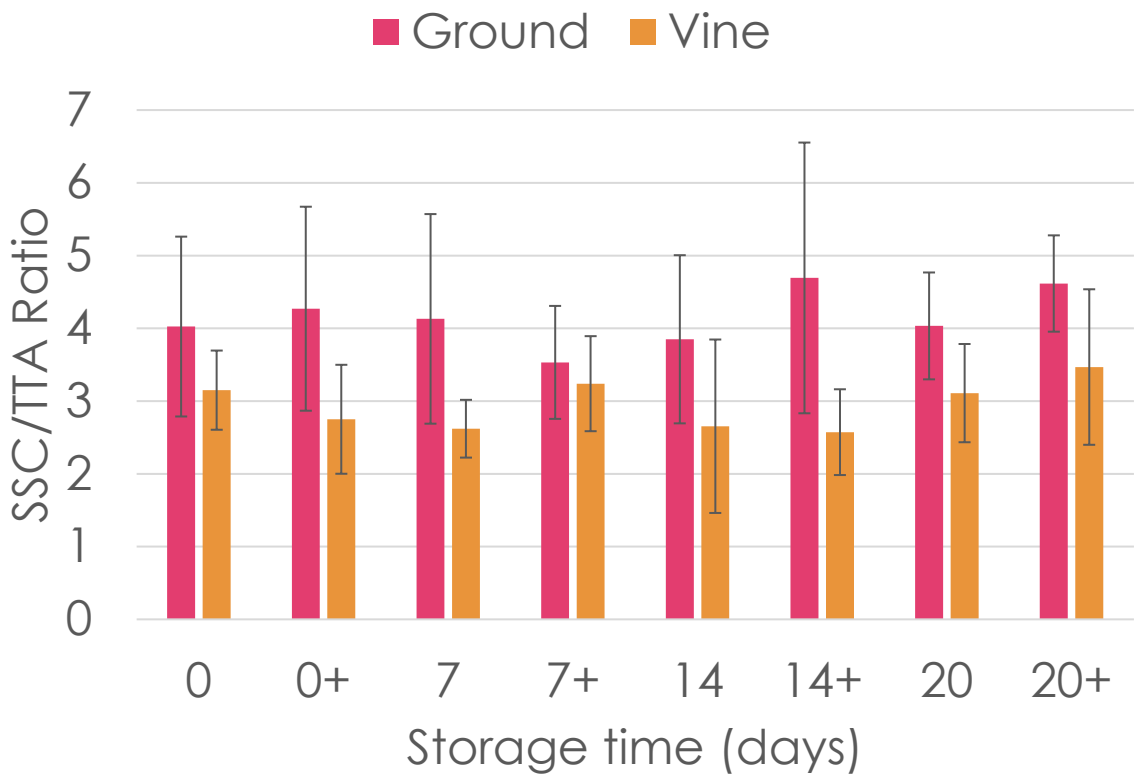
Storage	Ground	Vine
Day 0		

After 21 days at 50 °F + 7 days at 68 °F

Storage	Ground	Vine
21 d at 10 °C		
21 d at 10 °C + 7 d at 20 °C		

Results: flavor

- SSC was 14 °Brix for both methods
- Acidity was lower for ground-harvested fruit (3.8%) compared to clipped fruit (5.0%)
- Acidity impacted the SSC/TTA ratio
  - Ground = 4.1
  - Clipped = 3.0
- 7 days at 20 °C/68 °F did not affect these parameters



Conclusions

- Ground-harvested fruit
  - Were riper than vine-clipped fruit
  - Had deeper rind color
  - Shriveled faster (shorter shelf life)
  - Had lower pulp acidity, therefore less acidic
- Harvest maturity did not affect:
  - Weight loss
  - Pulp volume

- **Benefits of clipping fruit:**
  - **Longer shelf life**
  - **Lower potential for mechanical damage**
  - **More sanitary**

Research Question #2A

- Does high relative humidity reduce shriveling?
  A) Countertop ripening containers

- 'Possum Purple'; PSREU
- Ambient: 70 °F/ 50% RH
- Open container
- Perforated lids: >90% RH

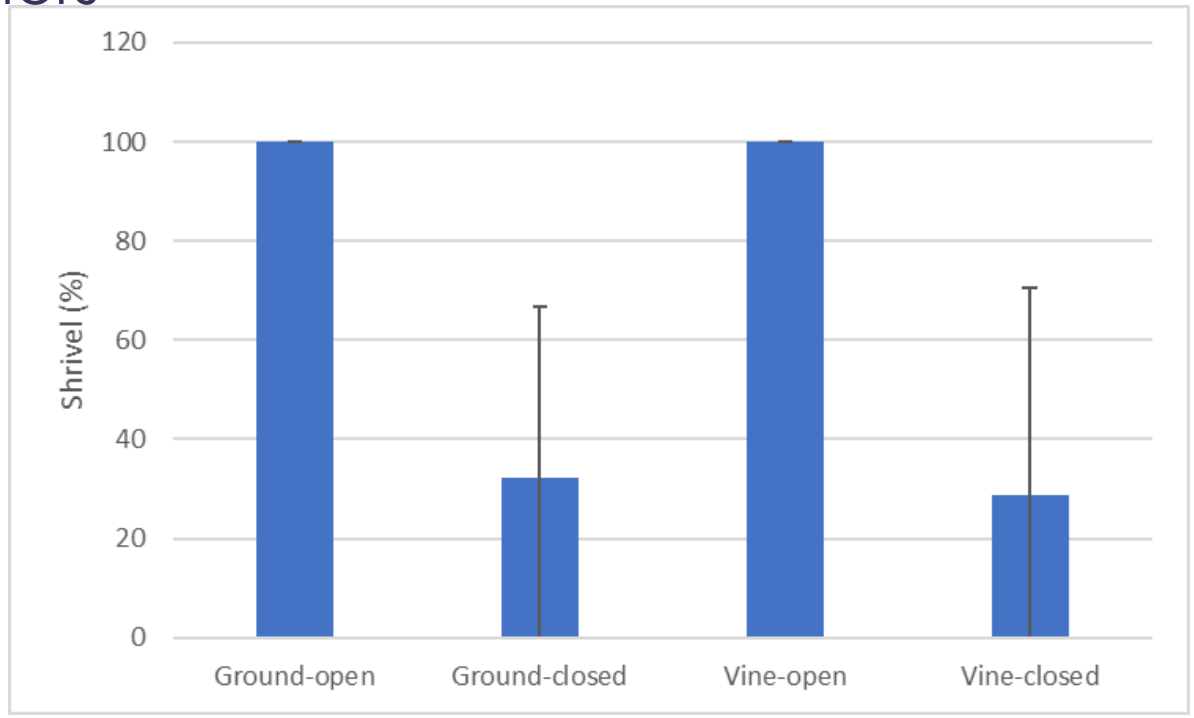
Results: Shrivel

Does high relative humidity reduce shriveling?

A) Countertop ripening containers

- Shrivel after 21 days:
  - Ambient RH: 100%
  - Perforated lids: 30%

- **Under high RH, fruit ripened with better appearance**



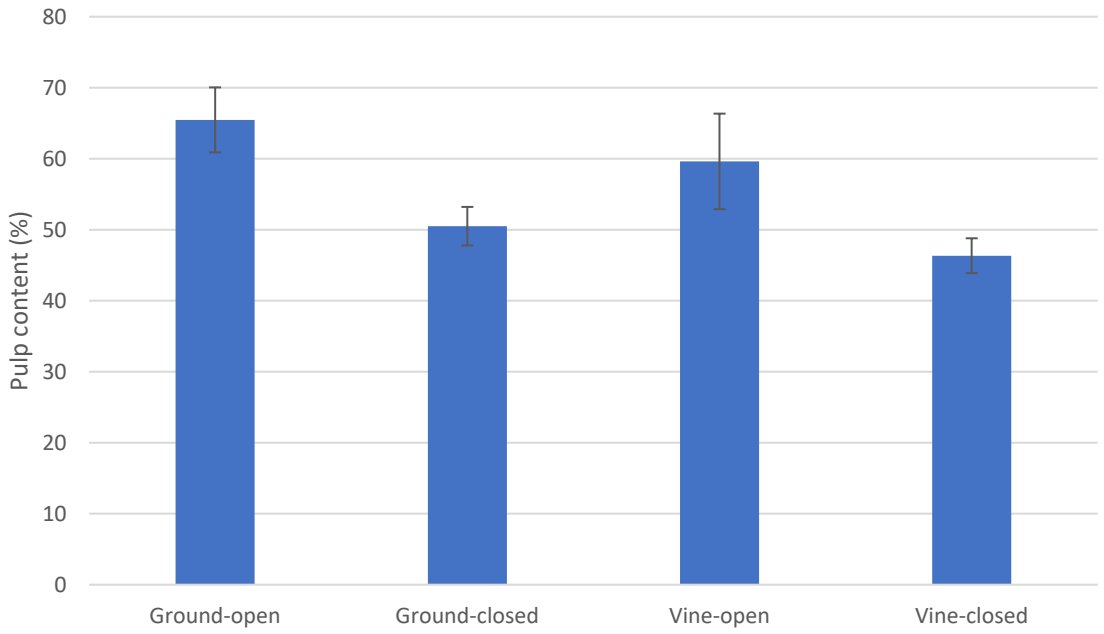
Results: Pulp volume

Does high relative humidity reduce shriveling?

A) Countertop ripening containers

- Pulp volume after 21 days:
  - Ambient RH: 60-65% of fruit wt.
  - Perforated lids: 48-50%

- **Under low RH, the rind lost more moisture**



Initial appearance; after 21 days

- **Rind ripening and shrivel differences**

	GROUND -HARVESTED		CLIPPED	
	Lidded	Open	Lidded	Open
0				
21				

Research Question #2B

- Does high relative humidity reduce shriveling?

B) Effect of coating and fungicide – 2 tests underway

1. Untreated control ('Possum Purple'; PSREU)
2. Carnauba wax coating
3. Perforated packaging
4. Wax coating + perforated packaging
5. Scholar SC fungicide dipping
6. Scholar SC fungicide dipping + wax coating
7. Scholar SC fungicide dipping + perforated packaging
8. Scholar SC fungicide dipping + wax coating + perforated packaging

Research Question #2B

- Store for 21 days at 68 °F/50-60% RH
- Evaluate weekly

Questions????