

# Pre-Harvest Factors that Affect Quality of Melons:

**Calcium**

**UV Reflective Mulch**



*Jorge M. Fonseca*

December 3, 2003



# SUMMARY



## Overview General Information

### Fall 2003 Experience: Yuma

**Calcium**

**UV Reflective Mulch**



# MUSKMELON QUALITY



**Firms, well netted, well formed**

**USDA grade 1: 8% Sugar (10 Brix best)**

**~15 days shelf life at 36-41 °F.**

**4.4-2.6 lbs**

**Strong orange for most muskmelon cv.**

**High levels of Vit. C and B carotene**



# QUALITY AT HARVEST



# QUALITY AT HARVEST



**Last two weeks are critical**

**Good leaf condition (no disease)**

**Good supply of Mg**

**No excessive irrigation or rainfall**

**Harvested at one-half to full slip**



# CALCIUM: BACKGROUND



## Work of Gene Lester

Four applications AA-Ca chelate or  
Mannitol-Ca complex

**Honeydew:** Fruit firmness increased,  
same Brix

**Cantaloupes:** Same firmness and Brix.  
Firmness was higher during storage



# CALCIUM FACTOR



**Essential in cell division and elongation**

**Fruit Growth!**

**Primary building block for cell wall**

**Exchange balance of other nutrients**

**Decrease permeability to Sodium**





# 1<sup>st</sup> Study: Yuma-Fall 03

**Four applications after flowering**

**Quality: At harvest, fresh cuts**





# Effect of Calcium on Quality



## Treatments

**CaCl<sub>2</sub>: 0, 30, 60 mM**

**(CaNO<sub>3</sub>)<sub>2</sub>: 0, 30, 60 mM**

**NaCl: 0, 50, 100 mM (solution)**

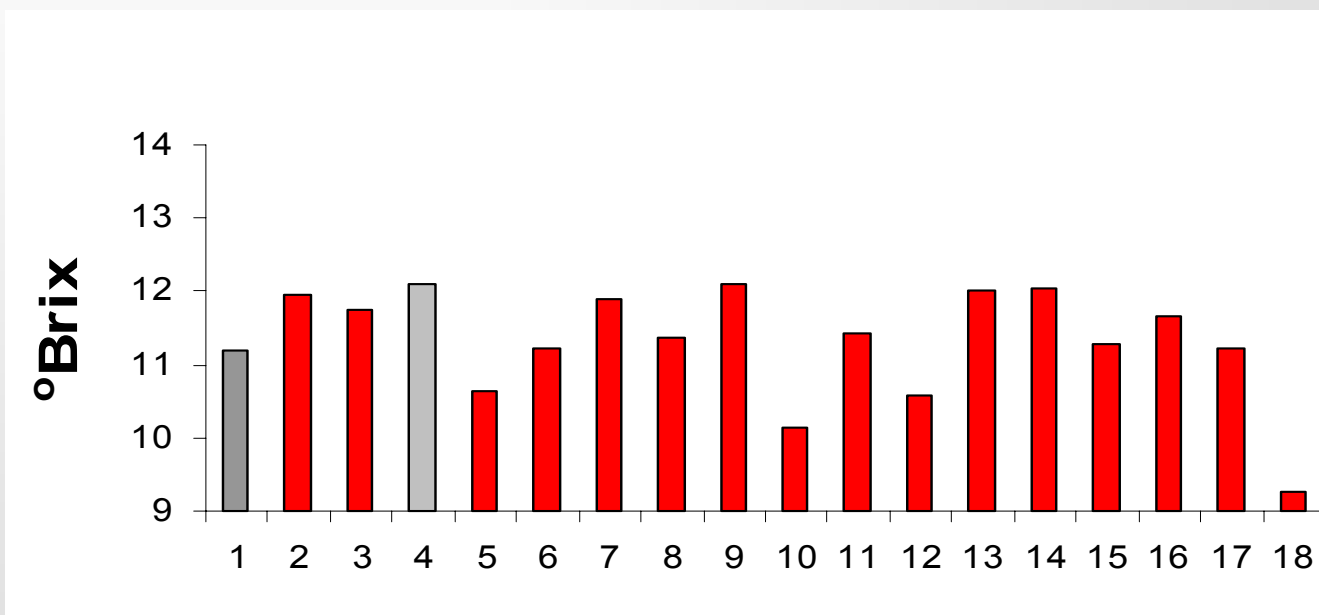
**Nutri-Cal**

**CAN-17**





# Effect of Calcium Application on Soluble Solids ---Gold Express



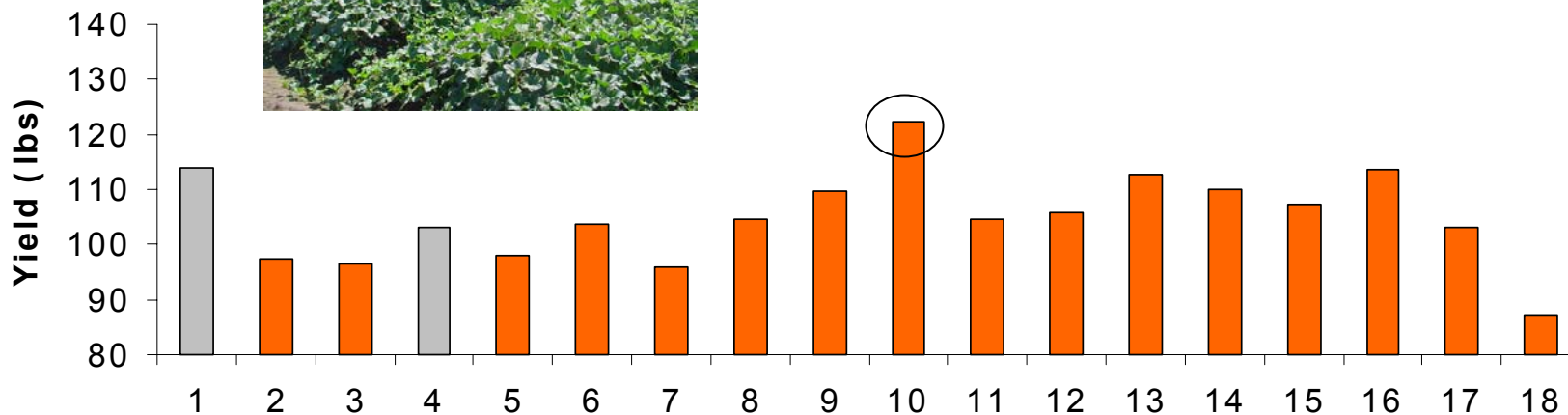
# Effect of Calcium Application on Diameter and Resistance to Penetration ---cv. Gold Express



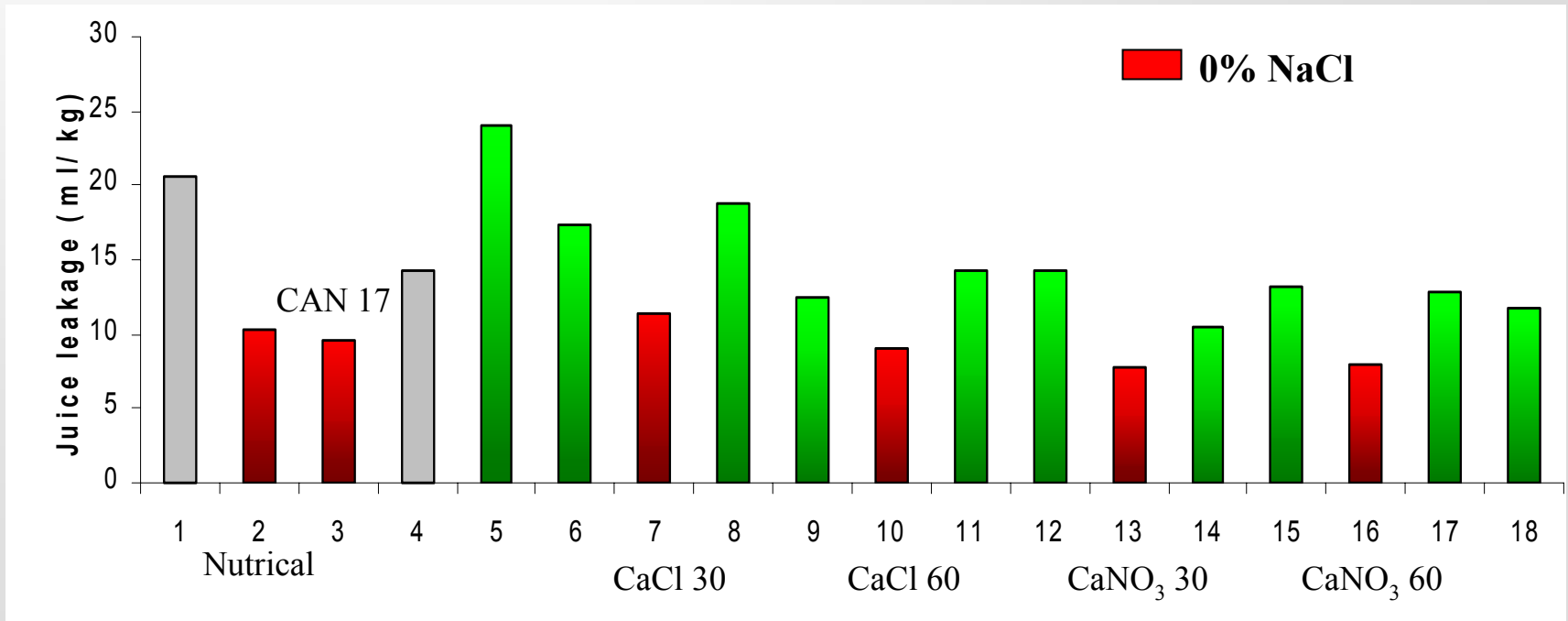
**No differences\***



# Effect of Calcium Application on Yield---Gold Express



# Effect of Calcium Application on Juice Leakage of Fresh Cuts, 5 d after processing---Gold Express



# FUTURE WORK



**Environment Effect**

**Other Interactions:**

**Titanium**

**Humic Acid**

**More on Fresh Cuts and other melons**



# UV REFLECTIVE MULCH



# UV REFLECTIVE MULCH:

## Effect on No. of Fruits

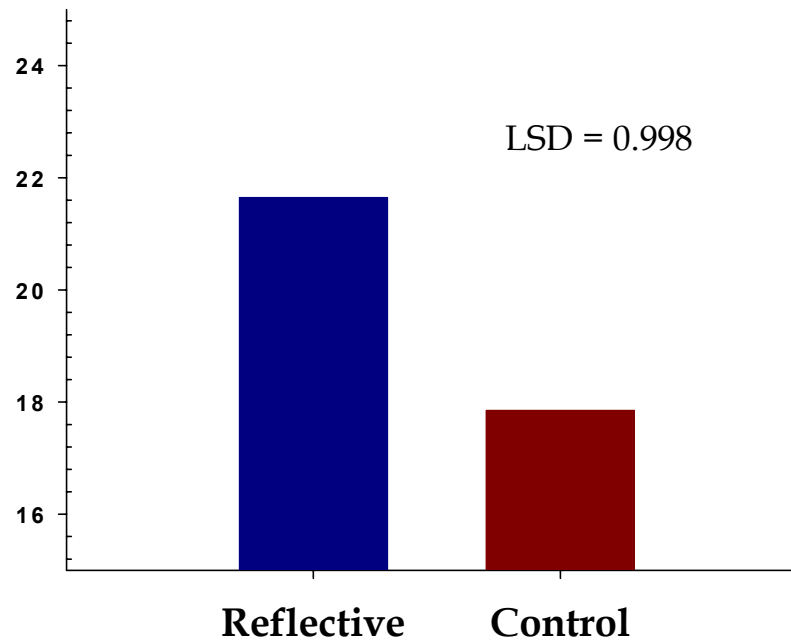




# Effect of UV Reflective Mulch on Number of Fruits in Muskmelon Plants



No. Fruits / 10 plants



# OTHER WORKS



**Hymenopteran insects were found more in reflective mulch (Pereira et al., 2000).**

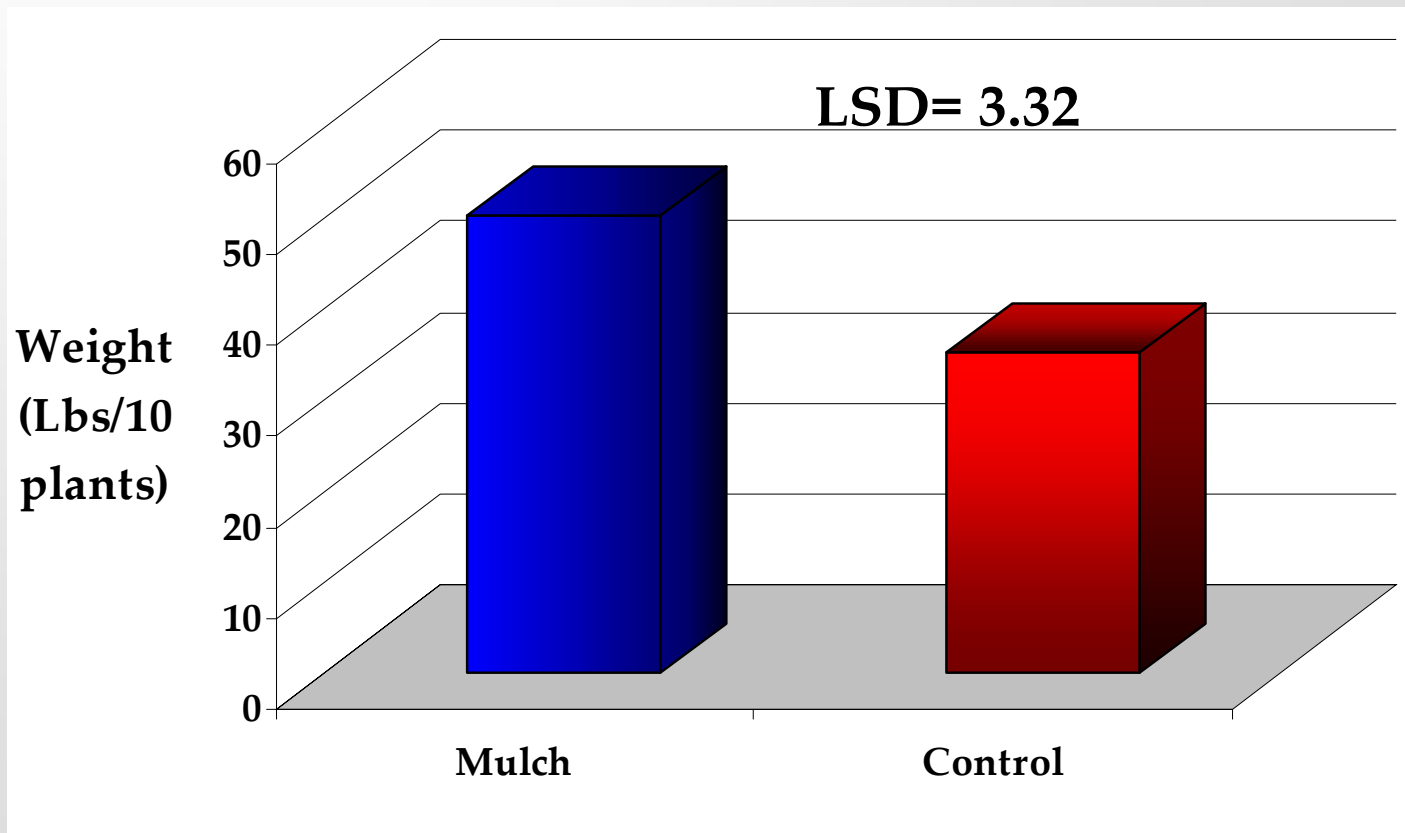
**Higher CO<sub>2</sub> fixation (Ito et al., 1996)**

**100% increase in cantaloupe yield (Stapleton and Summer, 2000).**



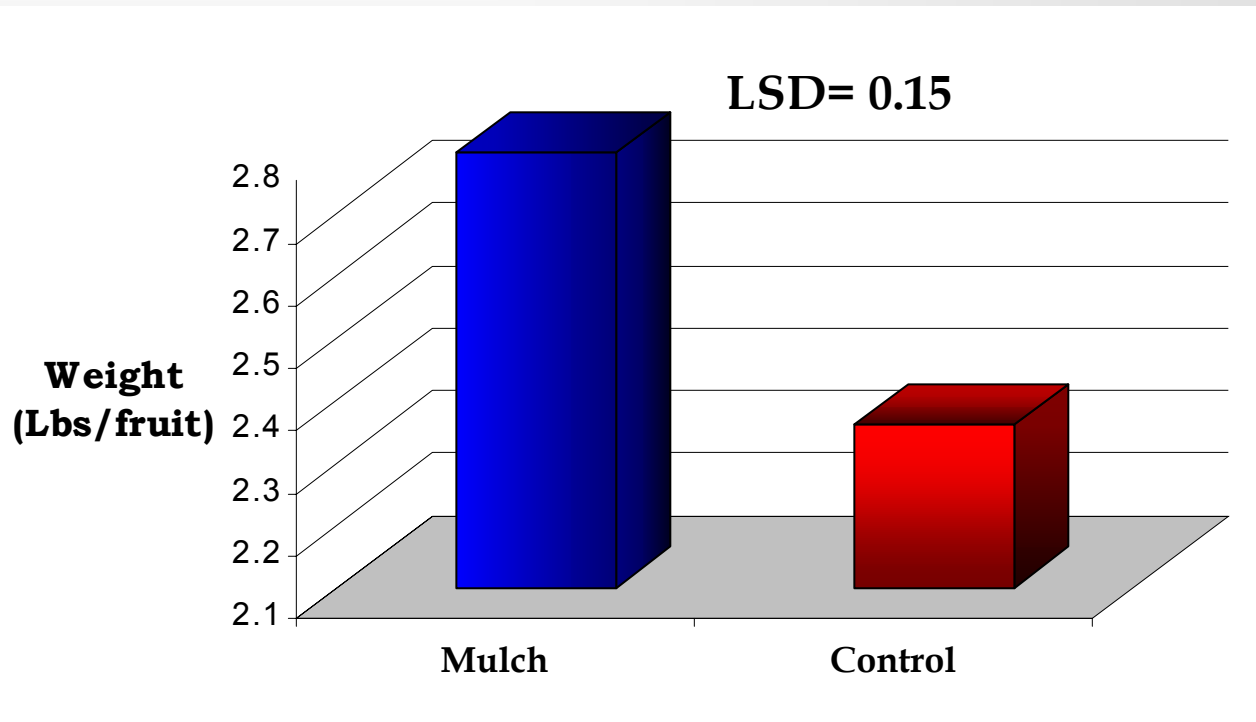
# UV REFLECTIVE MULCH

The effect of Reflective Mulching on yield



# UV REFLECTIVE MULCH

## The effect of Reflective Mulching on fruit weight

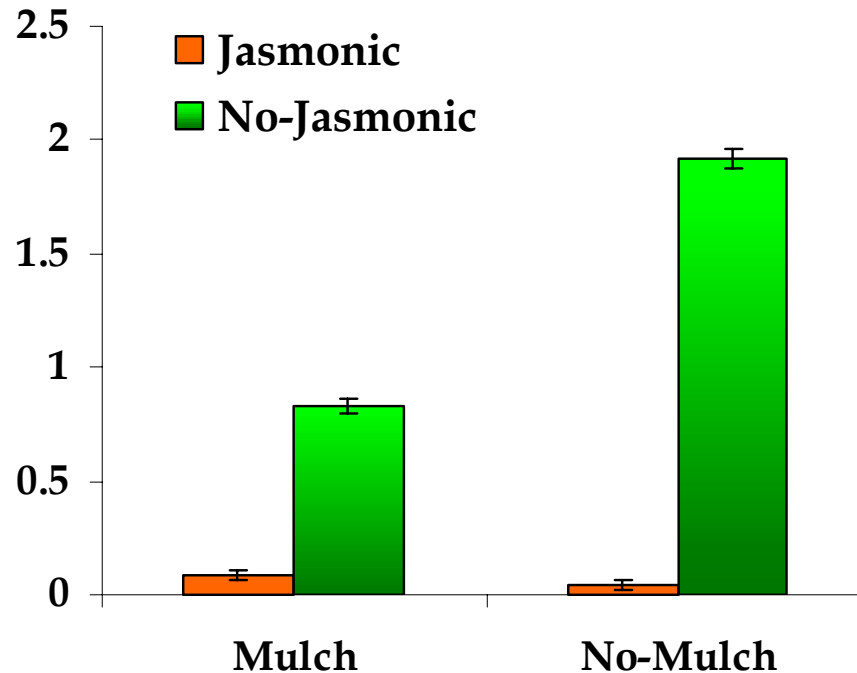


# UV REFLECTIVE MULCH

The effect of Jasmonic acid applied before transplanting on early flowering



No. Flowers  
after 9 d  
transpl.  
(in 10  
plants)



# FUTURE WORK



**Confirm 1<sup>st</sup> year results**

**Evaluate effect on shelf life**

**Evaluate water usage**





# Western Vegetable Quality

<http://cals.arizona.edu/crops/vegetables/>

*WestVeg News*: Electronic Newsletter



[jfonseca@ag.arizona.edu](mailto:jfonseca@ag.arizona.edu)