TIME COURSE OF POST-HARVEST FRUIT DETERIOTATION IN 'MARTINEZ' SPANISH LIME (*Melicoccus bijugatus*) AS AFFECTED BY TEMPERATURE AND BIOREGULATORS

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Introduction

- Spanish lime is a highly appreciated fruit in Puerto Rico. Its market value in the island is estimated at approximately $1 million yearly.
- The post-harvest life of this fruit is very short, the peel changing color and texture in a few days after harvest, and the pulp deteriorating several days later.
- Short-term storage under controlled conditions as well as exogenous physiological regulators may help extend the lenght of time quenepa fruits are still attractive to buyers.

Objective

- To determine the effect of temperature and exposure to selected exogenous regulators (AVG, kinetine, and a seaweed extract) on the post-harvest deterioration of the external appearance of Spanish limes.

Materials & Methods

- The research was conducted in 2009, at the Fruit Crops Lab, UPRM, Mayaguez.
- Fruits of 'Martinez' Spanish lime were dipped for 180 seconds in aqueous solutions of aminoethoxyvinylglycine (AVG)(0, 50 and 100 mg/L), an extract of the seaweed *Ascophyllum nodosum* (Stimplex®, 1 ml/L), and kinetin (50 mg/L).
- After exposure to regulators, seven fruits per treatment were stored at 10, 20, or 30°C for 12 days.
- Deterioration was assessed as peel loss of gloss and change of color. Fruits were photographed daily to develop a pictorial time-course of their external deterioration. Time from treatment to selected deterioration stages (Table 1) was recorded and submitted to analysis.

Results & Discussion

- Untreated fruit kept at ambient temperature (~30 C) lost gloss by 3 d, became unmarketable by 4 d and spoiled by 6-7 d (Table 1).
- Exposure to regulators increased the time it took the fruits to deteriorate. Similarly, storing at temperatures of 10 or 20 C after treatment slowed deterioration more than storing at ambient temperature (30 C)(Table 1).
- In general, AVG (an ethylene inhibitor) retarded deterioration more than kinetin and the cytokinin-containing seaweed extract.

Figure 1. Effect of selected regulators and temperatures on the external post-harvest deterioration of Spanish lime fruits. Data represents the number of days after treatment that the fruit reached each stage of deterioration.

Treatments					
Control, 30 C	3.1 a	4.0 ab	5.1bc	6.2 d	6.9 de
Control, 10 or 20 C	4.2 b	5.1bc	6.3 d	8.0 e	9.8 g
Kinetin or Seaweed extract, 30 C	4.6 b	5.5 c	6.7 d	9.0 ef	10.9 h
Kinetin or Seaweed extract, 10 or 20 C	4.9 bc	5.8 c	7.1 de	9.5 g	11.0 h
AVG (50 or 100 mg/L), 30 C	5.1 bc	6.1 cd	7.5 e	9.9 g	11.5 i
AVG (50 or 100 mg/L), 10 or 20 C	5.2 bc	6.2 d	8.1 e	10.5 gh	12.0 i

Preliminary Conclusions and Future Research

- ✓ AVG, kinetin and the seaweed extract retarded Spanish lime deterioration.
- ✓Storing at temperatures of 10 or 20 C also slowed deterioration as compared to storing at 30 C.
- ✓Future research will include other regulators and wax to retain gloss and retard surface browning. The research will include other Spanish lime selections/varieties.

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