QUALITY CONTROL FOR A FLORIDA CITRUS PACKINGHOUSE

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The Florida citrus industry is entering a new phase in this post-freeze era. A significant shift in citrus acreage from the north to warmer locations in south and southwest Florida have already taken place and is expected to intensify (Freie and Young 1989; Hall and Bowers 1989). New high density plantings (Whitney and Wheaton 1984) coupled with use of fertigation practices (Koo and Smajstrala 1984) will help increase yield per acre and bring groves into production at an early tree age and may have an impact on fruit keeping quality. Continued increase in consumption of fresh fruits and vegetables may also lead to a shift in planting to new varieties such as the AmberSweet and Sunburst and increased acreage of specialty citrus fruit (tangerines, tangelos and Temples), which are usually more vulnerable to physical injury and require greater care in harvesting and handling.

Florida citrus is well known for its excellent internal quality. Because of the warm climate and rainfall, Florida citrus fruit has thin peel, high juice and sugar contents and lower acid levels than comparable fruit grown in arid climates, e.g., California, Arizona and Mediterranean citrus growing areas (Soule and Grierson 1986). On the other hand, Florida citrus tend to be pale yellow in color on the outside and carries many scars and blemishes due to summer rainstorms and the many pests and diseases which thrive in

its subtropical climate. When Florida oranges are placed side by side in supermarket bins next to California citrus, the difference in appearance is very striking. Florida fruit are usually wind-scarred and blemished with symptoms of melanose, rust mite and greasy spot.

If Florida is to effectively compete in the world-wide market for fresh citrus, Florida growers, packers and shippers must place greater emphasis on those preharvest cultural practices and postharvest handling methods which will improve external fruit quality and extend its shelf life.

We believe that Florida citrus growers can produce fruit with good external appearance and excellent internal quality if the available information on pest control and cultural practices are applied properly and at the proper time.

Quality cannot be maintained without systematic and consistent quality control practices. In order to institute a successful quality control program, one must be able to monitor, measure, and maintain records of key parameters important to the preservation of quality. Extensive quality control programs are applied to citrus packing operations in California, Arizona, Israel, South Africa and Morocco, while in Florida few programs are in place.

This paper presents a general listing of important quality parameters between harvesting and packing for monitoring by a citrus packinghouses. It is presented here

as the Citrus Packinghouse Quality Control Checklist[1], a guide to the packinghouse manager from which to choose key parameters for gradual implementation. For example, in the first year of instituting a quality control program, one may start by monitoring important factors in drenching, degreening, washing, color-add, fungicide application, waxing, and fruit drying. Other parameters may be added to the program in subsequent years. A successful quality control program will require the full-time effort of a well-trained employee and must be implemented continuously and not just when problems arise.

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CITRUS PACKINGHOUSE QUALITY CONTROL CHECKLIST

Date _____
Observer _____
Packinghouse _____

1. Picking Information
   - Grove
   - Variety
   - Picking Crew
   - Harvest Date _____
   - Has fruit been treated with preharvest Benlate spray? _____
     Date _____
   - Pallet bin condition _____
   - Predegreening drench chlorine (ppm)_____pH_____
     TBZ (ppm)_____
2. Degreening
   - Temperature wet/dry _____/_____ (hourly)
   - Relative humidity _____ %
     Humidity system operation _____ (hourly)
   - Ethylene concentration _____ ppm
   - Degreening time _____ hours
3. Packingline Equipment
   - Dump rate _____ box/hr. Even flow from dump _____
   - Stems being removed effectively _____
   - Culls being removed effectively _____
     - Decay type(s) _____
   - Chlorine Spray
     - Cl_2 _____ ppm
     - pH _____
     - Time _____

- Presizer
  - Sizes being packed _____
  - Sizes being removed _____
- Washer
  - # of brushes _____ width _____
  - Brush speed _____ rpm
  - Rinse effective _____
  - Rinse gal/min _____
  - Soap _____ with SOPP _____
  - Time _____ sec.
- Pregrade
  - # of graders _____
  - % fruit being discarded _____
  - Cannery _____ %
  - Culls _____ %
  - Decay _____ %, Other _____ %
  - Fruit/grader/hour _____
- Water Elimination
  - # of brushes _____
  - # of donuts _____
  - Brush speed _____ rpm
  - Flick (Flipper) Bars in use _____
  - Time in water eliminator _____ sec
  - Effective water removal _____
- Fungicide Application
  - Brush speed _____ rpm
  - Residence time _____ sec
  - Fungicide type _____ ppm _____
  - Fungicide volume _____ ml/min
  - Nozzles clogged? _____
  - Field boxes/gal _____
  - Fruit volume controls _____
- Prewax Dryer
  - Width _____ inches
  - Rollers/minute _____
  - Temperature _____ °F
  - Residence time _____ sec.
  - Fruit condition at discharge _____

- Polisher
  - Temperature _____ °F
  - Brush speed _____ rpm
  - Wipeouts on? _____
  - Condition of fruit at discharge _____
- Wax Applicator
  - Wax _____ fungicide in wax _____
  - Brush speed _____ rpm
  - Time on brushes _____ sec
  - # brushes after wax application _____
  - Nozzles clogged? _____
  - Brush condition _____
  - Wax applicator type _____
  - Field boxes/gal _____
  - Fruit volume controls _____
- Wax Dryer
  - Temperature _____ °F
  - Drying time _____ sec
  - Roller condition _____
  - Fruit condition at discharge _____
  - Number of turns _____
  - Method of turns _____
- Final Grade
  - # of graders _____
  - Condition of grade table rollers _____
  - Fruit/grader/hour _____
- Sizing
  - Type _____
  - Condition _____
  - Sizes _____
- Packing
  - # of packers _____
  - Bulge _____ inches
  - Stack type (export or domestic) _____
  - Pallet type _____
  - # of Diphenyl pads _____