Main Changing Trends of Citrus Industry and HLB (Greening) Control in China

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Outline

- Overall Consumption and Production
- Decompose the Consumption—Fresh and OJ
- Decompose the Production—Fresh and OJ
- HLB Control
Overall Consumption and Production

Chinese Fresh Citrus Consumption (1000 MT)
Overall Consumption and Production

Chinese Orange Juice Consumption (MT, 65 Brix)
Overall Consumption and Production

Total Citrus Acreage of China (Million Acre)
Overall Consumption and Production

Chinese Citrus Production and Fresh Citrus Consumption

- Citrus Production (1000 MT)
- Fresh Citrus Consumption (1000 MT)
Overall Consumption and Production

Chinese Citrus Production and Fresh Citrus Consumption

- Citrus Production (1000 MT)
- Fresh Citrus Consumption (1000 MT)
Overall Consumption and Production

Chinese Orange Juice Production and Consumption

- Orange Juice Consumption (MT)
- Orange Juice Production (MT)
Decompose the Consumption—*Fresh* and OJ

Share of Chinese Fresh Citrus Consumption of the World
Decompose the Consumption—Fresh and OJ

Per Capita Fresh Citrus Consumption of China, US and the World

- Chinese Fresh Citrus Consumption (kg/Capita)
- World Fresh Citrus Consumption (kg/Capita)
- US Fresh Citrus Consumption (kg/Capita)
Decompose the Consumption—Fresh and OJ

Share of Chinese Fresh Citrus Consumption, by Type

- Share of China (Fresh Orange)
- Share of China (Fresh Tange/Mandarin)
- Share of China (Grapefruit)
Decompose the Consumption—Fresh and OJ

Per Capita Fresh Orange Consumption, China vs World

- World Fresh Orange Consumption (kg/Capita)
- Chinese Fresh Orange Consumption (kg/Capita)
Decompose the Consumption—Fresh and OJ

Per Capita Fresh Tange/Mandarin Consumption, China vs World

- World Fresh Tange/Mandarin Consumption (kg/Capita)
- Chinese Fresh Tange/Mandarin Consumption (kg/Capita)
Decompose the Consumption—**Fresh** and OJ

Per Capita Fresh **Grapefruit** Consumption, China vs World

- **World Fresh Grapefruit Consumption (kg/Capita)**
- **Chinese Fresh Grapefruit Consumption (kg/Capita)**
Decompose the Consumption—Fresh and OJ

Chinese Orange Juice Consumption (Gallon/Capita)
Decompose the Consumption—Fresh and OJ

Share of China (Orange Juice)
Decompose the Consumption—Fresh and OJ

Per Capita OJ Consumption, China, vs World, vs US

- Chinese Orange Juice Consumption (Gallon/Capita)
- World Orange Juice Consumption (Gallon/Capita)
- US Orange Juice Consumption (Gallon/Capita)
Decompose the Consumption—Fresh and OJ

Consumption of Soft Drinks in China, 1999-2013, Metric Liters
Decompose the Consumption—Fresh and OJ

Share of **Soft Drinks** in China, 1999

- **Still Drinks**: 16%
- **Squash/Syrups**: 1%
- **Sports Drinks**: 6%
- **Packaged Water**: 28%
- **Iced/RTD Coffee Drinks**: 0%
- **Nectars**: 2%
- **Energy Drinks**: 0%
- **Fruit Powders**: 3%
- **Iced/RTD Tea Drinks**: 16%
- **Juice**: 1%
- **Carbonates**: 37%
Decompose the Consumption—Fresh and OJ

Share of Soft Drinks in China, 2013

- Packaged Water: 35%
- Iced/RTD Tea Drinks: 13%
- Iced/RTD Coffee Drinks: 0%
- Juice: 1%
- Nectars: 2%
- Fruit Powders: 1%
- Energy Drinks: 2%
- Carbonates: 15%
- Still Drinks: 30%
- Squash/Syrups: 0%
- Sports Drinks: 1%
Decompose the Consumption—Fresh and OJ

Share of Chinese *Still Drink* Consumption by Flavor, 1999

- Orange: 58%
- Apple: 17%
- Other: 22%
- Pineapple: 1%
- Plum: 0%
- Other Non-Fruit: 0%
- Peach: 0%
- Pear: 0%
- Lemon: 1%
- Herbs & Spices: 1%
- Other: 0%
Decompose the Consumption—Fresh and OJ

Share of Chinese Still Drinks Consumption by Flavor, 2013

- OtherNonFruit: 38%
- Other: 9%
- Plum: 2%
- Orange: 13%
- Lemon: 3%
- Peach: 4%
- Pear: 9%
- Pineapple: 1%
- HerbandSpices: 19%
- Apple: 2%
Decompose the Consumption—Fresh and OJ

Share of Chinese Nectar Consumption by Flavor, 1999

- Orange: 65%
- Apple: 18%
- Other: 9%
- Pear: 4%
- Vegetable: 0%
- Mango: 1%
- Tomato: 0%
- Peach: 3%
- Haw: 0%
- Kiwi: 0%
Decompose the Consumption—Fresh and OJ

Share of Chinese Nectar Consumption by Flavor, 2013

- Orange: 13%
- Peach: 11%
- Tomato: 10%
- Pear: 5%
- Mango: 6%
- Kiwi: 5%
- Haw: 11%
- Apple: 10%
- Vegetable: 17%
- Other: 12%
Decompose the Consumption—Fresh and **OJ**

Share of Chinese **Juice** Consumption by Flavor, 1999

- **Orange**: 67%
- **Apple**: 28%
- **Pear**: 5%
- **Grape**: 0%
- **Tomato**: 0%
- **Other**: 0%
- **Vegetable**: 0%
Decompose the Consumption—Fresh and OJ

Share of Chinese Juice Consumption by Flavor, 2013

- Orange: 32%
- Apple: 19%
- Grape: 11%
- Tomato: 6%
- Pear: 6%
- Peach: 9%
- Vegetable: 13%
- Other: 4%
Strategic Plan: Long Term Goals

- Systematically develop China's citrus industry to
  - Increase farmer income
  - Reduce the dependence on import of citrus products.
Strategic Plan: Current Status

- First phase plan of 2003-2007:

- Second phase plan of 2008-2015:
Strategic Plan:

**Achievements**

1. Production bases with advantage in citrus production have been identified.
Dominant areas of citrus development in China

1. Juice orange area
2. Orange area
3. Mandarin area
4. Mandarin area
Production of Citrus Fruits across China

1. Juice orange area
2. Orange area
3. Mandarin area
4. Mandarin area

Legend:
- Purple: Pummelo
- Green: Orange
- Red: Tangerine
- Blue: Mandarin
Strategic Plan: **Achievements cont.**

2. Citrus industry has been developing rapidly and the industry is concentrating to the 4 belts.

- From 2002 to 2012 the citrus acreage and output increased by **58%** and **118%**, respectively.

- Large citrus growers are accounting for more citrus production.
3. Production technology has been continuously improved and the variety and maturity structures have been optimized.

- From 2002 to 2012, yield increased by 37%.
- Citrus supply has been extended from July to next February.
Strategic Plan: **Achievements cont.**

4. The role of citrus grower’s organization has been strengthened and the supply chain has been continuously extended.

- Citrus grower’s organizations:
  - 1.727 million members, 30% of the acreage, 57% of the output.
- A whole system of supply chain: breeding, seedling, professional planting, commercialized processing industry.
Strategic Plan: 
**Achievements cont.**

5. Fruit quality has been significantly improved.

- The ratio of high-quality fruits increased from 30% to 50%.

- The sale of the newly developed NFC orange juice products was promising.
Decompose the Production—Fresh and OJ

Total Citrus Acreage of China, 1993-2012 (Million Acre)
Decompose the Production—Fresh and OJ

Output of Citrus Fruits 1995-2010 (1,000 tons)
Decompose the Production—Fresh and OJ

Yield (Box/Acre, 80 Pound Box), 1993-2012
Decompose the **Production—Fresh** and OJ

From 2002 to 2012

- Output: Increased by 134% to **27.4** million tons.
- Acreage: Increased by **70%** to **6.04** million acres.
- Yield: Increased by **40%** to **122.9-145** boxes/acre.

- Both *production of pummelo and mandarin* increase at a faster rate: 2002-2010
  - Mandarin> 54%, Pummelo>47%, Orange>45%
Decompose the Production—Fresh and OJ

From 2002 to 2007

- Shard of China’s production of world total
  - Orange: Increased from 8% to 13%.
  - Tangerine: Increased from 48% to 64%.
  - Grapefruit/Pummelo: Increased from 32% to 53%.
Decompose the Production—Fresh and OJ

Chinese Orange Juice Production, 2000-2013

Orange Juice Production (MT)
Decompose the Production – Fresh and OJ

Share of China, 2000-2013 (Orange Juice Production)
Decompose the Production—Fresh and OJ

From 2002 to 2013

- OJ production Increased by 3900%.
- But, only 3.1% of world production (2013).
HLB / Greening Control

Distribution of HLB

11 out of 19 citrus production regions found HLB, about 80% of acreage

Infection Rate:
- Guangdong: 10%-40%
- Fujian: 5%, 20-30%

Heavy Infected Region
1. *Awareness of HLB varied significantly.* Growers in high infection regions are more aware of the HLB problem, while people in other regions are unaware, or ignoring the HLB problem.

One Tree that May be Infected with HLB

Farmers Claimed there was no HLB in his Grove
2012 China Trip Observations

1. Method to Control HLB:
   a. killing psyllid,
   b. removing infected trees
   c. using the enhanced foliar nutrient program
But

a. **Collaboration is the key**: help your neighbors to kill psyllid

b. **Replant the removed tree after 3-4 years** to avoid reinfection

c. **Big environment matters**: Cold weather kill the psyllid (Jiangxi), mountain prevent invention of psyllid (Chongqing)
Citrus trees on Mountain, Chongqing
HLB / Greening Control

- Daddy Zhu’s principle and Dr. Deng’s Experiment

- **Economics matters**: HLB is not a problem, as long as the grove can get the return for the investment.

- **Practice to reduce loss from HLB**: 
  1. start a grove with very high density (plant a lot of trees per unit),
  2. make sure that the yield will reach a higher yield more than 149 boxes /acre.
  3. if the tree has the HLB, it won't be removed, it was possible that after 10 years the investment would be recovered and the whole grove can be replanted with new trees.
HLB / Greening Control

- Another philosophy

1. start a grove with very high density (plant a lot of trees per unit),

2. make sure that the yield will reach a higher yield more than 149 boxes /acre.

3. if the tree has the HLB, remove it to make more spaces between trees as trees grow big.
Dr. Deng’s Experiment Grove-- The key: High density trees, and strictly kill and prevent the spread of psyllid.
HLB / Greening Control

- Dr. Deng’s Experiment Grove
Thank You!!!

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Production of Citrus Fruits across China