Proc. Fla. State Hort. Soc. 125:119–121. 2012.

An Overview of the Citrus Industry of China

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Additional index words. juice oranges, pummelos, production, exports, imports

According to production statistics from the UN Food and Agricultural Organization, China has surpassed Brazil as the world's leading citrus producing country. The Florida Department of Citrus commissioned a study by the University of Florida to provide an assessment of the market for citrus products in China with special reference to processed oranges and pummelos. In this paper, preliminary results from that study are presented. These results include the varieties of citrus fruit grown in China, regions of production, trends in imports and exports, and recent developments in the market for orange juice in China.

According to recent data from the Food and Agricultural Organization, China is the leading citrus producing country in the world with its estimated production exceeding 20 million metric tons (MMT) in 2010. The origins of many citrus varieties can be traced to China. In this paper, a brief outline of the citrus industry of China is provided. In 2011, the Florida Department of Citrus funded a study through the Food and Resource Economics Department at the University of Florida. This paper is a preliminary report of that research. The paper is comprised of a brief statistical overview of Chinese citrus production followed by a discussion of the market for orange juice in China. A brief assessment of the investment climate for citrus in China is also provided.

Statistical Overview

China is the leading citrus producing country in the world with total production in excess of 20 MMT (approximately 500 million boxes) in 2010 (Food and Agricultural Organization). China is the leading producer of mandarins at 12.5 MMT. In the statistics, pummelos and grapefruit are aggregated together so that China is identified as the leading producer of grapefruit even though nearly all of its production in this category is from pummelos. China is also a sizeable producer of sweet oranges; its 2010–11 production is estimated at 5.5 MMT. Brazil is the leading producer of sweet oranges with more than 17 MMT; the United States is second at nearly 8 MMT. Although lemons are produced in China, lemon production is not reported separately.

The evolution of Chinese citrus production is shown in Figure 1. The data contained in this figure suggest rapid growth in Chinese citrus production over the past 15 years with total production increasing 3-fold from approximately 7 MMT in 2005 to over 20 MMT by 1995. Increases are reported for all three major categories of citrus: mandarins, sweet oranges, and grapefruit/pummelos. Acres planted to citrus are shown in Figure 2. Planted citrus acreage in China now exceeds five million acres

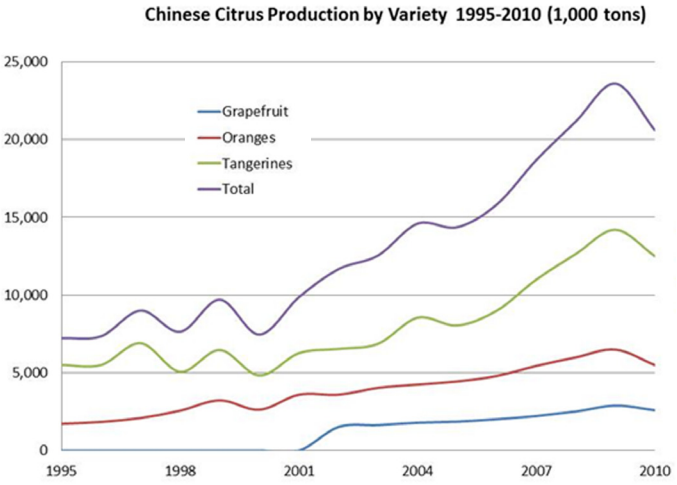

Fig. 1. The evolution of Chinese citrus production.

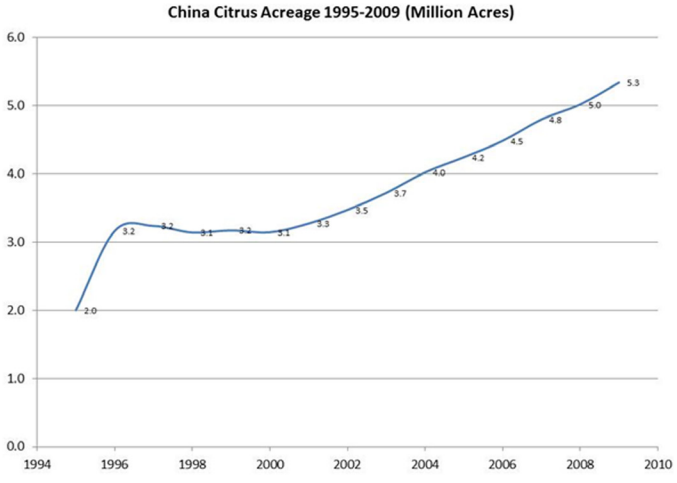

Fig. 2. Acres planted to citrus in China.

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compared to just over 500,000 acres in Florida and 811,000 acres in the United States.

With such a large land area planted to citrus, it is apparent that yields are quite low. With just over 20 MMT of production, citrus yields in China are calculated at approximately 10 MT per hectare, which is comparable to about 100 boxes per acre. Yields in this range would rank among the lowest in the world compared to other major citrus producing countries. U.S. yields are 30 to 40 MT per hectare for sweet oranges and higher for grapefruit (Davies and Albrigo, 1994). Sweet orange yields in Sao Paulo, Brazil, average approximately 20 MT per hectare. Ten MT per hectare would be comparable to Mexico. It is unclear why yields are so low but citrus production in China is highly fragmented, with many producers managing less than one acre. In southwestern China, the terrain contains steep slopes that are not conducive to high yields. The rapid increase in the production area suggests that a large proportion of the plantings are relatively young so that yields may increase over time as average tree age increases.

The locations of citrus production in China are shown in Figure 3. Citrus production is feasible over a large area extending from Zhejiang on the east coast down to Guangzhou province (near Hong Kong) in the southeast. Production takes place across south-central China west to Chongqing, and Sichuan provinces are located near the Tibet Plateau. As shown in Figure 3, mandarin production tends to be focused in the central production area in Hubei and Hunan provinces; pummelo production is more likely to be found in the east in Fujian province. There also is significant production of navel oranges in Jiangxi province.

The Chinese government would like to expand juice orange production in the western provinces of Chongqing and Sichuan. There are challenges there. First, the terrain is highly sloped. Second, given its proximity to the Tibet Plateau and relatively high moisture levels in the cool season, this area experiences much fog in the winter with limited sunlight. The results are oranges with a dark color, but low Brix and relatively high acid. A significant amount of processing capacity has been installed in this region. Our estimates are that approximately one million MT of fruit could be processed annually with existing processing capacity yielding 100 million pound solids. Actual juice production in China, however, is well below this figure. In 2010, FAS reported that 15,000 MT of frozen concentrated orange juice (FCOJ) at 65 °Brix (equivalent to 21.5 million pound solids) were produced. The message we received is that the domestic fresh market is a strong competitor for fruit. Extractor utilization is well below what is expected.

Chinese Citrus Consumption

Citrus consumption in China is mostly in the fresh fruit form. FAO statistics suggest that per capita consumption of fresh citrus in China is 35 lb per year, far above the U.S. consumption of 22.5 lb per person per year. On the other hand, Chinese orange juice consumption is quite low; annual per capita consumption is estimated at 0.6 SSE gal in 2009 compared to nearly 4 gal per person in the United States. Most orange juice consumed in China is less than 100% juice with much consumption coming from juice drinks that are 10% juice.

Recently, Minute Maid introduced a new product in China called Pulpy Juice. It is comprised of 7% orange juice pulp cells, 3% orange solids from FCOJ and sweetened with high fructose corn syrup. The pulp cells are imported from Florida, Sao Paulo, or

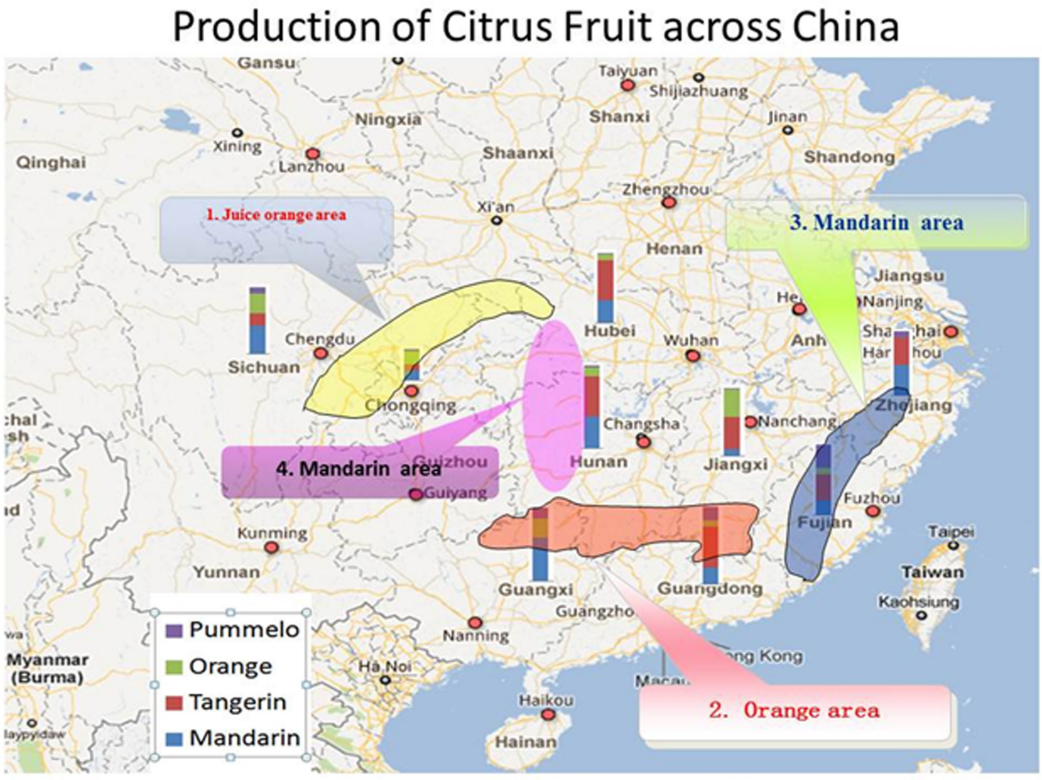

Fig. 3. The locations of citrus production in China.

Costa Rica and the FCOJ is imported from Sao Paulo. The product has been incredibly successful and recently became a one billion dollar of sales brand for Coca-Cola. The idea behind Pulpy Juice is that the inclusion of the pulp cells provides a mouth feel similar to fresh fruit. Given the success of Pulpy Juice, competitors are considering the introduction of similar products.

Investment Climate for Citrus in China

Although China has witnessed remarkable economic growth over the past two decades, investment in agricultural enterprises such as citrus still involves challenges. The government of China holds title to all land in China; individual families are given the right to farm a parcel of land. A family could chose to lease that land to another party. Land tenure is highly fragmented. Land area is measured in units of mu; there are approximately 6 mu per acre. Many individual citrus growers own a few hundred citrus trees, often planted at high density.

With these challenges, it is difficult to assemble sufficiently large tracts of land to allow economies of scale in production. Investment groups, however, have been formed that offer to lease land from farm families. Another approach is to lease land from individuals, establish a common management scheme, and hire back those same farmers to implement the management scheme. While this approach brings much needed capital and know-how to small farmers, it also brings a myriad of coordination issues.

Concluding Comments

China has become the largest citrus producing country in the world. Its citrus production is focused primarily on mandarins, table oranges, and pummelos. Juice production is relatively small. The domestic market for fresh citrus offers a challenge for increased processed utilization. An alternative juice production, Pulpy Juice, introduced by Minute Maid, has been highly successful. This suggests that while there may be potential for expanded fruit juice consumption in China, it may be in the form of products not widely found in the West.

Government ownership of land along with fragmentation of land tenure provides a challenge to investment in large-scale citrus production. Investment groups, however, are finding ways to assemble sizeable parcels of land and apply modern citrus production techniques.

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