

FLORIDA CITRUS INDUSTRY

The Florida Citrus Industry: An Economic Perspective

Gary F. Fairchild

Citrus first arrived in Florida in 1565 near St. Augustine, as explorers landed along the northeast coast of the state. Ever since the establishment of the first commercial citrus grove along the St. John's river near Jacksonville, the citrus industry has been moving south. In addition to advances in land-based transportation infrastructure, the driving force of this southward spread of citrus has been freezing weather.

Tree-killing freezes have spanned the last century including two major freezes in the mid 1890s and four major freezes in early to mid 1980s. The four freezes in the decade of the 1980s destroyed over 200,000 acres (80,940 ha) of citrus. Most of the acreage was accounted for by oranges. However, losses were also sustained by grapefruit, tangerines and tangelos. The value of the lost citrus acreage due to the 1983 and 1985 freezes has been estimated at \$1.2 billion.

Since 1986, Florida citrus growers have been rapidly replanting frozen groves in the north and central part of the citrus belt as well as establishing new groves in the southern part of the state. During the decade of the 1970s, new plantings of Florida citrus averaged about 13,000 acres (5,250 ha) per year. As of 1988, Florida has 69.3 million trees growing on 697,900 acres. Of Florida's 54.5 million orange trees in 1988, approximately 20% were non-bearing.¹ These numbers are expected to continue growing in the next few years.

In spite of the economic devastation caused by the recent series of

freezes, the value of bearing citrus groves in central Florida has been increasing steadily in recent years from \$8,471 per acre (\$20,923 per ha) in May 1986 to \$11,800 per acre (\$29,146 per ha) in May 1989. The increasing value of orange groves reflects the recent economic health of the Florida citrus industry.

Florida citrus production in the 1988-89 season totalled 210.9 million 1.6 bushel boxes or 8.6 million metric tons. Of this total, oranges accounted for 68%, while grapefruit represented 27%. Specialty citrus fruit, including tangerines, tangelos and honey tangerines, accounted for the remaining 5% of production.

In terms of farm-level income, Florida ranks 9th in total cash receipts in the nation among 50 states and second in value of crop production. Within Florida agriculture, citrus ranked first in farm-level cash receipts in 1988 with 30.3% of farm income. Vegetables and melons followed citrus with 21.9% and livestock accounted for 19.2%.² In recent years, the Florida citrus industry has had direct employment of an estimated 69,855. In addition, the industry has been responsible for the indirect employment of an additional 74,638 persons in such areas as fertilizer, chemical and machinery companies. Thus, total employment generated by the Florida citrus industry is estimated to be 144,493.

A PERSPECTIVE ON FLORIDA CITRUS

Total world orange production in 1987-88 was 770.2 million 90-lb. boxes

(31.44 million metric tons). Of this total, combined production of Brazil and the United States accounted for 61.4%, with Brazil leading with 36.1% and U.S. second with 25.3%. Other major orange-producing countries in 1987-88 included Spain (6.9%), Mexico (5.5%), Italy (5.1%), Egypt (4.1%) and Israel (2.2%). During the same season, world grapefruit production totalled 94.7 million 85-lb. boxes for 3.65 million metric tons. U.S. grapefruit production accounts for 69.6% of world grapefruit production. Among other grapefruit-producing countries are Israel (7.7%), Cuba (6.0%), Argentina (4.1%), South Africa (3.2%) and Mexico (2.9%).

Within the U.S. citrus industry, Florida is the dominant producer. Florida represented 69% of U.S. orange production in the 1988-89 season. U.S. orange production totalled 207.7 million boxes or 8.48 million metric tons in 1988-89. California accounted for 29% while Texas and Arizona each produced 1% of U.S. oranges. Florida's position is even more dominant in grapefruit with 79% of the total U.S. production of 70.6 million boxes (2.72 million metric tons). During 1988-89, California produced 12% of U.S. production while Texas and Arizona represented 7% and 2%, respectively, of U.S. grapefruit production.

The economic value of the Florida citrus industry has increased dramatically during the decade of the 1980s. The total on-tree (farm level) value of Florida citrus increased nearly twofold from \$696.5 million in 1981-82 to \$1,395.4 million in 1988-89. During the same period, the on-tree value of Florida orange production nearly doubled from \$551.5 million to \$1,089.9 million. Florida grapefruit on-tree value more than doubled from \$100.6 million in 1981-82 to \$247.7 million in 1989-90. Florida production of tangerines and other specialty citrus fruit increased in on-tree value from \$44.4 million to \$57.8 million during the same period.³

The wholesale (F.O.B.) value of the Florida citrus industry also increased during the past decade. The total wholesale value of Florida citrus increased from \$2,157.8 million in 1981-82 to \$3,545.5 million in 1988-89. During this period, the wholesale value of Florida fresh citrus increased from \$275 million to \$452 million while Florida citrus juices increased in value from \$1,882.8 million to \$3,093.5 million.

The estimated retail value (consumer level) of the Florida citrus industry has expanded in step with the on-tree and wholesale value of the industry. The retail value of Florida citrus has grown from \$3,870.0 million in the 1981-82 season to \$6,239.8 million in 1988-89. Growth in the retail value of Florida fresh citrus during the same period has been from \$833.3 million to \$1,329.4 million. At the same time, the retail value of Florida citrus juices has increased from \$3,036.7 million to \$4,910.3 million.

FLORIDA MARKETING PROGRAMS

The Florida Department of Citrus (FDOC) was established in 1935 to: 1) regulate the quality of fresh and processed citrus shipped from Florida as well as firms doing business in the Florida citrus industry; 2) promote and market Florida fresh and processed citrus products; and 3) conduct research in the areas of product quality, marketing and economics. The FDOC is funded by Florida citrus growers through self-imposed citrus excise taxes on each box of citrus entering commercial channels of trade and an import equalization tax on citrus products imported into the state of Florida.

The 1989-90 budget for the Florida Department of Citrus totals \$77.2 million. Of this total, \$65.4 million will be spent directly on marketing programs for Florida fresh and processed citrus products. In addition, \$3.9 million will be spent on research pro-

grams to support and strengthen FDOC marketing programs, including \$1.1 million for market research, \$0.4 million for economic research and \$2.4 million for scientific research. The remaining \$7.9 million will be spent on regulatory and administrative functions or maintained in reserve accounts.

The marketing strategies and objectives of the Florida Department of Citrus can be summarized as follows: 1) expand the U.S. market for Florida citrus fruit and juice; 2) develop and expand international markets for Florida fresh and processed citrus products; 3) increase the prices received by Florida citrus growers; and 4) increase the economic welfare of the entire Florida citrus industry. The financial resources of the Florida Department of Citrus are utilized for specific programs aimed at accomplishing these objectives.

Some of the issues which impact on the above objectives are: increasing market competition in terms of competing products or commodities and new and expanded production of citrus, changes in cultural practices and business management skills which both affect the productivity and profitability of citrus production in Florida and competing areas, consumer and environmental issues including concern about food safety and chemicals in the environment, and international trade issues including trade agreements and barriers to trade.

FLORIDA MARKETING SITUATION

There are several trends in both domestic and international markets for fresh and processed citrus products which create marketing problems and challenges for the Florida citrus industry. Although U.S. per capita fresh fruit consumption increased from 89.5 lb. (40.6 kg) in 1980 to 101.7 lb. (46.1 kg) in 1987, the market share for citrus declined from

32.2% to 27.7%. During this period, bananas, grapes and other fruits registered increases in fresh fruit market share.

Florida's total fresh citrus shipments have fluctuated in response to the four freezes during the 1980s. Furthermore, prices for fresh citrus have increased throughout the period. In addition, competition during the citrus marketing season has increased due to expanded imports of "summer fruits" from the southern hemisphere. Florida fresh citrus shipments during the 1988-89 season totaled 69.121 million 4/5 bushel cartons (1.33 million metric tons). Grapefruit dominated the Florida fresh shipments with 67%, followed by oranges with 23% and tangerines and other specialty citrus accounting for 10% of shipment.

The U.S. fruit beverage market, including 100% fruit juice and less-than-100% fruit juice drinks, increased dramatically from sales of \$3.253 billion in 1979-80 to \$4.933 billion in the 1987-88 marketing year. However, the share of the market represented by orange juice declined from 47% to 39.6% between 1979-80 and 1987-88. During the same period, grapefruit juice sales declined from a 4.9% market share to a 3.6% market share. Market share increases were observed for apple juice, multi-flavored juices and juice drinks. The decline in orange juice popularity in the U.S. market corresponds to a decline in the percentage of U.S. fruit beverage consumers who "like orange juice best." Market research indicates that this measure of popularity declined from 21% in 1986 to 10% in 1988, although 1989 data show an increase in popularity to 14%.

THE GRAPEFRUIT MARKET

Both fresh and processed markets are important to the Florida grapefruit industry. In recent years, 41-42% of the Florida grapefruit crop has been utilized in fresh form, with about 58% being processed. Projections for

the 1989-90 crop indicate that 50% of the Florida grapefruit crop will be sold fresh.

U.S. per capita grapefruit consumption has declined over the past decade from 8.3 lb. (3.76 kg) in 1978 to 6.7 lb. (3.04 kg) in 1987. This corresponds to the downward trend in Florida domestic fresh grapefruit shipments from, 23.4 million 4/5 bushel cartons (0.451 million metric tons) in 1979-80 to 19.2 million 4/5 bushel cartons (0.370 million metric tons) in 1988-89. The trends in the U.S. fresh grapefruit market are in sharp contrast to the export market for Florida fresh grapefruit which has increased dramatically from 13.1 million 4/5 bushel cartons (0.253 million metric tons) in 1979-80 to 27.1 million cartons (0.522 million tons) in 1988-89. All of this growth has been in the past three seasons, in response to favorable currency exchange rates and expanded export marketing program expenditures. During the past decade, the F.O.B. price of Florida fresh grapefruit has increased from \$3.77 per 4/5 bushel carton in 1979-80 to the \$5.75 to \$6.25 range in the past three seasons.

Consistent with the decline in grapefruit juice market share noted earlier, U.S. retail grapefruit juice sales have trended downward from 91.3 million single strength equivalent (SSE) gallons in 1980-81 to an estimated 72.5 million SSE gallons in 1988-89. Short supplies, higher prices, reduced marketing efforts and increased competition in the fruit beverage category are all factors in the downward sales trend for grapefruit juice.

THE ORANGE MARKET

Florida's orange crop is primarily utilized as orange juice. In recent years, approximately 93% of Florida orange production has been processed into orange juice. In spite of the impact of freezes on fresh fruit availability, U.S. annual per capita consump-

tion of fresh orange and specialty citrus fruit has trended upward over the past decade from 15.1 lb. (6.85 kg) in 1978 to 17.8 lb. (8.07 kg) in 1987. At the same time, FOB prices for Florida oranges and specialty citrus fruit (including tangerines and tangelos) have trended upward. The FOB price for Florida fresh oranges increased from \$4.23 to \$6.67 per 4/5 bushel carton from 1979-80 to 1988-89. The weighted average FOB price of Florida specialty citrus increased from \$5.43 to \$10.35 per 4/5 bushel carton during the 1979-80 to 1988-89 period.

Since the 1978-79 season, U.S. orange juice consumption has fluctuated somewhat in response to price variations. Orange juice consumption has ranged from 1.061 billion SSE gallons in 1981-82 to a high of 1.304 billion SSE gallons in 1982-83 during the period. Forecast U.S. orange juice consumption for 1989-90 is a record 1.37 billion SSE gallons. During the period considered, Florida FOB bulk FCOJ price fluctuated from a low of 96¢ per pound solids in 1979-80 to a high of \$1.70 per pound solids in 1987-88.

Prior to 1983, over 80% of U.S. FCOJ imports entered through Florida ports. However, with the shift in consumer demand from FCOJ to ready-to-serve chilled orange juice and the establishment of bulk tank farms by Brazil in the Northeastern U.S., Florida's share of imports has steadily declined from 55.1% in 1984-85 to 43.4% in 1988-89. As of 1988-89, Florida FCOJ movement (sales) represented two-thirds of the U.S. orange juice supply, down from 84.1% in 1981-82. Projections for the 1989-90 seasons indicate that Florida FCOJ movement will account for 59.7% of the U.S. orange juice supply.

THE DECADE AHEAD

Florida orange production is expected to increase significantly in the next decade. The average production trend for round oranges and Temple oranges is estimated to increase from

169 million 90-lb. boxes (6.9 million metric tons) in 1990-91 to 237 million boxes (9.68 million metric tons) in 1998-99. This assumes an annual planting rate of 3.5 million trees. Florida's record crop of round oranges and Temples was 212.7 million 90-lb. boxes (8.68 million metric tons) in 1979-80. Due to improved cultural and management practices in recent years, fruit yields per tree have increased dramatically since the 1985 freeze. For example, post-freeze yields per tree for 4-9-yr-old and 10-14-yr-old Florida Valencia oranges averaged 1.59 and 3.52 1.6-bushel boxes (64.9 and 143.7 kg), respectively. These yields represent increases of 48.6% and 69.2% over pre-freeze yields. The effect of these yield increases on estimated production are significant. Based on pre-freeze fruit yields, production in 1998-99 would be estimated at 194 million 90-lb. boxes (7.92 million metric tons) compared to 237 million boxes (9.68 million metric tons) using post-freeze yields.⁴

Based on existing trees, tree-loss and tree-planting rates, and post-freeze fruit yields per tree, average Florida grapefruit production is estimated to increase from 59 million 84-lb. boxes in 1990-91 to 67 million boxes in 1998-99. (2.27 to 2.58 million metric tons). This assumes an average annual planting rate of 250,000 trees. As with oranges, grapefruit yields per tree have increased dramatically. Post-freeze yields have increased as much as 55% over pre-freeze levels. Based on pre-freeze yields, Florida grapefruit production would be expected to reach 56 million 85-lb. boxes (2.16 million metric tons) by 1998-99, compared to 67 million boxes (2.58 million metric tons) based on post-freeze yields.⁴

Over the next decade, the economic health of the world orange juice market will be determined by the interaction of supply and demand. The primary sources of orange juice supplies in the next decade will be Brazil and the United States. Orange

juice supply will be a function of tree population, age distribution of trees, fruit yields per tree, juice yields, and processed utilization. Both orange and orange juice production in the U.S. and Brazil are expected to increase in the decade ahead. By 1998-99, Brazilian orange juice production is estimated to reach 960,000 metric tons, while U.S. orange juice production is estimated to 1.03 million metric tons.⁴

On the other side of the equation, orange juice demand will be influenced by demand in the United States, Europe, Canada, and the rest of the world, especially the Pacific Rim. The primary demand determinants will be price and growth in income, population, advertising and a time trend, as well as the level of currency exchange rates. World demand for orange juice is estimated to be 1.99 million metric tons by 1998-99. Estimated demand by region is distributed as follows: U.S., 61.3%, Europe, 29.6%, Canada, 5.5%, and other countries, 3.6%.⁴

Brazil's role of price leader in world markets is expected to continue in the decade ahead. Based on world supply and demand estimates, Brazil's export of FCOJ is expected to trend downward through the mid-1990's and then trend upward through the last half of the decade. Estimated on-tree prices in both Brazil and the United States are expected to follow a similar pattern during the decade ahead.

In the past decade, the orange juice market has become a world market. This phenomenon is expected to continue in the future. The internationalization of the fresh citrus market is now in process, as imports and exports of fresh citrus become more important. Florida now exports more fresh grapefruit than it sells in the domestic U.S. market. As debate continues on the merits of living in a global village, it is becoming more obvious that there is a global grove—citrus, that is.

LITERATURE CITED

1. Behr, R. M., M. G. Brown and Jong-Ying Lee.
1989. Florida citrus outlook, 1989-90 season. Working Paper 89 -Econ. Res. Dept., Florida Dept. Citrus, Univ. Florida, Gainesville.
2. Florida Agri. Stat. Serv. Cash Receipts from Farming, September 20, 1989, 1222 Woodward Street, Orlando, Florida.
3. Behr, R. M., M. G. Brown and G. F. Fairchild.
1988. Florida citrus production trends, 1989-90 through 1998-99. Citrus Industry Rep. 88-1. Econ. Res. Dept., Florida Dept. Citrus, Univ. Florida, Gainesville.
4. Behr, R. M., M. G. Brown and E. A. McClain.
1989. World orange juice outlook, 1989-90 through 1998-99. Working Paper 89-2. Econ. Res. Dept., Florida Dept. Citrus, Univ. Florida, Gainesville.