As the Duke brothers discovered in the motion picture, *Trading Places*, fortunes can be made and lost, in very short periods of time, when one trades in orange juice futures. Juice is a commodity, the demand for which is inelastic because there are no good substitutes. Consequently, small changes in supply result in large price swings from high profits, to just covering margins, to selling at less than cost.

# Citrus Industry Dynamics and Groveland Values

*by:*
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Some of these changes are dictated by weather, others by socioeconomic forces. For any ag lender involved with the citrus industry, a basic understanding of what drives the market, how it is changing, and its short- and long-term future are necessary to remain a "player."

**Understanding the Basics**

Although more than 100 countries grow oranges, Florida and Brazil account for more than half of world orange production and virtually all of world orange juice supply. Only Florida and Brazil have the combinations of climate, soils, rainfall and economic infrastructure to cost-competitively produce orange juice on a significantly large, commercial scale.

Brazil overtook Florida to become the world's largest orange producer in the 1980s. Five freezes during that decade reduced Florida's

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orange production to about half its 1979-80 crop level, and Brazil was positioned with the crops and ability to expand production to enable it to grow its share from 28 percent of world orange juice production in 1980 to almost half of world orange juice production today. Florida shrank from 55 percent of world orange juice production in 1980 to 42 percent today. Brazil also has lower production costs than Florida due to lower costs for land and labor and lower regulatory costs. The U.S. tariff of $0.297 per gallon on orange juice imported from Brazil currently equalizes these cost differences.

The United States and Europe represent almost 90 percent of the world orange juice market. Western Europe has grown from 24 percent to more than 40 percent of the world orange juice market since 1983, while the United States has dropped from 62 percent to 46 percent in that same time. The United States is a more mature orange juice market than Europe, with almost double Europe's per-capita consumption. And American consumers are switching to higher-value orange juices like not-from-concentrate (NFC) and calcium-added rather than just growing consumption of orange juice in general.

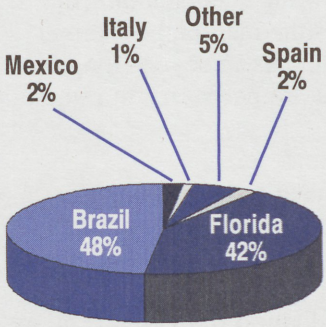
Florida represents more than 80 percent of U.S. orange production and more than 95 percent of U.S. orange juice production. California, Arizona and Texas are minor juice producers primarily because their climates are not as ideal as Florida's for the production of juice oranges.

The freezes of the 1980s reduced supplies and increased prices at grower, processor and retail levels. In response to these high prices, growers in Florida and Brazil planted the largest number of orange trees in history, with Florida orange tree inventories doubling since 1986 and Brazilian tree inventories increasing by more than 50 percent during that same time period.

Also, Florida growers replanted freeze-damaged groves further south than before in order to reduce future potential of freeze

**World Orange Juice Production**

3.4 Billion Gallons/Year




(Source: USDA)

damage to groves. For example, in 1970 only 37 percent of Florida's orange trees were south of Polk County, while, today, 76 percent are.

Currently, these large increases in plantings have resulted in greatly increased orange and orange juice supplies, and much lower prices. Juice orange prices in Florida during the most recent (2000-01) season were at or below cost of production levels, depending on cost efficiency and amount of debt for individual groves.

**Citrus Price Cycles**

Orange and orange juice prices over the long term follow cycles. Long-term citrus price cycles are changes in price levels and/or price trends that are primarily due to an imbalance in citrus production capacity and demand. When citrus prices are high, each grower's efforts to capture greater profit by increasing production collectively lead to an oversupply and lower prices.

In response to low prices and reduced earnings, investment in new grove plantings slows or stops, while growing populations, growing consumer incomes, lower prices, and marketing efforts stimulate market growth. After a time, demand begins to outpace supply and prices increase again. Freezes can and do reduce tree inventories and unpredictably speed this supply/demand balancing process.

The 1960s, 1970s, 1980s and early 1990s provide an example of how these citrus price cycles work in the orange industry. In 1962 a devastating freeze killed trees, reduced supplies and increased prices. These high prices caused an overexpansion in world production as ambitious planting activity in Florida and Brazil led to the largest orange tree inventory in history by 1970. The 1970s were a period of rapid growth in orange juice production and lower prices. Increased supply availability, lower prices and increased marketing efforts led to substantial orange juice market growth (the U.S. market grew 68 percent in the 1970-79 period). Freezes in the 1980s were the final event that sent prices at grower, processor and retail levels skyrocketing as aggressive marketing programs by major brands resulted in significantly increased demand in an environment where Florida citrus tree inventories, and thus supply potential, became drastically reduced. These higher prices, as in the 1960s, led to tree replanting and new plantings that, by the early 1990s had, once again, created the largest inventory of orange trees in history. Prices again declined in response to increased supplies, marketing efforts became more global as supply availability stimulated new market growth, and the cycle continues.

Citrus grove values follow these price cycles very closely without reflecting a long-term view. Thus groveland is valued higher during high-price phases of the citrus price cycle and lower during low-price phases of the citrus price cycle. It costs $8,000 to $9,000 per acre to purchase land, develop it into an orange grove, and care for the grove for four years until it begins to produce commercial crops of fruit.

After reaching 8 to 10 years of age, the grove is producing at its optimum level and would have a value of $9,000 to $10,000 per acre in normal citrus markets.

However, in the 1980s during the high price phase of the most recent citrus price cycle, Florida orange groves were, on average, selling for $12,000 to $13,000 per acre and on-tree orange prices were $6.00 to $7.00 per box. By 1998, orange groves were selling for below $7,000 per acre and on-tree orange prices were $3.61 per box. In extreme cases some groves sold for more than $15,000 per acre during the high fruit prices of the 1980s, and some groves are selling for less than $4,000 per acre during the current low fruit prices. This is a naive market in that it overvalues groves relative to long-term profitability in the high-price phase of the cycle, and undervalues groves relative to long-term profitability in the low price phase of the cycle.



**Orange Grower Consolidation**

Florida orange growers can be categorized as large, medium and small. Large growers are predominantly diversified agribusiness firms which primarily produce citrus, but may also produce winter vegetables, sugar cane or cattle. They grow 5,000 or more acres of citrus, may also own a bulk citrus processing plant and are typically privately held firms. They represent about half of supply.

Medium size growers own from 500 to 5,000 acres and primarily produce only citrus, or citrus and cattle. They do not own bulk concentrate plants, are family-owned firms and represent about 30 percent of supply.

Small growers represent the remaining 20 percent of supply. They each own less than 500 acres of groves and produce primarily citrus crops. Many are part-time growers and absentee owners. They often sell their crop through fruit brokers, who also offer harvesting and grove caretaking services, rather than direct to processors.

**Past, Current and Projected Future Financial Status of Florida Orange Growers in 1999$**

| | Past 1982/83-1991/92 | Current | Long-Term Future |
|---|---|---|---|
| Delivered Price | $1.52/lb. sol. | $.90/lb. sol. | $1.10/lb. sol. |
| Solids Yield Per Acre | 1,842 | 2,520 | 2,800 |
| Fruit Production Costs | $.817/lb. sol. | $.665/lb. sol. | $.653/lb. sol. |
| Grove Establishment Costs | $7,944/acre | $7,944/acre | $7,944/acre |
| Net Returns | $1,295/acre | $592/acre | $1,252/acre |
| Return on Assets | 16% | 7% | 16% |
| Net Returns 50% Financed | $976/acre | $275/acre | $909/acre |



In 1988, Florida's largest 10 growers held 23 percent of the citrus acreage and grew an average of 15,011 acres each. By 2000, Florida's largest 10 growers held 29 percent of the acreage and grew an average of 22,900 acres each. Now, the largest 5 percent of Florida's estimated 10,000 growers account for more than 75 percent of the citrus acreage.

Other than access to capital, marketing is the single most important element that is improved by size for Florida citrus growers. Larger growers are better able to negotiate and obtain longer-term contracts with guaranteed minimum (floor) prices. These increase long-term profitability by providing long-term average prices that are higher via the effect of floor prices. They also provide a guaranteed "home" for the fruit for more than one season.

Growers with floor prices are better able to expand than growers without floor prices because they are financially better able to purchase groves during low-price times when groves are underpriced. The risk-reducing effect of floor prices also improves these growers' ability to attract capital.

Consolidation of the Florida citrus grower sector is expected to continue, primarily because the key drivers of this consolidation continue to reward larger size. Continued consolidation will ultimately begin to mitigate extremes in groveland

## *Florida Citrus Grove Values and Citrus Prices*

| Year | Orange Prices | Grapefruit Prices | South Florida Groves Orange | South Florida Groves Grapefruit | Central Florida Groves Orange | Central Florida Groves Grapefruit |
|---|---|---|---|---|---|---|
| | ($ Per Box on-Tree) | | ($ Per Acre) | | | |
| 1984 | 5.75 | 2.72 | 9,166 | 6,992 | 9,314 | 6,925 |
| 1985 | 7.10 | 3.67 | 10,071 | 7,889 | 9,254 | 6,365 |
| 1986 | 3.94 | 4.09 | 8,685 | 8,289 | 8,798 | 6,916 |
| 1987 | 5.22 | 4.98 | 9,661 | 8,833 | 8,792 | 7,701 |
| 1988 | 7.58 | 5.57 | 10,911 | 10,012 | 10,550 | 8,835 |
| 1989 | 7.41 | 4.45 | 11,873 | 10,420 | 11,800 | 10,265 |
| 1990 | 6.21 | 5.65 | 13,351 | 12,169 | 12,863 | 10,058 |
| 1991 | 5.89 | 5.66 | 11,274 | 10,890 | 10,771 | 9,215 |
| 1992 | 5.93 | 6.62 | 10,756 | 10,804 | 10,250 | 8,695 |
| 1993 | 3.48 | 2.66 | 9,046 | 9,478 | 8,796 | 7,119 |
| 1994 | 4.09 | 3.28 | 8,097 | 8,188 | 7,822 | 6,749 |
| 1995 | 3.74 | 2.09 | 7,477 | 6,182 | 7,253 | 5,836 |
| 1996 | 4.40 | 1.93 | 7,457 | 4,986 | 6,744 | 4,980 |
| 1997 | 3.54 | 1.55 | 7,209 | 4,053 | 6,776 | 4,216 |
| 1998 | 3.69 | 1.27 | 6,882 | 3,035 | 6,763 | 3,322 |
| 1999 | 4.84 | 2.30 | 6,956 | 3,759 | 6,780 | 3,543 |
| 2000 | 3.67 | 3.56 | 7,073 | 4,824 | 6,899 | 4,431 |
| 2001 | 2.79 | 1.96 | 6,410 | 4,344 | 6,139 | 4,241 |

Source: Florida Agricultural Statistics Service and University of Florida Institute of Food and Agricultural Sciences/Food and Resource Economics Dept.

values during peaks and troughs of citrus price cycles. Larger growers will not be under as much financial pressure as smaller growers to sell groves during low-price times, and in fact, will likely wait until prices improve to sell groves they no longer desire to own. However, larger growers will capitalize on low price phases of the cycle for opportunistic expansion, which is exactly why the largest growers have been the largest grove buyers during the recent low-price phase of the cycle and its resulting low-priced groves.

## Outlook

The long-term (five-plus years) outlook for the Florida orange juice industry and orange grower sector is for a tightening of the current supply surplus, with resulting higher fruit prices. Consequently, the citrus industry is expected to pull out of the low-price phase of the price cycle and move toward higher prices and better returns.

Lower prices since the mid-1990s have significantly slowed growth in orange tree inventories in both Florida and Brazil. Disease problems such as Tristeza, Canker and CVC (Citrus Variegated Chlorosis) are reducing tree numbers. The result is a flattening of world orange juice supplies.

However, world orange juice markets are growing – the United States and Europe at about 2 to 3 percent per year, in an environment of flat supplies. The result will be increasing prices over the long term.

These higher prices are expected to return grove profitability to levels of the 1980s, during the last high-price phase of the citrus price cycle. Price gains are expected to be less than in the 1980s because the southward shift of Florida groves and increased share of world production accounted for by Brazil (where there are no damaging freezes) has reduced freeze risk, although freeze risk certainly has not been eliminated. Much of the projected improved profitability is expected to come from increased yields and cost efficiencies associated with consolidation. Price gains that are realized (barring an unpredictable freeze that damages southern Florida groves) will come from a growing U.S. market, its increasing preference for higher-value juices and flattening world orange supplies. **jal**