Cuba's Citrus Industry*

After rapid development into an important world producer and exporter of citrus, Cuba's citrus industry is now at a crossroads. Following the 1959 revolution, Cuba invested heavily to develop its citrus industry in order to diversify its sugar-dominated economy and expand exports to trade partners in the now defunct Council for Mutual Economic Assistance[1,2] (CMEA). Citrus was to serve as a centerpiece in Cuba's attempts to diversify traditional agricultural exports. Citrus acreage expanded rapidly, increasing from about 30,000 acres before the revolution to over 350,000 acres today. (The Cuban citrus acreage data are on a gross basis and include acreage for schools, roads, etc. Net acreage devoted to citrus production was reported to be about 285,000 acres.) Although production and exports of citrus products have generally fallen short of targets, there have been significant increases; and today Cuba ranks as the 14th largest producer in the world, producing about 1.0 million metric tons (25 million 90-lb. boxes) annually. As planned, the CMEA, countries were the principal beneficiaries of Cuba's export growth as more than 90% of Cuba's citrus exports went to these countries. Now, however, export prospects to these countries are uncertain because of the economic turmoil caused by the breakup of the Soviet Union and democratic reforms taking place there and throughout Eastern Europe. If Cuban citrus exports to these countries were to decline, Cuba would be forced to find other markets, which not only has implications for Cuba's citrus industry, but could affect other producing and consuming countries as well.

In the report that follows, the current situation and outlook for Cuba's citrus industry are reviewed. The report is based on a recent fact-finding trip to Cuba and information included in research materials documenting Cuba's citrus industry.

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[1] CMEC included Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, Cuba, Mongolia, the USSR and Viet Nam.

[2] "Cuban Citrus," USDA/FAS, *Foreign Agriculture Circular*, November 1985, pp. 7-12.

Historical Perspective

Cuba's citrus industry predates the 1959 revolution. However, before the revolution the industry was quite small, with only about 30,000 acres[3] devoted to citrus. It is estimated that Cuba was producing an annual average of roughly 60,000 metric tons and was exporting about 3,000 metric tons of fresh citrus, mostly to the U.S. Exports of citrus increased markedly in 1958 and 1959 as Cuban exports of oranges to the U.S. were sharply higher. In 1959, Cuba exported 15,728 metric tons of oranges to the U.S., accounting for 99.7% of its fresh orange exports (Table 1). Cuba shipped 753 metric tons of grapefruit to the U.S., accounting for 86.8% of its fresh grapefruit exports. By 1961, Cuban fresh citrus exports to the U.S. had ceased.[4]

During the early 1960s, Cuban citrus production averaged about 100,000 metric tons (2.5 million 90-lb. boxes) annually (Figure 1). During this period, Cuban citrus exports were diverted primarily to the CMEA countries following the loss of the U.S. market. Since 1967, the policy of the Cuban government has been to encourage production of fresh and processed citrus products and to increase trade and domestic consumption of these products.[5] There has been substantial investment in research programs, public investment expenditures in citrus production programs and favorable loans to support development. In 1981, an agreement was reached between Cuba and the CMEA countries in which the latter agreed to invest $350 million into the further development of the citrus industry. This investment facilitated the introduction of irrigation systems, which led to acreage expansion programs. As a result of these programs, the citrus industry became one of the fastest growing agricultural sectors in Cuba. Acreage devoted to citrus increased sharply during the 1960s and 1970s, reaching slightly more than 320,000 acres by 1978.[6] However, acreage has remained relatively

[3] "Cuban Citrus," USDA/FAS.

[4] The U.S. imposed a total embargo on trade with Cuba on October 13, 1960. It should be noted that a small amount of Cuban fresh grapefruit exports to the U.S. appears inexplicably in the export data shown in Table 1.

[5] "Policy Developments Affecting Citrus Trade," CCP: CI 91/7, Committee on Commodity Problems Intergovernmental Group on Citrus Fruit, Food and Agriculture Organization.

[6] "Cuban Citrus," USDA/FAS.

flat during the 1980s, as new plantings have largely offset or replaced the most unproductive areas. Currently, Cuba has just over 350,000 acres devoted to citrus production. Non-bearing citrus acreage accounts for 21% of the total (Figure 2).

Production is scattered throughout the Cuban provinces and the Isle of Youth, but the largest concentration is in the western and central areas (Figure 3). By far, the largest producing grove is in Jaguey Grande, Matanzas Province. This grove has over 115,000 acres and is probably the largest grove in the world under one management. In addition, there is a 37,000-acre grove of grapefruit on the Isle of Youth; other large groves are located in the Pinar del Rio, Santiago de Cuba and Ciego de Avila Provinces.

A unique feature of Cuban citrus production is the use of students to supplement full-time agricultural labor, which is not abundant primarily because Cuba's highly successful educational system has produced an intelligent and well-trained work force.[7] As such, the government has built around 200 schools within the groves to use student labor in what is called a study-work program. More than 100,000 students are involved in this program and are required to work in the groves three hours per day. Additionally, Cuba employs 27,000 full-time workers in citrus production and harvesting operations.

The organizational structure and management of resources within Cuba's citrus industry reflect the centrally planned nature of the Cuban economy. The Cuban government exercises strong influence at all levels of economic organization and over all functions of economic administration.[8] In Cuba, production units are called enterprises. There are 13 separate citrus-producing enterprises, which account for about 90% of total citrus production. The balance of Cuba's citrus acreage is privately held. The enterprises are ultimately managed by the Central Planning Board (Junta Central de Planificacion, JUCEPLAN). Since 1975, the Cuban government has sought to decentralize economic decision making and to increase the autonomy of the state enterprises. However, this has proven to be unsuccessful, and the Cuban economy continues to be largely centrally planned. The various citrus-producing enterprises prepare production plans and corresponding budgets. At the ministerial level, plans and budgets are reviewed, and

[7] "Conquering the Citrus Markets," *Financial Times*, February 17, 1989.

[8] *Cuban Communism*. Edited by Irving Louis Horowitz. Transaction Publishers: New Brunswick, 1989.

resources are allocated accordingly. There was no evidence that market prices were present to guide the resource-allocation process.

Cuban Citrus Production and Related Issues

According to Cuban officials, the country produced about 1 million metric tons (25 million 90-lb. boxes) of citrus in 1990, almost 70% above levels produced during the mid-1980s (Table 2). Despite the increase, Cuba continues to be a relatively small producer, ranking 14th among the world's citrus producers and accounting for less than 2% of total production (Table 3). Oranges, mostly Valencias, are the predominant variety produced in Cuba, accounting for about 60% of Cuba's citrus production. Grapefruit accounts for slightly more than 30% of total production. White seedless grapefruit is the most important grapefruit variety, accounting for 80% of production with red varieties accounting for the balance. However, the Cubans are planting and replanting mostly the red and pink varieties at this time, including Henderson, Rio Red and Star Ruby varieties. Limes account for slightly more than 6% of production, while tangerines account for almost 2%.

Although Cuban citrus production has expanded, the industry is not without its problems. Cuban officials admit that citrus production is hindered by delays in delivery of important raw materials such as herbicides, diesel fuel, fertilizer, pesticides, and spare parts. It was observed that weed control was inadequate, partly because supplies of herbicide were short.

Virtually all of Cuba's citrus is planted on sour orange rootstock, which makes the industry more vulnerable to diseases, such as tristeza. While tristeza is not considered to be a problem now, officials indicate that other concerns such as greasy spot, rust mite, melanose and phytophthora are troublesome and must be controlled through appropriate grove care programs.

Despite the production problems, Cuba has made technological advances in a number of areas, including irrigation and tree spacing. Government data indicate more than 70% of the acreage is irrigated. The most common irrigation system is a movable sprinkler system. Increasingly, the Cubans are installing low-volume systems, such as

drip and micro-jet, for water conservation purposes. Tree spacing in Cuba reflects the more technologically advanced, denser plantings. In Jaguey Grande, trees were planted on an 8-meter by 4-meter spacing or 150 trees per acre. Officials indicated that even denser plantings were being tried on new plantings with as many as 225 trees per acre.

Although Cuba has considerable technological know-how, productivity is rather low. The average per-acre yield for bearing trees of all ages was estimated to be about 110 90-lb. boxes.[9] The most productive groves had yields of about 250 90-lb. boxes per acre. In contrast, average yield for bearing orange acreage in Florida is around 350 90-lb. boxes per acre. A number of factors may explain the low levels of productivity, including climate and soil conditions, lack of resources and/or poor management. While yields are relatively low now, they have improved over the past decade. From the mid-1970s to the early 1980s, yields averaged only about 70 90-lb. boxes per acre. The improvement is more likely related to the maturation of trees than other factors, however.

Future production of Cuban citrus will depend upon continued yield improvement. Cuba has set a production goal of 1.6 million metric tons by the year 1995, 60% above current levels (Table 4). Orange production is targeted at 912,000 metric tons, up 51.0% from 1990 levels; while grapefruit production is targeted to be 540,000 metric tons, up 62.7% from 1990 levels. The Cubans have historically fallen below established production goals and will likely fall below the 1995 targets as well. Since only 21% of Cuba's citrus acreage is non-bearing, Cuba would have to increase yields substantially to achieve the 1995 production targets, which would require availability of resources and better management. In any event, some gains in production are expected, with grapefruit likely to show the greatest gains because of a relatively large amount of non-bearing acreage (Table 5).

Cuban Citrus Utilization, and Packinghouse and Processing Industries

Most of Cuba's citrus production is utilized for the fresh fruit market and is exported. For oranges, Cuban officials indicate that 6.6 million 90-lb. boxes, or 44.4% of total orange production in 1990, were utilized for the fresh export market (Table 6). For

[9] Yields are calculated on a net bearing-acreage basis.

grapefruit, 4.9 million 85-lb. boxes, or 56.9% of total grapefruit production, were utilized for the fresh export market in 1990 (Table 7). In total, there are 20 packinghouses in Cuba that pack citrus for the fresh market, and they are scattered throughout the citrus-producing areas. A typical packinghouse packs about 1,250 cartons per hour, employing around 80 people per shift and running two shifts per day. Cuba's fresh citrus season typically runs from August to March: the peak grapefruit harvest normally runs from August through December, while oranges run from December to March.

According to Cuban officials, an increasing amount of Cuba's fruit production is being processed, although detailed data are not available to confirm this trend. However, the information included in Tables 6 and 7 suggests that processed utilization may have increased markedly over the past six years. It is estimated that about 200,000 metric tons (5.0 million boxes) is being processed annually. It is believed that most of Cuba's processed citrus utilization is for the manufacture of concentrated juices for export, primarily to the former CMEA countries.

Cuba has been able to process more because of the addition of three processing facilities during the last 15 years. These processing facilities produce both single-strength and concentrate juices. A fourth, relatively old plant produces only single-strength juices. The three newer processing plants are located in Jaguey Grande (Matanzas Province), on the Isle of Youth, and Ceballos (Ciego de Avila Province) (Table 8). Each plant has an evaporation capacity of at least 40,000 lbs. of water per hour. The Jaguey Grande processing plant is scheduled to be expanded and will be operational for the 1992-93 season. Plans are to double the plant's current processing capacity, which is in line with Cuba's desire to increase processed utilization. The industry now has the capacity to process about 11 million 90-lb. boxes of citrus during the season, which normally runs parallel to the fresh citrus season. Most of the fruit for processing comes from packinghouse eliminations. Presently, less than 20% of the processed citrus is "field run," although this is expected to increase in future years.

Processing yields in Cuba are generally low, averaging about 4.5 pounds solids per box. Officials indicated the low yields were caused primarily by poor extraction capability. It is believed that yields would be significantly improved if the plants had better equipment.

Cuban Citrus Trade Prospects

Since the mid-1960s, most of Cuba's citrus exports have gone to the former CMEA countries. Recent data indicate that more than 90% of Cuba's fresh citrus exports went to the USSR, East Germany, Czechoslovakia, Poland and Bulgaria (Table 9). On December 27, 1991, contractual agreements between Cuba and the former CMEA countries expire. Cuban officials are concerned about future export prospects to these countries. These markets will continue to demand citrus, but lack of hard currency may limit future purchases. Barter arrangements between Cuba and the former CMEA countries will likely continue because these countries have products (i.e., machinery, parts, grain products) that Cuba needs. Moreover, products from the former CMEA countries may not have much value in Western markets, so continued trade among former CMEA countries should be expected. However, even if trade were to continue, it would be likely that Cuba would not receive the favorable terms of trade it once received; and, since Cuba is increasingly in need of hard currency, Cuba is likely to divert an increasing amount of its citrus exports to Western markets.

Cuban citrus officials are preparing for the potential loss of sales to the former CMEA countries. Perhaps the most interesting strategy Cuban officials are implementing is the development of third-party "marketing arrangements" to assist the exportation of Cuban fresh citrus in export markets, such as Western Europe. One example of this is a "marketing arrangement" between Cuba and a Chilean exporter to market Cuban fresh citrus. In this case, the Chilean exporter is providing marketing expertise and some supplies, while the Cubans are providing the fruit, packing facilities and labor. Plans are to export more than 1 million cartons of grapefruit, both red and white varieties, this season, primarily in the United Kingdom. If this season were to go well for both parties, they would likely increase exports in subsequent seasons. The Cubans are currently looking for other "marketing arrangements" or joint ventures to help market their citrus overseas. Since the Cubans have had very little experience in marketing citrus outside the CMEA countries, joint ventures provide an avenue to develop other markets. It

would not be surprising to see a significant portion of Cuba's citrus production being marketed this way in the future.

In addition to its plans for fresh citrus exports, Cuba is planning to increase processing capacity and to divert a greater portion of fruit production into juice production for the export market. Cuban officials also indicated that, in the event of reduced export sales to the former CMEA countries, more of Cuba's citrus production would be made available for domestic consumption. However, it must be emphasized that Cuba will likely seek means to increase its hard currency earnings, which will limit how much is made available for domestic consumption.

Today, U.S. foreign policy does not permit trade with Cuba. If this policy were to change, Cuba would likely find the U.S. an attractive market outlet for its fresh and processed citrus products. Even if current policy were to remain in place, Cuba's fresh and processed citrus products will likely compete overseas with Florida's citrus products. For example, Cuban fresh grapefruit has historically been available in the European Community (EC) markets in relatively small quantities one to two months prior to fruit from the Mediterranean or the U.S., primarily Florida. Once exports from these competing areas became available, demand for the Cuban fruit fell off because of its poorer quality. While Cuban fruit has not had a particularly good reputation in the EC markets, this perception will likely change with the influence of the Chilean and new joint ventures. This would make Cuban fresh grapefruit more competitive beyond the early-season window they now enjoy.

TABLES

Table 1. Cuban fresh orange and grapefruit exports, 1955-1962.

Year	Oranges		Grapefruit	
	- - - - - - - - - - - - - - - - - metric tons (%) - - - - - - - - - - - - - - - - - -			
1955	8	(50.7)[a]	1,910	(97.2)
1956	16	(15.7)	1,848	(96.4)
1957	47	(44.1)	2,010	(65.2)
1958	15,848	(94.0)	2,588	(90.5)
1959	15,776	(99.7)	868	(86.8)
1960	24	(33.3)	797	(99.0)
1961	1,617	(0.0)	795	(1.4)
1962	8,162	(0.0)	4,814	(0.0)

[a]Percent of total exported to U.S.
SOURCE: Armando Nova Gonzalez. "Aspectos Economicos de los Citricos en Cuba."

Table 2. Citrus production in Cuba.

Year	Oranges	Grapefruit	Tangerines	Other[a]	Total
	- - - - - - - - - - - - - - - - - 1,000 metric tons - - - - - - - - - - - - - - - - -				
1984	371	155	20	53	599
1985	408	237	32	70	747
1986	441	250	25	64	780
1987	496	285	25	80	886
1988	508	385	26	62	981
1989	474	264	17	69	824
1990	604	332	15	66	1,017

[a]Includes mostly limes.
SOURCE: CUBAFRUTAS.

Table 3. World citrus production, 1989-90.

Country	Production	Share
	- - million metric tons - -	- - % - -
Brazil	15.3	23.7
U.S.	9.8	15.2
Spain	4.8	7.4
China	4.1	6.4
Italy	3.4	5.3
Mexico	3.2	5.0
Japan	2.6	4.0
Egypt	1.8	2.8
Argentina	1.7	2.6
Turkey	1.5	2.3
Israel	1.5	2.3
Greece	1.2	1.9
Morocco	1.1	1.7
Cuba	1.0	1.6
Others	11.5	17.8
TOTAL	64.5	100.0

Table 4. Forecast Cuban production and utilization, 1995.

Item	Oranges	Grapefruit	Other	Total
	- - - - - - - - - - 1,000 metric tons - - - - - - - - - -			
Production	912	540	148	1,600
Utilization				
Fresh				
Domestic	172	30	68	270
Export	470	310	50	830
Processed				
Domestic	35	10	5	50
Export	235	190	25	450

SOURCE: CUBAFRUTAS.

Table 5. Estimated Cuban citrus tree age distribution, 1990.

Tree Age	Oranges	Grapefruit
- years -	- - - - - - - - - - % - - - - - - - - - -	
0 - 5	13	25
5 - 10	24	16
10 - 15	20	25
15 - 25	32	28
25+	11	6

SOURCE: CUBAFRUTAS.

Table 6. Cuban orange production and utilization.

Year	Production	Utilization		Percent Fresh Exports
		Fresh Exports	Other[a]	
	- - - - - - - - - - 1,000 90-lb. boxes - - - - - - - - - - -			- % -
1984	9,088	5,928	3,160	65.2
1985	9,994	6,393	3,601	64.0
1986	10,803	6,418	4,385	59.4
1987	12,150	6,540	5,610	53.8
1988	12,444	6,369	6,075	51.2
1989	11,611	6,026	5,585	51.9
1990	14,795	6,565	8,230	44.4

[a]Includes processed utilization and domestic fresh consumption.
SOURCES: CUBAFRUTAS and USDA-Foreign Agricultural Service.

Table 7. Cuban grapefruit production and utilization.

Year	Production	Utilization		Percent Fresh Exports
		Fresh Exports	Other[a]	
	- - - - - - - - - - 1,000 85-lb. boxes - - - - - - - - - - -			- % -
1984	4,020	2,957	1,063	73.6
1985	6,147	4,176	1,971	67.9
1986	6,484	4,487	1,997	69.2
1987	7,392	5,369	2,023	72.6
1988	9,986	6,692	3,294	67.0
1989	6,847	4,720	2,127	68.9
1990	8,611	4,902	3,709	56.9

[a]Includes processed utilization and domestic fresh consumption.
SOURCES: CUBAFRUTAS and USDA-Foreign Agricultural Service.

Table 8. Cuban citrus processing capacity, 1990.

Plant Location	Evaporation Capacity			Extractors
	Water	Fruit[a]		
	pounds/hour	boxes/hour	mil. boxes/year	
Jaguey Grande	50,000	1,225	4.41	20
Isle of Youth	40,000	980	3.53	20[a]
Ceballos	40,000	980	3.53	20[a]
Total	130,000	3,185	11.47	60

[a]Estimated. Estimates were provided by Bob Carter, Research Chemist Supervisor, Florida Department of Citrus, Lake Alfred, Florida.
SOURCE: CUBAFRUTAS.

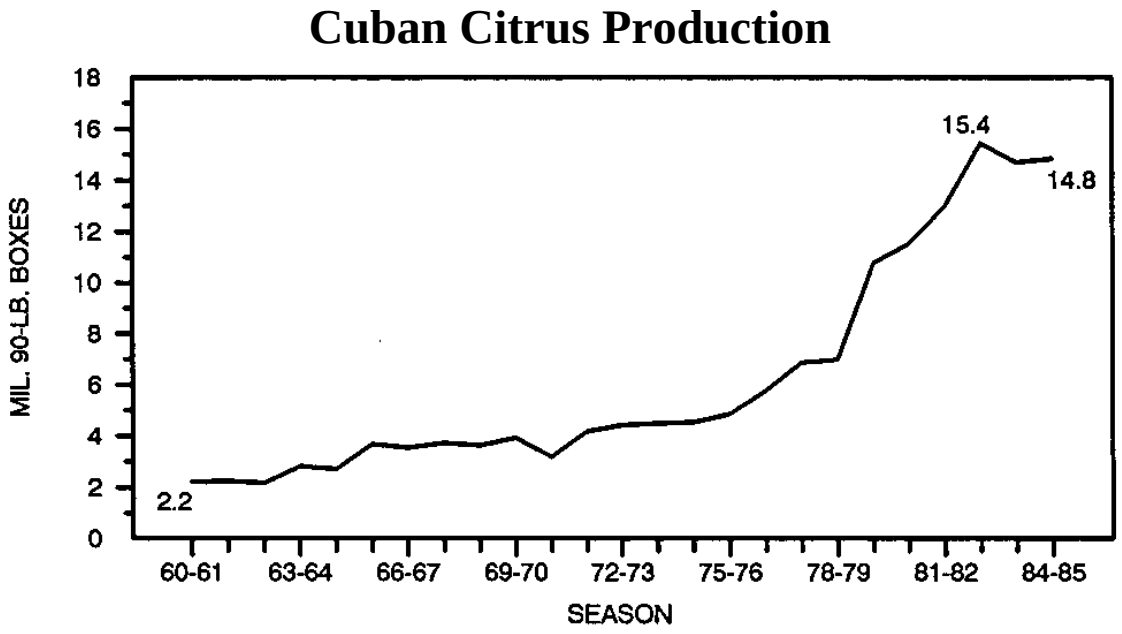
Table 9. Cuban fresh citrus exports by destination, 1989.

Destination	Oranges	Grapefruit	Other	Total
	- - - - - - - - - - 1,000 metric tons - - - - - - - - - -			
USSR	100.9	83.4	1.3	185.6
East Germany	86.6	41.0	6.2	133.8
Czechoslovakia	17.9	18.5	4.5	40.9
Poland	9.3	18.3	.9	28.5
Bulgaria	2.2	14.3	.8	17.3
Holland	10.6	.9	.0	11.5
Other	16.2	5.9	.0	22.1
Total	243.7	182.3	13.7	439.7

SOURCE: CUBAFRUTAS.

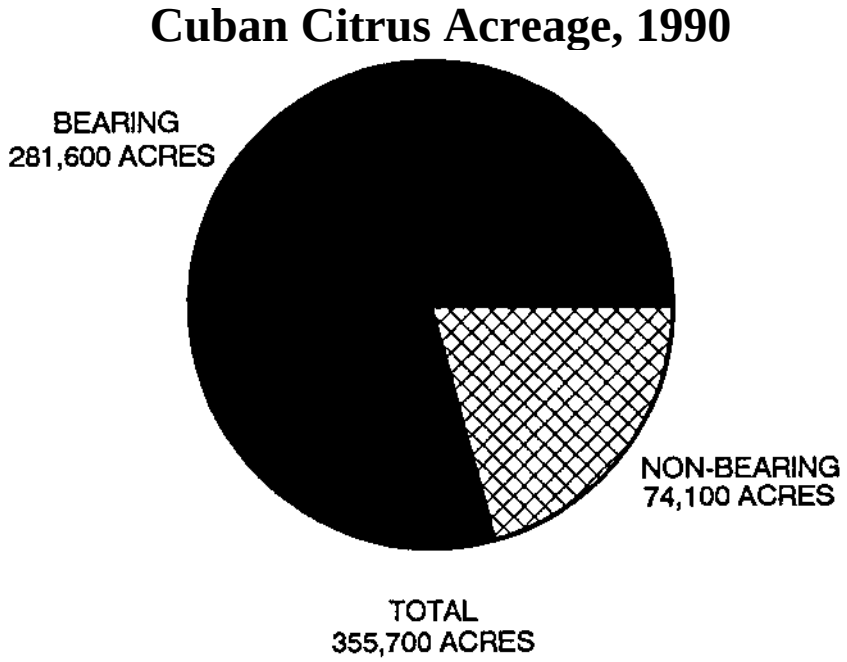
FIGURES

Figure 1.



SOURCE: USDA-Foreign Agricultural Service.

Figure 2.



SOURCE: CUBAFRUTAS.

Figure 3.

Cuba

Citrus production is denoted by shaded areas.
SOURCE: Aspectos Economicos De Los Citricos En Cuba, A.N. Gonzalez, 1983.