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CITRUS PRODUCTION, CONSUMPTION AND TRADE IN CHINA SINCE THE 1990s: DEVELOPMENT AND OUTLOOK¹

I. INTRODUCTION

1. As the third largest citrus producing country, and with a potentially enormous market for fresh citrus and processed products, China plays an increasingly important role in world citrus production and trade. Against this background, this paper describes the changes in citrus production, consumption, market conditions, price and trade in the 1990s and examines future development trends.

II. CHANGES AND TRENDS IN CITRUS PRODUCTION IN CHINA

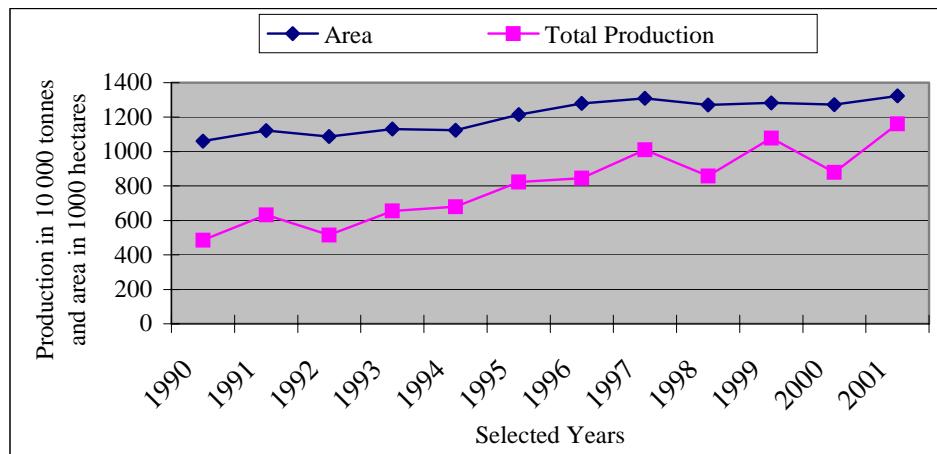
A. CHANGES IN TOTAL CITRUS PRODUCTION

2. Citrus production in China increased rapidly during the 1990s. The citrus growing area reached 1.3 million hectares in 2001 compared to 1.2 million hectares ten years before, an annual increase of 1.33 percent per year. Aggregate production climbed to 12 million tonnes in 2001 from 6.3 million tonnes in 1991, an average increase of 3.87 percent per year.

¹ This paper was prepared by Mr Qi Chunjie, Associate Professor, College of Economics and Trade, Central China (Huazhong) Agricultural University, Wuhan, China.

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Fig. 1 - Total yield and grove area of citrus fruit in China, 1990-2001

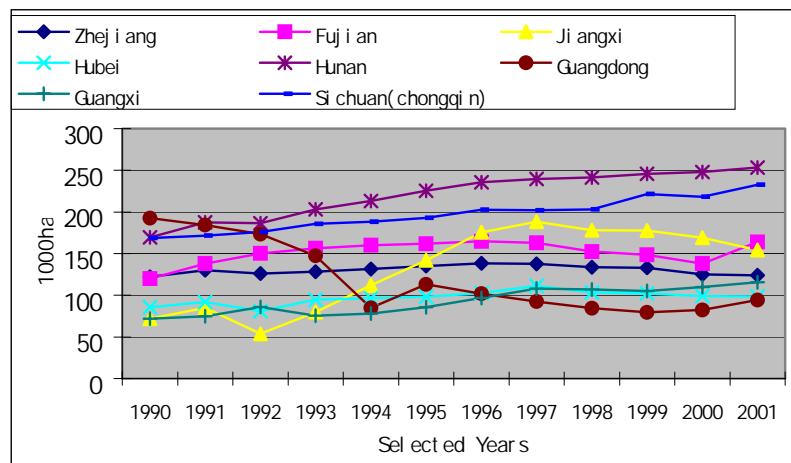


B. CHANGES IN GEOGRAPHICAL DISTRIBUTION OF CITRUS PRODUCTION

3. Since the implementation of the policy of reform and economic opening, especially since 1990, citrus production has shifted to the areas where the agro-ecological and economic conditions are the most adequate for this crop. For example, sweet orange cultivation is now concentrated in the Three Gorges' Reservoir Region, Southern Jiangxi Province, Northern Guangxi Province, Western Hunan Province and Southern Hunan Province. Production is also moving towards impoverished and backward regions that have favourable agro-ecological conditions. In this case, developing a citrus industry is seen by the government as an effective way of helping impoverished areas and mountain areas to improve economically. However, the main production regions are increasingly the ones with developed processed industries and good communication infrastructure. This means that citrus production is moving to the regions with higher technology levels.

4. China's citrus growing regions have adopted different reform policies and approaches to economic development. Figure 2 shows the variations in citrus growing areas in the eight leading Chinese citrus provinces from 1990 to 2001. The citrus areas of the provinces of Hunan, Sichuan, Jiangxi, Guangxi, Hubei and Fujian have expanded rapidly in this period. On the other hand, the citrus growing areas of the province of Zhejiang remained relatively stable, while in Guangdong Province both area and production fell substantially.

Fig. 2 - Citrus growing areas in eight leading citrus-producing provinces, 1990-2001



C. VARIETY MIX AND SEASONALITY

5. The variety mix has experienced many changes. In the mid-1980s sweet oranges accounted for about 30 percent of aggregate national production, loose-skin mandarins accounted for more than 65 percent, while pomelos, kumquats and lemons together accounted for less than 5 percent. A survey done in 2000 proves that China is beginning to focus on cultivating varieties bringing higher profit, and China's citrus variety structure is being optimized. In 2000, the sweet orange variety accounted for 31 percent of national citrus output, loose-skin mandarins for 59 percent, pomelos for almost 10 percent and lemons for some 0.5 percent.

6. In terms of seasonality, citrus fruit can be divided into early-maturing, mid-maturing and late-maturing varieties, which can be respectively harvested from September to October, from November to December and from January to May. In the early 1980s, over 90 percent of China's total citrus output consisted of mid-maturing varieties, while in the early 1990s the early, mid- and late-maturing varieties accounted for 15 percent, 80 percent and 5 percent respectively. Now the proportions are respectively 15-20 percent, 70-75 percent and 5-10 percent.

III. CHANGES IN CITRUS CONSUMPTION PATTERNS IN CHINA

A. DIFFERENCES BETWEEN THE CONSUMPTION OF FRESH AND PROCESSED CITRUS

7. The primary characteristic of China's citrus consumption is that citrus are overwhelmingly consumed fresh, as only a small share of output is processed. Presently about 60 percent of total production still consist of loose-skin mandarins, which are not amenable to processing into citrus juice. The only processing possibility is the production of canned mandarin segments. Traditionally, consumers buy loose-skin mandarins which are easy to decorticate, are safe and healthy to consume fresh and accord with present living conditions and habits. These factors, as well as variety structure, determine the fresh fruit consumption pattern. Processed products account for less than five percent of production, with canned mandarin segments the main processed products. Some of these processed mandarins are exported to Japan, the European Community, the United States and other countries. Some changes in consumption have taken place. Since the early 1990s, for example, canned citrus is disappearing from the shelves of Chinese food shops. Particularly in the past few years orange juice consumption has increased in the cities, and generally the trend towards higher juice consumption in China is strong.

B. DIFFERENCES BETWEEN CITRUS CONSUMPTION IN URBAN AND RURAL AREAS

8. China is a country with a dual economic structure, as incomes differ greatly between cities and rural counties. Such a discrepancy is reflected by a large difference in citrus consumption between cities and rural counties. In 2000, the average net income per capita of urban families was 2.67 times that of rural families. Accordingly, the per capita consumption of fruits and melons of urban residents and rural residents were respectively 50 kg and 20 kg. Citrus is the main category of fruits consumed in China, and it is estimated that citrus consumption accounts for between one-eighth and one-sixth of the aggregate national fruit and melon consumption. Guangdong Province, one of the most developed regions in China, has an annual average per capita consumption of fresh citrus of 3.22 kg (1.3 kg for sweet oranges). Research shows that the income elasticity of demand of rural residents is much higher than that of urban residents. Consequently, China's rural regions should provide enormous citrus demand in the future as their incomes increase gradually.

C. REGIONAL DISCREPANCIES IN CITRUS CONSUMPTION

9. The consumption of fruit overall and specifically of citrus differs to some extent among regions for both urban residents and rural residents. *The China Statistical Yearbook 2000* edited by the National Statistical Bureau supplies data on the individual consumption of dried and fresh fruit and melon of urban residents in 1998. The statistical results show that only residents of Beijing City and Shanghai City spend more than RMB¥200² annually on fresh and dried fruit and melon annually. Residents of Fujian Province, Guangdong Province, Zhejiang Province and Tianjin City spend between RMB¥150 and 200. Residents of the 13 provinces of Yunnan, Liaoning, Chongqing, Hunan, Guangxi, Jilin, Xinjiang, Shandong, Guizhou, Hailongjiang, Jiangsu, Hebei and Sichuan spend between RMB¥100 and 150; residents of the 11 provinces of Ningxia, Anhui, Gansu, Shanxi, Henan, Jiangxi, Qinghai, Shanxi, Neimenggu, Hainan and Hubei spend less than RMB¥100. Such regional discrepancies correspond to the regions' different average income levels to some extent, but not always.

D. SEASONAL VARIATIONS IN CITRUS CONSUMPTION

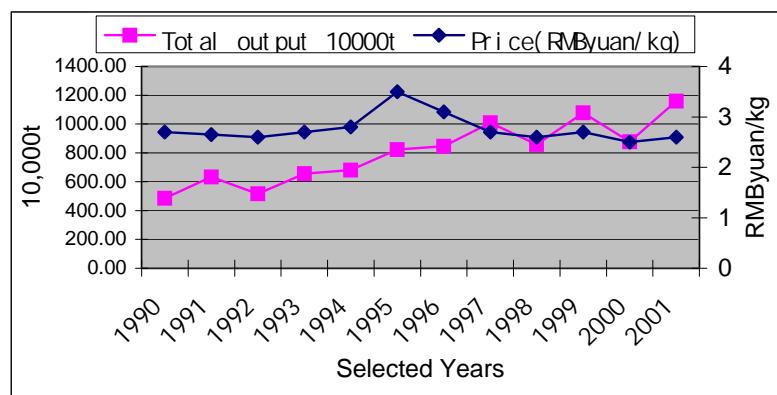
10. The high citrus consumption season in China is from New Year's Day to the Chinese traditional Spring Festival, and the demand is met by Chinese domestic citrus products which come into season from the end of September to April of the following year. However, about 80 percent of China's citrus production is concentrated in the autumn, from mid-October to December. After April, the late-maturing varieties such as Valencia oranges are in short supply and scarce on the market, even in mid- and large-size cities. Therefore, from then on till September imported citrus fruits such as navel oranges are the main products in the citrus market. Most Chinese citrus fruit is sold in agricultural markets, but some is distributed to supermarkets. However, imported sweet oranges such as navel and Valencia oranges and lemons are available all year around in supermarkets and slap-up marketplaces and hotels. The prices of imported citrus fruit are generally much higher than those of similar domestic citrus products. Average income consumers do not buy many imported fruits, especially in the autumn when all kinds of domestic citrus products are available.

IV. FLUCTUATIONS OF CITRUS PRICES

A. ANNUAL FLUCTUATIONS OF PRICES

11. Figure 3 compares output and price per kilogram. There seems to be a lagged production response to price changes. This situation is likely to continue, but some decrease in year-to-year price fluctuations is expected.

Fig. 3 - The aggregate yield and price of China citrus, 1990-2001

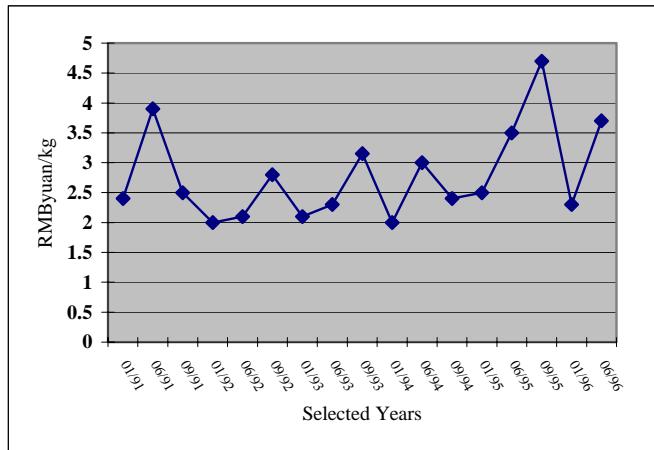


² US\$1 = RMB¥8.27

B. SEASONAL FLUCTUATIONS

12. Citrus prices vary with the seasons because of the seasonal nature of citrus production. More recently, seasonal fluctuations have tended to flatten out with the optimization of citrus varieties (introduction of early- and late-maturing varieties, as explained in section II.C.) and improvements in the cool chain.

**Fig. 4 – Monthly variations of citrus prices on free agricultural product market
(January 1991 to June 1996)**



C. FLUCTUATIONS OF IMPORT AND EXPORT PRICES

13. Fresh fruit average export prices were on the decline from 1995 to 2001, whereas average import prices were on the rise during the same period.

14. The average export price of fresh citrus fruits was US\$0.418/kg in 1995 and US\$0.205/kg from January to June 2001. On the contrary, average import prices went up from US\$0.324/kg to US\$0.487/kg over the same period.

15. For sweet oranges, the average export price decreased from US\$0.251/kg to US\$0.134/kg. Conversely, the average import price climbed from US\$0.321/kg to US\$0.490/kg over the same period. Quality differences between exported and imported fruits played a major role in these price differences.

16. Furthermore, the average price of canned citrus tended to fall as well. It dropped from US\$0.919/kg in 1995 to US\$0.713/kg in 2001. Comparatively, the average import price of orange juice (OJ) was more stable, varying from US\$0.919/kg to US\$1.249/kg.

V. SITUATION AND TREND OF CHINA'S FOREIGN TRADE OF CITRUS

A. EXPORTS AND IMPORTS OF FRESH AND PROCESSED CITRUS

17. China's fresh citrus fruit exports in 2000 were almost negligible in world citrus trade. China's export volume accounted for only 2.1 percent of the 9 698 000 tonnes of world fresh citrus fruits exports. Export value was only US\$47 million, accounting for only one percent of world fresh citrus fruits exports. Statistical data on the volume and value of Chinese citrus exports

in recent years show that the volume has increased, but the export revenue decreased, which indicates a worsening of the terms of trade for China.

18. Citrus imports increased 25-fold from 2 453 tonnes in 1995 to 61 860 tonnes in 2000. The import value increased from US\$0.8 million to US\$28.8 million over the same period, as shown in Table 1.

Table 1 - China's fresh citrus fruit: volume and value of imports and exports, 1995—2001

Year	Export value (US\$1000)	Export volume (tonnes)	Import value (US\$1000)	Import volume (tonnes)
1995	59 921	143 321	795	2 453
1996	66 847	166 128	1 951	6 895
1997	75 845	223 122	3 926	13 836
1998	48 886	175 458	1 924	5 592
1999	41 637	176 291	11 760	29 685
2000	47 101	200 271	28 802	61 861
2001 (1-6)	17 554	85 616	15 758	32 378

Source: General Customs Administration of the People's Republic of China, China's Customs Statistical Yearbook, 1995-2000; Customs Statistics (monthly), 2001(1-6)

19. As far as processed fruit is concerned, canned citrus exports have increased while imports have remained negligible (Table 2). Both imports and exports of citrus juice have increased, but the growth is much faster for imports. China is now a market for imported processed citrus products, especially orange juice.

Table 2 - China's canned citrus products: volume and value of imports and exports, 1995—2001

Year	Export value (US\$1000)	Export volume (tonnes)	Import value (US\$1000)	Import volume (tonnes)
1995	71 383	77 696	9.0	10
1996	77 038	79 626	21.0	574
1997	83 213	98 497	1.4	20
1998	79 535	112 234	3.0	28
1999	98 403	119 539	0.60	23
2000	119 172	175 484	3.00	80
2001 (1-6)	67 961	95 260	2.0	34

Source: General Customs Administration of the People's Republic of China, China's Customs Statistical Yearbook, 1995-2000; Customs Statistics (monthly), 2001(1-6)

Table 3 - China's citrus juice: volume and value of imports and exports, 1995—2001

Year	Export value (US\$1000)	Export volume (tonnes)	Import value (US\$1000)	Import volume (tonnes)
1995	628	1 237	2 120	1 698
1996	471	420	2 432	2 566
1997	1 245	1 014	3 680	4 574
1998	3 514	2 902	5 268	5 382
1999	2 909	2 675	9 000	9 788
2000	3 066	2 920	10 131	9 554
2001 (1-6)	1 758	1 789	8 027	8 624

Source: General Customs Administration of the People's Republic of China, China's Customs Statistical Yearbook, 1995-2000; Customs Statistics (monthly), 2001(1-6)

B. THE VARIETY COMPOSITION OF FOREIGN TRADE

20. Table 4 provides the breakdown of citrus fruit exports and imports, by types of products.
21. China's main fresh citrus exports in 2000 was fresh oranges (including cross-breed oranges). Sweet oranges were also the most imported citrus fruit. Exports of processed citrus consist mainly of canned mandarin segments (98 percent of total exports in volume).
22. In the marketing year 1998/99, China imported 24 857 tonnes of citrus fruits, of which sweet oranges accounted for 76 percent, lemons and limes for 10 percent and grapefruit for 6 percent. For the whole year of 2000, the import value of sweet oranges was US\$23 million, and that of lemons and limes was US\$2.3 million.

Table 4 - China's fresh citrus fruit: volume and value of imports and exports, 2000

Item code	Items	Export			Import		
		Volume (tonnes)	Value (US\$1000)	Price (US\$/kg)	Volume (tonnes)	Value (US\$1000)	Price (US\$/kg)
0805	Total citrus fruit, fresh or dried	200 261	47 102	0.235	61 861	28 795	0.465
0851000	Oranges	2 528	409	0.162	49 434	23 020	0.466
08052010	Chiao-kan	13 048	1 640	0.126	16	6	0.374
08052090	Other oranges, crossbreed oranges	175 767	43 322	0.246	3 881	1 801	0.464
08053000	Lemons and limes	2	2	0.886	4 837	2 341	0.484
08054000	Grapefruit	3 827	593	0.155	3 617	1 582	0.437
08059000	Unknown/not specified/others	5 088	1 136	0.223	74	45	0.604

Source: General Customs Administration of the People's Republic of China, China's Customs Statistical Yearbook, 2000

Table 5 - Processed products of citrus fruit in China: volume and value of import and export, 2000

Item code	Items	Export			Import		
		Volume (tonnes)	Value (US\$1000)	Price (US\$/kg)	Volume (tonnes)	Value (US\$1000)	Price (US\$/kg)
2007.9100	Orange jam, etc.	221	154	0.695	643	458	0.712
2008.3010	Citrus can	175 484	119 172	0.679	80	25	0.311
2009.1100	FCOJ	1 366	1 688	1.235	6 412	7 923	1.236
2009.1900	NFC orange juice	838	752	0.898	2 524	1 433	0.568
2009.2000	Teak juice	252	284	1.126	465	609	1.311
2009.3000	Other citrus juice	464	342	0.737	152	167	1.098
	Total	178 626	122 392		10 278	10 615	

Source: General Customs Administration of the People's Republic of China, China's Customs Statistical Yearbook, 2000

C. DESTINATION OF FOREIGN TRADE

Export destination

23. In recent years Southeast Asia, Hong Kong and Russia were the main export destinations, accounting for over 75 percent of total citrus exports. The other export destinations are Canada, Japan, the Republic of Korea and the Middle East, but their share is relatively small. In the year 2000, sweet oranges were mainly exported to Hong Kong, the Philippines, Viet Nam, Singapore and Macao; other oranges mainly to the Philippines, Malaysia, Indonesia, Hong Kong, Russia, Canada and Singapore; Chiao-kan mainly to Singapore, Malaysia, Viet Nam, Hong Kong. Lemons and limes were mainly shipped to Russia and Singapore.

24. Processed products, such as canned segments and juice, were mainly exported to Japan, the United States and Hong Kong. In 2000, China exported 80 975 tonnes of canned citrus to Japan, 61 374 tonnes to the United States, 18 429 tonnes to Germany, 4 263 tonnes to Canada and 1 994 tonnes to the Netherlands.

Origins of imports

25. According to the China customs office, in 1998 China imported oranges, mostly from Canada (including 2 196 tonnes of sweet orange), New Zealand, Australia, the United States (including 352 tonnes of sweet orange) and Viet Nam. Citrus imported from Canada were re-exports, as this country does not produce citrus fruit. The most noticeable change in 2000 was the concentration of shipments from the United States (sweet orange at 30 960 tonnes, lemons and limes at 2 671 tonnes), New Zealand (sweet orange at 17 571 tonnes, tangerines at 2 857 tonnes, lemons and limes at 1 975 tonnes) and South Africa (sweet orange at 482 tonnes). These three areas accounted for 93 percent of overall imports, which demonstrates the concentration of China's imports. The most noticeable change is that the US exports of oranges to China have increased as a result of the *Sino-US Agreement on Agricultural Cooperation*, enforced by China, and this tendency is also testified to by US Government statistics.

Table 6 - Volume and value of citrus fruits exported to China by the United States, 1995-2000

Items		1995	1996	1997	1998	1999	2000 (1-7)
Orange	Volume (MT)	430	529	91	3 199	334	7 570
	Value (US\$1000)	236	415	58	2 235	174	3 473
Grapefruit	Volume (MT)	206	0	0	37	19	62
	Value (US\$1000)	104	0	0	14	8	24
Orange juice	Volume (1000SSL)	1 698	900	923	664	1 788	1 029
	Value (US\$1000)	534	399	503	344	998	410
Grapefruit juice	Volume (1000SSL)	192	119	50	144	247	201
	Value (US\$1000)	124	33	15	85	82	99

Source: National Agricultural Statistics Service, United States Department of Agriculture

Table 7 - Volume of citrus (fresh and processed) re-export to Mainland China by Hong Kong, marketing year 1998/99–1999/00

Items	1998 (10)/99 (9)	1998 (10)/99 (9)	1999 (10)/00 (8)	1999 (10)/00 (6)
	China's Customs Statistics (MT)	Hong Kong Customs Statistics (MT)	China's Customs Statistics (MT)	Hong Kong Customs Statistics (MT)
Orange (HS0805.1000)	0	33 910	0	23 750
Tangerine (HS0805.2010)	0	688	0	212
Lemons and limes (HS0805.3000)	0	1 508	0	1 159
Grapefruit (HS0805.4000)	0	1 118	0	2 231
Total	0	37 224	0	27 352
Frozen orange juice (HS2009.1100)	1	336	0	183
Orange juice, not frozen (HS2009.1100)	1 697	1 688	163	523
Grapefruit juice (HS2009.2000)	0	197	0	173

Source: General Customs Administration of the People's Republic of China, Customs Statistics (monthly); Hong Kong Department of Census, Customs Statistics

D. SEASONAL VARIATIONS IN FOREIGN TRADE

26. China's citrus exports are highly correlated with the harvest period. Because the main varieties are loose-skin mandarins, the export period runs from November to March, and exports in these five months accounts for 95 percent of the total export over the season. December and January account for 53 percent of total season exports, which exposes China's weakness in exploiting export markets.

27. Imports are concentrated in the summer season. In 2000, imports from June to September accounted for about 65 percent of the total sweet orange imports.

VI. CONCLUSION

28. Entering the 21st century, China's citrus industry is now going through the phase of steady development and structural adjustment, with the most important mission in the future being improving quality, promoting production, optimizing the structure of varieties, lowering costs, improving distribution and boosting value added.

29. Due to the influence of traditional plantings, consumer habits, development levels and other factors, fruits are consumed fresh in China, especially in rural areas and among residents with low incomes. Demand for fresh citrus fruit is increasing, though rather slowly. The consumption of orange juice is more popular in some developed areas, such as big and middle-sized cities and some provinces along the coast. With rising incomes, it is expected to increase steadily.

30. The situation of the Chinese citrus market since 1996 has been that supply always exceeds demand, which makes it difficult to sell all citrus production. Prices at wholesale or retail level are fairly low. Taking account of all factors, such as the long growth cycle of citrus trees, inertia among farmers, slow introduction of improved varieties and long-time lags in improving processing levels, the market price of fresh mandarins or oranges is expected to level off at RMB¥2.5-3.0/kg. China's average export prices for fresh citrus fruit, sweet orange and canned mandarin segments are on a declining tendency.

31. On the other hand, China is becoming an interesting market for imported oranges and orange juice (FCOJ and NFC).

32. In order to implement the "go out" export strategy for China's citrus fruits and supply world markets, Chinese producers and exporters will have to improve citrus product quality and focus on marketing measures, making China's citrus products well known to foreign consumers over the world, strengthening international sales promotion, and exploring multiple export channels.