

FRUIT PRODUCTION AND EXPORT OF CHINA

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Summary

Fruit production in China has increased quickly since 1992; and the national total production in 2004 reached at 84 million metric tons (MT). In 2005, a total of more than 3.6 millions MT of fruit and fruit product was exported to other countries/regions including Asia (58.1%) and Europe (23.2%), with an income of 2 billions US\$. Out of the all kinds of fresh fruits, apple, citrus and pear ranked the first three in the production and export volume. In the past 5 years, the work including the government macro guiding, organizing the growers, and the extending bagging and post-harvest technologies, as well as signing the non-tariff trade agreement for fruit/vegetable with countries in ASEAN, all together promoted the fruit production and exportation in China. The fruit growers in China is of small scale, working out an efficient and feasible good agricultural practice protocol for fruits crops and organizing the farmers to follow the standard protocol to produce high quality fruits that can meet the requirements of the markets is being on the agenda.

1. Fruit Production and the Changes in Fruit Industry in China During the Past 5 Years

1.1 The general information of fruit production in China

Fruit is one kind of the cash crops for farmers in China. It has been playing important role in the income increasing of peasants. China has been the No. one producer of fruit crops in the world since 1990s, based on the total production. Fruit production in China comprised of 15.2% of the world total production in 2003; apple, and pear accounted for 35.5% and 53.1% respectively. Citrus acreage and production has been increasing recently, last year, China produced more than 16 MMT citrus fruits (FAO data), about 16% of the world, and became the No.2 producer of citrus in the world, just behind Brazil.

The diversified climates and long culture history has harbored most kinds of fruits crops in the world. According to the Ministry of Agriculture (MOA, 2005), in 2004, the total fruit acreage covered 9.769 millions hectares (HA) with 83.941 millions metric tons (MMT) of production (Table 1). Among all the fruits, apple ranked the first with 23.675 MMT, followed by citrus 14.958 MMT and pear 10.642 MMT; these three kinds of fruits accounted for 58.7% of the total production, and the rest fruits shared the left 41.3% (Fig 1). Besides the above-mentioned three kinds of fruits, peach, banana and grape are the less important categories. During the past 4 years, the total fruit production annually increased by 9.7%, but acreage increased only by 1.5%, as indicated production efficiency has been enhanced obviously.

Fruit production has been increasing (Fig 2) since 1980s when the government unfastened the horticultural crop production. From Fig 1, it can be seen that the increase during the period of 1980 to 1992 was very slow, and the speed became very fast after 1992; at the end of 1990s, the production kept stable, actually the fruit was seasonally over-supplied. During 1998-2002, the government and scientists work together to modify the structure of varieties and also made a plan for guiding the industry. After then, the production as well as the export has increased stably.

1.2 The changes in fruit production in China during the past 5 years.

Fruit production and export has increased in the past 5 years, this issue is related to many factors. The following points are a few of them.

The government policies enhanced the fruit production

During the past five years, the government changed the tax policy to help farmers to increase income. The first one was to abolish the “Special-crops tax”. This tax was enforced in 1980s, when the government tried to ensure the staple crop production and kept the land for growing rice and wheat etc instead of the horticultural or cash crops. Under this policy, a fruit farmer generally needed to pay 12% of the income for the tax, much higher than the agricultural tax (about 6%). In 2003, this tax is abolished, and but the fruit farmer still need to pay agriculture tax, this meant that all the farmers no matter they were rice growers or fruit growers, there were no tax discrimination. During the following year, the government decreased the agriculture step by step, and in 2006, all the tax for the farmer was finally canceled. The no-tax policy has helped the farmer to increase income on one side, and also encouraged the farmer to grow crops with higher profit such as fruit and flowers. Another policy that benefit the fruit production is the “giving up the crops to forestry” that enforced about 5 years ago; under this policy, the hilly and mountainous areas should grow trees including part of fruit trees to protect the soil from erosion and keep clean fresh water system. They government will give some compensation to the farmers during the shifting periods (about 5-8 years). As the results of these polices, the fruit crop and other horticulture production in China is being promoted and stimulated; More and more hilly and mountainous areas where rice or wheat were the main crops will shift to growing fruit trees or forestry trees. Whether it is a positive or negative trend need further evaluation. Today’s farmer is much more mature than they were before since they have better production & market information system. At the same time, both the central and local governments have made other policy to protect the land for annual staple crops to ensure the food safety. It can be believed that the fruit production in China will be stable in the future, but the structure will be modified further according to the market and the comparatively competitiveness for each crop and for different areas. For example, lychee plantation had increased during the 1990s in Guangdong and Guangxi provinces, but in the past 3 years, the producing area and production has decreased since the low price and the import from ASEAN; the same trends happened to longan. In Guangdong, they changed the lychee production to the local tangerine growing. They explored a local late ripening tangerine Shatangju (*Citrus reticulata* Blanco), and have achieved very good income.

The State developing plans for main fruit crops will improve the quality of fruits

Fruit production in China was considered as the by-production of agriculture and had not attracted the attention of the government in before the middle of 1990s. Its production and market system had been of the free state for a long time; the farmer could grow any fruit types if they liked, no matter the climates or other conditions are suitable to the crop or not. A typical example is that the apple was grown in the south area in 1960s where the climate was of high humidity and high temperature. Both the fruit quality as well as the efficiency was very low. In 2002, the MOA organized scientists to study this issue and made the “Development Plan for Advantageous Areas for Apple and for Citrus”, basing on the climate, the soil, the culture history, the expertise and the market for an area. The plans were released in 2003. According to the plan, the apple will be mainly concentrated to 2 areas, i.e. the Bohai gulf area including Shangdong, parts of Hebei and Liaoning provinces, and the Yellow soil area including most parts of Shanxi and parts of Henan, Gansu, and Shanxi province. For citrus, there will be 3 belts crossing the south part of China. The first belt goes along the middle and upper reaches of Yangtze River covering the area of west of Hubei, central part of Chongqing and Sichuan province. This belt has warm climates and few cold disasters in the winter, and is suitable for orange production. The second belt, crossing south part of Jiangxi and Hunan, and north part of Guangxi, is also suitable for sweet orange. At present, this belt is mainly for navel orange production. The third belt is for mandarin including the Satsuma mandarin and ponkan, it stretches from south part of Zhejiang, west part of Fujian and finally to the east part of Guangdong province. The first and the second belts are nearly horizontal along the latitude, and the third is nearly longitudinal. The plans has helped the investors to choice the best places to establish their producing, post-harvest treatment and processing factories, and also give confidence to the investor. Under this plan, the investments to fruit production have increased. The investments came not only from domestic but also abroad. In fact, most of the large-scale orchards or factories in the fruit industry are from non-agriculture. The multi-channel investments not only improved the capital structure, but also changed the idea of fruit industry. In the past, fruit production was thought to just supply a kind of food, and fruits could improve the diet. Today, more and more people think it as an industry; the growers accepted the concepts of market, competitiveness and supply chain etc. For example, in Yichang of Hubei province where is the main producing area of mandarin, the farmers just focused on how to produce high quality and high production of fruit in the past, the price fluctuated with the on-off year of the production, and in 1997, a good crop year, the price at the orchard gate is lower than the cost. In the past 5 years, the farmer invested cooperatively or lonely the post-harvest treatment, improved the package, and also organized to explore the market in the non-producing area of citrus. Now, they have the capacity to treat 40% of the citrus production with washing, waxing and grading equipments; the price increased and they got much higher net income from the citrus production than before. This kind of issue exists national widely; the storage capacity of fruits especially for apple and pear, and the package techniques have been improved very quickly in China. Today, apple and pear is of year-round supply relying on the atmosphere-changed storages.

Processing of the fruits increased, but varied with crops

The processing of fruits is a weak point for China, although the apple juice production increased in the past years, the processing of fruits is still backward. The processing of apple juice mainly relies on the out-grade fruits instead of the special processing varieties. For citrus, the main processing product is the canned segment of mandarin;

this product is labor intense and the profit will be less and less with the increase price of labor and the raw materials. Since the higher price of both the fruits and the labors, a part of the processing companies of canned citrus segments has moved the middle areas such as Hubei and Hunan from Zhejiang province where is the economically improved area. The juice production of orange did not get good achievement because of the limit land in the area where the climate is suitable to develop orange juice industry. Today, except for about 500 thousands metric tons of citrus was used for canned segments, the rest of citrus production, i.e. more than 15 millions MT of citrus fruits are still consumed freshly. In the near seen future, Citrus in China will still be for fresh purpose instead for processing juice. Other fruits crops, such as pear, peach and tropical fruits have the same situation; they will be produced also mainly for fresh.

The quality of fruits has been improving

In 1980s, the planed high-density culture system was promoted nationally, coupled with the intense pruning. This technique produced high production, but with very few attention to the quality and to the efficiency since the labor was cheap and the total fruit production is of under-supply in China. With the production increasing and the labor shortage began to become a problem in the countryside, this producing system demonstrated the backwards gradually. In the high-density orchard, the sunlight cannot reach the canopy, the production is low and quality is off the quality. So, many provinces have promoted the farmers to decrease the density by cutting or moving some trees in the old orchards, and to plant much less trees than before in the new plantation. For example, in south part of Jiangxi province where is a new areas with more than 60 thousand hectares of navel orange. The density is 600-750 trees per hectare, just half of the density in 1980s. The lowing density practice has improved the quality and also decreased the cost of pruning.

Bagging the fruit to improve the outer-appearance of apple and pear

Bagging the fruits of apple and pear has widely used in China for improving the outer-appearance. When the fruit settings finish, the fruits are bagged with special paper; at the color break stage, the bags will be removed. The bagged fruit of apple is generally more shinny with tender texture than the normal un-bagged ones; the peel color is evener and more attractive to the eyes than the normal ones. For pear, the bagged fruits changed the out-appearance; and are generally pale-yellow or creamy color with lowered flavors than the un-bagged fruit, but with tender and juicier taste than the un-bagged ones. Although this practice increases somewhat the cost of production, the market has offered a better price for the bagged fruits. As a result, more and more production in apple and pear, as well as in Lychee, loquat and grape are being bagged. According to the estimation, 5% of the apple and pear fruits will be bagged in the next years. It should be pointed out that the bagged fruit has attractive appearance, but the storage-tolerance is lower than the normal producing one.

Post-harvest treatments

During the past 5 years, the most significant improvement of technique in fruit production is the post-harvest treatment. More and more farmers released the importance of post-harvest treatments to the market. The post-harvest treatment capacity in Citrus has increased from less than 1% of the total production in 2000 to today's 10%. In some

citrus producing areas such as Yichang of Hubei province, more than 160 sets of packinghouses with varied capacity from 5 to 20 MT/hour have been invested by local farmers or by outside investors. In Gannan of Jiangxi province, South-north Fresh Limited Company set up the biggest packinghouse of citrus in China in 2004 with the packing capacity of 35 MT/hour. These packinghouses not only extended the production chain, but also guiding farmer to improve the fruit quality.

Setting up of ‘Fruit Bureau’ in the government strengthens the management of the industry

Before 2001, there was no any fruit bureau in the provincial governments of China. To strengthen the management of the industry of fruit crops, the provincial government of Shanxi set up a new bureau for fruit industry like Department of Citrus in Florida. This is the first provincial bureau for a kind of crop, as showed the importance of fruits to the local economy. This bureau has played an important role in promoting the apple production and exportation for this province. Every year, they help the farmers to improve the quality, construct better environments for the transportation of fruits; for example, all the trucks loaded with fresh fruits don’t need to pay the highway fee in this province. They also organize exhibitions abroad each year to explore the market for their fruits. In other province, there are fruits offices in the government. In Ganzhou of Jiangxi province, there is a bureau for fruit industry. About 20 staffs work for the technique and administrative management of the citrus industry in this city.

2. Fresh Fruit and Processed Fruit Export and Import

2.1 The trends

Export of fresh fruits in China has been increasing since 1990s, and reached 1.75 million MT in 2004 according to the custom of China (Fig 3). From Fig 3, it can be found that the export volume kept a low level for more than 10 years during 1980-1992. The next decade from 1992 to 2001, the export volume increased, and a sharp increase can be seen after 2001. However, China produced the fruits mainly for domestic consumption. Fig 3 also showed that the relative ration of the export volume to the total production is still low, the highest in the history is about 3.5% in 1980, and the ration kept decreasing until 1992, and then increased step by step, in 2004, it reached about 2%. China imported orange juice from Brazil and USA by 18.8% increase, and reached 68.8 thousands MT of FCOJ. China exported more 700 thousands MT of fruit juice to other countries. Apple juice is the main category, it accounted for 90% of the juice export.

The balance of export/import in China last year is positive with about 2.5 millions MT net export of fruits and fruit products, achieved a net income of 1.38 billions US \$ from the trade.

2.2 The structures

Table 2 showed a detail list of the import and export of fruit and fruit products in China in 2005. Comparing to 2004, 15.7 % of export increase was achieved for fresh fruits. Based on the volume, apple accounted for 40.5% of the total, followed by citrus 22.8%

and pear 18.1%. The most increase belonged to citrus, increase of 29.1% comparing to the previous year. At the same, we can also notice that China imported about 1 million tons of fresh fruits, with an increase of 8.3%. Out of the all fruits, banana from Southeast Asia (mainly from Philippines), longan from Thailand and Kiwi fruit from New Zealand ranked the first three respectively. It is also worth mentioning that pineapple import with triple times increase from Southeast Asia is very significant comparing to the decreasing of pear and apple etc.

In 2005, China exported about 300 thousands MT of canned citrus segments which accounted for about 60% of the total canned fruit exportation.

2.3 The destinations and supplies

When detail destination of export was examined (Table 3), it is easy to notice that 58.1% of the fresh fruit and products were exported to Asia, 23.2 to Europe, and 16.1% to Northern America. Export to ASEAN accounted for 28.8%.

If the export volume is classified based on countries/regions, USA, Japan, Russia, Vietnam, Hong Kong, Indonesia, Malaysia and other Southeast Asia countries are the important exporting destinations. For fresh fruit export, ASEAN is most important market.

For different fruit and product, the main destinations varied. In 2005, a total of 465.6 thousands MT citrus fruit were exported. Out of them, 66.3% were for ASEAN, 7.2% to NAFTA. The same situation was for apple, 824 thousand MT were exported including 46.7% to ASEAN and about 5% to EU. Export of pear fruit to ASEAN also accounted for 60% of the total of 368 thousands MT. In summary, for fresh fruits, the ASEAN is the most important exporting destination at present for China (Table 4).

In 2005, China imported near one million MT of fresh fruits. Banana ranked the first, all the 355 thousand MT of banana were from ASEAN; Longan is a traditional fruit in China, but now, China imported 143 thousands MT from ASEAN, mainly from Thailand. China also imported citrus, out of the 61 thousands MT import volume, 57.6% were from USA.

Canned Citrus segment export in 2005 reached at 300 thousand MT. The main market was NAFTA accounting for 47.1%, followed by EU 18.6%. Apple juice is the most important category to export in China. In 2005, a total of 650 thousands MT were exported; out of them, 39.1% was for NAFTA, and 30.3% for EU.

3 Practices to Promote Fresh Fruit Export

3.1 Agreement between or among nations with mutual benefit has promoted the optimization of resources and the export.

In the Oct. of 2003, Agreement between China and Thailand of non-tariffs for vegetables/fruits began to work. This agreement has enhanced the optimization of the resources of both sides (Zhang & Tao, 2005). Thailand has privilege of longan and other tropical fruits production, and China has very good temperate fruits such as apple and pear. According to the custom of Fuzhou in Fujian province where is main port to export the tropical fruits, one year after this agreement, import of fruits/vegetables from

Thailand increased sharply, reaching 11.3 thousand MT of 1.26 million US\$; the trade balance between China and Thailand at this port became -372 thousand US \$ from previous year's +455.6 thousand US \$. The main categories importing from Thailand were longan, lychee and Banana. But in other port, apple and pear export to Thailand increased sharply. During the period of Oct of 2003 to Sept of 2004, Combining the fruits with vegetables trade together, China imported a total of 2.81 millions MT fruit/vegetable from Thailand with 420 millions US\$ in value; and exported 179 thousands MT with 69.83 thousand US \$ to Thailand (Shi, 2005). Although there are still some issues need to be modified in this agreement, it has promoted the fruits trade between these two countries. In 2004, China signed non-tariffs agreements for fruits/vegetables with other 5 countries including Singapore, Malaysia, Indonesia, Philippines and Brunei; and in 2005, the cooperation expanded to more ASEAN countries. These agreements have facilitated the fresh fruit trade. In 2005, China imported 253,144 Mt fruits from Thailand, and exported 125,522 MT to it; for Philippines, import and export volume were 307,717 and 117,458 MT respectively. As mentioned before, ASEAN became the most import supplier of fresh fruits for with 72.2% of the total import in 2005; and also the important export destination, ASEAN consumed 28.8% of the total export from China. Since the import pressure, the longan and lychee growers in south part of China have been trying to shift from growing tropical fruits such as lychee and longan to growing citrus cultivars that need high temperature to perform well. In the past 3 years, the citrus acreage increased very quickly in Guangdong, as might an example for the optimization of the resource.

3.2 The farmer organizations will help the individual farmers to improve the quality and reduce the product cost

Package and post-harvest treatment is also the bottleneck for the fruit export. Although in the past years, a good improvement in the post-harvest treatment for apple, citrus and pear has been achieved, there is still a long way to extend the modern harvesting, packing and shipping technology to all the farmers. China's fruits growers are generally small with about one acre for a family, how go organize them and use the same protocol to produce fruits is what the government is considering. In the past few years, the farmer organization that units separate farmers together like a board to unify the culture practices and the market issue has increased, and also promoted by the governments. This work will benefit the improvement of quality and reduce the cost. There is a good trend that this kind of organization organizes technique training and also cooperatively invests packinghouse, they invite professors to lecture, establish websites and send message with mobile phone, edit and release newsletter. In south part of Jiangxi, Fujian and Zhejiang, this kind of organizations is replacing the traditional extension system, and played very important role in the technology transferring.

3.3 Good agricultural practice will become the threshold to export fruit

Europe is the most important consuming region for fresh fruits. With the increase of labor cost step by step, the European fresh market will have more space in the future than today for developing countries. However, the GAP system became the most import threshold for entering the market (Zhang et al., 2005). Some companies in China are adopting the EUROGAP system and trying to get the certification in order to export

apple to Europe. A localized GAP version that will fit to the situation and reach the same standards of EUROGAP is being studied and compiled in China. Frankly, there are too many things to learn from other countries for China. There are a few certificating systems in China for agriculture products such as the green food, free-polluted food. Each system has a few national standards to support it.

3.4 Establishment of the non-infected area of pests and diseases

The establishment of non-infected areas will be one of the main practices to promote the export. The government has released the importance from the exporting lessons of pear (Zhang and Liu 2005). For apple, the government of China has initiated the establishment of non-infected area of 'Fall Webworm' *Hyphantria Cunea* in 2004. After years of experience accumulation, more fruit crops will initiated this kind of work by the government.

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Table 1. Fruits production during 2001-2004 in China (Metric tons/ x1000 hectares)

Years	2001		2002		2003		2004	
	Production	Acreage	Production	Acreage	Production	Acreage	Production	Acreage
Total	60,452,648	9,200	69,519,803	9,098	75,515,217	9,437	83,941,335	9,769
Apple	20,014,986	2,066	19,240,985	1,938	21,101,776	1,901	23,675,473	1,877
Citrus	11,606,915	1,324	11,990,065	1,405	13,453,709	1,506	14,958,302	1,627
Pear	8,796,097	1,062	9,309,432	1,042	9,798,424	1,062	10,642,287	1,079
Peach	4,561,893	452	5,230,436	547	6,148,100	607	7,010,985	663
Banana	5,272,352	245	5,557,297	248	5,903,279	256	6,056,148	265
Grape	3,679,680	334	4,479,453	392	5,175,939	421	5,675,318	414
Lychee	953,625	558	1,523,165	555	1,123,811	559	1,555,803	586
Pineapple	869,049	61	827,307	56	821,868	53	808,254	51
Kiwi fruit	241,653	48	283,366	50	330,220	52	409,456	53

Categories	Export Volume (MT)	Change to previous year (%)	Export values (1000 US\$)	Import Volume (MT)	Change to previous year (%)	Import values (1000 US\$)
Fresh Fruits in subtotal	2,037,014	15.7	752,204	984,158	8.3	512,615
Banana	23,550	0.5	7,492	355,508	-6.6	100,031
Other fruits	307,332	28.1	153,114	393,419	44	205,916
Pineapple	5,395	-6.3	1,278	663	367.3	335
Citrus	465,622	29.1	143,287	61,550	-8	44,629
Grape	21,257	19.4	9,970	57,490	-2.5	82,353
Kiwi fruit	4,487	-12.3	3,586	82,101	-9.5	53,606
Apple	823,988	6.5	306,256	33,204	-10.9	25,411
Pear	368,333	15.8	122,177	81	-83.8	52
Peach	17,050	9.2	5,043	141	2.5	281
Canned fruits in subtotal	505,929	5.5	331,855	5,193	-24.3	3,994
Pineapple	72,084	-6.3	37,002	2,833	74.5	1,781
Citrus	299,479	5.9	198,739	246	108.5	468
Pear	34,511	15.8	18,701	4	-89.1	4
Peach	76,784	9.4	61,839	2,111	-58.5	1,740
Other fruits	23,072	18.4	15,575	0		0
Fruit Juice in subtotal	703,629	33.2	518,600	68,853	18.8	73,179
Citrus	4,055	22.7	4,209	61,483	27.4	63,149
Pineapple	4,960	-34.6	5,161	305	37.6	266
Grape	803	74.2	1,018	2,541	-1.2	3,851
Apple	650,608	33.6	459,709	465	-65.4	418
Other fruits	43,203	45	48,503	4,059	-26.9	5,496
Other processed fruits	401,462	12.4	433,264	86,847	-0.6	69,185
Grand total	3,648,034	16.8	2,035,923	1,145,051	8	658,973

Areas/organization	Volume (MT)	%	Value (1000 US \$)	%
Total	3,648,034	100.0	2,035,923	100.0
Asia	2,120,514	58.1	1,067,039	52.4
Europe	845,991	23.2	471,614	23.2
Oceania	64,966	1.8	48,119	2.4
South America	10,873	0.3	7,454	0.4
Africa	19,650	0.5	12,905	0.6
North America	586,039	16.1	428,792	21.1
ASEAN	1,049,572	28.8	391,880	19.2
EU	478,037	13.1	310,207	15.2
NAFTA	588,018	16.1	430,292	21.1
Others	1,532,407	42.0	903,545	44.4

Table 4. Export destinations of main fresh fruits in China for CY 2005, data from the Custom of China

Citrus		
Destinations	Export volume (MT)	%
Total	465,622	100.0
ASEAN	308,529	66.3
NAFTA	33,595	7.2
EU	6,731	1.4
Others	116,766	25.1
Apple		
Total	823,988	100.0
ASEAN	384,842	46.7
NAFTA	3,236	0.4
EU	37,679	4.6
Others	398,232	48.3
Pear		
Total	368,333	100.0
ASEAN	220,897	60.0
NAFTA	8,553	2.3
EU	16,054	4.4
Others	122,829	33.3



