China: competitor or chance on the international apple market

Developing China is the chance for the world

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1. Apple production and its benefits in China
1.1 Changes in the production of apple and other fruits (ten thousands tons)

- Apple
- Citrus
- Pear
- Grape
- Banana
- Peach
Apple consumption percentage of fruits and melon in China

- Apple: 25%
- Citrus: 21%
- Pear: 11%
- Peach: 8%
- Grape: 8%
- Banana: 7%
- Lizhi: 1%
- Pine apple: 1%
- Actinidia: 1%
- Others: 17%

Total: 100%
Apple Cultivar constitution in China

- Fuji: 69.90%
- Delicious: 9.20%
- Qinguan: 6.30%
- Gala: 6.80%
- Ralls: 2.40%
- Huaguan: 2.10%
- Golden Delicious: 1.20%
- Beni Shogun: 1.00%
- Jonagold: 0.90%
- Others: 0.50%
Changes in apple production (blue) and domestic consumption (red) recent 8 years in China (million tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>35,98</td>
<td>35,3</td>
</tr>
<tr>
<td>2012</td>
<td>38,49</td>
<td>37,52</td>
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<tr>
<td>2013</td>
<td>39,68</td>
<td>38,77</td>
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<tr>
<td>2014</td>
<td>40,92</td>
<td>40,24</td>
</tr>
<tr>
<td>2015</td>
<td>42,61</td>
<td>41,53</td>
</tr>
<tr>
<td>2016</td>
<td>43,88</td>
<td>42,59</td>
</tr>
<tr>
<td>2017</td>
<td>44,5</td>
<td>43,38</td>
</tr>
<tr>
<td>2018</td>
<td>31,15</td>
<td></td>
</tr>
</tbody>
</table>

Estimate -30%
History of apple production in China

Based on Liu Jundi
Changes in apple production profit in China

Gross income

Profit decreased because the cost has been increasing

Based on Liu Jundi
Changes in apple production cost in China

Based on Liu Jundi

Thinning, bagging, bag removing, pruning and picking need a lot of labour, and labour price has been increasing greatly.
Changes in import (blue) and export (red) of fresh apples recent 7 years in China (thousand tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Import (80)</th>
<th>Export (980, 990, 870, 830, 70, 1350, 1200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1030</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>980</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>990</td>
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<tr>
<td>2014</td>
<td>870</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>830</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>1350</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

About 3% of total production for export. Export increase in 2016-2017 because of lower price in domestic market.
Low price in domestic market increased export recent two years

Fuji price in domestic market recent years

- Purchase price
- Wholesale price up to July 21, 2017

From Lili
1.2 Contributions of apple to the countryside development and reducing poverty in China

• Yantai Geruite Fruit Cooperative was established by 180 families in Dongyuantou Village, Shewopo Town, Qixia City in 2013, which owns 200 hectare of land for building new orchards.
New Orchard of Yantai Geruite Fruit Cooperative

Family old orchards before cooperative

New orchard of cooperative
An old village in Loess Plateau came out of poverty by apples

Luoyang Village in Luochuan county, average annual temperature 9.2°C, annual rainfall 622 mm, 170 families, 774 population, among 191 hectare of land there is 121 hectare of apple, 40 hectare of grass for lamb, annual income about 16,200¥ (about 2000€)
Luoyang Village

Recreation center  Old cave dwelling
A happay grower in Luoyang village

- 45 tons/hectare,
- Gross income ¥300,000/hectare
Luochuan City

Old cave dwelling

Developing apple orchards
1.3 The benefits of apple consumption for human health

![Bar graph showing total antioxidant activity (umol vitamin C equivalents/g fruit) for various fruits including cranberry, apple, red grape, strawberry, peach, lemon, pear, banana, orange, grapefruit, and pineapple.](image)

from Jeanelle Boyer Rui Hai Liu
An apple a day to prevent cancer formation

Apple polyphenol phloretin inhibits growth of cancer cells through inhibition of type 2 glucose transporter. It was demonstrated that phloretin can induce growth arrest of cells in the G0/G1 phase, induce apoptotic cell death, and inhibit tumor cells migration and metastasis. All these effects can be attributed to the phloretin-induced intracellular glucose deprivation.

From Shih Hsin-Tu
Chinese consumers like apples more and more
Perhaps we need more apples for the world

• An apple a day keeps the doctor away

• Theoretically
  – World population 7,442 million
  – One apple is about 0.2 kg
  – We need $7442 \times 0.2 \text{ kg} = \frac{1488.4}{1000} \text{ tone} \times 365 \text{ day} = 543 \text{ million tones a year}$
  – Now we have only less than 70 million tones in the world.

• Big apple production in China may be a big competitor on the world apple market with its development if the world market always keeps the same size.

• However there are also the chances and the chance should be bigger than the competition.
2. Modern apple industry development in China gives the chances for apple industry in the world
2.1 Apple industry is changing in China
There are still 150 million hectare of apple orchards with seedling rootstocks
New orchards

Knip trees from Netherlands

Local small trees
Learning from Europe about nursery

What do they want, corn, peanuts or apples?
2.2 The chance for international nursery in China

Weihai international joint nursery with French company
A fruit company in Liaoning province cooperated with a nursery from Netherlands.
A Chinese fruit company, Zhonglinfengwo, cooperated with Verbeek nursery in Rizhao, Shandong Province
Zhonglinfengwo nursery
2.3 The chance for extending facilities and materials for new orchards
Machinery for modern apple industry
New materials and methods
2.4 The chance for transferring Intellectual property in apple industry in China

- First case of Intellectual property transfer in apple industry in China in 2017
- “Fuli” was transferred to Natural Farming company with 1.56 million yuan in 2017.
- This indicates that intellectual property protection becomes possible in fruit production in China.

“Fuli” apple bred by Qingdao Agricultural University (Telamon × Fuji in 1995), bloom to harvest is 165 days.
First new cultivar extension union was established in Shaanxi province for “Ruiyang” and Ruixue” extension.

“Ruiyang”, Fuji × Qinguan, harvest in middle of October, fruit size 283g, Brix16.5°, precocious, productive, good storability.

“Ruixue”, Fuji × Qinguan, harvest in middle of October, fruit size 296g, Brix16°, precocious, productive, good storability.
Ruiyang

Ruixue
2.5 International specialists are needed in modern apple industry in China
2.6 Potential chance: apple processing

Concentrate apple juice is the main processing product. There are some apple chips. There is few popular apple processing products in China market, such as NFC juice.
3. Prospects of apple production in China

- To control the acreage of apple orchards
- To optimize cultivar constitution
- To transfer seedling rootstocks to dwarf rootstocks
- To guide and optimize more regionalization
- To decrease the cost of apple production
- To increase the quality of apples to meet the requirements of various consumers.
- To optimize postharvest treatments and processing
Thank you for your attention

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