

# **CURRENT STATUS OF FRESH FRUIT EXPORT IN KOREA**

**Seung Koo LEE**

**Department of Plant Science, Seoul National University  
Seoul 151-921, Korea**

## **Summary**

As Korea is urbanizing rapidly farm population is decreasing, getting older and feminized, and the agricultural production structure has been shifted from food crops to high income horticultural crops. The value of fruit production is about 26% of the total horticultural crops. Major fruits produced in Korea include citrus, oriental pears, apples, grapes, persimmons, and peaches. Korea exports small volumes of horticultural crops which is about 3% of total fruit production. Quality competitiveness of Korean fruits is relatively high, but they have low competitiveness in price because of high production cost. Labor-saving technologies should be developed for improving price competitiveness. Restructuring of fruit production and marketing systems are also needed to improve price competitiveness. It is essential to develop the modernized systems for postharvest operations. Advanced postharvest technology is absolutely necessary to maintain the high quality of produces. Improving the brand values of Korean fruits into the overseas' markets is also important. Appropriate and systematic export promotion programs should be implemented. The Korean government should support export promotion activities including participation in international agricultural exhibitions. Variety improvement is not fast enough to meet the international market demand, and therefore development of new varieties is needed through new biotechnology technique.

## **1. Introduction**

The Korean peninsula lies between 33 and 43 latitude and 132 and 142 longitude, extending south-easterly from the China continent. The land area is relatively small, and its topography shows 65% hilly or mountainous regions. Only about 20% of the total land is flat and suitable for cultivation. Among the cultivated land about 20% are used for the production of horticultural crops. The peninsula is separated by the Demilitarized Zone roughly at the 38th parallel, and the Republic of Korea in the south and North Korea to the north are coexisting. The Republic of Korea is somewhat smaller in land area (9,900,000 ha) compared to the north, but its population (47.6 millions) is about twice that of the north. Korea has a typical temperate weather with four distinctive seasons. Her annual precipitation ranges from 900 to 1,300 mm, two thirds of which is concentrated during the monsoon season from June to August.

The world trade environments for agricultural products are rapidly changing on the principles of free trade and non-discrimination. Through the Uruguay Round Negotiation on Agriculture, several agreements have been made in reinforcing the trade order by removing all trade restrictions and distortional measures to resolve the uncertainty, imbalance between demand and supply, and instability in the world agricultural markets. Due to the trend of globalization, Korean markets for agricultural products are also forced to open much earlier.

## 2. Current Status of Horticultural Crops Production in Korea

The agricultural production structure in Korea has been shifted from rice to high income horticultural crops after the Uruguay Round Negotiation. The cultivation area and the production of rice have been markedly reduced. As a result, the horticultural industry has become increasingly important and getting more priority in agriculture. According to the statistics of the Ministry of Agriculture and Forestry, the total value of horticultural crops in Korea was about 11.5 billion dollars in 2004. The value of vegetable crops showed the largest figure (7.7 billion dollars) representing 66% of the total amount. The value of fruit production was the second largest (2.9 billion dollars) taking about 26% of the total horticultural products. The production value of flowers and nursery crops was 0.9 billion dollars ( Fig. 1).

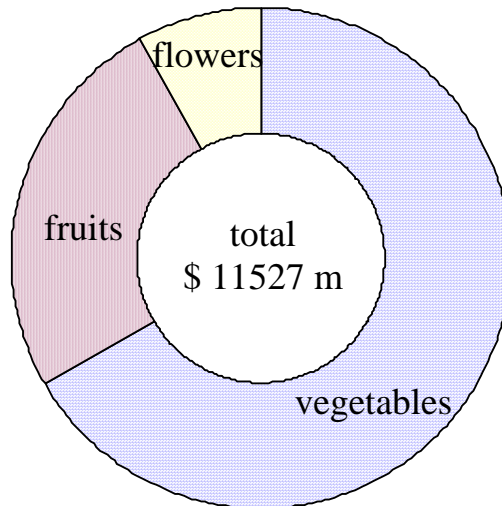


Fig. 1. Production value of horticultural products in Korea in 2004.

Vegetable production per capita in Korea ranks the top place in the world. The large cultivation of hot pepper, Chinese cabbage, and radish is responsible for the high amount of vegetable production and consumption per capita. These are the most frequently used vegetables for the preparation of kimchi, the staple vegetable mix in Korea. Per capita consumption of vegetables and fruits in Korea has shown an increase trend along with the increase in production amount. The consumption of vegetables is 132 kg, and that of fruits is 51 kg per capita per year.

One of the most striking changes in Korea is the sharp increase in greenhouse cultivation areas. In some vegetables such as green peppers, strawberry, oriental melon, lettuce, and tomato, the greenhouse cultivation acreage becomes larger than the open field cultivation acreage. Watermelon has the largest greenhouse cultivation acreage. More and more vegetables are being cultivated in greenhouse these days, and especially the cultivation area of fruiting vegetables increases dramatically in recent years. Along with the rapid increase in the greenhouse cultivation, significant changes have taken place in areas such as modernization of housing materials and structures, availability of efficient equipment such as computerized automation controls, gas heaters, CO<sub>2</sub> gas generators, irrigation and ventilation systems, and others.

### 3. Fruits Production in Korea

Total production of fruits has increased gradually for the last decades. Particularly, the production of citrus, oriental pears, persimmons, and peaches has increased, but apples and grapes tend to be unchanged or decreased slightly (Table 1).

|           | 1998  | 2000  | 2002  | 2004  |
|-----------|-------|-------|-------|-------|
| Citrus    | 511   | 563   | 642   | 584   |
| Pear      | 259   | 324   | 386   | 452   |
| Grape     | 397   | 475   | 422   | 368   |
| Apple     | 459   | 488   | 433   | 357   |
| Persimmon | 260   | 287   | 281   | 299   |
| Peach     | 151   | 170   | 187   | 200   |
| Plum      | 39    | 51    | 57    | 72    |
| Etc       | 73    | 66    | 71    | 78    |
| Total     | 2,153 | 2,428 | 2,500 | 2,410 |

Korea produced 2,410,000 M/T of fruits in 2004 from 157,000 ha (Fig. 2). The figures are around average value for the last 10 years. Citrus and oriental pears have become to be two major fruits grown in Korea in 2004, and these are followed by grapes, apples, persimmons, peaches and plums. The total fruit production per capita in 2004 was 50.6kg, and yet it was well behind the world average of 64.6kg per capita. Individual shares of fruit production per capita were 12.3kg of citrus, 9.5kg of oriental pears, 7.7kg of grapes, and 7.5kg of apples.

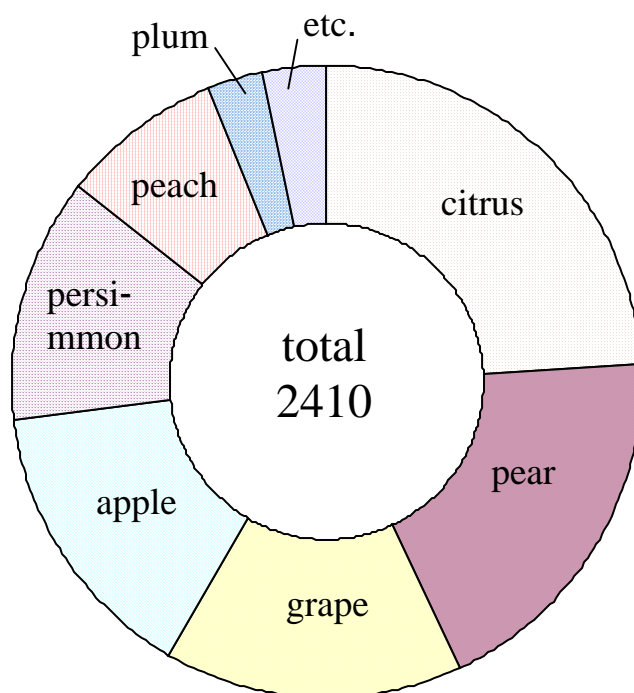


Fig. 2. Fruit production (10<sup>3</sup>M/T) in 2004.

#### 4. Export Value of Horticultural Crops in Korea

Korea exports small volumes of horticultural crops mainly to the United States, Japan, Canada, Taiwan, Hong Kong, and many countries in the south-east Asia. The export value of horticultural products has been stable for the last five years. In 2004 the export value of vegetable crops was 230 million dollars which was only 3% of total vegetable production. That of fruits was 86 million dollars taking also 3% of total fruit production. The export value of flowers and nursery crops was 49 million dollars comprising 5% of the total flower production amount (Table 2).

|            | 2000 | 2001 | 2002 | 2003 | 2004 |
|------------|------|------|------|------|------|
| Vegetables | 187  | 190  | 169  | 194  | 230  |
| Fruits     | 45   | 56   | 82   | 71   | 86   |
| Flowers    | 30   | 32   | 32   | 45   | 49   |
| Total      | 262  | 278  | 283  | 210  | 355  |

Four major fruits including oriental pear, apple, citrus, and persimmon are currently being exported to the countries above mentioned. The export volume of oriental pear has been increasing for the last five years. That of the other three fruits has been remained more or less stable. In 2005 the total export values of oriental pear, apple, persimmon, and citrus were 56.1, 7.8, 5.6, and 3.4 million dollars, respectively. The export value of these fruits is only 3% out of total fruit production in Korea. Quality

competitiveness of Korean fruits is relatively high, but they have low competitiveness in price because of high production cost. Labor cost and land price are relatively higher than many other countries. Furthermore, consumers' awareness of the brands for Korean fruits has not been well-established not only in international markets but also in domestic markets.

Table 3. Export value of fruits from Korea. (M US\$)

|           | 2001 | 2002 | 2003 | 2004 | 2005 |
|-----------|------|------|------|------|------|
| Pear      | 19.6 | 34.1 | 30.1 | 35.2 | 56.1 |
| Apple     | 3.0  | 14.2 | 7.7  | 5.2  | 7.8  |
| Citrus    | 4.9  | 5.7  | 4.3  | 5.6  | 3.4  |
| Persimmon | 4.4  | 4.6  | 2.3  | 3.6  | 5.6  |

## 5. Fruits for International Markets

### 5.1. Oriental Pears

Oriental pears comprise a large group of pears that are crisp in texture and are good to eat as soon as harvested or for several months after picking if held in cold storage. This ready-to-eat feature makes them more acceptable to Korean people than European pears that are usually served when soft and juicy, which takes about a week to ripen. The most popular cultivar is 'Niitaka' which is large and round to slightly flatten with a bronze-russet skin. Fruit is excellent in flavour, and its storage ability is high at low temperature. Another popular cultivar is '20<sup>th</sup> Century' which is round, yellow-skinned, easily bruised, but stores well. There has been a remarkable increase in production of pears in the last decades. In recent years, the area of new Korean cultivars, such as 'Whangkeumbae', 'Gamcheonbae', 'Chuwhangbae', 'Wonwhang', and 'Youngsanbae' has been steadily increased. 'Niitaka' cultivar still takes 79% of the total pear growing area. This has been creating marketing problems due to over-production and the consequent price drop of fruits. It has been recommended that growers should maintain variety distribution in the proportions of 35% of early-maturing cultivars, 50% of mid-season cultivars, and 15% of late-maturing cultivars. Harvested pears are placed in plastic containers (20kg) and stored in cold storage. When marketing takes place, these fruits are packed in box sizes of 15, 10, 7.5, and 5kg. There is a loss of 3.5% of fruits caused by quality deterioration when the storage is extended to March. Some physiological disorders such as tissue softening, skin blackening, and skin peeling-off can occur during cold storage.

### 5.2. Apples

The 'Fuji' apple is the late season cultivar often harvested in October. 'Fuji' apples are typically large, contain high sugar, and have a firm flesh texture. The apples have firm and smooth skin with yellow-green with red highlights. Mature 'Fuji' apples are excellent for eating fresh maintaining a good balance of high sugar and organic acid. 'Fuji' apples also have a very long storage life. The biggest threat will be from China which is the largest apple producer in the cheapest prices. In order to cope with the challenge caused by market opening, apple growers in Korea must improve the quality of their fruits as well as lower the production cost.

### **5.3. Persimmons**

There are two types of persimmon, sweet persimmon and astringent persimmon. Sweet persimmon production is about 80% of the total persimmon production. 'Fuyu' accounts for 82% of the sweet persimmon production. There are some significant losses from various physiological disorders during storage and marketing. Skin browning disorder is due to low oxygen combined with high carbon dioxide in sealed packages. Skin blackening is due to high oxygen and high humidity which would increase phenol oxidation in the skin and micro-organisms population. Fruit softening is caused by ethylene when cold-stored fruits are marketed at relatively high temperature. Traditionally, five fruits are packed in a 0.05mm polyethylene film bag for low temperature storage.

### **5.4. Satsuma Mandarins**

The major citrus cultivar grown in Korea is 'Satsuma Mandarin' which takes about 98% of total citrus production. 'Satsuma Mandarin' is very tolerant to cold weather and produces sweet, seedless fruit with delicate flavor. The rind is loose and can easily be removed by hand. Satsuma rinds are very sensitive to rough handling during harvest. Wherever possible, fruit should not be picked while still wet from rain or dew. Dry fruit has lower rind turgor, and there is less risk of oleocellosis occurring.

## **6. Agricultural & Fishery Marketing Corporation (AFMC)**

Agricultural & Fishery Marketing Corporation (AFMC) is in charge of exports and imports of agricultural products in Korea. Its main duty includes collection of agricultural and fishery trade information, promotion of sales, and public relations development in overseas markets. They participate in major international exhibitions, operate Korean traditional food exhibitions and overseas exhibitions, and install export public relations in partner trading countries. They also operate financial assistance programs which include wholesale market construction loans, advanced payment loans, and shipping promotion loans. Overseas offices are located in Japan (Tokyo, Osaka), Netherlands (Rotterdam), U.S.A. (New York, LA), Russia (Moscow), Singapore, and China (Beijing, Shanghai).

## **7. Problems in Horticultural Industry**

The agriculture system of Korea has been based on small, labor intensive and owner-operated farms. We are now faced with many problems in horticultural industry such as labor shortage, high labor cost, and low productivity.

**Farm size:** The average acreage per agricultural household is 0.8ha, and the number of households with less than 1 ha accounts for 85% of all fruit orchards. The small scale fruit production increases the production cost. Orchard size should be large enough for mechanization to reduce labor and production cost. Cooperative management is strongly recommended through combining several different individual orchards or joining the local commodity Agricultural Cooperatives.

**Labor:** Fruit production in Korea can be characterized by labor-intensive cultivation. The labor costs account for 20-30% in total production costs. Labor-saving technologies should be developed as early as possible for improving price competitiveness. Fruit growers are aging very rapidly, and more than half of the growers are older than 60, causing poor dissemination of new technologies and reduction of fruit productivity. Highly-trained professional growers will have to work on their farms of the optimum size with various hightec-controlled facilities.

**Fruit diversity:** Due to climate conditions in Korea, fruits and their cultivars are not diversified, and thus labor requirements for cultural managements are concentrated in particular periods of time. Breeding efforts for new cultivars should continuously be made, and the nursery stocks free from diseases and viruses should securely be produced and distributed to the growers.

**Packing house:** Postharvest management for grading, packaging, and storage is at the beginning stage in Korea. To market high quality fruits, fruit quality grading is important, and thus packing systems should be improved by developing high technology packing machines. It would be useful to introduce non-destructive technology for automated packing operation. Improvement of packaging, establishment of cold chain systems, and development of new technologies for fruit freshness should also be pursued.

## **8. Conclusions**

We should improve further labor-saving technology such as mechanization and automation in production, and handling processes to reduce production cost. We are vulnerable to agricultural market opening to global trade led by large-scale cultivators equipped with high technology and marketing strategy as well as competitive prices for their products. We also realize that our domestic market is no longer our exclusive property anymore. Many imported horticultural products are competing with ours in our own market. Production of high quality horticultural crops at a minimum cost would be the only way to win the international competition. To compete with other continental regions we should help each other and keep our doors more open to share available information on horticultural technology and business. Horticultural industry in Korea is expected to further develop and flourish. We are ready to do our responsibilities for a close cooperation among Asian countries.

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