RECENT DEVELOPMENTS IN WORLD PRODUCTION AND TRADE OF LYCHEE
(LITCHI CHINENSIS): IMPLICATIONS FOR FLORIDA GROWERS

EDWARD A. EVANS1* AND ROBERT L. DEGNER2
1University of Florida, IFAS
Tropical Research and Education Center
18905 SW 280 Street
Homestead, FL 33031
2University of Florida, IFAS
Food and Resource Economics Department
McCarty Hall B
P.O. Box 110240
Gainesville, FL 32611

Additional index words. Litchi chinensis, oriental fruit fly, cold treatment, phytosanitary, APHIS rules

Abstract. Production of lychee in Florida expanded rapidly in the 1990s following Hurricane Andrew in 1992. From about 200 acres pre-hurricane, acreages increased to slightly over 500 by 1996, and to the current level of about 1,200 acres. Growers were drawn to the high returns and favorable prospects driven by the strong domestic demand for the commodity. Several factors suggested that the situation would remain the same or could only become more favorable. First, the demand for the commodity was being driven by increasing U.S. Asian and Hispanic populations. Second, it was thought that the U.S. market was fairly well protected due to its relatively far distance from the main areas of production in Asia and because of phytosanitary restrictions. The feeling was that owing to the highly perishable nature of the fruit, it would have been difficult to ship significant quantities via sea freight from Asia to the United States. More importantly, since lychee is the host to a number of exotic pests, including oriental fruit fly, lychee fruit borer, and Asian fruit fly, imports were restricted from many countries considered fruit fly zones. Hence apart from a small amount of imports coming from Mexico, the consensus was that the fresh fruit market was more or less reserved for domestic growers. This was evident in the fact that demand for the fresh commodity grossly outstrips supply, resulting in lucrative returns. However, recent developments have proven the consensus wrong, as there has been a surge of imports coming mainly from China and Taiwan. This has resulted in domestic prices plummeting well below those obtained 3 to 5 years ago and with costs of production continually rising, many growers are questioning if it still makes sense to grow the commodity. From receiving net returns of about $10,000/acre 5 to 6 years ago, growers are now facing a situation with returns averaging $2,000/acre, assuming medium to high yields. Negative returns have been obtained in situations where yields have been poor, causing many of the growers in 2004 to seek federal assistance under the Trade Adjustment Program for Farmers and Fishermen. In the following analysis, we examine recent developments in the world production and trade of lychee and outline some of the implications for U.S. growers.

World Production and Trade

Lychee (Litchi chinensis) is an exotic subtropical fruit crop native to Southeast Asia. The tree is attractive, having a dense, rounded, symmetrical canopy of dark green foliage, and can grow to be very large. Lychee is an excellent fresh fruit with a pleasant, sweet flavor. The fruit is small, round to oval, and borne in loose clusters. When the fruit is ripe, the leathery skin develops an attractive pinkish to red color. The fruit is grown commercially in many subtropical areas, such as Israel, Australia, Thailand, Taiwan, India, Vietnam, parts of Africa, and at higher elevations in Mexico and Central and South America. World production of lychee is estimated to be around 2.11 million tons, with more than 95% of the world cultivation occurring in Asia. Total production in the Southern Hemisphere (mainly Africa, Madagascar, and Australia) is about 50,000 tons. A relatively small amount is produced in the United States, Mexico, and Central and South America (Evans et al., 2004).

The top five world lychee producing countries are China, India, Taiwan, Thailand, and Vietnam. China is the largest world producer of lychee (FAO, 2002). Current production covers approximately 1,482,626 acres, over 60% of which have been developed in the past 10 years. Total annual Chinese production of the fruit is 1.5 million tons in “good” years and about 0.6 million in “bad” years. Yields are relatively low even in the “good” years, averaging about one ton per acre. Because of the number of young trees which have only begun to bear, total output is forecasted to reach 2.5 million tons by 2010. The production season extends from mid-May to mid-August.

India is the second largest lychee producer, averaging approximately 500,000 tons of lychee annually on 138,873 acres. Productivity in India is relatively high compared to other growing regions, averaging about 3.1 tons per acre. Because cultivation occurs over a wide range of climates, the production period extends from the first week of May to the first week of July.

Thailand is the third largest lychee producer. Lychee cultivation peaked in 1988 at over 37,067 acres, but since then has declined to about 29,653 acres. Approximately 100,000 tons of lychee are produced annually, with more than 90% being sold on the domestic market. The production period in Thailand is quite long, with harvesting from June to August, due mainly to the myriad varieties being grown.

Vietnam, the fourth largest lychee producer, has an estimated annual output of 85,000 tons from 54,857 acres. Lychee production occurs mainly in the northern region of the country in the provinces of Chiang Mai and Chiang Rai. The fruit harvesting season runs from April to June.

Vietnam annual production is estimated at about 50,000 tons from 87,356 acres. Production occurs in the northern region of the country. Lychee is considered a major crop in Vietnam, with commercial production increasing quite rapidly. Harvesting of the fruit extends from May to June. Approximately three-fourths of the production is consumed domestically.

Other notable producers include South Africa (which has increased its production of lychee from 3,707 acres in 1991 to almost 7,413 acres in 2002 and exports 1,550 to 4,000 tons annually to Europe) and Australia (which produces 5,000 tons annually mainly from commercial growers in Queensland). Mexico currently has an estimated 2,780 acres, with acreage and
production increasing rapidly. The United States is considered a relatively small producer, with a total production of about 433 tons annually from 1,535 acres. American production occurs in Florida (1,201 acres), Hawaii (304 acres), and California (30 acres), with Florida being the main producing area.

Less than 5% of the world’s production, or approximately 100,000 tons, enters into world trade on an annual basis—although this amount is expected to increase in the coming years. The fresh fruit market dominates the trade, followed by dried and canned fruit. The main importing countries are the European Union, the United States, Hong Kong, Singapore, Japan, and Canada. The main exporting countries are China, Taiwan, Thailand, Madagascar, South Africa, Australia, and Mexico (most of it sent to California).

**U.S. Demand for Lychee**

The demand for fresh lychee in the United States has increased considerably within recent years. As noted earlier, this is due in part to increases in the Asian and Hispanic ethnic populations in the United States and health-conscious consumers who purchase fruit in specialty stores. In the past, the demand was mainly for frozen and canned fruit because of the general unavailability of the fresh commodity. But with the easing of import restrictions, demand for the fresh commodity has surged (Degner et al., 2002).

The main lychee suppliers to the United States are Taiwan, China, Mexico, and Israel. Between 1998 and 2004, imports of lychee grew from 967.9 tons to 15,131 tons (Fig. 1). The bulk of the increase was due to imports from China and Taiwan. Taiwan increased its exports from 295 tons to 7,404 tons, and China increased its exports 10-fold, from 436 tons to 4,595 tons over the same period. Mexico also realized substantial increases in their exports of fresh lychee to the United States, with export volumes increasing from about 200 tons in 1998 to 2,855 tons in 2004.

The considerable increase in the availability of fresh fruit on the local market caused U.S. domestic prices for lychee to plummet. Growers went from receiving $5.07/lb in 1998 to approximately $1.08/lb in 2003 (78.7% decline) and $1.05/lb in 2004 (Fig. 2).

**Factors Influencing Increased Imports of Lychee**

Increased imports of lychee can be attributed to several factors. Chief among them are: (a) increased production of lychee in China, (b) innovation in post-harvest handling and transportation, and (c) the APHIS rule change allowing imports of lychee from Asia.

With respect to the first factor, and as noted earlier, production of lychee in China has risen almost 10-fold in the last 10 years to an estimated 1.5 million tons, with prospects of reaching 2.5 million tons in the next few years. The considerable increase in production is due to a combination of cultural factors and support from the Chinese government. From a cultural point of view, growing a lychee tree is considered a form of long-term investment in China. As income levels began increasing in the main producing area of Guangdong Province many peasants began planting trees. Supporting this trend under the general slogan of “if you want to be rich, plant fruit trees,” the government, over the past 10 years, has supported the local agricultural industry through policies such as price supports and more direct investments. Many of the state-owned banks provided huge loans at very low interest rates to investors in profitable agricultural industry.

A direct consequence of the above factors has been an oversupply of lychee in China’s domestic market, prompting the need to aggressively find new outlets through exports. With retail prices of the best-quality lychee selling at U.S. $0.75/lb in China and the lower-quality lychee selling for less than U.S. $0.12/lb, compared with a wholesale price in the United States averaging $3.00/lb, it is easy to see why the U.S. market has become extremely attractive.

The second factor contributing to the surge of imports of lychee into the United States is innovation in post-harvest handling and transportation. In the past, a major impediment to exporting lychee was the fact that it is highly perishable and susceptible to browning and rotting. With a shelf life of about 17 d, it was difficult to ship the fresh fruit via sea from China to the United States. While transport by air freight was possible, the high cost of doing so made it unprofitable. However, new technology is reported to have increased its shelf life, enabling lychee to remain fresh for up to 40 d (Gain Report, 2001). Cold-treatment technologies and atmospheric-controlled containers have now made it feasible to ship the fruit over large geographic areas while still retaining freshness.

The third and probably the most significant factor is the revision by USDA/APHIS of the rules under which lychee is allowed to be imported from Asia. Previously, countries in Asia, mainly China and the Taiwan Province of China, which were considered fruit-fly zones, were not allowed to export fresh lychee to the United States. However, revision of the rules, in accordance with the World Trade Organization (WTO) Sanitary and Phytosanitary Agreement, which took effect in 1995, to fa-
cilitate trade has opened up the U.S. market to such imports. The new rule makes such trading much easier by identifying several treatment options, which when applied, would eliminate *Bactrocera dorsalis* (Oriental fruit fly) and other fruit flies. Acceptable treatments include cold treatment, hot water immersion, vapor heat, and irradiation. Of these, cold treatment appears to be the preferred treatment among exporters. Table 1 provides details of a cold treatment schedule.

### Implications for South Florida Producers

First, with the technologies in hand to guarantee unhindered passage through U.S. quarantine, and anti-pest checks, and with China and other Asian countries looking to the U.S. market, it is estimated that prices will remain depressed for the foreseeable future. Indications are that imports from Taiwan should remain at current levels (7,000 tons). Imports from Mexico are expected to increase slightly, reaching the market a bit earlier than before. Imports from China are expected to increase considerably and overtake Taiwan as the main supplier to the United States.

Second, it should be noted that increased foreign competition is expected to come not only from the Asian countries, but also from countries within the Americas. It has been reported that Mexico is expanding production as well as improving the quality of their lychee exports. In addition, it has been reported that many countries in Central America, notably Honduras and El Salvador, have begun large-scale planting of lychee trees, hoping to cash in on the U.S. market (personal communications with industry personnel Daniel Rodriguez, Agribusiness specialist).

Third, U.S. growers may need to replant groves with higher quality varieties if they wish to remain competitive in the lychee market. With better varieties of lychee being imported to the United States from China at fairly low prices, local packinghouses would be hard pressed to severely penalize inferior quality domestic produce. Efforts should also be made to plant earlier flowering varieties and/or using flowering stimulants such as potassium chlorate to take advantage of higher prices at the start of the season.

### Concluding Remarks

Trade liberalization, coupled with innovation in post-harvest handling and transportation, has opened up the U.S. domestic fresh lychee market to increased foreign competition. With the Florida market remaining relatively closed to lychee imports from Taiwan and China, the domestic industry would be well advised to regroup and develop a strategic plan to better position itself in this new operating environment.

### Literature Cited


---

Table 1. Cold treatment for *Bactrocera dorsalis* (Oriental fruit fly) and *Conopomorpha sinensis*.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Exposure period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.4°F (0.77°C) or below</td>
<td>13</td>
</tr>
<tr>
<td>33.8°F (0.99°C) or below</td>
<td>15</td>
</tr>
<tr>
<td>34.5°F (0.77°C) or below</td>
<td>18</td>
</tr>
</tbody>
</table>