



Economic
Research
Service

Situation and
Outlook

FTS-358SA

March 27, 2015

Fruit and Tree Nuts Outlook: Economic Insight

China's Potential as an Export Market for Tree Nuts

Zhengzhou Yang¹ and Fred Gale
zhengzhou028@gmail.com and fgale@ers.usda.gov

Approved by the
World Agricultural
Outlook Board.

China Tree Nut Market Overview

China has grown to become a significant market for U.S. tree nut exports, despite being a global leader in tree nut production itself. China dominates global production of chestnuts and walnuts, but its growers cannot meet Chinese consumers' developing taste for nuts that are not widely grown in the country, such as pistachios, almonds, pecans, and macadamia nuts. Trade was curbed by an economic slowdown and rising prices during 2013-14, but consumer demand suggests that China will become an even larger market for tree nuts.

U.S. Exports Grow to China and Hong Kong

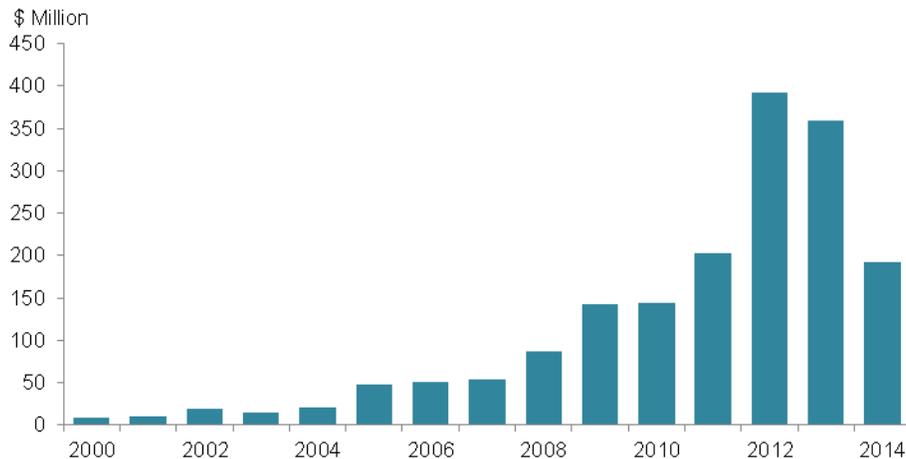
China's rising demand for tree nuts has played a key role in the growth of U.S. tree nut exports (Morecraft, 2015). Sales of U.S. tree nuts to China and Hong Kong combined soared from \$77 million in 2000 to over \$1.6 billion in 2012 (fig. 1). China-Hong Kong is the largest market for U.S. almond exports. Hong Kong accounts for most of the sales. Along with China's economic development and a rising standard of living, Chinese dietary structure is undergoing a significant change and the demand for tree nuts keeps rising dramatically.

Almonds and pistachios are the two predominant types of nuts exported to China-Hong Kong, together accounting for 70 percent of sales during 2013 (fig. 2). Walnuts are the third-largest export type, with 17 percent of sales, followed by pecans (8 percent) and hazelnuts (4 percent). Another 1 percent is comprised of macadamia, cashews, Brazil nuts, and mixed nuts.

Demand for imported nuts is so vigorous that China's Ministry of Finance reduced import tariffs for selected types of nuts beginning in January 2015 (fig. 3). Tariffs were cut by more

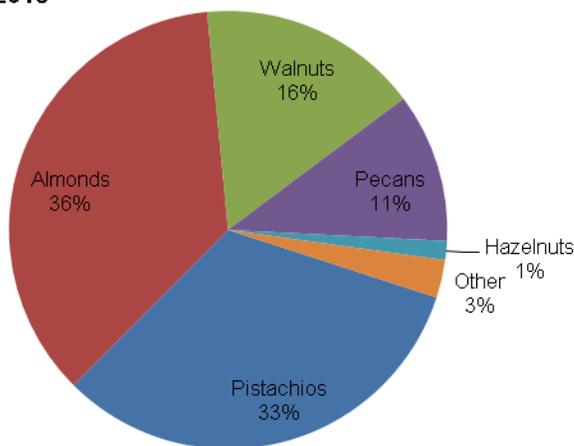
¹ Zhengzhou Yang is a research scholar at the University of Kentucky, Department of Agricultural Economics. H. Frederick Gale is an economist at USDA's Economic Research Service (ERS). We would like to thank Kristy Plattner, USDA/ERS, Bill Morecraft of Blue Diamond Growers, and Chris Frederick, USDA, Foreign Agricultural Service, for their valuable comments.

Figure 1
U.S. tree nut exports to China, 2000-14



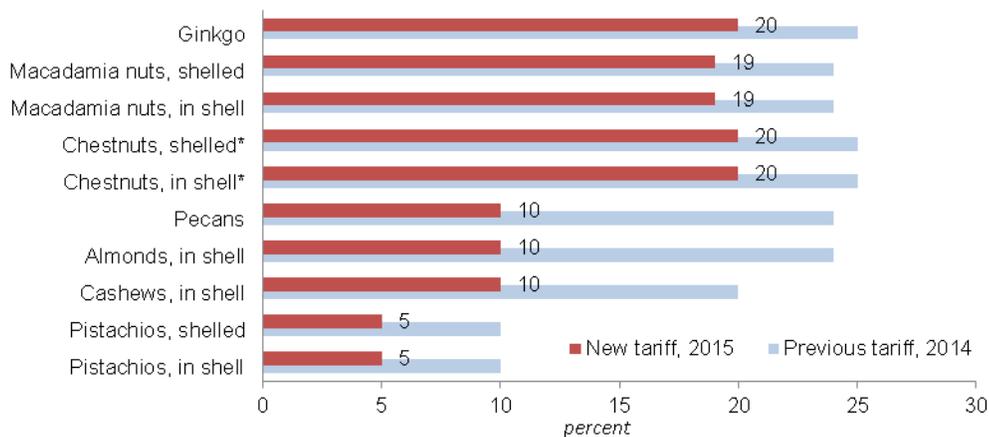
Source: USDA, Foreign Agricultural Service, *Global Agricultural Trade System* data.

Figure 2
Percentage share of the value of U.S. tree nut exports to China and Hong Kong, 2013



Source: USDA, Foreign Agricultural Service, *Global Agricultural Trade System* data.

Figure 3
China tree nut tariff reductions, 2015



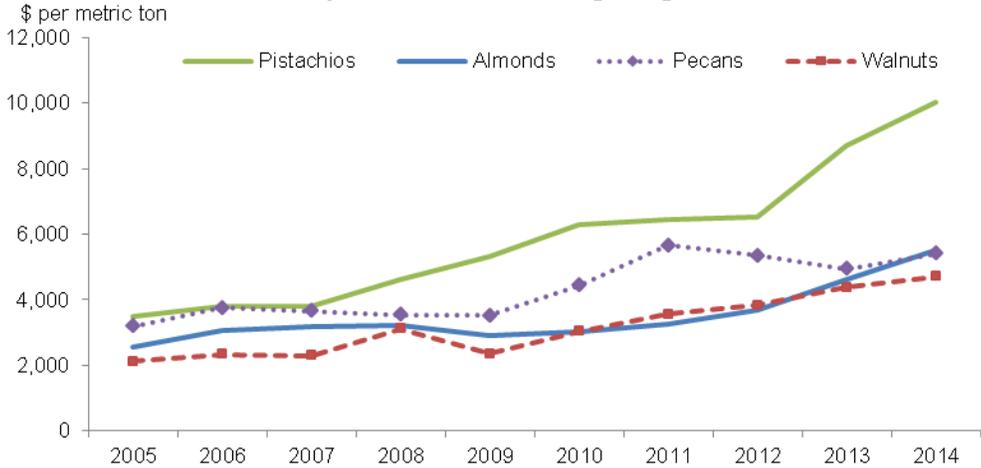
Source: China Ministry of Finance, <http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/2014/12/P020141216582770416363.pdf>

than half for the main U.S. exports. The pecan and almond tariffs were reduced from 24 percent to 10 percent. The tariffs on pistachios and cashew were cut in half to 5 percent and 10 percent, respectively. During 2012, China had temporarily cut tariffs on pistachios to 5 percent (Wu, 2011), which helped U.S pistachio exports to China in 2012 increase 34 percent from the previous year. Chestnut and ginkgo tariffs were also temporarily cut to 20 percent that year. Imported nuts are assessed a 13-percent value added tax in addition to the tariff.

The tariff cut was likely motivated by rising prices for nuts. The average unit values of U.S. pistachio and almond exports to China-Hong Kong each rose 50 percent from 2012 to 2014 (fig. 4). Walnut unit values rose 23 percent. Pecan unit values were steady during 2012-14, but they had risen 60 percent during 2009-11. The higher prices dampened consumer demand, and the higher U.S. export price, which was partly caused by the continuing deflation of the Chinese yuan exchange rate, may have contributed to the decrease in exports to China during 2013-14. According to an industry report, Chinese nut roasters persuaded authorities to cut tariffs during 2015 to help the industry meet the increased demand from Chinese consumers, and to reduce the cost of imported nuts (Chen, 2015).

In addition to rising prices, China’s demand for imported nuts may have been curbed by a general slowdown in the country’s economic growth during 2013-14. An anticorruption campaign reduced demand for a wide array of items when officials were ordered to cut back on banquets, travel, and other spending considered excessive or frivolous. The demand for imported nuts may have been affected since nuts are often given as gifts and are commonly consumed at restaurants and during travel. A dispute disrupted trade when a new Chinese nut industry standard required that almonds be sold under a different Chinese name (see box, “Almond Name Dispute”).

Figure 4
Unit value of U.S. tree nut exports to China and Hong Kong, 2005-14¹



¹ all values are inshell
Source: Calculations using USDA, Foreign Agricultural Service, *Global Agricultural Trade System*

Almond Name Dispute

When U.S. almonds were introduced to China in the 1980s there was no Chinese word for the nut. Sellers began calling almonds a name that is also used for apricot kernels, a seed used in pharmaceuticals. In recent years, Chinese apricot growers and processors complained that the Chinese name used for imported almonds confused consumers and hurt sales of apricot kernels. A new Chinese industry standard that took effect in 2012 determined that almonds should be labeled as “flat peach kernels.” Chinese retailers were ordered to remove packages of almonds using the old name, so U.S. industry officials agreed to rename almonds “badamu,” a phonetic translation of the Farsi word for almonds.

Rising Chinese Tree Nut Consumption

China's consumption of tree nuts is growing as living standards rise and the population urbanizes. Nuts are a popular snack and are prized by Chinese consumers for their health benefits. Processed products like nut-based milks, oils, milled powder, and confections are becoming more common, and nuts are now used in baking.

Chinese Dietary Guidelines issued by the Chinese Nutrition Society (2011) recommended consuming up to 10 grams of tree nuts daily for a healthy diet. Household surveys by China's National Bureau of Statistics reported an average per capita of 3 kilograms per year for 2013, about 20 percent below the recommendation.

Urbanization is a major influence on consumption. Surveys show that per capita purchases of nuts by urban residents are about 2.5 times those of rural residents. The urban share of China's population has been increasing about 1 percentage point annually and is now 52 percent. Urbanization is expected to continue rising as authorities reduce barriers to rural-urban migration. Expansion of convenience stores, highway rest areas, and airport shops and the growth of e-commerce increase the number of marketing channels for nuts.

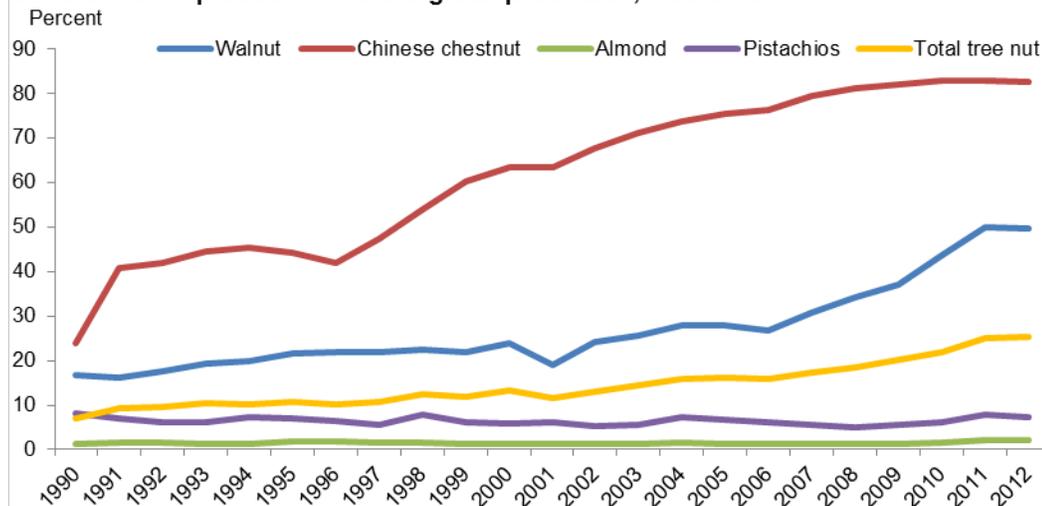
Major Global Producer of Chinese-type Chestnuts and Walnuts

China is also a major producer of tree nuts. Its output, mainly walnuts and Chinese-type chestnuts, is estimated at 3.8 million metric tons (mmt). Production of imported nuts, such as almonds and pistachios, is relatively small and has not kept up with consumer demand. According to Chen (2015), Chinese authorities were persuaded to reduce tariffs for pecans, pistachios, and cashews because increased imports would not compete with domestic production.

China's domestic tree nut output grew rapidly at the same time imports were growing. According to the United Nations' Food and Agriculture Organization (FAO) data, China's nut output grew from about 1 mmt in 2000 to 3.8 mmt in 2013, while China's share of global tree nut consumption rose from under 10 percent in the early 1990s to 25 percent in 2012.

However, the composition of China's nut output has not been in sync with the country's consumption. Nearly all of the growth in China's nut output has been in chestnuts and walnuts, which, combined, account for over 90 percent of total China's nut production. China accounts for over 80 percent of Chinese-type chestnuts and half of walnuts produced in the world, but its share of almonds (about 6 percent) and pistachios (under 2 percent) remained small and stagnant (fig. 5).

Figure 5
China's tree nut production share of global production, 1990-2012¹



¹Almond and walnuts are in shell.

Source: United Nations, Food and Agriculture Organization, FAOSTAT.<http://faostat3.fao.org>

China's nut output has expanded mainly by increased tree-planting on hilly and mountainous land in central, northern and southwest China, areas with relatively humid climates. Regions with dry, arid climates suitable for pistachios and almonds are concentrated in remote areas of northwestern China that lack irrigation resources to support growing nut trees. Xinjiang Autonomous Region, China's only pistachio-growing region, has focused its scarce water resources on cotton, tomatoes, and melon crops. These regional resource constraints have kept Chinese almond and pistachio output from expanding to meet the growing demand.

Cropland Retirement Program Adds Trees

Land-retirement and poverty-alleviation programs contributed to the boost in China's nut output during the last two decades. Beginning in the late 1990s, authorities encouraged expansion of nut production in hilly and mountainous regions to alleviate poverty and to replace cultivation of subsistence crops with trees on erodible land. A land-retirement program, known as "grain for green," gave villagers grain rations and one-time cash subsidies to plant trees or grass on 9 million hectares of erodible cropland on hillsides, wetlands, or grasslands (1 hectare = 2.47 acres). The proportion of retired land used for nut trees is unknown. However, the program may have contributed to output growth since the expansion of China's area in nut trees after 2000 coincided with the launching of the "grain for green" program.

A new round of land retirement began in 2014, but its target for land retirement is less than a third of the 1999-2013 area of 9 million hectares. The 2014 land retirement program offered a lower one-time subsidy for tree-planting than did the earlier program.

China has other programs to alleviate poverty and promote adjustment in rural areas that support nut production. Chinese authorities have ambitious plans to boost production of nuts and other tree crops to meet domestic demand. Forestry officials issued a strategic plan to increase output of 40 kinds of tree crops by 2020 (China State Forestry Administration, 2014). The plan includes three types of nuts: walnut, Chinese-type chestnuts, and almonds. The plan calls for increasing walnut production more than fivefold and increasing chestnuts by 80 percent. The plan aims to raise almond output from 40,000 metric tons to over 1 million metric tons. However, the objectives appear unrealistic since they would require vast amounts of land to be planted in nut trees.

Walnuts have been a particular target of Government support. Walnuts were singled out for support in the annual "Number one document" on rural policies in 2010. Frederick, Tang and Wu (2014) list a number of walnut-focused support programs that fund walnut demonstration farms and technical assistance.

A program to promote production of tree crops that can add to the Nation's supply of edible oil was initiated in 2011 (China Ministry of Finance, 2011). This program includes olives, walnuts, and tea oil. The program's 4 billion yuan in annual funding includes support for growing seedlings, development of new varieties, extension, establishing orchards, processing facilities, subsidized loans, and insurance. Portions of China's agricultural machinery purchase subsidies are designated for tree-based oil crops, and subsidies for seedlings, fertilizer, fuel and pesticide are available.

Chinese authorities give modest support to farmer cooperatives—including farmers growing nuts—to organize training, facilitate marketing, and construct storage or packing facilities. Some provincial and local governments assist groups of farmers to sell their products via e-commerce platforms and in shops that sell regional specialty products.

Fragmented, Dispersed Production Constrains Growth

Greater attention to food security concerns constrains the development of nut production in China. Nut companies have developed nut groves on some highly productive cropland, but officials want to retain this land for production of cereal grains. In many places, officials are zoning land as "permanent" cropland that cannot be converted to nongrain uses, a measure that constrains the development of large-scale, mechanized orchards on fertile, accessible

land. Most of the government-supported nut-development projects are in mountainous southwest provinces or the arid northwest, both of which are thousands of miles from coastal cities that have the strongest demand.

The pattern of production created by recruiting poor farmers poses a problem as the country moves into a new phase of economic development. China's nut production is dominated by scattered, small groves in relatively inaccessible areas that require large amounts of labor to maintain trees and harvest nuts. In recent years, many laborers have moved out of remote villages and wages are rising rapidly. This leaves producers vulnerable to tighter labor supplies demanding higher wages.

Yields and labor productivity are low, contributing to higher unit costs for Chinese nut producers. According to United Nations, Food and Agriculture Organization (FAO) data, Chinese yields of almonds, walnuts, and cashews are much lower than U.S. yields per hectare. Chinese officials are encouraging villages to consolidate collectively owned land and lease it to companies, but farmers earning high returns from nut trees in prime locations prefer to keep the land for themselves (Frederick, Tang, and Bu, 2014). Since a majority of the trees are on hilly terrain, they cannot be easily consolidated in larger stands, and mechanized equipment cannot be used. Moreover, the soil is often poor and irrigation is unavailable. Producers often lack equipment for drying and proper storage and roads are poor, leading to high proportions of waste and spoilage.

Modern nut production is capital-intensive and has a long production cycle. Field research by one of the authors estimated that one hectare of walnut production requires an outlay of nearly 90,000 yuan (about \$14,500) over 3 years. Salaries for managers and technical staff account for the highest proportion of cost. Few growers can obtain long-term loans, and most are unwilling to invest their own savings or borrow from informal lenders at high interest rates to plant nut trees that have risky, long-term payoffs.

Volatile Domestic Prices Influence Nut Trade

Domestic Chinese nut prices affect domestic policies as well as demand for imports. Rising walnut prices since 2005 explain Chinese officials' focus on promoting walnut production (fig. 6). In contrast, prices of Chinese chestnuts have a strong cyclical tendency—rising for 2 to 3 years before dropping sharply. Prices of both types of nut rose dramatically during 2009-12, a period of generally rising commodity prices in China. Rising prices also correspond to rising U.S. nut exports to China during those years. The peak in domestic walnut and chestnut prices during 2012 corresponds to the peak year for U.S. nut exports to China. Chinese prices fell in 2013, due to a combination of favorable weather that boosted nut output, and a general slowdown in commodity prices as the Chinese economy slowed. The decline in Chinese prices likely contributed to weaker U.S. nut exports to China during 2013-14.

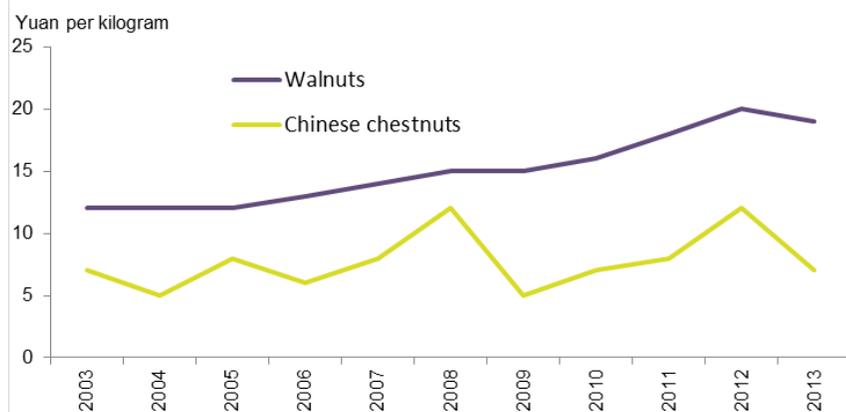
Table 1: Initial 3 years' investment for 1 hectare of walnut production in China, 2010-12

| | 2010 | 2011 | 2012 |
|--|--------|--------|--------|
| Item | Yuan | | |
| Land rent | 6,000 | 6,000 | 6,000 |
| Labor | 3,000 | 3,500 | 4,000 |
| Hired management and technical staff cost | 12,000 | 12,000 | 12,000 |
| Road building | 5,000 | - | - |
| Mechanized spray irrigation facility and irrigation cost | 3,000 | 500 | 500 |
| Seedlings | 5,000 | - | - |
| Others | 3,000 | 3,000 | 3,000 |
| | 37,000 | 25,000 | 25,000 |
| Total (all 3 years) | | | 87,500 |

Note: The labor cost was the seasonal hired labor cost. Irrigation facility and cost were accumulated with free access to the water. In fact, in Hebei, Shandong area, farmers will pay for the extra cost of digging a well to get water. The least average cost of digging a well is around 3,000 yuan in China.

Source: USDA, Economic Research Service calculations based on field research data from Sichuan, Hebei and Shandong provinces.

Figure 6
Average farm-gate prices in China for domestic nuts, 2003-13



Source: USDA, Economic Research Service calculations based on field research data from Sichuan, Heibe and Shandong provinces.

Fundamentals Favor Long-Term Import Growth

As China's population urbanizes, grows wealthier, and learns more about the outside world, consumers are demanding food products like almonds and pistachios that are not largely produced in the country. China is increasingly facing tradeoffs in use of land and water resources, and it no longer has abundant labor to fuel the growth of agricultural industries like tree-nut production. In fact, the pattern of production created by past development strategies is a constraint on future growth.

While a number of factors temporarily restrained China's imports of U.S. tree nuts during 2013-14, the fundamentals for long-term growth are in place. Chinese government officials interested in self-sufficiency have plans to boost domestic production, but those plans are not likely to be realized in light of resource- and climate-related constraints, the difficulty of expanding production on the basis of fragmented, small-scale production developed over the last two decades.

References

- Chen, Christina. 2015. "Jinkou Jianguo Shui Lv Quanmian Xia Jiang [Comprehensive Tariff Cut on Imported Nuts]," *International Fruit and Vegetable Report*. <http://www.guojiguoshu.com/article/865>
- Frederick, Chris, Crystal Tang, and Bugang Wu. 2014. *China Tree Nuts Annual*, USDA, Foreign Agricultural Service, GAIN CH14051. <http://gain.fas.usda.gov>
- Morecraft, Bill. 2015. *Growing Markets for U.S. Tree Nuts*, presentation at Agricultural Outlook Forum, February 19, 2015. http://www.usda.gov/oce/forum/2015_Speeches/BMorecraft.pdf
- Wu, Bugang. December 22, 2011. *China Cuts Import Tariffs for 730 Commodities on January 1*, USDA, Foreign Agricultural Service, GAIN 11066. <http://gain.fas.usda.gov/>
- China Ministry of Finance. 2011. *Woody Oil Crops Supporting Policy*. http://www.mof.gov.cn/zhengwuxinxi/caizhengwengao/2011caizhengwengao/wengao201103/201106/t20110602_556602.html
- China State Forestry Administration. 2014. *New Round of Reforestation of Cultivated Land Policy*. <http://www.forestry.gov.cn/main/3957/content-711547.html>