

## China's Japonica Rice Market: Growth and Competitiveness

*James Hansen, Frank Fuller, Frederick Gale,  
Frederick Crook, Eric Wailes, and Michelle Moore*

**Abstract:** This article briefly describes the evolution of China's japonica rice market over the last two decades, including the impact of changes on China's competitiveness in key Asian import markets. While China has traditionally exported long grain (or indica) rice varieties, in recent years it has exported substantial amounts of japonica rice as well. China's share of Japan's World Trade Organization (WTO) minimum access imports has more than doubled since 1995. The current round of WTO negotiations is expected to result in greater market access and lower tariffs for japonica rice exports to key Asian markets, with China a potential source for much of the expanded trade.

**Keywords:** China, rice, production, policy, exports, imports, prices, WTO.

China's rice economy is among the world's most diverse with respect to both the number of varieties grown and the different climatic conditions under which rice is produced. China has six agro-climatic zones for producing rice, ranging from the warm and humid tropics in the south, to the cooler subtropics of central China, and to northern China with its much cooler climate and shorter growing season. The extreme variation in agro-climatic conditions is a major reason for the large number of rice varieties grown in China.

In China, japonica rice was traditionally grown and consumed primarily in the northern provinces, while indica rice was dominant in the south. In 2000, indica rice accounted for about 60 percent of China's total rice production of 188 million tons (rough rice) and japonica rice about 29 percent, the remaining 11 percent is glutinous rice and some indigenous rice varieties (Crook et al.). Each year, China produces an early, a single, and a late indica crop; a single and late japonica crop in the Yangzi River valley; and a single japonica crop in the north. China is the largest rice-producing country in the world, accounting for a third or more of global production.

There are distinct differences between japonica and indica rice, the two primary types of rice grown worldwide. When cooked, japonica rice becomes moist,

sticky, and clingy, and has a more rounded appearance than indica varieties. In contrast, indica rice typically cooks dry, separate, and fluffy; and is typically longer and thinner than japonica rice. Consumers typically have distinct preferences for either one rice or the other, with little substitution between the two. Indica is the dominant grain produced worldwide.

### ***China's Japonica Rice Area Has Expanded for Two Decades***

Japonica rice area in China has expanded for the past two decades, growing from 11 percent of total rice area in 1980 to 29 percent by 2000 (Crook et al.). The largest expansion of japonica rice plantings has occurred in the three northeastern provinces, with growth averaging more than 5 percent a year during the 1990s, an increase totaling more than a million hectares. Most of the growth occurred in Heilongjiang province, where japonica rice was the most profitable crop during the 1990s. In the lower Yangzi River valley provinces of Jiangsu, Zhejiang, and Anhui, producers have substituted indica with japonica rice. In 2000, profits from japonica rice in Heilongjiang on a per-mu (the Chinese measure of area equal to 1/15 of a hectare) basis averaged 146 yuan, compared with 36 for corn, -9 for wheat, and 86 for soybeans.

Rapidly rising prices were responsible for much of the increase in China's grain production—including rice—

in the mid-1990s. From 1992 to 1994, japonica prices in China more than doubled, with the expansion of rice area in Heilongjiang province coinciding with the rapid rise in prices. In contrast, soybean prices rose much slower, making rice a more attractive planting option to producers in Heilongjiang where soybeans are the major crop.

Corn prices rose as well over this period, likely explaining why rice area did not expand as rapidly in Jilin where corn is the major crop. China's rice prices peaked in 1995 and 1996, and have declined since. In Heilongjiang, rice area has remained fairly stable since 1999. However, while rice area in Jilin exhibited little growth until 1999, since 1999 rice area has increased almost 40 percent, adding an additional 194,000 hectares to China's japonica area.

A major factor behind the expansion of rice area in Heilongjiang was the introduction of dry-field seedling transplantation methods in the mid-1980s (Kako et al.). The method generates faster maturation than direct seeding—important in regions that have a short growing season. Another factor that promoted the rapid area expansion in Heilongjiang was the abundance of both land and water resources.

However, continued expansion of japonica production in the northeast is unlikely, and the existing area may even decline if water shortages occur. Water resources in many areas of the north and the northeast are already limited. Hebei and Liaoning are currently

experiencing serious water shortages, with groundwater in some locations already insufficient. Some increase in rice plantings may occur in certain parts of northeastern China where water supplies are more abundant, but growth will be slow even in these areas.

In recent years, the government began to understand and became quite concerned about the water constraints in China. The government has announced it will prohibit rice production in the Beijing area after 2005 to conserve water. In addition, a new water law is currently being written and the issue of transferability of water rights is being considered; two factors that could limit or reduce rice area in the future.

Japonica rice is also grown in central China in the Yangzi River valley (which includes the provinces of Jiangsu, Anhui, Hubei, Zhejiang, and Shanghai). In the past, these provinces grew mostly low-quality early indica rice, with much of it bought by the government. This type of rice was mostly grown in the southern, eastern, and central provinces of China. However, in 1999 China made a major change in its grain policy, with one result being that it no longer purchased low quality rice. By 2001, approximately 80 percent of the rice grown in Jiangsu Province was japonica.

Farmers in these provinces have increased plantings of japonica rice, a result of both the new grain policy and a growing consumer preference for japonica rice in the region. In these areas, water is not a limiting factor. However, expansion is constrained by climate. The daily temperature variation is not large enough in the Yangzi River valley to produce high quality japonica rice. High quality japonica varieties require a regular period of cooler temperatures at night found farther north that allow the plant to fully develop the starch molecules.

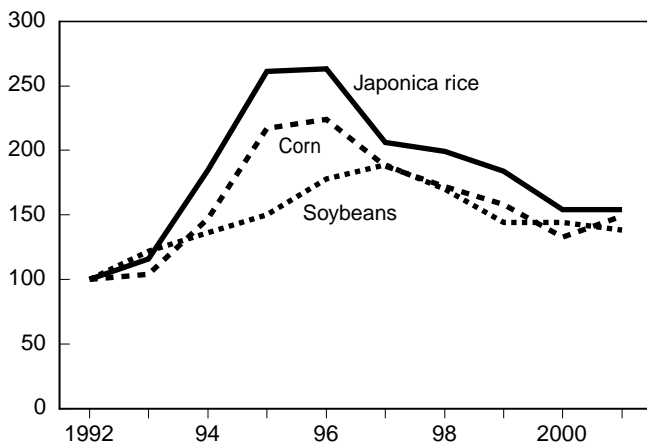
### ***Japonica Rice Consumption is on The Rise in China***

Demand for japonica rice in China has been rising at the same time that per capita consumption of all rice has declined. Several factors are behind the growth in japonica consumption. First, migration of rural people to the cities in northern China has boosted japonica consumption. While high-income urban consumers in northern China historically preferred japonica rice, the rural population in the region has traditionally consumed little rice. However, when the rural people migrate to the cities they often acquired a taste for rice—and in northern China that is typically japonica. Other factors boosting japonica consumption have been increased north-

Figure A-1

#### **Trends in China's farm prices: Japonica rice, corn, and soybeans**

Index (1992 = 100)



Source: China Ministry of Agriculture Information Center.

south migration and improved national marketing channels. These two factors are increasing demand for japonica rice in southern China as well.

Brand names are becoming an important marketing factor, likely boosting japonica consumption. Japonica brands are usually associated with northeastern counties or regions known for quality rice, such as *Wu Chang*, *Xiang Shui*, and *Mei He*. Branded rice is more commonly found in supermarkets than in wholesale markets, but it is sold in both outlets. Supermarkets are becoming an increasingly important outlet for rice in China because they emphasize food safety, high quality, and convenience.

Despite rising demand for japonica rice, the rapid expansion of japonica production in China, particularly in the northeast, has outpaced domestic consumption. In fact, over 20 million tons of japonica rice are currently in stocks in northeast China, depressing prices. While China's japonica prices are below international levels, high internal transportation and transaction costs often make it unprofitable to move rice out of northeastern China. The cost of trucking rice from Heilongjiang to Shanghai can exceed \$25 per ton (Crook et al.).

Also, despite evidence that China's rice markets are increasingly integrated, insufficient rail and road infrastructure continue to create bottlenecks in the flow of rice from north to south (Park et al.; Huang and Rozelle, 2002b). The persistence of large stocks of high-quality japonica rice in the northeast may reflect continued administrative barriers to inter-provincial grain trade, since other provinces also have excessive rice stocks. Nevertheless, inter-provincial transportation and marketing costs are expected to decline with China's entry to the WTO and its ongoing reform of its grain marketing system. Reforms include gradual abolition of government grain procurement and expanding the commercialization of China's grain bureau system.

### ***Freer Markets and Modern Mills Improve Quality of China's Rice***

China's agricultural sector has steadily adopted more market-oriented policies and institutions over the last two decades, and the changes in producer incentives have important implications for the future of japonica rice production in northeastern China. Grain policy reforms in 1998 and 1999 were aimed at:

- Reducing the central government's expenditures for the grain procurement and distribution system,

- creating a clear division between local grain transactions and maintenance of the national grain reserve,
- increasing the commercial orientation of local grain bureaus, and
- improving the quality of grain produced in China.

With the reform's emphasis on profitability of local grain operations and improved grain quality, grain bureaus in northeastern China are tapping into the growing market for high-quality japonica rice across China and abroad.

Historically, the quality of China's japonica rice has not been on a par with rice produced in Japan or the United States. The inferior status was a result of both the quality of the rough rice produced and the technology of the milling operations themselves. However, there have been substantial improvement in both of these areas in recent years.

First, breeding programs in Heilongjiang and Jilin have produced japonica rice varieties of high enough quality to compete in international markets. And second, while average milling technology in China is still 20 to 30 years behind Japan, several new mills have been built in northern China that utilize modern equipment from Japan (Satake) and Switzerland (Bühler). Local grain bureaus have established a number of these mills as private companies or joint ventures with Japanese, Korean, Taiwanese, or Hong Kong firms. Most of these new mills have a daily capacity of 100 tons, but a few mill more than 300 tons (Crook et al.).

Many of the new mills are designated as 'leading companies' or 'dragon-head companies' at the local or provincial level. Leading companies are part of China's agricultural industrialization strategy developed in the 1990s and continue to play an important role in the agricultural structural adjustment strategy emphasized since 2000 (Huang and Rozelle, 2002a). The leading company acts as a bridge between the older planned economy and the newer market economy, providing direction and substantial assistance to farmers while seeking to maximize profits. Government agencies at various levels facilitate the establishment of leading companies by providing land, tax breaks, financing, and access to agricultural inputs (Crook et al.).

The leading company facilitates the introduction of new technologies, production methods, and quality control practices at the farm level. In the rice industry, leading companies frequently contract with townships

and villages to produce a specific variety of rice using prescribed production methods. At harvest, the rice is sold to the leading company, usually with a premium of 40-80 cents per hundredweight (cwt). The company provides the seed and technical assistance to the farmers. Some companies also provide operating loans, or sell fertilizer and other inputs on credit to farm households. In this manner, the leading companies are assuming some of the rural credit and agricultural extension activities previously carried out by the Ministry of Agriculture grain bureaus and other government agencies (Crook et al.).

In northeastern China, leading companies are playing a key role in the production and marketing of rice that meets China's 'green food' standards. Detailed guidelines for green rice production are not publicly available; however, green rice is grown using reduced levels of chemical pesticide and fertilizer inputs.

There are two grades of green rice in China: Grade A (reduced chemical inputs) and Grade AA (organic). The Ministry of Agriculture has a Center for Green Foods, which maintains and enforces green food certification for production and processing. Once a product has been certified as meeting the green standards, processors can place the green food logo (a green image depicting the sun, water, and a seedling) on its package. Green rice is currently estimated to account for less than 1 percent of total rice production in China. However, green rice is particularly important for japonica because the bulk of the land that meets the green standards is located in northeastern China, especially in Heilongjiang (Crook et al.).

### **China Accounts for a Growing Share of Japan's Rice Imports...**

The three largest import markets in Asia for japonica rice are Japan, South Korea, and Taiwan. China exported 216,000 tons of rice to these three markets in 2000,

nearly 20 percent of all rice imported by the three countries. Turkey is the largest non-Asian market for japonica rice and is typically the second largest import market. Egypt, Australia, and the United States supply most of Turkey's rice.

Japan partially opened its domestic market to rice imports following the signing of the Uruguay Round Agreement on Agriculture in 1995. Japan's minimum access imports—currently about 680,000 tons (milled basis)—are purchased under two programs: ordinary market access (OMA) and the simultaneous buy and sell (SBS) system. The OMA purchases are made by the Japanese Food Agency and are used almost exclusively for feed, industrial uses, and food aid. Under the SBS system, private firms import rice through a competitive tender process administered by the Japanese Food Agency (see Dyck et al. for a discussion of Japanese import policy). Although often blended with domestic rice, most SBS rice eventually enters consumer markets.

The United States, Australia, China, and Thailand account for the bulk of Japan's rice imports. Table A-1 shows the total quantity of Japan's rice imports and individual country market shares for both total imports and SBS tenders. China's total market share has increased from 8 percent in 1995 to almost 18 percent in 2001. While the OMA import shares have been relatively stable since 1995, China's share of Japan's SBS imports has increased from 22 percent to almost 66 percent by 2001/02. And while the United States' total market share has remained at 47 percent, the U.S. share of SBS imports has dropped from 53 to 25 percent.

China's increasing share of Japan's rice imports is a result of both quality improvements and competitive prices. The advancements in milling technology and rice breeding have enabled China's exporters to supply rice of similar quality and appearance to rice grown in Japan. The similarities between the two countries' rice allow the rice to be blended for use in the foodservice

Table A-1--Japan's total rice imports and market share by country

April-March crop year	Total rice imports 1/ Metric tons	Share by source: Total imports and SBS					
		China		United States		Australia	
		Total	SBS 2/	Total	SBS 2/	Total	SBS 2/
----- Percent -----							
1995	408,794	7.9	22.3	47.4	53.4	21.3	18.1
1996	465,650	8.6	23.2	46.2	64.2	17.4	5.3
1997	544,341	8.1	25.2	50.1	62.9	15.7	5.7
1998	632,400	11.4	51.6	47.7	30.4	16.1	12.1
1999	653,100	11.7	52.2	47.9	30.7	16.0	12.2
2000	693,039	12.7	44.4	47.7	38.6	15.6	11.9
2001	679,969	17.8	65.7	47.7	25.2	14.7	8.5

1/ Actual shipment weights. 2/ Simultaneous buy and sell.

Source: Japan Grain and Feed Annual 2002, March 2002, FAS/USDA.

sector. China's rice prices have typically been below California prices. (See fig. A-2 for japonica prices in California and Heilongjiang).

Price differences between China's high-quality japonica rice and California's medium grain rice are not as great as the differences in production costs. For example, prices were nearly identical in July and August 2001. In 2001 the Heilongjiang wholesale price increased from January through September, reaching almost \$245 per ton by late September. Prices then dropped to \$198 by June 2002. In the United States, the California medium grain price decreased during the first 9 months of 2001, dropping to \$220 by late September. Prices jumped to \$287 in October 2001 and then dropped slightly to \$265 in April at the start of the 2002 plantings. California prices have remained quite stable since last spring.

Production costs in northeastern China are lower than costs in the United States. Production costs in China are less than half those in California. Seed, chemicals, custom services, irrigation, and land costs are substantially lower in China than in California on both a per-hectare and a per-ton basis. However, labor costs per hectare and per ton are higher in China due to the extensive use of manual labor in rice production. Figure A-3 displays average Japonica production costs for China and California from 1995 to 2000.

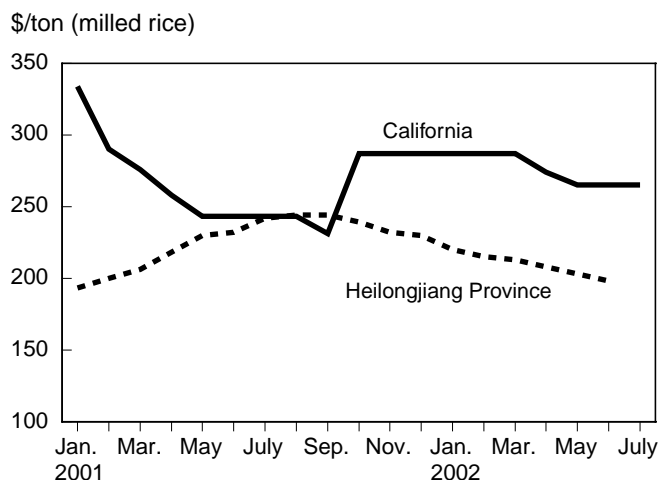
### ...And is the Largest Supplier of Rice to South Korea

Since 1995 China has accounted for the largest share of South Korea's WTO rice imports. However, the quality of rice China exports to South Korea is much lower than the quality sold to Japan. The bidding process for Korea's minimum access imports typically grants import rights to the lowest bidder, which promotes imports of low-quality rice. Until 2001/02 this policy virtually eliminated competition from suppliers of high-quality japonica table rice such as the United States and Australia (Sumner and Lee). In 2001/02 South Korea made its first purchase of U.S. rice—about 30,000 tons—under South Korea's WTO minimum access commitments. South Korea has purchased even larger amounts of U.S. rice in 2002/03.

Domestic support policies have created a surplus supply of rice in South Korea, and recently announced reforms are aimed at reducing domestic supply. Though the reforms are intended to prepare South Korea for further expansion of imports, they do not

Figure A-2

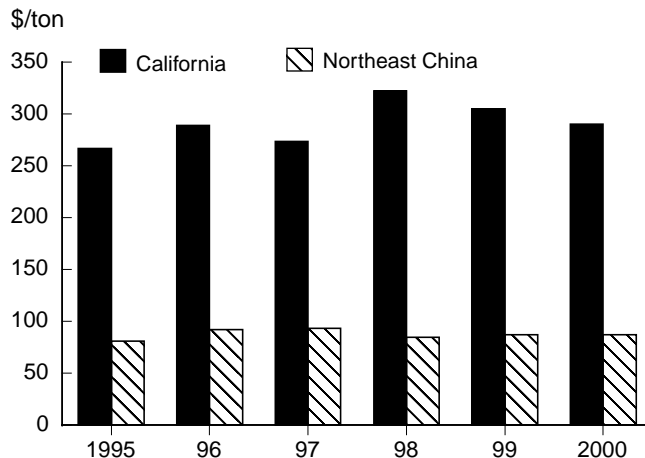
### Monthly prices for Japonica rice: Heilongjiang Province and California



Sources: China National Grain and Oil Information Center and Analysis and Forecast Department, China Grain Market Monthly Report, Issue No. 29, June 26, 2002. *Rice Situation and Outlook Yearbook (2001)* and *Rice Situation and Outlook Report (RCS 0802)*.

Figure A-3

### Cost of production, rough rice: Northeast China and California



Sources: Northeast China cost data: Research Centre for Rural Economy, Ministry of Agriculture, PRC. California cost data: ERS/USDA.

address the current practices for allocating the quota (Choi). As long as South Korea awards the bulk of its imports to the lowest bidder, the abundance of low-cost rice in northeast China will likely enable China to remain a major supplier.

Taiwan's entry into the WTO in 2002 created a new market for high-quality japonica rice exports. For sev-

eral decades, Taiwan virtually banned rice imports to protect domestic producers from lower priced rice. Taiwan's 2001 WTO accession agreement included a minimum access quota of 144,700 tons for rice (brown rice basis) in 2002. In addition, the agreement stated the imported rice could not be disposed of through food aid, re-exported, or used as feed; outlets frequently used by Japan and South Korea to prevent imports from competing with domestic table rice. Government authorities were granted 65 percent of the import quota rights; private traders the rest (Huang).

Political considerations are likely to play an important role in Taiwan's selection of import sources, particularly for the government's share of the quota. However, China's japonica rice should compete well in terms of quality and price with exports from the United States and Australia. The status of Taiwan's rice import commitments after 2002 is unclear and is currently being negotiated.

Recent improvements in the quality of milled rice in China—coupled with the integrated supply chain of the leading company system—create the potential for China to export high-quality japonica rice at competitive prices. However, high internal transportation costs continue to hamper the movement of grain from production areas to ports and consumption centers, as well as erode China's competitiveness in export markets. If greater investment in transportation and other infrastructure is successful at lowering costs, China's competitiveness will be improved. In addition, the recent emphasis on green production techniques may be particularly appealing to environmentally conscious consumers in Japan, Taiwan, and South Korea.

Growing demand for japonica rice in China may eliminate China's excess stocks of high-quality japonica rice. In addition, water constraints and competition from other crops for crop land are likely to slow or even halt the expansion of japonica rice area. Rising water costs and increasing off-farm employment may eventually increase China's production costs. However, in the near term, China's japonica supplies will likely be more than adequate to satisfy domestic demand and allow China to remain a top exporter.

## References

- Childs, N. and L. Hoffman "Upcoming World Trade Organization Negotiations: Issues for the U.S. Rice Sector." *Rice Situation and Outlook Yearbook*, ERS/USDA (November 1999): pp. 27-32.
- Choi, S. "Korea, Republic of, Grain and Feed: Comprehensive Plan on the Rice Industry." FAS/USDA GAIN Report No. KS2025, July 11, 2002.
- Crook, F., F. Fuller, F. Gale, J. Hansen, M. Moore, and E. Wailes. "Understanding the Relative Competitiveness of Chinese and U.S. Japonica Rice in Asian Markets: A Trip Report." Unpublished Manuscript, September 2002.
- Crook, F. "China's Rice Economy Segmented into Distinct Markets." *Rice Situation and Outlook Yearbook*, ERS/USDA (November 1996): pp. 18-21.
- Dyck J., N. Childs, K. Ackerman, D. Skully, S. Hansen, H. Maginnis, and L. Kotschwar. "Rice Tariffication in Japan." *Agricultural Outlook*, ERS/USDA (April 1999): pp. 13-16.
- Fukuda, H. "Japan Grain and Feed Annual: 2002." FAS/USDA GAIN Report No. JA2011, March 29, 2002.
- Huang, J. and S. Rozelle. "China's Accession to WTO and Shifts in the Agriculture Policy." Working Paper, Department of Agricultural and Resource Economics, University of California, Davis, January 22, 2002a.
- Huang, J. and S. Rozelle. "The Nature of Distortions to Agricultural Incentives in China and Implications of WTO Accession." Working Paper, Department of Agricultural and Resource Economics, University of California, Davis, February 2002b.
- Huang, S. "Taiwan's Rice Import Market To Open with WTO Accession." *Rice Situation and Outlook Yearbook*, ERS/USDA (November 2001): pp. 33-36.
- Kako, T., and J. Zhang, "Problems Concerning Grain Production and Distribution in China: A Case of Heilongjiang Province." *The Developing Economies*, 38 (March 2000): pp. 51-79.
- Park, A. H. Jin, S. Rozelle, and J. Huang. "Market Emergence and Transition: Arbitrage, Transaction Costs, and Autarky in China's Grain Markets." *American Journal of Agricultural Economics*, 84 (February 2002): pp. 67-82.
- Sumner, D. and H. Lee. "Assessing the Effects of the WTO Agreement on Rice Markets: What Can We Learn from the First Five Years?" *American Journal of Agricultural Economics*, 82 (August 2000): pp. 709-717.