

The logo for the United States Department of Agriculture (USDA), featuring the letters "USDA" in a bold, serif font above a stylized graphic of a field and sky.

United States
Department
of Agriculture

FTS-318-01

October 2005

The word "Outlook" in a stylized, red, italicized font, set against a white oval background with a blue border.

Electronic Outlook Report from the Economic Research Service

www.ers.usda.gov

Resolution of the U.S.-Japan Apple Dispute

New Opportunities for Trade

Linda Calvin and Barry Krissoff

Abstract

The World Trade Organization (WTO) ruled in June 2005 that Japan's phytosanitary protocol related to fire blight for imports of U.S. apples was not justified and was in breach of Japan's WTO commitments. In August 2005, Japan issued a new phytosanitary protocol that complies with the WTO ruling. With the elimination of the restrictive fire-blight protocol, U.S. producers have a new opportunity to export apples to a high-quality export market, at a significantly lower cost than before. This analysis estimates that over the long run, Japanese apple imports will increase by an average of \$144 million per year but that substantial variation from the average import estimate would be likely because of fluctuating market conditions from season to season.

Keywords: Apples, Japan, fire blight, phytosanitary barriers, World Trade Organization, trade disputes, ERS, USDA

Acknowledgments

The authors thank the many growers, shippers, industry representatives, and scientists who contributed to our understanding of the impact of the fire-blight protocol. We also acknowledge the staff of the U.S. Embassy in Japan for providing information on Japanese prices and transaction costs. We appreciate comments from our colleagues: Joy Harwood, Agnes Perez, Donna Roberts, and John Dyck of the Economic Research Service, USDA; John Love, World Agricultural Outlook Board, USDA; Carol Goodloe, Office of the Chief Economist, USDA; Larry Deaton, Heather Velthuis, and Doreen Chen-Moulec, Horticultural and Tropical Products Division, Foreign Agricultural Service, USDA; and Thomas Wahl and Thomas Schotzko, Washington State University. The authors likewise thank Priscilla Smith and Juanita Tibbs for excellent editorial and production assistance.

Introduction

The United States has a long history of trying to gain access to the Japanese apple market. Most recently, after U.S. complaints to the World Trade Organization (WTO), the WTO found that Japan's phytosanitary protocol with respect to fire blight for imports of U.S. apples was not justified and was in breach of Japan's WTO commitments. The WTO found that Japan's import restrictions on U.S. apples were without sufficient scientific evidence and not based on a risk assessment. In August 2005, Japan brought its phytosanitary protocol for apples from the United States into compliance with the WTO ruling.

Although Japan is recognized as a demanding market for apples, reducing the costs of complying with phytosanitary protocols should open up more export opportunities for U.S. apple growers. This report provides an estimate of the potential increase in Japanese apple imports. We begin with the history of U.S. efforts to gain access to the Japanese apple market. The next section describes the U.S. apple market and exports, particularly to Asia, as well as the Japanese apple market. A discussion follows of the previous Japanese phytosanitary protocol and the new one. This puts the Japanese protocol in perspective and explains why U.S. producers have not yet been successful in their efforts to develop a market for their apples in Japan.

Then the report turns to estimating the increase in trade made possible by the elimination of the restrictive fire-blight requirement. The first part of the analysis involves measuring the cost of the old fire-blight requirement, which we assume is equal to the decrease in U.S. export costs under the new Japanese protocol. The second part of the analysis takes the decrease in costs and estimates the volume of increased apple trade. The report ends with brief conclusions.

History of U.S.-Japan Apple Disputes

Japan officially opened its apple market in 1971, but its list of quarantine pests kept U.S. apples out of the market (Kajikawa, 1998). At bilateral talks in 1982 between the United States and Japan, the United States first asked officially for market access for U.S. apples. Japan rejected this request, citing the potential for introducing codling moth to their country. Japanese attention later shifted to fire blight. In 1993, with the U.S. apple industry having failed to gain access to the Japanese market, the U.S. Trade Representative threatened Section 301 general trade sanctions over Japan's failure to resolve the apple issue. Section 301 is the principal U.S. statute for addressing foreign government practices that are "unjustifiable, unreasonable, or discriminatory and [which] burden or distort" U.S. exports.

In 1994, Japan opened its market to U.S. Red and Golden Delicious apples from Washington and Oregon under a restrictive phytosanitary protocol directed at preventing the import of codling moth and fire blight (discussed in the following section). In 1995, U.S. growers shipped 8,935 metric tons of apples to Japan, with a Japanese import value of \$14.8 million (table 1). This first year of the Japan protocol represented the high point of U.S. exports to Japan. Over the next 2 years, U.S. exports fell to 404 metric tons (1996) and 105 metric tons (1997). In 1998, no U.S. growers registered for the Japan export program. Limited demand for Red and Golden Delicious apples in Japan, a high tariff, and the costly and risky phytosanitary requirements combined to make U.S. apple exports to Japan less profitable than originally anticipated. A problem with pesticide residues in the first year of U.S. exports also had a negative impact on Japanese consumer demand (Foreign Agricultural Service, 1996). While this experience is often cited as evidence that U.S. apples can not meet demanding Japanese consumer expectations, the history of U.S. exports of cherries to Japan shows that U.S. firms can compete profitably with the right product at the right price (see box, "U.S. Cherry Exports to Japan").

In the 1970s, when the United States began research to develop a phytosanitary protocol for the export of Red and Golden Delicious apples, Red Delicious was

Table 1

Japanese apple imports

Year	Australia	France	Nepal	New Zealand	South Korea	United States ¹	Total
				<i>Metric tons</i>			
1994				235	7		242
1995				190	171	8,935	9,295
1996			1	254	51	404	710
1997		12	1	9	22	105	150
1998				112	108		221
1999	110				39	159	308
2000	247				251	96	594
2001	650				1,411	278	2,339
2002	120				1		120
2003	108						108
2004	16				2		18

¹From 1994 to 1998, Japan limited U.S. apple imports to Red and Golden Delicious varieties. In 1999, Japan opened its market to five additional varieties of U.S. apples: Braeburn, Fuji, Gala, Granny Smith, and Jonagold.

Source: World Trade Atlas.

U.S. Cherry Exports to Japan

The success of U.S. cherry exports to Japan provides lessons that are relevant for apple exports. Japan imported 13,941 metric tons of fresh cherries in 2004, with 99 percent coming from California, Oregon, and Washington State. Japan has a relatively small cherry crop with a short marketing season. Imports accounted for an estimated 42 percent of the Japanese fresh cherry supply. The often-stated Japanese preference for domestic fruit does not prevent Japanese consumers from enjoying high-quality U.S. cherries.

In 2004, sales of California cherries began in late April and ended June 10 before the peak Japanese shipments that began in mid-June. Washington and Oregon cherries overlap with the Japanese season. By extending the cherry season and increasing supply during the traditional season, imports may increase consumer demand for cherries in general, benefiting both U.S. and Japanese producers. Cherry production area in Japan is increasing.

Most Japanese cherries are the Satonishiki variety, which is similar to the U.S. Rainier variety. Japanese traders have high regard for U.S. Rainier cherries which are largely used as gifts in Japan (Foreign Agricultural Service, 2004). Clearly U.S. cherry quality can meet the exacting Japanese consumer standards for flavor, size, and quality. Japan does not produce dark sweet cherries, yet U.S. exports of this type of cherry do very well in the Japanese market. Japanese consumers are obviously open to new varieties and tastes.

Cherries also face phytosanitary restrictions in the Japanese market. While U.S. cherries must be fumigated with methyl bromide, like U.S. apples, the fumigation has had less impact on cherry quality than on apple quality.

the most common type of apple grown in the United States and Japan (Kajikawa, 1998). Over the next two decades, sweeter varieties became more popular in both countries, particularly in Japan. Before the United States received Japanese clearance for exports of Red and Golden Delicious apples, U.S. growers realized that other apple varieties were likely to have stronger demand in Japan. But Japan required the efficacy of the codling moth treatment to be tested individually on each variety, a lengthy and expensive process. U.S. negotiators did not add additional varieties to the discussions out of concern that they might jeopardize their progress on Red and Golden Delicious apples and because of their belief that approval for these two varieties would ease the approval process for other varieties. New Zealand, which began negotiations with Japan at a later date when the shift in Japanese consumer preferences was more obvious, asked for permission to export varieties more likely to do well in the Japanese market. In 1993, 1 year before the United States gained access, Japan gave New Zealand permission to export Fuji, Gala, Royal Gala, Red Delicious, Braeburn, and Granny Smith apples to Japan.

The United States had long argued against testing for the efficacy of a quarantine treatment for insects on each variety of apple, claiming that a treatment to kill an insect on one variety of apple is equally effective on another variety. In 1997, the United States brought the varietal testing issue to the WTO. In 1998, the WTO concluded that Japan's varietal testing of apples was not consistent with the WTO Sanitary and Phytosanitary Agreement because varietal testing

was not supported by scientific evidence, was more trade restrictive than required, and was nontransparent (APHIS, 1999). Japan appealed the decision, and, in 1999, the WTO again sided with the United States. Japan announced that it would eliminate the import bans on five additional U.S. varieties—Braeburn, Fuji, Gala, Granny Smith, and Jonagold—beginning with the 1999/2000 season.

Two U.S. shippers registered for the phytosanitary protocol in the 1999/2000 season. In February 2000, the U.S. began selling Fuji apples in Japan. Two U.S. shippers registered for the program in 2000/01, the last season with exports to Japan. In 2001/02, one U.S. shipper registered for the protocol but did not export any apples. Clearly, U.S. firms felt that the expected costs of participating in the Japanese phytosanitary protocol exceeded the expected benefits even with access for apple varieties thought to be more competitive in Japan. Apple exporters in other countries have faced similar challenges in exporting to Japan (see box, “Other Countries that Export to Japan”).

Other Countries that Export to Japan

Japan opened its markets to imported apples in 1971. However, no country has exported large volumes on a regular basis. Before 1993, only North Korea and South Korea exported apples to Japan. In 1996 and 1997, Nepal shipped small quantities of apples to Japan. These countries do not have fire blight or codling moth so do not need to follow the same type of phytosanitary protocols as the United States. South Korea has the longest history of exports to Japan but exports have been very small in most years.

Countries with fire blight had to develop phytosanitary protocols with Japan. In 1993, New Zealand received permission to export Fuji, Gala, Royal Gala, Red Delicious, Braeburn, and Granny Smith apples to Japan. New Zealand growers exported for 5 years, but like their U.S. counterparts, found that the expected benefits of the Japanese export program were outweighed by the expected costs. In September 1997, France received permission to export Golden Delicious apples to Japan but only shipped during that year. In December 1998, Australia received permission to export Tasmanian Fuji apples to Japan. Australia claims to not have fire blight and does not therefore have to comply with the type of protocol the United States faces for this disease. But growers do have to fumigate for codling moth, as do U.S. growers. Exports to Japan are limited to the island of Tasmania, the only fruit-fly-free area in Australia. While Tasmania has exported apples every year since it gained entry to the market, the level of trade is very low in part because it is a small industry. Trade has declined rapidly from its 2001 high. Growers have had problems meeting Japanese size and color preferences for their relatively high-priced apples (Foreign Agricultural Service, 1999). Also, methyl bromide fumigation has caused problems with fruit deterioration. Australia’s efforts to change the protocol to allow fumigation in Japan have not been successful. This change would reduce the problem of shortened shelf life.

While Chinese apples are a rapidly growing presence in Asian markets, Japan prohibits the import of fresh Chinese apples due to codling moth and oriental fruit fly. Currently, China has not requested that Japan lift the import ban nor has there been any discussion to establish a protocol.

The United States also took aim at the Japanese requirements for fire blight. The United States argued that the fire-blight requirements were not based on science—specifically, that mature, symptomless fruit do not carry the disease. In 1997, the United States asked Japan to modify its phytosanitary protocol (Yue, Beghin, and Jensen, 2005). The United States and Japan conducted joint research that confirmed the U.S. position on the transmission of fire blight. In October 2001, Japan refused to change its protocol with respect to fire blight.

In 2002, the United States requested and was granted a panel by the WTO Dispute Settlement Body to hear the case, and, in July 2003, the panel agreed with the U.S. position (Office of the U.S. Trade Representative, 2003). Japan appealed the decision and lost again in December 2003. In June 2004, Japan submitted a revised protocol that the United States deemed inadequate to bring the protocol into compliance. In July 2004, the United States asked the WTO to review the revised protocol.¹ In June 2005, the WTO panel found that Japan’s revised protocol was still inconsistent with its WTO obligations. In August 2005, Japan issued a new phytosanitary protocol for apple imports from the United States that complies with the WTO ruling (Office of the U.S. Trade Representative, 2005). The United States and Japan jointly notified the WTO that Japan had ended the practices that were inconsistent with its WTO obligations.

¹The United States also sought authorization to impose trade sanctions against Japan in the amount equal to damages based on the annual value of forgone apple sales (Office of the U.S. Trade Representative, 2004).

Apple Markets in the United States and Asia

The United States is the second-largest apple producer in the world, after China, with 4.2 million metric tons in 2003, and is usually the largest apple exporter in the Western Hemisphere. The well-being of the U.S. apple industry depends on strong export markets. In the 2003/04 season, exports accounted for 18 percent of domestic fresh-market production. U.S. producers have a long history of exporting to a large number of countries and catering to diverse consumer preferences. In 2003, the United States exported 528,487 metric tons of fresh apples. Mexico and Canada were the largest markets for U.S. fresh apples, accounting for 43 percent of total export volume (table 2). Asian countries are also top markets for U.S. apple exports, despite considerable recent competition from China. Taiwan, Indonesia, and Hong Kong accounted for 24 percent of total U.S. fresh apple exports. Other Asian markets in the top 20 U.S. destinations for U.S. apple exports—Malaysia, India, Thailand, Singapore, China, and the Philippines—accounted for another 11 percent of the export volume. The U.S. share of imports in these Asian countries ranged from 4 percent in the Philippines (a country that has drastically reduced its imports of U.S. apples in favor of cheaper Chinese apples) to 47 percent in Indonesia. The prospect of gaining access to the high-income Japanese market has enticed U.S. growers for years.

Table 2

U.S. apple exports to top 20 markets in 2003

Country	U.S. exports	U.S. share of
	<i>Metric tons</i>	<i>country's imports</i>
		<i>Percent</i>
World	528,487	
Mexico	121,248	69
Canada	107,613	76
Taiwan	50,978	45
Indonesia ¹	40,783	47
Hong Kong	36,055	34
Malaysia	24,429	10
United Kingdom	24,077	4
United Arab Emirates	19,094	NA
India ¹	10,748	41
Thailand	9,157	12
Singapore	8,138	9
Saudi Arabia	6,924	NA
Greece ¹	5,367	5
Colombia ¹	5,154	6
China	4,676	46
Philippines ¹	4,547	4
Costa Rica	3,621	NA
El Salvador	3,293	NA
Guatemala	3,233	NA
Kuwait	3,227	NA

NA= not available.

¹U.S. share of imports based on 2002 data.

Sources: U.S. Department of Commerce and World Trade Atlas.

Hundreds of varieties of apples exist and different groups of consumers often favor particular varieties, as well as certain sizes. In the United States, the Red Delicious apple remains the most common variety, although its share of production and consumption has declined. The U.S. Apple Association estimates Red Delicious production at 29 percent of the U.S. crop in 2003, compared with 43 percent in 1994. Golden Delicious is the second most popular apple, maintaining approximately a 13- to 14-percent share of production over the last decade. In contrast, Fuji, Gala, and other new varieties (Braeburn, Jonagold, and Pink Lady) have increased in production, with Fuji and Gala each growing from less than 2 percent of total U.S. production in the early 1990s to nearly 10 percent in 2003. This change in varieties represents a response to changing U.S. consumer preferences for sweeter apples and high prices for these apples in the fresh export market.

Japan is a significant producer and consumer of apples, famous for its high-quality and very expensive fruit. In 2003, Japan ranked 13th in world apple production with 891,700 metric tons. The Japanese apple industry has thousands of small, high-cost producers. However, the country's apple industry has been declining slowly over the last decade as area planted and production have decreased. In 2003, production was down approximately 15 percent from 1990 and acreage had declined 20 percent. The number of growers is also down, as Japan's population of apple producers is aging and the lifestyle has failed to attract a younger generation (World Apple Review, 2004).

The Fuji is the most popular apple variety grown in Japan, accounting for approximately 55 percent of the nation's production. Producer prices for Fuji apples are higher than for other varieties. Production practices differentiate Fuji apples; there are bagged Fuji and sun Fuji. Bagged Fuji apples are individually covered with bags until just before harvest. This technique protects the fruit from blemishes and yields an almost iridescent coloring. These pampered apples are often used as gifts; they are sold individually wrapped or boxed in department stores at very high prices. Production of bagged Fuji apples is declining because of the high labor costs. Sun Fuji apples are grown without the protective bag, similar to U.S. Fuji apples, and sell at lower prices than bagged Fuji apples.

With phytosanitary restrictions on most imports, Japan has high domestic prices and relatively low per capita apple consumption. Japanese consumers often eat apples as a dessert with one apple divided among several diners. They do not tend to eat them as snacks as do U.S. consumers. Japanese apple consumption has the potential to grow.

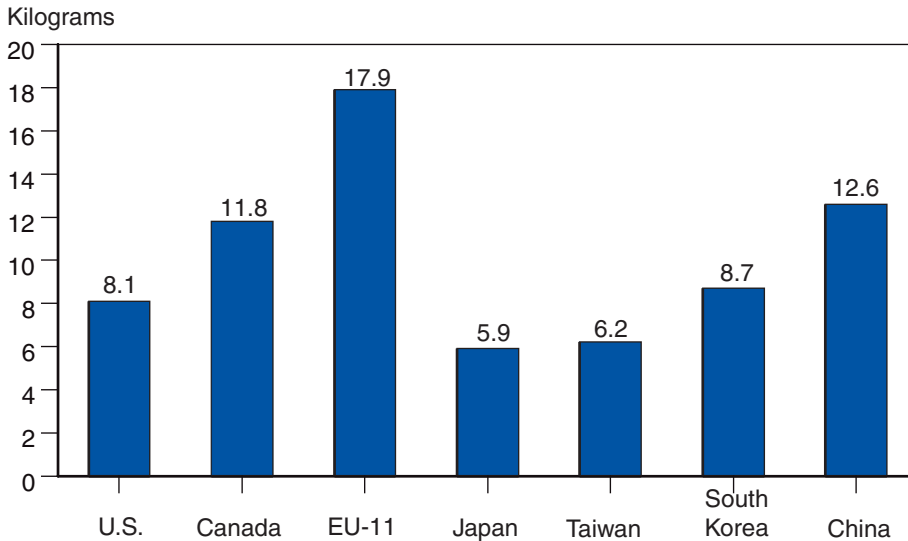
Figure 1 shows per capita consumption for six major Northern Hemisphere production groups and Taiwan (World Apple Review, 2004; Korea Rural Economic Institute, 2002). The high-income North American and European countries have a tradition of apple production and consumption. From 1991 to 2003, per capita apple consumption averaged 8.1 kilograms (kg) in the United States and 11.8 kg in Canada. Per capita consumption in the 11 European Union countries averaged 17.9 kg, but ranged from an average of 9.3 kg in the United Kingdom to 24.0 kg in Austria.² In China, the world's largest apple producer, apple consumption averaged 12.6 kg per capita.³ Northern China may have a higher consumption level than southern China, which is more tropical. In Taiwan, a tropical and subtropical country with

²The 11 countries are Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and the United Kingdom.

³Consumption data in figure 1 are based on disappearance data, not actual consumption data from consumer surveys. With disappearance data, fresh consumption equals production plus imports minus exports and processing. This is the maximum possible consumption. Losses at many levels reduce actual consumption. Losses can occur in the field, packing-house, retail outlets, and the kitchens of consumers. If losses are more substantial in China, the per capita consumption numbers for that country may be inflated.

obvious cultural similarities to southern China, per capita consumption averaged 6.2 kg. Taiwan has a small domestic apple industry and imports over 90 percent of all apples consumed (Foreign Agricultural Service, 2003). Japan has relatively low per capita consumption, averaging 5.9 kg per person—just 73 percent of U.S. consumption levels. In South Korea, which also restricts imports, per capita consumption averaged 8.7 kg—slightly above U.S. consumption levels and 47 percent more than Japanese levels.

Figure 1
Average per capita apple consumption, 1991-2003¹



¹For South Korea, average consumption for 1991-2001.
 Sources: World Apple Report and Korea Rural Economic Institute.

Japan's Phytosanitary Protocol for Apples

In 2004, the United States exported apples to 85 countries. Many export markets accept U.S. apples produced under standard industry operating practices with the addition of a phytosanitary certificate asserting that the packed apples have been inspected and are free of diseases or pests of concern. Other countries require additional production or postharvest practices beyond the standard U.S. industry operating practices. Exporting to these countries can be much more expensive. In some cases, for example, a government may require fumigation to kill a pest. In other countries, a government may require a systems approach to protect its domestic industry. A systems approach uses a combination of risk-mitigating measures that individually and cumulatively reduce the risk of the target diseases or pests to an acceptable level. This approach is typically employed in cases where a country or region cannot qualify as a disease-free or pest-free zone, or the postharvest treatment damages the commodity or leaves unacceptable chemical residues. Japan's previous protocol required a systems approach for fire blight. In extreme cases, a country may refuse to accept U.S. apples under any conditions.

The previous Japanese protocol for U.S. apples that was challenged by the United States in the WTO had two main parts—preharvest activities, which dealt with fire blight, and postharvest cold treatment and methyl bromide fumigation, which dealt mostly with codling moth—that are not part of U.S. standard industry operating practices. The new 2005 protocol eliminates the fire-blight requirements, but the codling-moth requirements remain in force. Japan also is concerned about lesser apple worm and apple maggot but we do not address those pests here.

As part of the old Japanese fire-blight protocol, growers from Washington and Oregon, the only growers then allowed to export to Japan, had to register their core acreage for the program in early spring. Representatives of USDA had to inspect each tree in the orchard three times for signs of fire blight—at blossom time, when the fruit was 3 centimeters in size, and just prior to harvest in the presence of a Japanese inspector. In the event of hail, the orchard had to be re-inspected because conditions might increase the risk of fire blight.⁴

Additionally, each orchard block had to have a 500-meter buffer zone on all sides, which involved a substantial area, to ensure that no fire blight was near the apples in the core area. Pear trees or other natural fire-blight hosts in the buffer zone also had to be individually inspected on the same schedule. Although not required by the Japanese protocol, Washington and Oregon growers decided to ban pear trees in the buffer zone to minimize the risk of fire blight. Apple orchards typically surrounded the core acreage so the buffer zones usually required inspection. Any evidence of fire blight found in the orchard or the buffer zone eliminated the orchard from the export program for that year. If there was no evidence of fire blight at the final orchard inspection before harvest, apples from the core acres were eligible to continue in the export program. Apples from the buffer acres

⁴While no other country requires this type of orchard inspection program for fire blight, several countries, such as Australia and South Africa, reject U.S. apples outright because of the presence of fire blight in the United States. In the wake of the WTO ruling, these restrictions may change.

were not allowed into Japan. In 1994/95, the first season of the export protocol, only about half of the core acres still qualified for export by harvest time; over time, as growers became more familiar with the protocol, this share increased (table 3).

At harvest, growers had to decide whether to proceed with the postharvest protocol. If apples were free of fire blight but a high percent of the apples were not consistent with Japanese consumer demands, the grower might have decided to quit the program before incurring more costs. Japanese consumers are used to large and very good-looking apples. Market conditions posed another risk to producers. All the decisions regarding participation had to be made before relative market conditions in the United States and Japan were known. Growers could comply with every phytosanitary requirement only to discover that market conditions precluded trade. Japan is a major apple producer and would not necessarily be expected to import large volumes every year if its domestic supplies were ample. At harvest time, there might have been enough information for a grower to decide there were no Japanese market opportunities and redirect the apples to other markets.

The new protocol eliminates orchard registration, buffer zones, and orchard inspection. The old protocol included inspection of packed apples to ensure that there was no evidence of fire blight and this provision remains in force. The new protocol also requires tests for maturity on any shriveled fruit. In addition, the new protocol allows imports of California apples (Office of the U.S. Trade Representative, 2005).

The postharvest treatment, which remains in effect, is mostly directed at killing codling moth and its larva. Apples are held in cold storage rooms dedicated to the Japan export program. U.S. and Japanese inspectors check the monitoring equipment, and then seal the apples in the storage room for 55 days of cold treatment to kill codling moth. Once apples are removed from cold storage, they are fumigated with methyl bromide, which kills the codling moth larva. Japan is the only country that requires methyl bromide fumigation of U.S. apples. It also requires apples to be fumigated in field bins instead of in packed cartons. This requirement raises costs because all

Table 3

Washington/Oregon apple export program for Japan

Season	Core acres	Buffer acres ¹	Core acres qualified at harvest	Shipments to Japan
	----- Acres -----			<i>Metric tons</i>
1994/95	2,386	4,843	1,212	8,872
1995/96	2,188	2,510	1,390	1,050
1996/97	739	656	739	231
1997/98 ²	0	0	0	0
1998/99	0	0	0	0
1999/00	450	511	361	362
2000/01	321	408	321	505
2001/02	250	142	250	0
2002/03	0	0	0	0
2003/04	0	0	0	0
2004/05	0	0	0	0

¹Acres in buffer zones in the early years of the program are estimates.

²No growers participated in the program for the 1997/98-1998/99 and 2002/03-2004/05 seasons.

Source: James Archer, Northwest Fruit Exporters.

apples from an orchard must be fumigated whether or not they meet the quality and size standards for the Japanese market.⁵

Methyl bromide fumigation may damage fruit or reduce its shelf life, but the impact is not observable immediately. Once the phytosanitary protocol activities are completed, the apples are graded and packed, and both U.S. and Japanese inspectors sign off on the phytosanitary export permit. At this stage, growers may still decide not to export if relative market prices are unfavorable. If fruit is exported and then methyl bromide damage is discovered after it arrives in Japan, buyers may discount the price or reject the load.

⁵Depending on the technology used, some packers can presort apples before they go into cold storage. Then the grower can reduce costs by fumigating just those bins that contain fruit most likely to meet Japanese consumer preferences.

