

## Export Strategies of Japanese Agricultural Products: A Focus on Production Management in Japanese Agricultural Co-operatives

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### Abstract

Japanese agricultural exports have been expanding in terms of both volume and value. Japanese exporters must produce agricultural products that satisfy the plant quarantine standards demanded by export markets. This paper analyzes Japanese yam exports to Taiwan by examining problems inherent in the production management system affecting the ability to pass plant quarantine inspections, and the ability of Japanese agricultural co-operatives to meet Taiwanese consumer demand. The agricultural co-operative in Hokkaido has improved its washing and packing methods and the quality of its equipment, in order to enhance its production management system. These improvements have led to increases in equipment cost. Therefore, it is important that such exporters receive government subsidies to help Japan improve yam production and sales, not just internationally, but also domestically.

**Keywords:** export strategy, production management, quarantine

### I. Introduction

Japanese agricultural exports have been expanding in terms of both volume and value. Competition is intense among an increasing number of Japanese exporters<sup>2</sup> to primary markets such as Taiwan. Japanese exporters must produce agricultural products that satisfy the plant quarantine standards mandated by export markets. Taiwan's plant quarantine laws prohibit the import of certain agricultural products, including tomatoes. They also demand that a plant quarantine certificate be issued by the export country at the time of import for certain agricultural products, including *Dioscorea Batatas* (hereinafter, yam), and impose additional special quarantine conditions on the production of certain agricultural products, including those in export countries.<sup>3</sup> Most Japanese exports meet plant quarantine requirements set by

both Japan and Taiwan. However, if Taiwan's plant quarantine authorities were to find any harmful insects, pests, or diseases in Japanese exports awarded a Japanese plant quarantine certificate, they may impose additional special quarantine conditions on such produce. Therefore, Japanese exporters should at least ideally maintain, if not further improve, upon the already high quality of their agricultural exports.

Since the initiation of reforms to Japan's agricultural administration, the number of studies on exports of Japanese agricultural products has increased. Sato, Ishizaki, and Oshima [5], Shimoe [2], and Tanaka [7] revealed problems in the distribution process used to export agricultural products. Ikeda [10] and Taniguchi [6] studied the background of exports and factors relating to economic realization and development in Japan. Tateiwa [9] examined the production and shipment structure of export products among Japanese

farm organizations. Morio [1] also revealed helpful marketing strategies for exporting Japanese agricultural products.

None of these previous studies, however, considered the extent to which these exports meet plant quarantine requirements. In other words, the export strategies examined by these studies simply assume that all exports meet plant quarantine requirements. However, economically developed markets have continued to reiterate their concerns about harmful insects, pests, and diseases carried by agricultural exports. Therefore, it is in the interests of exporters to pay added attention to plant quarantine requirements demanded by export markets, the lack of which might otherwise prohibit them from exporting to those markets. Thus, to construct an export strategy for Japanese agricultural products, we must first consider how these products can continue to meet plant quarantine inspection standards.

In this regard, Sato [3] and Sato [4] examined Japanese pear exports to Taiwan, and uncovered problems in establishing the required quality management systems in Japanese farm organizations.

It revealed two major points: (a) Taiwan's plant quarantine authorities have often found harmful insects, pests, and diseases on certain imported fruits certified by a Japanese plant quarantine certificate, and so, they imposed additional special quarantine conditions on the production of these exports from Japan;<sup>4</sup> (b) as Taiwan's plant quarantine authorities allow the import of many other agricultural products, Japanese large- and small-scale exporters can capitalize on the opportunity to expand their agricultural exports to Taiwan, by increasing export volumes and varieties. Moreover, the Taiwanese authorities do not impose any additional restrictions/ de-

mands other than a Japanese plant quarantine certificate at the time of importation. Therefore, the current study also examines how Japan may increase its agricultural exports to Taiwan by (a) meeting the standard plant quarantine requirements imposed by Taiwan, and thus avoiding more stringent quarantine measures and (b) increasing their product volumes and varieties.

In the case of yam exports to Taiwan, the current study focuses on problems with production management systems vis-à-vis their inability to help the producer pass plant quarantine inspections, and the ability of Japanese agricultural co-operatives to meet Taiwanese consumer demands. Yam exports were chosen as the focus of this study because (1) both the export volumes and the export value of yam have recorded a steady increase over the years and (2) although the export volumes of yam is greater than those of other produce, insect damage has not been observed in yam crops, and thus, Taiwan does not currently impose additional special quarantine conditions on yam production in Japan.

## II. Yam Exports to Taiwan

### 1. Taiwan as Japan's primary agricultural export market

Japan currently exports many agricultural products to Taiwan, which has developed into a multi-item importer. The reasons for this growth in exports are as follows.

First, exporters, such as agricultural co-operatives, have been increasing their volumes of agricultural production intended for export. Sharp increases in both production and exports were seen especially after Japanese agricultural policy reforms. Following these reforms, the administration has often organized and hosted ex-

port promotion conferences throughout Japan, intended to urge more organizations and firms to export more varieties and volumes of Japanese agricultural products.

Second, a number of exclusive Taiwanese department stores, serving higher-income customers, also source Japanese agricultural exports. These stores directly import Japanese agricultural products from Japanese exporters. Additionally, they commission Taiwanese corporate buyers to procure the quantities of Japanese products (either small or large) that they need for resale in Taiwan's wholesale markets. This becomes significant in that such wholesaling makes it possible to procure small volumes of many products.

Third, many products are exported to Taiwan. The "Simplified Matrix of Quarantine Conditions of Certain Japanese Exports"<sup>5</sup> shows the particulars of Japan's exports to its main export destinations: Taiwan, China, the United States, and other countries<sup>6</sup>. In terms of plant protection, each region allows, prohibits, or determines particular importation conditions for certain designated Japanese agricultural products. For instance, while Taiwan allows the importation of most products, including certain fruits, its prohibition on the import of *Solanum* spp. is exceptional. In contrast, China and the United States have imposed restrictions on the importation of many products. Therefore, comparatively, it appears to be relatively easy for Japan to expand the volumes and varieties of its Taiwan-bound agricultural exports<sup>7</sup>.

It is also quite intriguing that while Taiwan allows the import of yam that have been certified with a Japanese phytosanitary certificate, the United States does so only under an import permit, and China expressly prohibits their importation. Clearly, importation conditions vary widely, for

yam in particular, another reason for prompting the examination of Japanese yam exports in this study.

## 2. Increased volumes of yam export

In recent years, the Hokkaido, Aomori, and Nagano prefectures together have accounted for a large share of Japanese yam consumption.

According to Japan's Ministry of Agriculture, Forestry, and Fisheries' "Vegetable Production and Shipment Statistics," total yam production in 2009 reached 138,000 t, of which Hokkaido, Aomori, and Nagano produced 59,200 t, 59,500 t, and 8,650 t, respectively. These three areas thus accounted for 92.3% of all yam production in Japan that year. Moreover, agricultural co-operatives in these areas have exported yam both directly and indirectly<sup>8</sup>; most co-operatives ship their products to Japanese interposed middlemen, who export them later. This study analyzes the case of Hokkaido, namely its problems with yam exports, and proposes improved export strategies for meeting the plant quarantine requirements of export markets.

Table 1 compares the annual volumes and value of Japanese yam exports to Taiwan and elsewhere. The table shows that both the total volume and value of yam exports tended to increase, with the former increasing rapidly from 244.2 t in 1990 to 5,499.5 t in 2010. Particularly high growth rates can be seen between 2000 and 2002. One factor contributing significantly to this growth has been Taiwan's accession to the World Trade Organization (WTO). In addition, the ratio of exports to Taiwan versus the total export volume rose from 4.4% in 1990 to 65.1% in 2010,<sup>9</sup> and similar tendencies can be observed with regard to export values.

These results suggest that the demand for Japanese yam has grown rapidly since 2000, and

that the increase in total exports can be attributed to the growth in exports to Taiwan.

Table 1. Comparison of Annual Export Volumes and Values of Japanese Yam  
(Units: yen, t, 100 million yen, %)

Year	Exchange rate (US dollar)	Total export volume		Total export value	
			to Taiwan		to Taiwan
1990	144.79	244.2	10.8 ( 4.4)	1.4	0.0 ( 1.4)
1995	94.06	387.0	99.1 (25.6)	1.2	0.2 (16.7)
1996	108.78	369.0	139.1 (37.7)	1.4	0.4 (28.6)
1997	120.99	641.3	372.2 (58.0)	2.5	1.3 (52.0)
1998	130.91	822.0	529.9 (64.5)	2.8	1.6 (57.1)
1999	113.91	873.6	608.7 (69.7)	2.9	1.8 (62.1)
2000	107.77	1,837.3	1,553.4 (84.6)	6.5	5.3 (81.5)
2001	121.53	2,795.2	2,453.9 (87.8)	10.4	9.2 (88.5)
2002	125.39	4,026.4	3,680.8 (91.4)	20.3	18.5 (91.1)
2003	115.93	3,801.0	3,419.6 (90.0)	15.2	13.6 (89.5)
2004	108.19	3,205.5	2,822.4 (88.1)	13.3	11.5 (86.5)
2005	110.22	5,541.9	4,221.8 (76.2)	12.5	10.3 (82.4)
2006	116.30	6,903.0	5,727.5 (83.0)	17.9	14.9 (83.2)
2007	117.75	5,794.2	4,783.9 (82.6)	18.7	15.6 (83.4)
2008	103.36	5,975.2	4,879.0 (81.7)	19.1	15.4 (80.6)
2009	93.60	6,224.0	4,469.2 (71.8)	19.0	14.0 (73.7)
2010	87.78	5,499.5	3,582.3 (65.1)	19.6	13.2 (67.3)

Source : Japanese Ministry of Finance, “*Trade Statistics of Japan*” (Accessed: June, 2011), and International Monetary Fund, “*International Financial Statistics YEARBOOK*” (1995-2011)

Note 1 : Figures in parentheses show ratios of export volumes to Taiwan (by value) to total export volumes (by value).

Note 2 : Figures in the table represent agricultural products including “arrowroot, salep, Jerusalem artichokes, and other similar roots and tubers that contain large amounts of starch and inulin (fresh, refrigerated, dry, and frozen), and marrow of sago palm.”

Note 3 : Each export volume and value figure is rounded to one decimal place.

### 3. Yam exports from Hokkaido prefecture

The export of yam from Hokkaido was started in 1999 by T agricultural co-operative, in response to adjustments in yam supply and demand in Japan, and due to a strong demand for Japanese yam in Taiwan’s exclusive department stores. At the beginning of this export period,

several other agricultural co-operatives, besides T agricultural co-operative, were launched.

However, occasionally, some exported yams did not meet the required standard, given the lack of sufficient export knowledge among those involved. Only two agricultural co-operatives, including T agricultural co-operative, both of which produce yam in large quantities, continue to ex-

port directly, while others have had to cease direct exports. Additionally, although T agricultural co-operative and other co-operatives have begun collaborating among themselves, in order to collect and ship exports indirectly, T agricultural co-operative and one other co-operative are the only two primary organizations from Hokkaido that ship yam for export.

The annual export volume of T agricultural co-operative increased from 1,000 to 1,300 t in recent years, with approximately 1,000 t being exported to Taiwan alone. The next largest export destination is the United States, with about 300 t<sup>10</sup>. It is important to note that T agricultural co-operative's yam exports have the highest ratio of total export volume to total production. The export volumes in 2007 and 2008 were 1,379 t and 1,354 t, respectively, accounting for 25.7% (5,366 t) and 23.0% (5,877 t) of total production, respectively. The increasing export ratio can be attributed to T agricultural co-operative's increased emphasis on exporting yam. On the other hand, the other agricultural co-operatives consider domestic sales as a priority, and only export products that have low domestic sales. In contrast, after it started exporting its produce (particularly yam), T agricultural co-operative changed its policy, shifting its focus from prioritizing domestic sales to prioritizing exports.

In other words, T agricultural co-operative first secured a certain quantity for export volume, and then sold the remaining volume in the domestic market. When it first began exporting yam, domestic prices ranged between 4,000-5,000 yen/10 kg, whereas the export prices were 7,000-8,000 yen/10 kg. Moreover, the domestic market had become saturated. Thus, by expanding on its export volume, the co-operative could earn

higher revenues, which prompted the change in its policy.

### **III. Export Strategies to Meet Taiwan's Demands: Exporter Enhancements to Help Meet Plant Quarantine Requirements**

#### **1. Japan's export quarantine for yam**

Like other products, exporters of Japanese yam are required to maintain and improve the quality of their products in order to pass plant quarantine inspections. For yam, Japanese export quarantine inspectors check for the presence or absence of spot caused by nematodes, and for any soil attached to the product. The inspectors will issue a phytosanitary certificate only if they conclude that the yams are disease- and pest-free. Inspectors must confirm that no *Ditylenchus dipsaci*<sup>11</sup> were detected and that all yams have been treated with insecticides in the prescribed fashion.

Table 2 shows the rejection rates of yam for export to Taiwan during Japanese export quarantine inspections. Table 2 shows that while the number of inspections has increased, the rejection rate has been less than 1% in most years. However, while the export of yam has not been adversely affected by the presence of *Ditylenchus dipsaci*, the nematodes *Pratylenchus* spp. or *Meloidogyne* spp. may have nevertheless been present. However, because these latter two nematodes also appear in Taiwanese yam, import quarantine measures for yam do not include an inspection for them. However, they do affect yam quality adversely, and Japanese farms must take preventive measures in this regard. Thus, as far as yam is concerned, there is a gap between Taiwan's quarantine requirements and the actual production process in Japan. Therefore, in terms of quarantine requirements, yam can be consid-

ered as an agricultural product that has comparatively fewer such requirements to meet.

Moreover, all potential agricultural exports must be of high quality. In order to export

high-quality yam, agricultural co-operatives direct their production management efforts toward enhancing their production management systems.

Table 2. Quarantine Inspection Rejection Rates of Japanese Yam Exports to Taiwan  
(Units: case, t, %)

Year	Number of Inspections	Rejected		Year	Number of Inspections	Rejected	
		Number of Cases	Volume			Number of Cases	Volume
1997	97	5	0.1 (0.03)	2004	297	2	22.1 (0.75)
1998	132	0	0.0 (0.00)	2005	368	2	49.0 (1.17)
1999	160	2	16.0 (1.02)	2006	468	2	8.2 (0.14)
2000	239	4	55.5 (2.60)	2007	514	1	7.0 (0.14)
2001	384	1	7.0 (0.12)	2008	443	0	0.0 (0.00)
2002	418	3	8.9 (0.24)	2009	342	0	0.0 (0.00)
2003	358	5	16.4 (0.36)	2010	372	0	0.0 (0.00)

Source : Plant Protection Station “*Plant Quarantine Statistics of Japan*”(Accessed: June, 2011)

Note 1 : Figures in parentheses show the ratio of total rejected volume to total inspected volume.

Note 2 : Figures in parentheses are rounded to two decimal places.

## 2. Enhanced production management systems

T agricultural co-operative has improved its washing and packing methods and its equipment, in order to enhance its production management system<sup>12</sup>. The co-operative installed new washing and packing facilities in 2000, and introduced an additional new non-brushing washing system in 2005. Until then, yams were traditionally washed with a large brush under a jet of water, which at times damaged their surface resulted in quality deterioration. Japanese export quarantine inspectors reject yam if the product quality appears to have deteriorated. Such deterioration is normally exacerbated during and after long transport times, such as sea transport. In contrast, with the aforementioned new non-brushing washing system, yams are cleaned solely with a jet of water. As a result, T agricultural co-operative is now able to ship higher-quality yam.

In 2005, T agricultural co-operative also installed two additional large refrigeration facilities, thus bringing their total number of large refrigeration facilities to five. As a result, the yams are stored properly now. Yam seeds and tubers are usually planted in May or June, with October-November and March-April usually being the periods during which the yam crops are harvested twice annually<sup>13</sup>. Following a harvest, the yam to which soil is attached, are stored in large refrigeration facilities. T agricultural co-operative ships yam year round, for both domestic sales and export. Also, as yam consumption, and hence exports, have expanded due to the increased health consciousness of Taiwanese consumers, the country’s year-round demand for yam has also risen. In Taiwan, yam is not only bought for daily consumption, but also serve as gifts (occasionally, some Taiwanese demand that certain Japanese

produce be used solely as gifts). The new additional refrigeration facilities thus helped the co-operative ensure proper storage of yam, and hence, a stable export supply for Taiwan.

Such enhanced production management initiatives naturally increase equipment costs, and often, these high costs prevent exporters from installing and upgrading their facilities. The agricultural co-operative received subsidies from Japan's Ministry of Agriculture, Forestry, and Fisheries. In 2000, it received subsidies under the auspices of *Kei-ei Kozo Taisaku Jigyo* (The Measures for Management Structure Project) for its new washing and packing facilities<sup>14</sup>. In 2005, it received subsidies under *Nogyo, Shokuhin Sangyo Kyosoryoku Kyoka Shien Jigyo* (The Support Project for Agriculture and Food Industry Competitiveness) for the non-brushing washing system and additional refrigeration facilities<sup>15</sup>. These subsidies are aimed at assisting reforms in production management, while another subsidy called *Norinsuisanbutsu, Shokuhin Yushutsu Sokushin Jigyo* (Project for Encouraging Agricultural and Marine Export)<sup>16</sup>, is directly aimed at expanding agricultural exports. The subsidies to the agricultural co-operative were not directly aimed at expanding Japanese agricultural exports. However, after receiving the subsidies in 2005, according to the government's project evaluation, the co-operative's yield rate improved on account of its improved capacity for proper yam storage, which prevented product deterioration<sup>17</sup>. Therefore, there is little doubt that these subsidies helped ensure the stable export of yam from Japan to Taiwan.

#### IV. Conclusion

An increase in Japanese yam export volumes is desirable. While Japanese yam continue to be exported in line with current quality control standards, augmented import quarantine conditions imposed in the future may change that. The status quo is supported by exporters who take independent initiatives to secure large markets, by improving their equipment, as exemplified by the agricultural co-operative's strengthening of its production control system. At this time, the efforts of agricultural co-operatives are largely sufficient to help them meet plant quarantine standards. If agricultural co-operatives continue their efforts towards export proliferation, for example, by installing large refrigeration, and washing and packing facilities, the quality of Japanese yam will be high, regardless of whether they are sold domestically or internationally. If the agricultural co-operative plans to respond to increased manure prices and pressure from other exporters, it should produce high-quality yam for export and domestic sale alike, thus resulting in increased revenues for it within the domestic market as well.

Emulating the Hokkaido and Aomori prefectures, the Nagano prefecture has also started to export yam, thus increasing Japan's yam export area. It is estimated that the export area will expand further, and that there will be continued growth in the top categories of yams. The Export Promotion Office for the International Affairs Department of the Minister's Secretariat in the Ministry of Agriculture, Forestry, and Fisheries [8] has noted that if the aforementioned production management systems are implemented on a larger scale in Japan, Japanese yam would be of a high quality and the benefits to Japan will be large, as Taiwan imports yam solely from Japan.

Therefore, future research can focus on the efforts highlighted in the current study, to better understand how Japan's yam production industry has grown and changed over time.

**Footnote\***

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<sup>2</sup> The exporters examined in this paper include not only trade companies but also farm organizations such as agricultural co-operatives that ship and export agricultural products. This is because export ventures warrant production efforts that differ from those pertaining to domestic sales in the production area.

<sup>3</sup> For example, in accordance with such additional special quarantine conditions, Japan may export fruit such as pears to Taiwan, which would be certified as having been produced in specially designated orchards in a specific prefecture, packed using special packing processes in a specific packinghouse, etc.

<sup>4</sup> For details, refer to Sato [3] and Sato [4].

<sup>5</sup> For details, refer to Ministry of Agriculture, Forestry, and Fisheries, [http://www.maff.go.jp/pops/j/search/pdf/ex\\_quickhelp\\_20110906.pdf](http://www.maff.go.jp/pops/j/search/pdf/ex_quickhelp_20110906.pdf) Accessed: September, 2011.

<sup>6</sup> In 2010, the total export value of Japanese agricultural products classified as "fruits and vegetables" in the report "Trade Statistics of Japan" by the Japanese Ministry of Finance, With regard to these three regions was 19.13 billion yen. The total value of exports to Taiwan was 8.67 billion yen (percentage of total value: 45.3%); to China, 1.35 billion yen (7.1%); and to the United States, 2.86 billion yen (15.0%).

<sup>7</sup> However, in response to the Fukushima nuclear accidents in 2011, these three regions were forced to consider one of the following: (a) stop imports from this region, on account of the possible presence of radioactive material or (b) demand a certificate introduced by the Japanese government for agricultural products harvested in areas such as Fukushima. The total inspection and sampling inspection procedures for produce from areas were also strengthened.

<sup>8</sup> The term "directly," refers to partnerships formulated by farm organizations, such as agricultural co-operatives, to enhance/implement their export strategies. Farm organizations partner with trading companies or wholesalers. Alternatively, in some situations, farm organizations do not build export strategies. Instead, trading companies buy "indirectly" from wholesale agricultural markets for specific export dates, as a matter of convenience. In the latter case, farm organizations often do not have enough knowledge of the export dates, import regions, export volumes, or export pathways for their agricultural products.

<sup>9</sup> Yam exports to Taiwan declined after peaking in 2002, due to a gradual expansion of other export markets, such as Singapore and the United States. However, as Taiwan remains the largest export market for Japanese yams, this country is the focus of the current study.

<sup>10</sup> Exports to the United States are destined for Chinese retail outlets in Los Angeles. In addition, while the T agricultural co-operative did begin exporting to Singapore on a trial basis in 2009, the export volumes were small.

<sup>11</sup> *Ditylenchus dipsaci* is a type of nematode that damages root vegetables, resulting in lacerations and deformities.



<sup>12</sup> This information was gathered through interviews by author with the co-operative in February 2010.

<sup>13</sup> Spring harvests of yam crops require sufficient winter snowfall, a condition fulfilled in many jurisdictions of the T agricultural co-operative, which results in harvests occurring twice a year. Some other areas harvest only once per year, in the fall, as there is little or no snowfall.

<sup>14</sup> *Kei-ei Kozo Taisaku Jigyo* (The Measures for Management Structure Project) offers support for repairing production, processing, or distribution facilities, and provides agricultural machinery needed for agribusiness (see the Ministry of Agriculture, Forestry, and Fisheries homepage: *Kei-ei Kozo Taisaku ni tsuite*, [http://www.maff.go.jp/j/keiei/keikou/kouzou\\_taisaku/index.html](http://www.maff.go.jp/j/keiei/keikou/kouzou_taisaku/index.html)). Accessed: March, 2011.

<sup>15</sup> *Nogyo, Shokuhin Sangyo Kyosoryoku Kyoka Shien Jigyo* (The Support Project for Agriculture and Food Industry Competitiveness) offers support aimed at increasing the competitiveness of Japanese agricultural products, thus making domestic production areas and farmers more competitive (see the Ministry of Agriculture, Forestry, and Fisheries homepage: *Tsuyoi Nogyo Dukuri no Shien*, [http://www.maff.go.jp/j/seisan/suisin/tuyoi\\_nougyou/index.html](http://www.maff.go.jp/j/seisan/suisin/tuyoi_nougyou/index.html)).

<sup>16</sup> See the Ministry of Agriculture, Forestry, and Fisheries homepage: *Yushutsu Sokushin Taisaku no go Shokai*, [http://www.maff.go.jp/j/export/e\\_intro/index.html#zigyou](http://www.maff.go.jp/j/export/e_intro/index.html#zigyou).

<sup>17</sup> See the Ministry of Agriculture, Forestry, and Fisheries homepage: *Heisei 17nendo Ko Model, Senshingata Jigyo Jigyo Hyoka Kekka Ichiranhyo* (List of results of project evaluations of models and highly developed businesses in 2005),

[http://www.maff.go.jp/j/seisan/suisin/tuyoi\\_nougyou/t\\_zigyo\\_hyouka/pdf/h17\\_k.pdf](http://www.maff.go.jp/j/seisan/suisin/tuyoi_nougyou/t_zigyo_hyouka/pdf/h17_k.pdf).

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