VG624
A market profile of the Japanese melon industry

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Know-how for Horticulture™

VG624

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Executive summary

1. The purpose of this paper is to assess whether Australia should proceed with investing in a disinfestation program for melons in order to access the Japanese market.

2. A detailed price analysis can be made of the Japanese market for melons using annual data relating tp production, imports and wholesale markets. Monthly data relating to imports and wholesale data can be used to further focus the price analysis. Wholesale data from the markets which constitute the Tokyo wholesale market system can be used as it represents national trends.

3. Annual production of melons is declining.

4. Annual imports increased until 1994 after which they have declined. Annual CIF landed prices for imports have nearly halved in the ten years to 1995. Current landed prices are around Yen 120 /kg.

5. Imports from New Zealand are very low in volume but command a premium compared with the volume suppliers from Mexico and California.

6. Annual data from the wholesale market system is not encouraging. Throughput and prices are both declining, not a positive sign for future prospects. The bursting of the "Bubble Economy" at the end of the 1980s has had a major impact on melon prices.

7. Annual wholesale consumption of melons is declining in both volume and total expenditure.

8. Monthly import data show that there are major windows of opportunities for melons. New Zealand supplies in the first three months of the year and gains a price premium of around 25 percent compared with product which arrives later in the year.

9. Monthly wholesale data are available for seven varieties of melons. In the main the data show that prices are higher in the first part of the year and drop quickly when volumes start to flow.

10. Of the seven varieties, the high priced ones are *Earls, Andes* and *Prince*. However, *Homerun, Honeydew, Kinsho* and *Amasu* are either low priced or low volume.

11. Melons are subjected to considerable changes in consumer tastes. In ten years a total of 13 varieties were considered to be of sufficient volume that their wholesale performance was recorded. However, data was only available for seven in 1995.

12. Any wholesale data must be discounted by around 30 percent in order to establish the CIF landed price.

13. An examination of five regional centres throughput Japan shows that there are marked regional preferences for specific varieties in terms of either volume and/or price.

14. Domestic shipping standards for the Prince variety show the market preference for a smaller size melon. Red/orange fleshed varieties are currently popular but flesh colour is a variable issues. Netted varieties are the more popular types.

15. Despite the points raised in paras.#7-#11 above, the overall view is that the market for melons in Japan is not optimistic over the medium to long term. This is notwithstanding the success of specific varieties at specific marketing periods.

16. The conclusion is that the investment of industry money to fund disinfestation research which may allow the Australia melon industry to access the Japanese market is not recommeded.

1. Objective

This paper provides a market-based analysis of the Japanese melon industry.

Its objective is to establish a market profile of melons in Japan. From this it should be possible estimate the future prospects for melons in Japan.

2. Approach

The paper uses a three-phase approach.

Phase One is an examination of annual trends. Specifically, it looks at production, import, and wholesale data. This establishes broad demand and supply parameters.

Phase Two uses monthly data to examine the existence of a seasonal window. Whilst seasonality is but one form of a market niche, it is still a very strong indicator that a niche can be developed.

Phase Three looks at other issues which affect future supply and demand parameters.

3. Data

Japan has four suites of data which involve melons:

* production
* import
* wholesale
* retail

Of the four, the most extensive data relate to wholesale. The next most extensive is that relating to production, then imports, and finally retail.

Production data is only published annually and therefore has no role in this paper once the annual data has been examined.

Japanese import data suffers from a major weakness in terms of this paper. Up until the December 1995, the data was expressed at the nine-digit level of the Harmonised Code. Even then the data related to "melons (including watermelons)". Whilst trade sources interviewed in Japan indicated that the bulk of imports were of melons and not watermelons, the fact remains that the data do not distinguish between the two. Data after 1996 do delineate between "melons" and "watermelons". However, the short time period since then does not allow for any meaningful comment to be made.

Retail data is considered the least reliable of the four data types. This is because the retail system encompasses such a wide range of outlets that average data becomes meaningless. In addition, retail data has to handle issues as general and specific loss leadering, intra-store pricing differentials, inter-store pricing policies associated with geographic location, and promotional activities involving cooperative action with the supplier. For these reasons, this paper ignores retail data.

Japanese production and import data do not delineate between varieties, a major element in this paper, whereas wholesale data does.

This paper places a great deal of emphasis on wholesale data emanating from the Tokyo central wholesale system. Three reasons are given for this emphasis.

(i) **Wholesale market data.** In the main the Japanese wholesale system is very transparent. There may be are issues relating to rebates, *sakidori*, and *yoyakuaitai*[1] but these do not disguise the fact that the prices which result from the wholesale auction system are strongly representative of the actual prices and fairly present essential supply and demand trends.

(ii) Wholesale market system. Three sets of data are available which relate to Japan's wholesale market activities:

* Ministry of Agriculture, Forestry and Fisheries which administers the entire wholesale system.
* Provincial and/or municipal authorities which administer specific market or markets.
* Research institutions and industry service organisations such as the Japan Food Service Association, Japan Food Distribution Research Organisation, and the Research Institute of Retail Industry and Distribution System which include fresh foods in their publications.

Each of the sources have their strengths and weaknesses. On the whole, these evolve around timeliness, extensiveness, and the level of aggregation. This paper concentrates of data issued by the Tokyo Municipal Government, the regulating authority for the Tokyo system. The data is extensive but tends to lack timeliness: as of April 1997 available data only related to December 1995. Less extensive data comes from the Distribution Research Organisation but this has the advantage of including 1996 data. This data included five melons types. There are small differences between the two data sets which reflect the different data collecting methods. Generally, the differences are marginal and do not reflect changes in the directions of price and volume movements. In the analyses presented below, data for 1996 combines both sources.

[1] Variations on the auction system some of which stretch the legal parameters under which they operate.

(iii) **The Tokyo system**. Japan has over 80 central wholesale markets[2]. The Tokyo system comprises 11 markets which handle fruit and vegetables. This system is representative of the country's wholesale markets as it handles between 10-20 of the national total of most fruit and vegetables[3]. Whilst there are differences in the absolute levels of prices and throughput, the trends in Tokyo are representative of the trends throughout Japan.

Varieties

Over the years Tokyo central wholesale market system has reported on different melon varieties:

Amasu	*Andes*	*Cossack*	*Earls*	*Elizabeth*
Homerun	*Honeydew*	*Kinsho*	*Kosashiku*	*Papaya-melon*
Prince	*Quincy*	*Takami*		

In December 1995 the following varieties were reported through the Tokyo Municipal Government system:

Amasu, Andes, Earls, Homerun, Honeydew, Kinsho, Prince

Data for 1996 from other sources dealt with:

Amasu, Andes, Earls, Homerun, Quincy, Prince

This paper provides data on the following melon varieties:

Amasu, Andes, Earls, Homerun, Honeydew, Kinsho, Prince

[2] See ***Inside Japan's vegetable industry*** (Vinning G, 1991. Queensland Department of Primary Industries).

[3] See Vinning G and Kobayashi K (1991) Comparison of wholesale vegetable prices in Australia and Japan. Technical Bulletin of the Faculty of Horticulture, Chiba University (Japan) 44:41-72.

3. Phase One: Annual

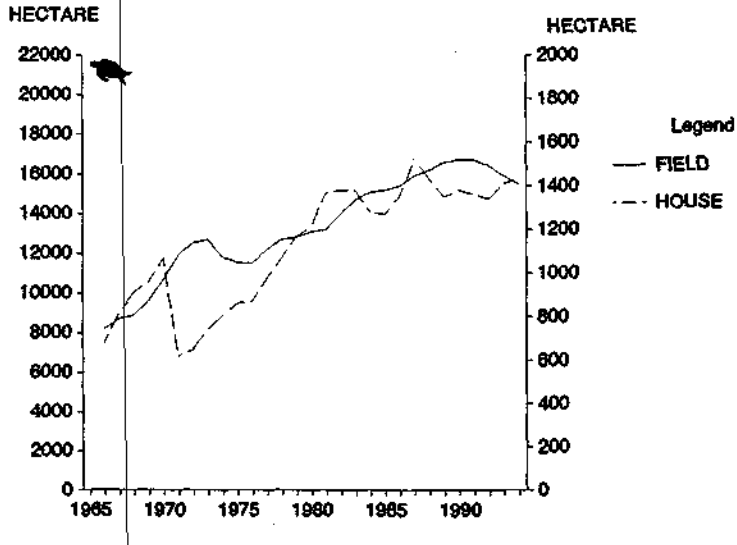
3.1 Production[4]

AREA

Production data on melons relate to "field" and "house". The former refers to melons grown in open field production and the latter to green house production. The definitions do not necessarily relate to varieties although the musk melon variety "Earls melon" is produced nearly exclusively under green house conditions.

Total melon plantings have doubled since detailed statistics commenced publication in 1965. Field plantings appear to have peaked in 1990 whilst house plantings continue to grow, albeit incrementally.

Melons. Area planted to field and house melons: 1965-94

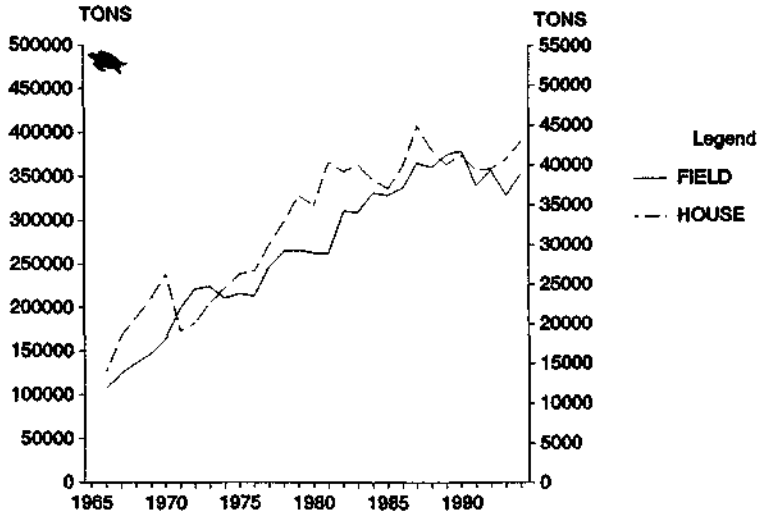


In 1994 plantings to "field" melons were 15 500 ha and to "green house melons" 1 430 ha.

[4] Draws on the **Statistical Yearbooks** of the Ministry of Agriculture, Forestry and Fisheries.

VOLUME

Melons. Production of field and house melons: 1965-94



Production in 1994 of field melons was 353 700 tons. This is a 7 percent increase on the previous year, an increase which occurred despite a decline of 2 percent in plantings. Production from green houses increased to 43 000 t in 1994.

The flattening trend in production from the mid-1980s is understandable. Japanese farmers are aging and melons are essentially a cumbersome crop which discourages the older farmers from entering production. In addition, the small size of most farms inhibits the use of labour saving devises thus offering no relief for the older farmers.

Despite their high per unit market value, a surprisingly small percentage of total melon plantings occur under protected production. Melon production in glass/vinyl houses is labour intensive with little room, literally as well as allegorically, for labour saving devices. The halving of green house planting in the early 1970s reflected the rapid rise in heating costs associated with the oil shock. Some varieties are grown in tunnels which are semi-circle structures about a metre high made of vinyl and offer crude protection against wind, rain, and bird damage. Tunnel production results in a high percentage of fruit set and early ripening.

Concentration ratio, or the measure of total production which comes from the four largest producing prefectures, is used to give an indication of the susceptibility of a crop to localised natural phenomena. Ratios greater than 35 percent suggest that localised weather factors such as drought or, more commonly cyclones, could affect national production and thus prices. With a concentration ratio over 60 percent, a relatively high proportion of field melons are grown in the four biggest producing prefectures of Kumamoto (in the far south), Ibaraki (east of Tokyo), Hokkaido (in the far north), and Aichi (on the mid-east coast).

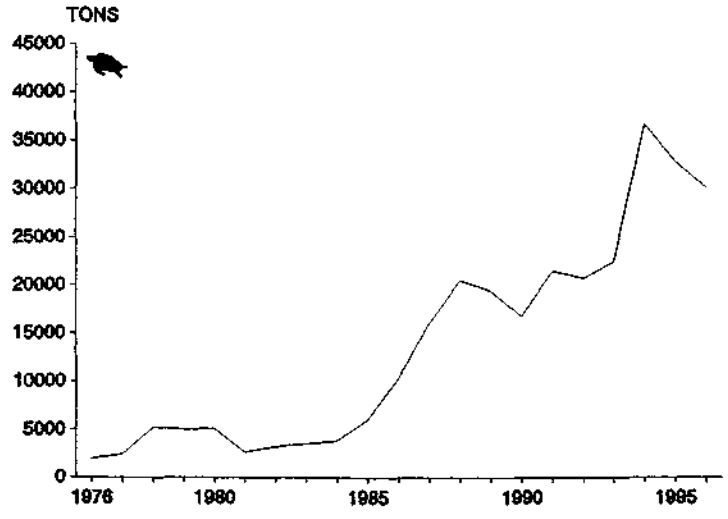
This figure has remained relatively static over the past two decades despite the relative rise of Kumamoto.

Nevertheless, with production being spread nearly equally between the south, central, and north, field melons are not susceptible to regional weather factors. With house production, Shizuoka, on the mid-east coast, produces over 40 percent of the national total and Aichi, which is contiguous to Shizuoka, produces 20 percent of house melons. This would normally suggest price sensitivity to local production variations. However, being produced in glass houses means that the melons are not really susceptible to natural phenomena.

3.2 Imports[5]

Melons imports have grown significantly over the past 15 years to the current level of around 30 000 t.

Melon imports: 1978-96



The steep increase in the mid-1980s was a result of what the Japanese call *endaka*. This is when the United States forced Japan to revalue its currency in an effort to reduce its trade surplus. The sudden artificial re-evaluation reduced the price of a number of products making their importation cheaper. Fruit, such as cherries, mangoes and melons, experienced a surge in imports. By the end of the decade the novelty effect had worn off. At the same time Japan's convoluted distributed system militated against the passing on of cheaper import prices. Most of the products whose imports soared during this period reverted back to their pre-*endaka* patterns, albeit at a higher plateau.

[5] Draws on data provided by the Japan Tariff Association. Again, it is noted that melon import data include watermelon.

As the above figure shows, melon imports continued to grow strongly after the initial *endake* effect. Equally importantly, melons appear not to have suffered with the bursting of the "Bubble Economy" in the late 1980s and import volumes continued to surge.

The term "Bubble Economy" refers to the 1980s when everything Japanese businesses touched turned to gold: the economy boomed, share prices climbed, land prices soared, unemployment was unheard of, and the major economic problem was the size of the trade surplus. From the individual consumer's perspective the consumption ethos was one of affluence and conspicuous consumption. By 1990 the bubble had burst and Japan entered recession.

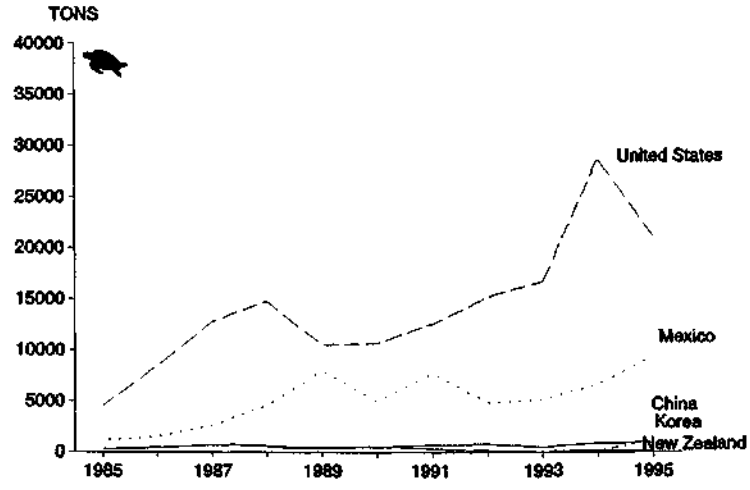
Whilst the annual volumes of melons imports has grown, the annual C.I.F., that is the landed price, has suffered from both *endake* and the "bubble burst".

Melons. Annual C.I.F. prices: 1985-96

C.I.F. prices have nearly halved in the period 1985 to 1995. Despite Japan's low rate of inflation, the decline in real terms would be greater than 50 percent.

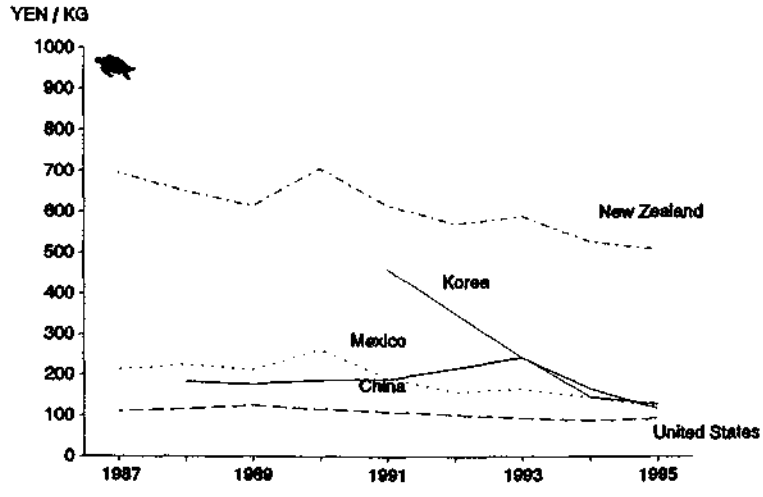
The United States consistently provides more than 50 percent of all imports. Of this volume about 90 percent are *Honeydews*. However, Mexico is emerging as a significant source.

Melon imports by origin and volume, 1985-95



Whilst New Zealand is a minor importer by volume, it commands by an outstanding margin the highest values.

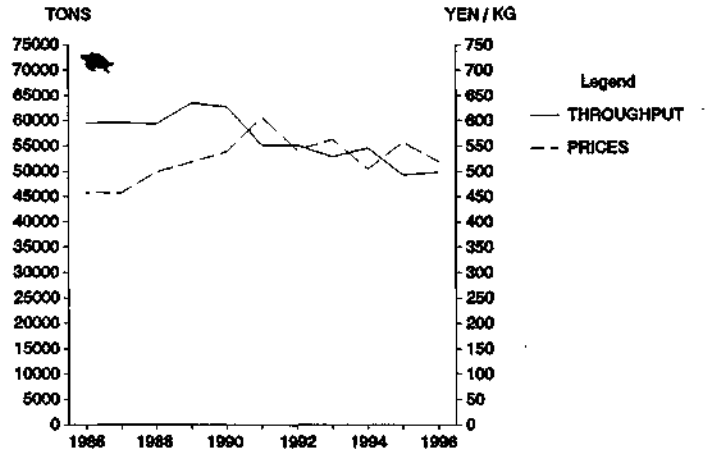
Melon imports by origin and value, 1985-95



3.3 Wholesale marketing

The annual volume of melons marketed through the Tokyo wholesale system has declined by about 15 percent for the ten years to 1996. In contrast, prices have increased by about 20 percent over the same period.

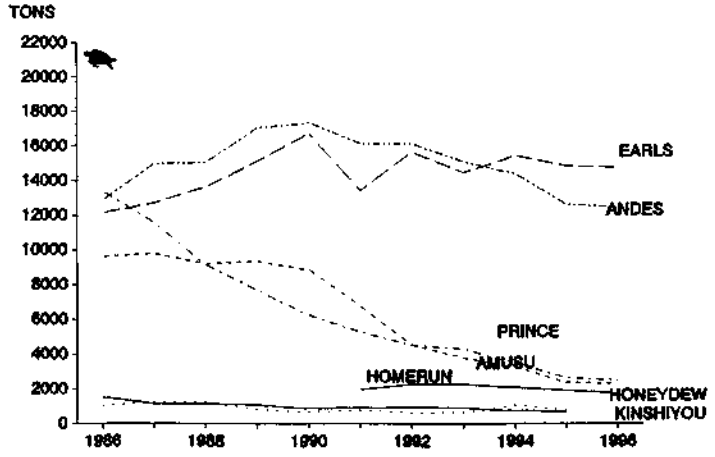
Melons. Annual throughput and prices, Tokyo: 1986-96



From 1986-91 the increasing prices were associated with the flattening rate of production growth. The decline after then is attributed to the bursting of the "bubble" economy.

Japan has a highly segmented melon market.

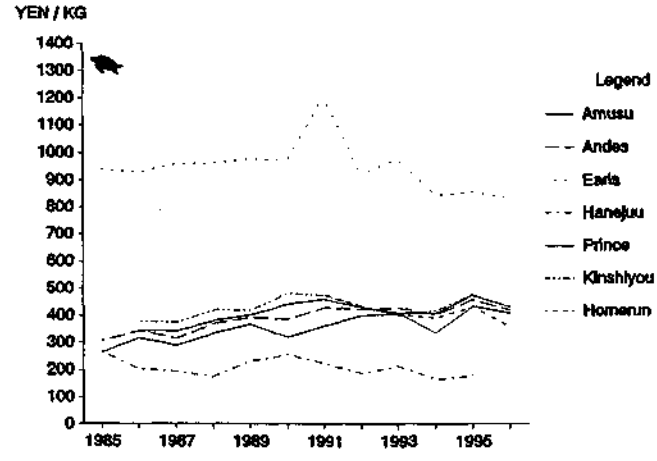
Melons. Annual wholesale markets throughput by types, Tokyo: 1986-96



In volume terms, there is a three tiered market. On one tier there is *Earls* and *Andes*. Annual wholesale volume through the Tokyo system is around 12 000 tons. *Amusu* and *Prince* with a turnover of around 3 000 t are on a second tier, whilst *Honeydew* and *Kinsho* constitute a third tier of about 1 000 tons.

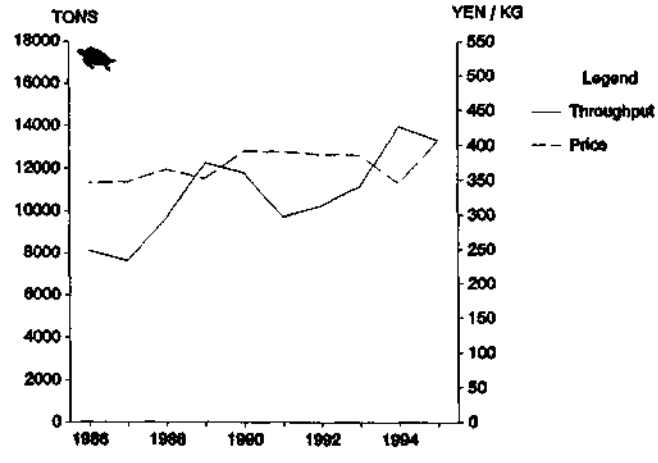
In value terms, *Earls* melons are in a sector by themselves. Annual average wholesale prices are around Yen 900 /kg. The other types constitute a broad second tier with prices around Yen 300-400 /kg. *Honeydew*, with an average annual wholesale price of around Yen 200/kg is the low priced product.

Melons. Annual average wholesale prices by types, Tokyo: 1986-96



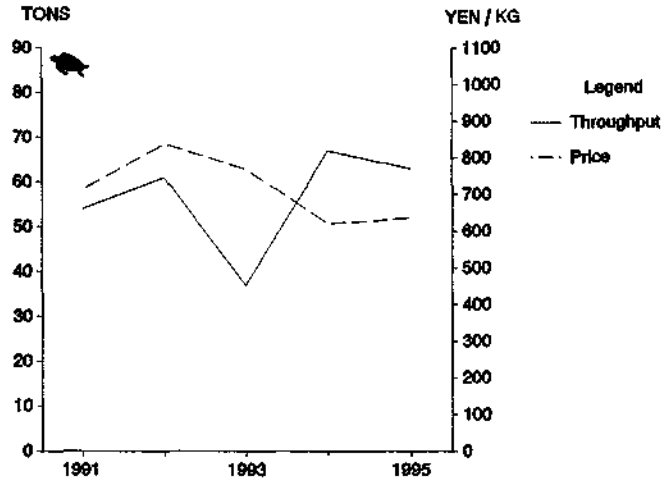
Tokyo's wholesale market data has a category "other melons". The category is significant in that it is the currently the second largest category of all melons and it is the most rapidly expanding category

Other melons. Annual wholesale performance, Tokyo: 1986-95



A number of imports are identified in the category "other melons": New Zealand, United States, China, Mexico, and Thailand. New Zealand is by far the largest supplier. The prices received by New Zealand are considerably higher than those received by other suppliers.

New Zealand. Annual supply and prices, Tokyo: 1991-95

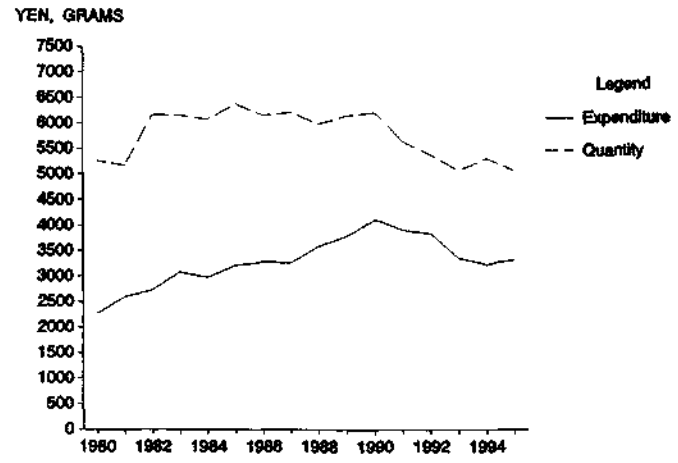


Extrapolating from the supply of New Zealand melons onto the Tokyo wholesale market to the entire Japanese wholesale system and comparing this with the total volume of New Zealand imports, it is estimated that less than a quarter of New Zealand's melons are marketed through the wholesale system.

3.4 Household expenditure

Annual household expenditure data are available specifically for melons. This shows that the quantity purchased and total expenditure increased during the "bubble economy" but there has been a sharp decline in both since the "bubble burst" in 1990.

Melons. Household expenditure, 1980-95



Source: Annual Report on the Family Income and Expenditure Survey, 1995.

The marked decline in the quantity purchased since the 1990 "bubble burst" must raise concern that melons will not revert back to their previous history as a high status consumption item. With a number of house-hold expenditure items, conspicuous consumption ethos of the "bubble economy" has ceased and the new ethos is one of value-for-money. The disconcerting aspect of the above figure is that whilst household expenditure on melons has declined so too has the volume purchased. This suggests that households are becoming wary of spending money on melons.

3.4 Summary - annual data

Annual production data indicates that production has levelled off. Production is not expected in increase and, if anything, is likely to decline.

Import data show a disturbing decline in C.I.F. prices. These are expected to decline in the near-term due to the impact of the "bubble burst" and a flat economy. Whilst New Zealand product is suffering a decline along with the other importers, the fact remains that its prices receive a significant price premium over the other suppliers. This premium has retained its three-fold advantage for the past decade.

Annual wholesale data show the impact of the "bubble burst". Throughput declined during the 1980s and prices increased accordingly. This showed that producers were not producing but consumers were demanding. After 1990 throughput continued to decline. However prices have also declined. In short, producers are not producing and consumers are not consuming.

This downward trend parallels the downward trend in household expenditure where both the volume purchased and the amount spent have moved down sharply since the "bubble burst".

Once has to wonder if the demand for melons and thus the price will increase once the economy picks up.

Earls variety earns a price premium by a factor of two. With the exception of *Honeydew* the other melon varieties receive an annual average wholesale price of around Yen400/kg. The limited annual import data show that New Zealand does well.

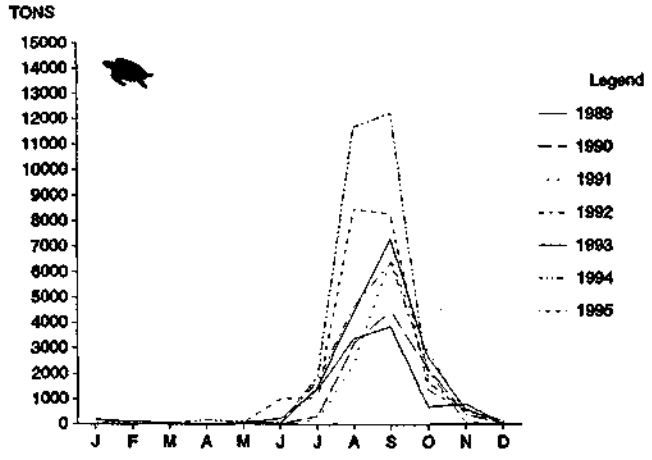
4. Phase Two: Monthly data

There is no monthly production data.

4.1 Imports

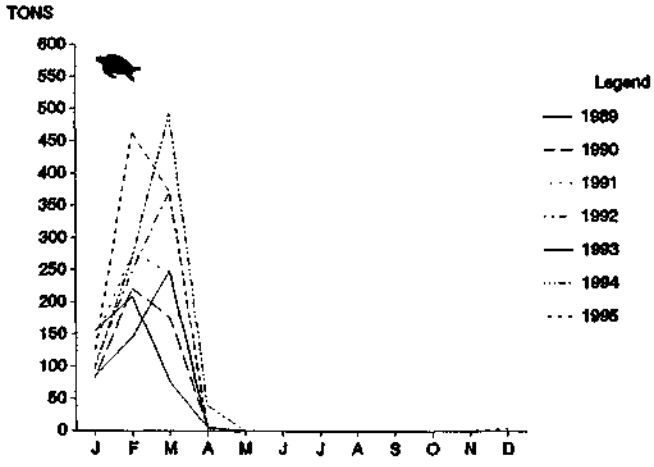
Monthly melon import data show that the most product arrives in August - September.

Monthly melon imports from USA: 1989-95



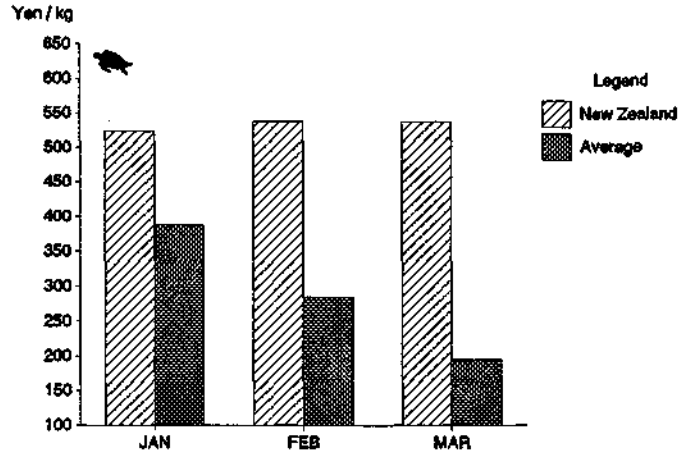
New Zealand concentrates its imports into the January-March period.

Monthly melon imports from New Zealand, 1989-95



This period is highly remunerative. The figure below compares New Zealand's five-year average price for the three months January, February, and March with that of all imports.

Melon imports for three months: New Zealand and all imports



The figure shows that New Zealand's premiums are at least 25 percent.

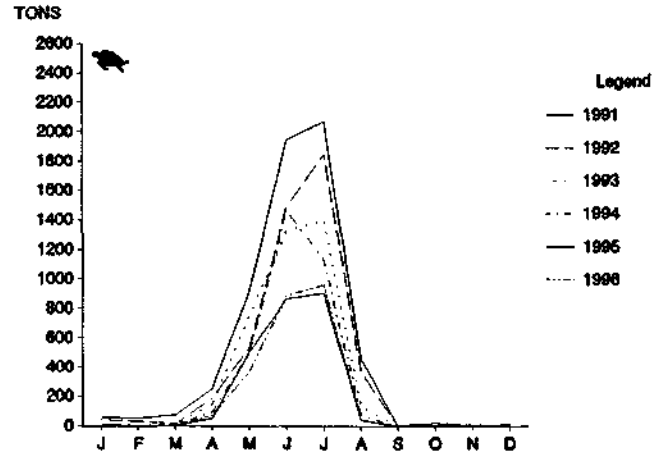
4.2 Wholesale markets

The following analyses the wholesale monthly data for seven melon varieties.

4.2.1 Amasu

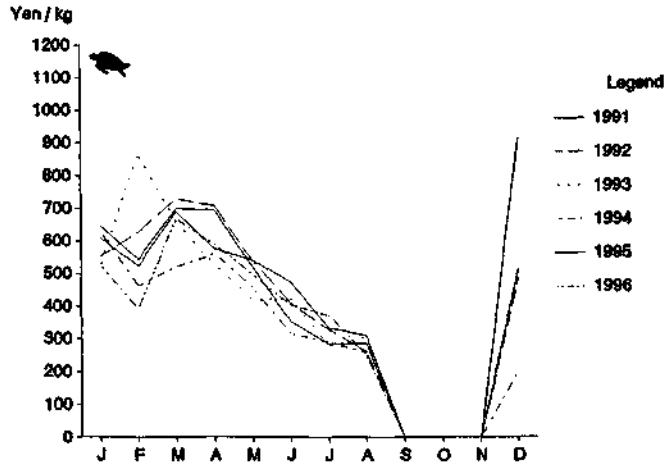
Amasu used to be supplied on a year-round basis. This has gradually shrunk to the spring-summer period of May-June-July.

Amasu. Monthly throughput, Tokyo: 1991-96



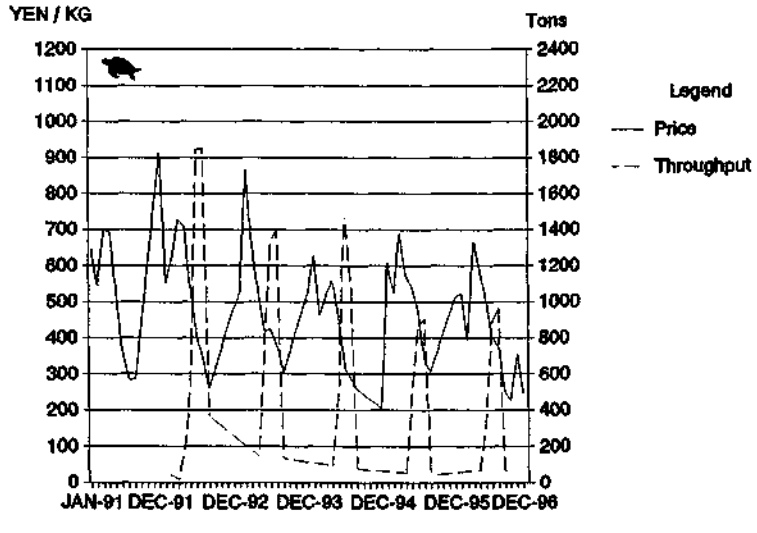
Prices are highest in the four months January-April. The lowest priced month of August is also the month with the lowest supply indicating the influence of competing fruit in the late summer-autumn period.

Amasu. Monthly prices, Tokyo: 1991-96 (single-year axis)



Amasu is declining in both volume and value.

Amasu. Monthly prices, Tokyo: 1991-96 (multi-year axis)

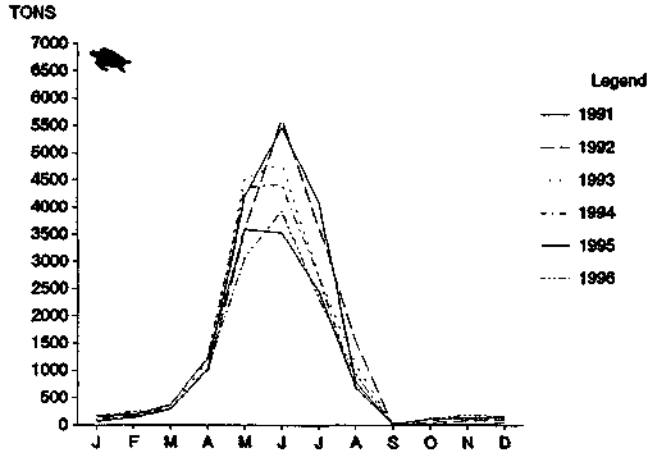


The figure shows declining peaks in monthly price and volume. This does not bode well for the marketing future of the *Amasu* variety.

4.2.2 Andes

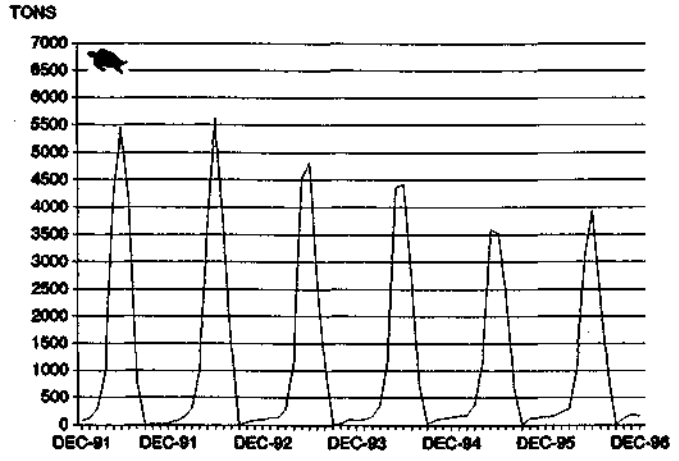
Andes has a close net, is firm fleshed, and is very sweet. It is usually grown in glasshouses. *Andes* is currently the second largest volume melon variety traded through the Tokyo wholesale system. There is year-round supply and the degree of throughput concentration is less than most other varieties.

Andes. Monthly throughput, Tokyo: 1991-96



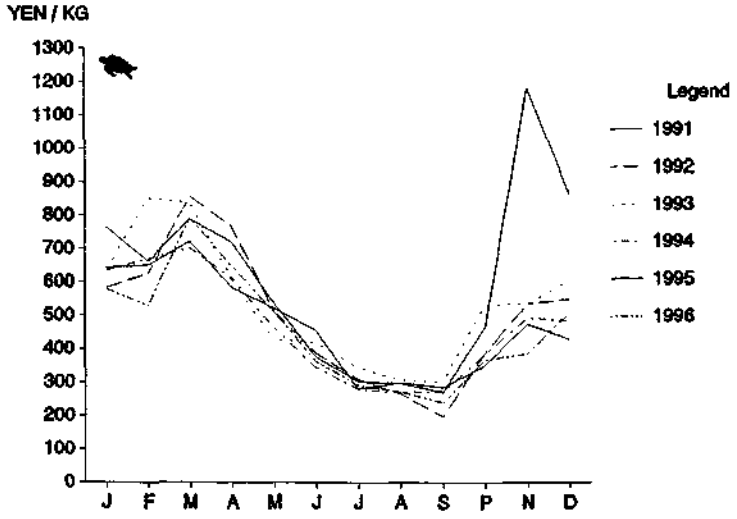
The steady decline in annual throughput is shown below.

Andes. Monthly throughput, Tokyo: 1991-96 (multi-year axis)



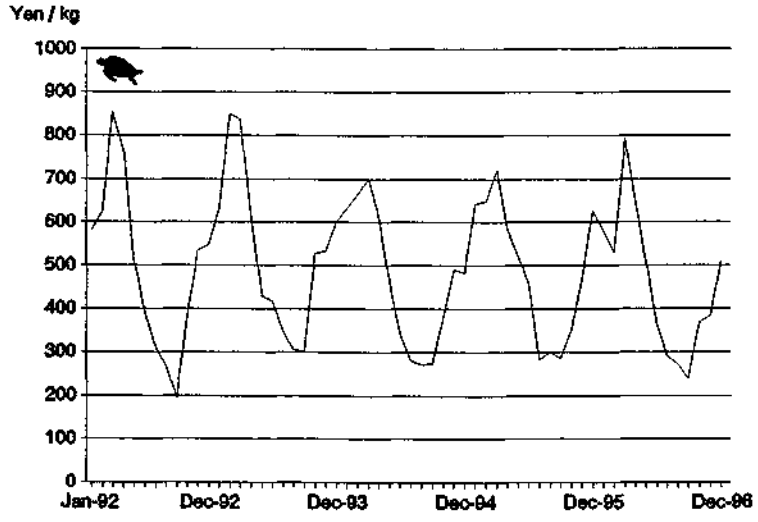
There has been some effort to increase supplies in the off-months with supplies in November-February trebling over the six years to 1996. Monthly prices are highest in the late winter-early spring period.

Andes. Monthly prices, Tokyo: 1991-96 (single-year axis)



Prices range from Yen 300-800 /kg and show marked seasonality. The peak prices occur in January to April and then drop rapidly as supplies build up in May to July.

Andes. Monthly prices, Tokyo:1992-96 (multi-year axis)



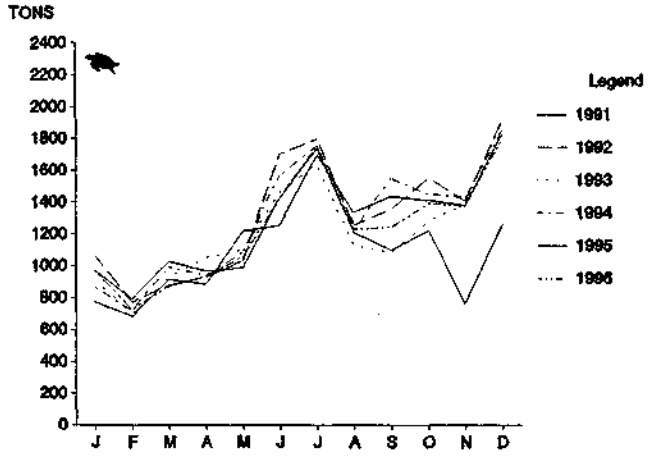
Using the peak-price concept, the above figure shows it is difficult to establish if prices are trending downwards. On the other hand it appears that the period of high prices is widening a little, moving out into May and then starting again in September.

4.2.3 Earls

Earls melon is the variety which retails for stratospheric prices in Japanese department stores: Yen 20 000 for a boxed gift pair are far from uncommon. It is a clean net melon with a pale green flesh.

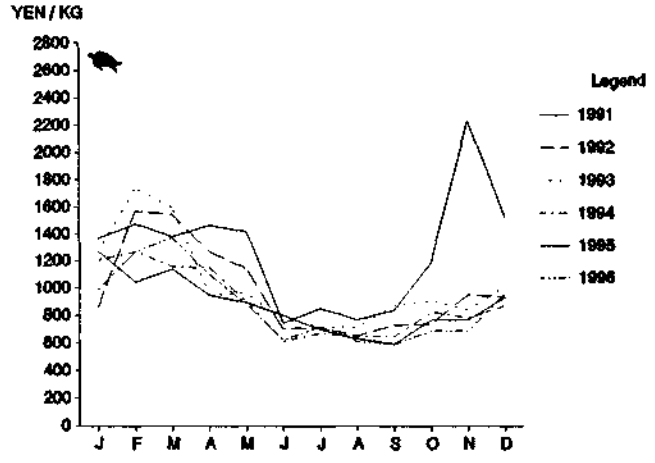
Throughput rises in spring, peaking in mid-summer. There is a second peak in December. These two periods are the Japanese gift giving seasons of *Chugen* (mid-year) and *Seibo* (year-end). Japanese delicacies, such as *Earls* melon, are popular gift items.

Earls. Monthly throughput, Tokyo: 1991-96



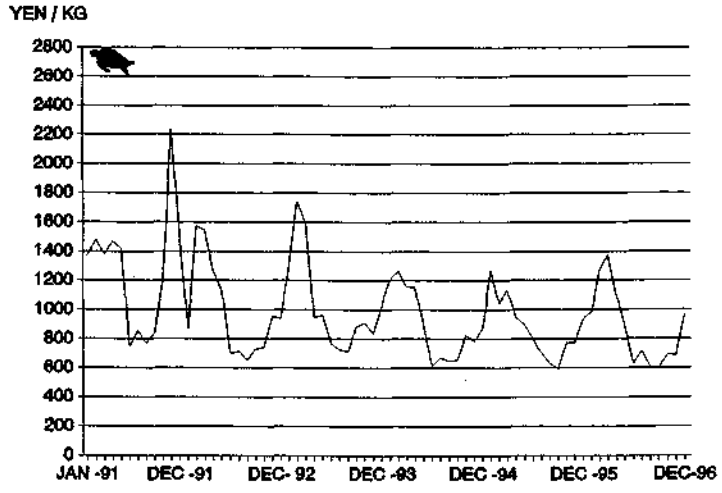
Monthly wholesale prices are highest in late winter-early spring, starting at around Yen 1200 /kg and falling to about half that as the season progresses.

Earls. Monthly wholesale prices, Tokyo: 1991-96 (single-year axis)



Despite their high prices, there is evidence that *Earls* are losing their gloss. Annual peak prices are gradually declining: in 1993, 1994 and 1995 they were Yen 1200-1400 / kg compared with over Yen 1600 /kg two years earlier. The data suggests that it would appear that *Earls* are a victim of Japan's flat economy. Demand is likely to remain suppressed at least until the economy picks up considerably.

Earls. Monthly wholesale prices, Tokyo: 1991-96 (multi-year axis)



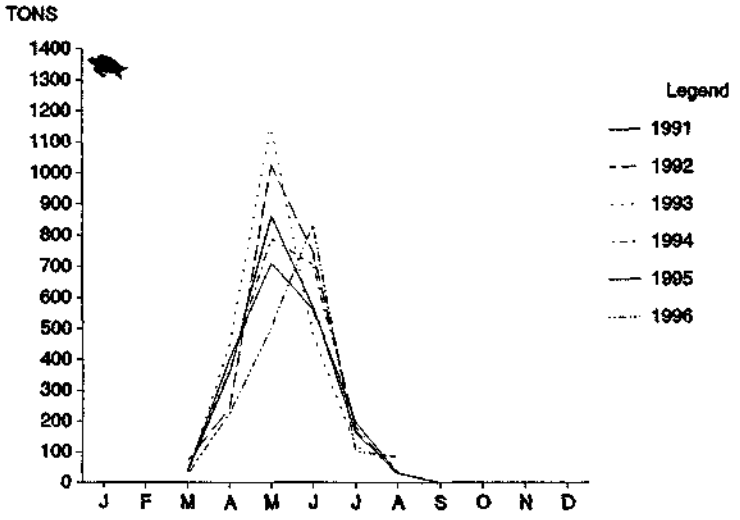
Earls hold a special place in the Japanese psyche. It is melon of choice when prestigious gift giving is involved. Indeed, it is likely that should its price drop demand will actually fall as it will not been seen as being greatly prestigious. This unusual phenomena will limit *Earls* ability to move into the wider mass market. For this reason it is considered that there will always be a market and a very high priced one at that for *Earls* but this is will be a limited market.

Again, it is stressed that Earls are quintessentially Japanese. Even though an importer may supply an *Earls* melon grown from seed supplied from Japan and grown precisely to specific detailed Japanese instructions under Japanese supervision, it is still not a Japanese *Earls* melon. It will not have the crown-shaped logo on its label and it will not have the individual grower's number. For this reason it is considered that whatever the price the *Earls* melon commands it will not be a market for non-Japanese suppliers.

4.2.4 Homerun

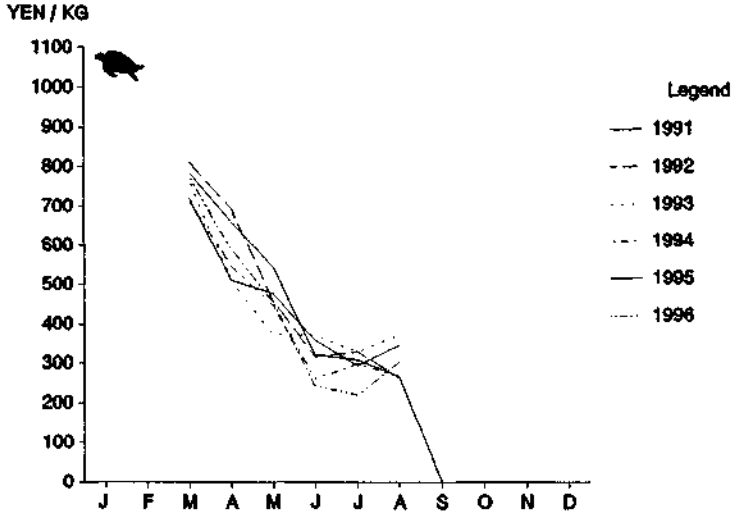
Homerun was developed to slot into a slightly later time period than the *Prince* variety. Its season starts in March, a month later than *Prince*, and goes to August, again, a month later than that of *Prince*.

Homerun. Monthly throughput, Tokyo: 1991-96



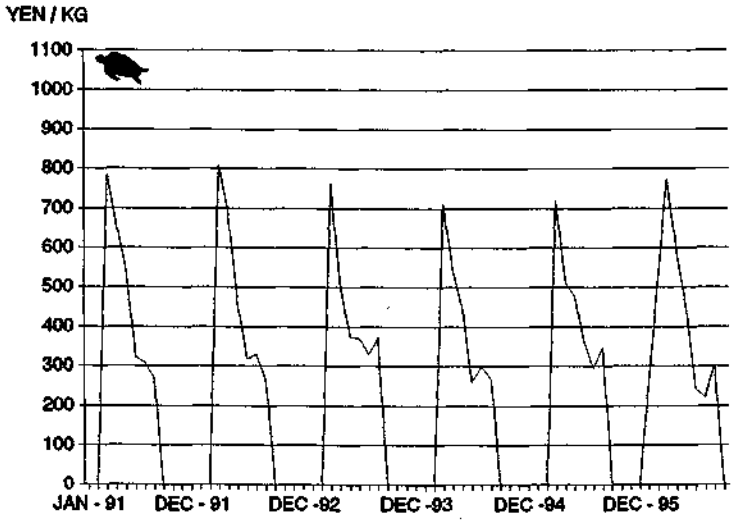
Monthly prices of *Homerun* are not as high as those of *Prince* but unlike *Prince*, they hold up higher into July and August.

Homerun. Monthly prices, Tokyo: 1991-96 (single-year axis)



Whilst there has been a decline in peak prices over the period 1991-96, the decline is very slight.

Homerun. Monthly prices, Tokyo: 1991-96 (multi-year axis)

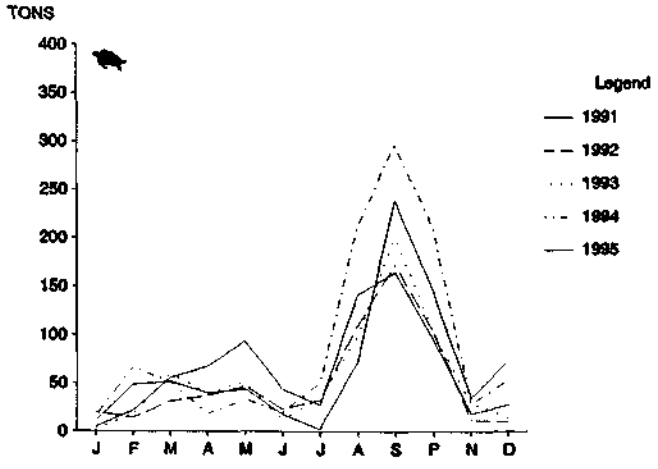


There appears to be no imports of *Homerun.*

4.2.5 Honeydew

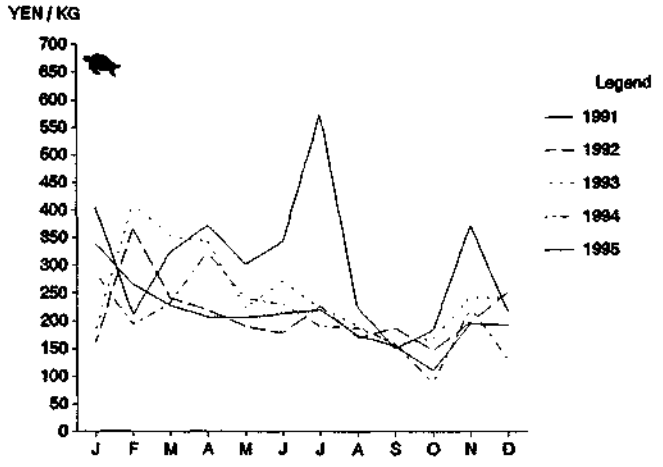
Honeydew is a minor melon. In 1995 its throughput was less than 2 percent of all melon throughput and its price was a low Yen 250 /kg. Unlike the other melon varieties, *Honeydew* is supplied over a large number of months. This is feasible because a considerable volume is imported. Nevertheless, more than 50 percent of all arrivals on the Tokyo wholesale market occur in the three months August-October.

Honeydew. Monthly volume through Tokyo wholesale system: 1991-95



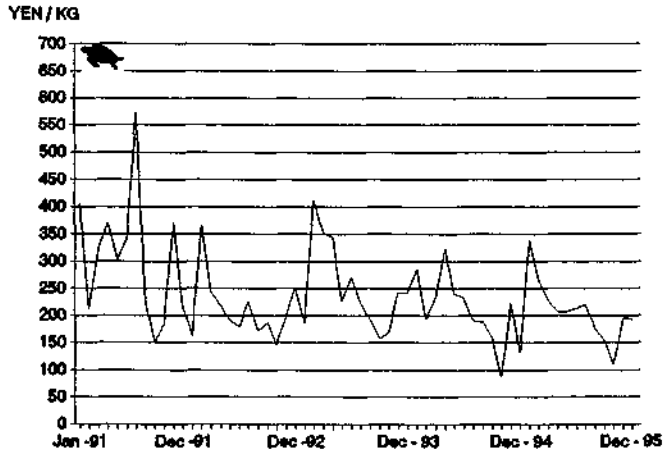
Prices move from a high of around Yen 300 /kg in late winter-early spring to a low of around Yen 150 /kg in late autumn.

Honeydew. Monthly wholesale prices, Tokyo: 1991-95 (single-year axis)



Over the five year period 1991-95[6] monthly prices have shown a continuing decline.

Honeydew. Monthly wholesale prices, Tokyo: 1991-95 (multi-year axis)



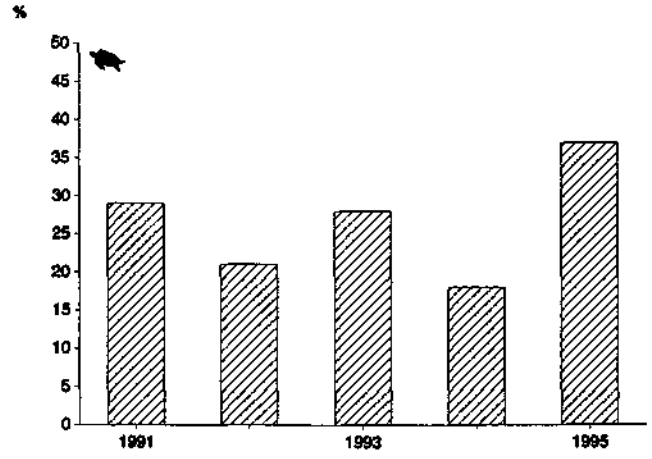
[6] As evidence of its minor status *Honeydew* data was only available from the one source which limited the analysis until 1995.

Imports

Data enables an analysis of the supply of *Honeydew* from non-Japanese supplies within the wholesale system.

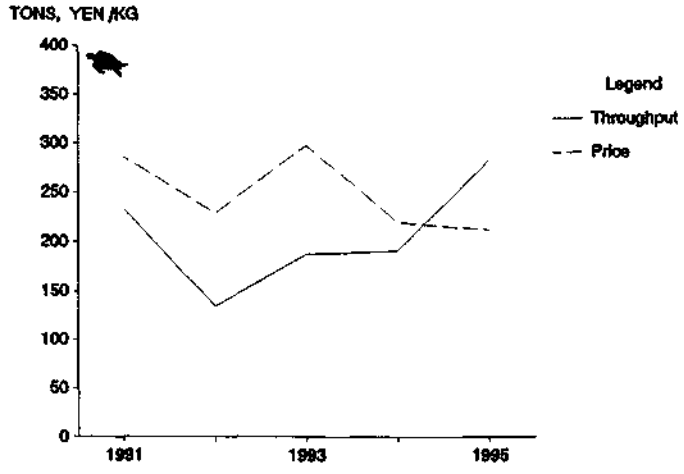
Mexico is the major non-domestic supplier to the Tokyo market. Its share of the market has varied from 17-36 percent over the five years to 1995.

Honeydew - Mexico. Percentage of annual throughput, 1991-95



The throughput of Mexican product has increased in the four-year period 1992-95. Whilst prices have declined, the decline is not as great as the increase in volume. This suggests that there is a good demand for the variety.

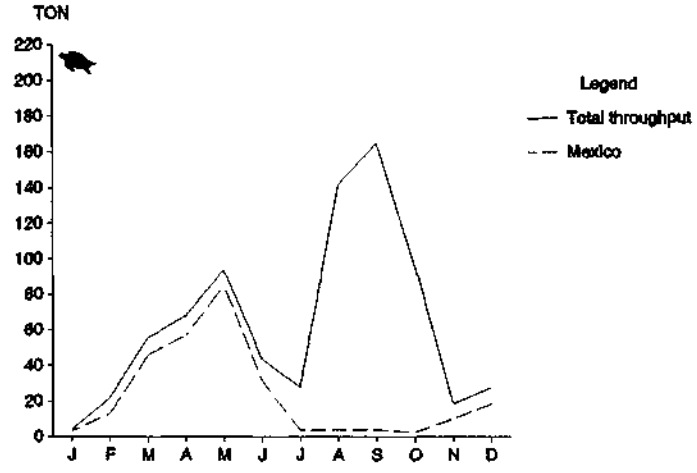
Honeydew - Mexico. Wholesale performance, Tokyo: 1991-95



In 1995 Mexico supplied 282 tons or 36 percent of Tokyo's total throughput at an average annual wholesale price of Yen 212/kg. This was considerably higher than the average annual wholesasle price of Yen 161 /kg which the domestic *Honeydew* earned.

For the first six months of the year Mexico is virtually the sole supplier as it provides over 90 percent of the total throughput.

Honeydew - Mexico. Monthly throughput, Tokyo: 1995



In contrast, Mexican prices tend to parallel total prices for the whole of the year.

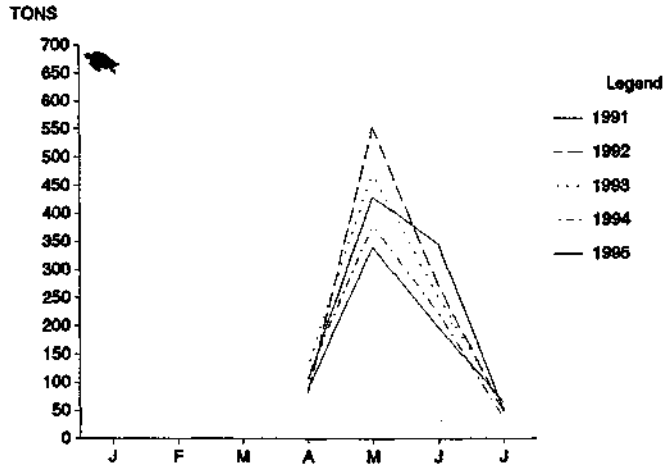
Honeydew - Mexico Monthly prices, Tokyo: 1995

4.2.6 Kinsho

Kinsho is a hybrid of Oriental and Spanish-type melons. Its flesh is white, firm and crisp.

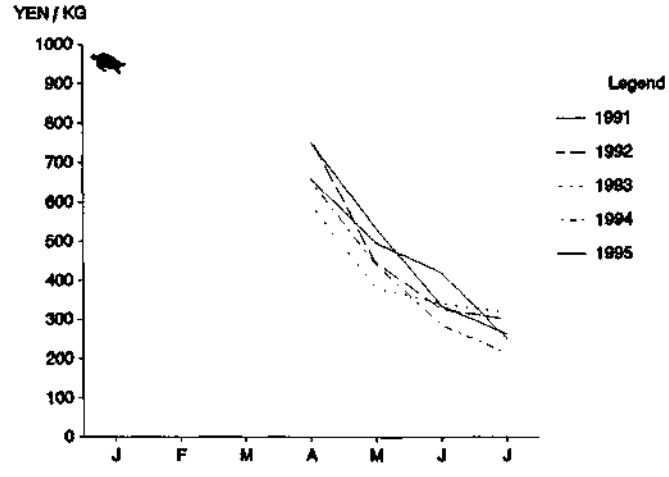
Throughput is highly seasonal with over 90 percent arriving at the markets in the four months April to July.

Kinsho. Monthly throughput, Tokyo: 1991-95



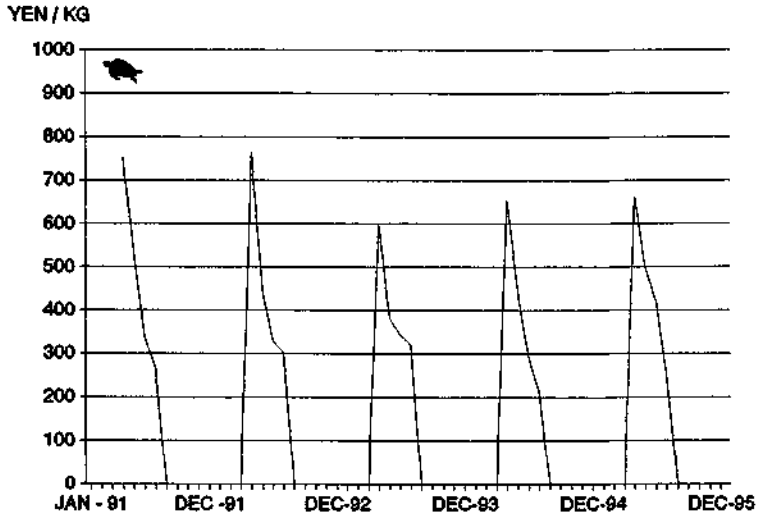
Prices collapse very quickly once product comes on-stream. They start around Yen 800/kg and quickly drop to around Yen 250/kg. August's low prices are disproportionately low compared with throughput. This suggests strong competition from other fruit and indicates that *Kinsho* is not considered a major consumption item.

Kinsho. Monthly prices, Tokyo: 1991-95 (single-year axis)



It is difficult to detect any trend in the movement of peak prices.

Kinsho. Monthly prices, Tokyo: 1991-95 (multi-year axis)

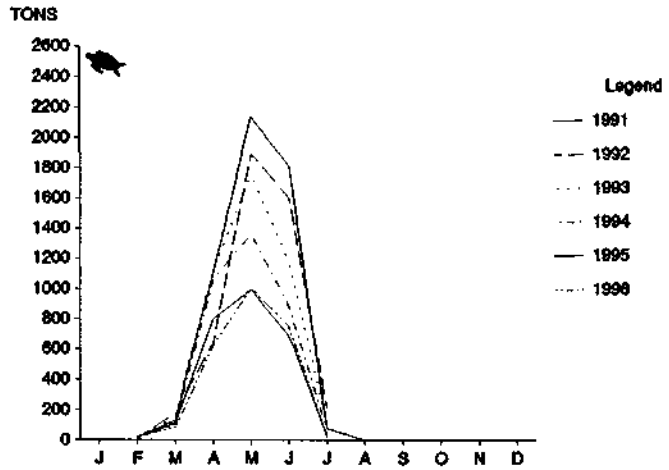


4.2.7 Prince

Prince is a cross between the *Makuwauri* Oriental melon and European cantaloupe-type.

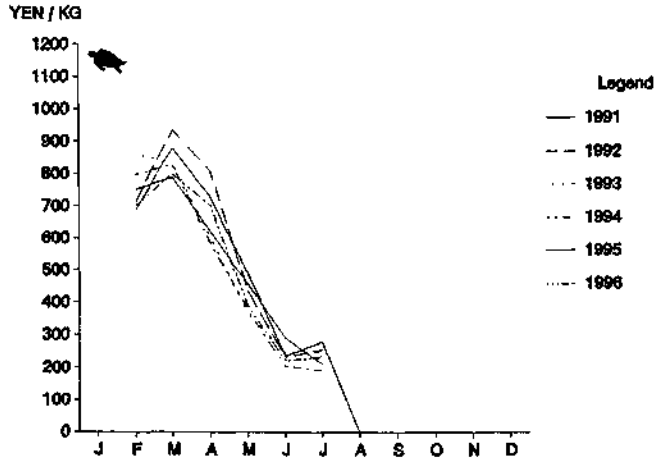
Throughput is highly seasonal. About 80 percent of throughput occurs in the three months April-June. By August volume drops to less than a ton.

Prince. Monthly throughput, Tokyo: 1991-96



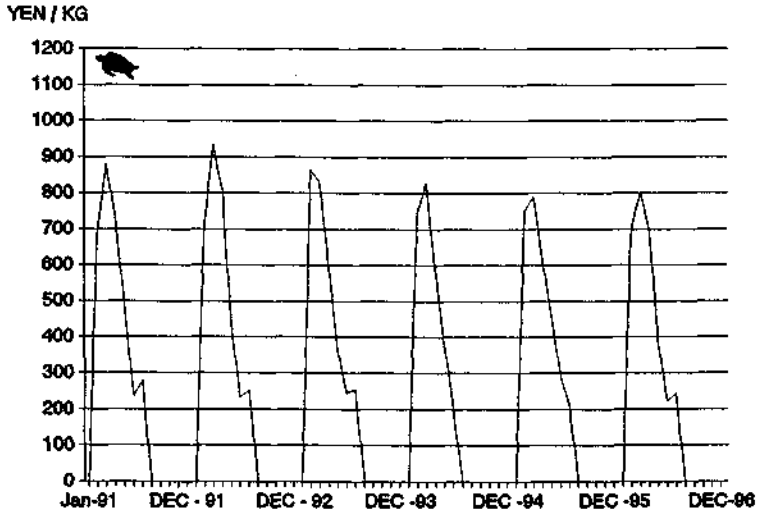
Monthly prices reflect the highly seasonal throughput. They hold up relatively well around Yen 600-800/kg for the three months February - April, even May, but collapse to Yen200 -300/kg in June-July.

Prince. Monthly wholesale prices, Tokyo: 1991-96 (single-year axis)



Over the six years 1991-96, the peak monthly prices in March and April have declined marginally.

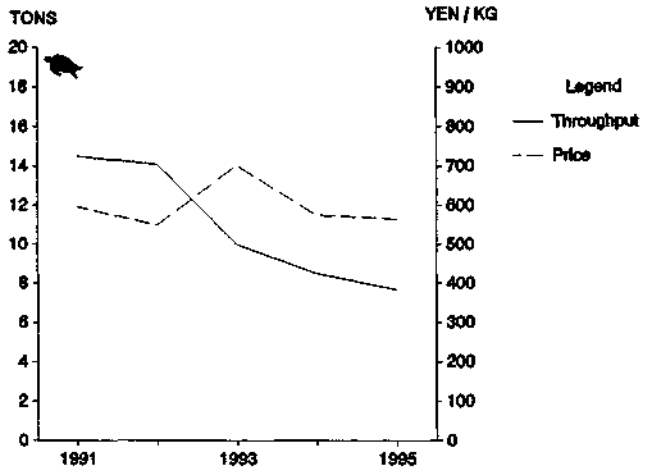
Prince. Monthly wholesale prices, Tokyo: 1991-96 (multi-year axis)



Non-Japanese supplies

New Zealand has tried to enter this market in the low supply period January to March. The data show that New Zealand's volume has shrunk from 14 tons in 1991 to less than 8 tons in 1995. Prices have stayed relatively flat at around Yen 600 /kg

Prince - New Zealand. Annual throughput and prices, Tokyo: 1991-95



It is repeated that this market is probably only a quarter of total New Zealand exports to Japan. Further, the wholesale outlet would have to be considered the low price option.

4.3 Summary

Monthly import data show that the high-priced period is January to March. Monthly wholesale data show that this is the high priced period for all seven varieties, albeit the trend for *Honeydew* is harder to identify.

In terms of individual varieties, the following conclusions are reached:

* *Amasu* is declining in both volume and value.
* *Andes* is a high volume melon whose price is maintaining its value.
* *Earls*, despite its absolute high price, is facing a downward price trend.
* *Homerun* prices hold up well later in the year, albeit at a medium range.
* *Honeydew* is a low volume-low price melon with declining prospects.
* *Kinsho* is a low volume-low price melon.
* *Prince*, a medium volume-medium priced melon, is best before April.

The data shows that there is considerable movement in melon preferences. To gain an understanding of the likely future prospects of any specific variety a detailed consumer study would have to be undertaken.

It should also be remembered that wholesale prices are at least 30 percent greater than that of the CIF landed price. The latter price is the one which prospective importers should concentrate on. More detailed distribution channel costs are required before the wholesale prices can be converted to specific target prices for potential exporters.

5. Inter-city comparison

Consistent, albeit dated[7], time series data for melons are available from the Ministry of Agriculture, Forestry, and Fisheries for all central wholesale markets in the major cities. There are small differences in specific data between this source and the other two but as the trends are in the same direction, the differences are ignored.

The data refers to four melons:

* "melons"
* *Prince*
* *Andes*
* *Amasu*

The category "melons" refers to green-house melons. As this is not specifically a variety, it is ignored.

Data has been taken for the five cities into which Qantas flies:

* Sapporo on Hokkaido in the far north
* Tokyo
* Nagoya in mid central eastern region
* Osaka in western Japan
* Fukuoka on Kyushu in the south

The data state the size of the population serviced by the specific market:

Sapporo	1 719 210
Tokyo	11 541 346
Nagoya	2 091 143
Osaka	8 542 624
Fukuoka	1 220 683

This data are important when comparing the volume passing through the various markets.

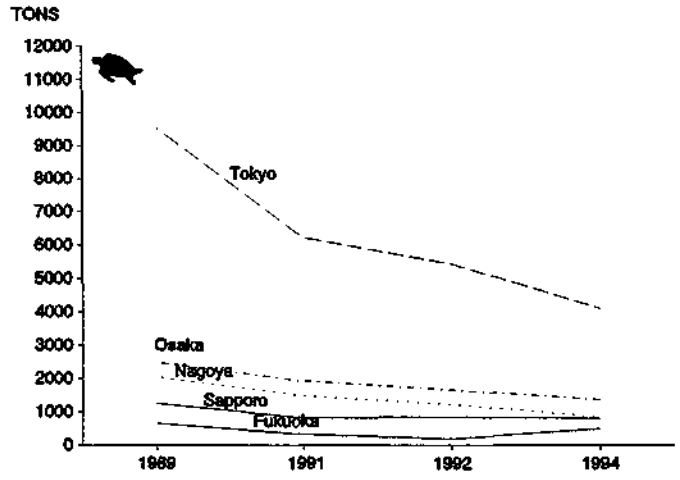
The following compares the differences in throughput and prices for the five cities for the three melon varieties.

[7] Published August 1996 but covering the period up to December 1994.

5.1 Prince

With the exception of Fukuoka, the other four cities are experiencing declines on their throughput.

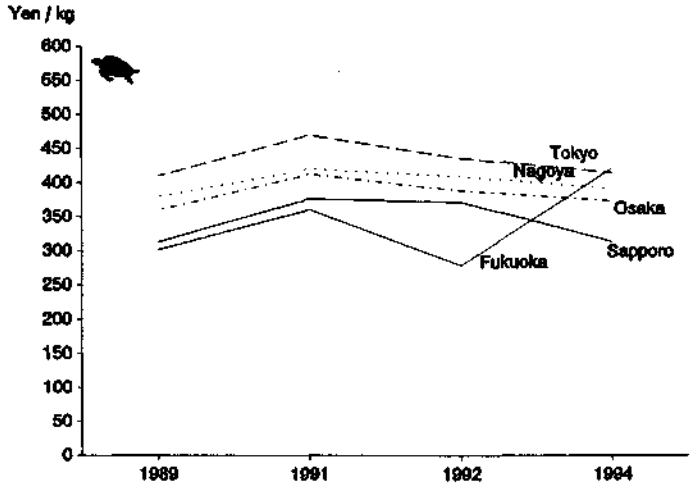
Prince. Annual wholesale throughput for five cities, selected years



As to be expected, Tokyo has the greatest throughput whilst given its population, Osaka's throughput is surprisingly small. The figure suggests that per capita throughput in Nagoya, Sapporo and Fukuoka are comparatively high.

Annual wholesale prices are highest in Tokyo and lowest in the cities with the lowest throughput.

Prince. Annual wholesale prices for five cities, selected years



The data suggests that Tokyo is both the preferred market in terms of volume and price. However. the higher prices could reflect the higher distribution costs associated with Tokyo compared with, say, Nagoya rather than an actual higher demand.

Nagoya has an encouragingly high price. When combined with its comparatively high per capita consumption, the data suggests that Nagoya is a preferred market for *Prince* melons compared with the other regional cities.

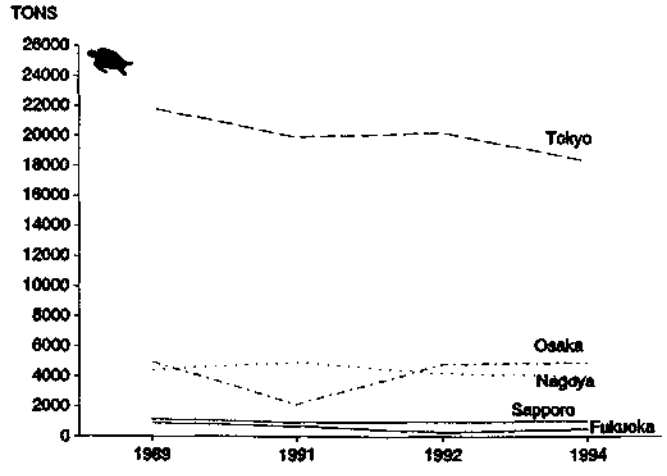
In contrast, Sapporo has both a low throughput and a low price.

5.2 Andes

The data show that the decline in throughput of the *Prince* and *Amasu* varieties is not occurring with the *Andes*.

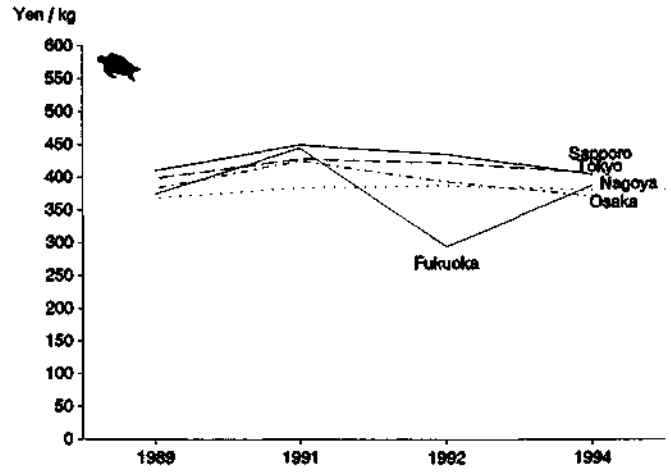
Tokyo obviously likes *Andes* melons. Its throughput volume is far greater than what would have been expected solely on a population basis. Again, the gap in throughput volume between Nagoya and Osaka is far less than the difference in their populations.

Andes. Annual wholesale throughput for five cities, selected years



Unlike with *Prince*, the price differentials between the cities for *Andes* is quite narrow. Sapporo's higher price is based on a comparatively small volume.

Andes. Annual wholesale prices for five cities, selected years

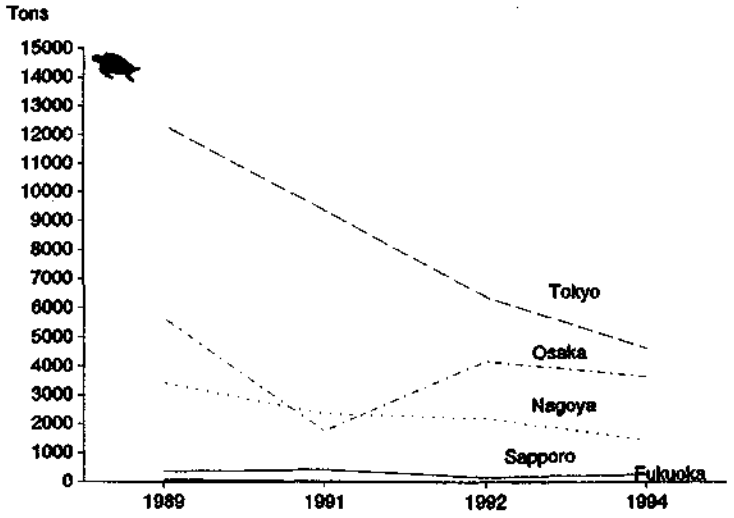


Given this, Tokyo and Nagoya are the preferred markets.

5.3 Amasu

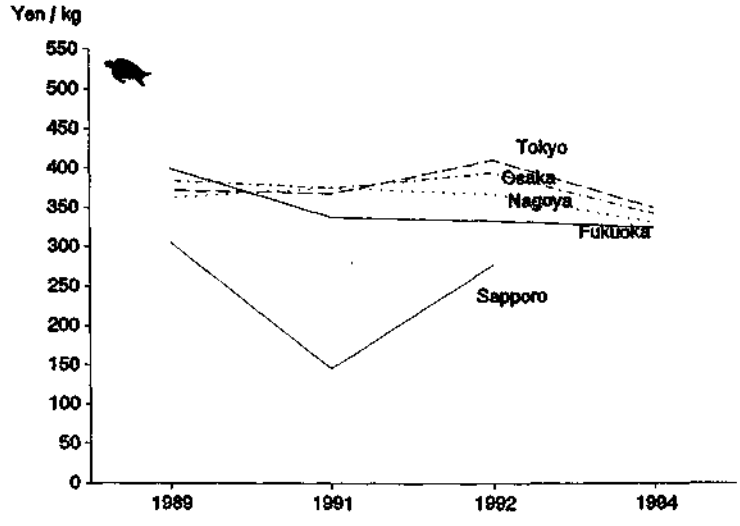
Amasu has lost a great dal of popularity in Tokyo. Its decline in the other markets is no where near as marked. Osaka's throughput is more in line as to what would be expected relative to Tokyo and Nagoya. Sapporo and Fukuoka remain small markets.

Amasu. Annual wholesale throughput for five cities, selected years



With the exception of Sapporo the price difference between the other four cities is quite narrow.

Amasu. Annual wholesale prices for five cities, selected years



The conclusion is that Osaka is the preferred market.

5.4 Summary

There are identifiable differences in the wholesale prices and throughput patterns for the five identified regional markets. The data suggest that Tokyo and Nagoya show a marked preference for *Andes* and *Prince* whilst Osaka prefers *Amasu*.

6. Standards

Japan has a series of domestic shipping standards for different fruit and vegetables. These are in addition to whatever standards may be negotiated between the grower/shipper and the buyer. The shipping standards refer to size, shape, and, usually, packaging. The standards are national. In addition, there are prefectural standards. These tend to originate from prefectures which are major producers of the specific crop.

Shipping standards are not binding on exporters. However as they are a strong indicator of the minimum market preference, prospective exporters should be aware of them.

Shipping standards exist for the ***Prince*** variety. These are based around size:

Size	**Minimum - Maximum**
3L	800 - 900 g
2L	650 - 800 g
L	550 - 650 g
M	450 - 550 g
S	400 - 450 g
2S	350 - 400 g

I was advised that the New Zealand melons were smaller rather than larger and this accounted for their market success.

The recommended box size is 380 mm X 250 mm X 120 mm.

Colour

The two basic flesh colours are green and "red/orange". The latter two colours were seen as indicating non-green rather than specifically referring to the actual flesh colour.

A number of seed companies were approached to ascertain which colour melon was the more popular in terms of seed sales. A precise answer was difficult to establish. The current demand was for red flesh types although it was stressed that this was just the current demand. Some of their catalogues are attached.

Mexican and Californian melons tended to be green fleshed.

Netted type

Netted melons are considered to be more "natural". They have an image of high class and thus attract the higher prices.

2　出荷規格

(1)　国の標準規格

露地メロン(プリンスメロン)の標準規格

1．規格の対象

この規格は、ウリ科に属し、生鮮のまま消費者に供給される露地メロンのうちプリンスメロンを対象とする。

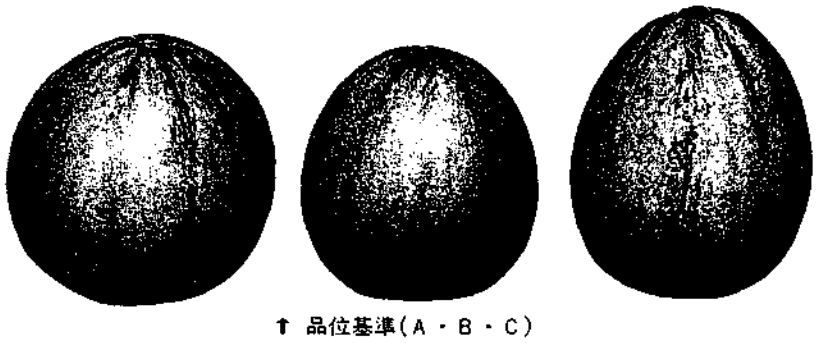
2．規格の内容

この規格は、1に定めるメロンの出荷段階における品位、大小、量目及び包装の基準とする。

(1)　品位基準

等級区分は、品質形状によるA、B及びCの3等級に区分し、それぞれの品位基準は次のとおりとする。

項目＼等級	A	B	C
品位基準	ア　形状及び色沢が特に良好で、玉そろいのよいこと。 イ　日焼け及び縁縞のないこと。 ウ　病害、虫害又は傷害のないこと。	ア　形状及び色沢が良好で、玉そろいのよいこと。 イ　日焼けがなく、縁縞の程度が軽微なものであること。 ウ　病害、虫害又は傷害のないこと。	ア　色沢が良好で、変形度合いが軽微であること。 イ　日焼け程度が軽微であり、縁縞の程度が著しくないこと。 ウ　病害又は虫害がなく、傷害の程度が軽微であること。

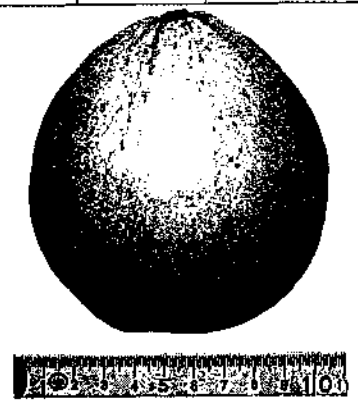


↑ 品位基準(A・B・C)

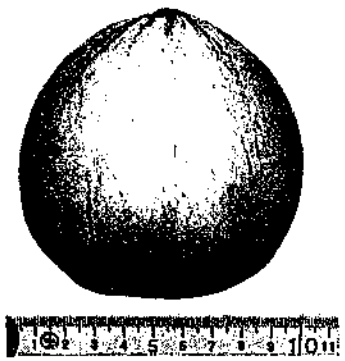
(2) 大小基準

大小の区分は、1個の大きさによるものとし、その基準は次のとおりとする。

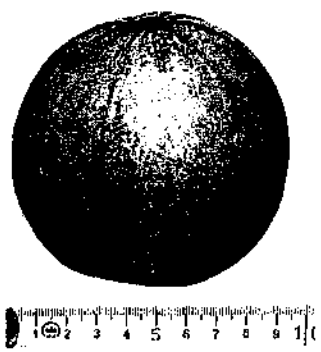
大小区分 / 大小基準	3 L	2 L	L	M	S	2 S
1個の重量	800g以上 900g未満	650g以上 800g未満	550g以上 650g未満	450g以上 550g未満	400g以上 450g未満	350g以上 400g未満



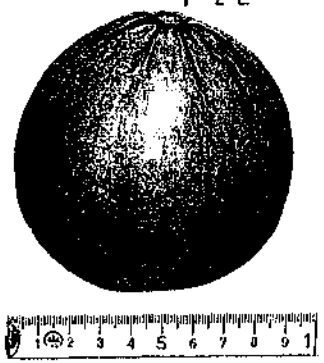
↑ 3L



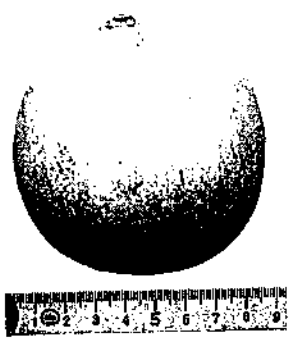
↑ 2L



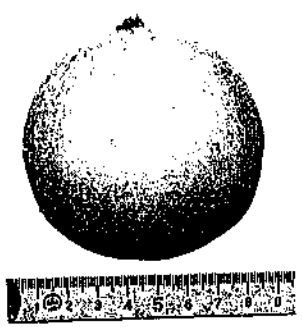
↑ L



↑ M



↑ S



↑ 2S

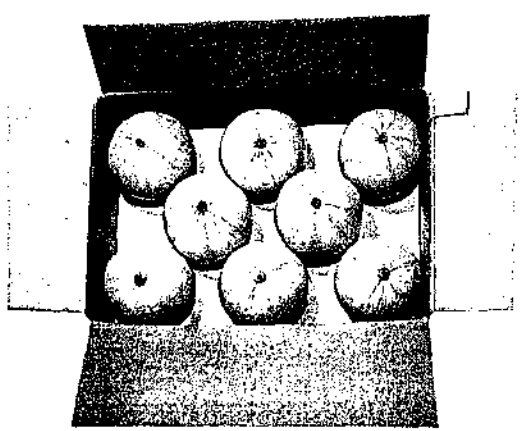
(3) 量目基準

1包装単位の量目は4kg又は5kgとし、販売時においてこれが確保されるものとする。

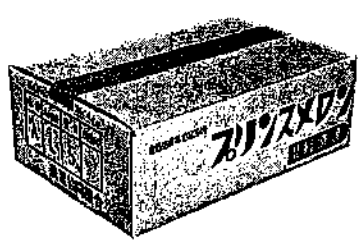
(4) 包装基準

包装容器は、段ボール箱とし、その基準はそれぞれ次のとおりとする。ただし、段ボール箱の長さ、幅及び深さについては10mmの差異は許容する。

	段ボール箱
容器の大きさ	長さ(内法) 380mm 幅(内法) 250mm 深さ(内法) 120mm
材質	JISZ1516で定める外装用段ボールの両面第2種以上で耐圧加重380kg以上とする。
荷造方法	封かんは、足の長さ15mm以上、幅2mm以上の平線を用い、上面2カ所、下面2カ所以上とめるものとする。ただし、JISZ1511で定める包装用ガムテープ第1種又はこれと同等以上の効力を有する資材を使用しても差し支えない。
表示事項	品目 品位 大小区分 量目又は個数 出荷者名又は商標



↑ 段ボール箱(5kg)



↑ 段ボール箱(5kg)

ア　熊　本　県

プリンスメロン標準選別規格表

収　　穫　1．果皮は灰白色でプリンスメロン固有色を有するものとし糖度は３月15度以上、５月20日迄は14度以上とし、以後は13度以上とする。

2．裂果、へた落ちは除く。

		(秀　　品)	(優　品)	(良　品)
1．形状	(1)	果形の比率10：11.5	10：11.6以上	
	(2)	肩落ち、変形していないもの	秀品に入らないもの	著しく肩落ち変形しているもの
	(3)	花落ちは直径2.5cmまで	3cmまで	4cmまで
	(4)	出べそはないもの	高さ0.5cmまで	1cmまで
2．果皮	(1)	青縞の色かすかなもの	濃いもの	著しく濃いもの
	(2)	青筋は果梗より花落ちまで続いていないもの	2本まで続いているもの	4本まで続いているもの
	(3)	果皮の斑点かすかなもので½まで	明確なもので½以内	明確なもので½以内
	(4)	果皮の黄色はかすかな黄色で½以内	黄色明確なもので½以内	黄色明確½以内
	(5)	果皮のビニール焼けしていないもの	わずかなもの	著しくないもの
	(6)	風ずれ、外傷のないもの	わずかなもの	著しくないもの
	(7)	ネットのないもの	わずかなもの	著しくないもの

資料：熊本県経済農業協同組合連合会「熊本県青果物自治検査標準出荷規格」

イ　茨　城　県

秀：正常な形状にして糖度14以上のもの（軽度の日焼け果も含む）

プリンスメロン　品質区分　優：秀に次ぎ品質が優れているもので糖度14以上。

良：ただし、糖度については、甘味のないものは出荷しないこと。

階級	1果の重量	1箱の個数	容器	量　　目
3L	850g以上	6個	D.B	5kg標準（満杯詰）
2L	750　〃	7		
LA	650　〃	8		
L	550　〃	9		
M	450　〃	11		
S	400　〃	12		
2S	350　〃	13		

資料：茨城県、茨城県経済農業協同組合連合会「茨城県青果物標準出荷規格」

ウ　愛　知　県

メロン（プリンスメロン）

区分＼階級	品位 1個の個数	品位 1個の標準の重さ	品位 品質等級	品位 選別調整	荷造り 容器	荷造り 標準量目	荷造り 入目	荷造り 荷造り方法
LL	7、8個	750g未満 650g以上	(秀) 品種固有の形状、色沢を有し、熟度斉一で品質良好なもの (優) 秀に次ぎ品質の優れているもの (良) 優に次ぎ品質の優れているもの	1　熟度、大きさをそろえ、損傷果を除く。 2　よごれをふきとる。 3　果こうを短く切る。	段ボール箱	5kg	2%以上	ガムテープ貼り、又は平線止めとする。
L	9	650g未満 550g以上						
M	11	550g未満 450g以上						
S	12	450g未満 400g以上						
SS	13、14	400g未満 350g以上						

(注) 1個の標準の重さが750グラム以上で1箱の個数が6個以内のものはLLLとすることができる。

資料：愛知県「愛知県園芸農産物検査関係例規」

エ　山　形　県

プリンスメロン

(1)　等　　級

区分	選　　別　　基　　準
秀	品種固有の色沢、形状を有し熟度適正無傷で品質優秀なもの。
優	秀に次ぐ良好なもの。
良	優に次ぐもの。

(2)　階級区分

区分	果　　重	基準玉数
3L	800g以上	7以下
LL	650　〃	8　〃
L	550　〃	9　〃
M	450　〃	10～11〃
S	400　〃	12
SS	350　〃	13～14〃

(3)　容器及び内容量

容器	内容量	容器規格（単位mm） 長さ（内のり）	幅（内のり）	深さ（内のり）	備　考
段ボール箱	5kg	380	255	110～120	玉数明記のこと

資料：山形県「山形県青果物等出荷規格集」

7. Distribution

The above analysis has been conducted with near sole reliance on wholesale figures. It must be stressed that the use of the wholesale system is but one marketing channel for an importer.

Japan's distribution channels are currently going through a major revolution. Traditionally melons were imported by the *sogoshoshas* or trading houses. Up until the mid 1980s these were responsible for over 85 percent of all food imports into Japan. The *sogoshoshas* epitomised the Japanese distribution system. They were based around *keiretsu* or relationships and their associated complex system of inter-related companies. With *endaka*, the forced appreciation of the Japanese yen, specialist horticultural importers emerged. They developed new distributions channels are started to give retailers and the food service sector choice. New relationships were forged and new players entered the system.

In the 1990s the rate of change in distribution channels increased. Key to this change was the development by the major retail chains of their own distribution centres. Inhibited by exorbitant land prices in the major metropolitan areas around Tokyo and Osaka, the chains tended to use third-party distribution systems. In the 1990s the major chains developed in the contiguous prefectures to the major metropolitan areas their own expansive distribution centres. With these in place, the major chains no longer became dependent on the wholesale market system for their requirements. Direct buying of domestic product became relatively common. This has seen the percentage of total fruit moving through the wholesale market system decline. With better in-house warehousing, a number of the major chains have increased direct buying from overseas suppliers. The impact of this can be seen with New Zealand melons where it is estimated that only about a quarter of its exports to Japan pass through the wholesale system.

The other major distribution change in the late 1980s-early 1990s has been the rise in importance of non-metropolitan regional centres. It is wrong to consider "Tokyo/Osaka" as "Japan". As the section on **Inter-city comparison** showed, Japan has distinct regional preferences for melons. It must be recognised that whilst some of the regional centres may have lower prices than Tokyo, often times their distribution channels are shorter and therefore the costs are lower.

8. Conclusions

The overall trend for melons is not encouraging.

Production is declining for field melons. Whilst production of house melons has increased this production method is only a tenth of total production. The age composition of Japanese farmers militates against the production of a relatively heavy and cumbersome item such as melons. This suggests that the production of field melons will continue to decline. The production of house melons is relatively capital intensive and certainly labour intensive. This suggests that prices will have to rise if production of melons grown by this method is to continue.

Imports have shown encouraging rates of growth. However this has been at the expense of price. There has been a halving of the annual CIF price over the decade to 1995.

Using Tokyo data, annual wholesale volumes and prices are declining. This reflects the fact that household consumption in both volume and expenditure terms is down.

Micro data shows a slightly different picture. There is clear evidence that monthly import data show that there is a marked price advantage for melons imported in the first three months of the year. Similar monthly wholesale data show that for specific melon varieties there are good high prices at particular periods during the year.

However, two points need to be reiterated about the wholesale data.

First, the data presented in this paper indicates that the gap between the wholesale price and the CIF price is at least 30 percent. Specific distribution channel costs would have to be established in order to assess if these prices would convert to profit for Australian melon exporters. Similarly, detailed costs would need to be established in order to assess if the different prices recorded in the different cities would also convert into strong marketing opportunities.

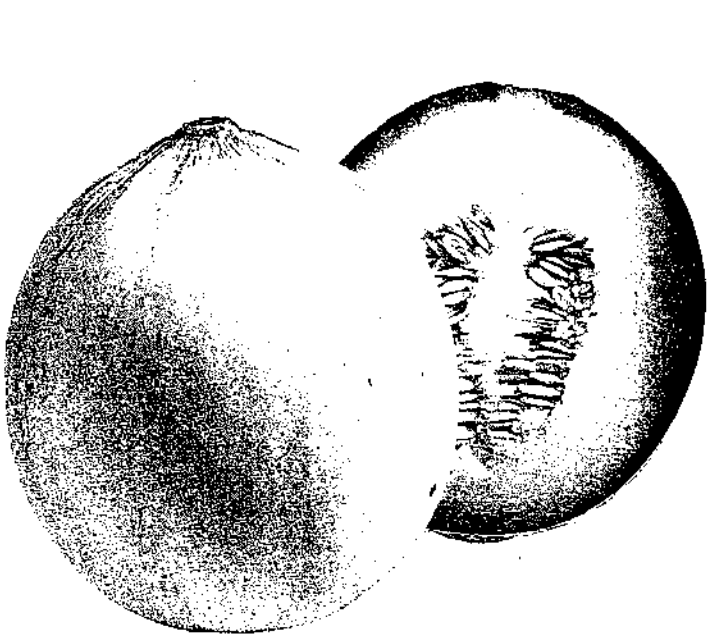
Second, melons are a "fashion" item in that there is clear evidence of different melon varieties moving in and out of popularity. Over the past ten years, data was available for 13 varieties. In contrast in 1995 data was only available for seven varieties. Even that data showed that some varieties were clearly losing popularity. It was beyond the scope of this paper to conduct a detailed consumer[8] analysis in order to establish the future prospects of specific varieties. The issue of preferred flesh colour would also have be assessed in the detailed consumer analysis.

[8] A "consumer" analysis would have to encompass wholesalers, retailers, and the food service sector as well as the more traditionally considered end-consumer.

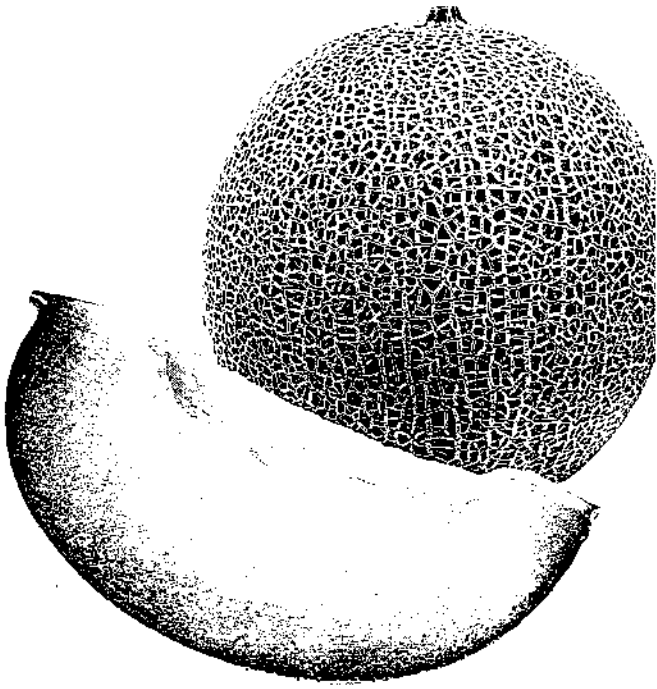
The specific micro analysis was required in order to focus the potential disinfestation research. However it is considered that the specificity of such data is too narrow on which to base a recommendation.

On balance, it was considered that the despite the specific prospects for specific varieties at specific times of the year, the overall view is that the market for melons in Japan is not optimistic over the medium to long term.

For this reason, it is recommended that the melon industry not proceed with to fund disinfestation research.



SUMMER DREAM



BONUS

SUMMER DREAM

Wonderfully sweet and good flavor. 55 days after flowering. Shelf life about 10 days after harvest.
Salmon orange flesh with yellowish gray skin.
1.2 kg, round, no netting.

BONUS II

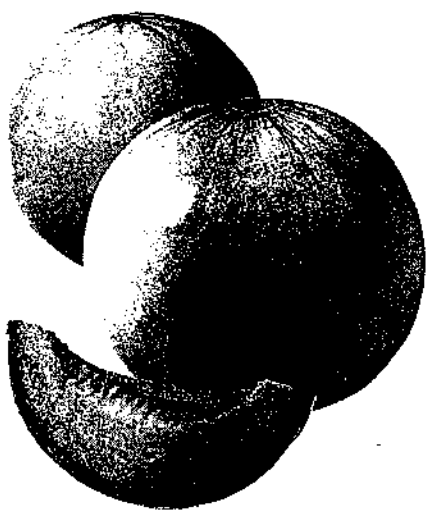
Beautiful netted melon. Bright green flesh, gray green skin. Very sweet and long shelf life.
Powdery mildew resistant and high tolerant to Fusarium. 1.2-1.4 kg in weight.

SWEET MELODY

Summer Dream type hybrid. Uniform and high sugar content. High yielding. Orange colored flesh.
Medium maturity. 1.2 kg. Resistant to Powdery mildew.

SUNGOLD

Extra early. White flesh with yellow skin.
1.3 kg. Good fruit setting under low temperature and low light intensity.
Powdery mildew resistant.



SWEET MELODY

SUNGOL

HYBRID MELON *(Cucumis melo)*

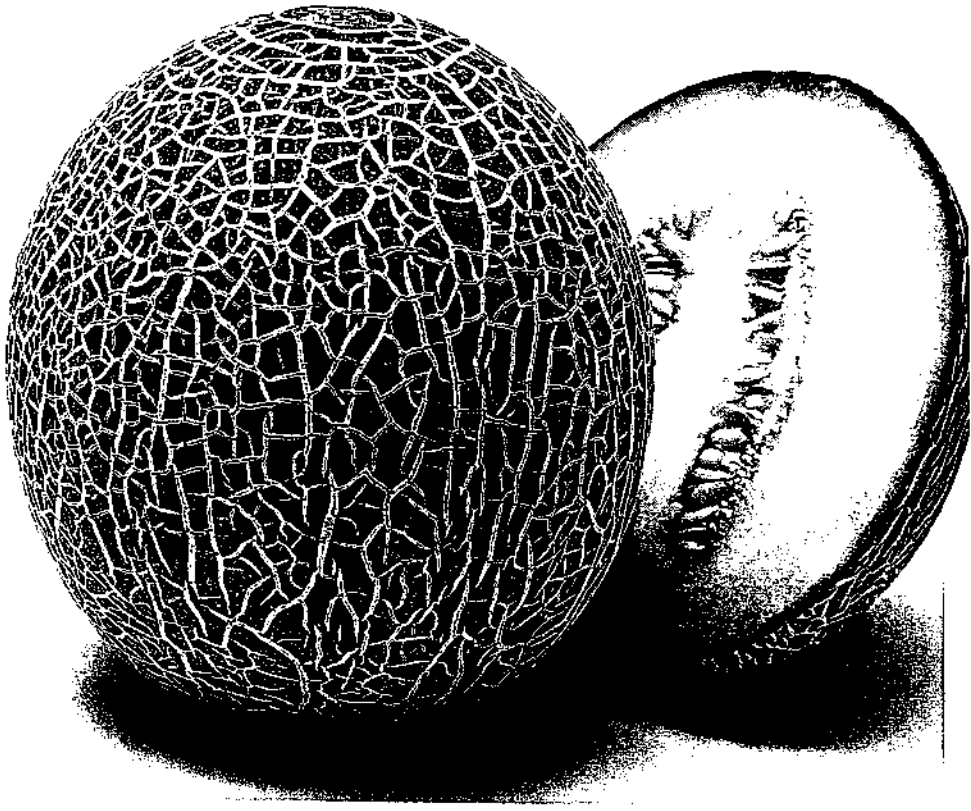
NEW

ANDROS

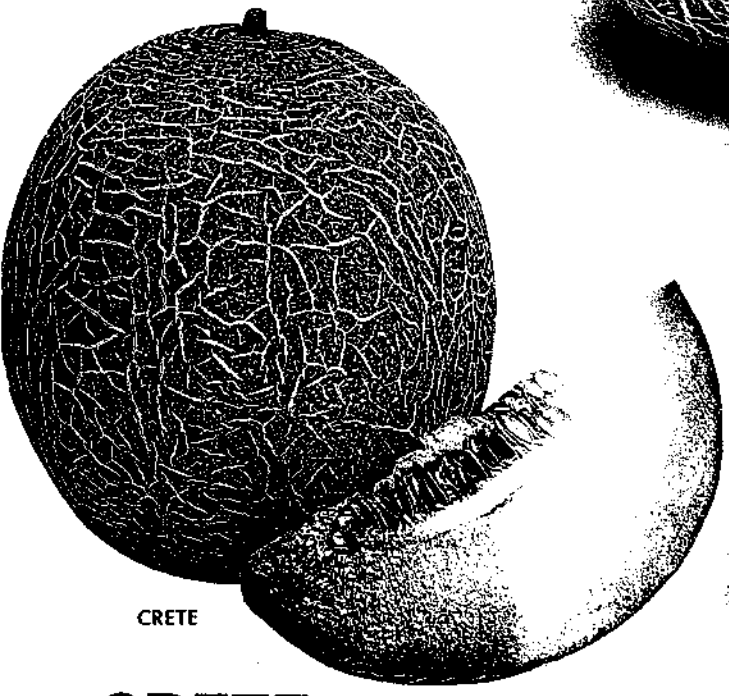
Very sweet Galia type Powdery mildew resistant

Galia type. Early maturity. 1.5 kg. Pale green flesh. Very sweet. Brownish green skin with netting. Resistant to Powdery mildew.

Note : Skin color stays the same at maturity.



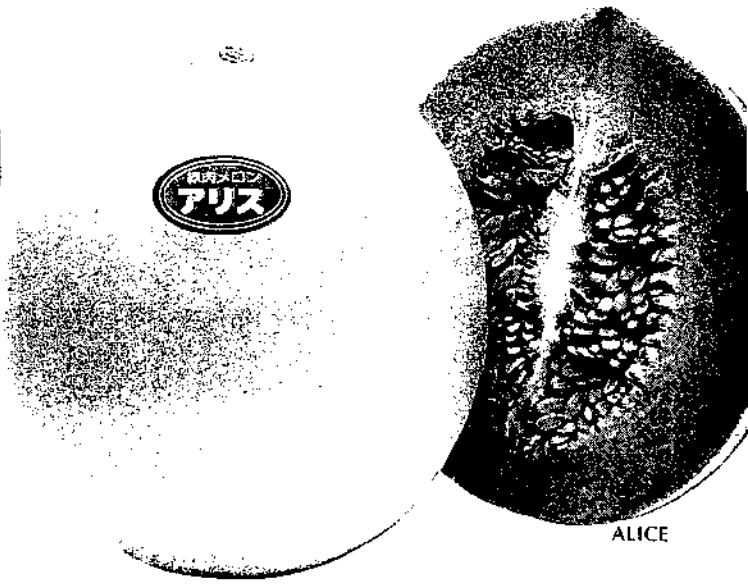
ANDROS



CRETE

CRETE

Galia type. 50-55 days after flowering. 1.5-1.6 kg per fruit. Pale green flesh with green skin. Netted. Relatively long shelf life. Very sweet. Resistant to Powdery mildew and high tolerant to Fusarium.



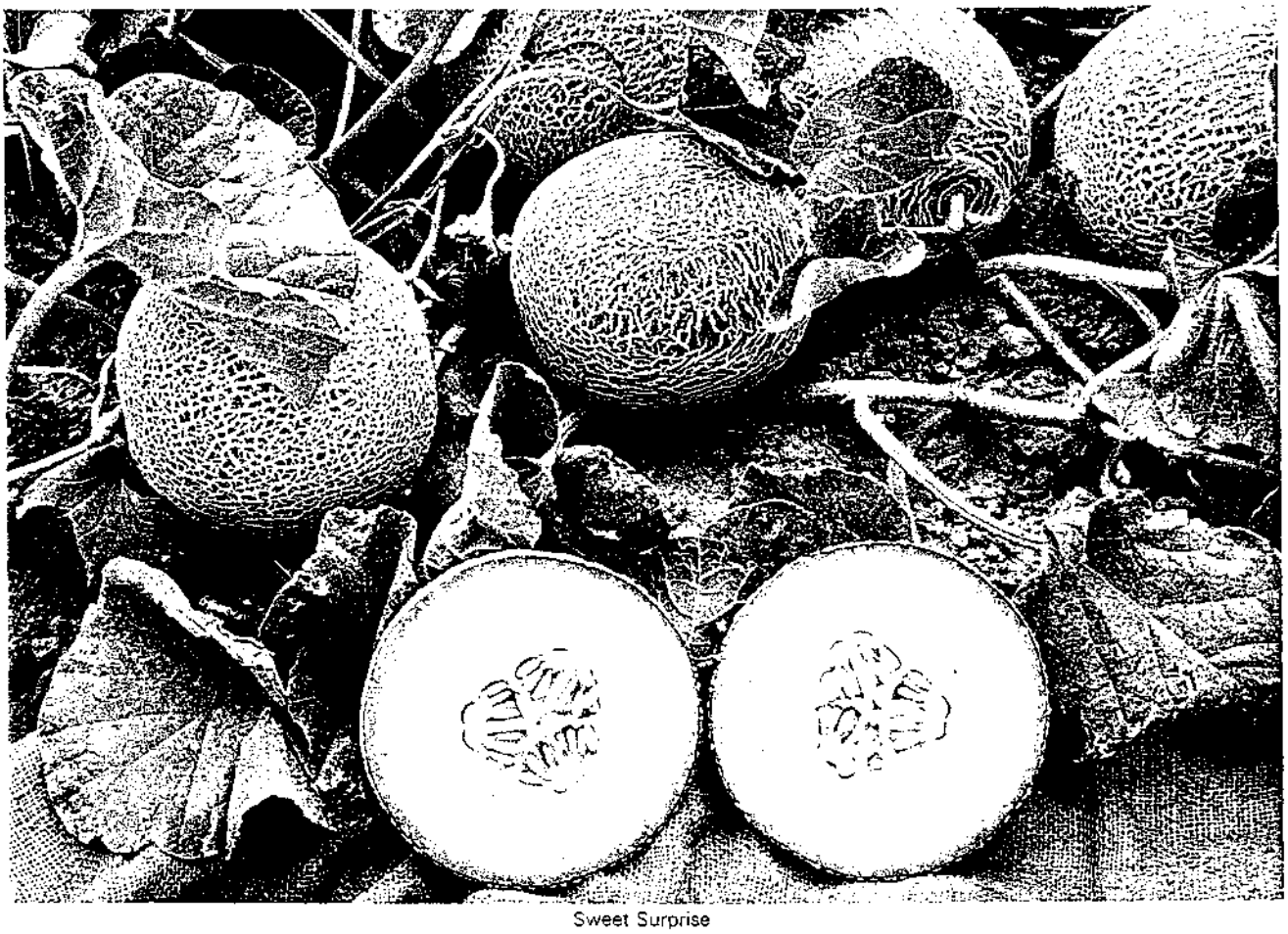
ALICE

ALICE

1 kg fruit, oval shaped without netting. Creamy white skin with green flesh. Very sweet and good shelf life. High yielding. Powdery mildew resistant.

SAKATA

HYBRID MELON



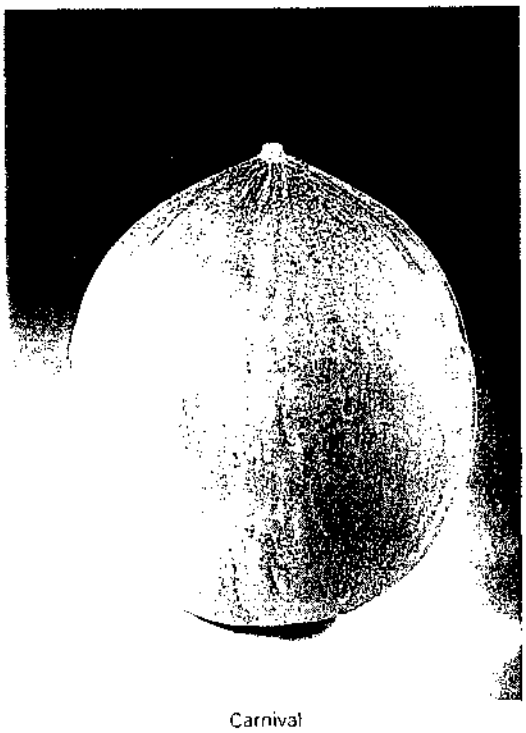
Sweet Surprise

SWEET SURPRISE NEW

An American Cantaloupe. Early, matures in 80 days from sowing. Fruit nearly round with dense net evenly. Thick fleshed, of salmon color and tastes quite sweet, 12-15% in Brix. Small seed cavity. A vigourous grower with good fruit settings, weighs 1.0-1.5 kgs. Harvest before full slip to avoid over-mature. Resistant to Fusarium wilt (race 0 & 2) and Powdery Mildew. Highly recommended for early shipping and for the market where sweet, quality cantaloupe is needed.

CARNIVAL NEW

A Crenshaw type hybrid. Medium-late maturity. Oblong fruit of dark green rind color. Light orange fleshed, thick and firm. Excellent quality, sweet, tender and fragrant when ripe with 12-15% Brix sugar content. Fruit 1.8-2.5 kgs. Much higher productivity and more uniform than o.p. Crenshaw. Fusarium wilt (race 0 & 2) and Powdery Mildew resistant. Good fruit setting.



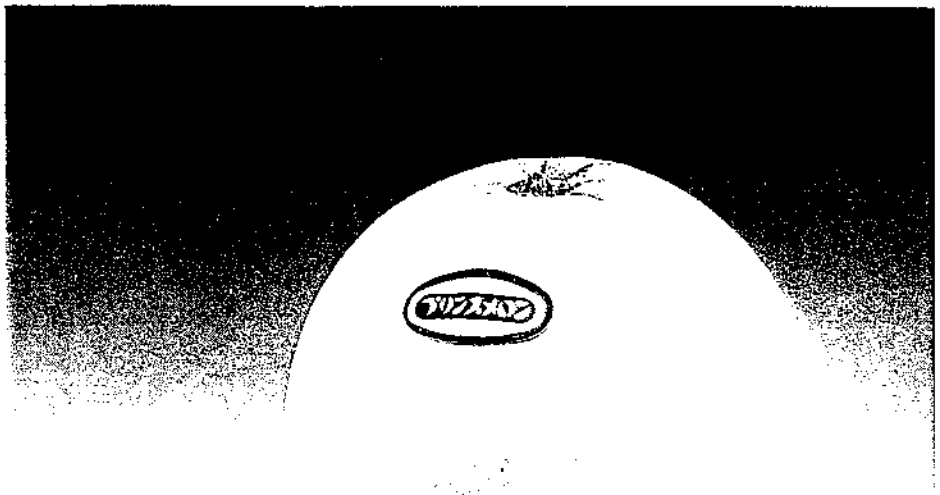
Carnival

HYBRID MELON

SWEETIE PF-R

No.6

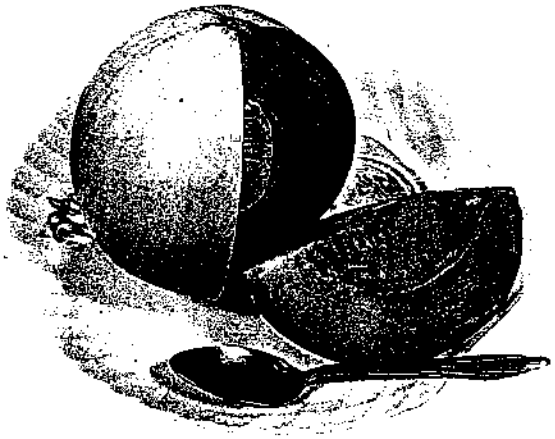
An improved type of the former Sweetie. An early, heavy yielding variety producing somewhat larger fruits. Resistant to Fusarium Wilt and Powdery Mildew. High sugar content, abundant in fragrance and exceedingly sweet and delicious. Has excellent fruit setting ability. Recommended for short growing season districts. Has a wide adaptability.



No.19

A sister line of Sweetie PF-R No.6, but slightly later and larger fruited. Fruit slightly oval, roundish in shape. It contains higher sugar contents than No.6. Has also a good fragrance and exceptionally sweet. Fusarium Wilt and Powdery Mildew resistant. Plants grow more vigorously than No.6 with good fruit setting ability. Like Sweetie PF-R No.6, it has wide adaptability and is an easy grower.

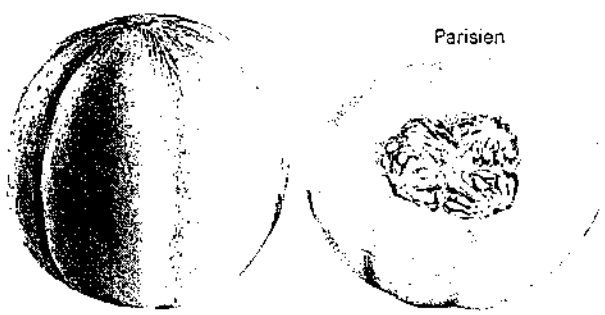
Sweetie PF-R



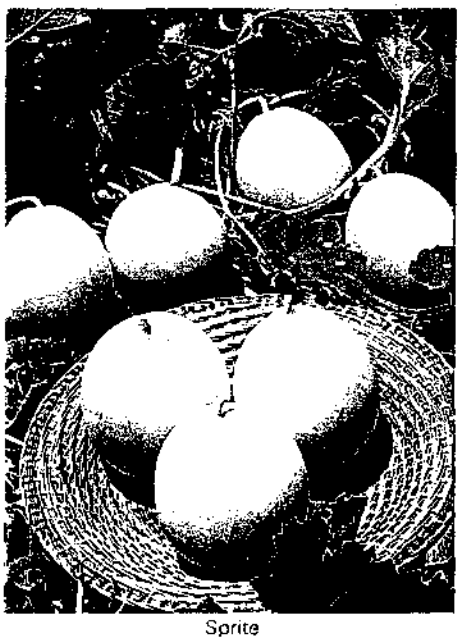
Sweetheart

SWEETHEART

An interesting F-1 hybrid, an earlier type of "Charentais", but a little smaller and somewhat smoother skinned. Produces fruits of excellent quality. Very good for short season districts in the northern latitude. Flesh thick, sweet, mild and aromatic of salmon-red color. Fruits do not crack even at maturity.



Parisien



Sprite

PARISIEN

A "Charentais" type hybrid. Fruit almost round with 8-10 ridges. Fruit surface smooth turning to light yellow when ripe. Pleasing salmon-orange flesh being superior textured and very sweet, it is one of our most delicious melons. Has a good aroma. Vines are Fusarium Wilt and Powdery Mildew resistant; very vigorous and healthy plants remain green even after all fruits are picked. An early cropper.

SPRITE

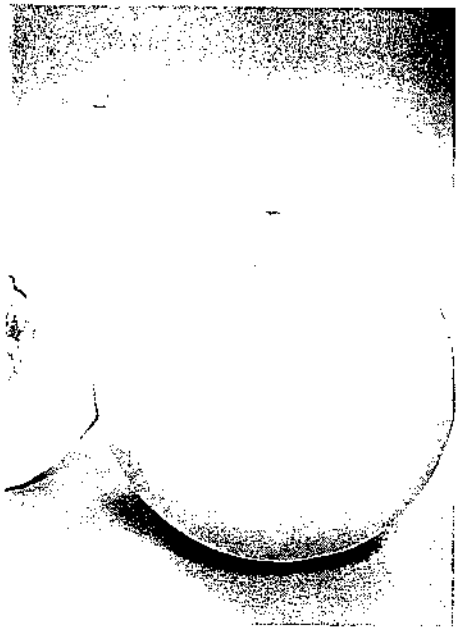
An Oriental type hybrid melon. Oval shaped fruit with green rind color at immature stage, turning to white, and covered with yellow pattern at full maturity. Harvest when 1/3 of total fruit surface changes to yellow. Very prolific yielder. Flesh is thick, white, very sweet quality, recommend eating 5-7 days after picking due to somewhat hard texture. Fusarium Wilt and Powdery Mildew resistant, and tolerant to Canker and Virus. Good keeping quality. Highly recommended for bedding plant growers and home gardeners.

SAKATA

HYBRID MELON

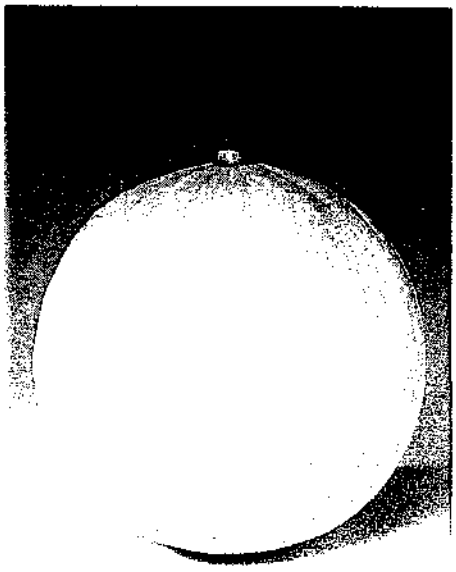
TY-3 NEW

Early, small-sized hybrid with very attractive bright yellow skin like Amarillo, but earlier and smaller. Adapted for outdoor culture, but better performed under plastic house or tunnel. Matures early, in 40-45 days from flowering, weighing 0.8-0.9 kgs., high round shape. Flesh so sweet being 15-16% in Brix sugar content. Fusarium wilt (race 0 & 2) and Powdery Mildew resistant.



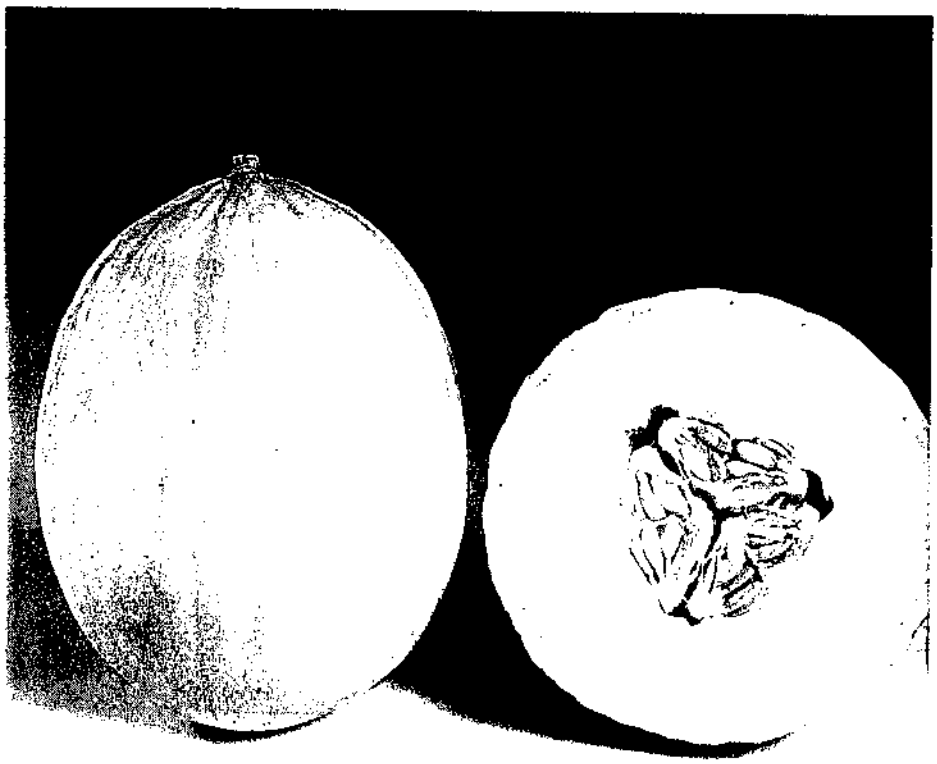
No.90 *(HY-2)* NEW

A Tendral Amarillo type, but earlier and much sweeter. Has better fruit settings and is more productive. Round fruit of deep, clean yellow color, 1.2-1.5 kgs. Smooth skinned, nice attractive looking. Light greenish white flesh exceedingly sweet, being 15-17% sugar content in Brix. Fusarium wilt (race 0 & 2) and Powdery Mildew resistant.



KINKA *(Oasis)*

A Tendral Amarillo type hybrid with good disease resistance. Fruit is slightly roundish, oval in shape with beautiful, light green fleshed, very juicy texture with good eating quality. Sugar content being 13-14% in Brix. Maturing in 50-55 days after flowering. Fruit weighs 1.4-1.6 kgs. which has a good keeping quality; it can be kept for at least 15 days even in summer. Fusarium Wilt and Powdery Mildew resistant, very easy to grow. Superior to Tendral Amarillo in every respect.



Utopia

UTOPIA *(HY-3)*

UTOPIA is Amarillo type hybrid melon with Fusarium Wilt and Powdery Mildew resistance. Fruit is not so oblong as Amarillo with less wrinkles on the rind. Very deep yellow rind color and very attractive looking. Light green flesh. Juicy, and excellent eating quality, sugar content about 13-14% in Brix. Earlier in maturity than Amarillo, harvestable in about 55 days from flowering. Each fruit weighs 1.2-1.4 kgs. Has an exceptionally good keeping quality; it can be kept under room temperature for about 30 days after harvest.

SAKATA

HYBRID MELON

Variety	Type	Maturity after Flowering (days)	Fruit				Sugar Content (%)	Disease Resistances		
			Shape	Weight (kg.)	Rind Color/Net	Flesh Color		F.W.	P.M.	D.M.
Sweet Surprise	American Cantaloupe	43-45	round	1.0-1.5	dark green netted	salmon	12-15	R(0&2)	R	–
Carnival	Crenshaw	56-57	oblong	1.8-2.5	dark green no net	light orange	12-15	R(0&2)	R	–
Temptation	Honey Dew	45-48	round	1.2-1.5	cream no net	light orange	13-15	R(0&2)	R	–
Honey Brew	Honey Dew	50	oblong	1.5-2.0	creamy white no net	light green	13-15	R(0&2)	R	T
HW-1	Honey Dew	43	oblong	1.2-1.4	milky white no net	light green	15	R(0&2)	R	–
TY-3	small Amarillo	40-45	high round	0.8-0.9	bright yellow no net	white	15-16	R(0&2)	R	–
No.90 *(HY-2)*	Tendral Amarillo	43-47	round	0.9-1.1	deep yellow no net	greenish white	15-17	R(0&2)	R	–
Kinka *(Oasis)*	Tendral Amarillo	50-55	roundish oval	1.4-1.6	yellow no net	light green	13-14	R(0&2)	R	–
Utopia *(HY-3)*	Amarillo	50	oval-oblong	1.2-1.4	deep yellow with wrinkles	light green no net	13-14	R(0&2)	R	–
No.78 *(HS-1)*	Piñonet	50	oblong	1.5	dark green mottled	light greenish white	13-16	R(0&2)	R	–
No.117	Temprano Rochet	50	oblong	1.4-1.6	dark green with wrinkles	light green	14-17	R(0&2)	R	–
No.118	Tendral Negro	60	oblong	1.5-2.0	dark blackish green with wrinkles	light greenish white	15-17	R(0&2)	R	–
No.80 *(HS-2)*	Piñonet/ Galia	43-45	round-oval	1.4-1.8	yellowish brown lightly netted	light greenish white	15-17	R(0&2)	R	–
Harvest King	Red Fleshed Pearl	45-46	round	1.0	yellow green netted	salmon	12-13	–	–	–
Paradise	American/ European	48-50	round	1.2-1.3	light creamy yellow, netted	salmon w/light green	14-15	R(0&2)	R	–
Sunrise	Red Fleshed Pearl	45-48	round	1.0	creamy yellow netted	light salmon	12-13	–	R	–
Sweetie PF-R No.6	Charentais	35-38	round	0.5	greenish white no net	salmon orange w/light green	14-15	R(0&1) R(0&2)	R	T
Sweetie PF-R No.19	Charentais	40-43	round-oval	0.7	greenish white no net	salmon w/light green	15-17	R(0&1) R(0&2)	R	T
Sweetheart	Charentais	33-36	round	0.6	greenish white no net	salmon red	13-15	R(0&2)	R	T
Parisien	Charentais	45	round	1.0-1.3	light yellow sutured	salmon orange	13-15	R(0&2)	R	–
Sprite	Oriental	40-45	oval	0.5	white with yellow pattern	white	15-17	R(0&2)	R	T
Amur	Japanese	50	round	1.0-1.8	dark green netted	light green	12-14	R(0&2)	R	–
"A-One"	Ogen	55	round-oval	1.0-1.5	dark green netted, ribbed	light green	13-14	R(0&2)	R	–
Emerald Jewel	Japanese	53	round-oval	1.3-1.5	dark green netted	light green	13-15	R(0&2)	R	–
Volga	Japanese	56-57	high round	1.2-1.5	dark green densely netted	mid green	13-16	R(0&2)	R	T

Diseases : F.W.=Fusarium wilt, P.M.=Powdery Mildew, D.M.=Downy Mildew
Disease Resistances: R=Resistant T=Tolerant
Sugar Content : in Brix by Refractometer