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Japanese melons: Cultivation, consumption, and cultivars

Seisuke Motonishi, Tetsuo Mikami*

HAL GREEN Co., Ltd., 193-6 Toiso, Eniwa, 061-1405, Japan

*Correspodence: Tetsuo Mikami (temi.mars03@gmail.com)

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ABSTRACT

Melon (*Cucumis melo* L.) is a commercially important horticultural crop worldwide and exhibits an impressive diversity in plant and fruit characteristics. It is divided into ssp. *melo*, which includes western melon cultivars, and ssp. *agrestis*, including oriental melon such as makuwa and conomon groups. The history of cultivation of oriental melon is very old in Japan, and oriental melon has been used as fresh desserts (makuwa melon) and for pickling or cooking (conomon melon). Western melon was introduced into Japan as fresh dessert fruit crop in the late 19th century. Breeding efforts were made to develop good-quality, affordable melon cultivars, and as a result, western melon became popular throughout the country in the 1960s. The cultivation area of western melon in the country reached its peak in 1990 and then has decreased gradually. In this review, we describe the cultivation history and commercial production of Japanese melon as well as agronomic characteristics of major cultivars, with the expectation that the synthesized information will aid in understanding the problems and prospects of melon cultivation in Japan.

Keywords: Breeding, Cultivation history, Cultural practices, Fruit quality, Genomics

INTRODUCTION

Melon (*Cucumis melo* L.) is one of the predominant horticultural crops grown in tropical and temperate climates. It belongs to the gourd family, Cucurbitaceae, which also includes many economically important crops such as cucumber (*Cucumis sativus* L.), watermelon [*Citrullus lanatus* (Thunb.) Matsum. et Nakai], squash and pumpkin (*Cucurbita* spp.), and zucchini (*Cucurbita pepo* L.) (Siskos et al., 2022; Tsuchiya and Mikami, 2022). According to the FAO statistics (FAO, 2024), global melon production was 29.54 million metric tons in 2023. China is the largest producer of melons with 14.5 million tons, followed by India (1.5 million tons), Turkey (1.4 million tons), Kazakhstan (1.37 million tons), Brazil (0.86 million tons), and Guatemala (0.85 million tons) (FAO, 2024).

The geographic origin and region of domestication of melon have been debating. The high diversity of landraces in India and East Asia suggests the idea of an Asian domestication center (Dwivedi et al., 2010; Schaefer and Renner, 2020). Based on the high number of wild *Cucumis* species in Africa and the identical chromosome number (2n = 24) of *C. melo* and wild African species, several researchers have held that *C. melo* is of African origin (Périn et al., 2002; Sebastian et al., 2010). These theories have been challenged, however, by molecular biological evidence which has implied alternate patterns of domestication. Phylogenetic analysis of nuclear and plastid DNA data led Endl et al. (2018) to infer that melon was domesticated at least twice in Africa and Asia. The authors revealed that melon cultivars grown today can be traced back to two wild lineages, with one restricted to Asia (*C. melo* ssp. *melo*), and the other restricted to Africa (*C. melo* ssp. *meloides*). Moreover, the genome resequencing of many diverse *C. melo* accessions suggested two independent domestication events within ssp. *melo*: one event was the origin of the commercially important cultivars and their market types including the most widely cultivated

'Galia', 'Cantaloupe', and 'Honeydew' melon types, and another event was the origin of cultivars grown specifically in East Asia (classified as ssp. *agrestis*) (Siskos et al., 2022; Campos et al., 2023; Li et al., 2023).

Cultivated melon genotypes exhibit high genetic diversity in plant and fruit characteristics and are suited to different culinary and consumer preferences (Yashiro et al., 2005; Swamy, 2017). In Japan, melons have been consumed as fresh desserts and for pickling or cooking (Kusakawa, 1992). Breeding efforts have been made to develop new cultivars with higher fruit quality, better disease resistance, and other characteristics that enhance acceptability by end users (Sugiyama, 2017). It is also worth mentioning that melon fruits are a source of vitamins, minerals, and other health-promoting substances (e.g., amino acids, carotenoids, dietary fiber, and antioxidant enzymes) (Shahwar et al., 2023). However, information regarding the melon production and commercial cultivars in Japan is scattered among individual scientific reports. With this in mind, we herein present an overview of the history, current state, problems, and prospects of melon cultivation in Japan. The paper also describes the agronomic characteristics of representative cultivars.

HISTORY OF MELON CULTIVATION IN JAPAN

1. Oriental Melon

Cucumis melo ssp. *agrestis* is generally divided into five horticultural groups or varieties, viz. makuwa, conomon, chinensis, acidulous, and momordica (Pitrat, 2008). The makuwa and conomon groups are believed to have been introduced into Japan from China in ancient times (Katsumata and Yasui, 1964; Yoshida, 2022). The makuwa melon group appears in an ancient Japanese history book, the Kojiki compiled in 717 (Katsumata and Yasui, 1964). It is likely that the fruits of this crop plant were moderately sweet and fragrant when fully ripened and were commonly eaten fresh as dessert fruit (Fujishita, 1992). At least eight local landraces of makuwa melon were already recognized by the early 1800s (Katsumata and Yasui, 1964). Until the mid-20th century, Japan cultivated a considerable amount of makuwa melon (Yoshida, 2022). In the 1960s, however, the domestic production of makuwa melon decreased rapidly. This is attributed to the development of sweeter and affordably-priced western type melon cultivars in the country (see below).

Unlike makuwa melons, conomon melons have flesh without sweetness and aroma. Yoshida (2022) reported a description of the conomon melon cultivation in the Wamyo Ruijyusho, a Japanese encyclopedia published between 931 and 938. Traditionally, immature and mid-ripened fruits of conomon melon have been used for pickling in Japan (Kusakawa, 1992). Conomon melons were also utilized for cooking (Kusakawa, 1992). Commercial production of conomon melon continues to this day, albeit on a small scale; in 2022, the crop was harvested from ca. 80 ha with a total yield of ca. 4,800 tons (MAFF, 2024a).

2. Western Melon

The cultivation of western melon genotypes in Japan is relatively recent, with Cantaloup melon being first introduced from France in 1893 (Seko, 1999). This melon produced aromatic fruits but its flesh was not sweet enough, so that its cultivation failed to spread in the country. Thereafter, a number of melon cultivars were introduced from the United Kingdom. Among them, a green-flesh cultivar ‘Earl’s Favourite’, which was introduced in 1925, was characterized by highly desirable sweet taste even though it lacked aromatic or musky odor (Seko, 1999). Moreover, the fruits of this cultivar had comparatively long shelf-life (Seko, 1999). Ethylene, a gaseous phytohormone, increases the respiration rate of fruits, which in turn shortens their shelf-life. The ethylene production in ‘Earl’s Favourite’ fruits is known to be low (Shiomi et al., 1999).

'Earl's Favourite' was suitable for spring cropping and less well-adapted to hot summer weather in central and southwestern Japan. Japanese breeders carried out inter-varietal crossing between 'Earl's Favourite' and a white-flesh UK cultivar 'British Queen', leading to the birth of good quality cultivars suited to summer cropping (Seko, 1999). 'Earl's Favourite' and its descendants were commonly grown in glass greenhouses and were available throughout the year; these melon cultivars dominated in almost all western melon-producing areas of the country until the 1960s.

'Earl's Favourite' and its descendants were considered a luxury item at the time and were not easily affordable for common people. Meanwhile, a new cultivar 'Prince Melon' was bred by a Japanese private seed company from a cross between a European cultivar 'Cantalupo di Charentais' and a makuwa-melon cultivar 'New Melon', and was released to commercial markets in 1962 (Sugiyama, 2017). 'Prince Melon' offered a mild, refreshing sweetness and typical aroma (Chachin and Iwata, 1988) Sweetness and aroma are the major determinants of both fruit quality and consumer acceptance (Khanom et al., 2003; Khanom and Ueda, 2008). 'Prince Melon' had slightly salmon pink to reddish orange flesh that was dense and succulent with a melting, soft texture (Chachin and Iwata, 1988). In addition, this cultivar was generally grown outdoors and was able to be mass-produced. After its release, 'Prince Melon' was sold at reasonable prices and immediately became most popular commercial melon in Japan; in the mid-1970s, it accounted for more than 50 % of the melons sold to the public in Japan (Aita, 1992).

The success of 'Prince Melon' gave impetus to the subsequent development of various good-quality melon cultivars that could be easily enjoyed by ordinary households. Since the 1970s, superbly tasty, affordable melon cultivars (e. g., 'Andes', 'Takami', and 'Ams') have been generated. Over time, 'Prince Melon' faded from commercial production (Sugiyama, 2017). Over thirty melon cultivars are now grown commercially throughout Japan (Kikkoman Corporation, 2025).

Production

From the late 1970s to the 1980s, melon production in Japan increased, reaching its peak in 1990: ca. 420,700 tons of melons were harvested from ca. 18,100 ha (Fig. 1). Thereafter, production decreased gradually, and in 2022, domestic melon-cultivation area covered only 5,800 ha and the harvest amount decreased to 142,400 tons (Fig. 1). The question inevitably arises why melon acreage has continued to decline. The reasons must be numerous, of which we have synthesized a few important ones that have direct implication in the decline in melon cultivation as stated below.

Over the past several decades, growth in the demand for labor from non-agricultural sectors such as manufacturing sector has a significant impact on the agricultural labor force (OECD, 2009; Musashi, 2025). Younger populations are leaving rural areas and shortage of farm successors is continuing; the number of farmers decreased from ca. 11.8 million in 1960 to ca. 1.4 million in 2020 (Ryan, 2023). Agricultural workforce is aging, and there are not sufficient hands to work in the field. Melon farming is highly labor-intensive (e.g., vine pruning, fruit thinning, and harvest), causing the farmers to reduce melon planting.

Another reason is the changes in fruit consumption in Japan. The population in Japan is estimated to have peaked at 128 million in 2008 and then it has been gradually decreasing due to low birth rate (USDA, 2018). The domestic food market is generally in a downward trend with the lower population, and the fresh fruit market is no exception (Japan's MAFF defines "fruit" as fruit produced from perennial trees and plants, and the melon crop is categorized as vegetables. However, melons are popularly consumed as a dessert fruit in the country). Moreover, Japan has progressively liberalized imports of agricultural produce since the 1960s (Kawakubo, 1996). As for fruit, domestic production has decreased significantly and this decrease has been substituted by imports. In 2022, Japan imported fresh fruit weighing 1.63 million tons, accounting for about one-third of total domestic supply (USDA, 2023). The leading imported produce was bananas with a 64 % share, followed by pineapples with 11 %, kiwi fruit with 7 %, oranges with 4 %, and avocados with 3 % (USDA, 2023). Trade liberalization led to diversification of the variety of fruit, and as a result, the gross amount of consumption of melons has declined. It should also be pointed out that Japanese consumers recently prefer foods with greater convenience of preparation, and they tend to opt for easy-to-peel or easy-to-prepare fruit such as bananas and oranges among fresh fruit.

Imports and Exports

Japanese trade statistics show that the amount of melons imported annually into Japan ranged from 26,400 tons to 39,000 tons in the late 2000s (Fig. 2). After that, melon imports to Japan continued a generally downward long-term trend and were estimated at 11,600 tons in 2022. In the same year, the major suppliers were led by Australia with 33 %, Honduras with 22 %, Mexico with 18 %, and the United States with 17 % (MAFF, 2024b).

Most of the fruit and vegetables grown in Japan are known for their high quality, and they are popular, in particular, among Asian countries (USDA, 2018). Japanese melons are also a case in point. As shown in Fig. 2, melon exports have been increasing steadily since 2013 and totaled 1,308 tons in 2022. Hong Kong was the largest destination for melons exported from Japan, accounting for a 90 % share of total exports. It was followed by Singapore (5 %), Taiwan (2.5 %), Macao (1 %), and the United States (0.98 %) (MAFF, 2024c; MOF, 2024).

Major Cultivars

In Japan, a UK melon cultivar 'Earl's Favourite' has been frequently used as an excellent breeding material for pure line selection and hybrid breeding (Kato et al., 1998; Yano et al., 2018; Nonaka et al., 2023). The recent breeding effort has produced numerous hybrids aiming to improve fruit yield and quality, storage and shelf-life capacity, and resistance against biotic and abiotic stresses (Sugiyama, 2017). Cytoplasmic male sterility is a widely applied tool for efficient and low-cost hybrid seed production (Moritani et al., 2013; Islam et al., 2014). In melon, however, cytoplasmic male sterility system is not available yet, and thus F1 hybrid seed production requires laborious manual emasculation and pollination (Odera et al., 2022).

Melon is basically an outcrossing crop that is also capable of self-pollination (Kato et al., 1998). Imperfect emasculation can result in the contamination of F1 hybrid seeds with selfed seeds of the female parent. To address this issue, several reliable and practicable methods have been developed for testing the genetic purity of hybrid seeds using various DNA markers (Kishor et al., 2020; Odera et al., 2022).

Melon cultivars differ in such horticultural traits as fruit shape (e.g., round, elongated, and oblong), fruit rind netting (viz. with rind netting or without netting), and flesh color (e.g., green, orange, and white). In Japan, melon is grown in either protected environments (in glass greenhouse or plastic greenhouse) or uncontrolled environments (outdoors). Table1 shows the main characteristics of representative cultivars currently grown in Japan.

Cultural Practices

Melon should not follow melon and other cucurbits such as watermelon, squash, pumpkin, and cucumber for at least three years. This crop grows best in well-drained, sandy or silt loam soils with a pH between 6.0 and 6.5 (Hide Farm Management Consultant, 2017).

Transplanting is the common method used for crop establishment, and seedling production is carried out in glass greenhouse, plastic greenhouse or plastic tunnel. Seeds should be planted after the soil temperature has warmed up sufficiently (28 - 30°C) to promote rapid germination. Commercial melon seedlings are mostly grafted onto the same species (melon-homo grafted combination) or squash (squash hetero-grafted combination) with the aim of reducing crop damage caused by pathogens such as *Fusarium oxysporum* and Melon necrotic spot virus (see below). Seedlings are generally grown in suitable containers such as plastic pots, peat pots or trays to be successfully transplanted. Transplants are planted at a density of 400 to 800 plants per 10 a, and rows should be at least 70 cm apart (MAFF, 2007; Hide Farm Management Consultant, 2017).

Many melon cultivars produce extensive vine growth. Pruning of vines is widely performed to achieve a balance between vine growth and fruit set; vine pruning is known to increase average fruit weight while reducing the number of unmarketable fruit (Buwalda and Freeman, 1986; Silva et al., 2019). Melon requires pollination (either honeybee pollination or hand pollination) for fruit set, higher yield, and to prevent misshapen fruit (Duncan and Ewing, 2015). Fruit thinning should begin when fruits grow to the size of a chicken egg. This practice can improve the distribution of photo-assimilates in the plant, resulting in increased fruit production and size, as well as the enhancement of fruit quality (Ganvit et al., 2025). Hydroponic melon cultivation, which involves growing plants without soil and using nutrient solutions, has been also attempted in Japan (Asao et al., 2014). An advantage of hydroponic system is the continuous supply of oxygen and nutrients to the plant roots, which promotes rapid growth and high-quality yields (Phankaen and Kumpanuch, 2025).

Melons are harvested by hand, since their skin is tender and easily damaged during harvesting. The appropriate time of harvesting is determined by fruit maturity. Sugar content is the principal measure of maturity (MAFF, 2007). This is expressed as Brix scores, and growers are encouraged to measure Brix content of their crops using a refractometer (Duncan and Ewing, 2015). Other useful indicators of maturity include the formation of the abscission layer between the stem and fruit, skin and flesh color, skin firmness, and netting structure on the skin (MAFF, 2007; Hide Farm Management Consultant, 2017). Melon produces ethylene as it ripens, and ethylene accelerates the ripening process. Consequently, melon fruits are able to continue to ripen after being harvested (Pech et al., 2008). Over-ripening can lead to excessive softening, causing spoilage and damage during shipping and handling. Even when harvested and handled under optimum conditions, melons will be of only fair quality around two weeks after harvest. Ripened melons may be stored at 4°C for three to four weeks (Sugiyama, 2017).

Disease and Pest Problems

Powdery mildew and Fusarium wilt, which are caused by fungal pathogens, *Sphaerotheca fuliginea* (Schlechtendal) Pollacci and *Fusarium oxysporum* Schlechtendal f. sp. *melonis* W. C. Synder et H. N. Hansen, respectively, have been the most widespread and serious diseases of melon in Japan (Nonaka and Ezura, 2024). A preventive program combining the use of genetic resistance, agrochemicals, and cultural practices as needed usually helps alleviate disease problems. Many Japanese melon cultivars have resistance to powdery mildew and/or Fusarium wilt. However, it should also be mentioned that resistance efficacy has occasionally been compromised by the emergence of resistance-breaking races of the pathogens (Sakata et al., 2006).

Other fungal and bacterial diseases that can result in crop losses include downy mildew [caused by *Pseudoperonospora cubensis* (Berkeley et M. A. Curtis) Rostovzev], angular leaf spot [caused by *Pseudomonas syringae* pv. *lachrymans* (Smith et Bryan 1915) Young, Dye et Wilkie 1978], secondary root rot [caused by *Pyrenochaeta terrestris* (H. N. Hansen) Gorenz, J. C. Walker et

Larson], and gray mold (caused by *Botrytis cinerea* Persoon) (NARO Genebank, 2024). Various viruses are also known to infect melon crops, including Cucumber green mottle mosaic virus (CGMMV; Fukui and Komuro, 1973), Melon yellow spot virus (MYSV; Kato et al., 2000), Melon necrotic spot virus (MNSV; Kishi, 1966), and Cucurbit chlorotic yellow virus (CCYV; Gyoutoku et al., 2009) (Sugiyama, 2013). These viral infections may damage the crop during any given growing season, leading to reduced or poor-quality yields. The solution for the management of viral diseases of melon lies in the strategies of the integration of several methods such as, (i) use of virus-free seeds or seedlings, (ii) grafting on resistant root stocks, (iii) planting resistant melon cultivars, and (iv) interfering with insect vectors using insecticides.

Insect pests of melon in Japan include greenhouse whitefly (*Trialeurodes vaporariorum* Westwood), melon aphid (*Aphis gossypii* Glover), leafminer fly (*Liriomyza sativae* Blanchard), and kanzawa spider mite (*Tetranychus kanzawai* Kishida) (MAFF, 2007). It is necessary to protect the plants through traditional insecticide application and integrated pest management strategies (Gyoutoku et al., 2007; Zhang et al., 2025). In addition, periodic scouting is recommended for early detection and best management of insect pests.

CONCLUDING REMARKS

In Japan, the melon improvement programs have been implemented with the main emphasis being on the creation of superior cultivars with high fruit quality and yield, and enhanced disease resistance. Fruit quality greatly affects consumer preferences and the concomitant selection of market-preferred cultivars (Shahwar et al., 2023). Fruit quality consists of many attributes, including internal quality (e.g., flavor/taste, nutritional content, flesh color, and texture) and external features (e.g., shape, rind/skin color, and stripe pattern) (Weng et al., 2020).

All current Japanese melon cultivars were developed through conventional breeding methods like pedigree selection, backcrossing, and inter-varietal crossing. The traditional breeding method is, however, time-consuming and laborious, particularly when dealing with complex traits such as fruit quality and yield, as these traits mostly have a multi-genic nature and are vulnerable to environmental influence (Pérez-de-Castro et al., 2012). This method also heavily depends on the phenotype, making selection prone to errors due to the strong influence of genotype-environment (G x E) interactions (Shahwar et al., 2023). To address these challenges, the plant breeding paradigm has shifted and now aims to combine both conventional and molecular breeding approaches with the hope of enhancing the accuracy of breeding practices and saving time.

The last decade has witnessed a rapid development of genetic and genomics resources in melon. Since the first melon genome sequence was released (Garcia-Mas et al., 2012), the draft genome assembly has been improved using new technologies and experimental data (Ruggieri et al., 2018; Castanera et al., 2020). With the advancement of sequencing technologies and related research tools, high-resolution genetic maps have been constructed using single nucleotide polymorphisms (SNPs) from genotyping-by-sequencing and re-sequencing data for melon (Weng et al., 2020; Xu et al., 2022). It is also noteworthy that the candidate genes as well as tightly linked molecular markers have been discovered for the traits of rind color, flesh color, and acid content (Xu et al., 2022). These genomic tools will enable the rapid and precise identification of desirable genotypes and accelerate the breeding process.

In Japan, the consumption of melons is gradually decreasing (ALIC, 2020). As mentioned above, Japanese melons are regarded for their high standard of quality and safety and are becoming increasingly popular abroad. Hence, it is crucial to expand the exportation of Japanese melons and secure additional demand. The Japanese government has been encouraging the export of domestically produced melons with various programs (USDA, 2018), but the export volume is still limited (see Fig. 2).

Japanese melons mostly have a short shelf-life and face challenges when exported to distant overseas market. It is considered that the *ACO* (aminocyclopropane carboxylic acid oxidase) gene is one of the key genes to control the shelf-life of melon fruit (Nonaka and Ezura, 2024). Recently, Nonaka et al., (2023) have succeeded in extending the shelf-life of melon cultivar 'Earl's Favourite' by modifying the *ACO* gene using genome editing technology. Genome editing allows for precise, targeted mutation in one or a few genes without altering the plant's genetic background (Nonaka and Ezura, 2024). This technology can also overcome many of the public concerns about previous genetic modification techniques because it does not leave foreign genes in the final crops (Khosa et al., 2016; Shahwar et al., 2023). Genome editing is thus expected to play a significant role in future melon improvement.

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CRediT AUTHORSHIP CONTRIBUTION STATEMENT

Seisuke Motonishi: Conceptualization, writing – review and editing. Tetsuo Mikami: Conceptualization, writing – original draft, review and editing.

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The authors declare that they have no known competing financial interests of personal relationships that could have appeared to influence the work reported in this paper.

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SAŽETAK

Japanske dinje: uzgoj, potrošnja i sortiment

Dinja (*Cucumis melo* L.) komercijalno je važna hortikulturna vrsta diljem svijeta te pokazuje impresivnu raznolikost svojstava biljke i samih plodova. Dijeli se na podvrstu ssp. *melo*, koja uključuje zapadne sorte dinje, i podvrstu ssp. *agrestis*, koja uključuje orijentalne dinje poput skupina makuwa i conomon. Povijest uzgoja orijentalne dinje u Japanu vrlo je duga, a orijentalna se dinja upotrebljavala kao svježi desertni plod (*makuwa* dinja) te za kiseljenje ili kuhanje (*conomon* dinja). Zapadna dinja uvedena je u Japan kao svježe desertno voće krajem 19. stoljeća. Provedeni su oplemenjivački napori radi razvoja kvalitetnih i cjenovno pristupačnih kultivara dinje, a kao rezultat toga zapadna je dinja postala popularna diljem Japana tijekom 1960-ih godina. Površina uzgoja zapadne dinje u Japanu dosegnula je vrhunac 1990. godine, a zatim se postupno smanjivala. U ovom preglednom radu opisana je povijest uzgoja i komercijalna proizvodnju japanske dinje, kao i agronomska svojstva glavnih sorata, s očekivanjem da će objedinjene informacije pomoći u razumijevanju problema i perspektiva uzgoja dinje u Japanu.

Ključne riječi: oplemenjivanje, povijest uzgoja, uzgojne prakse, kvaliteta ploda, genomika

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Table 1. List of representative melon cultivars presently grown in Japan

Cultivar	Characteristics	Reference
New Crown	This is an early maturing cultivar which can be usually harvested 35 to 40 days after flowering. It bears nearly round-shaped, small (ca. 500 g in weight) fruits with a grayish white, no-netted rind. Its flesh is pale orange, sweet (Brix: 15 to 16 degrees), and with a pleasing flavor.	Honda (1971)
Home Run	An early maturing melon with resistance to downy mildew and powdery mildew. It produces round or slightly oval fruits (1.1 to 1.3 kg in weight) that are smooth-skinned, with white flesh. 'Home Run' offers sweet taste (Brix: 15 to 17 degrees) and melting texture.	Fujiwara (1978)
Quincy	'Quincy' has a good fruit setting and produces uniform, round-shaped, well-netted fruits. The cultivar has salmon-pink, thick and dense flesh with good Brix level (over 16 degrees) and a clean aftertaste. Resistant to Fusarium wilt and powdery mildew.	Itoh (1991)
Rupia Red	This is a medium-sized (1.3 to 1.5 kg in weight), oval-shaped melon with a grayish-green ridged skin and dark orange flesh. The flesh is also characterized by its smooth texture and refreshing sweetness (Brix: 16 degrees). Harvest when the abscission layer between the stem and fruit is formed. 'Rupia Red' has resistance to Fusarium wilt and powdery mildew.	Yamaguchi (1991)
Takami	The round or slightly oval fruit weighs as much as 1.3 to 1.5 kg. Its deep green rind is finely netted, and flesh is green, dense, very sweet, and with refreshing flavor. The cultivar is resistant to Fusarium wilt and powdery mildew.	Hirabayashi (1991)
Tiara	This is a late maturing melon that grows round-shaped fruits with well-netted, grayish green rind. Flesh is salmon colored, thick, juicy, and sweet (Brix: 14 to 16 degrees). 'Tiara' can be harvested 60 to 62	Horii (2003)

	days after pollination, and exhibits resistance to Fusarium wilt as well as moderate resistance to powdery mildew.	
Lennon	The cultivar produces round fruits with well-netted rind. Flesh is dark orange in color, firm and very sweet (Brix: 15 to 16 degrees). ‘Lennon’ melons have received high praise for their mellow aroma and smooth texture. This is a medium-maturing cultivar that has resistance to Fusarium wilt as well as moderate resistance to powdery mildew.	Horii (2006)
Ibaraking	It produces round-shaped, netted melons weighing as much as 1.2 to 1.5 kg. Flesh is opal green in color, and is characterized by its elegant fragrance, sweetness (Brix: 16 degrees), and smooth texture. ‘Ibaraking’ demonstrates resistance to Fusarium wilt.	Ishii (2013)
Yubariking	An early maturing cultivar. Its fruit is oval in shape and weighs 1.0 to 2.5 kg. Green colored rind is covered in a fine white mesh. Flesh is orange and less fibrous, and is also characterized by sweetness and rich aroma.	JA Yubari City (2015)

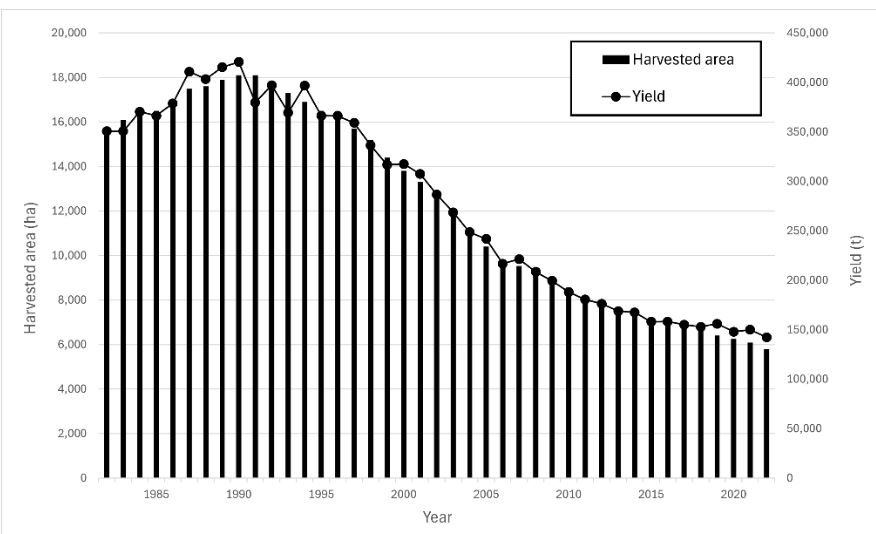

Figure 1. Evolution of harvested area and yield of melon in Japan from 1982 to 2022. Source: MAFF (2025)

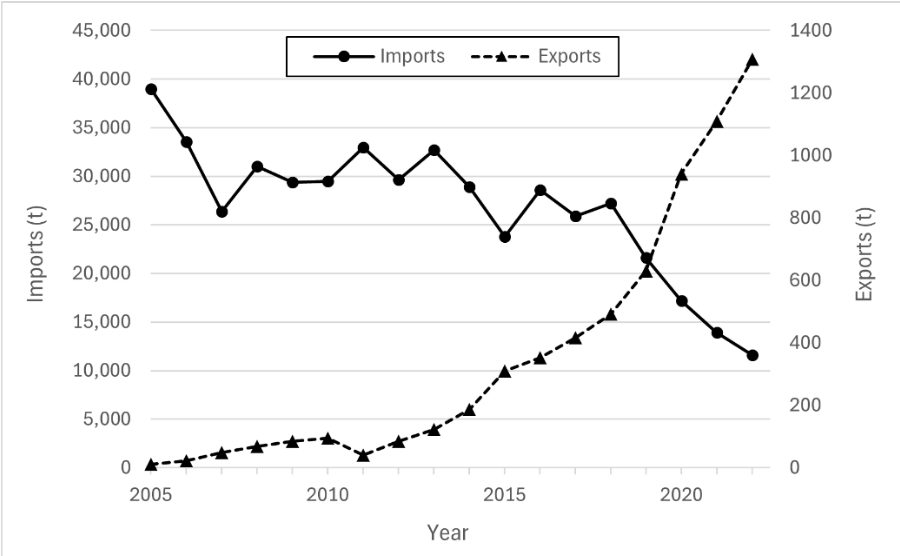

Figure 2. Import and export volumes of melons in Japan from 2005 to 2022. Source: MAFF (2024b, 2024c), MOF (2024)