Current Status of Flowers and Plants in Japan

July 2017

"Flowers Make You Feel Good" Campaign

Ministry of Agriculture, Forestry and Fisheries
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For inquiries:
   Agricultural Production Bureau
   Flower Industry and Greenhouse Horticulture Promotion Office
## Definition of Flowers and Plants

According to Article 2 of the “Flowers and Plants Promotion Act,” "flowers and plants" are defined as plants provided for ornamental purposes. Specifically, they refer to cut flowers, potted plants, flowering trees and shrubs, flower bulbs, seedlings for flower beds, lawn grass and ground-covering plants.

### [Flowers and Plants Promotion Act] (Act No. 102 of 2014) (Excerpt)

(Definition)

Article 2 (1) For the purpose of this Act, the term "flowers and plants" means plants provided for ornamental purposes.

(2) (Abbreviated)

### Flowers and Plants

<table>
<thead>
<tr>
<th>[Cut flowers]</th>
<th>[Flowering trees and shrubs]</th>
<th>[Seedlings for flower beds]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrysanthemums, roses, carnations, cut leaves (e.g. palm leaves), cut branches (e.g. cherry blossoms)</td>
<td>Woody plants used as garden trees and shrubs (e.g. azaleas), including greening trees (excluding those produced as potted plants)</td>
<td>Pansies, petunias, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[Potted Plants]</th>
<th>[Flower bulbs]</th>
<th>[Lawn grass]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclamens, orchids, foliage plants, Japanese bonsai plants, etc.</td>
<td>Tulips, lilies, etc. (excluding edible types)</td>
<td>Those cultivated for landscape gardening purposes, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[Ground-covering plants]</th>
<th>[Wild plants]</th>
<th>[Forest trees]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants covering grounds and walls (e.g. bamboo leaves, vines)</td>
<td>Grass plants, shrubs and some undershrubs, etc. growing naturally outdoors</td>
<td>Japanese cedars, Japanese cypresses, Japanese red pines, Japanese black pines, larches, etc.</td>
</tr>
</tbody>
</table>

While there are no clear-cut definitions for “wild plants” and “forest trees,” it is reasonable to treat those grown for ornamental purposes as flowers and plants.
1. Characteristics of Flowers and Plants

- Unlike vegetables and fruits, which are chosen for the purpose of food consumption, flowers and plants are used for a variety of purposes, such as ceremonial occasions, gifts and decorations.
- Flowers and plants are highly dependent on people's preferences, with many different kinds, breeds, colors, etc., available, depending on the purpose and situation of their use.
- Therefore, in implementing measures to promote flowers and plants, it is vital to adopt measures based on the perspective of the consumers (downstream), taking into account their wide variety of needs, more so than when dealing with other items such as vegetables and fruits.

<table>
<thead>
<tr>
<th>Chrysanthemums</th>
<th>Tropical orchids (pot-grown)</th>
<th>Lilies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funerals</td>
<td>Flowers of condolence</td>
<td>Decorations</td>
</tr>
<tr>
<td>&quot;Ringiku (a single chrysanthemum flower per stem)&quot; (white)</td>
<td>Phalaenopsis orchids (white, pink)</td>
<td>Flowers of condolence</td>
</tr>
<tr>
<td>No. 1 output 69.2 billion yen</td>
<td>No. 2 output 33.3 billion yen</td>
<td>No. 3 output 21.7 billion yen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roses</th>
<th>Cut branches</th>
<th>Carnations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weddings</td>
<td>Flowering trees and shrubs (pot-grown)</td>
<td>Nursery trees for gardens</td>
</tr>
<tr>
<td>Anniversaries</td>
<td>No. 5 output 16.8 billion yen</td>
<td>No. 6 output 14.8 billion yen</td>
</tr>
<tr>
<td>(pink etc.)</td>
<td>&quot;Ikebana&quot; Japanese flower arrangements</td>
<td>Town development</td>
</tr>
<tr>
<td>(red etc.)</td>
<td>Hydrangeas, poinsettias, etc.</td>
<td>Mother's Day</td>
</tr>
<tr>
<td>No. 4 output 19 billion yen</td>
<td>No. 7 output 15.1 billion yen</td>
<td>No. 8 output 12.6 billion yen</td>
</tr>
</tbody>
</table>

2. Production of Flowers and Plants ① (Output)

- The output of flowers and plants came to 380.1 billion yen in 2015, accounting for 4% of the total agricultural output.
- Of the total output of flowers and plants, cut flowers accounted for approximately 60%, potted plants about 30% and seedlings for flower beds about 10%.

Japan's agricultural output (2015)

- Potatoes, beans, wheat and barley: 337.7 B. Yen (4%)
- Others: 314.6 B. Yen (4%)
- Grass: 783.8 B. Yen (9%)
- Rice: 1,499.4 B. Yen (17%)
- Vegetables: 2,391.6 B. Yen (27%)
- Livestock: 3,117.9 B. Yen (35%)

Breakdown of output of flowers and plants (2015)

- Chrysanthemums: 69.2 B. Yen (18%)
- Lilies: 21.7 B. Yen (6%)
- Roses: 19 B. Yen (5%)
- Carnations: 12.6 B. Yen (3%)
- Eustomas: 11.7 B. Yen (3%)
- Cut branches: 15.1 B. Yen (4%)

- Flowering trees and shrubs: 22.6 B. Yen (6%)
- Seedlings for flower beds: 30.2 B. Yen (8%)
- Flowering trees and shrubs (pot-grown): 11.3 B. Yen (3%)
- Foliage plants (pot-grown): 16.8 B. Yen (4%)
- Flower bulbs: 2.7 B. Yen (1%)
- Other potted plants: 25.8 B. Yen (7%)

Calculated output

- Cut flowers subtotal: 218.2 B. Yen (57%)
- Potted plants subtotal: 95.9 B. Yen (25%)

Source: "Statistics on Agricultural Production Income," "Production status survey for flowering trees and shrubs," Ministry of Agriculture, Forestry and Fisheries

* For the output of flowers only, the output value in the "Production status survey for flowering trees and shrubs" is added to that in the "Statistics on Agricultural Production Income." Therefore, the output values for the items shown above do not add up to the total agricultural output of 8,797.9 billion yen, which is based on output figures in the "Statistics on Agricultural Production Income."
2. Production of Flowers and Plants ② (Output, planted area, etc.)

- The output of flowers and plants has been on a declining trend for all items since peaking in 1998, due mainly to an increase in imports of cut flowers and a drop in the number of flower growers.
- Some producers have succeeded in establishing favorable sales models through stable shipments for year-round supply and production through direct dealing according to demand.

## Changes in output and planted area of flowers and plants

![Graph showing changes in output and planted area of flowers and plants](image)

**[Case 1] JA (Japan Agricultural Cooperative) Aichi Minami, Ringiku Committee**

- **Item:** Ringiku
  - **(Tahara City, Aichi Prefecture)**
  - **Total committee members:** 856
  - **Annual shipments:** 2.7 million cases (2013)
  - **Stable shipments for year-round supply made possible by switching planted breeds**
  - **Created 3 subcommittees that have different characteristics, in order to meet the demands of various sales channels**
    - **Team Star** (Mainly box shipments, with emphasis on in-advance negotiated transactions)
    - **Team Sky** (Mainly box shipments, with emphasis on production of each grower)
    - **Team Max** (Mainly individual sale; meets demands of markets per item)

**[Case 2] Jardin Co.**

- **Item:** Seedlings for flower beds
  - **(Inzai City, Chiba Prefecture, etc.)**
  - **No. of employees:** 226
  - **Annual production:** 41.5 million plug seedlings, 14.7 million pot seedlings
  - **Switched from production of potted flowers to production specialized in seedlings, thus marking a shift from handling shipments mainly intended for markets to direct dealing with DIY stores, etc.**
  - **Places emphasis on human resources development, such as staff training and technology presentations, to meet the advancement of production technologies**
  - **Gathers information on consumer needs and places different POP displays and samples in each store to create differentiation from other products**

Source: "Statistics on Agricultural Production Income," "Statistics on cultivated area and planted area," "Statistics on Production and Shipment of Flowers" (Statistics Department); "Production status survey for flowers," "Production status survey for flowering trees and shrubs" (Agricultural Production Bureau)

Note 1: Regarding data on flowering trees and shrubs, the production value is shown until 2007 and the shipment value from 2008.

Note 2: The planted area shows the total area of outdoor sites and facilities that grow cut flowers, potted plants and seedlings for flower beds.
2. Production of Flowers and Plants

- Major producers of flowers and plants are Aichi, Chiba, and Fukuoka prefectures. In Aichi Prefecture, flowers are an important agricultural field, accounting for 20% of total agricultural output.
- Horticultural crops are seen as an attractive field, with 85% of new farmers choosing vegetables, fruit, and flowers as their main crop.

### Output of flowers and plants by prefecture (2015)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Prefecture</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aichi</td>
<td>62.6</td>
</tr>
<tr>
<td>2</td>
<td>Chiba</td>
<td>25.6</td>
</tr>
<tr>
<td>3</td>
<td>Fukuoka</td>
<td>22.9</td>
</tr>
<tr>
<td>4</td>
<td>Saitama</td>
<td>18.5</td>
</tr>
<tr>
<td>5</td>
<td>Shizuoka</td>
<td>18.0</td>
</tr>
</tbody>
</table>


* The output value in the "Production status survey for flowering trees and shrubs" is added to that in the "Statistics on Agricultural Production Income."
2. Production of Flowers and Plants ④ (Planted area, shipments and No. of commercial farm households)

- Planted areas and shipments have been on a downtrend in recent years due to factors such as a drop in the number of commercial farm households and an increase in imports of cut flowers.
- While the number of commercial farm households for flowers is on the decline, it is clear from the farmers’ age groups that the younger generation is active, as the proportion of young flower growers below 45 years of age is approximately double that of young rice farmers.

![Graphs](https://via.placeholder.com/150)

- Changes in planted area of flowers and plants (1,000 ha)
- Changes in number of commercial farm households for flowers and plants
- Comparison of age groups of rice farmers and flower growers

Source: "Census of Agriculture and Forestry," Ministry of Agriculture, Forestry and Fisheries
2. Production of Flowers and Plants ⑤ (Supply-demand structure <in value>)

- Of the domestic supply of flowers and plants, domestic production (in value terms) accounts for some 90% and imports around 10%.
- Of the domestically produced flowers and plants, cut flowers account for about 60%, followed by potted plants and seedlings for flower beds.
- Of the imported flowers and plants, nearly 90% are cut flowers and the remainder are flower bulbs.

Supply-demand structure of flowers and plants (2015)

- **Imports 52.4 B. Yen [12%]**
- **Domestic production 380.1 B. Yen [88%]**
  - **Cut flowers 218.2 B. Yen [57%]**
  - **Potted plants 95.9 B. Yen [25%]**
  - **Seedlings for flower beds 30.2 B. Yen [8%]**
  - **Flowering trees and shrubs 22.6 B. Yen [6%]**
  - **Cut flowers 44.9 B. Yen [86%]**
  - **Lawn grass 7.3 B. Yen [2%]**
  - **Ground-covering plants 3.2 B. Yen [1%]**
  - **Flower bulbs 7.5 B. Yen [14%]**

2. Production of Flowers and Plants ⑥ (Supply-demand structure <in volume>)

- 25% of cut flowers are imported (on volume basis), with carnations, roses and chrysanthemums ranking high in import percentage. Major importers are Colombia, Malaysia, China, Kenya, etc.
- Around 80% of flower bulbs are imported (on volume basis), with the majority imported from the Netherlands.

### Supply-demand structure of cut flowers (2015)

<table>
<thead>
<tr>
<th>Item</th>
<th>Import percentage</th>
<th>Import volume (in millions of flowers)</th>
<th>No. 1 importer</th>
<th>No. 2 importer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnations</td>
<td>56%</td>
<td>340</td>
<td>Colombia</td>
<td>China</td>
</tr>
<tr>
<td>Roses</td>
<td>18%</td>
<td>60</td>
<td>Kenya</td>
<td>India</td>
</tr>
<tr>
<td>Chrysanthemums</td>
<td>16%</td>
<td>300</td>
<td>Malaysia</td>
<td>Vietnam</td>
</tr>
</tbody>
</table>

### Supply-demand structure of flower bulbs (2015)

- Domestic shipments: 3.87 B. flowers [75%]
  - Imports: 1.27 B. flowers [25%]
- Imports: 360 M. bulbs [78%]
  - the Netherlands: 310 M. bulbs [88%]
  - Others: 40 M. bulbs [39%]
  - Toyama Pref.: 20 M. bulbs [18%]
  - Niigata Pref.: 20 M. bulbs [19%]
  - Kagoshima Pref.: 30 M. bulbs [25%]
  - New Zealand: 20 M. bulbs [6%]
  - Others: 20 M. bulbs [7%]

2. Production of Flowers and Plants

- The majority of flowers are bred by private companies and producers themselves.
- Institute of Vegetable and Floriculture Science at National Agriculture and Food Research Organization (NARO) is working on the development of technologies for [1] cost reduction and energy saving and [2] vase life extension and disease resistance improvement, which are matters that cannot be easily addressed by private companies.

### Branding and other efforts

- **Branding and differentiation through the development of original varieties at private companies, etc.**
  - Reviving double pansies that have gone extinct overseas
  - Developing the world’s first yellow primroses

### Cost reduction/energy saving technologies

- **Technology for low-cost planned wintertime production of eustomas**
  - Reducing fuel consumption by 50%. Keeping production cost under 100 yen per flower
- **Energy-saving flower production technology utilizing heating and lighting after sundown**
  - Reducing fuel consumption by 30% by promoting earlier flowering with heat treatment after sundown
  - Shortening cultivation period per production cycle by seven to ten days by applying far-red light after sundown

### Vase life extension technologies

- **Utilization of preservative solutions**
  - Vase life can be extended by 30% by properly using preservative solutions in each phase of production, distribution, retail and consumption.

### Disease resistance improvement technology

- **Developing and cultivating varieties with high disease resistance**
  - Developing a new carnation variety named “Hanakoi Rouge” with high resistance against bacterial wilt (*a soil-borne infectious disease that causes plants to shrivel and die quickly), which frequently occurs at higher temperatures

<table>
<thead>
<tr>
<th>Variety</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double pansy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow primrose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miracle Rouge</td>
<td>Vase life can be extended by 30% by properly using preservative solutions in each phase of production, distribution, retail and consumption.</td>
<td></td>
</tr>
<tr>
<td>“Hanakoi Rouge”</td>
<td>Stayed healthy even after infection with bacterial wilt.</td>
<td></td>
</tr>
</tbody>
</table>

Research results from the Institute of Vegetable and Floriculture Science, NARO
Production Related Issues – Breeding and Variety Development

Current Situation and Challenges

- Approximately 60% of applications based on the Plant Variety Protection and Seed Act are related to flowers, of which 90% were filed by individuals and seed/seedling companies. Development of flower varieties is mainly led by private companies and individual breeders.

- 70% of agricultural varieties that are deregistered as renewal procedures were not taken are flowers. The color and shape of flowers are greatly affected by trends.

- Mass production of virus-free flower bulbs is an important issue. Some varieties take as long as 20 years to develop.

- Export value for flowers is approximately 10 billion yen, of which 90% is accounted for by garden trees. Resource depletion is an issue. Efforts concerning cut flowers need to be made in order to expand exports for the future.

Variety development period and target variety appearance ratio

- It took Toyama Prefecture, which is known for active tulip breeding and variety development, about 20 years to develop “Arisa.”
- The ratio of appearance of “Wedding Veil,” which was born around the same period as “Arisa,” is one-30,000th. It was found in one of approximately 30,000 seeds produced through 400 crossings.

Policy for the future

- Accelerate the cultivation of new varieties through collaboration among private companies and individual breeders that hold various seed/seedling materials and researchers that have quality genetic resources, such as disease resistance and longevity.

Private companies, individual breeders

- Original varieties developed with an aim of branding and differentiation

Researchers

- Varieties developed with new breeding technologies, such as DNA markers

[Example of new variety development by a private company]

Suntory Group developed the world’s first blue carnations, which are now sold under the name “Moon Dust.” In 2004, it also succeeded in the development of blue roses, which are sold under the name “Blue Rose Applause.” It launched research on blue lilies in April 2006. The company has already succeeded in the development of blue lilies and is now working on their commercialization.
Oil prices have been highly volatile in recent years, causing a squeeze on the management of greenhouse horticulture farms as fuel costs account for a large portion of their operating costs. Urgent response is needed, such as shifting to a management structure that is less vulnerable to high oil prices.

**Proportion of fuel costs in agricultural expenditures**

<table>
<thead>
<tr>
<th>Industry</th>
<th>Item</th>
<th>Fuel Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Bell pepper</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td>Mango</td>
<td>44%</td>
</tr>
<tr>
<td></td>
<td>Tea (processed)</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>Rose</td>
<td>31%</td>
</tr>
<tr>
<td>Fishery</td>
<td>Squid fishing (coastal)</td>
<td>26%</td>
</tr>
<tr>
<td>Other industries</td>
<td>Taxi</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Truck</td>
<td>5%</td>
</tr>
</tbody>
</table>

Agriculture: Proportion of fuel costs estimated based on the 2015 Statistics on Individually Managed Farms by Farm Type. The figure for mango is based on surveys in production areas.

Fishery: Based on the 2015 Fishery Management Survey Report.

Other industries: Figures for taxi and truck are based on the Business Management Index for the Automobile Transportation Industry.

**Fuel consumption in flower production**

<table>
<thead>
<tr>
<th>Items</th>
<th>Usage volume per 1000m² (ℓ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light-cultured chrysanthemum</td>
<td>7,500</td>
</tr>
<tr>
<td>Rose</td>
<td>13,500</td>
</tr>
<tr>
<td>Eustoma</td>
<td>10,963</td>
</tr>
<tr>
<td>Phalaenopsis orchid (potted)</td>
<td>9,000</td>
</tr>
</tbody>
</table>

Source: “Miyazaki Prefecture Farm Management Policy”

**Price comparison of heavy oil (class A) and other fuels**

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Unit calorific value</th>
<th>Price ($)</th>
<th>Price per 1,000kcal ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel coal</td>
<td>6,354 kcal/kg</td>
<td>10.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Wood chips</td>
<td>2,530 kcal/kg</td>
<td>15.5</td>
<td>6.1</td>
</tr>
<tr>
<td>Pellet</td>
<td>4,000 kcal/kg</td>
<td>40.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Heavy oil (class A)</td>
<td>9,341 kcal/litter</td>
<td>95.9</td>
<td>10.2</td>
</tr>
<tr>
<td>Kerosene</td>
<td>8,767 kcal/litter</td>
<td>111.8</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Source: Prepared by the Forestry Agency

Note: Figures for fuel coal are based on interviews with relevant persons. The price for wood chips is calculated by adding transportation cost of 3,000 yen/ton to the ex factory price in April 2014 provided in “Wood Prices” (for pulp) published by the Ministry of Agriculture, Forestry and Fisheries. The unit calorific value and price for wood chips are calculated with a moisture content of 40%. Price for heavy oil (class A) is the delivery price for small-sized industrial trucks as of March 2014 published by the Oil Information Center. Price for kerosene is the consumer price as of April 2014 published by the Oil Information Center. Price for pellets is calculated by assuming 40 yen/kg as the current price for pellets that are produced by timber mills using remainder wood materials and delivered to a nearby pellet factory.
Production Related Issue – Energy

- Fuel costs account for a significant portion of operating costs for greenhouse horticulture. In addition, oil prices have repeatedly swung up and down due to the influence of the situation of currency exchange and international commodity markets. Fuels are difficult production materials whose future prices are unpredictable.
- For this reason, greenhouse horticultural production areas that have already engaged in energy saving efforts are also required to shift to a management structure that is less vulnerable to high oil prices.
- The government promotes the development of a safety net by providing production areas addressing such management reform with compensation money when oil prices exceed a certain level.

[Basic mechanism of the countermeasures against high oil prices]

Shifting to a management structure that is less vulnerable to high oil prices
- Promote stable management by providing a safety net to mitigate the effect of high oil prices that cannot be covered solely by energy saving efforts for greenhouse horticultural production areas that have formulated an energy saving promotion plan for the goal of fuel consumption reduction of 15% or more.

Formulating an energy saving promotion plan in greenhouse horticultural production areas
- Setting a target fuel consumption reduction (-15% or more) and measures toward the achievement of this goal

Reducing fuel consumption by 15% or more by implementing the energy saving promotion plan

Promoting safety net development (subsidy rate: 50%)

Support formulating plan

Formulation of the plan
1st year
2nd year
3rd year

Fuels are production materials whose prices are unpredictable.

Greenhouse horticultural areas have already been in energy saving efforts.

The amount exceeding the standard price is compensated when the monthly oil price rises by 20% or more compared to the average price for the heating period in the previous year.

[Revision 1] Standard price for activating the safety net
The standard price has been fixed since FY2012. This price will be revised using the recent data.

[Revision 2] Introduction of special measures against soaring prices

The standard price will be fixed at 97.2 yen/liter.

Promoting safety net development (subsidy rate: 50%)

- Activating the safety net
- Compensate the amount that exceeds the activation standard price using reserves funded half by the government and half by the producers

[Revision 3] Enrollment requirements

- Reduce fuel consumption per 10a by 15% or more by introducing energy saving facilities, etc.
- Further reduce fuel consumption per 10a by 15% or more by improving cultivation technologies, etc.
- Contain fuel costs and consumption by utilizing private financial instruments, etc.

Greenhouse horticultural production areas that continue to address energy saving measures
(Must fulfill one of the following)
- Further reduce fuel consumption per 10a by 15% or more by introducing energy saving facilities, etc.
- Reduce fuel consumption per ton of products by 15% or more by improving cultivation technologies, etc.
- Contain fuel costs and consumption by utilizing private financial instruments, etc.

Support formulating plan

Formulation of the plan
1st year
2nd year
3rd year

Fuel Consumption

Shifting to a management structure that is less vulnerable to high oil prices

Promoting safety net development (subsidy rate: 50%)

Support formulating plan

Formulation of the plan
1st year
2nd year
3rd year

Fuel Consumption
3. Market of Flowers and Plants

- Due to the number of items and varieties and very small retail structure, an extremely large portion of flowers (nearly 80%) are distributed through wholesale markets.
- At wholesale markets, approximately 30% of flowers are traded by auction. Although this ratio is high compared to those for vegetables and fruits, it has been constantly decreasing since it reached 80% in 1995.
- Retail costs account for 50% of flowers’ retail prices. This is due to cost for processing them into bouquets and significant product losses.
- There is a new trend for non-market trade, such as trading flowers only online and at logistics centers.

### Ratio of agricultural and fishery products distributed through wholesale markets (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits and vegetables</td>
<td>74.0</td>
<td>70.4</td>
<td>64.5</td>
<td>62.4</td>
<td>60.0</td>
<td>59.2</td>
<td>60.0</td>
</tr>
<tr>
<td>Vegetables</td>
<td>80.5</td>
<td>78.4</td>
<td>75.2</td>
<td>73.0</td>
<td>70.2</td>
<td>69.2</td>
<td>70.2</td>
</tr>
<tr>
<td>Fruits</td>
<td>63.4</td>
<td>57.6</td>
<td>48.3</td>
<td>45.0</td>
<td>42.9</td>
<td>42.4</td>
<td>42.2</td>
</tr>
<tr>
<td>Fishery products</td>
<td>67.6</td>
<td>66.2</td>
<td>61.3</td>
<td>56.0</td>
<td>55.7</td>
<td>53.4</td>
<td>54.1</td>
</tr>
<tr>
<td>Flowers</td>
<td>81.9</td>
<td>79.1</td>
<td>82.8</td>
<td>83.4</td>
<td>84.4</td>
<td>78.7</td>
<td>78.0</td>
</tr>
</tbody>
</table>

Source: “Wholesale Market Data,” Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries

### Retail price formation for flowers (estimation)

<table>
<thead>
<tr>
<th></th>
<th>Price received by producers</th>
<th>Cost of collection and shipment</th>
<th>Wholesale commission</th>
<th>Retail cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37.1</td>
<td>9.9</td>
<td>4.9</td>
<td>48.1</td>
</tr>
</tbody>
</table>

Unit: %

Source: “FY2009 Survey on Distribution Costs in the Flower Industry” (project commissioned by the Ministry of Agriculture, Forestry and Fisheries)

Note 1: Estimation for the case in which a retailer purchases flowers from a wholesaler.
Note 2: Producers’ labor costs for sorting and packing are included in the price received by producers and not included in the cost of collection and shipment.

### Proportion of actions at central wholesale markets (in value terms)

Source: “Wholesale Market Data,” Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries

### Distribution of flowers: New trends

**Case of Company A**

Company A shares shipment and sales information with producers and flower companies solely by the Internet. Transaction costs are reduced by completely separating sales channels and distribution channels. The distribution of products is entirely handled by logistics centers. The trade volume has increased every year from approximately 0.5 billion yen when the project started (1998) to 7.5 billion yen in FY2012.
4. Imports of Flowers and Plants

- Cut flowers account for the vast majority of imported flowers and plants. Cut flowers import has been on an increasing trend since 1985 when the custom duty was abolished. Major import partner countries include Colombia, Malaysia and China.

- Looking at items, imports of carnations and chrysanthemums are increasing remarkably due to improved vase life.

### Changes in the domestic shipment volume and import volume of cut flowers

<table>
<thead>
<tr>
<th>Year</th>
<th>Domestic Shipment Volume (10^9 units)</th>
<th>Export Volume (10^9 units)</th>
<th>Total (10^9 units)</th>
<th>Proportion of imported cut flowers (in volume terms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>42.5</td>
<td>1.2</td>
<td>43.7</td>
<td>3%</td>
</tr>
<tr>
<td>1990</td>
<td>53.2</td>
<td>3.6</td>
<td>56.7</td>
<td>6%</td>
</tr>
<tr>
<td>1995</td>
<td>55.8</td>
<td>6.6</td>
<td>62.4</td>
<td>11%</td>
</tr>
<tr>
<td>2000</td>
<td>55.9</td>
<td>8.3</td>
<td>64.2</td>
<td>13%</td>
</tr>
<tr>
<td>2005</td>
<td>50.2</td>
<td>10.4</td>
<td>60.7</td>
<td>17%</td>
</tr>
<tr>
<td>2013</td>
<td>40.7</td>
<td>13.5</td>
<td>54.2</td>
<td>25%</td>
</tr>
<tr>
<td>2014</td>
<td>39.5</td>
<td>12.7</td>
<td>52.2</td>
<td>24%</td>
</tr>
<tr>
<td>2015</td>
<td>38.7</td>
<td>12.7</td>
<td>51.4</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: “Statistics on Flower Production and Shipment” and “Statistics on Plant Quarantine,” Ministry of Agriculture, Forestry and Fisheries

### Changes in the import ratio of cut flowers (carnation and chrysanthemum)

#### Carnation

- **2005**
  - Produced in Japan: 73%
  - Imported: 27%

- **2015**
  - Produced in Japan: 44%
  - Imported: 56%

#### Chrysanthemum

- **2005**
  - Produced in Japan: 16%
  - Imported: 8%

- **2015**
  - Produced in Japan: 84%
  - Imported: 16%

### Import ratio and import volume by major cut flower item (2015)

<table>
<thead>
<tr>
<th>Item</th>
<th>Import Ratio</th>
<th>Import Volume (10^9 units)</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnation</td>
<td>56%</td>
<td>3.42</td>
<td>Colombiə</td>
<td>China</td>
<td>Ecuador</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>65%</td>
<td>21%</td>
<td>9%</td>
</tr>
<tr>
<td>Chrysanthemum</td>
<td>16%</td>
<td>2.98</td>
<td>Malaysia</td>
<td>Vietnam</td>
<td>China</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>62%</td>
<td>19%</td>
<td>15%</td>
</tr>
<tr>
<td>Rose</td>
<td>18%</td>
<td>0.61</td>
<td>Kenya</td>
<td>India</td>
<td>Colombia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38%</td>
<td>21%</td>
<td>11%</td>
</tr>
<tr>
<td>Lily</td>
<td>5%</td>
<td>0.07</td>
<td>South Korea</td>
<td>Vietnam</td>
<td>Ecuador</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>92%</td>
<td>6%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: “Statistics on Flower Production and Shipment” and “Statistics on Plant Quarantine,” Ministry of Agriculture, Forestry and Fisheries
Comparison of Carnation Production in Japan and Colombia

- While there is no significant difference in annual average temperature between Japan and Colombia, the monthly temperatures are virtually constant throughout a year in Colombia. For this reason, heating facilities are unnecessary. ⇒ Facility expenses and heating and lighting expenses (fuel expense, in particular) are not required.
- Since there are no prominent seasonal changes in Colombia, seasonal shifting in production areas does not occur and products are stably supplied throughout the year. In addition, there is a big temperature difference within a day, which is ideal for the color and growth of carnations.
- Flower production in Colombia started as farm and auxiliary facility development by some wealthy people worked in harmony with guidance on crop diversion by the US and the Colombian government’s domestic security measures.

Comparison of the overview of carnation production

<table>
<thead>
<tr>
<th></th>
<th>Japan</th>
<th>Colombia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area</strong></td>
<td>318 ha (2015)</td>
<td>1,066 ha (2015)</td>
</tr>
<tr>
<td><strong>Production value</strong></td>
<td>12.6 billion yen (2015)*</td>
<td>26.1 billion yen (2015)*</td>
</tr>
<tr>
<td><strong>Annual average temperature</strong></td>
<td>High: 17°C Low: 7.4°C</td>
<td>High: 16°C Low: 6°C</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>Approx. 1,500 m</td>
<td>2,600 m</td>
</tr>
</tbody>
</table>

Source: "Statistics on Production and Shipment of Flowers", "Statistics on Agricultural Production Income" (Statistics Department); International Statistics Flowers and Plants 2015(AIPH)

* Calculated at 136 yen to a euro, Figures for annual average temperature and altitude are those in the vicinity of production areas in Nagano Prefecture and Bogota.
Comparison of Carnation Production in Japan and Colombia

- The average cost per unit in Colombia is half that of Japan (excluding distribution costs).
- While gray mold is a common disease in Japan, the risk of infection is lower in Colombia due to the weather conditions and cultivation environment.
- Colombia conducts thorough post-harvest temperature control and freshness control using antimicrobial agents, etc. In Japan, post-harvest processing and temperature control are still insufficient. Comprehensive efforts covering the production, distribution and retail phases need to be taken.

### Comparison of costs of carnations

<table>
<thead>
<tr>
<th>Japan (Nagano)</th>
<th>Colombia</th>
</tr>
</thead>
<tbody>
<tr>
<td>264,000 yen/year</td>
<td>0</td>
</tr>
<tr>
<td>3,711,000 yen</td>
<td>Wooden frame and polyethylene film</td>
</tr>
<tr>
<td>130,000 yen/month</td>
<td>240,000 yen</td>
</tr>
<tr>
<td>28.7 yen</td>
<td>260 dollars/month (Approx. 25,000 yen)</td>
</tr>
<tr>
<td>10.4 yen (Production area → Market)</td>
<td>14 cents (Approx. 13 yen)</td>
</tr>
</tbody>
</table>

**Botrytis cinerea**

- Botrytis cinerea is a fungus that is a great threat to flowers, as it causes gray mold disease.
- As it is a common disease in Japan, thorough temperature control and crop dusting are needed, which adds to costs.

**Greenness control for carnations**

- Sorting after harvesting is conducted at room temperature in Japan, while in Colombia it is carried out in a room at 2-3 °C and flowers are then transported to airports at a low temperature.
- Since imported products have to endure lengthy transportation, freshness control is conducted in a thorough manner, through means such as using antimicrobial agents, preservation solutions and other chemical solutions.
- Such temperature control process is discontinued upon arrival at a Japanese airport and imported products are exposed to the same temperature conditions as the domestic products in the course of distribution to markets and retail stores.

*1: Since Colombia is free from typhoons, simple facilities are sufficient.
*2: Figure for Nagano is calculated with the minimum hourly wage (713 yen).
In order to recapture the market share seized by imported flowers and plants, it is important to leverage the strengths of domestically produced flowers, such as freshness and longevity.

In order to extend the vase life, on which consumers put a high priority in determining product quality, [1] temperature control (establishment of the cold chain), [2] hygiene control and [3] use of preservative solutions must be thoroughly conducted in each phase of production, distribution and retail.

Timeline from harvesting to retailing for flowers produced in Japan and imported flowers and plants

<table>
<thead>
<tr>
<th>Day</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imported flowers (Colombian carnations)</td>
<td>Picking</td>
<td>Picking</td>
<td>Airport</td>
<td>Shipping</td>
<td>Market</td>
<td>Retail stores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flowers Produced In Japan</td>
<td>Picking</td>
<td>Market</td>
<td>Retail stores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Establishment of a distribution system to enhance the freshness and vase life of flowers

Growers
- Post-harvest pretreatment (soaking in water with antimicrobial solution, etc.)
- Strict temperature control before shipping (storing at a low temperature)

Markets
- Lowering temperatures at distribution facilities and wholesale markets
- Strict temperature control during transportation (lowering temperatures inside storehouses for loading products onto trucks, etc.)

Retail stores
- Preventing temperature rise on the way from markets to retail stores
- Soaking flowers in water upon arrival, using floral coolers, etc.

Emphasis grewed in Japan by production area indication and sale with vase life guarantee

Based on interviews with market insiders
5. Exports of Flowers and Plants

- The export value of flowers and plants (export items of focus) in 2016 was 8.8 billion yen, with garden trees, bonsai, and potted plants accounting for the vast majority. Although the share of cut flower is low, the absolute value is growing thanks to promotional activities in export partner countries, etc.

- Based on the Strategy on the Enhancement of Export Power in the Agriculture, Forestry and Fishery Industries formulated in May 2016, Japan aims to increase the export value of garden trees, bonsai, potted plants and cut flowers to 15 billion yen by 2019 by communicating the attractive features of Japan-made flowers and plants that flowers and plants made in mass producing countries lack.

<table>
<thead>
<tr>
<th>Export items of focus</th>
<th>2016 (results)</th>
<th>2019 target</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export value (B. yen)</td>
<td>Major export partner countries</td>
</tr>
<tr>
<td>Garden trees, bonsai, potted plants</td>
<td>8.03</td>
<td>China, Vietnam, Hong Kong</td>
</tr>
<tr>
<td>Cut flowers</td>
<td>0.72</td>
<td>Hong Kong, US, China</td>
</tr>
<tr>
<td>Total</td>
<td>8.75</td>
<td></td>
</tr>
<tr>
<td>Flower bulbs, etc.</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9.07</td>
<td></td>
</tr>
</tbody>
</table>

Source: "Trade Statistics of Japan," Ministry of Foreign Affairs
Export of Garden Trees and Bonsais

- Japanese garden trees are gaining a high reputation among wealthy people attracted by genuine Japanese gardens, and have grown to become a main pillar of Japanese flower exports. "Bonsai" has already become a universal word, and has fans all over the world including the EU (e.g. Italy, Spain), China and South Africa.

- The World Bonsai Convention was held in Saitama, Japan from April 27 to 30 in 2017, for the first time in 28 years. MAFF opened a plant quarantine counter at a bonsai shop booth, so as to facilitate export of bonsais, including purchasing by inbound tourists.

- Negotiating with EU to lift the export quarantine restriction on Japanese black pine. (Made a request for lifting the restriction in March 2016)

---

**Change in export value of garden trees/bonsais**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value (100M yen)</td>
<td>14</td>
<td>23</td>
<td>51</td>
<td>52</td>
<td>45</td>
<td>62</td>
<td>67</td>
<td>82</td>
<td>94</td>
<td>81</td>
<td>76</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: "Trade Statistics of Japan," Ministry of Foreign Affairs

---

**Export value of garden trees/bonsais (by country)**

- China: 45.0
- Viet Nam: 13.6
- Italy: 3.8
- Germany: 1.1
- Hong Kong: 7.2
- Taiwan: 5.0
- Others: 4.5

Export value in 2016: JPY8 billion

---

[8th World Bonsai Convention (in Saitama)]

Period: April 27-30, 2017
Venue: Saitama Super Area/Omiya Sonic City
Turnout:
(Number of visitors)
- General visitors: about 45,000
- Registered participants: about 1,200 (about 800 foreign participants)

Plant quarantine counter

Source: "Trade Statistics of Japan," Ministry of Foreign Affairs
About Export of Cut Flowers

- Export value of cut flowers in 2016 increased to 0.72 billion yen.
- Particularly in the U.S., there is demand for rare flowers and gorgeous floral materials for high-end parties, fashion events, etc. As Japan started efforts for expanding the export of quality Japanese flowers, export value of cut flowers to the U.S. in 2016 reached 0.19 billion yen, or a 3.8-fold increase compared to four years ago.

Change in export value of cut flowers

Export value of cut flowers (by country)

Source: "Trade Statistics of Japan," Ministry of Foreign Affairs

Japan-made gloriosa used in decoration at the reception of the Consulate General of Japan in New York in celebration of the Emperor’s birthday
In order to increase the flower and plants export value to 15 billion yen by 2019, it is important to study outstanding cases from major exporting countries and investigate the market situation of export partner countries of focus.

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**Examples of investigations on one of the major cut flower exporting countries, Kenya**

- In order to acquire foreign currencies, the government implemented a national policy to stimulate cut flower production and export, with a focus on roses.
- A unified Kenyan brand was established and common promotional activities were carried out by the entire country.
- The cold chain from production areas to airports was established.
- Producers are engaged in the whole process, from production to processing, transportation, overseas marketing and branding.
- They are also making active efforts to obtain environmental certifications, such as MPS.

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**Examples of investigations on one of the export partner countries of focus, Singapore**

- Singapore is a multi-ethnic country of the same size as Tokyo 23 special wards, and its population is about 5.54 million. Singapore has many residents from abroad.
- Agricultural land is scarce, and the only domestically-grown flower species is the orchid. In spite of this, Singapore is rich in plants and is called “Garden City.” People have strong interest in flowers.
- In recent years, Singapore has been importing flowers from China, EU, Africa, etc., but species of imported flowers are limited.

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**Examples of investigations on one of the export partner countries of focus, Hong Kong**

- Hong Kong is the logistics center for East Asia and thus is a very important export destination for potted plants and cut flowers. Many cargoes are forwarded to casinos in Macau.
- There is strong demand for flowers in vivid colors, such as red and yellow, which are believed to bring good luck, especially on Chinese New Year and Valentine’s Day. Flowers are also in high demand at shopping malls, hotels, squares, etc.
- It is important to improve the profile of Japan-made flowers that are rich in variety and have delicate colors.
Export Japanese Flowers and Plants, and then Culture to the World through Collaboration among Producers (year-round supply etc.)

To EU that has a rich flower and plant culture and Russia that has potential demand!

To North America beyond the Pacific! (US, Canada)

To Asian countries with rapid economic growth! (Hong Kong, Singapore, China)

Measures to be taken:
- Collecting information on the situation of overseas markets
- Communicating information on Japanese flowers and plants including culture
- Improving quality control technologies to prepare for long distance transportation
- Measures for plant quarantine, such as the development of nematode control and elimination technologies
- Inviting overseas buyers

Continue to develop new sales channels through overseas market investigations!


**Case 1**

**Ashiro Rindo (Hachimantai Flower Production Group, Shin-Iwate Agricultural Cooperative)**

- Efforts for Developing World-Class Brands with Original Varieties -

---

**Won the Emperor’s Cup Award at the FY2015 Agriculture, Forestry and Fisheries Festival**

<management>

- Gentian production area that accounts for approximately one-fourth of cultivation area and approximately 30% of the shipment volume in Japan.
- [Number of members] 170 farmers; [Cultivation area] 110ha; [Shipment Volume] Cut flowers - 24.69 million units, Potted flowers - 0.14 million units. The sales have been over 1 billion yen for 10 consecutive years since 2005.

<initiatives>

(1) Producers and local government work together in growing regional original varieties

30 kinds of cut flowers and 9 kinds of potted plants are currently being produced. In developing these varieties, Ashiro Rindo Development Corporation, whose employees are all cooperative members, concluded a joint research contract with the Hachimantai Flower Research Center. They cooperated in the characteristics inspection of candidate lineages and establishment and management of test fields for growing parent strains. The corporation also entered into a license agreement on exclusive user rights with the city government, which limits the use of original varieties to cooperative members. In addition, producers contribute 2% of their sales to the research fund so as to ensure stable corporation management and inclusion of producers’ opinions in the process of variety development.

(2) Establishment of production area brands built on strong ties among producers

The corporation has established the brand named “Ashiro Rindo” and an advantageous position at markets with [1] stable shipment under a joint sales system that maintains the lineage shipment ratio at 90% or more; [2] production of quality original varieties by jointly raising all seedlings, visiting all fields and providing instruction, and carrying out strict self-inspection; and [3] cost reduction efforts, such as strict freshness preservation measures and mechanization of shipment and adjustment work.

(3) Export and overseas production of cut flowers, and export of intellectual property

- Export of cut flowers to Netherlands started in 2002. In recent years, new sales channels have been developed in Hong Kong, Singapore, and North America. As for potted flowers, the corporation entered into a cultivation licensing agreement with overseas bodies and is also working on the export of intellectual property.

- Overseas production is carried out in New Zealand and Chile based on cultivation agreements. Cut flowers can be stably supplied throughout the year by cultivating them in the southern hemisphere in which the seasons run the opposite of Japan.
Overseas Sales of the Prefecture-Developed Carnation Varieties, “Mini Tiara” Series (Kagawa Prefecture)

1. Overview
- Kagawa Prefecture entered into a five-year license agreement with Hilverda Kooij, a major seed and seedling company in Netherlands, for the overseas production and sales of seedlings of two carnation varieties under the prefecture-developed “Mini Tiara” series.
- The two varieties subject to licensing are “Mini Tiara Coral Pink” and “Mini Tiara Lilac.”
- User countries are EU, Kenya and Colombia.
- It is hoped that sales in overseas markets will raise the international profile of the prefecture’s original varieties and increase not only overseas demand, but also significantly increase domestic demand.

2. History
- In 1994, prefectural agricultural test fields started interspecific crossing between carnation cultivars and wild dianthus.
- In 2007, the prefecture grew a new carnation variety “Mini Tiara,” which has pointed petals.
- In 2011, “Mini Tiara Coral Pink” and “Mini Tiara Lilac” were grown.
- The petal shape and color variations of “Mini Tiara” caught the attention of Hilverda Kooij. In March 2012, the company and Kagawa Prefecture entered into two-year agreement on cultivation in Netherlands.
- In January 2014, the license agreement was concluded (currently preparing to file variety registration applications to above mentioned three countries (regions)).

【Carnation: “Mini Tiara” series】
It was named after the ornamental crown for women as the petal shape resembles it and the flower is small and pretty. Seven varieties have been developed so far, for which variety registration applications have been filed.

Name of the seven varieties:
“Mini Tiara Pink,” “Mini Tiara Cream,” “Mini Tiara Coral Pink,” “Mini Tiara Lilac,” “Mini Tiara Star Yellow,” “Mini Tiara Milk White,” “Mini Tiara Baby Pink,”

【Hilverda Kooij】
One of the world’s largest seed and seedling companies that develop flower variety and seed/seedling sales with a focus on carnations. It accounts for approximately 20% of the world’s carnation seed and seedling production. Many of the varieties developed by the company are also produced in sold in Japan.
6. Japanese Flowers and Plants in the world

- Japan participated in the EXPO 2016 Antalya International Horticultural Exposition held in Antalya, Turkey, from April 23 to October 30, 2016.
- During this exposition, approximately 160,000 people visited the Japanese government’s exhibition, which won the gold prize for the indoor exhibition section. In addition, many Japan-made flowers and plants also won prizes at the contest with some attaining record high scores, gaining international reputation for Japanese flowers and plants.

Outline of the EXPO 2016 Antalya

Name: EXPO 2016 Antalya
Theme: Flowers and Children - A Green Life for Future Generations
Period: April 23 to October 23, 2016
Participating countries/regions: 55 (including Turkey)
Number of visitors: 4.5 million
Turkey’s first EXPO
Varieties that won the gold prize at the contest

- Tulip
  - Haru-otome
  - Haru-no-awayuki
  - Nagori-yuki
- Lily
  - Petit Cheminée
  - Petit Selene
  - Petit Fraise
  - Petit Blanc
- Bonsai
  - Shinpaku (Chinese juniper)
  - Acer palmatum
- Eustomas
  - Miyabi
7. Consumption of Flowers and Plants

- Spending of cut flowers has been on decrease over a long term. According to the statistics by the age group of heads of household, the younger generation spends less on cut flowers.
- Among flower and plants dealers, retailers specialized in flowers and plants constitute 60% of number of stores and 70% of sales turnover.

**Household spending on cut flowers**

- **Changes in annual spending**
  - 2002: 11,531 yen
  - 2014: 9,317 yen

- **Annual spending by householder age group (2015)**
  - Average: 9,317 yen
  - 29 y/o - 39 y/o: 1,685 yen
  - 40 y/o - 49 y/o: 2,784 yen
  - 50 y/o - 59 y/o: 4,160 yen
  - 60 y/o - 69 y/o: 8,387 yen
  - 70 y/o -: 12,360 yen

**Note**: Figures for 2008 and onward are the spending of "households with two or more members (including agriculture, forestry and fishery households)." Other figures are the spending of "households with two or more members excluding agriculture, forestry and fishery households."

**Sales of flower and plants dealers**

- 2014 (519.5 B. yen)
  - 70%: 368.3 B. yen
  - 19%: 96.6 B. yen
  - 11%: 54.6 B. yen

**Note**: Figures for retailers specialized in flowers, etc. are the total of the figures for "retailers specialized in flowers" and "retailers mainly handling flowers (50% or more of the goods dealt in are housing-related goods (including flowers and garden trees))."

**Source**: "Annual Report on the Family Income and Expenditure Survey," Statistics Bureau, Ministry of Internal Affairs and Communications

**Note**: Figures for 2008 and onward are the spending of "households with two or more members (including agriculture, forestry and fishery households)." Other figures are the spending of "households with two or more members excluding agriculture, forestry and fishery households."

**Source**: "Census of Commerce," Ministry of Economy, Trade and Industry

**Note 1**: Figures for retailers specialized in flowers, etc. are the total of the figures for "retailers specialized in flowers" and "retailers mainly handling flowers (50% or more of the goods dealt in are housing-related goods (including flowers and garden trees))."

**Note 2**: Figure for supermarkets/home improvement stores is the figure for specialized supermarkets.
Expanding Demand: Revitalization of Floral Culture

In order to revitalize floral culture, the following measures need to be promoted:

- use of flowers and plants in city planning and at public facilities and other facilities where flowers and plants bring about beneficial effects, such as social welfare facilities;
- promotion of educational programs using flowers and plants (floral education) for pupils and students and regional events using flowers and plants; and
- promotion of use of flowers and plants in everyday life, succession of floral traditions, and creation of new floral culture.

**Use of flowers and plants in city planning and at public facilities**
- Indoor greening at offices, etc.
- Greening of stations and airports
- City planning featuring flowers and greens

**Use of flowers and plants in education and regional activities**
- Promotion of regional floral education activities
- Flower festivals held in individual prefectures

**Dissemination of benefits of flowers and plants**
- Utilizing flowers’ healing effects at social welfare facilities, etc.

**Succession of floral traditions**

**Creation of new floral culture**
Creation of New Demand

- Creating new demand through campaigns, including “Flower Valentine’s Day,” “Flower Biz” and “Flower Friday.”

Spending on cut flowers and garden supplies (2016)

![Graph showing spending on cut flowers and garden supplies from January to December 2016.]

- Source: “Family Income and Expenditure Survey,” Ministry of Internal Affairs and Communications

The “Flower Valentine’s Day” campaign is carried out to create new demand in January and February as spending in these months is low.

Bring flowers into your life!

Work: Flowers at office
Have new flowers at your office every Monday

Life: Flowers in everyday life
Send flowers or bring flowers home every Friday

Introduce flowers into your lifestyle.
Keep them close in your workplace and home.
“Flower Biz” “Flower Friday”
How about having flowers around you more frequently in your everyday life and making your living space more comfortable?
Bring flowers into your life for your health!
Benefits of Flowers

- Flowers and plants have stress relief effects and adjustment effects to optimize people’s physical conditions.

**Sympathetic activity**
- Heightens when nervous and stressed

**Parasympathetic activity**
- Heightens when relaxed

<table>
<thead>
<tr>
<th></th>
<th>Sympathetic activity (LF/HF)</th>
<th>Parasympathetic activity (HF) (msec²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With flowers</td>
<td>1.51</td>
<td>828.6</td>
</tr>
<tr>
<td>Without flowers</td>
<td>1.13</td>
<td>1072.6</td>
</tr>
</tbody>
</table>

- More relaxed
- Stress relief

+29%
Programs for Hospitals/Social Welfare Facilities Leveraging Benefits of Flowers and plants

- To leverage benefits of flowers, some hospitals and social welfare facilities have created green space within their buildings or introduced gardening activity as their programs. These efforts are received well by patients.

Program for hospital leveraging flowers and plants

- Decorating 120 locations within hospital with flowers. "Flower club" held once a week
- Creating green space at the four-storied stairwell entrance

Program for social welfare facilities leveraging flowers and plants

- Group planting workshop
- Flower arrangement workshop
The Parliamentary Association for the Flower Industry* of the Liberal Democratic Party (LDP) requested LDP’s Agriculture and Forestry Division to formulate a bill on flowers and plants industry revitalization.

In response to this, the Task Force for Examining the Bill to Revitalize the Flower Industry headed by Tetushi Sakamoto (director of the Upland Farming Subcommittee) under the Vegetable, Fruit and Upland Field Crops Subcommittee under the Agriculture and Forestry Division, LDP. The members, including Gen Nakatani (Chairman of the Research Commission on Agriculture, Forestry and Fisheries Strategy), Ken Saito (Director of the Agriculture and Forestry Division), and Takeo Kawamura (Director of the Parliamentary Association for the Flower Industry), are working on lawmaker-initiated legislation (Parliamentary Vice-Minister for Finance Yasuhiro Hanashi, who headed the Task Force until the second meeting attends subsequent meetings as an observer).

*The Parliamentary Association for the Flower Industry was established in 1987 by the late Takami Eto. The current chairman is Takeo Kawamura and director is Taku Eto (former Vice Minister of Agriculture, Forestry and Fisheries).

2013
- Sep. 25: 1st meeting of the Task Force for Examining the Bill to Revitalize the Flowers and Plants (LDP) (2nd meeting on Oct. 3, 3rd meeting on Oct. 25, 4th meeting on Nov. 15)
- Nov. 26: 5th meeting of the Task Force for Examining the Bill to Revitalize the Flowers and Plants (LDP) Bill completed
- Dec. 4: Joint meeting with the Agriculture and Forestry Division (LDP) Bill approved

2014
- Feb. 6: Meeting of the Agriculture, Forestry and Fishery Division (Komeito) Bill approved by Komeito
- Feb. 13: Meeting of the Policy Research Council (Komeito) Bill approved by Komeito
- Feb. 20: Examination at the Policy Research Council Board (LDP)
- Feb. 21: Meeting of the General Council Meeting of the policy planners from the ruling parties Bill approved by ruling parties
- Mar. 5: Interviews with organizations at the meeting of the Agriculture, Forestry and Fishery Division (DP)
- Apr. 8: Opinion exchange between DP executives and flower-related organizations
- May 29: Bill screening (LP)
- May 30: Bill screening (DP), (JIP), (UP) 186th ordinary session of the Diet
- Jun. 5: Plenary session of the House of Representatives Approved (Approved on June 4 by the Committee on Agriculture, Forestry and Fisheries, House of Representatives (proposed by the Chairman, approved))
- Jun. 20: Plenary session of the House of Councilors Approved and passed (Approved on June 19 by the Committee on Agriculture, Forestry and Fisheries (explained by Chairman from the House of Representatives, approved)
- Jun. 27: Promulgation of the Act (Act No. 102 of 2014)
- Dec. 1: Enforcement of the Act

Source: Prepared by the Policy Research Council, Liberal Democratic Party
Overview of the Flowers and plants Promotion Act (Act No. 102 of 2014)

1. Purpose
To achieve the sound development of the flower and plant industry and enhance public mental well-being

2. Definition
Flowers and plants: Plants for ornamental purposes
Flower and plant industry: Business of production, distribution, sale or new variety development

3. Basic policies, etc.
- The Ministry of Agriculture, Forestry and Fisheries is to formulate basic policies for revitalizing the flower industry and floral culture
- Prefectures are to formulate a plan for revitalizing the flower and plant industry and floral culture
- The national government, local governments, companies, research institutions, etc. are to strengthen mutual collaboration.

4. Measures for the flower and plant industry
- Stabilization of management by producers (Article 6)
- Promotion of productivity and quality improvement (Article 7)
- Sophistication of processing and distribution (Article 8)
- Consideration for the importance of freshness preservation (Article 9)
- Promotion of export (Article 10)
- Special measures under the Plant Variety Protection and Seed Act (Article 13)
- Promotion of research and development (Article 15)

5. Measures for floral culture
- Promotion of use of flowers and plants at public facilities, etc. (Article 16, paragraph (1))
- Promotion of “floral education” (Article 16, paragraph (2))
- Promotion of use of flowers and plants in everyday life (Article 16, paragraph (3))

6. Other measures
- Holding of expositions (Article 17)
- Commendation of contributors to the revitalization of the flower and plant industry and floral culture (Article 18)
- Government aid aimed at the smooth implementation of revitalization plans (Article 19)
- Establishment of the Flower and Plant Utilization Promotion Council (Article 20)
Special measures under the Plant Variety Protection and Seed Act are applied to varieties cultivated as a result of a R&D project plan certified by the Minister of Agriculture, Forestry and Fisheries.

Specifically, application and registration fees (from first year to sixth year) are reduced by three-fourths concerning the cultivation of new varieties contributing to the strengthening of the industry’s international competitiveness, such as those with strong disease resistance and longer vase life.

### Special measures under the Plant Variety Protection and Seed Act

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard</th>
<th>Special measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application fee</td>
<td>47,200 yen</td>
<td>11,800 yen</td>
</tr>
<tr>
<td>Registration fee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st-3rd year</td>
<td>6,000 yen/year</td>
<td>1,500 yen/year</td>
</tr>
<tr>
<td>4th-6th year</td>
<td>9,000 yen/year</td>
<td>2,250 yen/year</td>
</tr>
<tr>
<td>7th-9th year</td>
<td>18,000 yen/year</td>
<td>—</td>
</tr>
<tr>
<td>10th-30th year</td>
<td>36,000 yen/year</td>
<td>—</td>
</tr>
</tbody>
</table>

### Number of certified R&D project plans (as of July 2017)

**18**

**New variety cultivation subject to the special measures under the Plant Variety Protection and Seed Act (idea)**

- **Expansion of export**
  - New sweet pea variety with high resistance against gray mold that can be exported under high temperatures and high humidity during summer

- **Regaining of domestic share**
  - New chrysanthemum variety with high tolerance for high temperatures that can be stably supplied during the high demand period in summer
Project for Taking Urgent Action to Promote Exports of Japan-Produced Flowers and Plants

[Included in the FY2016 supplementary budget of 2,997 million yen]

Current situation of exports of Japan-made flowers and plants

- As cheap mass-produced cut flowers from Colombia and Kenya dominate the global market, Japan has promoted Japan-made flowers mainly for flower designers in the US, etc., taking advantage of their quality and uniqueness of varieties (sweet peas, ranunculus, gloriosas, etc.). As a result, the export of cut flowers is steadily growing (0.1 billion yen (2013) → 0.3 billion yen (2014) → 0.5 billion yen (2015)).

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit: 100 million yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2012</td>
<td>0.5</td>
</tr>
<tr>
<td>FY2013</td>
<td>0.7</td>
</tr>
<tr>
<td>FY2014</td>
<td>1.1</td>
</tr>
<tr>
<td>FY2015</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Changes in the export value of cut flowers to the US

- The spread of ikebana culture is effective in promoting Japan-made flowers. However, the situation is such that flowers available in individual countries are used.

- The same transportation method as domestic shipment is used for exports. Boxes are not standardized and newspapers are used for packing, which lessens the brand value.

Challenges concerning exports of Japan-made flowers and plants

- In order to further increase exports, it is necessary to hold trade fairs and business meetings and constantly provide opportunities for people to see and purchase Japan-made flowers and plants.

- It is necessary to provide Japan-made flowers in a timely manner to ikebana events in overseas countries.

- It is necessary to improve transportation materials (box, buffer, etc.) for exports that can contain multiple items at a time and have a high customer appeal effect.

Content of the project

- **Strengthening of promotional activities in export partner countries**
  With a view to further expanding overseas markets, constantly promote promotional activities for Japan-made flowers via local shops, etc.

- **Promotion of exports utilizing ikebana events**
  Promote exports to countries in which ikebana events are held by providing Japan-made flowers and vases as a package to such events.

- **Standardization of the design of export packaging materials**
  Support efforts for standardizing the design of export packaging materials, with a view to improving the brand value of Japan-made flowers.
### Project to Create Facilities Aimed at Expanding Exports of Agricultural and Livestock Products

**FY2016 supplementary budget: 10,000 million yen**

In order to achieve aggressive agriculture, forestry and fisheries, this project supports the development of jointly used facilities and wholesale market facilities necessary to expand exports and strengthen agriculture, from production to distribution, which will contribute to the improvement of quality and value added.

<table>
<thead>
<tr>
<th>Subject of subsidies:</th>
<th>Jointly used facilities, wholesale market facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidy ratio:</td>
<td>The ratio is fixed for all prefectures (for project implementers, 50% of project costs, etc.)</td>
</tr>
<tr>
<td>Project implementers:</td>
<td>Prefectural governments, municipal governments, agricultural organizations, etc.</td>
</tr>
</tbody>
</table>

**Flow of the project:**

1. Identified by prefectural governments
2. Accumulate and submit requests
3. Lump sum provision
4. Project adoption

**Organizations of farmers, etc.**

(Examples of facilities)

- **HACCP-certified meat processing facilities**
  - US, EU, etc. require HACCP certification for meat processing facilities

- **CA storage facilities**
  - Establishing a system for long-term preservation that enables supply of fruits and vegetables to export partner countries in high demand periods

- **Wholesale market facilities for the cold chain**
  - By shutting out outside air and controlling the temperature inside wholesale market facilities, establish a comprehensive cold chain system up to export destination countries
Project to Develop Facilities for Expanded Export of Agricultural and Livestock Products (Naniwa Flower Auction Co., Ltd (Osaka City, Osaka Prefecture)): Expanding Exports of Quality Cut Flowers with Optimal Temperature Control

Current situation

The exports of cut flowers have grown thanks to the promotional activities for overseas flower designers conducted by Naniwa Flower Auction. 2012: 0.5 million yen/year → 2015: 160 million yen/year [Japan: 500 million yen/year]

However, this wholesale market does not have any dedicated facilities for exports.

Issues in expanding exports

Maintenance issues
1. Low efficiency due to manual sorting
2. Short vase life due to the lack of thorough cold chain
3. Lack of fumigation facilities, which leads to the disposal of products at quarantines in export destination countries.

Distribution issues
• Individual production areas use different boxes, which damages the brand image and raises logistics costs

Solutions for the issues

Tangible aspects
1. Establish collection and shipment facilities in the vicinity of the wholesale market.

Intangible aspects
1. Standardize the designs and specifications for export packing materials

Plan after facility development

Solving maintenance issues
1. Effective cargo handling using dock shelters (entrance used for cargo shipment and receipt that allows workers to directly bring the products from the truck to storehouse)
2. Low-temperature packing center that can be used for the sorting of flowers, and storehouse that allows for item-specific temperature control
3. By establishing a fumigation space as a disease and pest control measure, improve efficiency and flowers’ longevity and reduce risks of loss due to disposal

Solving distribution issues
• Improve the brand image of Japan-made flowers and reduce logistics costs

Objective: Increasing annual export value from 160 million yen to 550 million yen
Establishing the image of Japanese flowers as high-end cut flowers
Project to Promote Innovative Measures for Domestically Produced Flowers (Enhanced)

Approved budgetary request for FY2017: 751 (702) million yen

In order to regain share and expand exports of domestically produced flowers, this project works on the establishment of a cost-efficient system that enables the stable supply of quality cut flowers in high demand periods. It also supports efforts for shortening time for raising seedlings, which is necessary for strengthening the production system for garden trees and bonsais.

1. Support for coordination among people in the flower and plants industry

- Holding meetings of prefectural councils, which consist of producers, researchers, distribution and sales companies, exporters, and other people involved in the flower and plant industry, to discuss measures to revitalize the regional flower industry.

2. Strengthening production and supply systems to enhance the strengths of domestically produced flowers and plants


- In order to achieve the stable supply of domestically produced cut flowers that can compete with imported products, support efforts to realize low-cost production and shipping of quality cut flowers in high demand periods, by such means as the demonstration of new technologies to control quality loss with greenhouse temperature control (e.g., EOD heating), and selection of varieties less affected by weather conditions.

*End-of-day Heating Treatment
A technology to reduce production costs while maintaining the quality and growth condition at the same level as ordinary cultivation methods, by controlling temperature before and after sunset

- In order to strengthen the production system to expand exports of garden trees and bonsais, support efforts to shorten the time for raising seedlings through the utilization of large-sized plant cutting and demonstration of innovative cultivation practices.

3. Increasing demand for domestically produced flowers and plants


Underlined are enhanced measures.
### Structure of the Project to Promote Innovative Measures for Domestically Produced Flowers and Plants

Under this project, 47 prefectures across Japan have established councils that unite people in the flower and plant industry. These councils carry out various measures across the country to promote collaboration among people in the industry, strengthen production and supply systems, and expand demand for flowers and plants.

#### Regionally promoted programs

<table>
<thead>
<tr>
<th>Regionally promoted programs</th>
<th>Nationally promoted programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Support for collaboration among people in the flower and plant industry</strong></td>
<td><strong>1. Activities related to the production and sale of flowers and plants</strong></td>
</tr>
<tr>
<td>• Discussion on measures for revitalizing the flower and plant industry</td>
<td></td>
</tr>
<tr>
<td>• Holding technological exchange events, developing technological manuals</td>
<td>• Establishment of a system for the stable supply of scarce floral materials</td>
</tr>
<tr>
<td><strong>2. Strengthening of production and supply systems to enhance the strengths of domestically produced flowers</strong></td>
<td></td>
</tr>
<tr>
<td>• Demonstration of flower processing and distribution under wide-area coordination</td>
<td>• Measures to extend flowers’ vase life</td>
</tr>
<tr>
<td>• Examination and demonstration concerning the improvement of logistics efficiency</td>
<td></td>
</tr>
<tr>
<td>• Examination and demonstration of recycling systems</td>
<td></td>
</tr>
<tr>
<td>• Formulation of export strategies</td>
<td></td>
</tr>
<tr>
<td>• Establishment of perfect cold chain</td>
<td></td>
</tr>
<tr>
<td>• Export measures to be carried out by production areas</td>
<td></td>
</tr>
<tr>
<td>• <strong>Demonstration concerning the stable supply of domestically produced flowers in high demand periods</strong></td>
<td></td>
</tr>
<tr>
<td>• <strong>Support for efforts to shorten the time for raising seedlings of garden trees and bonsais</strong></td>
<td></td>
</tr>
<tr>
<td><strong>3. Expansion of demand for domestically produced flowers</strong></td>
<td></td>
</tr>
<tr>
<td>• Holding flower contests, exhibitions, etc.</td>
<td>• Verification and dissemination of the benefits of flowers and plants</td>
</tr>
<tr>
<td>• Promotion of floral education experiences at schools, social welfare facilities, etc.</td>
<td>• Fostering of floral education practitioners</td>
</tr>
<tr>
<td>• Promotion of use of flowers and plants at companies and nursing care facilities (Commendation of best practices)</td>
<td>• Creation of new demand for flowers and plants in everyday life</td>
</tr>
<tr>
<td>• Dissemination of information on floral culture and domestically produced flowers and plants</td>
<td></td>
</tr>
</tbody>
</table>

**Regaining share and expanding exports of domestically produced flowers and plants**
In order to improve the profitability of greenhouse horticulture in Japan, Centers for Next-Generation Greenhouse Horticulture will be established, by arranging Netherlands’ highly profitable greenhouse horticulture model to suit the Japanese flower industry.

The Centers for Next-Generation Greenhouse Horticulture are expected to raise incomes and create jobs through [1] improvement of productivity by the introduction of advanced environmental control technologies, [2] breaking dependence on fossil fuels by utilizing regional energy sources, [3] introduction of large-sized greenhouses and accumulation of facilities for all processes from production to shipment.

The Ministry of Agriculture, Forestry and Fisheries supports the development of Centers for Next-Generation Greenhouse Horticulture in ten locations.

Accumulate a large concentrations of facilities and create centers to carry out all processes from energy supply using woody bio-mass and other regional resources, to production, preparation and shipment.

Break dependence on fossil fuels, while reducing costs and creating local jobs.

Promote collaboration between the agriculture industry and other industries to utilize their knowledge and knowhow concerning ICT etc.

Achieve all-season, planned production with advanced environmental control.

**Greenhouse horticulture in Netherlands**
- Cluster formation under industry-academia-government collaboration
- Pursuing mechanization and ICT utilization
- Yield of tomatoes per 10a: 50t or more (average in Japan: 11t)
- Utilizing abundant natural gas to supply heat, electricity and CO₂

**Arrangement into a Japanese model**

**Arrangements for Japan**

**Netherlands**
- Natural gas
- Thinner greenhouse pillars (to bring in more sunlight)
- First priority is to increase harvests

**Japan**
- Woody biomass and other regional resources
- Thicker greenhouse pillars (to protect from typhoon damage)
- Increasing harvests while also pursuing taste and quality

**Next-generation greenhouse horticulture**

- Accumulate a large concentrations of facilities and create centers to carry out all processes from energy supply using woody bio-mass and other regional resources, to production, preparation and shipment.
- Break dependence on fossil fuels, while reducing costs and creating local jobs.
- Promote collaboration between the agriculture industry and other industries to utilize their knowledge and knowhow concerning ICT etc.
- Achieve all-season, planned production with advanced environmental control.
Areas Subject to the Project to Accelerate the Introduction of Next-Generation Greenhouse Horticulture

- The development of Centers for Next-Generation Greenhouse Horticulture started in FY2013 in ten locations across Japan, all of which are completed in FY2016.
- Local governments, producers, consumers, etc. formed consortiums to promote large-scale greenhouse horticulture utilizing regional energy and advanced environmental control with ICT.

1. Hokkaido (Tomakomai City)  [completed in Oct. 2016]
   - Strawberry (4 ha)
   - Woody bio-mass

2. Miyagi Prefecture (Ishinomaki City)  [completed in Aug. 2016]
   - Tomato (1.1 ha)
   - Bell pepper (1.3 ha)
   - Woody biomass, geothermal heat

3. Saitama Prefecture (Kuki City)  [completed in Jan. 2017]
   - Tomato (3.3 ha)
   - Woody bio-mass

4. Shizuoka Prefecture (Oyama-cho)  [completed in Jan. 2016]
   - Tomato (3.2 ha)
   - Cherry tomato (0.8 ha)
   - Woody biomass

5. Toyama Prefecture (Toyama City)  [completed in Jun. 2015]
   - Tomato (2.9 ha)
   - Eustomas and other flowers (1.2 ha)
   - Refuse-derived fuels

6. Aichi Prefecture (Toyohashi City)  [completed in Mar. 2017]
   - Cherry tomato (3.6 ha)
   - Heat derived from discharge from sewage plants

7. Hyogo Prefecture (Kasai City)  [completed in Aug. 2015]
   - Tomato (1.8 ha)
   - Cherry tomato (1.8 ha)
   - Woody bio-mass

8. Kochi Prefecture (Shimanto-cho)  [completed in Mar. 2016]
   - Tomato (4.3 ha)
   - Woody bio-mass

9. Oita Prefecture (Kokonoe-machi)  [completed in Mar. 2016]
   - Bell pepper (2.4 ha)
   - Hot spring heat

10. Miyazaki Prefecture (Kunitomi-cho)  [completed in Jul. 2015]
    - Bell pepper (2.3 ha)
    - Cucumber (1.8 ha)
    - Woody bio-mass
Enhancement of Initiatives for Next-Generation Greenhouse Horticulture

[Approved budgetary request for FY2017: 2,501 (2,540) million yen]

- Challenges in expanding initiatives for next-generation greenhouse horticulture include the scarcity of farmers equipped with necessary technologies for shifting to next-generation greenhouse horticulture, and securing the enormous funds and vast land required by large-scale next-generation greenhouse horticulture.

- For this reason, initiatives for next-generation greenhouse horticulture will be enhanced using the following two approaches.
  1. Support for demonstration, training, and other regional activities for learning technologies, with an aim of accelerating the shift to next-generation greenhouse horticulture
  2. Support the development of large-scale next-generation greenhouse horticulture facilities and analysis and dissemination of the results and knowhow.

① Promotion of the shift to next-generation greenhouse horticulture

- Project to Support the Expansion of Next-Generation Greenhouse Horticulture
  (Project to Support Technology Acquisition for Next-Generation Greenhouse Horticulture)

- Support the development and cross-regional dissemination of regional systems for acquiring technologies through demonstration and improvement of technologies, acceptance of training programs at demonstration greenhouses, etc. aimed at the acceleration of the shift to next-generation greenhouse horticulture

- Development of technology acquisition systems for next-generation greenhouse horticulture

- Consortiums carry out demonstrations, training, etc. concerning technologies

  ▪ Demonstration of technologies
    - Improved productivity
    - Formulating production and operation plans and assigning staff
    - Training of employees for efficiency improvement
    - Data visualization and analysis
    - Improving environment inside greenhouse

- Consortiums disseminate demonstration results to other regions

② Promotion of large-scale next-generation greenhouse horticulture

- Subsidies for the establishment of strong agriculture
  (subsidies preferentially provided to next-generation greenhouse horticulture)

- Support the development of large-scale next-generation greenhouse horticulture facilities utilizing advanced environmental control technologies, regional energy technologies, and energy saving technologies.

- Accumulation of facilities for all processes from production to shipment

- Project to Support the Expansion of Next-Generation Greenhouse Horticulture
  (Project to Promote the Regional Expansion of Next-Generation Greenhouse Horticulture)

- Support the Centers for Next-Generation Greenhouse Horticulture in promoting their efforts for disseminating information regarding seminars that report results, etc.

- Support the development of manuals, etc. that analyse and summarize knowhow gained at the Centers for Next-Generation Greenhouse Horticulture
<table>
<thead>
<tr>
<th>Prefecture</th>
<th>Output</th>
<th>Major flowers in production</th>
<th>Prefectural flower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hokkaido</td>
<td>12.2</td>
<td>Statice(1), carnation(3), lily</td>
<td>Rugosa rose</td>
</tr>
<tr>
<td>Aomori</td>
<td>2.4</td>
<td>Chrysanthemum, flowering trees and shrubs (pot-grown), eustoma</td>
<td>Apple tree</td>
</tr>
<tr>
<td>Iwate</td>
<td>4.3</td>
<td>Gentian(1), chrysanthemum, lily</td>
<td>Paulownia tomentosa</td>
</tr>
<tr>
<td>Miyagi</td>
<td>2.9</td>
<td>Chrysanthemum, rose, Gerbera</td>
<td>Lespedeza thunbergii</td>
</tr>
<tr>
<td>Akita</td>
<td>3.1</td>
<td>Chrysanthemum, eustoma, gentian(2)</td>
<td>Butterbur scape</td>
</tr>
<tr>
<td>Yamagata</td>
<td>6.9</td>
<td>Rose(3), eustoma, stock(2)</td>
<td>Safflower</td>
</tr>
<tr>
<td>Fukushima</td>
<td>8.6</td>
<td>Cutting(2), chrysanthemum, lily</td>
<td>Rhododendron brachycarpum</td>
</tr>
<tr>
<td>Ibaraki</td>
<td>14.6</td>
<td>Cutting(1), lawn(1), chrysanthemum</td>
<td>Rose</td>
</tr>
<tr>
<td>Tochigi</td>
<td>6.9</td>
<td>Chrysanthemum, tropical orchids (pot-grown), rose</td>
<td>Rhododendron pentaphyllum</td>
</tr>
<tr>
<td>Gunma</td>
<td>5.1</td>
<td>Rose, chrysanthemum, cyclamens (pot-grown), rose</td>
<td>Japanese azalea</td>
</tr>
<tr>
<td>Saitama</td>
<td>18.5</td>
<td>Lilium(1), tropical orchids (pot-grown)(2), flowering trees and shrubs (pot-grown)(2)</td>
<td>Primrose</td>
</tr>
<tr>
<td>Chiba</td>
<td>25.0</td>
<td>Tropical orchids (pot-grown), Hinoki(1), carnation</td>
<td>Rape blossom</td>
</tr>
<tr>
<td>Tokyo</td>
<td>5.4</td>
<td>Cut leaves(1), foliage plants (pot-grown), cyclamens (pot-grown)</td>
<td>Yoshino cherry</td>
</tr>
<tr>
<td>Kanagawa</td>
<td>5.2</td>
<td>Tropical orchids (pot-grown), rose, pansy (flower seedlings) (2)</td>
<td>Golden rayed lily</td>
</tr>
<tr>
<td>Niigata</td>
<td>9.3</td>
<td>Lilium(2), tulip(1), tulip (bulbs)(2)</td>
<td>Tulip</td>
</tr>
<tr>
<td>Toyama</td>
<td>1.0</td>
<td>Tulip (bulbs)(1), chrysanthemum, tulip(3)</td>
<td>Tulip</td>
</tr>
<tr>
<td>Ishikawa</td>
<td>0.7</td>
<td>Stock, tropical orchids (pot-grown), cutting</td>
<td>Kamchatka lily</td>
</tr>
<tr>
<td>Fukui</td>
<td>0.7</td>
<td>Chrysanthemum</td>
<td>Narcissus</td>
</tr>
<tr>
<td>Yamanashi</td>
<td>3.6</td>
<td>Tropical orchids (pot-grown), cyclamens (pot-grown), rose</td>
<td>Fuji cherry</td>
</tr>
<tr>
<td>Nagano</td>
<td>14.9</td>
<td>Carnation(1), chrysanthemum, eustoma</td>
<td>Gentian</td>
</tr>
<tr>
<td>Gifu</td>
<td>6.6</td>
<td>Flowering trees and shrubs (pot-grown), foliage plants (pot-grown), tropical orchids (pot-grown)</td>
<td>Astragalus</td>
</tr>
<tr>
<td>Shizuoka</td>
<td>18.5</td>
<td>Chrysanthemum, rose(2), Gerbera(1)</td>
<td>Azalea</td>
</tr>
<tr>
<td>Aichi</td>
<td>62.6</td>
<td>Chrysanthemum(1), tropical orchids (pot-grown), Japanese iris</td>
<td>Sword leaved iris</td>
</tr>
</tbody>
</table>

Source: “Statistics on the Income from Agricultural Production” and “Investigation on the Production of Flowering Trees, etc.” (Ministry of Agriculture, Forestry and Fisheries)

*Circled numbers in the “major flowers in production” column indicate national rankings. The top three ranks are indicated.