

Current Status of Flowers and Plants in Japan



"Flowers Make You Feel Good" Campaign

July 2017

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

[Cut flowers]
Chrysanthemums,
roses, carnations, cut
leaves (e.g. palm
leaves), cut branches
(e.g. cherry
blossoms)

[Potted Plants]
Cyclamens, orchids,
foliage plants,
Japanese bonsai
plants, etc.

**[Flowering trees and
shrubs]**
Woody plants used as
garden trees and shrubs (e.g.
azaleas), including greening
trees (excluding those
produced as potted plants)

[Flower bulbs]
Tulips, lilies, etc.
(excluding edible types)

**[Seedlings for
flower beds]**
Pansies, petunias,
etc.

[Lawn grass]
Those cultivated for
landscape gardening
purposes, etc.

**[Ground-covering
plants]**
Plants covering
grounds and walls (e.g.
bamboo leaves, vines)

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.

[Wild plants]
Grass plants, shrubs and some
undershrubs, etc. growing
naturally outdoors



[Forest trees]
Japanese cedars, Japanese
cypresses, Japanese red pines,
Japanese black pines, larches, etc.



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.

Chrysanthemums

No. 1 output
69.2 billion yen

Funerals



"Ringiku (a single chrysanthemum flower per stem)" (white)

Flowers of condolence



Tropical orchids (pot-grown)

No. 2 output
33.3 billion yen

Celebratory gifts



Phalaenopsis orchids (white, pink)



Lilies

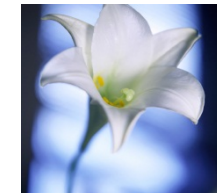
No. 3 output
21.7 billion yen

Decorations



Oriental lilies (pink, white, etc.)

Flowers of condolence



Easter lilies (white)

Roses

No. 4 output
19 billion yen

Weddings



(pink etc.)

Anniversaries



(red etc.)

Flowering trees and shrubs (pot-grown)

No. 5 output
16.8 billion yen



Hydrangeas, poinsettias, etc.

Cut branches

No. 7 output
15.1 billion yen

"Ikebana" Japanese flower arrangements



Nursery trees for gardens

No. 6 output
14.8 billion yen

Town development



Carnations

No. 8 output
12.6 billion yen

Mother's Day

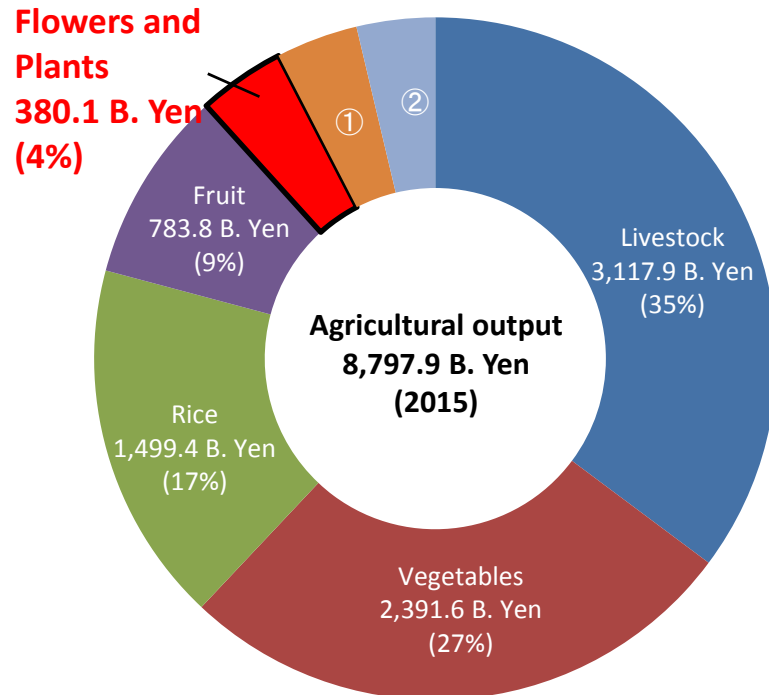


2. Production of Flowers and Plants ① (Output)

- 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)

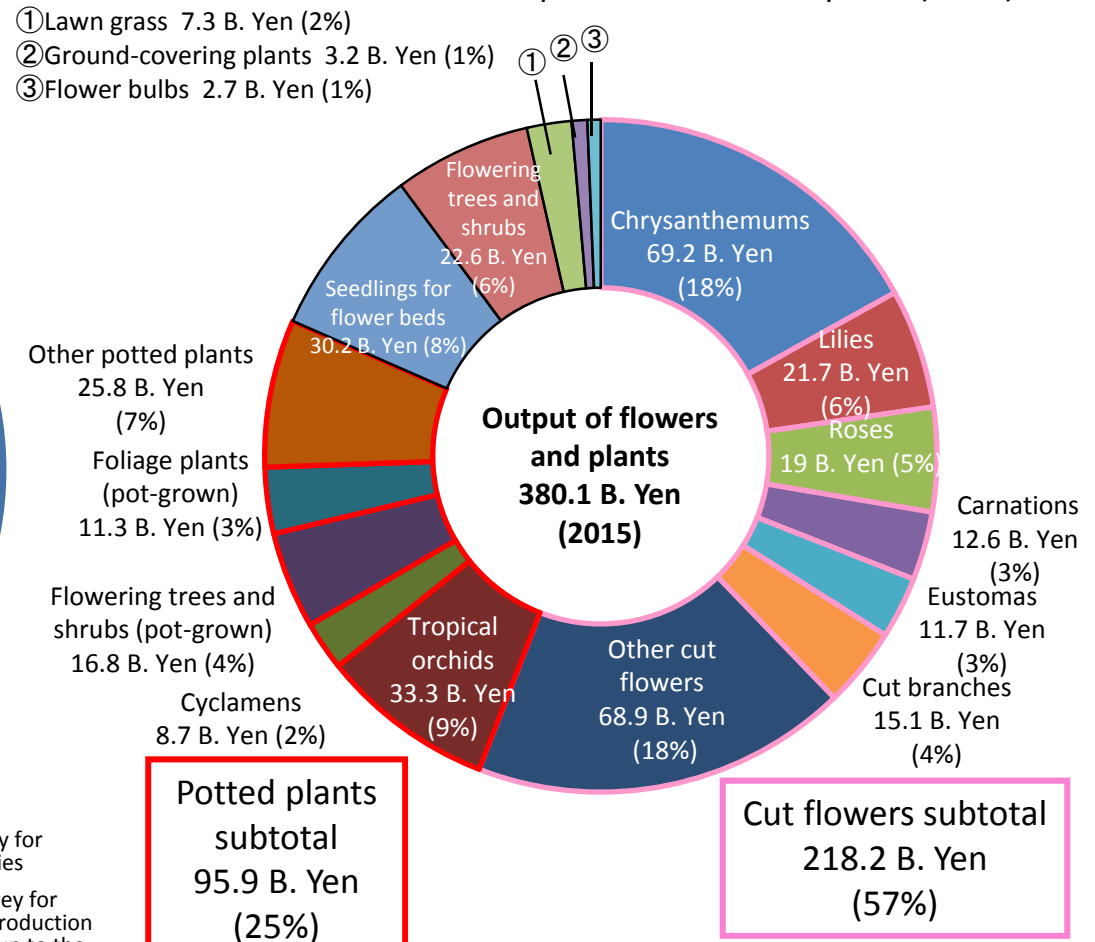
- ① Potatoes, beans, wheat and barley 337.7 B. Yen (4%)
- ② Others 314.6 B. Yen (4%)



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."

■ Breakdown of output of flowers and plants(2015)



Potted plants subtotal 95.9 B. Yen (25%)

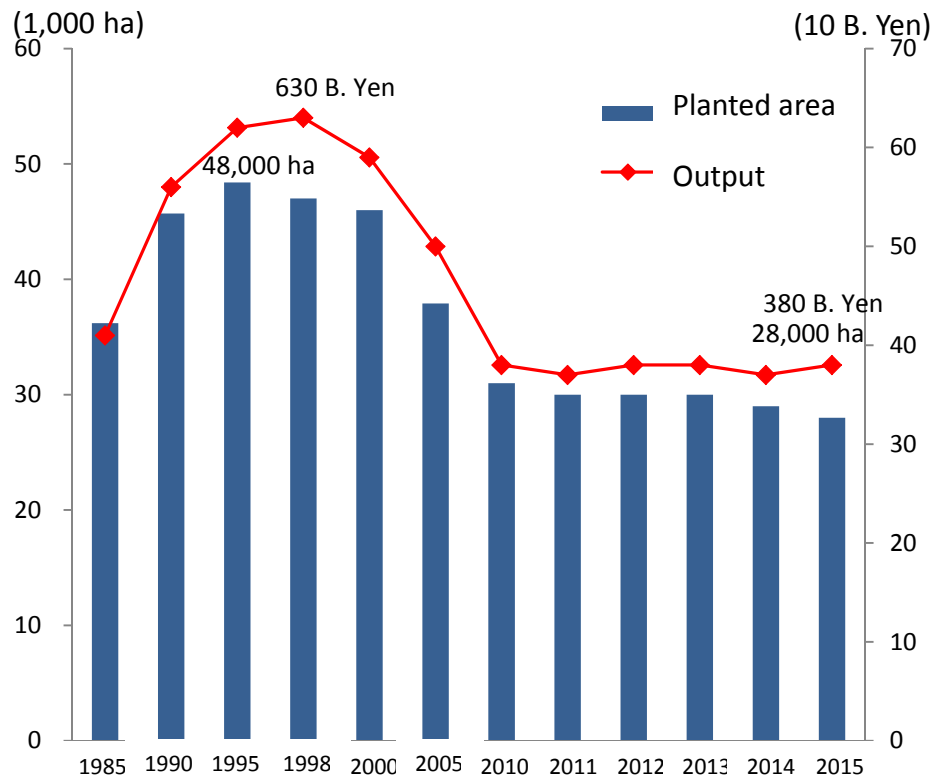
Cut flowers subtotal 218.2 B. Yen (57%)

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

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



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.

Examples of high-performing producers

[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

2. Production of Flowers and Plants ③

- 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)

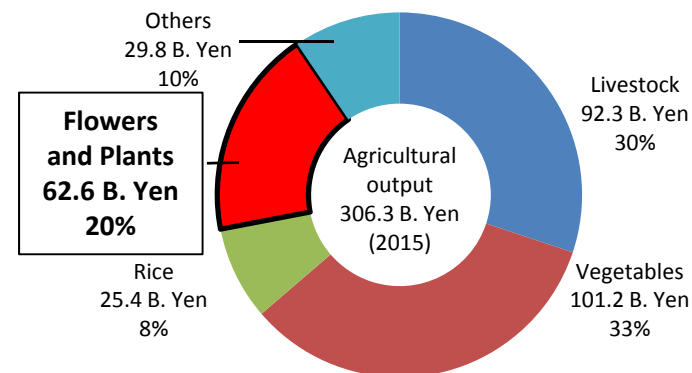
Unit: B. Yen

Rank	Prefecture	Output
1	Aichi	62.6
2	Chiba	25.6
3	Fukuoka	22.9
4	Saitama	18.5
5	Shizuoka	18.0

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

* The output value in the "Production status survey for flowering trees and shrubs" is added to that in the "Statistics on Agricultural Production Income."

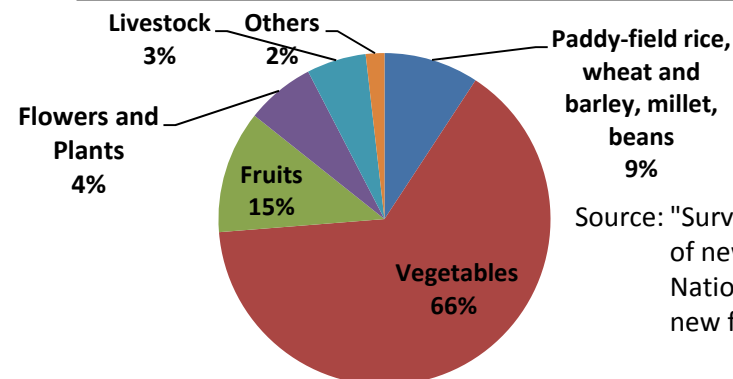
Agricultural output for Aichi Prefecture (2015)



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 and plantonly, 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 306.3 billion yen, which is based on output figures in the "Statistics on Agricultural Production Income."

Crops grown by new farmers (FY2016)



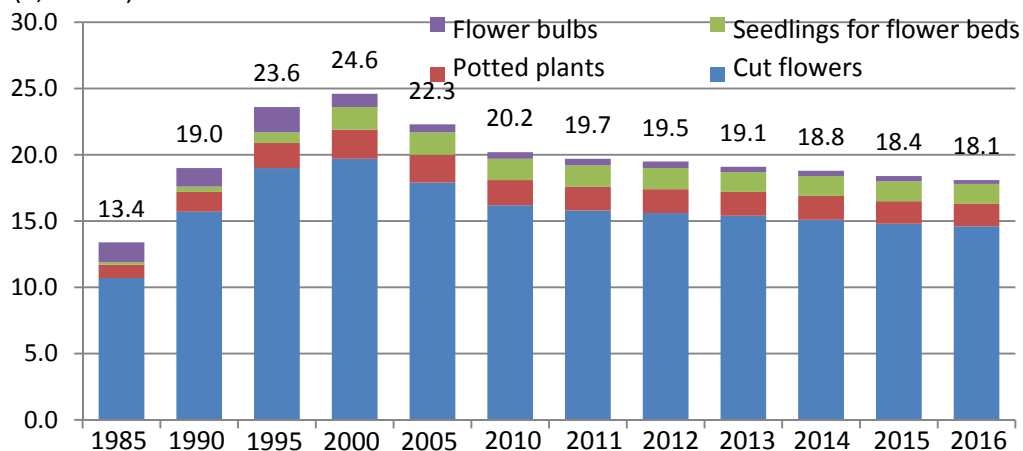
Source: "Survey results on the status of new farmers (FY2016)," National support center for new farmers

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.

■ Changes in planted area of flowers and plants

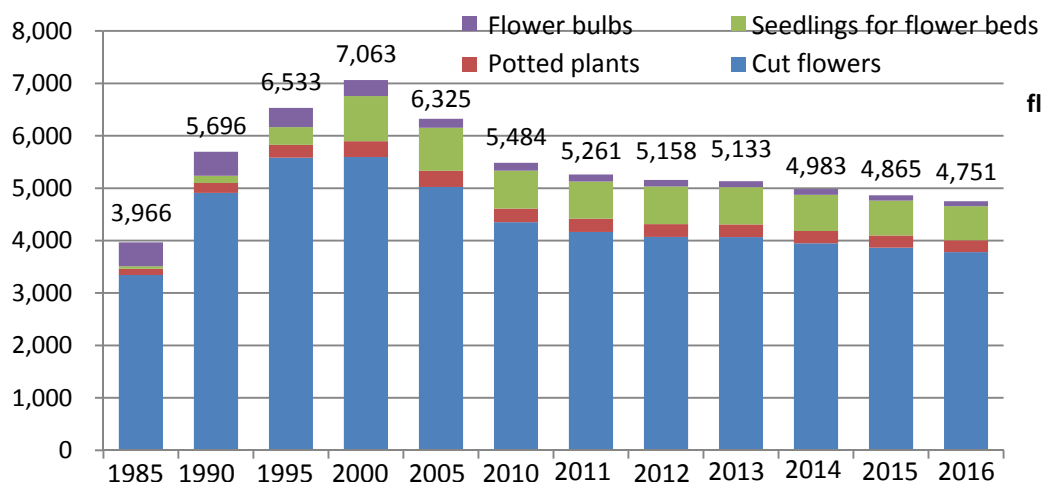
(1,000 ha)



Source: "Statistics on Production and Shipment of Flowers," Ministry of Agriculture, Forestry and Fisheries

■ Changes in shipments of flowers and plants

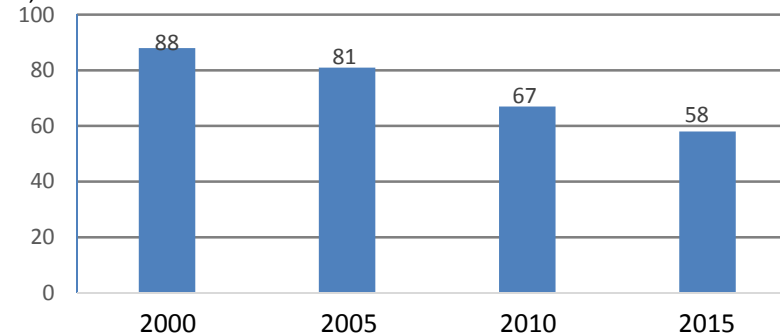
(in millions of flowers/bulbs/pots)



Source: "Statistics on Production and Shipment of Flowers," Ministry of Agriculture, Forestry and Fisheries

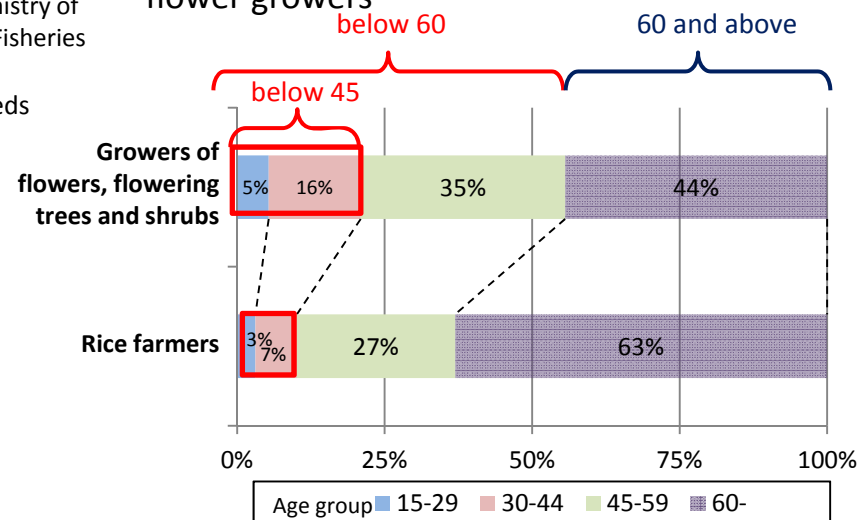
■ Changes in the number of commercial farm households for flowers and plants

1,000 households



Source: "Census of Agriculture and Forestry," Ministry of Agriculture, Forestry and Fisheries

■ Comparison of age groups of rice farmers and flower growers

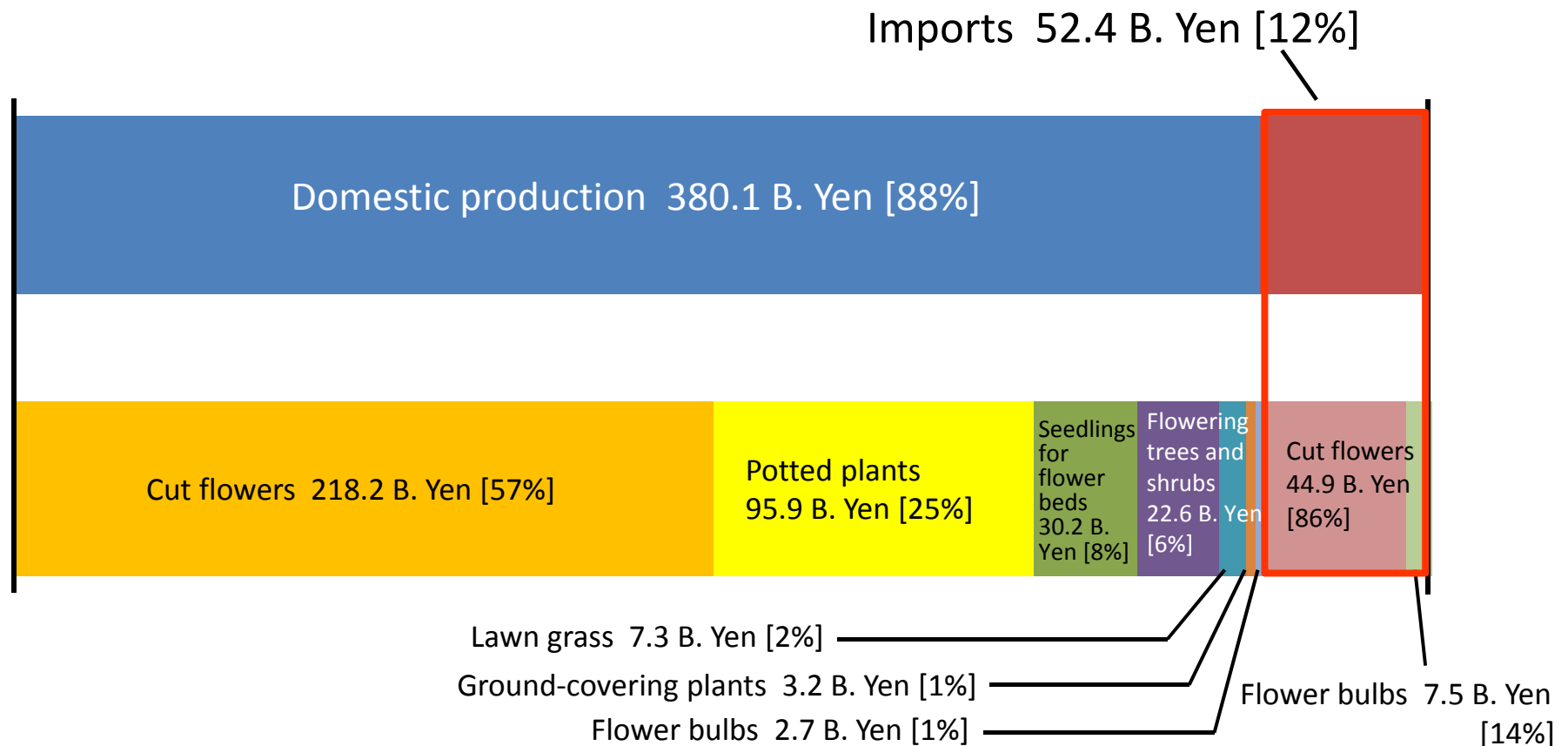


Source: Report on survey of agriculture and forestry management entities, "2010 World Census of Agriculture and Forestry," Ministry of Agriculture, Forestry and Fisheries
Of the commercial farm households, the number of dedicated farming household members shown under the "Statistics on population mainly engaged in farming by age group for business farm households" (the number of household members mainly engaged in self-employed

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)

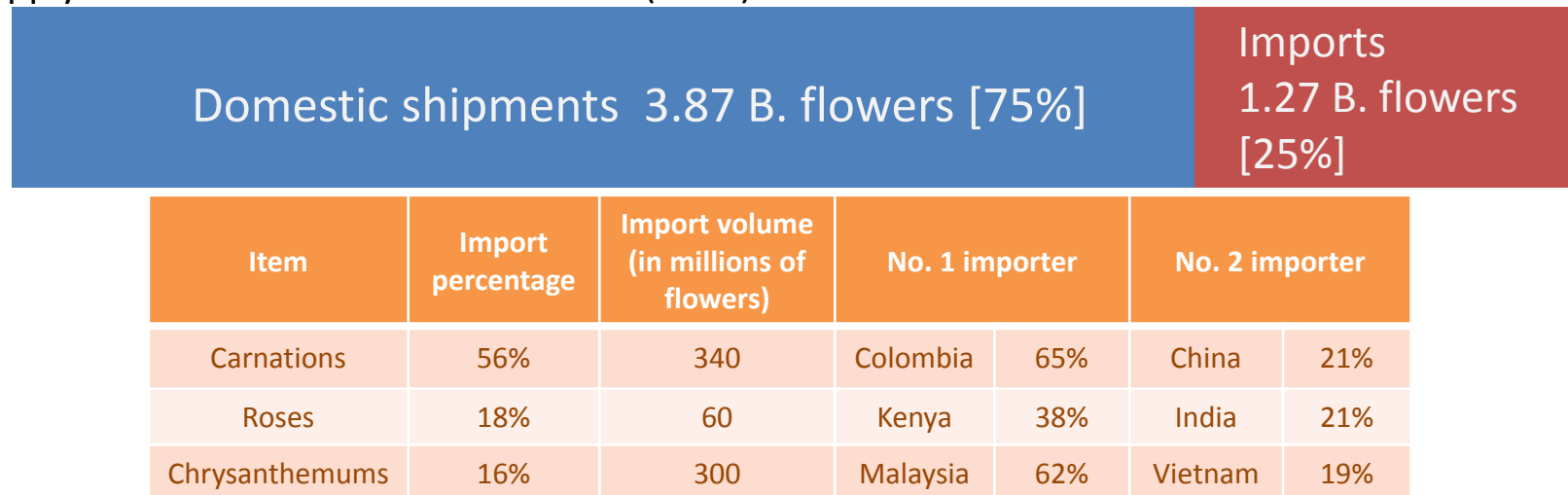


Source: "Statistics on Agricultural Production Income," "Production status survey for flowering trees and shrubs,"
Ministry of Agriculture, Forestry and Fisheries; Trade statistics, Ministry of Finance

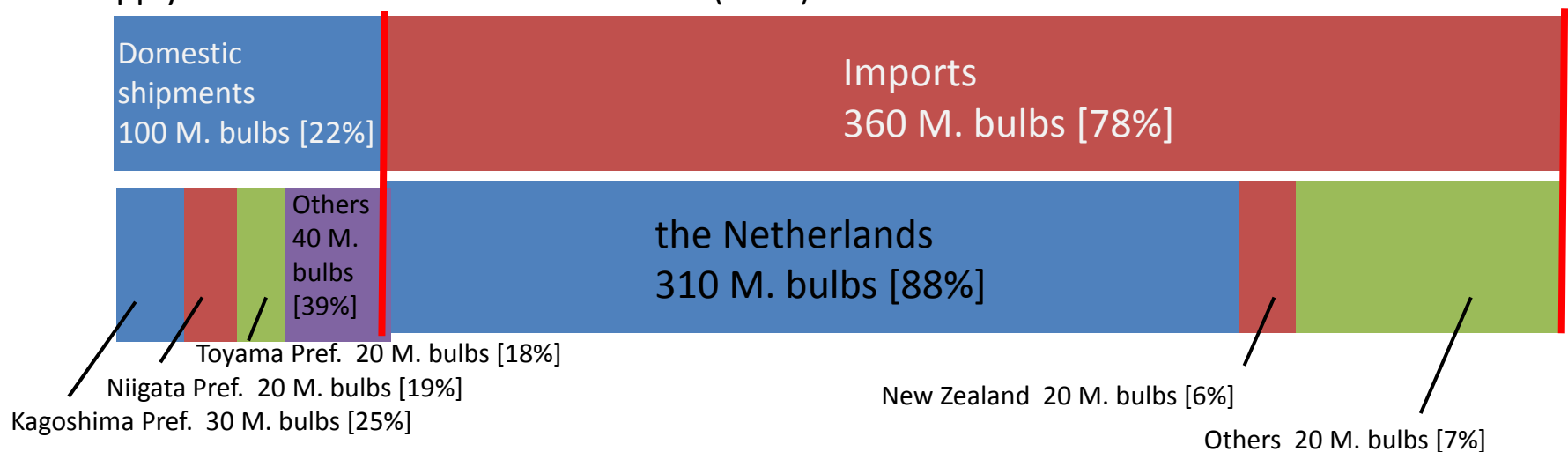
2. Production of Flowers and Plants ⑥ (Supply-demand structure <in volume>)

- 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)



■ Supply-demand structure of flower bulbs (2015)



Source: "Statistics on Production and Shipment of Flowers," "Statistics on Plant Quarantine," Ministry of Agriculture, Forestry and Fisheries

2. Production of Flowers and Plants ⑦

- 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



Double pansy



Yellow primrose

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



Flowers grow faster with three-hour heating and lighting after sundown

Source: "New Agricultural Technology 2012"

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.

■ Development of long-lasting varieties

- Developing new varieties named "Miracle Rouge" and "Miracle Symphony," whose vase life is three times longer than the ordinary varieties



Miracle Rouge (center) lasts for 18 days.

Research results from the Institute of Vegetable and Floriculture Science, NARO under the FY2011 Demonstration Project for the Sale of Flowers with Vase Life Guarantee

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



"Hanakoi Rouge" (center) stayed healthy even after infection with bacterial wilt

Research results from the Institute of Vegetable and Floriculture Science, NARO

- Shortening the breeding period by development DNA markers for identifying plants with high resistance

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.

Proportion of flowers in varieties for which applications have been filed

All varieties ①	Flowers ②	Application filed by individuals and seed/seedling companies ③	②/①	③/②
32,213	19,938	18,034	62%	90%

Source: "Statistics on Variety Registration," Ministry of Agriculture, Forestry and Fisheries (as of March 31, 2017)

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.

Varieties deregistered due to non-renewal

All varieties ①	Flowers ②	②/①
15,668	10,797	69%

Source: "Statistics on Variety Registration," Ministry of Agriculture, Forestry and Fisheries (as of March 31, 2017)

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



Researchers

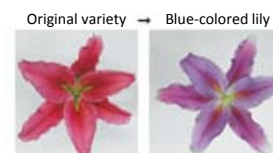


- Original varieties developed with an aim of branding and differentiation

- 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.**



Production Related Issue – Energy ①

- 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

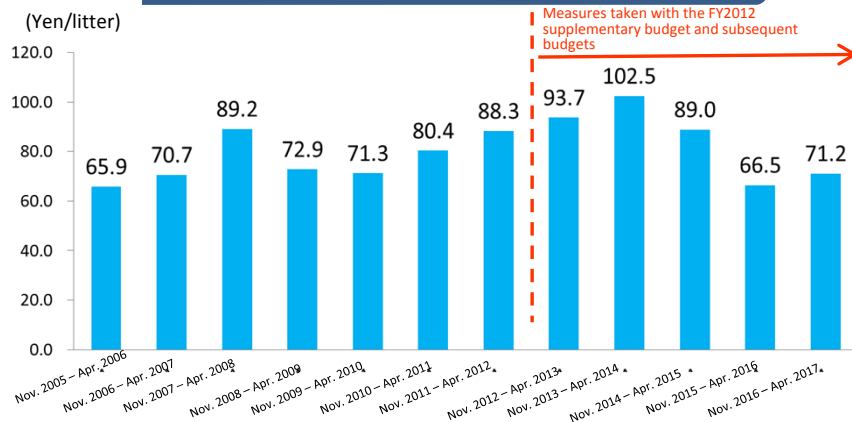
Agriculture	Bell pepper	26%
	Rose	31%
	Mango	44%
	Tea (processed)	27%
Fishery	Squid fishing (coastal)	26%
Other industries	Taxi	8%
	Truck	5%

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

Recent oil prices (average price during the heating period)



Source: “Statistical Survey on Commodity Prices in Agriculture”

Note: Average prices of heavy oil (class A) during the heating periods (November to April) at greenhouse horticulture farms

Fuel consumption in flower production

Items	Usage volume per 1000m ² (ℓ)
Light-cultured chrysanthemum	7,500
Rose	13,500
Eustoma	10,963
Phalaenopsis orchid (potted)	9,000

Source: “Miyazaki Prefecture Farm Management Policy”

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

	Unit calorific value	Price	Price per 1,000kcal
Fuel coal for power generation	6,354kcal/kg	10.0 yen/kg	1.6 yen
Wood chips (for paper manufacturing)	2,530kcal/kg	15.5 yen/kg	6.1 yen
Pellet	4,000kcal/kg	40.0 yen/kg	10.0 yen
Heavy oil (class A)	9,341kcal/litter	95.9 yen/litter	10.2 yen
Kerosene	8,767kcal/litter	111.8 yen/litter	12.8 yen

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 Wet. 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 – Energy②

- 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.

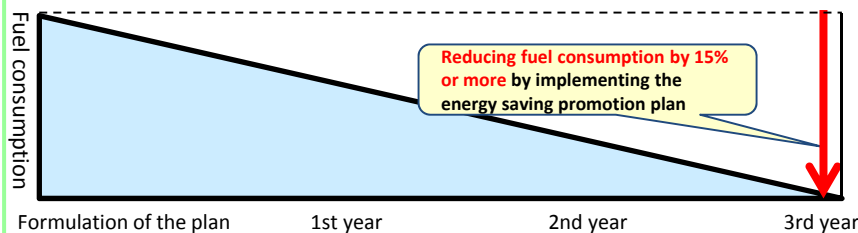
[Basic mechanism of the countermeasures against high oil prices]

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

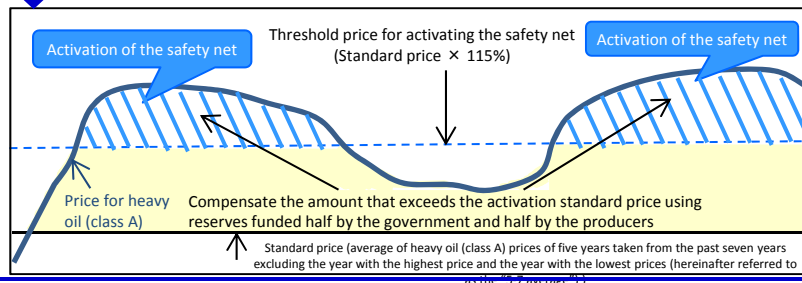
- Promote stable management by providing a safety net to mitigate the effect of high oil prices that cannot be covered solely by energy saving efforts for greenhouse horticultural production areas that have formulated an energy saving promotion plan for the goal of fuel consumption reduction of 15% or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



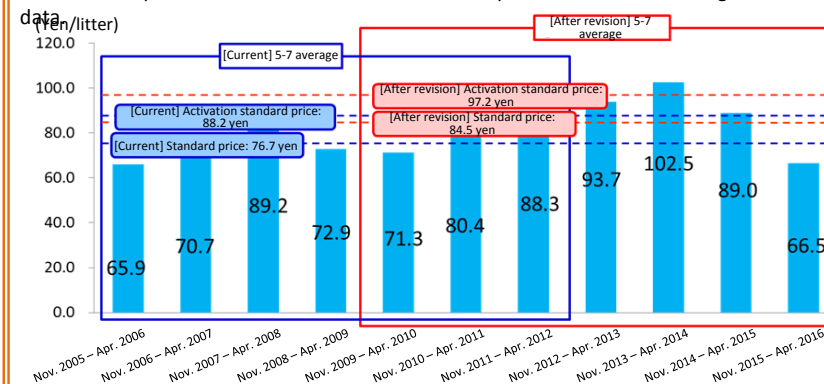
Promoting safety net development (subsidy rate: 50%)



[points of the revision]

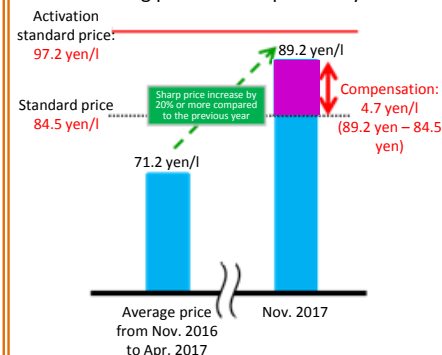
[Revision 1] Standard price for activating the safety net

The standard price has been fixed since FY2012. This price will be revised using the recent



[Revision 2] Introduction of special measures against soaring prices

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 3] Enrollment requirements

[Greenhouse horticultural production areas starting to address energy saving measures]

- Reduce fuel consumption per 10a by 15% or more by introducing energy saving facilities, 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.

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

3. Market of Flowers and Plants

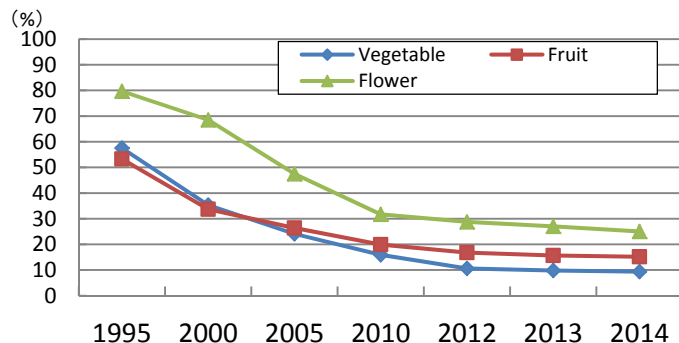
- Due to the number of items and varieties and very small retail structure, an extremely large portion of flowers (nearly 80%) are distributed through wholesale markets.
- At wholesale markets, approximately 30% of flowers are traded by auction. Although this ratio is high compared to those for vegetables 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 (%)

	1995	2000	2005	2010	2011	2012	2013
Fruits and vegetables	74.0	70.4	64.5	62.4	60.0	59.2	60.0
Vegetables	80.5	78.4	75.2	73.0	70.2	69.2	70.2
Fruits	63.4	57.6	48.3	45.0	42.9	42.4	42.2
Fishery products	67.6	66.2	61.3	56.0	55.7	53.4	54.1
Flowers	81.9	79.1	82.8	83.4	84.4	78.7	78.0

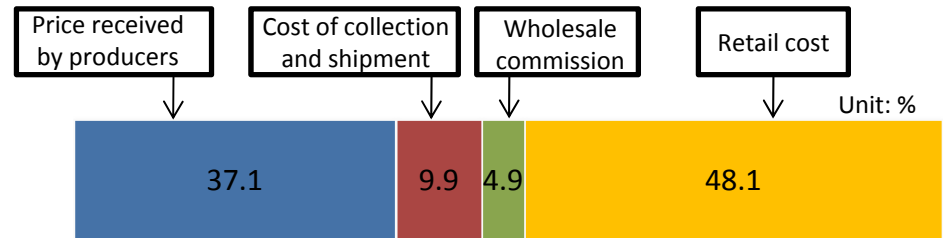
Source: "Wholesale Market Data," Food Industry Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries

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



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

Retail price formation for flowers (estimation)



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.

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.