

< Reference Information No.1 >

1. Areas of greenhouse horticulture in Japan

Source from the MAFF

- Greenhouse horticulture is essential for a stable annual supply of horticultural crops, such as vegetables, as they cannot be stored for a long period of time.
- Tunnels and greenhouses are used for greenhouse horticulture. In recent years, vegetable factories with advanced environmental control functions are also being used.
- Although 42,200ha is used for glass rooms and greenhouses, the number is decreasing in recent years. 70% of them are for vegetation.
- Meanwhile, the number of greenhouse horticulture is decreasing due to aging. 107,000 farms are for vegetable cultivation and 25,000 for flower cultivation.

○ Various forms of greenhouse horticulture



Tunnels



Pipe greenhouse



Steel-frame greenhouse

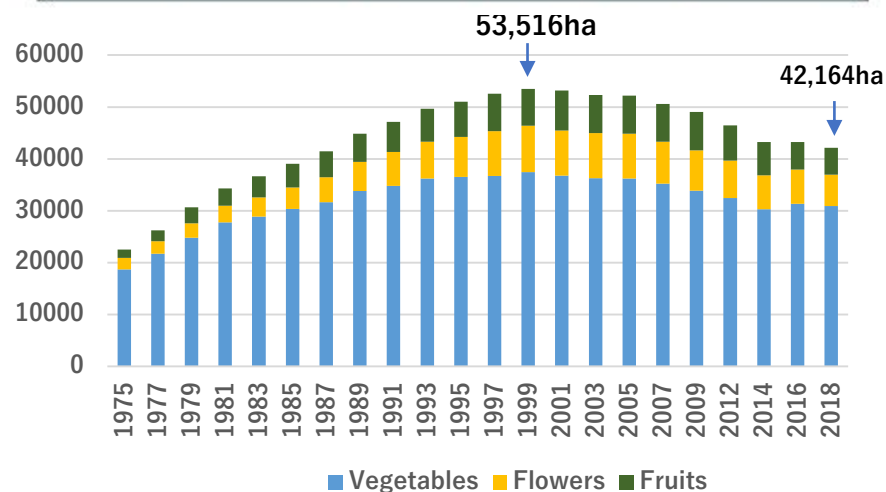


Sunlight vegetable factory

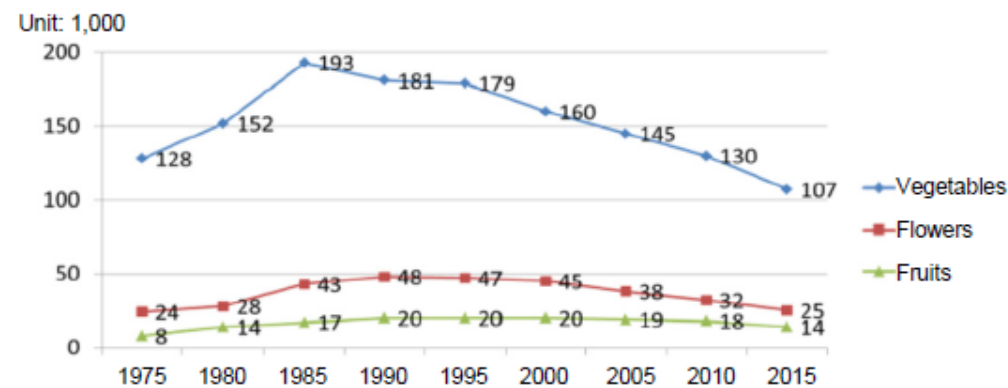


Artificial light vegetable factory

○ Change in the areas used for glass rooms and greenhouses



○ Change in the number of greenhouse horticulture farmers (market farmers)



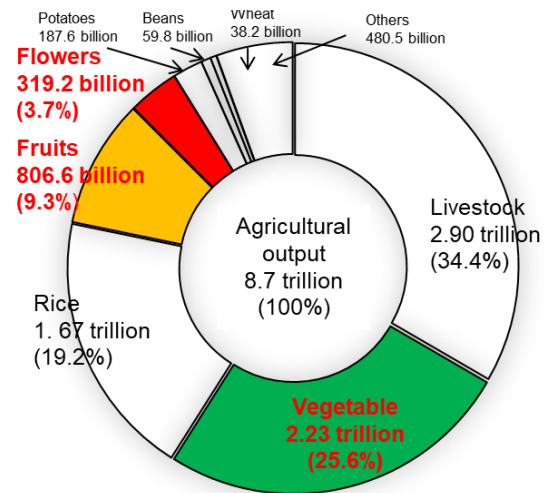
Source: "Census of Agriculture and Forestry," Ministry of Agriculture, Forestry and Fisheries of Japan

2. Importance of Greenhouse Horticulture

Source from the MAFF

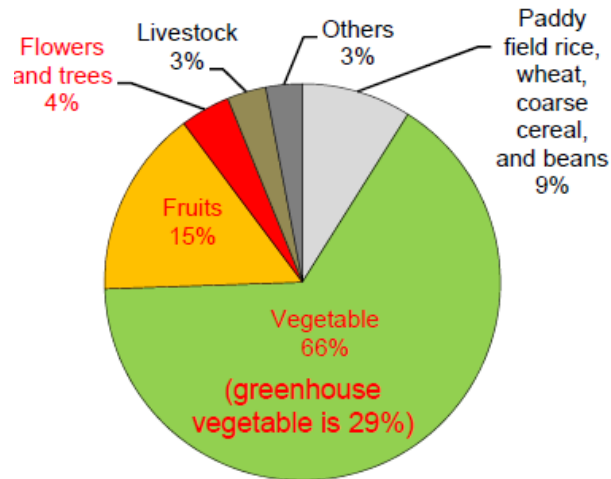
- Horticultural crops, such as vegetables, fruits and flowers, account for about 40% of the agricultural output in Japan. As farmers are also able to add high-value to these crops with ingenuity, 85% of new farmers select these crops as their main products, which are very Important and attractive fields.
- Vegetables and fruits account for the largest portion in food spending and therefore they are important consumption items for Japanese people. Moreover, it is essential to supply crops stably all through the year through greenhouse horticulture to meet consumer needs.

○ Agricultural output of Japan



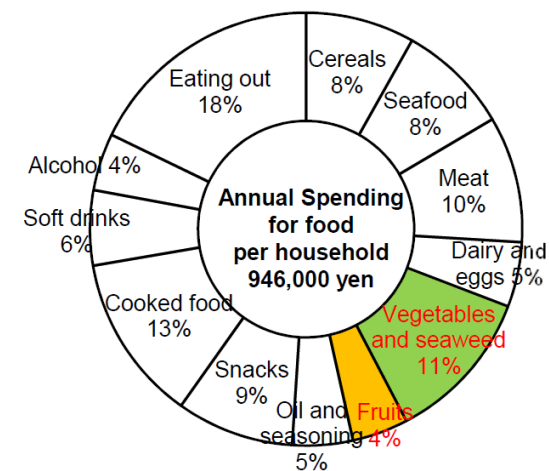
Source: "Income Statistics of Production Agriculture (2018)," MAFF

○ Main crops of new farmers



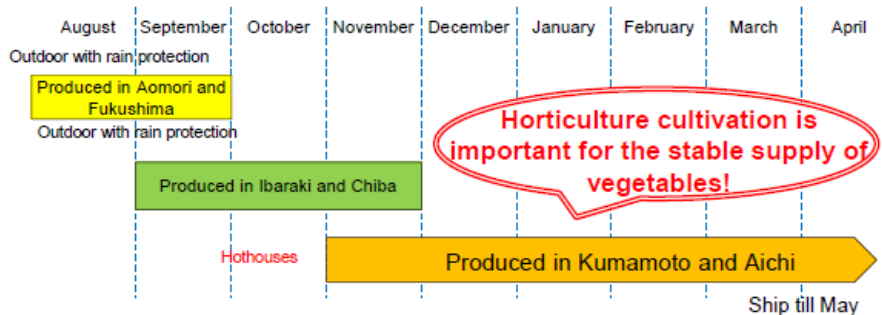
Source: "Research Result Concerning New Farmers and Their Status (2017)," National New Farmers Consulting Center

○ Annual spending for food per household

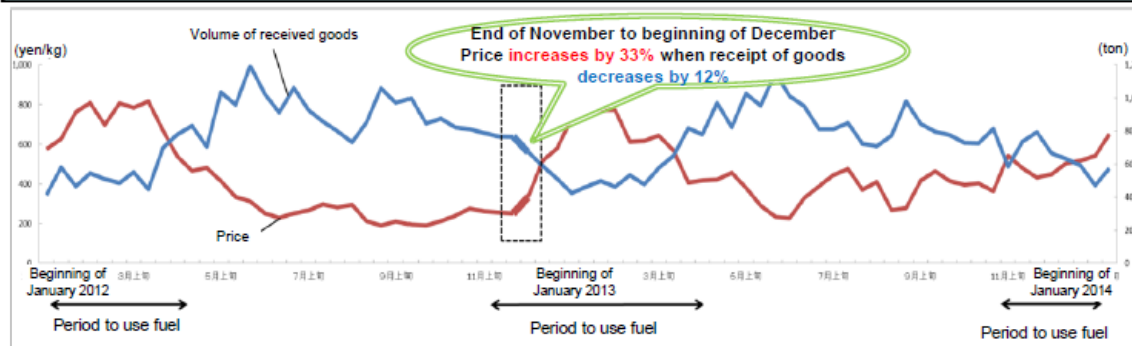


Source: MIC "Household Research (2018)"

○ Origin relay shipment status of tomatoes



○ Change to the wholesale price and delivered volume of green peppers at the Tokyo Central Wholesale Market



3. Installation Area for Different Types of Greenhouse Horticulture Facilities

(unit: ha, %)

| Category | 2007 | 2018 | 2018/2007 |
|--------------------------------------|--------|--------|-----------|
| Glass rooms & greenhouses | 50,608 | 42,164 | 83.3 |
| Steel-frame | 10,207 | 9,898 | 97.0 |
| Metal pipe | 40,401 | 32,266 | 79.9 |
| Glass rooms | 2,157 | 1,595 | 73.9 |
| Vegetables | 873 | 764 | 87.5 |
| Flowers | 1,145 | 820 | 71.6 |
| Fruits | 139 | 11 | 7.9 |
| Greenhouses | 48,451 | 40,569 | 83.7 |
| Vegetables | 34,364 | 30,159 | 87.8 |
| Flowers | 6,935 | 5,242 | 75.6 |
| Fruits | 7,153 | 5,168 | 72.2 |

Source: “Research on horticulture facilities and agricultural waste plastics,” MAFF

4. Use of Heating Devices and Hydroponic Facilities

● Use of energy-saving devices (2018)

| Category | Area (ha) | % against ⑤ |
|--|---------------|----------------|
| ① Devices with a heating function | 17,388 | 41.2 |
| Devices in ① with advanced environmental control | 1,134 | 2.7 |
| ② Devices that generate carbon dioxide | 1,742 | 4.1 |
| ③ Devices with double or more curtains | 5,570 | 13.2 |
| ④ Devices with fans and ventilation | 6,796 | 16.1 |
| ⑤ Total installation area of glass rooms and houses | 42,164 | — |

Source: "Research on horticulture facilities and agricultural waste plastics," MAFF

● Installation area for different types of hydroponic facilities (for vegetables and flowers)

(unit : ha、%)

| Category | 2007 | 2018 | 2018/2007 |
|--------------------|--------------|--------------|--------------|
| Hydroponic culture | 450 | 516 | 114.7 |
| Solid culture | 1,035 | 1,032 | 99.7 |
| Other | 201 | 378 | 188.1 |
| Total | 1,686 | 1,927 | 114.3 |

Source: "Research on horticulture facilities and agricultural waste plastics," MAFF

5. Trends in Numbers of Large Greenhouses and Plant Factories

| Research period | 2011.3 | 2012.3 | 2013.3 | 2014.3 | 2015.3 | 2016.2 | 2017.2 | 2018.2 | 2019.2 | 2020.2 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Sunlight | 13 | 83 | 151 | 185 | 195 | 79 | 126 | 158 | 160 | 164 |
| Combination of sun and artificial light | 16 | 21 | 28 | 33 | 33 | 36 | 31 | 32 | 30 | 35 |
| Artificial light | 64 | 106 | 125 | 165 | 185 | 191 | 197 | 183 | 202 | 187 |

Report on regional promotion project of next-generation greenhouse horticulture in FY2019.

- Note:
- Installation area of sunlight greenhouses after March 2016 is mostly larger than one hectare in size and limited to facilities with hydroponic devices (large greenhouses).
 - The “artificial light type” for FY 2019 may have included research and development, exhibition purposes, etc.

< Reference Information No.2 >

Initiatives of the Japan Greenhouse Horticulture Association (1)

- Overview of the Japan Greenhouse Horticulture Association
 - **Established:** 1972
 - **Chairman:** Mr.Hidenori Suzuki (Chairman of Daisen Co., Ltd)
 - **Purpose:** Conduct the necessary **research study and provide information to modernize greenhouse horticulture management, and disseminate superior greenhouse horticulture materials.**
 - **Members:** 78 companies that are concerned with greenhouse horticulture including housing construction and manufacturing companies, film manufacturers, heating devices, hydroponics, and seedlings. Others include 11 support organizations and a number of individual members.

Initiatives of the Japan Greenhouse Horticulture Association (2)

1 Survey and Research Projects

- (1) Development of safety structure standards for horticultural facilities
- (2) Research on facility horticulture in advanced regions in Japan and abroad

2 Information provision business

Information on facility gardening, including administrative information, technical information and industry trends information to members and others involved in facility horticulture, and Published the bulletin "Facilities and Horticulture" four times a year, etc.

3 Qualification of facility horticulture technical course and facility horticulture instructor

4 Seminars & Tech Show

- (1) Greenhouse Horticulture & Plant Factory Exhibition/Conference
(GPEC in Aichi in July 2021)
- (2) Seminars and exhibitions of new facility horticulture technologies

Initiatives of the Japan Greenhouse Horticulture Association (3)

5 Promotion of countermeasures against agricultural waste plastics

6 Structural diagnosis of the facility

7 Consultant

8 Implementation of government-subsidized/contracted projects

National Project to Support the Acceleration of the Introduction of Next Generation Horticulture Facilities

Measures to prevent fuel oil price hikes for facility gardening, etc.

National project to promote the production conversion of horticultural crops
(Vegetable Distribution and Cutting Council)

9 Secretarial duties of the relevant council

(1) Vegetable Distribution and Cutting Council

(2) Fruit and Vegetable Sorting and Pre-cooling Facilities Association

For details, see <http://www.jgha.com>.