Cherry Blossoms in Japan

By YOSHIO KOBAYASHI

Asakawa Experimental Forest, Forestry and Forest Products Research Institute
(Todori, Hachioji, Tokyo, 193 Japan)

Preservation of germplasm

Cherries, which are known widely in foreign countries as a representative flower of Japan, are composed of many species, such as *Prunus jamasakura* (Yama-zakura), *P. sargentii* (Ōyama-zakura), etc. They grow spontaneously in mountains and fields of Japan. In addition, there are many commercial cultivars, which have been developed from these native species. In recent years, however, famous cherry trees growing in parks, shrines, and temples suffer from environmental pollutions, diseases and insect pests, resulting in apparent loss of vigor in many of them. As countermeasures to such a situation, it is necessary not only to employ protective measures respectively to them, but also to multiply and preserve germplasm of these valuable trees. With the purpose of collecting and preserving precious kinds of trees, a 3-year project of ornamental cherries taxa preservation forest was initiated in 1966 in the Asakawa Experimental Forest of the Forestry and Forest Products Research Institute, Ministry of Agriculture, Forestry, and Fisheries[1].

This preservation forest is on a hill at an elevation of 183–287 m above sea level, located about 50 km west of the center of Metropolis. This area has the mean annual temperature of 13.4°C, and mean annual precipitation of 1,856 mm. The soil type is Loam brown forest soil and Gravel brown forest soil. Originally, the area was covered by natural forests of *Abies firma, Pinus densiflora, Quercus glauca, Q. salicina, Q. serrata, Castanopsis cuspidata* var. *sieboldii, Prunus jamasakura, U. grayana, Acer palmatum,* etc. Phytoclimatically it belongs to a northern portion of warm temperature zone.

For the collection of germplasm, a country-wide collection of scions, including those taken

Plate 1. Ornamental cherries taxa preservation forest

from giant trees which are famous as natural monuments, was made, and they were multiplied by grafting. For each kind of trees, 3–9 trees were planted. As of November 1981, a total of 1,807 trees, representing 215 kinds, were grown in 6 ha area.

Blossoms in the preservation forest[1,2,3,4)]

Cherry trees growing in Japan are basically *Prunus jamasakura, P. sargentii, P. leveilleana* (Kasumi-zakura), *P. lannesiana* var. *speciosa* (Ōshima-zakura), *P. incisa* (Mame-zakura), *P. spachiana* f. *ascendens* (Edohigan), *P. apetala* (Chōji-zakura), *P. maximowiczii* (Miyama-zakura), *P. nipponica* (Mine-zakura) etc., and their varieties and forms, accounting for a total of about 100 kinds. From these kinds and others such as *P. cerasoides* var. *campanulata* (Hikan-zakura) and *P. pseudo-cerasus* (Kara-mi-zakura), commercial cultivars totalling 200–300 kinds were developed and are cultivated.

As most kinds of the cultivars are kept in the preservation forest at Asakawa, they come into bloom in various colors in spring. Although the peak of blooming is from mid- to late-April, the blooming season lasts for a long period from late-February to early May. There are some kinds of cherry which unseasonably bloom in early winter. *P. parvifolia* (Fuyu-zakura), *P. subhirtella* cv. *Autumnalis* (Jugatsu-zakura), etc. are regarded to be rare, because they bloom from November to December.

On the other hand, *P. kanzakura* (Kanzakura) blooms in late February, and *P. kanzakura* cv. *Oh-kanzakura* (Ō-kan-zakura), *P. introrsa* (Tsubaki-kan-zakura), *P. cerasoides* var. *campanulata* (Hikan-zakura), etc. bloom in early March. In the period of rising temperature from March to April, cherries with slightly small flowers, such as *P. spachiana* f. *ascendens* (Edohigan), *P. incisa* (Mame-zakura), *P. apetala* (Chōji-zakura), etc. come into bloom, followed by *P. yedoensis* (Somei-yoshino) which is cultivated most usually in various places of Japan, and blooms with shoots full of flowers before leaf emergence. Then, *P. lannesiana* var. *speciosa* (Ōshima-zakura) and *P. jamasakura* bloom with the emergence of new leaves, when *P. yedoensis* ends its blooming. *P. jamasakura*, a typical cherry in Japan used to serve for cherry-viewing from old time, has variations in flowers and color of new leaves. For example, there are double flower cultivars like *P. jamasakura* cv. *Sanozakura* (Sano-zakura). *P. sargentii*, which has beautiful crimson flowers and is distributed plentifully in mountainous areas of Hokkaido and northern part of the mainland, bloom in mid-April, i.e. slightly later than *P. jamasakura*.

After the mid-April, a group of *P. lannesiana*, containing many forms which are the richest in variations among commercial cultivars, begins to bloom. This group is composed of cultivars developed mainly from *P. lannesiana* var. *speciosa* or crossings of it with

Plate 2. *Prunus lannesiana* cv. *Mikuruma-kaisi* (Mikuruma-gaeshi)

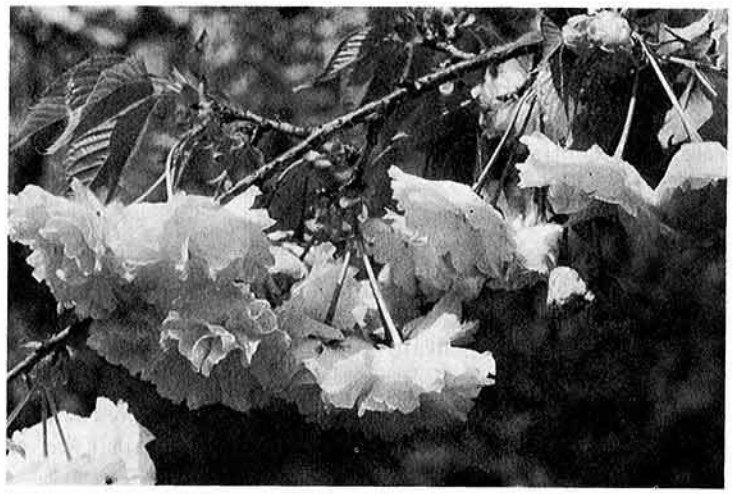

Plate 3. *Prunus lannesiana* cv. *Superba* (Shōgetsu)

P. jamasakura, *P. sargentii*, etc., and it is composed of many forms with diversified characteristics such as simple flowers, double flowers, different color intensity, and different flower size.

P. lannesiana cv. *Mikurumakaisi* (Mikuruma-gaeshi) has both simple flowers and double flowers with 6–8 petals in a same tree. Cv. *Affinis* (Jō-nioi) and cv. *Surugadai-odora* (Surugadai-nioi) have scented flowers with some stamens changed to petaloidy. Cv. *Contorta* (Fukurokuju), cv. *Azuma-nishiki* (Azuma-nishiki) and cv. *Sirotae* (Shirotae) bear large flowers, 4–5 cm in diameter, with an increased number of petals, 10–30. Cv. *Alborosea* (Fugenzō) and cv. *Sekiyama* (Kanzan) produce flowers with two green leafy pistils. Cv. *Grandiflora* (Ukon) and cv. *Gioiko* (Gyoikō) have light greenish yellow flowers. Cv. *Sphaerantha* (Kenrokuen-kiku-zakura) and cv. *Multipetala* (Najima-zakura), produce flowers, each of which has 100–400 petals and an additional flower overlapped at the center of a flowers. Their blooming season is late: they bloom from late April to early May with a great diversity of flowers.

Management of preservation forest and cherry growth[1)]

Cultural management influences a great deal growth of cherry trees. To maintain a high vigor of the growth, weedings in June and August, fertilizer application in each winter, mulching by bark-compost applied at the base of each tree, and protection against typhoon by Shinto-shrine-gate type or three-pole type supports, if necessary, are needed to be done. As cherry trees are more liable to be damaged by diseases and insect pests than other kinds of trees, early detection and prevention are necessary. Insect pests which apt to occur in the preservation forest are *Malacosoma neustria testacea* which occurs in spring and eats leaves, *Phalera flavescens*, occurring in early autumn, *Pseudaulacapsis prunicola* which adheres to trunks in a white mass, and *Tuberocephalus sakurae* which produces gall on new leaves, etc. *Conopia hector*, which enters between bark and xylem and eats, causes a great damage to commercial cultivars, but the damage is relatively less for wild species such as *Prunus jamasakura*, *P. spachiana* f. *ascendens*, etc. *Hyphantria cunea*, which is found in plenty in cities, occurs in the adjacent towns too, but is not found in the preservation forest, which is surrounded by natural forests and rich in natural enemies.

Regarding disease damages, *Monilia cinerea* f. *americana* attacks new leaves immediately after they expand in early spring, and it causes particularly great damages to trees with early

Table 1. Growth of cherries at the Asakawa Experimental Forest

Plant name	Planted site*	1968		1980		No. of trees examined
		Tree height, m (mean)	Basal diameter, cm, (mean)	Tree height, m (mean)	Basal diameter, cm, (mean)	
Prunus spachiana f. *ascendens* (Edohigan)	U	Planted in 1967	—	8.8 (10.0)	25.0 (28.0)	6
P. spachiana f. *spachiana* (Shidare-zakura)	U	1.27 (1.40)	1.74 (3.20)	6.8 (7.0)	27.8 (32.0)	5
P. spachiana f. *spachiana* cv. *Pendula-rosea* (Benishidare)	U	1.50 (1.85)	1.26 (1.80)	6.0 (6.0)	23.0 (29.0)	8
P. jamasakura cv. *Sanozakura* (Sano-zakura)	M	1.61 (1.80)	1.87 (2.20)	8.1 (9.0)	24.6 (27.0)	9
P. lannesiana cv. *Surugadai-odora* (Surugadai-nioi)	U	1.79 (2.00)	1.93 (2.60)	4.8 (5.0)	21.7 (23.0)	6
P. yedoensis (Someiyoshino)	L	1.84 (2.15)	1.47 (1.60)	9.5 (10.0)	26.3 (32.0)	8
P. lannesiana var. *speciosa* (Ōshima-zakura)	M	1.60 (1.80)	1.60 (1.80)	7.8 (9.0)	26.6 (38.0)	5
P. lannesiana cv. *Alborosea* (Fugenzō)	L	2.07 (2.40)	2.51 (3.00)	6.4 (8.0)	20.6 (23.0)	7
P. lannesiana cv. *Sekiyama* (Kanzan) A.	L	1.86 (2.10)	2.27 (2.50)	6.3 (7.0)	21.3 (24.0)	4
P. lannesiana cv. *Sekiyama* (Kanzan) B.	U	1.51 (1.62)	1.27 (1.40)	6.0 (6.0)	23.3 (24.0)	4
P. lannesiana cv. *Grandiflora* (Ukon)	M	1.91 (2.12)	2.61 (2.90)	6.9 (8.0)	24.3 (32.0)	8
P. lannesiana cv. *Hisakura* (Ichiyō)	L	1.95 (2.55)	1.90 (2.80)	6.6 (7.0)	22.8 (26.0)	5
P. cerasoides var. *campanulata* (Hikan-zakura)	L	Planted in 1969	—	5.8 (6.0)	17.3 (21.0)	4
P. kanzakura cv. *Rubescens* (Shuzenji-kan-zakura)	L	Planted in 1970	—	10.0 (10.0)	28.3 (30.0)	3

* U: Upper, M: Middle, and L: Lower part of the slope
Date of survey: 15 April 1968, and 30 Sept. 1980
Figures in parenthesis indicate maximum growth.

leaf expansion such as *Prunus pseudo-cerasus*, *P. kanzakura*, *P. introrsa* cv. *introrsa*, *P. spachiana*, *P. spachiana* f. *ascendens*, *P. cerasoides* var. *campanulata*, etc. As the site of the preservation forest is an area where broad leaved forest was cut, damages by *Armillariella mellea* are abundant. As the damaged trees have rotted roots, they fall or wither by strong wind. *Taphrina wiesneri* is also a great enemy to cherry trees, but there is no great damage due to early protections.

In the preservation forest, many wild species and cultivars are grown. The cultivars which prefer humid, fertile soils are planted on the lower part of slope, while those which are relatively tolerant to dryness on the upper part of the slope. After 16 years from the first planting in 1967, trees of relatively strong kinds planted in suitable places grow well and bear beautiful flowers every year. However, some trees were damaged by diseases and insect pests, lost their vigor, withered or fell by wind. Although growth differs by kinds, the growth of some selected kinds showing relatively better growth is given in Table 1.

Prunus yedoensis planted at the lower part of the slope which was 1.8 m in tree height and 1.5 cm in basal diameter at the time of planting, reached 10 m in tree height and 26 cm in basal diameter 13 years after planting. *P. jamasakura* cv. *Sanozakura* planted at the middle of the slope which was 1.6 m in tree height and 1.9 cm in basal diameter, reached 8 m and 24.6 cm, respectively after 13 years. *P. spachiana* f. *ascendens* planted at the upper part of the slope has grown to the average tree height of 8.8 m and basal diameter of 25 cm.

By describing the present status of the Cherry Taxa Preservation Forest at the Asakawa Experimental Forest, cherries of Japan are introduced in this paper. This Cherry Taxa Preservation Forest attracts attention of cherry researchers in Japan and overseas as a valuable germplasm collection, and is utilized by them. In spring, many cherry-lovers visit the forest to enjoy cherry blossoms. We in the Preservation Forest will continue our effort to adopt appropriate management for its maintenance in order to accomplish its object.

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(Received for publication, January 25, 1983)