Journal of the American Pomological Society 62(1):27-29 2008

'Honey Red', an Early Maturing Japanese Plum

J. H. Jun[1], K. H. Chung, S. J. Kang, Y. B. Kwack, K. S. Park, H. K. Yun, and S. B. Jeong

Abstract

'Honey Red', a Japanese plum (*Prunus salicina* Lindl.), originated from a cross between 'Oishiwase' and 'Santa Rosa' made in 1992 at the National Horticultural Research Institute (NHRI) of the Rural Development Administration (RDA) in Korea. It was first selected as 92Oishiwase*SantaRosa43-2 in 1997 for its high fruit quality with attractive appearance for a very early ripening cultivar. After evaluating the characteristics of the tree and fruit compared with those of 'Oishiwase', a leading Japanese plum in Korea, it was named as 'Honey Red' in 2002. It blooms two days later than 'Oishiwase'. 'Honey Red' has severe self-incompatibility. Therefore, cross-compatible cultivars such as 'Soldam', 'Formosa' and 'Akihime' that bloom simultaneously need to be interplanted in commercial orchards to ensure consistent fruit set. The tree is moderately vigorous and productive. 'Honey Red' is more susceptible than 'Oishiwase' to bacterial leaf spot (*Xanthomonas campestris* pv. *pruni* [Smith] Dye). The fruit ripens in early July at Suwon, similar to that of 'Oishiwase'. The fruit is round and skin color is bright red. Fruit weight averages 60 g and soluble solids content 12.5 °Brix. The fruit flesh is yellow, marketably firm, sweet and slightly adherent to the pit.

Recently, the total planted area of plum trees has considerably increased in the Republic of Korea because of relatively high prices in the fresh fruit market. The annual production of plums was 71,983 metric tons and total cultivated area was 6,600 ha in 2004 (3).

All plum cultivars grown in Korea are Japanese types (*Prunus salicina* Lindl.). Popular cultivars are 'Oishiwase', 'Formosa', 'Santa Rosa' and 'Soldam'. However, their fruits are not very sweet and attractive. In addition, frequent rainfall before or around harvest time causes lower sugar content, high fruit drop and fruit cracking. Nowadays, 'Akihime', released from Japan, is increasing in popularity. However, its fruit ripens very late and is susceptible to *Xanthomonas campestris* pv. *pruni* like 'Formosa'(1).

A great deal of effort has been focused on solving these problems related to fruit quality in the plum breeding program at the National Horticultural Research Institute (NHRI) which is an affiliated institution of the Rural Development Administration (RDA), South Korea. However, to date only one cultivar, 'Purple Queen' was released in 2001 (1). 'Honey Red', the second cultivar released by NHRI, produces early-maturing, attractive and sweet fruit for the fresh market.

Materials and Methods

To develop new cultivars with early maturity and high fruit quality, a cross between 'Oishiwase' and 'Santa Rosa' was made at NHRI, RDA in 1992 (Fig 1). Seedlings from the cross were transplanted into a breeding block in 1993. Of the seedlings, 92Oishiwase*SantaRosa43-2 was preliminarily selected and grafted on wild peach (*Prunus persica* L.) as a rootstock in 1997. Three grafted trees and one original seedling were evaluated for tree and fruit characteristics according to the manual for agricultural investigation (4) and guidelines for the conduct of tests for distinctness, homogeneity and stability for Japanese plum (5). Every spring, fruit thinning was carried out to prevent biennial fruiting. The final distance between fruits at harvest was maintained at a distance of 6 to 8 cm. For evaluation of fruit characteristics, five fruits per tree were taken from four trees at ripening time for 3 years from 2000 to 2002.

Natural infection rates of brown rot (*Monilinia fructicola* [Winter] Honey) and bacterial leaf spot (*Xanthomonas campestris* pv. *pruni*) were recorded under field conditions.

[1] National Horticulture Research Institute, RDA, Suwon 440-706, Korea, jun0810@rda.go.kr

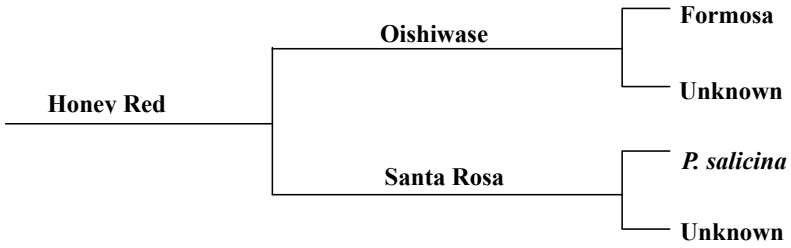

Figure 1. Pedigree of 'Honey Red' Japanese plum.

Description

Trees are moderately vigorous and productive. The growth habit of the tree is semi-upright and the main fruit-bearing branches are of medium length with a moderate number of spurs. Precocity is similar to 'Oishiwase' on wild peach rootstock, with the onset of fruiting in the third year. No yield data were collected. Leaf blades are elliptic with pointed tips. Leaf color is paler than that of 'Oishiwase'. The flowers are medium in size and their petals are separate. There are no double petals. The stigma position is at the same level as the anthers. The full bloom period is early- to mid- April at Suwon (127º01'E, 37º17'N) Korea, its breeding site, and 2 days later than 'Oishiwase'. Although it has abundant pollen, it is self-incompatible. Therefore, cross-compatible cultivars such as 'Soldam', 'Formosa', and 'Akihime' that bloom simultaneously need to be interplanted in commercial orchards to ensure good fruit set (2).

It seems that 'Honey Red' is resistant to brown rot, but susceptible to bacterial leaf spot, considering the natural field susceptibility (Table 1).

Fruits ripen 81 days after full bloom, typically in early July at Suwon, similar to that of 'Oishiwase' which is the earliest maturing plum cultivar in Korea. Fruit shape is round, and skin color is bright red (Fig 2). Fruit size is small, with 60 g being the average fruit weight (Table 2). In order to improve fruit size and prevent limb breakage, fruit thinning is required. Keeping a distance of 10 cm between fruits is recommended. The total soluble solids content is higher than that of 'Oishiwase' at 12.5 ^{o}Brix. The fruit flesh is firmer than that of 'Oishiwase', and fruit drop is less than that of 'Oishiwase' (Table 2). The fruit flesh is yellow, marketably firm, sweet, and slightly adherent to the pit. The pits are small and generally long-elliptical in shape. If severe pruning is repeated, the formation of spurs and flower buds is inhibited. Therefore,

Table 1. Tree characteristics of 'Honey Red' and 'Oishiwase' Japanese plums at Suwon, Korea, 2000-2002.

Cultivar	Leaf blade shape	Green color of adaxial side of leaf	Incisions of leaf margin	Brown rot	Bacterial leaf spot	Bloom date (Julian day)
Honey Red	Elliptic	Pale	Serrate	1[z]	3[z]	104.7a[y]
Oishiwase	Broad obovate	Medium	Crenate	1	2	102.7a

[z] Degree of susceptibility to brown rot (*Monilina fructicola* [Winter] Honey) and bacterial spot (*Xanthomonas campestris* pv. *pruni* [Smith] Dye): 1 = 0 to 5%, 2 = 6 to 15%, 3 = 16 to 25%, 4 = 25% to 35%, and 5 = more than 36% of fruit infected on the tree 60 days after full bloom

[y] Means within a column followed by the same letter are not significantly different at P=0.05 by t-test

Table 2. Fruit characteristics of 'Honey Red' and 'Oishiwase' Japanese plums at Suwon, Korea, 2000-2002.

Cultivar	Harvest date (Julian day)	Fruit diameter (mm)	Fruit weight (g)	Soluble solids (ºBrix)	Acidity (%)	Firmness[y]	Quality[y]	Fruit cracking	Fruit drop
Honey Red	185.7 a[z]	48.7 a	60.0 a	12.5 a	2.0 a	4.1 a	4.3 a	little	little
Oishiwase	185.0 a	48.4 a	62.0 a	9.7 b	1.9 a	3.0 b	3.8 b	little	medium

[z] Means within a column followed by the same letter are not significantly different at P=0.05 by t-test
[y] Subjective firmness and quality ratings: 1 = least desirable, 3 = commercially acceptable, 5 = most desirable

Figure 2. Fruit of Japanese plum cultivar 'Honey Red'.

pruning should use thinning cuts, not heading cuts. 'Honey Red' is superior in attractiveness and fruit quality to 'Oishiwase'.

Availability

Requests for scions for research purposes may be addressed to Ji Hae Jun (jun0810@rda.go.kr). Trees are available for sale at the Korean Society for Fruit Tree Nursery (4-38 Seonghwang-dong Cheonan, 330-130, Korea).

Literature Cited

1. Chung, K.H., J.H. Jun, S.J. Kang, Y.B. Kwack, S.B. Jeong, K.S. Park and H.K. Yun. 2003. 'Purple Queen' plum with beautiful appearance and high quality. Kor. J. Hort. Sci. and Technol. 21:1-3
2. Jun, J.H., J.H. Kwon, and K.H. Chung. 2007. Identification of self-incompatibility genotypes in Japanese plum (*Prunus salicina* Lindl.) by polymerase chain reaction and cross-pollination tests. Hort. Environ. Biotechnol. 48(4):228-234.
3. Ministry of Agriculture and Forestry. 2005. Agricultural and forestry statistical year book. Seoul, Korea.
4. Rural Development Administration (RDA). 1995. Manual for agricultural investigation. Suwon, Korea.
5. The International Union for the Protection of New Varieties of Plants (UPOV). 1982. Guidelines for the conduct of tests for distinctness, homogeneity and stability. Japanese plum (*Prunus salicina* Lindl & other diploid plums).

❖ ❖ ❖ ❖ ❖

Erratum

An author's name was incorrect on the first page of an article in the October 2007 issue of the *Journal of the American Pomological Society*. The correction citation should be as follows:

Schmidt, T.R. and D.C. Elfving. 2007. Crop load management of apple via induced plant stress. J. Amer. Pomol. Soc. 61(4):167-169.

The name appeared correctly in the Table of Contents for that issue.