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A New Mid-Season Peach Cultivar 'Misshong'

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Abstract

'Misshong' is a new peach cultivar, that originated from a cross between 'Yumyeong' and 'Chiyomaru' at the National Institute of Horticultural & Herbal Science (NIHHS), Rural Development Administration (RDA) in 2007. Trees are moderately vigorous and the growth habit of the trees is semi-upright. It has showy flowers and blooms in mid to late April at Suwon, Republic of Korea. The anthers have little pollen. Fruits ripen in early to mid August. Fruit weight is 230 g and the soluble solids concentration is 12.9°Brix. Fruit are attractively colored with a light red blush that covers more than 60% of the skin surface. Flesh color is creamy white and firmness is soft and of the melting type. Since its anthers have little pollen, pollinizers should be co-planted to facilitate insect pollination.

Peach is the fifth most important fruit following apple, citrus, grape, and pear in South Korea. In 2010, the total production area of peach and nectarine was about 13,000 ha (Statistics Korea, 2010). There are many peach cultivars in South Korea because market trends for peach steadily change over time. Major cultivars of peach are 'Kawanakajima Hakuto' (late maturing, 9.9%), 'Changhowon Hwangdo' (late maturing, 8.6%), 'Yumyeong' (late maturing, 7.1%), 'Hakuto' (late maturing, 6.3%), and 'Mibaekdo' (mid-season, 5.3%) (Ministry of Agriculture and Forestry, 2007). 'Mibaekdo' was the most important of the mid-season (from early to mid-August) cultivars. However, fruit qualities of this cultivar do not meet consumer expectations during the rainy season. In general, most mid-season cultivars that ripen during the rainy season have low sugar content compared to late maturing cultivars. Peach and nectarine breeding programs at the National Institute of Horticultural & Herbal Science (NIHHS), Rural Development Administration (RDA) have been focused on the development of cultivars that have a range of harvest times and good consistent quality during the rainy season from June to August. Until now, nine peach and three nectarine cultivars have been released by NIHHS since the peach breeding program was initiated in 1963 (Kang et al., 1986, 1999a, 1999b, Kim et al., 1978, Jun et al., 2007a, 2007b, 2007c).

Materials and Methods

To develop new peach cultivars, a cross between 'Yumyeong' (late maturing, long shelf life, non-melting, white flesh) and 'Chiyomaru' (very early maturing, melting, yellow flesh) was made in 1995 at the NIHHS, RDA (Fig. 1). Of the seedlings produced, 'Wonkyo Da-25' was initially selected in 2001. For 4 years, from 2004 to 2007, three grafted trees at seven sites were evaluated for tree and fruit characteristics following the manual for agricultural investigation (RDA, 2003) and UPOV guidelines (UPOV, 1995) for the conduct of tests for distinctness, uniformity and

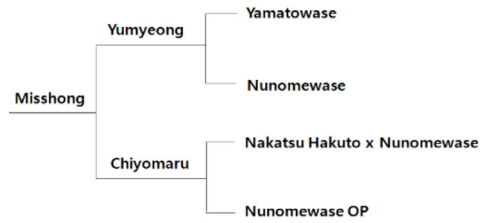

Fig. 1. Pedigree of 'Misshong' peach.

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Table 1. Fruit characteristics of 'Misshong', 'Mibaekdo' and 'Yumyeong' peaches (Suwon, Republic of Korea, 2004-2007).

Cultivar	Bloom date	Harvest date	Fruit weight (g)	Soluble solids (°Brix)	Acidity (%)[1]	Eating quality[2]	Susceptibility[3]	
							Brown rot	Bacterial leaf spot
Misshong	21 April	8 August	230±24.0[4]	12.9±1.7	0.20±0.05	4.0	3	3
Mibaekdo	22 April	8 August	214±27.6	10.4±0.4	0.31±0.07	3.0	3	3
Yumyeong	22 April	2. August	246±42.8	12.7±0.2	0.26±0.11	3.5	3	3

[1] Equivalent of malic acid per mL
[2] Subjective quality rating : 1=least desirable, 3=commercially acceptable, 5=most desirable
[3] Degree of susceptibility to brown rot and bacterial leaf spot
- Brown rot : 1=less than 1%, 2=1 to 5 %, 3=6 to 10%, 4=11 to 20%, 5= more than 21% of fruit infected on the tree 110 days after full bloom.
- Bacterial leaf spot : 1=less than 1%, 2=1 to 10 %, 3=11 to 20%, 4=21 to 50%, 5= more than51% of leaf infected on the tree 110 days after full bloom.
[4] Each value is expressed as mean ± standard deviation.

stability. This selection was formally named 'Misshong' in 2007. Natural infections of brown rot (*Monilinia fructicola* (Winter) Honey) and bacterial leaf spot (*Xanthomonas arboricola pv. pruni*) were assessed under field conditions, using the 1 to 5 scale defined in the footnotes of Table 1 (RDA, 2003).

Description

Tree characteristics. Trees of 'Misshong' are moderately vigorous and growing habit is semi-upright. Main fruit production is on medium sized branches of 10 to 30 cm length (8.0 mm diam.). Trees set a large number of flower buds and moderate flower bud thinning is needed to improve fruit size. Leaves have small reniform glands. Leaves have exhibited a susceptibility of less than 10% to bacterial leaf spot (*Xanthomonas arboricola* pv. *pruni*). 'Misshong' requires over 1,000 hours of chilling to break dormancy, similar to 'Raritan Rose' or 'Reliance'.

Bloom characteristics. Flowers of 'Misshong' are large, showy and pink. The full bloom date is mid to late April (ave. 21 April) at Suwon (37°15'02''N, 127°00'43''E). The anthers have little pollen and pollinizers should be co-planted to facilitate insect pollination.

Fruit characteristics. The fruit ripen on about 8 August, 110 days after full bloom, typically in early to mid-August at Suwon (Table 1) and within 5 days of that at other sites (Table 2). This is almost the same rip-

Fig. 2. Fruit of the 'Misshong' peach.

Table 2. Fruit characteristics of 'Misshong' peach evaluated at seven sites within the Republic of Korea (2004-2007).

Region[1]	Bloom date	Harvest date	Fruit weight (g)	Soluble solids (°Brix)	Acidity (%)[2]	Eating quality[3]
Suwon	21 April	8 August	230±24.0[4]	12.9±1.7	0.20±0.05	4.0
Chuncheon	25 April	8 August	216±27.5	11.1±0.2	0.34±0.07	3.5
Cheongwon	20 April	8 August	237±14.5	12.3±0.9	0.23±0.08	4.0
Yesan	20 April	13 August	210±19.1	11.9±0.7	0.43±0.06	3.5
Naju	6 April	7 August	216±24.5	11.5±1.1	0.16±0.03	3.5
Cheongdo	9 April	2 August	230±19.0	12.0±0.3	0.16±0.08	4.0
Jinju	7 April	2 August	199±10.6	12.6±0.7	0.29±0.04	4.0

[1] North (Chuncheon), Middle (Suwon, Cheongwon, Yesan) and South (Naju, Cheongdo, Jinju)
[2] Equivalent of malic acid per mL
[3] Subjective quality rating : 1=least desirable, 3=commercially acceptable, 5=most desirable
[4] Each value is expressed as mean ± standard deviation

ening date as 'Mibaekdo' and 'Nagasawa Hakuho'. Fruits of 'Misshong' are medium (75 to 80 mm diam.) with an average fruit weight of 230 g and shape is round (Table 1). Soluble solids concentration is 12.9°Brix. Flower bud and fruit thinning are required to produce large-sized fruit. Fruit are attractively colored with a light red blush that covers more than 60% of the skin surface. The name 'Misshong' translates as "pretty and red peach like shy lady". Flesh color is creamy-white and the flesh is melting and adheres to the pit even when fully ripe. Soluble solids concentration is higher but acidity is lower than in 'Mibaekdo' and 'Yumyeong'. Flesh firmness is adequate for fresh market use in contrast to 'Mibaekdo' where the flesh is too soft for picking, grading, and transportation. 'Misshong' is not resistant to brown rot (*Monilinia fructicola* (Wint.) Honey). However, 'Misshong' is superior in sweetness, attractiveness, firmness, and eating quality to 'Mibaekdo' and is predicted to have the potential to replace 'Mibaekdo' for mid-season marketing.

Availability

Plant Variety Protection for 'Misshong' was achieved in 2008 and registration was achieved in August 2010 following two years of examinations for distinctness, uniformity and stability according to Korean Seed Industry Law. Request for scions for research purposes may be addressed to Eun Young Nam (eynam@korea.kr).

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Evaluating the effectiveness of different strategies for calcium application on the accumulation of calcium in apple (Malus × domestica Borkh. 'Braeburn') fruit.

Orchards displaying calcium (Ca) deficiency are a common phenomenon worldwide, despite the presence of sufficient Ca in the soil and the plant. A 3-year trial was conducted between the 2007 – 2008 and 2009 – 2010 growing seasons to evaluate the contributions of soil and foliar Ca applications to Ca concentrations in 'Braeburn' apple (*Malus* × *domestica* Borkh.) fruit. $Ca(NO_3)_2$ (Calflo; Yara Africa, Fourways North, South Africa) was applied as six separate foliar sprays until run-off. Applications were made at 1-week intervals between approx. 21 – 70 d after full bloom (DAFB) at 6.75 ml l^{-1}. Soil applications of Ca (Tropicote™; International ASA, Oslo, Norway) at 300 kg ha^{-1} were applied at fruit set, or after harvest, according to standard practice. Mineral analysis was conducted to assess the soluble Ca concentrations of whole fruit (without pips and stalks), to quantify the contribution of foliar sprays or soil-applied Ca. Fruit Ca concentrations were maintained at satisfactory levels (4.5 mg Ca 100 g^{-1} FW) at harvest by applying a series of six foliar sprays early in the season (for all seasons) during the trial period. Fruit Ca concentrations at 80 DAFB were highest in the treatments with foliar applications of Ca. In 2009 – 2010, Ca concentrations in apple fruit were lowest (8.38 mg 100 g^{-1} FW) for soil application of Ca at fruit set. Ca applications to soil after harvest in the previous season, and soil applications shortly after fruit set in the current season, did not significantly increase Ca concentrations in current-season fruit, providing soil Ca levels were above the minimum requirement for apple trees. A possible explanation is that apple trees regulate their uptake of Ca through the roots when soil Ca is available in sufficient quantities. This confirms the importance of active root growth for efficient Ca uptake by apple trees when applying Ca to the soil. Abstract from: R.E. Wilsdorf, K.I. Theron and E. Lötze, 2012. The Journal of Horticultural Science & Biotechnology 87(6):565-570.