‘Yellow Dream’ Nectarine

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‘Yellow Dream’ is the fifth nectarine [Prunus persica (Batsch L.)] released from the National Institute of Horticultural and Herbal Science (NIHHS), Rural Development Administration (RDA). The NIHHS RDA has released 10 peach and 7 nectarine cultivars through the national peach and nectarine breeding program since 1962. ‘Yellow Dream’ is the first yellow-fleshed nectarine with low acidity (<0.30%). Before ‘Yellow Dream’, three nectarine cultivars with standard acidity (>0.80%), ‘Cheonhong’ (Kang et al., 1999a), ‘Suhong’ (Jun et al., 2007), and ‘Hahong’ (Jun et al., 2014), were released from 1990 through 2010. Recently, the nectarine breeding program has focused on better-tasting fruit with sweetness and low acidity, longer shelf-life, and later blooming to avoid spring frost. Peaches (including nectarines) are the second most important deciduous fruit after apples and account for 20% of the total production value in the Republic of Korea. Usually consumed as fresh fruit, 302,000 t of peaches were produced in the country in 2017, and the total cultivated area was 21,000 ha (Korean Statistical Information Service, 2017). Peaches and nectarines account for 83% and 17%, respectively, of the total cultivated area in the Republic of Korea (Kim et al., 2018). More than 70% of peach cultivars have white, nonacidic flesh, whereas most nectarine cultivars have yellow flesh with standard acidity (Jun et al., 2016). Some consumers prefer the sweet-and-sour taste of nectarine such as ‘Sunfre’, ‘Fantasia’, and ‘Redgold’, whereas other consumers feel that the nectarine acidity is too high because they prefer a sweet taste (Wi and Jo, 2016). Although peach cultivation area is increasing at an average annual rate of 6% in the Republic of Korea, the high acidity of nectarine is one of the major obstacles to the expansion of nectarine cultivation. ‘Yellow Dream’ has very firm and melting flesh and excellent nectarine flavor with low acidity. It ripens in early July in Wanju, Republic of Korea. ‘Yellow Dream’ is promising because of its superior sweetness with low acidity, early maturation, and late flowering to avoid frost damage.

Origin

‘Yellow Dream’ nectarine was originated from a cross between ‘Baekhyang’ and ‘Romamer I’ in 1999 (Fig. 1). The female parent ‘Baekhyang’ (Kang et al., 1999b) is a white-fleshed peach cultivar whose acidity is less than 0.30%. This cultivar was originated from an open pollination of ‘Garden State’, which is a yellow-fleshed nectarine. The male parent ‘Romamer I’ is a yellow-fleshed nectarine and ripens 3 d before ‘Sunfre’. Acidities of both ‘Garden State’ and ‘Romamer I’ are higher than 0.80%. ‘Yellow Dream’ was preliminarily selected as ‘99PH1084’ for early maturation and sweet taste with low acidity in 2004. To evaluate the properties of this selection, three grafted trees and one original seedling were observed at Suwon from 2005 to 2010 and then designated ‘Wonkyo Da-37’ in 2011 for local test. This selection was grafted onto ‘Maotao’ (Prunus persica L.) wild peach seedling rootstocks and planted in five sites: Suwon (lat. 37°17′N, long. 127°01′E), Yesan (lat. 36°41′N, long. 126°51′E), Cheongwon (lat. 36°33′N, long. 127°32′E), Cheongdo (lat. 35°39′N, long. 128°44′E), and Wanju (35°49′N, long. 126°59′E). In all testing, trees were trained as open-center form spaced 3 m between trees in rows spaced 6 m apart. At each site except Wanju, three randomized single-tree plots were observed from 2011 to 2016, along with other cultivars for comparison purposes. At Wanju, eight grafted trees were observed to evaluate the properties of ‘Wonkyo Da-37’. After 6 years of evaluation, this cultivar was named as ‘Yellow Dream’ in 2016 and released for commercial use in the Republic of Korea in 2017.

Fig. 1. Pedigree of ‘Yellow Dream’ nectarine.
female parent ‘Baekhyang’. The corolla color is dark pink (RP 68B, Royal Horticultural Society, 2007), with five narrow elliptically shaped petals. The inner color of calyx is orange (OG 28A) and pubescence was absent on outer wall of ovary (Fig. 2). The flower is self-fertile with abundant bright yellow pollen.

**Fruit characteristics.** The average ripening date of ‘Yellow Dream’ in Wanju was 11 July (Table 3), which is early season for the nectarine market in the Republic of Korea. The fruit of ‘Yellow Dream’ ripens about 90 d after full bloom, usually 3 d before ‘Sunfre’, which is one of the earliest ripening cultivars. Fruit shape of ‘Yellow Dream’ is round and ground color of fruit skin is greenish yellow (GY 1B) with light red blush in a mottled pattern (Fig. 3). Fruit flesh of ‘Yellow Dream’ has melting texture. Fruit flesh color is yellow (YG 10A) like the male parent, ‘Romamer I’. Red pigmentation is very weak in the outer flesh and around the pit. The average fruit weight of ‘Yellow Dream’ was 203.8 g when thinned to 10–15 cm apart. The fruit is relatively large for the early season. Fruit weight and yield per tree of ‘Yellow Dream’ tends to increase as the trees age. The average soluble solids content of ‘Yellow Dream’ was 13.1°Brix. This is highly acceptable considering the ripening time is July in which the quarter of yearly precipitation occurs (Table 1). The average fruit acidity of ‘Yellow Dream’ was 0.25%, which was similar to female parent ‘Baekhyang’. The acidity value was very low compared with that of other growing nectarine cultivars, such as ‘Cheonhong’ and ‘Sunfre’, in Republic of Korea (Table 4). The fruit of ‘Yellow Dream’ was semi-freestone, whereas that of ‘Baekhyang’ and ‘Romamer I’ were freestone and semi-clingstone, respectively (Table 4). The productivity of ‘Yellow Dream’ was \( \approx 1517 \) kg/10 a without alternate bearing in 7-year-old trees while ‘Cheonhong’ have productivity of \( \approx 1942 \) kg/10 a (Kim et al., 2012).

**Diseases and physiological disorder.** ‘Yellow Dream’ showed less than 1% leaf or fruit with lesions resulting from brown rot [**Monilinia fructicola** (Winter) Honey] and bacterial leaf spot [**Xanthomonas campestris** pv. **pruni** (E. F. Smith) Dye] (Table 5). This result was similar to that of other cultivars, and other specific diseases were not observed. ‘Yellow Dream’ has a low incidence of fruit cracking and little preharvest drop. Incidence of split pits was rare, which is desirable in early-season cultivars.

### Table 1. Location and meteorological information of five evaluation sites, 2011–16.

| Site       | Lat.   | Long.   | CU      | CH      | Yr   | January\(^a\) | August\(^a\) | Cumulative | July\(^a\) | Avg  |
|------------|--------|---------|---------|---------|------|---------------|--------------|------------|-----------|------|
| Suwon      | 37°17'N| 127°01'E| 1,021 ± 174 | 2,394 ± 133 | 12.7 | -2.8 (15.0) | 26.6 (35.6) | 1,265      | 430       | 103  |
| Yesan      | 36°41'N| 126°51'E| 1,063 ± 149 | 2,393 ± 123 | 11.6 | -2.9 (16.9) | 25.8 (35.4) | 1,310      | 324       | 109  |
| Cheongwon  | 36°33'N| 127°32'E| 1,104 ± 199 | 2,359 ± 110 | 11.6 | -2.0 (14.1) | 26.7 (35.8) | 1,174      | 272       | 98   |
| Cheongdo   | 35°39'N| 128°44'E| 1,237 ± 103 | 2,103 ± 174 | 14.0 | -0.1 (-12.6) | 26.6 (37.4) | 1,278      | 266       | 107  |
| Wanju      | 35°49'N| 126°59'E| 1,185 ± 180 | 2,181 ± 138 | 13.8 | -1.9 (-12.4) | 26.7 (38.6) | 1,231      | 286       | 103  |

\(^a\)Chilling accumulation was calculated based on hourly temperature by Korean Meteorological Administration from 1 Oct. to 28 Feb. of next year. Chill unit (CU) was calculated according to Utah model (Richardson et al., 1974), and chill hour (CH) is the number of hours below 7.2 °C.

\(^b\)Average monthly temperature of the year, respectively.

\(^c\)July is ripening season of ‘Yellow Dream’, and yearly precipitation is concentrated in this season.

\(^d\)Values in parentheses are the coldest and the highest temperature of the year, respectively.

### Table 2. Flowering dates, chill units, and degree of frost damage of ‘Yellow Dream’, the female parent ‘Baekhyang’ peach, the male parent ‘Romamer I’ nectarine, and other nectarine cultivars in Wanju, 2014–16 and 2018.

| Cultivar       | 2014          | 2015          | 2016          | 2018          | Avg          | Chill unit  | Frost Damage (%) \(^a\) |
|----------------|---------------|---------------|---------------|---------------|--------------|-------------|--------------------------|
| Yellow Dream   | 13 Apr.       | 15 Apr.       | 7 Apr.        | 10 Apr.       | 11 Apr.      | 950–1000°   | 1                       |
| Baekhyang (\(\_\)) | 14 Apr.       | No data       | 8 Apr.        | 11 Apr.       | 11 Apr.      | 1000–1050°  | 1                       |
| Romamer I (\(\_\)) | No data       | 15 Apr.       | 7 Apr.        | 11 Apr.       | 10 Apr.      | 950–1000°   | 1                       |
| Sunfre         | 12 Apr.       | No data       | 5 Apr.        | 6 Apr.        | 7 Apr.       | 500°        | 3                       |
| Fantasia       | 13 Apr.       | 11 Apr.       | 7 Apr.        | 8 Apr.        | 9 Apr.       | 750°        | 2                       |
| Redgold        | No data       | 14 Apr.       | 7 Apr.        | 9 Apr.        | 9 Apr.       | 850°        | 2                       |
| Summercrest    | No data       | 15 Apr.       | 7 Apr.        | 11 Apr.       | 11 Apr.      | 950°        | 1                       |
| Garden State   | No data       | 15 Apr.       | 11 Apr.       | 13 Apr.       | 13 Apr.      | 1050°       | 1                       |

\(^a\)Degree of frost damage: 1 = 0% to 10%, 2 = 10% to 20%, and 3 = 30% to 50% of damaged flower buds or young fruits by frost at full blooming time.

\(^b\)Estimated by cuttings (see section Performance).

\(^c\)Estimated chill units based on the other cultivars.

\(^d\)Okie (1998).
To evaluate the properties of ‘Yellow Dream’, eight trees (five trees for local testing and three trees for primary testing) were observed for comparison purposes from 2011 to 2016. The trees were planted in 6 x 3 m plots and trained to an open center system under standard commercial conditions in the Republic of Korea (Shin et al., 2002). Fruit are mainly set on medium to long (10–15 cm) branches. Because ‘Yellow
Dream’ is productive without alternate bearing, it is recommended that flower buds or fruit are thinned to maximize the fruit size. During harvest, 30 fruit samples were collected each year to determine their weight, flesh firmness, soluble solids content, and titratable acidity. The tree and fruit characteristics were evaluated according to the National Manual for Agricultural Investigation (RDA, 2012) and the International Union for the Protection of New Varieties of Plants (2010) guidelines for distinctness, uniformity, and stability of the peach (UPOV, 2010). Chilling requirement was estimated as chill unit according to Richardson et al. (1974) by taking cuttings. The branches were taken every 7 d and maintained at 25 °C under a 16-h photoperiod with relative humidity of 60% to 65%. After 14 d, the flower buds on the branch were monitored. Chilling requirement was considered to be satisfied if more than 50% of the floral buds were germinated.

Availability

‘Yellow Dream’ is the subject of plant variety protection according to Korean Seed Industry Law. Requests for bud wood should be directed to the NIHHS RDA. Nonindexed scions for research purposes may be addressed to Eun Young Nam (eynam@korea.kr).

Literature Cited

Jun, J.H., K.H. Chung, S.J. Kang, Y.B. Kwack, S.B. Jeong, K.S. Park, and H.K. Yun. 2007. A new mid-season nectarine cultivar, ‘Suhong’. J. Amer. Pomol. Soc. 61:23–24.
Jun, J.H., J.H. Kwon, E.Y. Nam, K.H. Chung, I.K. Yoon, S.K. Yun, Y.B. Kwack, S.J. Kim, and S.J. Kang. 2014. ‘Hahong’, Nectarine. HortScience 49:98–100.
Jun, J.H., J.H. Kwon, E.Y. Nam, K.H. Chung, I.K. Yoon, S.K. Yun, and S.J. Kim. 2016. Trends in public and private peach breeding in the Republic of Korea. J. Amer. Pomol. Soc. 70:180–186.
Kang, S.J., H.Y. Kim, K.H. Cheong, W.C. Kim, Y.U. Shin, J.Y. Moon, and J.H. Kim. 1999a. ‘Cheonhong’, a nectarine with resistance to fruit cracking and russetting. Kor. J. Hort. Sci. Technol. 17:15–16.
Kang, S.J., K.H. Chung, H.Y. Kim, W.C. Kim, and D.K. Lee. 1999b. ‘Baekhyang’, a rich-flavor, white-fleshed, late-maturing, and freestone peach. Kor. J. Hort. Sci. Technol. 17:17–18.
Korean Statistical Information Service. 2017. Census of Agriculture, Forestry and Fisheries. Statistics Korea. Daejeon, Republic of Korea.
Kim, S.H., J.H. Han, J.G. Cho, S.K. Yun, K.R. Do, J.H. Kim, H.J. Kwon, G.S. Cho, S.G. Han, and K.B. Ma. 2012. Estimated standard yield in peach (in Korean). p. 387-418. In: Natural disasters and fruit crop insurance. Natl. Inst. Hort. Herbal Sci., Wanju, Republic of Korea.
Kim, S.W., M.S. Park, H.W. Park, K.R. Choi, and S.P. Hong. 2018. Trends and prospect of peach supply and demand (in Korean). p. 525–530. In: Agricultural Outlook. Korea Rural Economic Inst., Naju, Republic of Korea.
Okie, W.R. 1998. Handbook of peach and nectarine varieties: Performance in the southeastern United States and index of names. U.S. Dept. of Agr., Byron, GA.
Richardson, E.A., S.D. Seeley, and D.R. Walker. 1974. A model for estimating the completion of rest for ‘Redhaven’ and ‘Elberta’ peach trees. HortScience 9:331–332.
Royal Horticultural Society. 2007. RHS colour chart. Royal Horticultural Society, London, UK.
Rural Development Administration (RDA). 2012. Manual for agricultural investigation. 5th edn. Rural Development Administration, Suwon, Republic of Korea.
Shin, Y.U., S.J. Kang, S.B. Jeong, J.H. Jun, M.D. Jo, K.H. Chung, S.J. Kim, J.M. Park, I.K. Yoon, J.H. Park, D.S. Kim, D.S. Jeong, and J.G. Kang. 2002. The standard manual of peach cultivation. Rural Development Administration, Suwon, Korea.
Union for the Protection of New Varieties of Plants. 2010. Guidelines for the conduct of tests for distinctness, uniformity, and stability. Peach, Nectarine [Prunus persica (L.) Batsch]. Geneva, Switzerland.
Wi, T.S. and S.J. Jo. 2016. The analysis of consumer and distribution market trend in fruit (in Korean), p. 41–53. In: The prediction of purchase behavior of horticultural and herbal crops. Natl. Inst. Hort. Herbal Sci., Wanju, Republic of Korea.