'Goshen Gold': A Late-season Apricot for Fresh and Dried Product Markets

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'Goshen Gold' is the most recent apricot (*Prunus armeniaca* L.) developed by the Agricultural Research Service *Prunus* breeding program in Parlier, CA. The new cultivar is self-compatible and capable of setting full crops without the presence of other cultivars to facilitate fruit set. 'Goshen Gold' fruit ripen late, ≈ 10 d after 'Patterson' harvest. Fruit of the new cultivar resist pit burning well, are generally dull gold-yellow in color, and without significant blush. From adequately thinned trees, fresh market producers can expect 70 g fruit that are juicy and fine grained with bright orange flesh. Postharvest life of 'Goshen Gold' at commercial maturity has been very good, and fresh eating quality has been extremely favorable during presentation at limited consumer trials. 'Goshen Gold' fruit hang well on the tree and continue to accumulate sugar as maturity progresses. Picked optimally for drying, 'Goshen Gold' produces a bright orange product with a low drying ratio and significantly better color retention during storage than 'Patterson'.

Origin

Tested as Y117-97-97, 'Goshen Gold' was planted as part of progeny no. 973065 in Feb. 1998 and selected in June 2001. Late-season fruit maturity is the characteristic that first distinguished 'Goshen Gold' from other siblings and led to its selection and propagation. Although making a new selection is usually based on a review of quality characteristics of the new accession as compared with an established competing selection or cultivar, quality comparisons were not possible in 'Goshen Gold' in that it has sufficiently late maturity and fruit of all other selections and cultivars had already matured and dropped to the orchard floor by that time. Pedigree of the new cultivar is provided in

Fig. 1, demonstrating eight generations of apricot breeding that began in Fresno, CA, during the late 1950s. Of particular note in the pedigree is cv. Shobaig, the female grandparent of 'Goshen Gold'. 'Shobaig' was collected from the Hunza region of northern Pakistan during a federally sponsored apricot germplasm collection trip in 1988 (Thompson, 1998).

Description

Tree characteristics. 'Goshen Gold' trees exhibit strong vigor as compared with 'Harlayne' and a semispreading tree habit, being slightly more upright as compared with descriptor cultivars Harglow and Harlayne (Guerriero and Watkins, 1984). Heavy maintenance pruning during the growing season is necessary to enhance light penetration and stimulate flower development for the following year. Fruit are borne on both spurs and 1-year-old shoots, with higher quality fruit always being on spurs. Spur density of 'Goshen Gold' is heavy, resembling more its central Asian grandparent 'Shobaig' as compared with California-adapted accessions (Ledbetter and Peterson, 2004).

Flowering characteristics. Preanthesis bagging studies over several seasons have shown 'Goshen Gold' to be self-compatible, consistently producing fruit after self-pollination. Chilling requirement of the new cultivar is currently unknown, but phenological records have shown the bloom interval of 'Goshen Gold' to be slightly later than average for

California-adapted apricots currently grown in the San Joaquin Valley. Bloom intervals of early-blooming cultivar Apache and late-blooming cultivar OrangeRed are provided with 'Goshen Gold' for comparison (Table 1).

Fruit characteristics. Fruit of 'Goshen Gold' are generally elliptic in shape with a dull gold-yellow skin color that is not enhanced by blush. The pubescent skin surface of the new cultivar is smooth and has not been susceptible to rain-induced skin cracks. The pit is removed easily from the freestone fruit, a benefit for growers using the new cultivar as a dried product. Flesh is bright orange, finely grained, firm, and juicy. Fruit remain on the tree well after commercial maturity, allowing sugars to increase and providing excellent fruit for a premium dry product (Fig. 2).

Fruit size, firmness, color, and juice characteristics. Physical measures and juice characteristics of 'Goshen Gold' fruit are presented in Table 2, along with 'Patterson', the major tonnage cultivar with a ripening date most similar to the new cultivar. Values presented represent average $\pm$ SE of each character calculated from two separate harvests during each of three consecutive years. Fruit representing commercial maturity were selected at each harvest on the basis of flesh firmness. Trees had been previously fruit thinned by commercial thinning crews (≈ 6 to 8 weeks postbloom) to allow increased sizing on remaining fruit. Flesh firmness was measured on the equatorial region of a cut fruit surface (skin removed) with an 8-mm tipped handheld penetrometer (D. Ballauf Manufacturing Co. Inc., Washington, DC). Similarly, a freshly cut fruit surface was also used to obtain hue angle (h°), an intuitively understandable representation of visual color (McGuire, 1992) using a chroma meter (CR-400; Konica Minolta Sensing Americas, Inc., Ramsey, NJ). The CR-400 meter was calibrated to a standard white calibration tile before any flesh color measurements. After physical measurements were completed, longitudinal slices were harvested from each fruit to form a composite for juice analysis. Slices were juiced in a Panasonic Juice Extractor (MJ-65PR; Panasonic Co.,

Fig. 1. Pedigree of 'Goshen Gold' apricot.

Table 1. Three consecutive years of bloom interval (first bloom to full bloom) in Parlier, Fresno County, CA, for new Agricultural Research Service apricot 'Goshen Gold' and reference cultivars Apache and OrangeRed.

Crop yr	'Apache'		'Goshen Gold'		'OrangeRed'	
	First ^a	Full ^b	First	Full	First	Full
2012	6 Feb.	24 Feb.	21 Feb.	4 Mar.	28 Feb.	21 Mar.
2013	15 Feb.	1 Mar.	28 Feb.	10 Mar.	10 Mar.	19 Mar.
2014	10 Feb.	23 Feb.	18 Feb.	4 Mar.	26 Feb.	13 Mar.

^aFirst bloom represents the date at which less than 1% of flowers have opened.

^bFull bloom represents the date at which greater than 80% of flowers have opened.

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Fig. 2. 'Goshen Gold' fruit before harvest on the parent tree and as a brightly colored dried product.

Table 2. Fruit characteristic comparisons (average $\pm$ SE) of 'Goshen Gold' and 'Patterson' apricots grown in Parlier, CA, 2012–14.

Fruit characteristic	'Goshen Gold'	'Patterson'
Physical characteristic		
Fruit weight (g)	68.1 $\pm$ 2.7 ^a	67.1 $\pm$ 2.3
Axial diameter (mm)	48.9 $\pm$ 0.7	49.0 $\pm$ 0.6
Flesh firmness (N)	22.7 $\pm$ 2.7	29.9 $\pm$ 3.9
Flesh hue (°)	74.1 $\pm$ 0.6	75.4 $\pm$ 1.0
Juice characteristic		
Total soluble solids (%)	14.4 $\pm$ 0.6	11.8 $\pm$ 0.9
Acid (meq/100 mL)	0.64 $\pm$ 0.04	0.89 $\pm$ 0.13
Fruit maturity date	24 June	14 June

^aCalculated values are based on two separate harvests per cultivar per year, and seven fruits were evaluated per harvest for three consecutive harvest years.

Secaucus, NJ). A 5-mL aliquot was used for titration to an endpoint of pH 8.1 for juice acidity measure. The composite juice sample was also measured with a handheld refractometer (Atago N1; Atago Co., Ltd., Tokyo, Japan) to determine total soluble solids concentration.

Physical measures of 'Goshen Gold' and 'Patterson' are quite similar in fruit weight, axial diameter, and flesh hue, differing only slightly for each of these characters. However, flesh firmness did differ (22.7 N vs. 29.9 N) between the two cultivars (Table 2). Contrasting the physical similarities, juice characteristics of the two cultivars did differ appreciably, perhaps due to fruit maturity differences as demonstrated in flesh firmness. Expressed differences in total soluble solids and juice acidity led to large differences in Brix:acid ratio between the two cultivars. Elevated soluble solids (14.4%) and reduced acidity (0.64 meq/100 mL) present in 'Goshen Gold' samples led to a 22.5 Brix:acid ratio for this new cultivar, whereas 'Patterson' juice chemistry yielded a much lower Brix:acid ratio of 13.2. Brix:acid ratio has been used successfully as a measure of consumer acceptance, with higher ratios denoting higher eating quality (Jayasena and Cameron, 2008).

Dry product characteristics. An estimated 9500 t (17%) of the 2014 California apricot harvest was used for drying (B. Ferriera, Apricot Producers of California, personal communication). Although this tonnage is small compared with world dried apricot volume, California dried apricot halves are known for their vibrant orange color and rich traditional flavor. Quality characteristics of 'Goshen Gold' as a dried product have been compared previously with 'Patterson', the predominant drying apricot in California. Drying ratio (fresh fruit weight:dried product weight) of 'Goshen Gold' was significantly less than that of 'Patterson' (3.95 vs. 4.61), and color stability of 'Goshen Gold' during storage was significantly better than 'Patterson' (Ledbetter, 2012). Using this new cultivar as feedstock for dried product will provide growers

with promising alternatives to the presently popular Patterson cultivar.

Availability. The mother tree of 'Goshen Gold' is located in Parlier, CA, at the San Joaquin Valley Agricultural Research Center of the Agricultural Research Service. This new cultivar has no restrictions placed on its propagation and is considered a free cultivar, without registration or patent. Limited quantities of dormant budwood are usually available on request. Wood from the mother tree has been indexed by the National Clean Plant Network Center at Washington State University–Irrigated Agriculture Research and Extension Center, Prosser, WA, and found free of known viruses and phytoplasmas. Scions of 'Goshen Gold' have been deposited at the National Clonal Germplasm Repository in Davis, CA, where requests can be made for research purposes, including development and commercialization of new cultivars.

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