‘Goldnine’ Peach

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‘Goldnine’ is the third non-melting flesh, clingstone peach [Prunus persica (L.) Batsch] released from the Univ. of Arkansas peach breeding program. Previous releases were ‘Allgold’ and ‘Goldlocks’ (Moore et al., 1984).

‘Goldnine’ is an early, clingstone processing peach that has reliable production, excellent flower bud hardness, later than average bloom date, above average resistance to bacterial spot [caused by Xanthomonas campestris pv. pruni (Smith) Dye], and good processing attributes. It is being released as an early to mid-season processing peach for cultivation primarily in northern regions of the United States with cooler summers than the deep South and for potential use as a fresh-market cultivar in areas desiring a non-melting flesh, clingstone peach for the fresh market (Mexico).

‘Goldnine’, which was officially named in 2000, has been marketed by commercial nurseries in the United States and Mexico as ‘Arkansas 9’, ‘Ark. 9’, or ‘A-9’. In a census of peach cultivars planted in Michigan in 1997, ‘A-9’ was planted on 99 ha (Bill Shane, personal communication), with increased plantings anticipated, and ‘Goldnine’ was used for processing. In 1999, ‘A-9’ was one of the more commonly planted peaches in the highlands near Casas Grandes, Chihuahua, Mexico, with 30 ha in production for the fresh market (Jaime Martinez, personal communication).

Origin

‘Goldnine’ resulted from a cross of NJ 554367 x G17-5E made in 1963 by Catherine Bailey and L.F. Hough of Rutgers Univ., New Brunswick, N.J. (Fig. 1). The original seedling trees of this cross were planted at the Univ. of Arkansas Fruit Substation, Clarksville, in 1964, and the original tree was selected in 1966 by J.N.M and R.C.R. and tested thereafter as ‘Ark. 9’.

The primary testing of ‘Goldnine’ was at the Fruit Substation, Clarksville, Ark. [west-central Arkansas, lat. 35°31’58” N and long. 93°24’412” W; U.S. Dept. of Agriculture (USDA) hardness zone 7a; soil type Linker fine sandy loam (Typic Hapludults)], with testing also at the Southwest Arkansas Research and Extension Center, Hope [southwest Arkansas, lat. 33°42’30” and long. 93°33’0”; USDA hardness zone 8a, soil type Bowie fine sandy loam (Fragic Paleudults)]. Additional evaluation plantings were established in southwest Michigan and Princeton, Ky. In all Arkansas testing, trees were trained to an open-center system and pruned annually, spaced 5.5 m between trees, fertilized annually with either complete or nitrogen fertilizers, irrigated as needed, and pests managed using a pest management program typical for commercial orchards of the area, including the applications of fungicides and insecticides. Fruit were thinned each year that a crop was present to a distance of 12 cm between fruit prior to pit hardening but after shuck split.

Trials consisting of two-tree observational plots were maintained at Clarksville and data were collected from these trees or the original tree from 1966 through 1999. Data are reported here only for a maximum of 9 years for any data point. Comparison cultivars also planted at this site included ‘Babygold 5’, ‘Babygold 7’, ‘Allgold’, and ‘Goldilocks’. Field observations included bloom date, bloom intensity, and fruit maturity date. Fruit maturity date was estimated for first commercial harvest. Fruit ratings were taken for size, shape, firmness, skin color, flesh color, finish, and flavor. Trees were rated for vigor, crop, health, and bacterial spot susceptibility. The rating scale for these variables was 1 to 10 with a rating of 10 most desirable, with the exception of vigor, in which a rating of 10 indicated excessive vigor. A rating of 7 to 8 would be most desirable for vigor in this rating scale. Additionally, a five-fruit sample was collected from ‘Goldnine’ for 9 years (1988, 1990–95, 1997–98) and average fruit weight, fruit size, color (using a model CR200 chroma meter, Minolta, Ramsey, N.J.), firmness (using a model FT327 fruit pressure tester with an 11-mm-diameter probe; McCormick Fruit Tree Co., Yakima, Wash.), and soluble solids (using a bench refractometer) were determined.

In some years all variables were not measured and this is noted in the text. A replicated trial at Hope was established in 1992 and data were collected for yield and fruit weight in 1995 and 1997 (crops were lost or damaged by spring frosts in 1994 and 1996). Four single-tree replications arranged in a randomized complete-block design were utilized in this planting and data were analyzed separately for each year. Data from the replicated trial at Hope were analyzed by analysis of variance and means separated by least significant difference (LSD) (SAS Institute, 1989).

Processing evaluations were conducted in 1988, 1994, and 1995 by the Dept. of Food Science, Univ. of Arkansas, from ~20-kg samples collected at Clarksville and delivered to Fayetteville. For all processing samples, fruit were peeled, pitted, and blanched in live water. The juice was used fresh and processed in syrup, canned, and dried in the sun. When dried, ‘Goldnine’ was marketed as a validated Sunsweet variety. The fruit was dried for 5 days in the sun, until the moisture content was ~5%. The juice was marketed with ‘Goldnine’ as a California-developed cling selection, but records do not indicate the meaning of “G” or “DIX.”

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steam for 5 min and then packed in a 0.5-L glass jar, which was exhausted for 10 min, sealed, and cooked for 25 min in boiling water. Soluble solids were measured with a bench refractometer from a blended, filtered sample. Titratble acidity and pH were measured on a 10-g blended sample diluted in 50 mL of deionized water, and titration utilized 0.1 NaOH and was taken to a pH of 8.2. These measurements were obtained for both fresh fruit (represented as the fresh-slice data in Table 1), and processing samples (represented in the canned slices and canned puree data in Table 1). Processed sample color was determined by a Gardner Color Difference Meter (Colorguard System 1000 Colorimeter; Gardner/Neotec Instrument Division of Pacific Scientific Co., Silver Spring, Md.) that was standardized with a plaque (L = 93.5, a = 1.4, and b = 3.2). Sensory evaluations were also conducted on processed samples by a trained panel of 10 to 15 evaluators. These evaluations were done 3 to 4 months following processing of the fruit, and panelists rated the samples for color and flavor.

Description and performance

Average 10% bloom date at Clarksville for ‘Goldnine’ was 18 Mar., 1 d later than ‘Goldilocks’ and ‘Babygold 5’, and 3 d later than that for ‘Allgold’ and ‘Babygold 7’ (Table 2). Average full bloom date for ‘Goldnine’ was later than all comparison cultivars by 2 to 3 d (Table 2). Intensity of bloom ratings averaged over 9 years for ‘Goldnine’, a reflection of the amount of bloom, exceeded those for ‘Allgold’, ‘Goldilocks’, ‘Babygold 5’, and ‘Babygold 7’ (data not shown). Flowers of ‘Goldnine’ are showy and self-fertile. Leaf glands are reniform. Tree vigor was rated slightly lower than that for ‘Allgold’ and ‘Goldilocks’ (Table 2), although this difference was minimal and would not affect canopy management decisions. Crop load ratings conducted at fruit maturity were generally similar to the test cultivars (Table 3). Consistent cropping was achieved in all years of fruiting except when frosts near bloom eliminated the crop. Ratings for tree health for ‘Goldnine’ were between those for ‘Allgold’ and ‘Goldilocks’ (Table 3). ‘Goldnine’ was comparable with ‘Allgold’ in bacterial spot resistance, and less susceptible to this disease than were ‘Goldilocks’ and ‘Babygold 5’ (data not shown). In some years a limited number of bacterial spot lesions were seen on leaves of ‘Goldnine’ but defoliation was not a concern. Bacterial spot lesions were rarely seen on fruit and, when seen, were very minimal. No other disease problems have been seen on ‘Goldnine’, although a commercial fungicide program was used to control brown rot (caused by Monilinia fructicola (G. Wint.) Honey). Peach scab (caused by Cladosporium carpophilum Thuen.) was observed on the fruit of ‘Goldnine’ 1 year at Hope, but was judged to be no more severe than on other cultivars in the planting.

Winter bud hardiness is very good for ‘Goldnine’ and is probably at least part of the basis for its reliable cropping. Following –22 °C on 24 and 25 Dec. 1989 at Clarksville, percent flower bud survival for ‘Goldnine’ was 76% vs. 10% for ‘Allgold’ and 24% for ‘Goldilocks’. In that same time period, data from Kentucky indicated that ‘Goldnine’ had 38% flower bud survival following exposure to –26 °C vs. 2% survival for ‘Redhaven’ and 14% for ‘Reliance’ (Brown and Strang, 1990). Chilling requirement of ‘Goldnine’ has not been determined, but is probably near 750 h below 7 °C based on observations of budbreak and bloom in comparative plantings with test cultivars of known chill requirement. In Chihuahua, Mexico, in 1999, ‘Goldnine’ fruited well with an estimated chilling of 500 h below 7 °C. Budbreak of ‘Babygold 5’ and ‘Babygold 7’ was reduced because of lack of adequate chilling (Jaime Martinez, personal communication).

Fruit of ‘Goldnine’ mature on average 10 d after ‘Allgold’, 7 d before ‘Goldilocks’, and 10 and 19 d before ‘Babygold 5’ and ‘Babygold 7’, respectively (Table 2). Yield data, collected at Hope for 1995 and 1997, indicated that ‘Goldnine’ had significantly higher yields than did ‘Babygold 5’ and ‘Babygold 7’ in 1997 and statistically similar yields in 1995 (Table 4). Fruit size ratings were similar to those for ‘Goldilocks’ and ‘Babygold 5’, but less than those for ‘Allgold’ and ‘Babygold 7’. Average fruit weight for ‘Goldnine’ over 8 years was 187 g and exceeded that of all comparison cultivars except ‘Allgold’ at Clarksville (Table 2). Fruit weight at Hope for ‘Goldnine’ was less than for ‘Babygold 5’ and ‘Babygold 7’, although crop loads for ‘Goldnine’ were heavier than for either of these comparison cultivars (Table 3). ‘Goldnine’ fruit averaged 6.1 cm in length and 7.1 cm in diameter in measurements taken over 9 years. Fruit shape, skin color, and finish ratings were generally similar among ‘Goldnine’ and the other cultivars evaluated (Table 3). The skin usually had 40% blush with some red striping when grown in Arkansas. Skin ground color (background color) had 7-year average values of 71.7 for L (the lower the L value, the darker the sample), 11.1 for a (the higher the a value, the redder the sample), and 3.2 for b (the higher the b value, the more yellow the sample).

Table 1. Quality analyses of processing peach cultivars grown at the Univ. of Arkansas Fruit Substation, Clarksville.

| Characteristic     | Goldnine | Allgold | Goldilocks | Babygold 5 |
|-------------------|----------|---------|------------|------------|
| Soluble solids (%) | 11.3     | 11.4    | 12.1       | 13.5       |
| pH                | 3.73     | 3.62    | 3.86       | 3.83       |
| Titratable acidity | 5.40     | 5.30    | 4.10       | 4.80       |
| CDM-L             | 56.3     | 65.7    | 60.3       | 62.4       |
| CDM-a             | 19.3     | 12.3    | 20.0       | 15.8       |
| CDM-b             | 30.6     | 35.1    | 34.1       | 34.7       |

Table 2. Bloom and harvest dates and fruit characteristics of processing peach cultivars, Univ. of Arkansas Fruit Substation, Clarksville.

| Cultivar  | Bloom date | Harvest date | Fruit wt  | Fruit firmness | Soluble solids (%) |
|-----------|-------------|--------------|-----------|----------------|-------------------|
| Goldnine  | 18 Mar.     | 11 July      | 187       | 4.8            | 12.7              |
| Allgold   | 15 Mar.     | 1 July       | 204       | 3.3            | 12.1              |
| Goldilocks| 17 Mar.     | 18 July      | 147       | 5.2            | 12.6              |
| Babygold 5| 17 Mar.     | 21 July      | 153       | 5.8            | 14.0              |
| Babygold 7| 15 Mar.     | 30 July      | 170       | 6.6            | 13.3              |

Table 3. Quality analyses of processing peach cultivars grown at the Univ. of Arkansas Fruit Substation, Clarksville.

| Characteristic    | Goldnine | Allgold | Goldilocks | Babygold 5 |
|-------------------|----------|---------|------------|------------|
| Soluble solids (%) | 11.3     | 11.4    | 12.1       | 13.5       |
| pH                | 3.73     | 3.62    | 3.86       | 3.83       |
| Titratable acidity | 5.40     | 5.30    | 4.10       | 4.80       |
| CDM-L             | 56.3     | 65.7    | 60.3       | 62.4       |
| CDM-a             | 19.3     | 12.3    | 20.0       | 15.8       |
| CDM-b             | 30.6     | 35.1    | 34.1       | 34.7       |
samples was near that of the other Arkansas cultivars (Table 3). Soluble solids content of orchard grown 'Goldnine' was generally comparable to those of the other Arkansas cultivars and 'Allgold' or 'Goldilocks', but near those for 'Babygold 5' (data not shown). Sensory evaluations on pureed samples, averaged over 4 years, flavor of 'Goldnine' rated near that of 'Goldilocks' and 'Allgold', and higher than that of 'Babygold 5' (data not shown). Sensory values for color desirability were higher for 'Goldnine' than for 'Goldilocks' and 'Babygold 5' (data not shown).

The outstanding characteristics of 'Goldnine' are its reliable production, excellent flower bud hardness, later than average bloom date, above average bacterial spot resistance, and good processing attributes. 'Goldnine' is recommended for trial where other eastern, North American–developed processing clingstone peaches are grown.

**Availability**

'Goldnine' is available from commercial nurseries under this name or as 'Arkansas 9', 'A-9', or 'Ark. 9'. A limited amount of budwood is available for research and evaluation purposes; requests can be sent to J.R.C., 316 Plant Science, Dept. of Horticulture, Univ. of Arkansas, Fayetteville, AR 72701.

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