‘Gumdrop’, a New Early Harvest Pistachio Cultivar

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Abstract. ‘Gumdrop’ is a new female pistachio (Pistacia vera L.) cultivar for California. It matures earlier than all commercial cultivars with equivalent yield and nut quality to ‘Kerman’. ‘Gumdrop’ can be harvested about 10–12 days before ‘Golden Hills’ pistachio (Parfitt et al., 2007) and 24 days before ‘Kerman’, the standard pistachio cultivar grown in California (Parfitt et al., 2012). ‘Gumdrop’ has very good yield, nut quality, and processed nut appearance similar to ‘Golden Hills’ and ‘Kerman’. ‘Gumdrop’ blooms about 5 days before ‘Golden Hills’ and 10–11 days before ‘Kerman’, ‘Gumdrop’, ‘Golden Hills’, and ‘Kerman’ comprise a harvest series, maturing over a 24–30 day period. The early nut maturity of ‘Gumdrop’ will permit pistachio growers to extend their harvest period. The earlier maturing date of ‘Gumdrop’ also makes it less susceptible to insect damage from navel orangeworm, a major pest of pistachio implicated in the occurrence of aflatoxin contamination. An application for a U.S. Plant Patent was submitted on 4 Apr. 2016.

‘Gumdrop’ is an open-pollinated off-spring of female seedling ‘B15-69’, located in a selection plot near Famoso, CA, with 1410 seedlings, described in Chao et al. (1998). ‘B15-69’ was developed as part of the Parfitt, Kallsen, and Maranto breeding project in the 1990s (Kallsen et al., 2009), from a cross of female 2-35, originally selected by Dr. J. Crane in the 1970s, and ES2, an early flowering male of unknown parentage. ‘Gumdrop’ was selected as seedling S-43 (one of 35 seedlings from ‘B15-69’ seed) for precocity, early season nut maturity, and nut size in 2006 from a breeding selection plot, established near Bakersfield California in 2001. ‘Gumdrop’, ‘Kerman’, and ‘Golden Hills’ were grafted onto UCB1 rootstock and tested in a randomized block trial (three blocks, four to six trees per cultivar/block) established near Buttonwillow CA in 2007. This trial is located near the center of the major U.S. pistachio-growing region.

Description

Tree. ‘Gumdrop’ is a large, vigorous tree on UCB1 rootstock. The crown is somewhat irregular in shape, more so than for ‘Golden Hills’ or ‘Kerman’ (Fig. 1). Tree structure is similar to ‘Kerman’ with scaffold branch angles 80° to 90°. It forms fewer scaffolds than ‘Golden Hills’. Primary and secondary branches are stiff, which facilitates shaking to remove the nuts for harvest. Bark color is gray, similar to ‘Kerman’ and ‘Golden Hills’ (202C to 202D). Color evaluations are from the Royal Horticultural Society Color Chart (R.H.S. color chart v. 3 QC495 R8 V.1-4).

Leaves. Leaves are deciduous simple compound imparipinnate with one or two pairs of oppositely arranged lateral leaflets. Leaflet margins are entire to slightly crenate. Leaflets vary considerably in shape, in general being ovate with cuspisate to rounded tips and rounded base. Leaflets are somewhat larger than for ‘Kerman’ and ‘Golden Hills’. Margins of leaf blades are entire. Leaf surfaces are glabrous, smooth, and waxy. Leaves range from light green at first emergence to medium green at maturity.

Table 1. Bloom ratings over four years for ‘Gumdrop’, ‘Golden Hills’, and ‘Kerman’.

| Cultivar | 2012 | 2013 | 2014 | 2015 |
|----------|------|------|------|------|
| Gumdrop  | 0.5  | 0.5  | 0.2  | 0.2  |
| Golden Hills | 0.2  | 0.5  | 0.5  | 0.5  |
| Kerman   | 0.0  | 0.2  | 0.2  | 0.2  |

Fig. 1. ‘Gumdrop’ in replicated trial on the west side of the San Joaquin valley, showing tree size and large nut clusters.

Fig. 2. Inflorescences of ‘Gumdrop’, ‘Golden Hills’, and ‘Kerman’ pistachio on 20 Mar. 2014, showing differences in development. All shoots were collected on the same date (20 Mar. 2014).

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dark green at maturity with no difference between upper and lower leaf surfaces. Color ratings from three or more mature leaves were 139B for the upper and lower surfaces and for new leaves 138B to 139C and 139C for the lower surface. Leaf midrib color was 143C.

Flowers. Female inflorescences are born laterally on 1-year-old wood. One hundred to more than 200 female flowers are present on panicle inflorescences with 8–15 branches/panicle inflorescences with 8–15 branches/more than 200 female flowers are present on laterally on 1-year-old wood. One hundred to 143C. for the lower surface. Leaf midrib color was and for new leaves 138B to 139C and 139C were 139B for the upper and lower surfaces ratings from three or more mature leaves between upper and lower leaf surfaces. Color dark green at maturity with no difference for the lower surface. Leaf midrib color was 143C.

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Availability

Budwood of ‘Gumdrop’ is being distributed to California nurseries and commercial budders in 2016 and should be available in small quantities from those sources beginning in 2018. Lists of nurseries producing ‘Gumdrop’ will be available from the UC Davis Technology Transfer Services, UC Davis Innovation Access, 1850 Research Park Drive, Suite 100, Davis, CA 95618-6159, www.research.ucdavis.edu/InnovationAccess.

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Table 2. Performance of ‘Gumdrop’ pistachio compared with ‘Golden Hills’ and ‘Kerman’, in a randomized block trial near Buttonwillow, CA. Letters below means show significance at 95% as determined from Bonferroni ranges.

| Trait                          | Measurement units | Gumdrop | Kerman | Golden Hills | ANOVA P value for cultivar | ANOVA P value for yr | ANOVA P value for cultivar*yr | ANOVA P value for block | Total df |
|-------------------------------|-------------------|---------|--------|-------------|---------------------------|----------------------|-------------------------------|------------------------|-----------|
| Payable yield mean            | kg/ha             | 1,408   | 1,270  | 1,662       | 0.000                     | 0.000                | 0.000                         | 0.433                  | 35        |
|                               | lb/ac             | 1,257 a | 1,134 a| 1,484 b     |                           |                      |                               |                        |           |
| Split nut percentage mean     | %                 | 85.9 a  | 71.5 b | 87.5 a       | 0.000                     | 0.000                | 0.296                         | 0.274                  |           |
| Blank nut percentage          | %                 | 5.97 a  | 11.2 b | 4.38 a       | 0.000                     | 0.000                | 0.458                         | 0.078                  |           |
| Insect damage percentage      | %                 | 0.99 a  | 0.95 a | 0.55 a       | 0.151                     | 0.010                | 0.000                         | 0.114                  |           |
| Nut weight                    | g/nut             | 1.35 a  | 1.38 a | 1.35 a       | 0.850                     | 0.382                | 0.122                         | 0.656                  |           |
| Loose shells                  | %                 | 0.84 a  | 0.25 b | 0.28 b       | 0.000                     | 0.056                | 0.061                         | 0.912                  |           |
| Adhering hulls                | %                 | 0.70 ab | 1.59 b | 0.51 a       | 0.012                     | 0.089                | 0.357                         | 0.666                  |           |
| Stain fraction                | %                 | 1.22 a  | 0.30 b | 0.58 a       | 0.001                     | 0.001                | 0.923                         | 0.611                  |           |
| Harvest date: days after 1    | days              | 18.3 a  | 41.8 b | 28.6 c       | 0.000                     | 0.000                | 0.000                         | 0.422                  |           |
| Avg.                          |                   |         |         |             |                           |                      |                               |                        |           |
| Trunk XC area (Scion)         | cm²               | 342 a   | 185 b  | 190 b        | 0.000                     | *                    | *                             | 0.857                  |           |
| Trunk XC area (rootstock)     | cm²               | 256 a   | 215 ab | 196 b        | 0.055                     | *                    | *                             | 0.887                  |           |

*data collected in 2016 only.