

Register of New Fruit and Nut Cultivars List 50

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Crop Listings^z. Almond, Apple, Apricot and Pubescent-skinned *Prunophora* hybrids, Avocado, Avocado rootstock, Blackberry, Blueberry, Citrus, Citrus rootstock, Elderberry, Fig, Grape, Kiwiberry, Kiwifruit, Mango, Nectarine, Pawpaw, Peach, Pear, Persimmon, Pineapple, Plum and interspecific hybrids, Pomegranate, Raspberry, Strawberry

ALMOND

Thomas M. Gradziel, Dept. of Plant Sciences, University of California, Davis, CA

Capella. Self-fertile, blooms 2 d after Nonpareil, with early to midseason harvest time and kernel-to-shell ratio 23%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia, by M. Wirthensohn, and Plant & Food Research, Adelaide, by A. Granger. Nonpareil × Lauranne; crossed 1997; selected 2009; introd. 2017. USPP 29,674; 18 Sept. 2018. **Nut:** shell ovate, hard; kernel slightly flatter and wider than Nonpareil, easily blanched, large, 1.48 g, 53% oil, 67% oleic acid; hull flares away from shell at maturity. **Tree:** growth habit upright to slightly open; crops heavily on spurs; tolerant to bacterial spot (*Xanthomonas arboricola* pv. *pruni*).

Carina. Self-fertile, blooms 4 d before Nonpareil, with very early to early harvest time and kernel-to-shell ratio 29%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia,

by M. Wirthensohn, and Plant & Food Research, Adelaide, by A. Granger. Nonpareil × Lauranne; crossed 1997; selected 2009; introd. 2017. USPP 29,676; 18 Sept. 2018. **Nut:** shell well sealed, semi-hard; kernel medium, 1.13 g, 57% oil, 62% oleic acid, less than 5% doubles. **Tree:** slightly spreading, similar to Nonpareil; bearing primarily on spurs; tolerant to bacterial spot.

Maxima. Self-incompatible, blooms 4 d after Nonpareil, with early to medium harvest time and kernel-to-shell ratio 26%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia, by M. Wirthensohn, and Plant & Food Research, Adelaide, by A. Granger. Nonpareil × Lauranne; crossed 1997; selected 2009; introd. 2017. USPP 29,423; 26 June 2018. **Nut:** shell cordate, large, well sealed, semi-hard; kernel very large, 2.05 g, 62% oil, 60% oleic acid, less than 5% doubles. **Tree:** slightly spreading, similar to Nonpareil; tolerant to bacterial spot.

Mira. Self-fertile, blooms 3 d after Nonpareil, with early harvest time and kernel-to-shell ratio 30%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia, by M. Wirthensohn, and Plant & Food Research, Adelaide, by A. Granger. Nonpareil × Lauranne; crossed 1998; selected 2009; introd. 2017. USPP 29,675; 18 Sept. 2018. **Nut:** shell well sealed, semi-hard; kernels medium, 1.27 g, 61 % oil, 59% oleic acid content, less than 5% doubles. **Tree:** growth habit upright to slightly spreading; crops heavily on spurs.

Rhea. Self-incompatible, blooms 3 d before Nonpareil, with medium harvest time and kernel-to-shell ratio 36%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia, by M. Wirthensohn, and Plant & Food Research, Adelaide, by A. Granger. Nonpareil × Lauranne; crossed 1998; selected 2009; introd. 2017. USPP 29,634; 4 Sept. 2018. **Nut:** cordate, medium, well sealed paper shells; kernel medium, 1.14 g, 55% oil, 68% oleic acid content, less than 5% doubles. **Tree:** growth habit slightly open; crops heavily on spurs; tolerant to bacterial spot.

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^zSpecial thanks to the crop contributors for compiling this information. Individuals with cultivars to describe should contact the crop editors directly. **DISCLAIMER OF LIABILITY AND ACCURACY:** This information is provided as a courtesy of the American Society for Horticultural Science (ASHS) and is presented with the explicit understanding that ASHS and its authors are not rendering any professional service or advice. While ASHS does its best to present current, accurate, and complete information, the information provided herein may be changed at any time by its owners, or become outdated. Readers are encouraged to inquire further for confirmation of all information on cultivar description and intellectual property protection. ASHS strictly disclaims the accuracy or completeness of the information contained herein. ASHS and its authors strictly disclaim any liability whatsoever, direct or indirect, for any damages of any kind resulting from the use of this material. This is an open access article distributed under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

APPLE

Sarah Kostick and Kate Evans, Washington State University Tree Fruit Research and Extension Center, Wenatchee, WA

A 68-173 (Blushing Delight™). Columnar tree with juicy, balanced sweet/sour fruit. **Origin:** Geisenheim, Germany, by P. Braun. Waltz × Pinova. USPP 28,439; 26 Sept. 2017. **Fruit:** large, diameter 9 cm; slightly flattened; overcolor 40% red with green ground color; very juicy, sweet-tart flavored, slightly aromatic; flesh firmness 7.7 kg; ripens mid-September in Geisenheim. **Tree:** vigorous; growth habit columnar; blooms midseason, early April in Dundee, OR; tolerant to drought; tolerant to apple scab (*Venturia inaequalis*) and powdery mildew (*Podosphaera leucotricha*).

Alpigala. Early coloring, dark Gala mutation with defined stripes. **Origin:** International Fruit Obtention, Seiches sur le Loir, France, by T. Clos. Gala whole tree mutation; discovered 2010; propagated 2010. USPP 30,061; 8 Jan. 2019. **Fruit:** medium, diameter 7.3 cm; conical; overcolor dark purple with light yellow ground color; strongly defined stripes; flesh medium firm; sweet, 11 °Brix; moderately aromatic and juicy; ripens with Galaxy. **Tree:** vigor medium; ramified; growth habit spreading; blooms late April in Loire Valley, France.

Bigbucks (Flash Gala™). Dark red Royal Gala mutation. **Origin:** Pink Vein Pty. Ltd., Elgin, Western Cape, South Africa, by D.A. Corder, P.J. Nell, and A.G. Rawbone-Viljoen. Royal Gala mutation; discovered 2011; propagated 2012. USPP 29,365; 12 June 2018. **Fruit:** medium, diameter 7.1 cm; cylindrical-globose; overcolor 90-100% dark red; flesh crisp, juicy, 13 °Brix at harvest; ripens early February in Elgin. **Tree:** vigorous, similar to Royal Gala; ramified; blooms mid-late October in Elgin; susceptible to scab, similar to Royal Gala.

Blushing Delight™. See A 68-173.

Cherish™. See PremA34.

CP 101. Early maturing, attractive, and flavorful. **Origin:** University of Maryland, College Park, by C.S. Walsh and J.M. Harshman. Cripps Pink × CGM (McIntosh Wijcik × Gala). USPP 28,595; 7 Nov. 2017. **Fruit:** medium, diameter 7.0 cm; oblate to conic; overcolor 90% red and striped with green-yellow ground color; flesh crisp, moderately juicy with weak aroma; ripens mid-October in Keedysville, MD, 3-4 weeks before Cripps Pink. **Tree:** vigor low-moderate; growth habit spreading; blooms early to mid-April in Keedysville, similar to Gala and Cripps Pink; tolerant to brown marmorated stink bug (*Halyomorpha halys*) and fire blight (*Erwinia amylovora*); susceptible to bitter rot (*Glomerella cingulata*).

Coryphée®. See Zouk 32.

Crunch-A-Bunch®. See MAIA7.

Dazzle™. See PremA129.

Duke Fuji. Early coloring, solid red Fuji. **Origin:** Andrian, Italy, by D. Helmuth. Brak Fuji limb mutation; selected 2009; propagated 2010. USPP 30,660; 9 July 2019. **Fruit:** large, diameter 8.8 cm; overcolor 100% solid red flush; globose; flesh crunchy, sweet, 14-15 °Brix, juicy; ripens mid-October in Andrian, like other Fuji-type varieties. **Tree:** vigorous; ramified; growth habit drooping; blooms mid-April in Andrian; similar disease resistance/susceptibility to other Fuji-type varieties.

E756-36. Pink-fleshed, crisp with pleasant taste. **Origin:** NIAB EMR, Cambridge, United Kingdom, by K.M. Evans. Gala × SA908-12 (Falstaff × Pink Pearl); crossed 2003; selected 2006; propagated 2011. USPP 30,627; 2 July 2019. **Fruit:** medium, diameter 6.52 cm; overcolor pink-orange with orange-yellow ground color; conic,

slightly asymmetric; lenticels prominent; flesh pink, crisp and juicy with pleasant flavor, acidity 3.4 pH, 0.71 ± 0.02 g malic acid/100 ml; 14.2 °Brix; storability moderate, 3-4 months in regular atmosphere; ripens early September in East Malling, Kent, United Kingdom. **Tree:** vigor moderate; ramified; growth habit upright; blooms April in East Malling.

Flanders Pink®. See Zouk 16.

Flash Gala™. See Bigbucks.

Fuji VW (King Fuji®). Solid red-purple Fuji. **Origin:** Kiku Srl. GmbH., Giran/Eppan, Italy, by J. Braun. Brak Fuji limb mutation; selected 2009; propagated 2010. USPP 30,174; 5 Feb. 2019. **Fruit:** large, diameter 8.7 cm; globose; overcolor solid red-purple; flesh moderately firm, crunchy, very juicy, sweet, 14-15 °Brix; ripens with Fuji. **Tree:** ramified; growth habit spreading; full bloom mid-April in Giran.

Gala 0502. Solid purple-red Gala. **Origin:** Kiku Srl. GmbH., Giran/Eppan, Italy, by J. Braun. Gala limb mutation; discovered 2009; propagated 2010. USPP 28,235; 1 Aug. 2017. **Fruit:** medium-large, diameter 7.7 cm; conic; overcolor 100% purple-red; flesh crunchy, sweet, 14-15 °Brix, juicy; colors early; ripens with other Gala types. **Tree:** vigor similar to Gala; ramified; growth habit drooping; blooms mid-April in Giran; disease resistance/susceptibility similar to Gala.

Gala 0502B. Early coloring, deep purple-red Gala. **Origin:** Kiku Srl. GmbH., Giran/Eppan, Italy, by J. Braun. Gala Royal Beaut limb mutation; discovered 2010; propagated 2011. USPP 30,511; 21 May 2019. **Fruit:** medium-large, diameter 7.7 ± 0.7 cm; conic; overcolor 100% purple-red; flesh moderately firm, crisp, sweet, 14-15 °Brix, juicy; ripens mid-August in Casaleone, Italy, with other Gala type cultivars. **Tree:** vigor moderate, similar to other Gala types; ramified; growth habit drooping; blooms mid-April in Casaleone; disease resistance/susceptibility similar to other Gala types.

Gala One®. See ZoukG1.

Galafab (Gala Star®). Intensely red Gala. **Origin:** Entraigues, France, by L. Fabre. Gala limb mutation; selected 2008; propagated 2009. USPP 28,885; 23 Jan. 2018. **Fruit:** medium, diameter 6.5-7.5 cm; truncated conical; overcolor 90-100% intense red; flesh crisp, moderately juicy, and firm; 13.0 °Brix; ripens early August in Entraigues. **Tree:** vigor medium; ramified; growth habit spreading; blooms early April in Entraigues; disease resistance/susceptibility similar to Gala.

GalaMic. Early coloring, deep purple Gala. **Origin:** Kiku Srl. GmbH., Giran/Eppan, Italy, by J. Braun. Gala limb mutation; discovered 2010; propagated 2011. USPP 30,512; 21 May 2019. **Fruit:** medium-large, diameter 7.9 ± 0.7 cm; conic; overcolor 100% deep purple; flesh moderately firm, crisp, sweet, 14-15 °Brix, juicy; ripens mid-August in Zevio, Italy, similar to other midseason Gala apples. **Tree:** vigor low; growth habit spreading; blooms mid-April in Zevio; disease resistance/susceptibility similar to Gala.

Gala Star®. See Galafab.

Gala Surf. Very dark purple-red Gala. **Origin:** International Fruit Obtention, Soeudres, France, by F. Brisset and D. Brisset. Gala whole tree mutation; propagated 2012. USPP 30,009; 25 Dec. 2018. **Fruit:** medium, diameter 7.1 cm; conical; overcolor dark purple red with light yellow ground color; flesh moderately firm, juicy, moderately aromatic, sweet, 11 °Brix; ripens late August in Loire Valley. **Tree:** vigor medium; ramified; growth habit spreading; blooms mid-April in Loire Valley.

Gradisca. Bright red, highly perfumed, sweet. **Origin:** Mudaison, France, by O. Grard and A. Grard. Fuji O.P.; selected 1994;

propagated 1996. USPP 30,008; 25 Dec. 2018. **Fruit:** medium-large, diameter 7.0-8.0 cm; globose, slightly conical; overcolor 70-80% intense red with yellow ground color; flesh firm, light, perfumed, juicy; sweet, 13.5-15.5 °Brix; ripens early October in Madaison. **Tree:** vigorous; ramified, growth habit drooping; blooms mid-April in Madaison; susceptible to scab.

Harley05. Early maturing, bright rose-pink with strong, distinctive flavor. **Origin:** Fashion Foods, Nelson, New Zealand, by W.J.E. Lynch. Parentage unknown; discovered 1999. USPP 30,351; 9 Apr. 2019. **Fruit:** medium-large, diameter 7.7 cm; conical-truncated; overcolor 75% bright pink-red; flesh firmness 7.6-9.9 kg at harvest; ripens mid-February to early March in Nelson. **Tree:** vigor moderate; ramified; growth habit upright; blooms early to mid-October in Nelson; susceptible to scab and powdery mildew.

HC2-1 (Zingy®). Attractive, early maturing, highly productive. **Origin:** International Fruit Obtention, Seiches sur le Loir, France, by V. Fouillet. DL33 × HY46-3; crossed 2003; propagated 2009. USPP 30,628; 2 July 2019. **Fruit:** medium, diameter 7.3 cm; globose; overcolor orange-red; flesh moderately firm and juicy, aromatic; 13.5 °Brix; ripens 2-3 d after Gala. **Tree:** vigor moderate; ramified; growth habit drooping; blooms 2 d after Golden Delicious.

Howell TC2 (Lucy Rose™). Red, sweet-tart with red flesh. **Origin:** Prosser, WA, by W.E. Howell. Airlie Red Flesh O.P.; crossed 2001; selected 2010. USPP 28,545; 24 Oct. 2017. **Fruit:** medium, diameter 7.4 cm; rounded; overcolor 90% red with yellow ground color; flesh red, crisp, very juicy; taste sweet-tart with notes of berry; ripens 7 d after Honeycrisp. **Tree:** vigor low-moderate; blooms early May in Prosser.

Howell TC3 (Lucy Glo™). Yellow-green with red flesh. **Origin:** Prosser, WA, by W.E. Howell. Airlie Red Flesh O.P.; crossed 2001; selected 2010. USPP 28,546; 24 Oct. 2017. **Fruit:** medium, diameter 7.62 cm; rounded; yellow-green with red blush; flesh red, crisp, very juicy; aroma faint, sweet-tart with notes of berry, 15 °Brix; ripens 4 d after Honeycrisp. **Tree:** semi-vigorous; blooms late April in Prosser.

Howell TC4 WF. Bicolored pinkish-red with sweet-tart flavor. **Origin:** Prosser, WA, by W.E. Howell. Cripps Pink × Honeycrisp; crossed 2001; selected 2010. USPP 29,168; 3 Apr. 2018. **Fruit:** medium-large, diameter 7.7 cm; rounded; overcolor pinkish-red with yellow-green ground color; flesh crisp, juicy, sweet-tart. **Tree:** semi-vigorous; blooms late March to early April in Prosser.

Howell TC5 WF. Bright pink with sweet-tart flavor. **Origin:** Prosser, WA, by W.E. Howell. Cripps Pink × Honeycrisp; crossed 2001; selected 2010. USPP 29,215; 10 Apr. 2018. **Fruit:** medium-large, diameter 7.6 cm; rounded; overcolor bright pinkish-red with yellow ground color; flesh crisp, very juicy, intensely sweet-tart, 15 °Brix. **Tree:** semi-vigorous; blooms late March to early April in Prosser.

King Fuji®. See Fuji VW.

Inolov (Mandy®). Flavorful with resistance to apple scab. **Origin:** Institut National de la Recherche Agronomique, Angers, France, by F. Laurens. X4712 Gala × X6908; crossed 1992; propagated 1994. USPP 28,398; 19 Sept. 2017. **Fruit:** medium-large, diameter 7.5-8.0 cm; ovoid-cylindrical; overcolor 40-60% red with yellow ground color; flesh juicy, crisp, firm, and sweet, 12-13 °Brix; ripens late in Angers. **Tree:** vigor moderate; ramified; growth habit spreading; blooms early April in Angers; resistant to scab.

Jive. Red with defined striping. **Origin:** Hastings, New Zealand, by E.M. Burkitt. GS48 limb mutation; propagated 2001. USPP 28,544; 24 Oct. 2017. **Fruit:** large, diameter 7.4 cm; globose-obloid; overcolor 50-75% red with yellow ground color; strongly defined stripes;

flesh moderately firm and juicy; 13-16 °Brix; ripens March in Pakowhai, New Zealand. **Tree:** vigor medium-strong; growth habit ramified; blooms late April in Wapato, WA; susceptibility to powdery mildew low.

Kirameki. Bright yellow with light blush and intense red flesh. **Origin:** Nagano Prefecture, Japan, by K. Yoshiie. Irodori × Orin; crossed 2005; propagated 2007. USPP 28,594; 7 Nov. 2017. **Fruit:** large, diameter 8.6 cm; obloid; bright yellow; flesh intense red, low acid, 14.2 °Brix, firmer than Moon Rouge; ripens late, early to mid-November in Nagano Prefecture. **Tree:** ramified; growth habit upright.

Kissabel® Jaune. See Y102.

Kissabel® Orange. See Y101.

Kissabel® Rouge. See R201.

Lucy Glo™. See Howell TC3.

Lucy Rose™. See Howell TC2.

Ludacrisp®. See MAIA-L.

Luiza. Low-chill, early maturing with resistance to Gala leaf spot. **Origin:** Empresa de Pesquisa Agropecuaria e Extensao Rural de Santa Catarina, Florianopolis, Santa Catarina, Brazil, by F. Denardi, M. Vinicius Kvitschal, and M. Crestani Hawerth. Imperatriz × Cripps Pink; crossed 2001; propagated 2004. USPP 29,931; 4 Dec. 2018. **Fruit:** medium, diameter 6.9 cm; conical; overcolor 70-80% red with yellow ground color; flesh firm and very juicy, 13-13.5 °Brix; early maturing, ripens early February in Cacador, Brazil. **Tree:** vigor moderate; ramified; growth habit spreading; blooms late September in Cacador; resistant to Gala leaf spot (*Colletotrichum spp.*); tolerant to powdery mildew; susceptible to scab.

MAIA7 (Crunch-A-Bunch®). Crisp, aromatic, sweet-tart, yellow. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Honeycrisp O.P.; planted 2001 in Pataskala, OH. USPP 29,126; 20 Mar. 2018. **Fruit:** medium, diameter 7.4-8.5 cm; round ovate, sometimes oblique; yellow-orange blush over green-yellow ground color; flesh crisp, firm, juicy, sweet; flavor is distinctly apple with hints of brown sugar and pineapple; ripens 4-5 weeks after Honeycrisp. **Tree:** vigor moderate; round; growth habit spreading; blooms late April in Pataskala, similar to Golden Delicious; resistant to scab and fire blight; susceptible to powdery mildew and soft rot (*Penicillium expansum*).

MAIA8 (Bakers Delight®). Crisp, aromatic, sweet-tart. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Goldrush × Sweet 16; planted 2001 in Belleville, IL. USPP 29,147; 27 Mar. 2018. **Fruit:** medium, diameter 6.8-8.3 cm; oblate conic; red-purple with light stripes over yellow ground color; flesh firm, chewy; aroma spicy with peach, pear, and strawberry flavor tones; sweet, 14-18 °Brix; ripens 5 weeks before Goldrush. **Tree:** vigor moderate to weak; round; growth habit spreading; blooms late April in Ohio, with Golden Delicious; resistant to scab and fire blight; susceptible to powdery mildew.

MAIA11 (Rosalee®). Extremely crisp, sweet-tart with long storability. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH. Honeycrisp × Fuji; planted 2001 in Wabash, IN. USPP 29,146; 27 Mar. 2018. **Fruit:** medium, diameter 6.6-8.9 cm; ribbed; red blush over yellow-green ground color; flesh firm, crisp, juicy, mildly aromatic; sweet, 14-19 °Brix; ripens 3 weeks after

Honeycrisp. **Tree:** vigor moderate; round; growth habit spreading; blooms late April in Ohio, similar to Golden Delicious; tolerant to fire blight; susceptible to scab and powdery mildew.

MAIA12 (Summerset®). Extremely crisp, sweet-tart with long storability. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Honeycrisp × Fuji; planted 2001 in Wabash, IN; propagated 2010. USPP 29,213; 10 Apr. 2018. **Fruit:** size medium; red overcolor with yellow-green ground color; flesh extremely crisp, firm, juicy; 14–19 °Brix; storability good, 17 weeks regular atmosphere storage; ripens 6 weeks before Fuji. **Tree:** vigor moderate; round; growth habit spreading; blooms late April in Newcomerstown, similar to Golden Delicious; slightly resistant to fire blight; susceptible to scab and powdery mildew.

MAIA-L (Ludacrisp®). Deep red, crisp, sweet-tart with resistance to fire blight, scab, and powdery mildew. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Honeycrisp O.P.; planted 2001 in Pataskala, OH; propagated 2010. USPP 30,472; 7 May 2019. **Fruit:** large, diameter 7.2–8.5 cm; conical, regular, symmetrical; dark, intense red over yellow ground color; flesh very crisp, firm, juicy; flavor complex, sweet-tart; ripens late October in Newcomerstown; storability long. **Tree:** very vigorous, fast-growing; round; growth habit spreading; leaves large; blooms with Golden Delicious; resistant to fire blight, scab, and powdery mildew.

MAIA-T. Purple, russeted, crisp with sweet-tart flavors. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Honeycrisp O.P.; planted 2001 in Pataskala, OH; propagated 2010. USPP 30,088; 15 Jan. 2019. **Fruit:** medium, diameter 6.8–8.9 cm; russeted; overcolor red-purple with yellow-orange ground color; flesh crisp, firm, juicy; flavor sweet-tart, aromatic; ripens late September in Newcomerstown. **Tree:** vigor moderate; round; growth habit spreading; blooms late April in Newcomerstown, slightly before Golden Delicious; slightly tolerant to fire blight and scab; susceptible to powdery mildew.

MAIA-Z (Sweet Zinger®). Large, crisp, sweet-tart flavored with long storability. **Origin:** Midwest Apple Improvement Association, Newcomerstown, OH, by W. Dodd, D. Doud, J.M. Lynd, and G. Miller. Goldrush × Sweet 16; planted 2001 in Belleville, IL. USPP 30,059; 8 Jan. 2019. **Fruit:** oblate, conic; overcolor red with yellow ground color; flesh crisp, firm, juicy; flavor sweet-tart with honeyed citrus notes; ripens early October in northeast OH. **Tree:** vigor moderate; round; growth habit spreading; blooms late April in northeast OH, with Golden Delicious; resistant to fire blight and scab; susceptible to powdery mildew.

Makali. Juicy, crisp with scab resistance. **Origin:** Better3Fruit, Heverlee, Belgium, by I. De Wit, H. Eyssen, J. Keulemans, J. Nicolai, E. Pauwels, and P. Van Laer. Delcorf × unknown proprietary variety; crossed 1990; selected 1996. USPP 28,076; 6 June 2017. **Fruit:** medium-large, diameter 7.7 cm; obloid; overcolor 50% red striped, mottled with yellow-green ground color; flesh crisp, juicy, moderately aromatic; flavor well-balanced, sour-sweet, 13.3 °Brix, 6.3 g/L malic acid; ripens mid-September in Heverlee. **Tree:** vigor moderate; ramified, drooping; blooms early, before Idared and Boskoop.

Mandy®. See Inolov.

Mariposa®. See Zouk 16.

Mayo (Franklin). Sweet, dry bittersharp cider apple with scab and cedar apple rust resistance. **Origin:** Franklin, VT, by W.L. Mayo and S.B. Mayo. Parentage unknown; propagated 2008. USPP 28,791; 26

Dec. 2017. **Fruit:** medium, diameter 4.5–5.0 cm; generally conical; overcolor red, carmine with yellow ground color; flesh crisp, juicy, and mild; dry bittersharp; sweet, 17.5–19.5 °Brix; aroma pleasant; ripens end of October in Franklin. **Tree:** vigorous; growth habit slightly upright; blooms mid-May in Franklin; cold hardy; no apparent susceptibility to scab and cedar apple rust (*Gymnosporangium juniperi-virginianae*).

Milly. Red-purple, striped, with crisp, juicy, firm texture. **Origin:** Ferrara, Italy, by L. Salvi. Cripps Pink mutation; propagated 2012. USPP 28,359; 5 Sept. 2017. **Fruit:** large, diameter 8.2 cm; overcolor 50–60% red-purple, striped; flesh crisp, juicy, firm; flavor mildly aromatic, fragrant, slightly acidic to sweet, 13–16 °Brix, 4.6–5.7 g/L malic acid; ripens early October in Ferrara. **Tree:** moderately vigorous; growth habit upright spreading and conical; precocious; blooms late March to early April in Ferrara.

Moon Rouge. Yellow-orange with purplish red flesh. **Origin:** Nagano, Japan, by K. Yoshiie. Irodori (Jonathan × Pink Pearl) × Fuji; crossed 2005; selected 2011. USPP 28,543; 24 Oct. 2017. **Fruit:** large, diameter 9.5 cm; yellow-orange; flesh purplish red, low-acid, 14.2 °Brix; flesh firmness 7.2 kg; ripens after Pink Pearl. **Tree:** ramified; growth habit spreading.

NY56. Crisp, juicy, flavorful with scab resistance. **Origin:** Cornell University, Geneva, NY, by S. Brown and K. Maloney. Honeycrisp × NY65707-19; crossed 1994 in Geneva, NY; selected 1999; tested as NY94410-56. USPP 30,758; 30 July 2019. **Fruit:** large, diameter 7.9–8.8 cm; mostly conic; overcolor grayed-red with yellow-green ground color; flesh white, firm, crisp, and juicy; 11.2–15.7 °Brix, pH 3.3–3.6; ripens early October in Geneva. **Tree:** vigor low; ramified; resistant to apple scab and cedar apple rust.

PE. Early-maturing Cripps Pink with intense pink-red overcolor. **Origin:** Fruit Varieties International, Grove, Tasmania, Australia, by B. Francis. Cripps Pink limb mutation; propagated 2013. USPP 30,144; 29 Jan. 2019. **Fruit:** cylindrical and slightly ellipsoid; overcolor 95–100% pink-red; flesh firmness 8.8 kg; 15 °Brix; ripens late in Grove. **Tree:** vigor medium to strong; ramified; growth habit spreading to occasionally upright; anthocyanin levels in leaves high; blooms mid-October in Grove.

PremA129 (Dazzle™). Attractive with superb texture and long storability. **Origin:** Prevar, Hastings, New Zealand, by A.G. White. Scired × PremA280. USPP 29,214; 10 Apr. 2018. **Fruit:** medium-large, diameter 6.9 cm; conical; 95% red to orange-red overcolor with yellow-green ground color; flesh firm, moderately juicy; texture fine; ripens midseason in Hawkes Bay, New Zealand. **Tree:** vigor moderate; ramified; growth habit semi-spreading; less susceptible to fire blight than Gala; susceptible to scab and powdery mildew.

R10-45. Flavorful, red with prominent, evenly distributed lenticels. **Origin:** Regal Fruit International, Ephrata, WA, by K. Adams. Honeycrisp × Cripps Pink; crossed 2002; propagated 2008. USPP 28,150; 4 July 2017. **Fruit:** small to medium, diameter 7.7 cm; flat round; 95–100% overcolor blotched red with grey-yellow ground color; flesh crisp, melting, juicy, mildly aromatic, subacid; ripens early October in Ephrata. **Tree:** moderately vigorous; growth habit upright and spreading; blooms late April in Quincy, WA.

R201 (Kissabel® Rouge). Red-fleshed with sweet berry flavors. **Origin:** International Fruit Obtention, Seiches sur le Loir, France, by V. Fouillet. MNR33S1A51 × Galaxy; crossed 2006; propagated 2011. USPP 28,218; 25 July 2017. **Fruit:** medium, diameter 7.8 cm; globose; overcolor dark purple brown; flesh 80% red, moderately firm and juicy; flavor sweet, berry-like, 15 °Brix; ripens late in Seiches sur le Loir, with Braeburn. **Tree:** vigor moderate; ramified; growth habit drooping; blooms mid-April in Seiches sur le Loir; resistant to scab.

Red BG. Granny Smith with red overcolor. **Origin:** Page Family Nurseries, Grove, Tasmania, Australia, by B. Page. Granny Smith limb mutation; propagated 2013. USPP 30,510; 21 May 2019. **Fruit:** medium, diameter 7.8 cm; globose; overcolor red on whitish green ground color; flesh crisp, medium firm; 13.0-15.5 °Brix; ripens early April in Grove. **Tree:** vigor like Granny Smith; ramified; growth habit drooping; flowers large, pink; blooms 2 d before Granny Smith.

Red Moon®. See RM-1 and RS1.

RKD. Early maturing and coloring Gala. **Origin:** Callahan Orchards, Royal City, WA, by R. Callahan. Tenroy Gala limb mutation; discovered 2006; propagated 2007. USPP 28,721; 5 Dec. 2017. **Fruit:** medium, diameter 7.5 cm; round to oblate; >90% red overcolor with yellow ground color; flesh fine, crisp, juicy, and moderately aromatic; ripens 21 d before Tenroy Gala. **Tree:** vigor moderate; growth habit moderately spreading; blooms 4 d after Simmons Gala; susceptibility to fire blight, powdery mildew, and bitter pit similar to Gala.

RM-1 (marketed along with **RS1** as **Red Moon®**). Late maturing, pink-red with red flesh. **Origin:** Red Moon GmbH., Bozen, Italy, by J.-L. Carrières. Zwintcher CSR 22 O.P.; discovered 2000 in Lot, France; propagated 2006. USPP 28,247; 8 Aug. 2017. **Fruit:** medium-large, diameter 7.5-9.0 cm; cylindrical; overcolor 90% pink-red; flesh red, juicy, firm, and moderately aromatic; ripens late October in Lot. **Tree:** vigorous; growth habit semi-upright; blooms mid-April in Lot.

Rosalee®. See MAIA11.

RS1 (marketed along with **RM-1** as **Red Moon®**). Pink-red with red flesh. **Origin:** Red Moon GmbH., Bozen, Italy, by J.-L. Carrières. Zwintcher CSR 18 O.P.; discovered 2000 in Lot, France; propagated 2006. USPP 28,234; 1 Aug. 2017. **Fruit:** medium, diameter 7.5-8.0 cm; cylindrical; overcolor 90% pink-red with weakly defined stripes and yellow-green ground color; flesh juicy, firm, red, and moderately aromatic; 12-15 °Brix; ripens late August to early September in Lot. **Tree:** vigorous; growth habit semi-upright; blooms mid-April in Lot.

RS103-110. Dark red, striped with resistance to scab. **Origin:** State of Queensland Department of Agriculture and Fisheries, Brisbane, Queensland, Australia, by A. Zeppa. Royal Gala × CPR7T90. USPP 29,089; 13 Mar. 2018. **Fruit:** small to medium, diameter 7.3 cm; obloid to globose; overcolor red with yellow ground color; flesh moderately juicy, mildly sweet with low acid, 10.9-13.5 °Brix; ripens mid-late February in Applethorpe, Queensland. **Tree:** vigor low to moderate; growth habit spreading to slightly drooping; blooms late September in Applethorpe.

Rubisgold®. See Zouk 31.

Ruiyang. Late-ripening with high fruit quality. **Origin:** Yangling, Shaanxi, China, by H. Gao, Z.Y. Zhao, L.C. Wang, Z.Z. Liu, and Y.Z. Yang. Qinguan × Fuji; crossed 2004; tested as 6B1-4; selected 2009; released 2015. **Fruit:** medium to large; conical; overcolor uniform, bright dark-red with yellow-green ground color; flesh yellowish-white, fine, juicy, sweet, slightly tart, 16.5 °Brix, aromatic; ripens 3-5 d before Fuji and Qinguan. **Tree:** vigor moderate; growing habit spreading/drooping; blooms a few days after Fuji and Qinguan; resistant to Marssonina leaf blotch (*Marssonina coronaria*).

Seaton99. Bright pink, early-maturing. **Origin:** Fashion Foods, Nelson, New Zealand, by W.J.E. Lynch. Heritage Gala mutation or O.P.; selected 1999. USPP 30,352; 9 Apr. 2019. **Fruit:** size medium, diameter 7.7 cm; conical-truncated; overcolor 75% bright pink with light yellow (RHS 1d) ground color; random flecking observed in 30% of fruit; flesh firmness 7.8-9.4 kg; flavor distinctive and stronger than Royal Gala; ripens mid-February in Nelson. **Tree:**

vigor moderate; ramified; growth habit upright; blooms early October in Nelson; susceptible to scab and powdery mildew.

Shinku. Red-pink with dark red sporadic stripes and red flesh. **Origin:** Nagano, Japan, by K. Yoshiie. Irodori (Jonathan × Pink Pearl) × Fuji; crossed 2005; selected 2012. USPP 28,503; 10 Oct. 2017. **Fruit:** large, diameter 9.0 cm; conic; overcolor 100% radiant red pink, with sporadic dark red stripes; flesh vivid purplish-red, low-acid, 14.7 °Brix; flesh firmness 7.0 kg; ripens early to mid-October in Nagano. **Tree:** ramified; growth habit spreading.

SPA766. Red, crisp, pleasant tasting with prominent lenticels. **Origin:** Agriculture and Agri-Food Canada, Summerland, British Columbia, Canada, by W.D. Lane. 11W-16-016 × Chinook; crossed 1999; propagated 2000. USPP 30,060; 8 Jan. 2019. **Fruit:** size medium, diameter 8.4 cm; globose, symmetrical; overcolor red; flesh firm; 13.6 °Brix, 0.62 g/L titratable acidity (malic acid equivalent); ripens late August in Summerland. **Tree:** vigor low; growth habit spreading; blooms midseason, early to mid-May in Summerland.

Starapple1. Intense red with scab resistance. **Origin:** Stargrow Cultivar Development, Stellenbosch, South Africa, by J. Fourie. Parentage unknown; selected 2009. USPP 29,364; 12 June 2018. **Fruit:** size medium, diameter 6.6-7.2 cm; overcolor 60-100% dark red; flesh crisp, firm; ripens late February in South Africa, 1 week before Golden Delicious. **Tree:** ramified; blooms mid-late September in South Africa.

Summerset®. See MAIA12.

Sweet Zinger®. See MAIA-Z.

Swing®. See Xeleven.

UEB 1813. Red-purple with *Vf*-resistance to scab. **Origin:** Institute of Experimental Botany, Prague, Czech Republic, by J. Tupy, R. Cerny, O. Louda, and J. Zima. Topaz × Fuji; crossed 1997; propagated 2004. USPP 29,987; 18 Dec. 2018. **Fruit:** small-medium, diameter 6.6 cm; globose; overcolor 80-100% red to red-purple with yellow ground color; flesh fine, juicy, crisp; aroma moderate, well-balanced sugar-acid ratio; ripens late, with Topaz. **Tree:** vigor moderate; ramified; growth habit drooping; blooms ~5 May in Prague, with Golden Delicious; resistant to scab (*Vf*).

UEB 38026. Early maturing with resistance to scab. **Origin:** Institute of Experimental Botany, Prague, Czech Republic, by J. Tupy, R. Cerny, O. Louda, and J. Zima. Julia × Ametyst; crossed 1998; selected 2003; propagated 2006. USPP 29,960; 11 Dec. 2018. **Fruit:** small to medium; globose-conical; overcolor red with yellow ground color; flesh very juicy, moderately firm, with sweet aroma; ripens early August in Prague. **Tree:** vigor medium; ramified; growth habit spreading; blooms 3 d before Golden Delicious; polygenic resistance to scab.

UEBI 406/1. Crisp, firm, juicy, slightly aromatic with *Vf*-resistance to scab. **Origin:** Institute of Experimental Botany, Prague, Czech Republic, by R. Cerny, J. Tupy, O. Louda, and J. Zima. Topaz × Cripps Pink; crossed 1998; selected 2004; propagated 2005. USPP 29,959; 11 Dec. 2018. **Fruit:** small-medium, diameter 6.0 cm; globose cylindrical to ellipsoid; overcolor 70-100% red with yellow-orange ground color; flesh juicy, firm, crisp, slightly sour with well-balanced sugar-to-acid ratio, 14.4 °Brix, moderately aromatic; ripens early October in Pencin u Liberce, Czech Republic, with Golden Delicious. **Tree:** moderately vigorous; growth habit pyramidal; blooms end of April to early May in Pencin u Liberce, ~3 d before Golden Delicious; resistant (*Vf*) to scab.

Venice. Low chilling requirement with Gala leaf spot resistance. **Origin:** Empresa de Pesquisa Agropecuaria e Extensao Rural de Santa Catarina, Florianopolis, Santa Catarina, Brazil, by F. Denardi,

M. Vinicius Kvitschal, and M. Crestani Hawerth. Imperatriz × Baronesa; crossed 2000; propagated 2004. USPP 30,040; 1 Jan. 2019. **Fruit:** small-medium, diameter 7.0 cm; conical; overcolor orange-red with green-yellow ground color; flesh firm, 8.2-8.4 kg; juicy; 14-14.5 °Brix; ripens midseason in Florianopolis. **Tree:** vigor medium; ramified; growth habit spreading; blooms late September in Florianopolis; resistant to Gala leaf spot; moderately resistant to scab; tolerant to powdery mildew; susceptible to penicillium storage fruit rots.

WUR37. Red with vigorous growth habit and resistance to scab. **Origin:** Stichting Dienst Landbouwkundig Onderzoek, Wageningen, the Netherlands, by R. Smulders. Elise × 1984-015-017; crossed 1993; selected 2005; propagated 2006. USPP 28,397; 19 Sept. 2017. **Fruit:** large, diameter 8.5-9.0 cm; obloid; red with numerous lenticels; flesh firm, aromatic. **Tree:** vigorous; growth habit upright; blooms continuously April-May in Wageningen; resistant to scab.

Xeleven (Swing®). Red and resistant to scab. **Origin:** Lot, France, by J.-L. Carrières. ([Esopus Sptizenberg O.P. × PRI 612-1] × Gala) O.P.; selected 1994. USPP 30,260; 5 Mar. 2019. **Fruit:** medium-large, diameter 7.5-9.0 cm; cylindrical; 90% red; flesh fine, firm; ripens mid-October in Lot. **Tree:** vigorous; growth habit semi-upright; blooms mid-April in Lot; resistant to scab and powdery mildew.

Y101 (Kissabel® Orange). Pink-fleshed fruit. **Origin:** International Fruit Obtention, Seiches sur le Loir, France, by V. Fouillet. Golden Delicious × SJ109; crossed 2006; propagated 2012. USPP 28,201; 18 July 2017. **Fruit:** medium, diameter 7.1 cm; conical; overcolor 90% orange-red; flesh 80% dark pink; moderately firm, crunchy, juicy, with balanced aroma, 13 °Brix; ripens early September in Seiches sur le Loir. **Tree:** vigor moderate; ramified; growth habit drooping; blooms mid-April in Seiches sur le Loir; resistant to scab.

Y102 (Kissabel® Jaune). Pink-fleshed fruit. **Origin:** International Fruit Obtention, Seiches sur le Loir, France, by V. Fouillet. Golden Delicious × SJ109; crossed 2006; propagated 2011. USPP 30,041; 1 Jan. 2019. **Fruit:** size medium, diameter 7.2 cm; globose asymmetrical; overcolor 70% dark orange-yellow; flesh pink, moderately juicy and firm; 14.5 °Brix; ripens 5-7 d after Golden Delicious. **Tree:** vigor medium to high; ramified; growth habit drooping; full bloom 7 d after Golden Delicious.

YCP. Bright lime green Cripps Pink. **Origin:** Shepparton East, Victoria, Australia, by M. Silverstein, C. Silverstein, and B. Silverstein. Cripps Pink limb mutation; selected 2009; propagated 2011. USPP 30,551; 4 June 2019. **Fruit:** size medium, diameter 7.8 cm; cylindrical and slightly ellipsoid; bright lime green; crisp, flesh firmness 9.3 kg; juicy, 14.6 °Brix; aroma fresh; ripens mid-late season in Tasmania, Australia. **Tree:** vigorous; ramified; growth habit spreading to upright; blooms mid-late October in Tasmania.

Zingy®. See HC2-1.

Zouk16 (Flanders Pink® [UK] / Mariposa® [EU]). Pink bicolor fruit with bright white flesh. **Origin:** Zouk Ltd., Sint-Truiden, Belgium, by J. Nicolai. Nicogreen × Nicoter; propagated 2013. USPP 30,659; 9 July 2019. **Fruit:** medium to large, diameter 8.3 cm; globose to globose-conical; overcolor bright-pink to red with yellow-green ground color and occasional pale, yellowish pink stripes; flesh white, very juicy, firm; flavor balanced, moderate apple-like aroma, 14 °Brix; 1-MCP treatment improves shelf life; ripens mid-late September in Sint-Truiden. **Tree:** vigor moderate, similar to Golden Delicious; growth habit spreading; blooms mid-late April in Velm, Belgium with Granny Smith or Idared; susceptible to scab.

Zouk 31 (Rubisgold®). Yellow fruit with pink-gold blush. **Origin:** Zouk Ltd., Sint-Truiden, Belgium, by J. Nicolai. Rubinstep × Delblush; propagated 2013. USPP 30,490; 14 May 2019. **Fruit:** medium; conical; ground color yellow with pink-gold blush; flesh

juicy, firm; flavor strongly aromatic, balanced sweet and sour, 15 °Brix; skin tends to crack; ripens with Golden Delicious. **Tree:** vigor moderate, strong apical dominance; growth habit spreading; leaves dark green; blooms late April in Sint-Truiden; more tolerant to scab than Golden Delicious.

Zouk32 (Coryphée®). Scab-resistant, high yielding. **Origin:** Zouk Ltd., Sint-Truiden, Belgium, by J. Nicolai. Rubinstep × Nicoter; propagated 2013. USPP 30,703; 16 July 2019. **Fruit:** medium to large, diameter 7.2 cm; globose-conical; overcolor red with brilliant yellow ground color; flesh firm, very juicy; flavor mild with sweet-tart balance, moderate apple-like aroma; ripens early to mid-September in Sint-Truiden, with Elstar, Gala, and Honeycrisp. **Tree:** vigor moderate to weak, similar to Golden Delicious; ramified; growth habit spreading; blooms mid-April in Sint-Truiden; resistant to scab.

ZoukG1 (Gala One®). Dark red, striped, crisp with sweet flavor. **Origin:** Zouk Ltd., Sint-Truiden, Belgium, by J. Nicolai. Royal Beaut branch mutation; discovered 2012; propagated 2013. USPP 39,576; 18 June 2019. **Fruit:** medium to large, diameter 7.1 cm; asymmetrical, conic; overcolor striped vivid red with brilliant green-yellow ground color; skin tends to crack; flesh crisp, moderately juicy, moderately firm, aroma similar to Royal Beaut, 14.1 °Brix; ripens mid-late August in Sint-Truiden. **Tree:** vigor moderate, similar to Royal Beaut; growth habit spreading; blooms mid-late April in Sint-Truiden.

APRICOT AND PUBESCENT-SKINNED PRUNOPHORA HYBRIDS

Craig A. Ledbetter, USDA-ARS San Joaquin Valley Agricultural Sciences Center, Parlier, CA

Apricot

Balboa. Regular and productive bearing, late-season, orange-fleshed with good flavor and eating quality. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 376LH543 O.P.; selected 2001. USPP 28,626; 14 Nov 2017. **Fruit:** large, 111 g; globose; texture firm, meaty; eating quality and flavor good; freestone; ripens late. **Tree:** vigorous; growth habit semi-spreading; branching density medium; bearing productive, regular; self-fertile; chilling requirement 800 h.

Suaprifourteen. Productive, midseason, orange-fleshed with high sugar content and high red blush. **Origin:** Sun World International, Bakersfield, CA, by T. Bacon. AP540 × BSCot2; crossed 2008; tested as AP1440. USPP 28,754; 12 Dec 2017. **Fruit:** size medium, ~92 g; rounded; overcolor covers 30% of fruit surface; freestone; flavor sweet-mild, aromatic; shipping/keeping quality medium; ripens midseason. **Tree:** vigor medium-high; growth habit semi-upright; canopy density medium; fertility unknown; bearing productive, regular; chilling requirement 500 h.

Apricandy. Very long shelf life, self-fertile with good firmness, orange flesh and attractive luminous purple red skin on orange background. **Origin:** Elne, France, by A. Maillard and L. Maillard. ASFCOT0201 × ASF0408. USPP 29,883; 27 Nov 2018. **Fruit:** size medium, 60-75 g; round to slightly oblong; skin blush 80-85% of fruit surface, flavor and eating quality very good, texture fine, firm; kernel bitter; ripens midseason. **Tree:** vigor medium; growth habit semi-upright; branching very dense; bearing productive, regular; chilling requirement 350 h.

AVOCADO

Eric Focht, Dept. of Botany and Plant Sciences, University of California, Riverside, CA

3-29-5 (GEM™). Dark-skinned, spring- or late spring-maturing with lower tendency to alternate bearing and somewhat compact

canopy. **Origin:** University of California, Riverside, CA, by G.E. Martin and B.O. Bergh. Gwen O.P.; seed collected 1985; initial selection 1992. USPP 14,239; 14 Oct. 2003. **Fruit:** 235 g; ellipsoid; skin dark purple or black, with yellow-flecked lenticels; flesh yellow; harvest season later than Hass in Irvine, CA. **Tree:** growth habit open, upright, moderately spreading; canopy more compact than Hass; fruit carried more interior in canopy than Hass; less alternate bearing than Hass; moderately resistant to persea mite (*Oligonychus perseae*); flowering type A.

5-552. See BL 5-552.

AO.06. Very large, early-maturing fruit. **Origin:** Hans Merensky Holdings, T/A Westfalia Technological Services, Tzaneen, Limpopo, South Africa, by S.J. Köhne. Parentage unknown. USPP applied for. **Fruit:** very large, 1,200 g, clavate or pyriform; skin medium green; flesh yellow; peel moderately resistant to fungal pathogens; matures with GEM™ in South Africa. **Tree:** vigorous; growth habit semi-drooping; flowers have slight jasmine scent, flowering type A.

BL 5-552 (5-552). Green-skinned, summer- or fall-maturing fruit. **Origin:** University of California, Riverside, by M.L. Arpaia, E. Focht, G.E. Martin, and B.O. Bergh. Gwen O.P.; seed collected 1984; initial selection 1991. USPP applied for. **Fruit:** 277 g, rhomboidal or occasionally obovate or high spheroid; skin medium green; flesh yellow; harvest season summer and fall in Irvine, CA. **Tree:** growth habit open, upright, spreading; moderately resistant to persea mite; flowering type B.

Buck 3. Presumed bud mutation of Choquette with late-maturing fruit. **Origin:** Homestead, FL, by C. Dorsey. Presumed bud mutation discovered as one limb of a Choquette tree. USPP 23,573; 30 Apr. 2013. **Fruit:** medium to medium-large, 262-668 g; ovate; skin slightly leathery and rough, green or dark green; harvest season mid-March to mid-May. **Tree:** growth habit intermediate or spreading; flowering type B.

Eugenin. Presumed bud mutation of Hass with larger average fruit size. **Origin:** Hijuelas, Chile, by J. Eugenin. Presumed bud mutation. USPP 25,635; 23 June 2015. **Fruit:** more elongated and larger than Hass, 305 g in Irvine, CA; ovate; skin rough, dark purple or black, similar to Hass; harvest season similar to Hass. **Tree:** growth habit spreading; blooms slightly before Hass; flowering type A.

Flavia. Presumed bud mutation of Hass with larger average fruit size and earlier harvest season. **Origin:** Agrofruticola San Bernardo de Mallarauco, Santiago, Chile, by A. Schiappacasse Macchiavello. Presumed Hass bud mutation discovered 1998 in the Mallarauco Valley, Chile. USPP 26,798; 7 June 2016. **Fruit:** more elongated and larger than Hass, 278 g in Irvine, CA; ovate; skin rough, dark purple or black, similar to Hass; harvest season 4-5 weeks before Hass. **Tree:** growth habit vigorous, upright; flowering type A.

GEM™. See 3-29-5.

Lali. Medium size, ovate or rhomboidal fruit. **Origin:** Acosta Farms, Miami, FL, by A. Acosta. Parentage unknown. USPP 26,954; 19 July 2016. **Fruit:** medium, 397-510 g; diameter 127 mm; ovate or rhomboidal; harvest season late February–late March. **Tree:** vigorous; growth habit upright; flowering type B.

Maluma. Early-maturing, precocious and high-yielding. **Origin:** A.H. Ernst & Sons, Tzaneen, Limpopo, South Africa, by A.G. Joubert. Parentage unknown. USPP 21,099; 29 June 2010. **Fruit:** 150-400 g; pyriform; skin purple when ripe; flesh yellow; less prone to skin blemishes than Hass; harvest season early April to mid-June. **Tree:** growth habit upright with open-intermediate canopy density; flowering type A.

Nico. Large, ovate fruit. **Origin:** Acosta Farms, Miami, FL, by A. Acosta. Parentage unknown. USPP 26,571; 5 Apr. 2016. **Fruit:**

large, 454-624 g; length 135 mm; ovate; smooth textured, dark green skin, thin peel; harvest season March to early April. **Tree:** vigorous; growth habit upright growth; flowering type B.

Pflum's Best. Large, maroon, precocious and early maturing. **Origin:** Palm City, FL, by J. Pflum. Choquette × Brogdon. USPP 23,885; 10 Sept. 2013. **Fruit:** large, 709 g; length 216 mm, diameter 114 mm; ovate to slightly pyriform; skin smooth, maroon with some green mottling; harvest season August to September. **Tree:** vigorous, growth habit upright and spreading; production precocious; tolerant of wet soils; flowering type A.

Premero. Precocious-flowering and high-yielding with firm-fleshed, nutty-flavored fruit. **Origin:** Korora, New South Wales, Australia, by D.F. Tate. Fuerte or Hass O.P. USPP 29,790; 6 Nov. 2018. **Fruit:** 230 g; length 120 mm, diameter 75 mm; ovate, more elongated than Hass; skin rough-textured, maroon when ripe; flesh firm, flavor nutty; harvest season very early to early. **Tree:** vigorous; growth habit freely branching and rounded; selected for precocious production, high yield, and eating quality.

Victor. Large, ovate- or rhomboidal-fruited. **Origin:** Acosta Farms, Miami, FL, by A. Acosta. Parentage unknown. USPP 26,572; 5 Apr. 2016. **Fruit:** large, 454-624 g; length 152 mm, diameter 114-127 mm; ovate or rhomboidal; skin moderately rough, medium glossy; harvest season February to late March. **Tree:** vigorous; growth habit upright; flowering type A.

AVOCADO ROOTSTOCKS

Eric Focht, Dept. of Botany, Plant Sciences, and University of California, Riverside CA

Ben-Ya'Acov1. Highly productive with lower tendency for alternate bearing, and resistance to root rot (*Phytophthora cinnamomi*) and salinity. **Origin:** Ministry of Agriculture & Rural Development, Agricultural Research Organization, Rishon Lezion, Israel, by A. Ben Ya'Acov, M. Silberstein, and V. Irihimovitch. Discovered late 1970s in Ma'Agan Michael, Israel. USPP 30,447; 13 Apr. 2019. **Plant:** vigorous; growth habit semi-upright with generally globular canopy. **Rootstock performance:** dwarfing; performs well with Pinkerton scion; resistant to root rot and salinity.

KB1. Rapid, uniform growth with high, precocious productivity and resistance to root rot and salinity. **Origin:** Lima, Peru, by K. Bederski Lehmann. O.P. seed from a local escape tree isolated under netting with 3 potential pollen donor trees, Villa Campa, Brillosa, and Huevo de Toro, in Chincha, Peru. USPP 29,767; 23 Oct. 2018. **Plant:** leaves anise-scented; new leaves and growing tips red; mature branches and trunk have large horizontal lenticels; feeder roots vigorous and extensive. **Rootstock performance:** growth rapid, uniform; productive early with Hass scion.

Miriam. Resistant to root rot, drought, alkaline soils, and salinity. **Origin:** Ministry of Agriculture & Rural Development, Agricultural Research Organization, Rishon Lezion, Israel, by A. Ben Ya'Acov, M. Silberstein, and V. Irihimovitch. Discovered late 1970s in Givat Haim, Israel. USPP 30,353; 9 Apr. 2019. **Plant:** vigor medium; growth habit semi-upright, with generally globular canopy. **Rootstock performance:** resistant to root rot, drought, alkaline soils, and salinity.

Steddom. Relatively slow-growing with strong resistance to root rot. **Origin:** University of California, Riverside, by J.A. Menge, G.E. Martin, B.O. Bergh, F.B. Guillemet, B.S. McKee, and L. Guillemet. Toro Canyon O.P. USPP 24,279; 4 Mar. 2014. **Plant:** vigorous; growth habit upright; flowering type A. **Rootstock performance:** generates low vigor, short stature scion tree; strongly resistant to root rot; high yield/canopy volume ratio; some salinity resistance.

Tami. Resistant to root rot. **Origin:** Ministry of Agriculture & Rural Development, Agricultural Research Organization, Rishon LeZion, Israel, by A. Ben Ya'Acov, M. Silberstein, and V. Irihimovitch. Discovered late 1970s in Givat Haim, Israel. USPP 30,384; 16 Apr. 2019. **Plant:** vigor strong; growth habit semi-upright, with dense canopy. **Rootstock performance:** generates scion of medium vigor; highly tolerant to root rot; resistance to lime chlorosis medium.

Uzi. Vigorous and fast-growing with strong resistance to root rot. **Origin:** University of California, Riverside, by J.A. Menge, G.E. Martin, B.O. Bergh, F.B. Guillemet, L. Guillemet, and B.S. McKee. Thomas O.P. USPP 24,278; 4 Mar. 2014. **Plant:** vigorous; growth habit upright and spreading; flowering type B. **Rootstock performance:** generates larger canopy in Hass than Thomas rootstock in first 3 years of planting; strongly resistant to root rot.

Zentmyer. Strongly root rot resistant and highly saline sensitive. **Origin:** University of California, Riverside, by J.A. Menge, G.E. Martin, B.O. Bergh, F.B. Guillemet, L. Guillemet, and B.S. McKee. Thomas O.P. USPP 24,258; 25 Feb. 2014. **Plant:** vigorous; growth habit upright and spreading; flowering type A. **Rootstock performance:** generates a medium-sized canopy in Hass in first 3 years of planting; strongly resistant to root rot; does not perform well under conditions without root rot presence compared to sensitive rootstocks; severely damaged by salt.

BLACKBERRY

Chad E. Finn[†], USDA-ARS, Horticultural Crops Research Unit, Corvallis, OR

John R. Clark and Carmen A. Johns, Dept. of Horticulture, University of Arkansas, Fayetteville, AR

BRS Caingua. Thorny, upright to semi-upright, productive with good tasting, elongated fruits. **Origin:** Embrapa Clima Temperado, Pelotas, Rio Grando do Sul, Brazil, by M. Bassols Raseira and R.C. Franzon. Selection 2/96 (unknown origin) × Caingangue; selected 2008; tested as Black 212; introd. 2019. MAPA 20190133. **Fruit:** medium-large (6.5–8.1 g) without irrigation; long conical (3.0 by 1.8 cm); SSC/TA ratio ~7; ripens midseason on floricanes, ~1 week after Tupy. **Plant:** thorny with low thorn density; growth habit erect to semi-erect; internodes short; yield medium to high; similar to Tupy in chilling requirement; adapted to areas with 200–300 h of chilling (temperatures <7.2 °C).

Caddo. Thornless, erect, floricane-fruiting with large fruit, good postharvest performance, and exceptional flavor. **Origin:** University of Arkansas, Fayetteville, by J.R. Clark. APF-45 × A-2108T; crossed 2004; selected 2008; tested as A-2428T; introd. 2018. USPP applied for. **Fruit:** large, 8.0 g; oblong; glossy, with uniform black appearance; flavor exceptional, with balanced aromatic sweetness, acidity, 9.8 °Brix, 1.01% titratable acidity expressed as citric acid; outstanding postharvest storage potential and consistent flavor even after storage and rain events; ripens midseason. **Plant:** thornless; growth habit erect; yield consistently high; cold hardy to -17 °C.

Twilight. Thornless semi-erect plant with large, firm, dark fruit that ripen early for this type. **Origin:** USDA-ARS, Corvallis, OR, by C.E. Finn, B.C. Strik, B.M. Yorgey, M.E. Peterson, P.A. Jones, J. Lee, and R.R. Martin. Ouachita × ORUS 2867-4; crossed 2009; selected 2012; tested as ORUS 4370-1; introd. 2019. USPP 30,879; 10 Sept. 2019. **Fruit:** large, 8.7 g; blocky-conical; fairly uniformly sized, shaped and arranged drupelets, better than Chester Thornless; excellent drupelet fertility; attractively shaped; bright, glossy black; flavor excellent, sweet, 13.2 °Brix, pH 3.5, low titratable acidity, 8.5 g·L⁻¹ as citric acid; texture comparable to Triple Crown; very firm with drupelet skin that is resistant to tearing, similar or better than Chester Thornless; fruit store very well with low levels of drupelet reversion; ripens after Eclipse and Galaxy, before Triple Crown and well before Chester Thornless. **Plant:** vigorous; growth habit semi-erect; crown

forming; thornless with the Merton Thornless source of thornlessness; high yield (10.0 kg/plant); less susceptible to UV and heat damage than Chester Thornless. Susceptible to red berry mite (*Acalitus essigi*); cold hardiness very good, has shown no injury despite temperatures below -20 °C in some winters.

Sweetie Pie. Thornless, upright to semi-upright, medium vigor and yield, medium berry size with relatively high sugar content. **Origin:** USDA-ARS, Poplarville, MS, by C.L. Gupton and S.J. Stringer. MSUS 29 × Navaho; crossed 1989; selected 1993; tested as MSUS 119; introd. 2017. **Fruit:** size medium, 8.1 g; ovate; firmness soft to medium; 11.4 °Brix, 1.3% titratable acidity expressed as citric acid; ripens June–July on floricanes. **Plant:** thornless, growth habit upright to semi-upright; productivity medium; resistant to rosette disease (*Cercospora* spp.); susceptible to orange rust (*Gymnoconia* spp.); recommended for home gardens, U-Pick, and local fresh market berries.

BLUEBERRY

Mark K. Ehlenfeldt, USDA-ARS, P.E. Marucci Center for Blueberry & Cranberry Research and Extension, Chatsworth, NJ

BB06-507MI-52 (Envy). Early-season northern highbush with very large, firm fruit, and excellent flavor, for high-chill locations. **Origin:** Berry Blue, Grand Junction, MI, by E. Wheeler and J. Hancock. Brigitta Blue × Draper; crossed 2006; selected 2010; tested and patented as BB06-507MI-52. USPP 30,422; 23 Apr. 2019. **Fruit:** 18–20 mm; nearly round; light blue; very firm; flavor and texture excellent; storage ability long. **Plant:** moderately vigorous; growth habit very upright; crown narrow; cluster density very loose; ripening concentrated; suitable for machine harvest; propagated by vegetative cuttings or tissue culture.

BB06-50FI-1 (Stellar). Midseason southern highbush with very large, firm fruit and excellent flavor, for low-chill locations. **Origin:** Berry Blue, Grand Junction, MI, by E. Wheeler and J. Hancock. Jewel × Sweetcrisp; crossed 2006, selected 2009; tested and patented as BB06-50FI-1. USPP 30,445; 30 Apr. 2019. **Fruit:** 18+ mm; nearly round; picking scar very small; medium blue; firm; flavor and texture excellent; storage ability medium-long. **Plant:** very vigorous; growth habit upright; crown medium-small; cluster density loose; ripening concentrated; suitable for machine harvest; propagated by vegetative cuttings or tissue culture; chilling requirement 350 h.

BB07-7FL-4 (Presto). Early-season southern highbush with very large, very firm fruit and excellent flavor for low-chill and tropical locations. **Origin:** Berry Blue, Grand Junction, MI, by E. Wheeler and J. Hancock. Millennia × Jewel; crossed 2007; selected 2009; tested and patented as BB07-7FL-4. USPP 30,421; 23 Apr. 2019. **Fruit:** 18–20+ mm; oblate; picking scar small; medium light blue; very firm; flavor and texture excellent; storability medium-long. **Plant:** vigorous; growth habit medium upright; crown medium-sized; cluster density very loose; ripening concentrated; suitable for machine harvest; propagated by vegetative cuttings or tissue culture; for low- and no-chill locations.

Big Dipper. Northern highbush with good flavor, suitable for fresh markets. **Origin:** Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang and G. Xu. Northland O.P.; sown 2010; selected 2015; tested as Senmao 230. CNPVP application filed (20180687). **Fruit:** size medium, 2.0 g; oblate; picking scar dry; light blue; firm; stores very well; sweet; acidity low; ripens 30 June. **Plant:** vigorous; bush shape round to upright; flowers early; high yielding; recommended for machine or hand harvest; requires cross-pollination for maximum yields; chilling requirement 800–1000 h.

Bountiful™ Delight. See ZF06-051.

C08-141. Southern highbush for hand harvest for fresh markets. **Origin:** CostaExchange, Corindi, New South Wales, Australia, by G. Wright, and University of Florida, Gainesville, by P. Lyrene. FL00-057 × C99-042; crossed 2006; selected 2008. USPP 31,007; 5 Nov 2019. **Fruit:** large; oblate; firm to very firm; sweetness medium; acidity medium; flavor good; shelf life long; ripens early- to midseason. **Plant:** evergreen; vigorous; growth habit upright; self-fruitful; yield medium to high; chilling requirement low.

Chunhui. Northern highbush suitable for fresh markets. **Origin:** Dalian University and Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang and L. Lei. Northland O.P.; sown 2010; selected 2015; tested as Senmao 438. CNPVP application filed (20180614). **Fruit:** 2.2 g; oblate; medium blue; very firm; sweet, low acidity, flavor good; ripens early. **Plant:** vigorous; bush shape round to upright; blooms early; productivity high; recommended for machine or hand harvest; self-fertile, but cross-pollination desirable; chilling requirement 800-1000 h.

Colossus. Low-chill southern highbush blueberry. **Origin:** University of Florida, Gainesville, by P. Lyrene and J. Olmstead. FL08-35 × FL04-103; crossed 2008; selected 2011; tested as FL11-35; USPP applied for. **Fruit:** jumbo; very firm; sweet; ripens late March. **Plant:** vigorous; growth habit bushy; excellent survival in the field; chilling requirement 150-200 h; very short bloom-to-ripe; propagates readily from softwood; machine harvestable for fresh market.

Delicious Blue. Early-season northern highbush for fresh markets. **Origin:** Dalian Pushilan Agricultural Technology Co., Dalian, China, by G. Xu and Y. Chen. Big Bluegold O.P.; sown 2010; selected 2015; tested as Senmao 368. CNPVP application filed (20180569). **Fruit:** 2.1 g; oblate; medium blue; firm; flavor good; ripens late June in Liaoning Province, China. **Plant:** vigorous; growth habit upright, spreading; blooms early; productivity high; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

DrisBlueFourteen. Late-ripening northern highbush for fresh market. **Origin:** Driscoll Strawberry Associates, Watsonville, CA, by B.K. Caster, M.C. Baptista, B.D. Mowrey, A. Draper, and J.K. Izzo. G-455 × MS 122; selected 2004. USPP 27,622; 31 Jan 2017. **Fruit:** large; spherical; medium blue; sweetness medium. **Plant:** vigor high; growth habit semi-erect; productivity good; cold hardy.

DrisBlueFifteen. Midseason southern highbush with good storage capacity for fresh market. **Origin:** Driscoll Strawberry Associates, Watsonville, CA, by B.K. Caster, A. Draper, and J.K. Izzo. MS 122 × MS 6. USPP 28,933; 6 Feb. 2018. **Fruit:** size medium; cluster density low; very firm; light violet-blue; sweet; ripens late May to early August; fruit can be stored 2 weeks without significant deterioration in quality. **Plant:** growth habit semi-erect; size medium, height 1.4 m, width 1.9 m.

EB 8-46 (Oz Bella®). Early-season highbush with very large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. BB5 × SB1; crossed 2005, selected 2008. USPP 26,173; 1 Dec 2015. **Fruit:** extra large; picking scar small, dry; flavor very good. **Plant:** vigor medium to strong; growth habit intermediate; blooms early.

EB 12-19 (Oz Magnifica®). Very early-season highbush with large to very large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. EB8-19 × EB8-1; crossed 2009, selected 2012. USPP 27,142; 13 Sept. 2016. **Fruit:** large to very large; oblate; flavor excellent; ripens early. **Plant:** vigor strong; growth habit semi-upright; bloom excellent and very early.

Envy. See BB06-507MI-52.

Eureka Sunrise. See Ridley 1602.

Eureka Sunset. See Ridley 1607.

FC13-083. Early-season northern highbush for fresh markets; mid/high chill. **Origin:** Fall Creek Farm and Nursery, Lowell, OR, by D.M. Brazelton, A.L. Wagner, P.S. Boches, and W. Light. ZF06-050 × ZF06-013; crossed 2010; selected 2013. USPP 31,793; 26 May 2020. **Fruit:** 21 mm; very firm; flavor and crunch excellent. **Plant:** vigor medium; growth habit upright; yield competitive with Duke and Draper.

FC13-122. Early/midseason northern highbush for the fresh market; mid/high chill. **Origin:** Fall Creek Farm and Nursery, Lowell, OR, by D.M. Brazelton, A.L. Wagner, and P.S. Boches. ZF 06-050 × ZF 06-013; crossed 2010; selected 2013. USPP applied for. **Fruit:** 20 mm; very firm; texture crispy; juicy; sweet. **Plant:** vigor medium; growth habit upright; yield competitive with Duke and Draper.

FCM14-052. Southern highbush for the hand-harvest fresh market; zero-chill or evergreen production. **Origin:** Fall Creek Farm and Nursery, Lowell, OR, by D.M. Brazelton, A.A. Bermudo, and P.S. Boches. FL 01-06 × FL 06-556; crossed 2012; selected 2014. USPP applied for. **Fruit:** 3.3 g; picking scar small; medium blue; sweet and aromatic with a characteristic “pop”; ripens ~180 d after pruning in Tala, Mexico. **Plant:** vigorous; yield high.

First Quest. Mid-to-late-season northern highbush for fresh markets. **Origin:** Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang, and G. Xu. Chandler O.P.; sown 2010; selected 2015; tested as Senmao 804. CNPVP application filed (20180702). **Fruit:** 4.2 g; oblate; medium blue; firm; sweet, low-acid, flavor good; ripens mid-July in Liaoning Province, China. **Plant:** vigorous; bush shape round; blooms late; high yielding; recommended for machine or hand harvest; requires cross-pollination for maximum yields; chilling requirement 800-1000 h.

Fragrant Cloud. Early season, northern highbush for fresh markets. **Origin:** Dalian University and Dalian Senmao Modern Agriculture Co., Dalian, China, by G. Xu and M. Zhang. Legacy O.P.; sown 2010; selected 2015; tested as Senmao 295. CNPVP application filed (20180615). **Fruit:** 2.1 g; oblate; picking scar small, dry; medium blue; firm; flavor good; ripens late June in Liaoning Province, China. **Plant:** vigorous; growth habit round to upright; blooms early; high yielding; recommended for machine or hand harvest; requires cross-pollination for maximum yields; chilling requirement 800-1000 h.

Heroine. Early-season northern highbush for fresh markets. **Origin:** Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang and G. Xu. Big Bluegold O.P.; sown 2010; selected 2015; tested as Senmao 397. CNPVP application filed (20180558). **Fruit:** 2.5 g; oblate; light blue; firm; flavor good, with balanced sugar and acidity; aromatic; ripens late June in Liaoning Province, China. **Plant:** vigorous; bush shape round to upright; blooms moderately early; productivity high; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

Magnus. Low-chill southern highbush. **Origin:** University of Florida, Gainesville, by P. Lyrene. Emerald × FL00-58; crossed 2001; selected 2004; tested as FL04-213; USPP applied for. **Fruit:** large; very firm; sweet; ripens very early April. **Plant:** vigor medium-high; growth habit upright; survival in the field excellent; chilling requirement 150-200 h; blooms early; propagates readily from softwood.

Missblue. Midseason northern highbush for fresh markets. **Origin:** Dalian Pushilan Agricultural Technology Co., Dalian, China, by Y. Wang and Y. Chen. Cara's Choice O.P.; sown 2010; selected 2015; tested as Senmao 327. CNPVP application filed (20180567). **Fruit:** 2.1 g; round; light blue; medium firm; high sweetness; flavor good; ripens

early July in Liaoning Province, China. **Plant:** vigorous; bush shape round; blooms early; high yielding; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

Morning Snow. Early-midseason northern highbush for fresh markets. **Origin:** Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang and G. Xu. Big Bluegold O.P.; sown 2010; selected 2015; tested as Senmao 403. CNPVP application filed (20180695). **Fruit:** 2.3 g; oblate; light blue; firm; sweet; low-acid; flavor good; ripens early July in Liaoning Province, China. **Plant:** vigorous; growth habit semi-upright; blooms early; high yielding; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

Muffin Man. Public domain, edible, ornamental, rabbiteye for home garden and landscape. **Origin:** USDA-ARS, Poplarville, MS, by S. Stringer, A.D. Draper, and E. Babiker. T 366 × Brightwell; crossed 2003; selected 2011; tested as MS 1190; released 2018. **Fruit:** size medium, with attractive colors; blooms and ripens before Brightwell and near Alapaha. **Plant:** vigorous; canes numerous; canopy dense; notable fall coloring in leaves; numerous unique pale pink blooms; chilling requirement 400-500 h; recommended for planting with other rabbiteye blueberry cultivars with similar bloom period such as Pink Lemonade; USDA Zones 8a-9a.

NS 13-1. Very early-season highbush with large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. F-1 × SCOP18; crossed 2011, selected 2013. USPP 30,756; 30 July 2019. **Fruit:** medium to large; detaches well from plant; firm; very sweet when ripe, low-acid. **Plant:** vigor low; growth habit spreading; flowering and fruit production very early.

NS 13-6. Midseason highbush with large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. 7-26 × 8-10; crossed 2012; selected 2013; USPP 30,934; 15 Oct. 2019. **Fruit:** medium to large; round; picking scar small, dry; firm; sweet to very sweet when ripe, acidity low to medium. **Plant:** vigor strong; growth habit semi-upright; blooms midseason; yield extremely high.

NS 14-3. Midseason highbush with medium to large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. 7-26 × 8-10; crossed 2012, selected 2014. USPP 30,626; 7 Feb. 2019. **Fruit:** medium to large; picking scar small, dry; firm; sweetness when ripe medium to high; acidity low to medium. **Plant:** vigor very strong; growth habit upright to semi-upright; blooms midseason; yield high.

NS 14-4. Very early-season highbush with large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. SC10 × NS30; crossed 2012, selected 2014. USPP 30,755; 30 July 2019. **Fruit:** large; picking scar small, dry; firm; sweetness when ripe medium to high; acidity medium. **Plant:** vigor medium; growth habit semi-upright; blooms very early; yield high.

NS 14-5. Early-season highbush with very large fruit, suitable for Western Australia. **Origin:** Yanchep, Western Australia, Australia, by V.D.A. Mazzardis. 7-26 × EB 8-30; crossed 2012, selected 2014. USPP 30,846; 27 Aug. 2019. **Fruit:** very large; picking scar small, dry; calyx strongly star-shaped; firmness medium; very sweet when ripe; acidity high. **Plant:** vigor medium; growth habit semi-upright; blooms early; yield high.

Optimus. Low-chill southern highbush. **Origin:** University of Florida, Gainesville, by J. Olmstead and P. Lyrene. FL96-22 × Cor00-17; crossed 2005; selected 2008; tested as FL08-262. USPP applied for. **Fruit:** size medium; picking scar small; very firm; flavor good, very sweet; texture excellent; ripens very early April. **Plant:** vigorous; growth habit semi-upright; excellent survival and leaf

disease resistance in the field; short bloom-to-ripeness; propagates readily from softwood; machine harvestable for fresh market; chilling requirement 150-200 h.

Oz Bella®. See EB 8-46.

Oz Magnifica®. See EB 12-19.

Potential Elite. Very early-season northern highbush for fresh markets. **Origin:** Dalian Senmao Modern Agriculture Co., Dalian, China, by H. Wang and G. Xu. Sunrise O.P.; sown 2010; selected 2015; tested as Senmao 353. CNPVP application filed (20180693). **Fruit:** 2.3 g; oblate; picking scar small, dry; light blue; firm; flavor good; ripens early June in Liaoning Province, China. **Plant:** vigorous; growth habit round to upright; flowers early; productivity high; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

Presto. See BB07-7FL-4.

Ridley 0808. A late-season southern highbush with large, sweet berries. **Origin:** Mountain Blue Orchards, New South Wales, Australia, by T. Gunther and R. Bell. M09-48-01 × M08-34-01; crossed 2011; selected 2014; tested as M14-08-08. USPP 31,074, 19 Nov. 2019. **Fruit:** 2-3 g; picking scar small; very firm and crisp, has a pleasant “pop”; sweet, 14-17 °Brix, low-acid; bloom good; ripens very late; shakes well for machine harvest; suited to fresh fruit markets. **Plant:** vigorous; growth habit upright, bushy; leaves large; yields high, 5.4 kg/bush on 3 harvests; blooms very late; mature plants are deciduous, and difficult to evergreen; highly self-fertile; propagation by softwood cuttings and tissue culture.

Ridley 1212 (Splash). A mid- to late-season southern highbush with large crisp fruit, for evergreen culture. **Origin:** Mountain Blue Orchards, New South Wales, Australia, by R. Bell. M07-18-03 × M05-05-04; crossed 2009; selected 2012; tested as M12-12-12. USPP 30,143; 29 Jan. 2019. **Fruit:** 2.5-3.5 g; picking scar very small, dry; dark blue; very crunchy; very sweet, 14-17 °Brix, acidity medium; ripens early to midseason; stores well; shakes very well for machine harvesting; very fast for hand harvest; suited to fresh market, but also dries very well. **Plant:** growth habit upright to semi-upright and open bush; slow to establish, but ultimately high yielding, 7.1 kg/bush on 3 harvests; self-fertile, but crosses well with Eureka, Twilight, and Firstblush; strong bloom; blooms early to midseason; propagation by softwood cuttings or tissue culture.

Ridley 1602 (Eureka Sunrise). Early-season southern highbush with crunchy, sweet fruit and unique sweet flavor, suited to evergreen culture inside and outside plastic tunnels. **Origin:** Mountain Blue Orchards, New South Wales, Australia, by R. Bell. Ridley 1403 × Ridley 4609; crossed 2011; selected 2014; tested as M14-16-02. USPP 31,605; 31 Mar. 2020. **Fruit:** 2-3 g; very crisp; picking scar small, dry; flavor sweet, acidity medium, aromatic; ripens early; suitable for fresh market; suitable for hybrid harvester and fast hand harvest. **Plant:** growth habit round with whippy canes; very vigorous and tough; fruits deep down along laterals; leaves large; yields high, 9 kg/bush on 3-year bushes; blooms early; bloom fair; self-fertile; propagation by softwood cuttings or tissue culture.

Ridley 1607 (Eureka Sunset). Mid- to late-season southern highbush with unique crisp sweet flavor, suited to evergreening. **Origin:** Mountain Blue Orchards, New South Wales, Australia, by R. Bell. Ridley 1403 × Ridley 4609; crossed 2011; selected 2014; tested as M14-16-07. USPP 31,035; 12 Nov. 2019. **Fruit:** 2-4 g; picking scar small; very firm and crisp; flavor unique, sweet, aromatic, acidity medium to low; ripens mid- to late-season; hand harvest good; suited to fresh market. **Plant:** round bush; leaves large; medium to vigorous; yields high, 4.7 kg/plant on 2 harvests; bloom medium; blooms late to very late; highly self-fertile, but cross-pollination (Twilight, Splash) required for optimum fruit size; propagation by softwood cuttings or tissue culture.

Ryoku NH-11. Northern highbush suitable for PYO, fresh fruit, and processed fruit markets. **Origin:** Nippon Ryokusan Co., Matsumoto-shi, Japan, by S. Sakurai. Chandler O.P. USPP 30,754; 30 July 2019. **Fruit:** large and uniform; picking scar small, dry; ripens early, ~15 July in Nagano, Japan. **Plant:** vigor strong; growth habit upright.

Ryoku NH-12. Northern highbush suitable for PYO, fresh fruit, and processed fruit markets. **Origin:** Nippon Ryokusan Co., Matsumoto-shi, Japan, by S. Sakurai. Spartan, Duke, or Denise Blue O.P. USPP 30,753; 30 July 2019. **Fruit:** large and uniform; firm; sweet, with good balance of sweetness and acidity; ripens early, ~50% ripe in late June in Nagano, Japan. **Plant:** growth habit relatively compact.

Ryoku NH-13. Northern highbush suitable for PYO, fresh fruit, and processed fruit markets. **Origin:** Nippon Ryokusan Co., Matsumoto-shi, Japan, by S. Sakurai. Chandler O.P. USPP 30,914; 1 Oct. 2019. **Fruit:** large; sweet, with a good balance of sweetness and acidity; picking scar small; ripens early, ~July 10 in Nagano, Japan. **Plant:** growth habit upright; vigor strong.

Southern Bluebelle™. See TO-1319.

Splash. See Ridley 1212.

Stellar. See BB06-50Fl-1.

TO-1319 (Southern Bluebelle™). Ornamental ultra-dwarf southern highbush for home gardens and landscapes. **Origin:** University of Georgia, Griffin, by D.S. NeSmith. Rebel × TH-639; crossed 2007; selected 2010; introduced 2015. USPP 28,665; 21 Nov. 2017. **Fruit:** 1.7-2.3 g; picking scar small, dry; medium to light blue color; firmness good; flavor good; ripens 4-8 d after Rebel in south and middle Georgia. **Plant:** growth habit very dwarfed and compact, canopy 0.3-0.4 m tall and 0.4-0.6 m wide at maturity; flowers 5-7 d after Rebel; self-fruitful; propagation by softwood cuttings and in vitro; chilling requirement 350-450 h.

Wayne. Low-chill southern highbush. **Origin:** University of Florida, Gainesville, by P. Lyrene. FL03-73 × Jewel; crossed 2003; selected 2006; tested as FL06-354. USPP applied for. **Fruit:** medium-large; firm; sweet; ripens very early April. **Plant:** vigor medium-high; growth habit upright; excellent survival in the field; propagates readily from softwood; chilling requirement 200 h.

Wind Chime. Late-season northern highbush for fresh markets. **Origin:** Dalian University and Dalian Senmao Modern Agriculture Co., Dalian, China, by G. Xu and B. Wei. Bluechip O.P.; sown 2010; selected 2015; tested as Senmao 486. CNPVP application filed (20180613). **Fruit:** 1.2 g; oblate; picking scar dry; medium blue; firm; flavor good; ripens late. **Plant:** vigorous; growth habit round to upright; blooms late; high yielding; recommended for machine or hand harvest; requires cross-pollination; chilling requirement 800-1000 h.

ZF06-051 (Bountiful™ Delight). Low-chill ornamental cultivar, well suited for nursery, landscape, and home garden use. **Origin:** Fall Creek Farm and Nursery, Lowell, OR, by D.M. Brazelton, A.L. Wagner, P.S. Boches, and A.A. Bermudo. Gulfcoast × Cape Fear; crossed ~2003; selected 2006. USPP 29,437; 3 July 2018. **Fruit:** size medium. **Plant:** growth habit round, compact, and hedge-like; mature size 0.6-1.2 m; leaves dark green, elliptical; new growth reddish tinged; flowers cylindrical to campanulate with moderate amounts of pink anthocyanin before fully open.

ZF08-029. Early/midseason northern highbush for fresh markets. **Origin:** Fall Creek Farm and Nursery, Lowell, OR, by D.M. Brazelton, A.L. Wagner, and P.S. Boches. G-344 × Draper; crossed 2004; selected 2008. USPP applied for. **Fruit:** 17 mm; firm; sweet;

flavor distinct, peach-like. **Plant:** vigor medium; growth habit upright; yield competitive with Draper and Legacy.

CITRUS

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3 ELS 0. Fresh-market seedless lemon with high fruit quality. **Origin:** 2PH Farms, Emerald, Queensland, Australia, by C.R. Pressler. Gamma irradiation-induced bud mutation of Eureka lemon 1998; selected 2003. USPP 29,552; 31 July 2018. **Fruit:** height 74.6 mm, diameter 57.2 mm, 143 g; oval, with very short neck and weakly prominent nipple; rind smooth, green, thickness 4.5 mm, difficult to peel; flesh yellow; segments 8.9; 8.0 °Brix; seeds none or very few with no reduction in fruit size; ripens early; keeping and shipping quality similar to Eureka. **Tree:** vigorous; growth habit upright spreading, with open center; winter hardiness similar to Eureka.

5-1-99-5. Pummelo producing delicious and juicy red-fleshed fruit in central Florida. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Hirado Buntan Pink O.P. USPP 25,151; 9 Dec. 2015. **Fruit:** size uniform, height 140-160 mm, diameter 160-180 mm, 1.7 kg, round and slightly bell-shaped; rind green-yellow to yellow (RHS 1C-2B), medium firm, softer when fully ripe, thinner than most common pummelos, 8-10 mm; segments 12-13; ease of peeling similar to grapefruit; flesh red (RHS 39A), darker than Hirado Buntan; juicy; flavor excellent, 10 °Brix, TA 1.1% on 4 Jan. 2010; seeds 120-130, monoembryonic; for fresh use; ripens mid-October-January, retains good quality on tree for several months, keeps well in cold storage. **Tree:** diploid; large; vigorous; canopy dense, growth habit obloid with upright branches, fruiting branches droop, current season branches grow laterally; cold hardy in Lake Alfred; exhibits good tolerance to citrus canker (*Xanthomonas axonopodis* pv. *citri*), much better than grapefruit; appears to be slightly tolerant of Huanglongbing (*Candidatus Liberibacter asiaticus*), although not as tolerant as other red pummelos.

7 ELS C3. Seedless lemon with high fruit quality. **Origin:** 2PH Farms, Emerald, Queensland, Australia, by C.R. Pressler. Gamma irradiation-induced bud mutation of Eureka lemon 1998; selected 2003. USPP 29,440; 3 July 2018. **Fruit:** height 84.2 mm, diameter 60.3 mm, 159 g; oval, with very short neck and nipple at apex weak to medium prominence; rind smooth, green, thickness 4.7 mm, difficult to peel; segments 8.2; flesh yellow; 7.5 °Brix; seeds none or very few with no reduction in fruit size; for fresh market; ripens early; keeping and shipping quality similar to Eureka. **Tree:** vigorous; growth habit upright spreading; canopy dense; winter hardiness similar to Eureka.

7B97. Seedless lemon with high fruit quality. **Origin:** 2PH Farms, Emerald, Queensland, Australia, by C.R. Pressler. Gamma irradiation-induced bud mutation of Eureka lemon 1998; selected 2003. USPP 29,439; 3 July 2018. **Fruit:** height 81.9 mm, diameter 60.6 mm, 153 g; length-to-width ratio 1.35; oval; neck very short; nipple weakly prominent; rind smooth, green, thickness 4.9 mm, difficult to peel; flesh yellow; 7.7 °Brix; seeds none or very few with no reduction in fruit size; for fresh market; keeping and shipping quality similar to Eureka. **Tree:** vigorous; growth habit upright spreading; canopy very dense, with open center; winter hardiness similar to Eureka.

7ELS1. Seedless to low-seeded lemon with high fruit quality. **Origin:** 2PH Farms, Emerald, Queensland, Australia by C.R. Pressler. Gamma irradiation-induced bud mutation of Eureka lemon

1998; selected 2003. USPP 24,608; 8 July 2014. **Fruit:** height 80.0 mm, diameter 60.0 mm, 160 g; oval, with very short neck; nipple present with weak to medium prominence; rind smooth, green, thickness 4.3 mm, difficult to peel; segments per fruit 8; flesh yellow; 7.3 °Brix; seeds none or very few with no reduction in fruit size; for fresh market; keeping and shipping quality similar to Eureka. **Tree:** vigorous; canopy dense; thorns absent or sparse; winter hardiness similar to Eureka.

Amoa 8. Intensely red-fleshed tangor, seedy with good flavor. **Origin:** CREA—Centro Olivicultura, Frutticoltura e Agrumicoltura, Acireale, Italy, by F. Russo. Moro × Avana; crossed c. 1990; seed received at University of California, Riverside 2002; seedling selected by T. Siebert-Wooldridge 2015; released by Citrus Clonal Protection Program (CCPP) as VI 925; budwood not yet available from CCPP. **Fruit:** obloid; rind rough, with deep brownish-red blush; flesh deep red to purple; seeds 9.6 + 1.1; 15.0 + 0.7 °Brix, TA 1.10% + 0.1, SSC/TA ratio 14.2 + 0.7; juice content 27.0% + 1.5; 70.1 g + 3.6 in mid-February 2014-2018 in Riverside, CA; ripens December-February in Riverside. **Tree:** small with dense foliage on Carrizo and C-35 rootstocks.

Arctic Frost™. See Gremoy79.

Asuki (Kankitsu Okitsu 60). Late-maturing mandarin hybrid with high °Brix and excellent flavor, easy to eat because of its soft segment membranes. **Origin:** Division of Citrus Research, Institute of Fruit Tree and Tea Science, National Agriculture and Food Research Organization, Shimizu, Japan, by T. Yoshioka, T. Yoshida, H. Nesumi, S. Ota, M. Kita, T. Kuniga, M. Nonomura, N. Nakajima, H. Hamada, K. Nonaka, and F. Takishita. Kankitsu Okitsu 46 × Harumi; crossed 1992; grafted 1994; selected 2005; tested as P-92; phylogenetically named Kankitsu Okitsu 60; varietally denominated Asuki. USPP 31,146; 3 Dec. 2019. **Fruit:** 180 g; oblate; rind vivid orange (RHS 28B), smooth, thickness 2.7 mm, does not puff or crack, easy to peel; rind flavor orange-like; segment membranes thin, soft; flesh color strong orange (RHS 169B); texture medium to slightly firm; does not drip much when cut, so suitable for use as cut fruit; flavor very rich, 15-16 °Brix, TA 1.18%; seeds few; for fresh use; ripens late February to early March. **Tree:** more vigorous than Setoka and Shiranui; spheroid to ellipsoid; growth habit upright to spreading; thorns none to few, short.

Bingo. Attractive, flavorful, easy peeling, seedless, early-ripening mandarin with some evidence of tolerance to Huanglongbing. **Origin:** University of Florida, Lake Alfred, by F.G. Gmitter, Jr. LB7-11 (Clementine mandarin × Valencia sweet orange) × Seedless Kishu; crossed 2005; planted 2007; selected 2013; tested as 7-6-27. USPP 27,778; 14 Mar. 2017. **Fruit:** height 49.5-51.4 mm, width 59.7-62.5 mm, weight 93.2 g; round; rind orange (RHS N25B-N25A), smooth, thickness 2.3-2.4 mm, very easy to peel; segments 10-11; flesh color orange (RHS 25A); firm to medium soft; juicy; flavor excellent, 11.6-12.5 °Brix, TA 0.81-0.83%, SSC/TA ratio 14.3-15.1; seedless, although small seed traces can be found; ripens early October to mid-November in central Florida. **Tree:** small to medium; vigorous; canopy dense; growth habit both upright and lateral, with more lateral growth; productivity substantial, with fruit size enhanced by early-season thinning; appears to tolerate Huanglongbing with good horticultural management.

Brown. See M 4.

C37. Large, easy-peeling, nearly seedless mandarin with attractive internal and external color. **Origin:** Winter Haven, FL, by B. Roe. Hybrid of 2 mandarins, both parents unknown; crossed 2000; selected 2006. USPP 27,439; 6 Dec. 2016. **Fruit:** large, length 62-70 mm, width 70-85 mm, 170-290 g; spherical to very slightly oblate, not as round as Hamlin or Valencia, but not as oblate as Murcott; rind orange (RHS N25B), mostly smooth with very small

protruding oil cells, thickness 2 mm, very easy and dry to peel; rind oil quantity low; segments 9-13; flesh orange (RHS 26A-N25A), very juicy; juice color rich; 11.3 °Brix, TA 0.68%, SSC/TA ratio 16.6; seeds 1-6, average 3; ripens early November to January; storage life >45 d at 2 °C. **Tree:** vigor good; canopy density below average; thorns absent to minimal; bears heavily.

Cambria 1. See Witkrans.

Carninka (Carnika Ultra; Dansweet™). Navel orange with firm, sweet, late-maturing fruit. **Origin:** Ripple Hill Farm, Patensie, Eastern Cape, South Africa, by D.F. Rautenbach. Whole tree mutation of Palmer navel orange, discovered 2005. USPP 24,934; 30 Sept. 2014. **Fruit:** size medium to large, diameter 76-89 mm; round; navel absent to small; rind yellow orange; texture medium, thin, 5-9 mm; ease of peeling moderate to good; segments 9-11; membranes tough initially, becoming soft; 13-15 °Brix; seedless; for fresh market; ripens late, mid-late September in Patensie, 2 weeks after Witkrans. **Tree:** vigorous; precocious in juvenile phase; vigor of mature trees comparable to Palmer navel; growth habit spreading; canopy average to dense; bearing precocious; productivity high; compatible with Troyer and Carrizo citrange, Swingle citrumelo, rough lemon, and Volkameriana rootstocks.

Carnika Ultra. See Carninka.

Code 3X97. Seedless lemon with high fruit quality. **Origin:** 2PH Farms, Emerald, Queensland, Australia, by C.R. Pressler. Gamma irradiation-induced bud mutation of Eureka lemon 1996; selected 2003. USPP 29,438; 3 July 2018. **Fruit:** height 76.9 mm, diameter 54.5 mm, fruit length/diameter ratio 1.41, 151 g; oval, with very short neck and short to medium nipple at apex; rind smooth, green, thickness 4.3 mm, difficult to peel; segments 7.7; flesh yellow; 7.9 °Brix; seeds none or very few with no reduction in fruit size; for fresh market; ripens early; keeping and shipping quality similar to Eureka. **Tree:** vigorous; growth habit upright, spreading; canopy density open; winter hardiness similar to Eureka.

Dansweet™. See Carninka.

Dolei™. See M 4.

Excalibur. Attractive, acid citrus fruit referred to as “red lime”, seedy, with orange flesh, good flavor and fragrance. **Origin:** Excalibur Rare Fruit Tree Nursery, Lake Worth, FL, by R. and L. Wilson. Introduced into California as budwood by D. Karp 2005. Parentage unknown but purportedly kumquat × Rangpur hybrid. Released by CCPP as VI 924; budwood not yet available from CCPP. **Fruit:** small; vase-shaped, larger than Nagami kumquat; rind reddish orange, very smooth, thin and edible; flesh highly acidic, flavor excellent; ripens January-March in Riverside, CA. **Tree:** everbearing and productive on Yuma Ponderosa lemon rootstock.

First Canadian. Dwarf, bushy lemonlike hybrid ideal for small container windowsill culture in homes and commercial buildings. **Origin:** Saskatoon, SK, Canada, by M.M.P. Nair. CLX-1 (*Citrus medica* × *C. limonia*) × Meyer lemon; crossed 1991; selected 2010. Canadian PBR 5488; 19 May 2017. USPP 30,630; 2 July 2019. **Fruit:** length 60-65 mm, diameter 50-60 mm, 110 g; spheroid with an extended style and stigma 5-7 mm long; rind glossy, brilliant yellow, outer layer pitted, thickness 5-6 mm; segments 10-12; flesh color 4B with endocarp partitions 155B; flesh glossy, juicy; flavor tart, strongly lemon-scented, 7-8 °Brix; nearly seedless; for home use, primarily for fresh consumption, juice and processing into pickles, or rind for candy making, not intended for commercial juicing; keeps 2-3 weeks at room temperature, 6-8 weeks if refrigerated with humidity control. **Tree:** dwarf; growth habit upright, rounded; evergreen subtropical bush, controllable by pruning for indoor growing and shape; growth rate slow to moderate in a 15-cm

container; performs well in constant temperatures in indoor windows of homes without any artificial light; blooms every 3 months for 4 crops per year; fruits year-round in various stages of development; fruit set heavy.

First Canadian Golden. Dwarf, bushy limelike hybrid suited to small container windowsill culture in homes and commercial buildings in cold climates. **Origin:** Saskatoon, SK, Canada, by M.M.P. Nair. CLX-1 (*Citrus medica* × *C. limonia*) × Key lime; crossed 1991; selected 2010. Canadian PBR 5489; 19 May 2017. USPP 30,590; 25 June 2019. **Fruit:** length 60–65 mm, diameter 50–60 mm, 90–110 g; spheroid with extended style and stigma 5–7 mm long; rind glossy, color 4B, outer layer pitted, thickness 5–6 mm; segments 9–10; flesh color 4B with endocarp partitions 155B; flesh glossy, juicy; flavor tart, with aroma, taste and juice quality of a lime, 10 °Brix; seedless; for home use, primarily for fresh consumption and processing to pickles, or rind candying, not intended for commercial juicing; keeps 2–3 weeks at room temperature, 6–8 weeks if refrigerated with humidity control. **Tree:** dwarf; growth habit upright, rounded; evergreen subtropical bush, controllable by pruning for indoor growing and shape; growth rate slow to moderate in a 15-cm container; performs well in constant temperatures in indoor windows of homes without any artificial light; flowers every 3 months for 3–4 crops per year; fruit set heavy.

Florida EV1. Somaclonal mutation of Valencia sweet orange ripening 10–16 weeks before standard Valencia. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Somaclone tree regenerated from an adventitious bud developed on a nucellar seedling stem piece induced from Valencia using tissue culture techniques, 1989. USPP 29,791; 6 Nov. 2018. **Fruit:** height 72.5–76.0 mm, width 72.5–80.0 mm, 219.4 g; round; rind yellow-orange to orange (RHS 23A–24A), smooth, thickness 5.0–5.8 mm; adherence of albedo to flesh strong; segments 13–14; flesh yellow-orange (RHS 23B), medium soft, juicy; 11.3 °Brix, TA 0.71%, SSC/TA ratio 15.9 on 8 Dec. 2014; juice quality excellent, with good color early; seeds 9–10, polyembryonic; for juice and fresh use; harvest season November–December in central Florida, 10–16 weeks before standard Valencia. **Tree:** diploid; size medium; less vigorous than standard Valencia; canopy dense, obloid; growing habit both lateral and upright; no more thorny and at least as productive as standard Valencia; disease/insect resistance similar to standard Valencia.

Florida EV2. Somaclonal mutation of Valencia sweet orange ripening 10–16 weeks before standard Valencia. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Protoplast, regenerated from protoplasts isolated from an embryogenic suspension culture of standard Valencia, 1989. USPP 29,824; 13 Nov. 2018. **Fruit:** height 67.5–78.2 mm, width 79.2–80.5 mm, 206.2 g; round; rind yellow-orange (RHS 15A–17A), smooth, thickness 3.4–5.0 mm, adherence to flesh strong; segments 11–12; flesh orange (RHS 21A), medium soft, juicy, 11.1 °Brix, TA 0.67%, SSC/TA ratio 16.5 on 8 Dec 2014; juice quality typical of Valencia; seeds 7–8 (vs. standard Valencia, 4–5), polyembryonic; for juice and fresh uses; harvest season November–December. **Tree:** diploid; size medium to large; vigor and thorns similar to standard Valencia; canopy dense; growth habit both upright and lateral; at least as productive as standard Valencia; disease/insect resistance similar to standard Valencia.

Garbi. Late-maturing triploid mandarin, nearly seedless, with excellent mildly acidic flavor and a pleasant aroma. **Origin:** Instituto Valenciano de Investigaciones Agrarias, Valencia, Spain, by L. Navarro, J. Juarez, P. Aleza, J. Cuenca, J.M. Julve, and J.A. Pina. Fortune (diploid) × Murcott (diploid); crossed 1996; embryos isolated and cultured *in vitro*; after germination, 116 plantlets were subcultured in elongation medium; triploidy confirmed by flow cytometry; selected 2004. USPP 21,580; 21 Dec. 2010. **Fruit:** height 58 mm, diameter 65–70 mm, 63±21 g; rind medium orange, thin, smooth, glossy, similar to Clemenules, easy to peel; segments 10–11; flesh near orange; flavor excellent, mildly acidic, with a pleasant

aroma, 18 °Brix, TA 1.8%, SSC/TA ratio 8.9; juice content 48%; substantially seedless, with very few seeds on rare occasions; for fresh market; ripens late, commonly mid-February to late April at Moncada, Valencia. **Tree:** triploid; vigorous; growth habit drooping; productivity similar to parents; tolerant to citrus tristeza virus and *Alternaria* spp.

GCM 305. Late-maturing triploid mandarin, nearly seedless, with excellent mildly acidic flavor and a pleasant aroma. **Origin:** GCM Variedades Vegetales, Huelva, Andalusia, Spain, by F. Ballester Martinavarro. Kara O.P.; seed extracted 2008. USPP 26,526; 22 Mar. 2016. **Fruit:** size medium, length 53 mm, diameter 76 mm, 128 g; obloid; rind medium orange (RHS 30B), smooth, with medium number of oil glands, thickness 2.5–3 mm; ease of peeling medium; segments 9–10; flesh medium orange (RHS 28A), with fine texture; flavor rich, sweet, aroma pleasant, 13 °Brix, TA 1%, SSC/TA ratio 13; juice content 51%; seedless when self-pollinated; ripens early February in Huelva; keeps well in storage. **Tree:** size medium; vigorous; growth habit spheroid, erect-drooping like Kara; tolerant to citrus tristeza virus and *Alternaria* spp.

Greenwood. Red-fleshed navel orange with strongly variegated foliage. **Origin:** limb sport of Cara Cara, discovered in Nangiloc, Victoria, Australia by D. Lyell, operations general manager of Southern Cross Farms, on property owned by J. Greenwood, Merewyn Pty. Ltd., 2016. Australian PBR 2016/266; 19 Oct. 2016. **Fruit:** small to medium; rind medium orange, thin, very smooth to smooth, oil glands moderately conspicuous; radial grooves at stalk end long; albedo pink; flesh red (RHS 179 - 34A-B), pigmented with lycopenes; SSC/TA ratio 8.7; harvest season medium to late. **Tree:** growth habit drooping; leaf blade variegation strongly expressed, twisting and blistering strong, undulation of margin strong.

Gremoy79 (Arctic Frost™). Cold hardy, low-seeded, easy-peeling mandarin with sweet-tart flavor. **Origin:** Greenleaf Nursery, San Antonio, TX, by Y.D. Moy and L. Stein. Changsha mandarin × unnamed satsuma mandarin seedling; crossed 1998; selected 2005. USPP 25,531; 12 May 2015. **Fruit:** height 45 mm; diameter 65 mm, 110 g; oblate; rind orange, thin, 5 mm, easy to peel; segments 10; flesh orange (RHS N25A), glossy, juicy; flavor sweet-tart, 13 °Brix; aroma orange-scented; seeds 0–4; juice production 70 ml/fruit; primarily for fresh consumption but may have potential for commercial juicing; ripens mid-November to late December. **Tree:** vigor moderate; growth habit upright, rounded, bushy; fruit set medium, heavily dependent on early spring weather during bloom; bears annually; cold hardy USDA Zone 8b.

Italian Pink Flesh. Attractive, typically shaped lemon with slight to pronounced pink flesh, low seeded to seedless, and no foliage variegation. **Origin:** Avondale Nursery, Auckland, New Zealand; imported as PI 133875 in 1939. In therapy at CCPP; budwood not yet available. **Fruit:** size medium, 120.2 g in early November 2018 in Riverside, CA; elliptical to oblong, neck inconspicuous, apex tapering with prominent nipple surrounded by areolar furrow; rind smooth; flesh variable in lycopene pigmentation, from medium pink to yellow; flavor good, 7.2 °Brix, TA 4.5%, SSC/TA ratio 1.6; seeds 2.2. **Tree:** vigorous; growth habit upright, spreading; densely foliated.

JR13. Attractive, seedless white-fleshed grapefruit. **Origin:** Mal-elane, Mpumalanga, South Africa, by L. Esselen. Gamma irradiation-induced bud mutation of FE1 (syn. Jackson) grapefruit, 2005. USPP 25,454; 21 Apr. 2015. **Fruit:** apical diameter 78.8 mm, axial diameter 77.2 mm, 259 g; oval to globose; rind yellow, smooth, thickness 5.5 mm, difficult to peel; segments 12, membranes moderately tough; flesh white; 13.1 °Brix; seedless; for fresh use, juice, and segments; ripens mid-late-season, 4th week of May in Mpumalanga, harvest window 4 weeks. **Tree:** vigor moderate; growth habit compact; canopy dense.

Kankitsu Okitsu 60. See Asuki.

Kirkwood Red. Midseason lycopene-pigmented navel orange with intense orange-red flesh and outstanding flavor. **Origin:** Kirkwood, Eastern Cape, South Africa, by A. Potgieter. Branch mutation of Palmer navel orange discovered 1992. USPP 24,778; 19 Aug. 2014. **Fruit:** medium to large, 65-85 mm, 220 g; round to slightly oval, with small navel end; rind deep orange, with occasional blush, medium smooth to smooth, easy to peel; flesh firm, intense orange-red, deeper in color than Cara Cara; flavor exceptional, 10.7-11.5 °Brix; seedless; ripens midseason, with Washington navel, slightly later than Cara Cara; for fresh market; less susceptible to creasing than Cara Cara. **Tree:** vigor and growth habit comparable to Washington navel; canopy compact; lycopene pigmentation is present in vascular bundles of leaves and fruit stems; bearing precocious, no alternate bearing.

Lange Rosy Red Valencia. Lycopene-pigmented sweet orange with pinkish-red flesh and blush, variegated leaves, and ripening late spring and summer. **Origin:** near Exeter, CA, by N.B. Lange. Spontaneous limb sport of Olinda Valencia; discovered 2009; reproduced by budding 2012. USPP 29,706; 25 Sept. 2018. **Fruit:** medium to large, 182.6-294.6 g, average 222.3 g; round and uniform; rind medium to thin, with distinctive reddish blush; ease of peeling moderate to difficult; flesh firm, pigmented pinkish-red by lycopenes and beta carotenes; juice abundant, distinctive pinkish-red; internal and external color persist and increase as the fruit matures; on some fruit rind regreening begins in mid-June and persists; eating quality very good, 10.8-11.9 °Brix, TA 0.46-0.70, SSC/TA ratio 16-23; seeds 0-3; for fresh market; harvest season May-August in Central California; fruit shipping and keeping quality good. **Tree:** vigor medium to high; growth habit semi-upright; canopy dense; leaves dimorphic; type 1 leaves small, compact, appear bunched up around the fruits, and are variegated, particularly when young; variegation becomes less prominent as the leaves mature; type 2 leaves are larger and appear more like normal orange leaves, with little or no variegation; productive, yields 71 fruits/tree in 2nd season; no particular susceptibilities to insects or diseases noted.

Late Cara Cara. See Villa11.

Leanri. Mandarin hybrid with deep orange-red skin and flesh, nearly seedless, filling the harvest gap between Clemenules and W Murcott Afourer. **Origin:** Esselen Nursery, Malalane, Mpumalanga, South Africa, by F.J. Veldman and L.L. Esselen. Branch mutation of Furr (Clementine × Murcott) discovered 2001; reproduced by budding 2008. USPP 28,216; 10 Apr. 2018. **Fruit:** medium to large, 110-120 g; shape variable, flat to round; firm; rind deep orange at maturity, smooth, thin; easy peeling with a low rind oil content; segments even and large, core open; membranes tough; flesh deep orange at maturity; juicy; flavor rich, 11-13 °Brix, SSC/TA ratio 11-14; seeds 2 in variety block, but lower, often seedless in isolated plantings; ripens between Clemenules and W Murcott Afourer (in South Africa, mid-May to mid-June in hot areas, and mid-June to mid-July in cooler areas); for fresh market; prone to creasing when picked later than normal; keeping quality good to excellent. **Tree:** moderately vigorous; growth habit initially upright, later spreading; canopy medium dense; yield 60 kg per tree, but low cropping could be a problem due to reduced seed content, crop manipulation may be required; pollen tested with aceto-carmin stain exhibited 27.9% viability; alternate bearing can lead to excessively large fruit in off-years; mildly cold hardy; more susceptible to *Alternaria* (*Alternaria alternata*) than Nadorcott, but less susceptible than Nova.

M4 (Brown; Dolci™). Triploid navel orange with brownish, bronzed rind and orange flesh. **Origin:** Pacific Fresh Enterprises, Leeton, New South Wales, Australia. Limb sport of Washington navel orange, discovered in J. Nardi's orchard in Leeton by a fruit picker named Lenay, 2006. Australian PBR 2011/175; 26 Aug. 2011. USPP applied for. **Fruit:** length medium to long, diameter medium; round;

rind color at maturity greenish brown (combination of grey-brown RHS 199A with grey orange N167A with yellow green 146A and 146B); rind texture slightly pebbled; rind thickness medium; diameter of navel opening small to medium; size of navel viewed internally medium to large; peels like standard navel orange cultivars; albedo greenish; segment walls weak; flesh light orange, similar to Washington; juicy, juice content 51%; flavor sweet, SSC medium to high, 10-12 °Brix; TA low to medium, 0.7-1.0%, SSC/TA ratio 11-14; seed count none or very few; for fresh market; midseason, with Washington, mid-November–March in San Joaquin Valley, California. **Tree:** growth habit drooping, similar to Washington; bearing similar to Washington.

M7. Early-maturing navel orange with early color, seedless, uniform globose fruit, and excellent fruit quality. **Origin:** Chislett Investment, Kenley, Victoria, Australia, by G.J.K. Chislett. Limb sport mutation of Navelina, selected 2004. USPP 18,774; 29 Apr. 2008. **Fruit:** height 89 mm, diameter 87.6 mm, 350 g; navel present; rind yellow-orange, medium smooth, slightly smoother than Navelina 7.5, thickness 1.5-3.5 mm, not easy to peel; segments 10; flesh orange; juice content 41%; 12.7 °Brix, TA 1.16%, SSC/TA ratio 10.9 on 28 Apr. 2005; seedless; for fresh market; ripens 3 weeks before Navelina 7.5, early April to mid-to-late-July in Kenley. **Tree:** more vigorous than Navelina 7.5 with open canopy and less dense than Navelina 7.5; growth habit upright to spreading; winter hardiness and drought tolerance similar to Navelina 7.5.

Marathon. Seedless, easy peeling, well colored, early-ripening mandarin that holds remarkably well on the tree. **Origin:** University of Florida, Lake Alfred, by F.G. Gmitter, Jr. Daisy × Seedless Kishu; crossed 2005; planted 2007; selected 2013. USPP 31,347; 14 Jan. 2020. **Fruit:** size medium, height 49.2-51.0 mm, width 59.3-60.0 mm, weight 94.5 g; round; very firm; rind orange (RHS 25A-24A), smooth, thickness 2.2-2.3 mm; easy to peel; segments 10-12; flesh orange (RHS 24B), medium soft, juicy; 12.5-17.4 °Brix, TA 0.6-0.9%, SSC/TA ratio 14-28, increasing throughout the season; seedless; harvest season September to mid-December, but holds well on tree later. **Tree:** diploid; size medium; vigorous; canopy dense; growth habit both upright and lateral; bears fruit annually; somewhat tolerant to Huanglongbing.

Minnie. Finger lime hybrid that grows well in pots and fields and produces abundantly on very compact trees. **Origin:** USDA-ARS, Ft. Pierce, FL, by K.D. Bowman, G. McCollum, and A. Plotto. *Microcitrus australasica* × *Microcitrus inodora* (clone 80-527A); crossed 1997 at A.H. Whitmore Foundation Farm, Groveland, FL; tested as BS97-R4-15 and US-1936; released 2018. **Fruit:** mature fruit 50-100 × 15-30 mm; cylindrical, elongated ellipsoid to slightly fusiform, showing a blunt protuberance on both ends, with the blossom-end protuberance becoming more obtuse to acuminate as fruit matures and after harvest; rind thickness 0.95-1.5 mm, shows numerous visible oil glands; immature fruit dark green with smooth skin, changing to light green and then yellow with semismooth skin at maturity; locules per fruit 6-7; pulp vesicles pale yellow to pale green, long-stalked, ovoid to pyriform, averaging 7 × 3 mm and loosely cohering, and end in a very blunt or rounded tip; fruit taste sour, similar to common finger lime; texture crunchy, juicy; <1 developed seed per 50 fruit, and seeds are 4 × 4 mm and 16 mg each. **Tree:** small, compact and attractive; leaves dimorphic, as described for *M. australasica*, and most other morphological features are similar to those described for that species; young shoots and leaves reddish purple, becoming green or dark green when mature.

Norin 1. See Puchimaru.

Or. See Orri.

Orri (Or). Low-seeded mandarin with low pollen viability and a long, late ripening period. **Origin:** Ministry of Agriculture and Rural Development, Bet Dagan, Israel, by A. Vardi, R. Spiegel-Roy, A.

Frydman-Shani, A. Elchanati, and H. Neumann. Gamma irradiation-induced bud mutation of Orah mandarin 1987-88; planted 1989-90; tested as 1/24/27. USPP 13,616; 4 Mar. 2003. **Fruit:** size medium, 140 g, height 55 mm, diameter 66 mm; oblate/spheroid; rind orange (RHS 23B), smooth, thin, peels easily; albedo yellow-orange; flesh light orange, dense; very juicy, juice content 50-60%; segments 9-11; seeds 0-4 (vs. 9-27 in Orah), seed cotyledons white, monoembryonic seeds present; flavor excellent, pleasantly sweet, 14 °Brix, TA 0.7%, SSC/TA ratio 20; harvest season mid-January to late April. **Tree:** vigorous; growth habit upright; canopy moderately dense, similar to Orah; vigorous watershoots can be thorny; bearing regular; productivity high, but a heavy crop one year may result in low yield the next; manipulation required; pollen viability 12.5%.

Puchimaru (Norin 1). Triploid, nearly seedless, sweet kumquat. **Origin:** Department of Citrus Research, Okitsu Branch, National Institute of Fruit Tree Science, Shizuoka, Japan, by T. Yoshida, H. Nesumi, T. Yoshioka, H. Ieki, Y. Ito, M. Nakano, I. Ueno, Y. Yamada, S. Murase, and F. Takishita. Diploid Nagami kumquat × tetraploid Meiwa kumquat; crossed 1987; selected 1992; tested as Kankitsu Okitsu 49. Registered as 10379 under the Seed and Seedlings Law of Japan; 10 July 2002. **Fruit:** 9-22 g, average 13.5 g; ellipsoid; rind deep orange, thickness 4 mm, smooth, semi-firm, oil glands somewhat large and conspicuous; rind flavor sweet, not bitter; flesh orange, tender, not very juicy or acidic; 17.5 °Brix, TA 1.4%; aroma similar in intensity to Meiwa; seeds none or very few, average 0.3, monoembryonic, cotyledons green; begins to color early November, fully ripe early January; fruit slowest to color is most aromatic. **Tree:** triploid; vigor medium; growth habit intermediate between upright and spreading; canopy moderately dense; thorns short, few; blooms mid-July; recommended for commercial cultivation in warmer citrus districts, greenhouses, and home gardens; resistant to citrus canker and very resistant to citrus scab (*Elsinoë fawcettii*).

RBB7-34. Sweet orange hybrid that resembles navel orange in size, shape and presence of a navel on the blossom end, but with better internal and external color. **Origin:** University of Florida, Lake Alfred, by F.G. Gmitter, Jr. LB8-9 mandarin × tetraploid Hamlin sweet orange, via embryo rescue. USPP 30,324; 2 Apr. 2019. **Fruit:** resembles Glen navel orange in size, shape and presence of a navel on the blossom end of ~70% of the fruit; when grown in humid, subtropical Florida, internal and external pigmentation resemble navels grown in a Mediterranean climate; height 73.1-75 mm, width 79.1-81.5 mm, 238.5 g; round; rind yellow-orange (RHS 23A) to orange (RHS 24B), smooth, thickness 2.7-3.4 mm; adherence of albedo to flesh medium-strong; segments 11-12; flesh yellow-orange (RHS 23A); medium-soft; juicy; 15.2-17.4 °Brix, TA 1.0-1.2%, SSC/TA ratio 12.7 in mid-December; seedless; suitable for fresh fruit; harvest season December-January. **Tree:** triploid; size medium; vigor moderate; canopy moderately dense, round with mostly lateral branches growing at low to medium angles; growth habit upright and lateral; thorns larger and more conspicuous than on LB8-9 and Hamlin; susceptible to citrus canker and Huanglongbing.

Red Lina (Rosalina). Early-ripening pink-fleshed navel orange, pigmented with lycopene. **Origin:** Fort Beaufort, Eastern Cape, South Africa, by G. Knott. Branch mutation of Lina sweet orange discovered 2009. USPP 31,258; 24 Dec. 2019. **Fruit:** small; round, less oblong than Lina; stalk end depression deep; navel size medium; rind texture medium to rough; rind thickness medium, thinner than Lina; rind color dark orange to red; albedo pink-flushed; flesh deep orange-red (near RHS orange-red 34B, 34C; vs. yellow-orange for Lina); moderately juicy; juice darker than Cara Cara; 12.5 °Brix; TA 0.88%, SSC/TA ratio 10.5; seedless; for fresh market; ripens early; shipping quality and storage life excellent, better than parent; rind creasing <5%. **Tree:** growth habit upright, more spherical and compact than parent.

RHM (Royal Honey Murcott). Mandarin hybrid with intense red-orange rind and flesh color, and rich mandarin flavor. **Origin:** Eidsvold, Queensland, Australia, by A.W. Jenkin and S.R. Jenkin. Chance seedling believed to be Ellendale × Murcott; discovered

2001. USPP 24,947; 7 Oct. 2014. **Fruit:** medium to large, height 58 mm; diameter 80 mm, 133-260 g; slightly rounded, with a slight neck; navel occasionally present; rind orange-yellow (RHS 25B), smooth to medium, thickness 2.3 mm, easy to peel; albedo slightly pink; segments 11; flesh orange-yellow (RHS 23A); 10.0-22.2 °Brix, TA 0.5-0.7%, SSC/TA ratio 16-17; juice content 53-61%; seeds 1-10, but seedless if not cross pollinated; midseason, ripens May-June in Queensland; for domestic and export markets; keeping and shipping qualities good. **Tree:** as vigorous as Nova; growth habit upright; density of canopy open; may require crop set manipulations; tip-bearer; yield 40-50 t/ha on mature trees; drought tolerance good.

Royal Honey Murcott. See RHM.

Ruby SL. Pink-fleshed, seedless Valencia sweet orange, for fresh and juice markets. **Origin:** Nelspruit, Mpumalanga, South Africa, by B.E. Hawks, G.F. Piner, and D.I. Solomon. Irradiated mutation of Ruby Valencia, 2013. USPP 31,795; 26 May 2020. **Fruit:** 65-80 mm; round; fairly firm, with a slightly pebbly, bright orange rind; flesh deep pink to red, with a closed to slightly open core; seedless in mixed variety block; for fresh market and juice; ripens with Olinda Valencia. **Tree:** medium to large; canopy dense.

Ruby Valencia. Pink-fleshed sweet orange, pigmented with lycopene, for fresh use and juice. **Origin:** Crocodile Valley Estate, Nelspruit, Mpumalanga, South Africa, by D. Solomon. Branch mutation of Olinda Valencia, discovered 1992. South African PBR 20084102; 2 Oct. 2008. **Fruit:** medium to large, 60-80 mm, but tends to overcrop, producing smaller fruit; round; rind bright orange, smooth to slightly pebbly; moderately easy to peel; flesh deep pink to red, with a closed to slightly open core; juice content 49-59%; 10-12 °Brix, TA 1.0-1.4%, SSC/TA ratio 7.2-10.0; seeds 0-3.2 in a mixed block; for fresh market and for juice, for blending with other orange juices to provide a deeper orange color; ripens with other Valencias; hangs well due to firmness and high internal quality. **Tree:** medium to large; dense, similar to other Valencia Late cultivars; production good; suited to warmer districts, where higher lycopene levels result and excessive cropping is less prevalent; trees tend to bear alternately, crop manipulation is required in on-years; fruit tend to crease and split when the crop is heavy; trees and fruit can develop chimeras.

RubyGS. High-flavored, nearly seedless mandarin for fresh market. **Origin:** Dareton, New South Wales, Australia, by G. Sanderson. Mutation of Daisy mandarin, induced from two irradiations of budwood, in 1999 and 2006. USPP 30,662; 9 July 2019. **Fruit:** height 37 mm, diameter 68 mm, 150 g; shape flattened, no neck, truncate at distal end with slight depression; rind orange-red (N30C), medium glossy, thickness 4.38 mm; ease of peeling moderate to easy; segments 11-13; membranes fine and weak; ripens ~4 weeks after Daisy, mid-July to mid-August in southern hemisphere; seed count <1; for fresh market; ships and stores very well. **Tree:** vigorous, same as Daisy; growth habit sprawling and open with first production in 2nd year from planting, becoming more spherical and drooping in subsequent years; tends to alternate bear, especially if fruit is held late on tree.

Shahani Red. Red-fleshed navel orange, with few or no seeds, excellent flavor and fragrant, pleasant aroma. **Origin:** probable bud sport of Washington Navel discovered by F. Shahani in Southern California; selected by T. Siebert-Wooldridge, D. Karp, and T. Kahn 2008. In therapy at CCPP as VI 969; budwood not yet available. **Fruit:** spheroid; rind smooth with varying amount of red blush and red internal flesh pigmentation from anthocyanins; navel present; mean seed number 1.7 ± .4; flavor excellent, 15.0 ± 0.2 °Brix, TA 0.80%, SSC/TA ratio 20.0 ± 0.4; juice content 45.5% ± 0.9; 157.2 g ± 7.2 in mid-February 2014-2018 in Riverside, CA; matures January-April in Riverside. **Tree:** larger than standard Washington navel orange at the same age and on the same rootstock (Carrizo and C-35 citrange), but with more open growth habit.

Sonet. Early-ripening, easy-peeling, low-seeded mandarin with firm fruit that does not puff easily, and better flavor than satsuma in its season. **Origin:** Agricultural Research Council, Addo, Eastern Cape, South Africa, by J.E. Miller, N.K. Combrink, and J.G.J. Maritz. Miho Wase satsuma O.P.; likely pollen parents Nova, Ellendale, or Novelty; crossed 1996. USPP 27,249; 11 Oct. 2016. **Fruit:** height 42 mm; diameter 65–85 mm; 83 g; obloid, satsuma-like, but with no puffing; rind color yellow-green (RHS 15A–17A) to yellow-orange (RHS 21A–23A), smooth, medium glossy, thickness 1.5–2.0 mm, easy to peel; oiliness dry to medium; segments 10–12; core open; flesh orange to dark orange (RHS 23A–24A), texture fine; juicy, juice content on Carrizo rootstock 59.5%; flavor good, mandarin-like, 9.8–12.6 °Brix, TA 1.05–1.34%, SSC/TA ratio 9.0–12.6; seeds 0–3 in solid blocks, more in mixed blocks; for fresh use; ripens early, end March to mid-April in Eastern Cape; fruit stored and shipped at 4 °C keep for up to 6 weeks, optimal protocols for degreening and waxing required for extension of shelf life. **Tree:** vigor low; compact and satsuma-like with a clementine-like leaf shape; growth habit spreading; precocious and heavy bearing, no alternate bearing observed; compatible with Carrizo and Troyer citrange, and Swingle citrumelo.

Summer Prim. Lemon ripening ~6 months after standard cultivars. **Origin:** Murcia, Spain, by J.A. Gómez Marin. Spontaneous tree mutation of Primofiori (syn. Fino) lemon, discovered 2005. USPP 28,236; 1 Aug. 2017. **Fruit:** length 75 mm, diameter 55 mm; elongated, neck absent, nipple medium size; rind yellow-green (RHS 150D), smooth, moderately glossy, thin; flesh yellow (RHS 8C), juicy; seeds 6–10; for fresh market, for beverages and cooking; late season, end of March to early July in Murcia; degreens well; resistance to long-distance shipments and shelf life good. **Tree:** diploid; vigorous; growth habit dense and spreading; thorns present in moderate quantity, short, ~6 mm; production high; parthenocarpic.

Tamdo No. 3. Seedless, easy-peeling mandarin ripening in mid-February. **Origin:** Citrus Research Institute, National Institute of Horticultural & Herbal Science, Seogwipo, Jeju Island, South Korea, by J.H. Park, S.H. Yun, S.W. Koh, Y.H. Choi, D.H. Lee, I.U. Yang, and C.W. Chae. Kiyomi tangor × Sunburst mandarin; selected 2010; tested as Jegamna-27. USPP 29,300; 22 May 2018. **Fruit:** height 59.7 mm, width 89.4 mm, 171–291 g; oblate; rind medium orange (RHS 30D), smooth, moderately glossy, thickness 2.7 mm, peels easily; flesh medium orange (RHS 25A); 13.7 °Brix, TA 0.79%, SSC/TA ratio 17.34; typically seedless; ripens mid-February in Seogwipo. **Tree:** diploid; vigorous; growth habit upright, similar to Kiyomi, thorns none or sparse; blooms late May, parthenocarpic.

Tamdori. Mandarin ripening in mid-February in protected structures. **Origin:** Citrus Research Institute, National Institute of Horticultural & Herbal Science, Seogwipo, Jeju Island, South Korea, by J.H. Park, S.W. Koh, S.M. Park, M.J. Kim, Y.H. Choi, S.H. Yun, and I.U. Yang. Kiyomi tangor × Fortune mandarin; crossed 2005; planted 2006; selected 2013; tested as Jegamna-40. USPP 31,288; 31 Dec. 2019. **Fruit:** height 65.6 mm, width 70.7 mm, 168.9 g; rind medium orange, rough, thickness 2.3 mm, easy to peel; flesh orange; 14.6 °Brix, TA 1.17%, SSC/TA ratio 12.46; seeds 10.8; for fresh use; starts coloring late October, finishes coloring late December, ripens mid-February in Jeju. **Tree:** vigor strong; growth habit upright, similar to Kiyomi; blooms late May; pollen fertile; parthenocarpic; yield ~2,500–3,000 kg/4 ha; typically planted in protected environments in Korea; intermediate in resistance to citrus scab, citrus canker, and melanose (*Diaporthe citri*).

Tamnaneunbong. Late-ripening mutation of Shiranui mandarin hybrid. **Origin:** Citrus Research Institute, National Institute of Horticultural & Herbal Science, Seogwipo, Jeju Island, South Korea, by J.H. Park, S.H. Yun, D.H. Lee, S.W. Koh, H.J. An, and I.U. Yang. Mutation resulting from embryo sac culture of Shiranui in 2000. USPP 31,289; 31 Dec. 2019. **Fruit:** 237–365 g; rind and flesh color and texture same as Shiranui; easily peeled; 17.5 °Brix, TA 1.51%

(compare Shiranui, 1.22%); seedless; for fresh market; fruit starts coloring late October, ripens late March (compare Shiranui, early October and early March). **Tree:** vigor strong; growing habit upright; in Korea, intended to be protected against cold; intermediate in resistance to citrus scab and citrus canker; susceptible to melanose.

Tift2-16. Low-seeded mutation of Ichang lemon valuable as a backyard fruit tree and for landscaping. **Origin:** University of Georgia, Tifton, by W.W. Hanna and B.M. Schwartz. Gamma irradiation-induced mutation from seed of Ichang lemon (*Citrus wilsoni* or *C. ichangensis* × *C. maxima*) 2003; selected 2009; grafted 2010. USPP 30,815; 20 Aug. 2019. **Fruit:** height 73–81 mm, diameter 75–95 mm, 179–372 g; round, somewhat flattened at stalk end, neck absent; rind green-yellow, thick, with medium oiliness, smooth, medium glossy, adherence to flesh medium; segments 10–11, core diameter small; flesh greyed-yellow (RHS 160D), juicy; 7.5–12.2 °Brix, acidity medium; seeds 5–8; for fresh consumption and for use in landscaping/backyard plantings; ripens end of October to end of December in Tifton. **Tree:** vigorous; growth habit sparse and spreading; length of thorns 11–33 mm; relatively disease-free.

Tift3-46. Low-seeded mandarin valuable as a backyard fruit tree and for landscaping. **Origin:** University of Georgia, Tifton, by W.W. Hanna and B.M. Schwartz. Gamma irradiation-induced mutation from seed of Changsha mandarin 2003; grafted 2008. USPP 30,816; 20 Aug. 2019. **Fruit:** height 40–49 mm, diameter 24–33 mm, 49–105 g; round, somewhat flattened at stalk end; rind greyed orange (RHS 173C), texture smooth to moderately rough, moderately glossy, thickness medium, adherence to fruit medium; segments 10–12; fruit core diameter large; flesh greyed orange (RHS 172B); juicy; 10–16 °Brix; seeds 1–5; for consumption and for backyard/landscaping plantings; season end of October to end of December in Tifton. **Tree:** highly vigorous; dense; growth habit spreading.

TR-1. Grapefruit with red rind, red flesh, mild flavor, and reduced bitterness. **Origin:** Texas A&M University, Weslaco, by E.S. Louzada and H.S. del Rio. Rio Red grapefruit bud sport; discovered 2004. USPP 31,702; 28 Apr. 2020. **Fruit:** 466.96 g; spherical to oblate; rind vivid reddish orange (RHS 34A–C); rind texture smooth, thickness 5.5 mm; ease of peeling moderate to difficult; albedo light yellowish pink; segments 12.2, membranes moderately tough; internal color vivid red (RHS 45A–D); juice sac and juice color moderate red (RHS 180C–D); 9.15 °Brix, SSC/TA ratio 14 in January; seeds 2.75, polyembryonic; for fresh market, juice and segments; ripens midseason-late, October–March. **Tree:** vigorous; growth habit compact; canopy dense; bearing habit inside canopy.

UF 11-1-24. Nearly seedless, midseason sweet orange with higher soluble solids/box ratio and juice color than Midsweet orange. **Origin:** University of Florida, Lake Alfred, by F.G. Gmitter, Jr. Bud sport mutation induced by irradiation of Midsweet sweet orange budwood 1991; planted 1992 near Venus, FL. USPP 27,777; 14 Mar. 2017. **Fruit:** width 65–74 mm, length 64–74 mm; round; rind yellow-orange (RHS 20B–20A), slightly pebbled, thickness 3.0–4.0 mm; segments 11–12; flesh yellow orange (RHS 20B), soft, juicy, 12.8 °Brix, TA 0.75%, SSC/TA ratio 19.7; seeds 0–4 (vs. 10–15 for Midsweet), polyembryonic; harvest season mid-January to mid-March, but holds well on the tree later; primarily for juice. **Tree:** diploid; large; very vigorous; canopy very dense; growth habit both upright and lateral; yield on Carrizo rootstock 176.4–198.8 kg/tree.

UF 1351. High-quality midseason mandarin with significant tolerance to Huanglongbing. **Origin:** University of Florida, Lake Alfred, by F.G. Gmitter, Jr. LB8-9 mandarin hybrid × Murcott tangor; crossed 1991; planted 1993. USPP 31,290; 31 Dec. 2019. **Fruit:** height 55–65 mm, diameter 62–72 mm; oblate to spheroid; rind orange (RHS N25C–N25B); rind firmness medium, thickness 2.5–3.0 mm; easy to peel; segments 12–13; flesh orange (RHS N25A), juicy, soft; juice moderately acidic, 12.9 °Brix, TA 0.87%, SSC/TA ratio 14.8; seeds 5–15, monoembryonic, cotyledons greyed-green;

ripens mid-November to late December for commercial harvest, holds on the tree in good condition through March for home garden use. **Tree:** diploid; large; very vigorous, canopy quite dense; growth habit round and drooping; exhibits tolerance to Huanglongbing; tolerant to *Alternaria* brown spot (*Alternaria alternata*).

UFGlow. Seedless, easy-peeling, early-maturing mandarin adapted to north central Florida and similar climates. **Origin:** University of Florida, Gainesville, by J.X. Chaparro and W.B. Sherman. [(Clementine mandarin × Orlando tangelo) × O.P.] × Kishu mandarin; selected 2010. USPP 27,581; 24 Jan. 2017. **Fruit:** small, height 45–60 mm, diameter 55–75 mm, 120 g; rind medium-thick, 3–4 mm, orange (Pantone 15-1157); susceptible to sunburn on exposed fruits; peels readily; segments 9–12; flesh orange-apricot (Pantone 15-1153), firm and extremely juicy when ripe; eating quality good, sweet, and slightly acidic, 8–9 °Brix at peak ripeness in mid-October; typically seedless, with small aborted seeds; for fresh use; harvest season mid-October–November in Gainesville, 4 weeks earlier in Indian River district; ripe fruit can be stored for at least 24 d under standard conditions. **Tree:** medium-small; moderately vigorous; canopy dense; self-fertile; very productive annually without alternate bearing, producing ~1 bushel/tree on 5-year-old trees; bears most fruit on shoot terminals; trees in Gainesville have survived freezes of -7.8 °C without damage to small branches or leaves.

US 7650, US 7651, and US 7652. Hybrids for use in breeding sweet-orange-like cultivars. **Origin:** USDA-ARS, Orlando, FL, by C.J. Hearn. Ambersweet × FF-1-30-52 (Wilking × Valencia); crossed 1995-96; selected by R. Driggers and E. Stover 2012; introd. 2017. **Fruit:** US 7650 fruit are similar in size to typical oranges and spherical in shape; US 7651 is half to 2/3 the size of typical oranges and slightly flattened; US 7652 is larger than most sweet oranges, with size and shape similar to many navel oranges; aroma volatiles and general appearance similar to sweet oranges; 12.6–14.0 °Brix, TA 0.8–1.2%; juice color scores 41–42, superior to Valencia; ripen November/December; seeds per fruit when used in controlled crosses have been 15–20 for US 7650 and US 7651, and 7–15 for US 7652; seeds monoembryonic (not apomictic) so that they can be used as seed parents, with all resulting seeds producing hybrids; pollen highly viable. **Tree:** size medium, somewhat smaller than Valencia, Hamlin, and navel; trees appear to be parthenocarpic, as they have set well in screenhouses; healthy trees crop well but are sensitive to Huanglongbing. Most hybrids display good vigor even when crossed with predominantly sweet orange parents, and 66% of their pedigree is from sweet orange over the last three generations, suggesting elimination of some deleterious recessive genes found in sweet orange.

US HoneyCoat. Pink true grapefruit with low seed count, somewhat thick peel, excellent flavor, low acidity, low bitterness, and earlier maturity. **Origin:** USDA-ARS, Orlando, FL; C.J. Hearn irradiated standard Foster grapefruit 1973; initially selected by C.J. Hearn, Leesburg, FL 1984; regenerated from adventitious buds by H. Barrett; selected by E. Stover 2011; tested as Seedless Foster and FF-1-26-51; introd. 2018. **Fruit:** external appearance and flavor like standard pink grapefruit; low acidity and bitterness, 10.4 °Brix, TA 0.90% (standard grapefruit 11.7 °Brix, TA 1.60%); peel smooth, but thicker than standard grapefruit with a pink blush; core somewhat open, like a pummelo; flesh pink, frequently completely seedless and averaging <2 seeds/fruit; ripens mid-October to early January in Leesburg; fruit hold well on tree, but as acidity drops in winter, may become insipid. **Tree:** vigorous; crop load and growth habit similar to other conventional grapefruit cultivars and with similar sensitivity to Huanglongbing; may be somewhat more cold hardy than standard grapefruit, based on anecdotal observations following freeze events, and its early ripening trait permits harvest before risk of fruit freezing.

US Ortanique-LS. Rich-flavored, late-maturing, low-seeded, peelable but not zipper-skin mandarin hybrid. **Origin:** USDA-ARS, Ft. Pierce, FL; J. Chaparro irradiated standard Ortanique budwood 1998; selected by R. Driggers and E. Stover 2011; introd. 2018. **Fruit:** essentially identical to standard Ortanique (which is similar to Temple but later maturing) but slightly smaller, with fewer seeds per fruit (mean of 5 in mixed plantings vs.

15 in standard Ortanique growing nearby); rind pebbled, orange, medium thick, somewhat adherent, removable by hand in chunks; flesh dark orange; flavor rich; ripens January–March. **Tree:** vigor medium; canopy compact; standard Ortanique is self-incompatible and poorly parthenocarpic, so use of solid plantings is not likely to provide both lower seed count and acceptable yields; anecdotally US Ortanique-LS is somewhat tolerant of Huanglongbing, responding favorably to enhanced nutritional therapy.

US Seedless Surprise. White mild grapefruit-like hybrid, low-seeded, early maturing, with excellent flavor, low acidity, and low bitterness. **Origin:** USDA-ARS, Indio, CA, by J. Furr. Pearl tangelo × Red Mexican grapefruit; crossed 1964; seedy progenitor selected in Leesburg, FL by C.J. Hearn 1973; budwood irradiated 1980; tested as Early Sweet, FF1-77-19, USDA 77-19, and 77-19; introd. 2017. **Fruit:** external appearance like standard white grapefruit, with a smooth yellow peel of medium thickness; flesh cream-yellow with somewhat irregular segment size; flavor grapefruit-like but mild with low acidity and no bitterness in flesh, segment walls, or albedo. **Tree:** vigor medium; canopy spreading; performed better on Carrizo and sour orange than on Cleopatra rootstock; reportedly somewhat more cold-tender than conventional grapefruit; yields of 8–10-year-old trees ranged from 116–270 kg/tree at 2 locations, with fruit averaging 350–500 g and containing 0–9 polyembryonic seeds, but averaging fewer than 5 seeds/fruit; in Florida fruit reach initial market maturity in late September when the rind is still green in color; fruit displays a number of postharvest issues, it is sensitive to ethylene exposure in the degreening process similar to Oroblanco, has a tendency to stem-end rot (*Lasiodiplodia theobromae*) and may require fungicide treatments to prevent postharvest decay; anecdotally juice develops after-bitterness, making it a poor choice for juice production; Huanglongbing sensitivity is similar to standard grapefruit.

US SunDragon. Sweet-orange-like hybrid including *Poncirus* in its pedigree, with remarkable tolerance to Huanglongbing. **Origin:** USDA-ARS, Leesburg, FL, by J. Chaparro. FF-5-14-96 × FF-1-11-7; crossed 1999; pedigree is 1/8 *Poncirus*; selected Fort Pierce, FL 2011 by R. Driggers and E. Stover; tested as FTP-6-49-96, USDA4996, and Gnarlyglo; introd. 2018. **Fruit:** 200–475 g; often slightly pyriform; rind highly pebbled, dark orange, with green retained at stem end; flesh light orange with relatively few seeds (typically 5–10 per fruit); texture slightly crisp; flavor mild, orange-like, with a distinctive “zesty” note, ~11 °Brix, acidity low; color score low, 33–34; if harvested early, fruit often have a slight off-taste (sometimes described as soapy) to many but not most consumers, but when fully mature the off-taste is no longer present; peelable by hand similar to a California navel orange; ripens October–January in Florida. **Tree:** vigorous; canopy spreading open, somewhat leggy branches; in a replicated Huanglongbing-exposed trial of 27 different genotypes trees had the second largest mean canopy volumes; leaves are unifoliate, extremely dark green compared to surrounding trees and distinctly v-shaped when viewed longitudinally down the mid-rib; among the most Huanglongbing-tolerant citrus types in tests; useful as a parent for further citrus breeding, and is best as a pollen parent due to small number of seeds per fruit; notably this is the first *Poncirus* hybrid released for use as a scion cultivar, though there have been many released as rootstocks and a few as breeding parents.

US Superna. Extraordinarily richly flavored, nearly seedless mandarin hybrid that peels easily and bears modest crops in California, but bears unacceptably poor crops in Florida. **Origin:** USDA-ARS, Leesburg, FL, by C.J. Hearn. Lee × Nova; crossed 1966; tested as 6-13-44, 88-2, USDA 88-2, and Lee × Nova; introd. 2019. **Fruit:** size medium to very large for a mandarin (typically 90–125 g in California, larger in Florida but low crop load); mandarin- to orange-like in appearance; rind somewhat pebbly dark orange to orange-yellow, medium thick; frequently but not always has a blossom-end “navel” from secondary fruit development; fruit peel easily in California, but less so in Florida; flesh medium firm, juicy, orange, with no or few seeds (<1 seed/fruit); taste rich and distinctive, among the most flavorful and sweetest citrus; ripens late October to mid-December. **Tree:** vigor medium; canopy unusually spreading for a mandarin-type; appears to be relatively cold hardy;

trees in Florida crop very poorly, in California trees produce a modest but acceptable crop; somewhat tolerant to Huanglongbing.

Variegated Cara Cara. Variegated sport of Cara Cara navel orange with more intense pink flesh but less juicy, few seeds, and good flavor, low yields due to variegation. **Origin:** University of California, Riverside, by O. Bier. Bud mutation of Cara Cara in UCR Citrus Variety Collection, selected 2006. In therapy at CAPP; budwood not yet available. **Fruit:** 156 g; spheroid; rind smooth; immature rind pale yellowish with green striping; mature rind light yellowish orange to subtly pink-blushed, with occasional darker orange, slightly raised stripes; flesh reddish pink, with more intense lycopene pigmentation than Cara Cara; navel small; flavor good, very sweet and fruity, 14.08 °Brix, TA 1.0%, SSC/TA ratio 14.7; seeds 3.6; juice content 49.0%; ripens December-January in Riverside. **Tree:** smaller with more dense growth habit than standard Washington navel orange on the same rootstock (Carrizo and C-35 citrange); leaves strongly variegated, dark green, lighter shades of green, and cream.

Villa11 (Late Cara Cara). Pink-fleshed, lycopene-pigmented sweet orange, ripening 6 weeks after Kirkwood Red. **Origin:** Leeton, New South Wales, Australia, by F. Mercuri, D. Mercuri, F. Nardi, M. Nardi, and J. Nardi. Whole tree mutation of Cara Cara, discovered 2015. Australian PBR 2015/248; 2 Oct. 2015. **Fruit:** small to medium; navel very small; rind medium orange, texture smooth to medium, thickness thin to medium; flesh juicy, orange red, pigmented with lycopene; 11.45 °Brix, TA 1.06, SSC/TA ratio 12.3; ripens late, 6 weeks after Kirkwood Red. **Tree:** growth habit drooping.

WG 02. Easy-peeling, low-seeded mandarin that maintains moderately high acid levels. **Origin:** Winter Haven, FL, by B. Roe. Dancy mandarin × Honey mandarin; crossed 2000; selected 2006. USPP 25,170; 16 Dec. 2014. **Fruit:** height 50-53 mm, width 67-70 mm, 110-180 g, average 145 g; oblate; rind near orange-red (RHS 33B), fairly thin, 2-3 mm, fairly smooth, non-oily; peels cleanly, starts somewhat in pieces, but finishes easily; segments 9-10, core open; flesh near orange-red (RHS N30B); 9.6 °Brix, TA 0.83%, SSC/TA ratio 11.56, maintains moderately high acid levels; seeds <2, typically aborted; ripens November-December; storage life minimum 14 d at 2 °C. **Tree:** vigorous; growth habit spreading; limbs easily weep under heavy fruit load; fruits throughout canopy.

WG32. Highly flavored mandarin with distinctive stem end nipple. **Origin:** Winter Haven, FL, by B. Roe. Lee mandarin × unnamed proprietary mandarin; crossed 2000; selected 2006. USPP 27,440; 6 Dec. 2016. **Fruit:** height 58-64 mm, width 70-77 mm, 100-246 g; oblate, pronounced stem end nipple; rind orange (RHS N25A), slightly bumpy with oil glands; rind adherence moderate, loose in largest fruit, tight in lower half of smaller fruit; segments 9-11; flesh orange (RHS N25B); juicy; flavor high, both sweet and tart, 12.5 °Brix, TA 1.0%, SSC/TA ratio 12.5; seeds 10-12; ripens late October to November; ripe fruit is tender and can easily bruise at 50% color break; stores >60 d at 2 °C, fruit does not dry out. **Tree:** growth habit upright with weeping and flexible limbs; thorns minimal, nearly absent; crops very heavily, with a range of fruit sizes; appears not to be susceptible to *Alternaria*.

Witkrans (Witkrans Late, Cambria 1). Late-maturing navel orange of good size and internal quality. **Origin:** Witkrans Nursery, Boshoeck, North West Province, South Africa, by J.-C. Grobler. Mutation of Palmer navel orange. South African PBR 20053324; 22 Aug. 2005. **Fruit:** medium to large, diameter 68-85 mm; round to ovoid; firm; rind deep orange, smooth; navel closed; flesh deep orange; 10-14 °Brix, TA 0.6-0.9%, SSC/TA ratio 13-17; 48-60% juice; seedless; for fresh market; matures late, with or 1 week after Royal Late, 2-3 weeks after Lane Late; production comparable to Royal Late. **Tree:** smaller and more compact than Palmer; productivity precocious, high, comparable to Royal Late; compatible with Troyer and Carrizo citrange, Swingle citrumelo, rough lemon and Volkameriana rootstocks.

Witkrans Late. See Witkrans.

CITRUS ROOTSTOCKS

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UFR-1. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent Cleopatra mandarin+Argentine trifoliate orange; tested as Orange #3. USPP 27,277; 18 Oct. 2016. **Plant:** tetraploid; medium-large; moderately vigorous; canopy moderately dense, obloid; growth habit both upright and lateral. **Rootstock performance:** seeds 4-16, mostly <10, but produces adequate nucellar seed for standard nursery propagation practices; scion trees grow quickly but remain small and thus suitable for use in high density plantings; limited data indicate UFR-1 imparts to scions good productivity and fruit quality; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; tolerant to the Diaprepes root weevil (*Diaprepes abbreviatus*)/*Phytophthora* complex in greenhouse tests.

UFR-2. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent Cleopatra mandarin+Argentine trifoliate orange; tested as Orange #4. USPP 27,742; 7 Mar. 2017. **Plant:** tetraploid; size medium; vigorous; canopy quite dense, round; growth habit mostly lateral, with upright growth on canopy top. **Rootstock performance:** seeds 20-30, highly polyembryonic, amenable to standard nursery propagation practices; limited data indicate UFR-2 imparts to scions good productivity and fruit quality; imparts to scions a reduced frequency of Huanglongbing infection and reduced symptoms once infected; produces medium-sized trees in Florida, comparable to trees on Swingle.

UFR-3. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent Cleopatra mandarin+Argentine trifoliate orange; tested as Orange #15. USPP 27,744; 7 Mar. 2017. **Plant:** tetraploid; size medium; vigorous; canopy quite dense, obloid; growth habit both upright and lateral. **Rootstock performance:** seeds 5-23, mixture of polyembryonic and monoembryonic, seedlings must be carefully rogued in nursery; suitable for high density plantings; limited data indicate UFR-3 imparts to scions good productivity and fruit quality; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program.

UFR-4. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent Cleopatra mandarin+Argentine trifoliate orange. USPP 27,745; 7 Mar. 2017. **Plant:** tetraploid; size medium; vigorous; canopy quite dense, rounded; growth habit mostly lateral, with upright growth on the top. **Rootstock performance:** seeds

18-23, occasionally fewer, polyembryonic; scion trees grow quickly but remain medium in size, comparable to trees grafted to Swingle citrumelo rootstock; imparts to scions good productivity and fruit quality; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; tolerant to *Diaprepes/Phytophthora* complex in greenhouse tests; good salinity tolerance at one location, but less flooding tolerance at another location.

UFR-5. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent Succari acidless sweet orange+Argentine trifoliate orange. USPP 27,298; 25 Oct. 2016. **Plant:** tetraploid; medium-large; moderately vigorous; canopy moderately dense, round; growth habit both upright and lateral. **Rootstock performance:** seeds 24-34, polyembryonic, suitable for standard nursery propagation practices; scion trees grow quickly and produce medium-sized trees, comparable to scions grafted to Swingle citrumelo rootstock; imparts to scions good productivity and very good fruit quality; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; tolerant to *Diaprepes/Phytophthora* complex in greenhouse tests.

UFR-6. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid somatic hybrid produced by protoplast fusion. Changsha mandarin was the embryogenic suspension culture parent, the source of parental protoplasts; and 50-7 trifoliate orange was the leaf parent. USPP 27,276; 18 Oct. 2016. **Plant:** tetraploid; small; moderately vigorous; canopy moderately dense, obloid; growth habit both upright and lateral. **Rootstock performance:** seeds 30-37, highly polyembryonic, amenable to standard nursery propagation practices; grafted sweet orange trees have precocious bearing and generally do not exceed 3 m, suitable for high density plantings; imparts to scions good productivity and fruit with high SSC; reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; exhibits good cold hardiness; citrus blight tolerance appears to be better than Swingle citrumelo.

UFR-15. Citrus rootstock for improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Hirado Buntan pummelo × Cleopatra mandarin; tested as 46×20-04-37. USPP 27,275; 18 Oct. 2016. **Plant:** diploid; size medium; moderately vigorous; canopy quite dense, obloid; growth habit both upright and lateral. **Rootstock performance:** seeds 20-23, occasionally fewer, partially polyembryonic, seedling trees need to be carefully rogued to remove zygotics; grafted trees grow quickly and are vigorous, producing medium-large trees, comparable to trees on sour orange rootstock; trees do not begin cropping until 4th year; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program.

UFR-16. Citrus rootstock for improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Hirado Buntan pummelo × Shekwasha mandarin. USPP 27,743; 7 Mar. 2017. **Plant:** diploid; medium-large; vigorous; canopy quite dense, rounded; growth habit both upright and lateral. **Rootstock performance:** seeds 15-20, occasionally fewer, partially polyembryonic, seedling trees need to be carefully rogued to remove zygotics; grafted trees grow quickly and are vigorous, producing medium-sized trees, smaller than trees on UFR-15 rootstock; trees do not begin cropping until 4th year; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; tolerant to *Diaprepes/Phytophthora* complex in greenhouse tests.

UFR-17. Allotetraploid citrus rootstock for tree size control and improved disease tolerance. **Origin:** University of Florida, Lake Alfred, by J.W. Grosser. Allotetraploid zygotic hybrid derived from a conventional cross of two somatic hybrids previously produced by protoplast fusion: somatic hybrid seed parent Nova mandarin hybrid+Hirado Buntan pummelo (zygotic seedling), and somatic hybrid pollen parent sour orange+Carrizo citrange; tested as Green #2. USPP 28,091; 13 June 2017. **Plant:** tetraploid; size medium; vigorous; canopy quite dense, obloid; growth habit both upright and lateral. **Rootstock performance:** seeds 18-26, mostly polyembryonic; scion trees grow quickly but remain small-medium-sized and thus suitable for use in high density plantings; limited data indicate UFR-17 imparts to scions good productivity; imparts to scions reduced frequency of Huanglongbing infection and reduced symptoms once infected, when grown with enhanced nutrition program; has shown good cold tolerance and performs well on flatwoods soils.

US SuperSour 1. Rootstock imparting superior fruit productivity, good tree health, and good fruit quality to sweet orange trees infected with Huanglongbing. **Origin:** USDA-ARS, Ft. Pierce, FL, by K.D. Bowman. Hirado Buntan seedling pummelo × Cleopatra mandarin; crossed 1997 at A.H. Whitmore Foundation Farm, Groveland, FL; tested as BS03-H9-8 and US-1691, with an original source tree identified as FT05-198; released 2018. **Plant:** diploid. **Rootstock performance:** suitability for uniform apomictic seed propagation has not been evaluated; cuttings or micropropagation recommended for propagation; 39% of single node cuttings rooted and grew to make healthy nursery liners; cumulative yield of Hamlin 36-38% greater than on sour orange, 8-10% greater than on Swingle; cumulative yield of Valencia 41% greater than on sour orange, 44% greater than on Swingle; fruit quality of Hamlin and Valencia, including % juice, juice color, TSS, % acid, and Brix/acid ratio, similar or superior to fruit on sour orange and Swingle; tree health equal or better than on Swingle, sour orange, Cleopatra, and Ridge, when trees are heavily affected by HLB.

US SuperSour 2. Rootstock imparting superior fruit productivity, good tree health, and good fruit quality to sweet orange trees infected with Huanglongbing. **Origin:** USDA-ARS, Ft. Pierce, FL, by K.D. Bowman. Benecke trifoliate orange × (Chinotto sour orange × *Citrus ichangensis*); crossed 2000 at A.H. Whitmore Foundation Farm, Groveland, FL; planted 2001; tested as BS00-AI-8 and US-1777, with an original source tree identified as FT06-76; released 2018. **Plant:** diploid. **Rootstock performance:** suitability for uniform apomictic seed propagation has not been evaluated; cuttings or micropropagation recommended for propagation; 52% of single node cuttings rooted and grew to make healthy nursery liners; cumulative yield of Hamlin 92% greater than on sour orange, 53% greater than on Swingle in one trial, similar in another; fruit quality of Hamlin, including % juice, juice color, TSS, % acid, and Brix/acid ratio, similar or superior to fruit on sour orange and Swingle; tree size, health, and survival similar or superior to trees on Swingle, sour orange, Cleopatra, and Ridge, when trees are heavily affected by HLB.

US SuperSour 3. Rootstock imparting superior fruit productivity, good tree health, and good fruit quality to sweet orange trees infected with Huanglongbing. **Origin:** USDA-ARS, Ft. Pierce, FL, by K.D. Bowman. Sunki mandarin × US-802 (Siamese pummelo × Gotha Road trifoliate); crossed 2006 at A.H. Whitmore Foundation Farm, Groveland, FL; tested as BS06-II-19 and US-2152, with an original source tree identified as FT13-032. **Plant:** diploid. **Rootstock performance:** suitability for uniform apomictic seed propagation has not been evaluated; cuttings or micropropagation recommended for propagation; 82% of single node cuttings rooted and grew to make healthy nursery liners; cumulative yield of Valencia 139% greater than on sour orange, 69% greater than on Swingle; fruit quality of Valencia, including % juice, juice color, TSS, % acid, and Brix/acid ratio, similar or superior to fruit on sour orange and Swingle; tree size, tree health, and tree survival equal or better than on Swingle, sour orange, Cleopatra, and Ridge, when trees are heavily affected by HLB.

ELDERBERRY

Patrick L. Byers, Webster County Extension University of Missouri Extension, Marshfield, MO

AggieBlue™ Rendezvous. See BL-North.

Berry Hill. Hardy, uniformly ripening berries, suited for cold climates. **Origin:** Greensboro, VT, by L. Hill. Chance American elderberry seedling. **Fruit:** clusters large; edible; purple-black; ripens uniformly in late summer. **Plant:** vigorous; growth habit spreading; cold hardy USDA Zone 3.

BL-North (AggieBlue™ Rendezvous). Blue fruited, adapted to the high-elevation valleys of the U.S. Intermountain West. **Origin:** Utah State University, Logan, by T. Maughan, B.L. Black, and L.A. Rupp. Vegetative clone of wild material selected by B. Willis in 2012; introd. 2019. Parent plant was found at 1815 m on soil pH of 7.9. **Fruit:** clusters large, 460 g; skin powder blue; quality high; ripens uniformly in September-October (at 1220-1520 m elev.). **Plant:** height 1.6-3.0 m, width 1.5-2.7 m; growth habit upright; blooms June; better adapted to alkaline soils than the common European cultivars that have been tested in the region.

Coomer. Hardy, uniformly ripening berries, suited for cold climates. **Origin:** Greensboro, VT, by L. Hill. Chance American elderberry seedling. **Fruit:** clusters large; edible; purple-black; ripens uniformly in late summer. **Plant:** vigorous; growth habit upright; cold hardy USDA Zone 3.

Goodbarn. Hardy, vigorous, and productive, suited for cold climates. **Origin:** Rochester, NH, by E. Meador. Chance American elderberry seedling. **Fruit:** clusters dangling; edible; berries smaller; purple-black; ripens late summer. **Plant:** vigorous; growth habit spreading; apparently self-fertile; cold hardy USDA Zone 3.

Pocahontas. High-yielding American elderberry (*Sambucus nigra* subsp. *canadensis*) well-adapted to midwestern U.S. **Origin:** University of Missouri, by A.L. Thomas, P.L. Byers, and S.E. Sargent. Collected from the wild in 2014 in Pocahontas, AR, by R. Starnes, Diamond City, AR; introd. 2019. **Fruit:** size medium, 70 mg; dark purple; high quality, TSS 11.12 °Brix, pH 4.89, titratable acidity 0.395 g/100 ml citric acid equivalents; ripens late, ~10 d after Bob Gordon. **Cyme:** very large; ripens uniformly. **Plant:** vigorous; very large, 1.3-1.8 m; growth habit strongly upright; bloom time average; production very high, consistent.

FIG

John E. Preece, USDA-ARS, National Clonal Germplasm Repository, Davis, CA

David Karp, Dept. of Botany & Plant Sciences, University of California, Riverside, CA

Champagne (Golden Celeste). Medium-size, common type, yellow, with tan to caramel flesh. **Origin:** Louisiana State University, Baton Rouge, by E.N. O'Rourke. Celeste × C1; crossed 1955; selected 1959; tested as L55-13-22; released 2010. **Fruit:** common type; size medium, diameter 30-40 mm, 23 g; eye partially closed; yellow with gold to caramel flesh; good quality, 15.2 °Brix; ripens over a 15-day period beginning the first week of July in Baton Rouge. **Tree:** growth habit upright, pyramid-shaped; foliage cover sparse; leaves palmate, with 5 distinct lobes; somewhat resistant to fig leaf rust (*Cerotelium fici*) and leaf spot (*Pseudocercospora fici*).

Giant Celeste. See Tiger.

Golden Celeste. See Champagne.

Honey King®. See S-49.

Little Miss Figgy (Majoam). Dwarf common type with dark purple skin and strawberry pulp, suited for growing in containers. **Origin:** Ridgeville, SC, by M. Nobles. Violette de Bordeaux branch mutation; discovered 2010; propagated 2014. USPP 27,929; 25 Apr. 2017. **Fruit:** length 4 cm, diameter 5 cm; obovate, without neck; ostiole width 1.3 mm; skin firm and satiny, dark purple; bloom, longitudinal ribs and skin cracks absent; pulp fine, strawberry color (RHS 184D), sweet; breba crop present April to mid-June, main crop present early September to early November, in South Carolina. **Tree:** compact, dwarf, upright, with very short internodes between lateral branches; height and width ~0.91 m; leaves deeply lobed, dark green; propagation by tissue culture preferred; highly productive; cold hardy USDA Zone 7.

Little Ruby. Compact, cold hardy plant with medium size, common-type, sweet red fruit, and strawberry-colored pulp. **Origin:** western USA, by D. McGaughy. Selected seedling. **Fruit:** common type; size medium; skin red; flesh strawberry-colored. **Tree:** dwarf, 0.9-1.2 m tall, 0.9-1.2 m wide; selected for patio culture in containers; suitable for bonsai; cold hardy USDA Zone 6 or 7.

LSU Gold. Good quality, large, yellowish-green fruit with pink to light red flesh. **Origin:** Louisiana State University, Baton Rouge, by E.N. O'Rourke. Celeste × L55-13-39; crossed 1959; selected 1961; tested as L59-46-63; released 2004. **Fruit:** large, diameter 37.5-50 mm, 45 g; eye partially open; quality good, 12.2 °Brix; yellowish-green with light red to pink flesh; ripens over a 15-day period beginning the last week of June in Baton Rouge. **Tree:** vigorous; growth habit upright; foliage cover sparse; leaves palmate with 5 distinct lobes.

LSU Purple (Purple Celestial). Medium size, red to dark purple fig with amber to strawberry colored flesh. **Origin:** Louisiana State University, Baton Rouge, by E.N. O'Rourke. Hunt × C1; released 1991. **Fruit:** size medium, length 5-6.4 cm; eye closed; red to dark purple with light amber to light strawberry-colored flesh; flavor excellent, sugars high; ripens main crop July, followed by another crop into December in the deep southern USA. **Tree:** vigorous; growth habit upright.

Majoam. See Little Miss Figgy.

Olympian. Cold hardy tree with large green and purple, sweet, common-type fruit with violet flesh. **Origin:** western USA, by D. McGaughy. Released 2014. **Fruit:** common type; very large; green and purple; flesh violet; sweet; ripens in July and September in the maritime northwestern USA. **Tree:** mature height 1.2-2.4 m; produces two crops; cold hardy to -18 °C, dies back to ground and resprouts at lower temperatures.

O'Rourke. Good quality, very productive, medium size, common-type fruit, tan with golden flesh, red near the center when fully ripe. **Origin:** Louisiana State University, Baton Rouge, by E.N. O'Rourke. Celeste × C1; crossed 1956; selected 1960; tested as L57-11-103; released 2010. **Fruit:** persistent; common type with long stalk, 14.2 mm; size moderate, diameter 30 mm, 20 g; eye slightly open; tan with golden flesh that ripens to red near center; 18.1 °Brix. **Tree:** vigorous; growth habit upright; moderately resistant to freeze damage; leaves palmate with 5-7 lobes; some resistance to fig leaf rust and leaf spot.

Purple Celestial. See LSU Purple.

Ruby Heart™. See S-64.

S-49 (Honey King®). Large, attractive red-purple common type, productive and regular bearer, suited for fresh market. **Origin:** Roseville, CA, by J.F. Doyle. Desert King × 91C caprifig; crossed 2010; propagated 2014. USPP 27,982; 9 May 2017. **Fruit:** persistent; common type. Breba crop: large, 55-70 g; spherical; eye

medium, diameter 4 mm; skin moderately thick, very dark purple; pulp strawberry-red, fine-grained; flavor very good, sweet and rich with a slight acidity; ripens 4-15 June in San Joaquin Valley, California. Main crop: large, 45-95 g, variable in size; spherical; eye small, tight, diameter 0-0.4 mm; skin moderately thick, light red-purple to dark purple; pulp dark strawberry-red, fine-grained; flavor sweet and rich; ripened 27 July 2015 in Traver, CA. **Tree:** medium; growth habit upright to spreading; leaves large, palmately lobed; hardy under normal San Joaquin Valley conditions.

S-64 (Ruby Heart™). Green to yellow skinned common type, excellent size, holds its size well late in the season, suited for fresh market. **Origin:** Roseville, CA, by J.F. Doyle. Desert King × 91C caprifig; crossed 2010; propagated 2014. USPP 27,983; 9 May 2017. **Fruit:** common type; main crop: large, 54-107 g; shape variable, but most frequently oblate; eye small, tight, diameter 0-0.4 mm; skin medium to thick, light yellow-green; pulp deep, bright, strawberry red, uniform and fine-grained; flavor sweet and rich, resembles Calimyrna; ripens 15 July 2015 in Traver, CA. **Tree:** size medium; relatively compact; growth habit upright to upright-spreading; leaves large, palmately lobed; hardy under normal San Joaquin Valley conditions; produces light breba crop.

Sequoia. Medium to large common type with a tight eye and green-yellow skin with reddish-amber pulp. **Origin:** near Clovis, CA, by J. Doyle and L. Ferguson. Tena × D3-1; crossed 1992; selected 1998. USPP 20,038; 26 May 2009. **Fruit:** common type; large to medium, length 96-104 mm, diameter 48-64 mm, 51-110 g; oblique-pyriform; stalk pubescent, short, 3-5 mm long and 5-7 mm thick; ribbing longitudinal; eye diameter 1-2 mm; skin medium to thin, green-yellow with waxy bloom and numerous white flecks; high quality; flesh amber to light strawberry red; ripens early August in central San Joaquin Valley, CA and harvests into fall. **Tree:** vigor medium; growth habit upright to upright-spreading; round topped.

Tiger (Giant Celeste). Good quality, large, common type, brown fruit with yellow to gold flesh. **Origin:** Louisiana State University, Baton Rouge, by E.N. O'Rourke. Celeste × C1; crossed 1957; selected 1961; tested as L57-13-121; released 2010. **Fruit:** large, 30-40 mm diameter, 27.5 g; eye partially closed; tan to brown with darker brown stripe often visible; flesh yellow to gold, with some red near center when ripe; 17.5 °Brix; ripens over a 15-day period beginning first week of July in Baton Rouge. **Tree:** small; growth habit semi-upright; leaves large, palmate with 5-7 lobes; some resistance to fig leaf rust and leaf spot.

Violetta. Brownish-purple, common type with sweet dark red flesh, cold hardy tree. **Origin:** Haag, Germany, by A.P. Baumschule. Whole-tree mutation of unidentified tree, selected 1983. USPP 12,828; 6 Aug. 2002. **Fruit:** common type; large, length 7 cm, diameter 6 cm; skin brownish-purple, non-bitter; flesh sweet, dark red; flavor excellent; ripens early, late July to early August (breba crop) and October (main crop) in Central Europe, 10-15 fruits/lateral stem. Keeps 2-3 d. **Tree:** growth habit upright and rounded with rapid growth; often container-grown; 5-year old plants 2.5-5 m tall, 2 m diameter; crops heavily; tolerant of temperatures to -20 °C.

GRAPE

Christopher L. Owens, IFG, Bakersfield, CA.

Allison®. See Sheegene-20.

Black Eye. Black-fruited, disease resistant, interspecific hybrid. **Origin:** Gangwon Provincial Agricultural Research and Extension Service and Kangwon National University, Chuncheon, South Korea, by Y.S. Park, J.Y. Heo, and S.B. Bang. Muscat Bailey A × *Vitis amurensis* KW-51; tested as GWMA-20; crossed 2004; selected 2010; introd. 2016. South Korean PVP applied for. **Fruit:**

2.9 g; berry attachment strong; black; crack resistant; seeded. **Cluster:** 193 g; ~106 d from flowering to harvest; conical. **Vine:** self-fertile; diploid; vigor moderate; resistant to downy mildew (*Plasmopara viticola*) and botrytis (*Botrytis cinerea*).

Ga. 1-1-48. See Hall.

Great Green®. See Sheegene-17.

Hall (Ga. 1-1-48). Early-season bronze self-fertile muscadine. **Origin:** University of Georgia, Tifton, by P.J. Conner. Fry × Tara; tested and patented as Ga.1-1-48; crossed 2001; selected 2004; introd. 2014. USPP 27,033; 9 Aug. 2016. **Fruit:** 10.6 g; percentage of pedicel scar splits very low; bronze to light yellow. **Cluster:** first harvest end of July in Tifton; first harvest is ~60% of total yield; between 1-4 harvests dependent on uniformity within season. **Vine:** self-fertile; vigor moderate; growth habit drooping lateral branches.

IFG Eighteen (Sweet Nectar®). Midseason red seedless table grape with muscat flavor. **Origin:** IFG, Bakersfield, CA, by D.W. Cain. IFG 01034-069-096 (unreleased) × IFG 01054-082-239 (unreleased); crossed 2004; selected 2005. USPP 25,913; 23 July 2015. **Fruit:** 5.3 g untreated; ovate; red; muscat aroma; seedless. **Cluster:** 978 g; conical; ripens ~4-5 weeks after Flame. **Vine:** highly vigorous; fruitful spurs.

IFG Eleven (Sugar Crisp®). Late-season white seedless table grape. **Origin:** IFG, Bakersfield, CA, by D.W. Cain. IFG 02103-090-033 (unreleased) × IFG 01034-069-026 (unreleased); crossed 2005; selected 2007. USPP 24,551; 19 Dec. 2013. **Fruit:** 8.9 g untreated; narrow elliptic; white; texture crisp; seedless. **Cluster:** 1384 g; conical; ripens ~1 month after Thompson Seedless. **Vine:** vigor moderate; very fruitful; fruitful spurs.

IFG Seventeen (Sweet Joy®). Mid- to late-season black seedless table grape. **Origin:** IFG, Bakersfield, CA, by D.W. Cain. Autumn Royal × unknown pollen parent; crossed 2001; selected 2004. USPP 25,435; 27 Nov. 2014. **Fruit:** 7.8 g untreated; ovate; black; seedless. **Cluster:** 1088 g; broad conical; ripens ~6 weeks after Thompson Seedless. **Vine:** vigor high; very fruitful; fruitful spurs.

IFG Sixteen (Sweet Favors®). Late-season black seedless table grape. **Origin:** IFG, Bakersfield, CA, by D.W. Cain. Autumn Royal × unknown pollen parent; crossed 2001; selected 2004. USPP 25,434; 27 Nov. 2014. **Fruit:** 9.5 g untreated; narrow elliptic; black; seedless. **Cluster:** 2270 g; broad conical; ripens ~1 month after Thompson Seedless. **Vine:** vigor high; very fruitful; fruitful spurs.

IFG Ten (Sweet Globe®). Mid- to late-season white seedless table grape. **Origin:** IFG, Bakersfield, CA, by D.W. Cain. B31-164 × Princess; crossed 2003; selected 2005. USPP 24,583; 19 Dec. 2013. **Fruit:** 7.9 g untreated; ovate; white; crisp texture; seedless. **Cluster:** 900 g; conical; ripens slightly after Thompson Seedless; resistant to browning. **Vine:** vigor high; very fruitful; fruitful spurs.

Itasca. Cold hardy, disease-resistant, interspecific white wine grape. **Origin:** University of Minnesota, St. Paul, by M. Clark, P. Hemstad, and J. Luby. Frontenac Gris × MN 1234; tested as MN 1285; crossed 2002; selected 2009; introd. 2017. USPP 29,847; 20 Nov. 2018. **Fruit:** 1.3 g; round; white. **Cluster:** 145 g; compact, elongated; lower levels of titratable acidity than Frontenac, La Crescent and Marquette, harvest mid- to late September in Minnesota. **Vine:** vigor moderate; yield 5.3 kg/vine; growth habit upright; low incidence of powdery mildew observed in Minnesota with no incidence observed of downy mildew or botrytis; cold hardy to ~ -34.4 °C to -37.2 °C.

Ivory®. See Sheegene-21.

Krissy®. See Sheegene-12.

Magenta®. See Sheegene-3.

Sheegene-3 (Magenta®). Midseason red seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2003. USPP 21,316; 28 Sept. 2010. **Fruit:** ovate; red; seedless; 19.0 °Brix. **Cluster:** 680-795 g; conical; ripens ~3 weeks after Flame in San Joaquin Valley, California. **Vine:** vigor moderate.

Sheegene-12 (Krissy®). Midseason red seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2003. USPP 20,252; 1 Sept. 2009. **Fruit:** 8.5 g; ovate; red; seedless; 20.0 °Brix. **Cluster:** 510-710 g; conical; ripens early August in San Joaquin Valley, California. **Vine:** vigor moderate.

Sheegene-13 (Timco®). Midseason red seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2003. USPP 20,110; 23 June 2010. **Fruit:** 11.3 g; red; seedless; 20.0 °Brix. **Cluster:** 1700 g; conical; compact; ripens ~ late August to early September in San Joaquin Valley, California. **Vine:** vigor moderate.

Sheegene-20 (Allison®). Late-season red seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2003. USPP 23,125; 23 Oct. 2012. **Fruit:** medium to large; ovate; red; seedless; 20.0 °Brix. **Cluster:** 510 g; conical; compact; ripens late September in San Joaquin Valley, California. **Vine:** large; vigorous.

Sheegene-17 (Great Green®). Midseason white seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2003. USPP 28,270; 15 Aug. 2017. **Fruit:** 5.6 g; ovate; white; seedless; 18.0 °Brix. **Cluster:** 965 g; conical; compact; ripens late August in San Joaquin Valley, California. **Vine:** vigor moderate.

Sheegene-21 (Ivory®). Midseason white seedless table grape. **Origin:** Sheehan Genetics, by T.P. Sheehan, Fresno, CA. Princess × Red Globe; crossed 2000; selected 2006. USPP 23,837; 20 Aug. 2013. **Fruit:** 2.3 g; ovate; white; seedless; 20.0 °Brix. **Cluster:** size medium; shape semi-saucer; compact; ripens late July in San Joaquin Valley, California. **Vine:** large; vigorous.

Sugar Crisp®. See IFG Eleven.

Sujeong. White triploid seedless table grape. **Origin:** Kangwon National University, Chuncheon, South Korea, by J.Y. Heo and S.M. Park. Kyoho × Thompson Seedless; crossed 2000; selected 2006. South Korean PVP 2826; 14 July 2009. **Fruit:** 2.0 g untreated; ~5.5 g following GA₃ application; elliptical; white; parthenocarpic; seedless. **Cluster:** ~80-85 g untreated; conical; harvested late September in Chuncheon. **Vine:** triploid; pollen-sterile; moderately resistant to powdery mildew and botrytis.

Sunpreme. White seedless raisin grape that dries naturally on the vine without cane-cutting. **Origin:** USDA-ARS, Parlier, CA, by D.W. Ramming and R.E. Tarailo. A4-162 × C82-88 (both unreleased selections from the USDA breeding program); selected 2001. USPP 26,527; 22 Mar. 2016. **Fruit:** ~2.3 g fresh weight; 0.7 g dried to moisture content of less than 13%; white; seedless; flavor slightly fruity. **Cluster:** ~184 g; conical; compactness moderate; berries begin to wilt naturally mid-July in San Joaquin Valley, California. **Vine:** vigor moderate.

Sweet Favors®. See IFG Sixteen.

Sweet Globe®. See IFG Ten.

Sweet Joy®. See IFG Seventeen.

Sweet Nectar®. See IFG Eighteen.

Timco®. See Sheegene-13.

KIWIBERRY

A. Ross Ferguson, The New Zealand Institute for Plant & Food Research, Auckland, New Zealand

Hortgem Rua. Female, green-skinned, green-fleshed *Actinidia arguta* × *A. melanandra* hybrid becoming partly purple-red on ripening. **Origin:** Horticulture and Food Research Institute of New Zealand, Auckland, by M.A. McNeilage, R.A. Beatson, and E.A. MacRae. AAME01_01 × AAME01_05; crossed 1987 by M.A. McNeilage; tested as E4I6; selected 1998. USPP 14,625; 23 Mar. 2004. **Fruit:** infructescences generally 3 fruit; small, length 37.4 mm, greater diameter 22.4 mm, 16.4 g; oblong; shoulders round; stylar end pointed, strongly protruding; cross section elliptical; skin edible, glossy green (RHS 140A-143B), becoming dull when ripe and red-purple (RHS 59A) from stalk end down; smooth, hairs absent; outer pericarp remaining green (RHS 137A-143A) on ripening, inner pericarp locules purple-red (59A), core yellow-green (RHS 150D) to green-white (RHS 157B); sweet, 12.4° Brix at eating ripeness; dry matter ~18.6%; aromatic; stores 3-5 weeks at 0 °C; matures February in Te Puke, New Zealand. **Vine:** tetraploid; vigor medium; precocious; blooms early November.

Hortgem Tahi. Female, green-skinned, green-fleshed *A. arguta*. **Origin:** Horticulture and Food Research Institute of New Zealand, Auckland, by M.A. McNeilage, R.A. Beatson, and E.A. MacRae. AA02_01 × AA13_01; crossed 1987 by M.A. McNeilage; tested as K2D4; selected 1998. USPP 13,815; 13 May 2003. **Fruit:** usually singles; small, length 26.5 mm, greater diameter 26.8 mm, lesser diameter 24.3 mm, 11.1 g; spheroid; shoulders square; stylar end round; cross section circular-elliptical; skin edible, glossy green (RHS 141C-143C) becoming dull when ripe; smooth; hairs absent; flesh green (RHS 139B-141B); core large; yellow-green to green-white (RHS 150D-157B); sweet, 20.2 °Brix at eating ripeness; aromatic; vitamin C 51 mg/100 g fresh weight; stores 6-8 weeks in cold storage; matures late February to early March in Te Puke, New Zealand. **Vine:** tetraploid; vigor strong; precocious; budbreak late August, blooms mid-November.

Hortgem Toru. Female, green-skinned, green-fleshed *A. arguta*. **Origin:** Horticulture and Food Research Institute of New Zealand, Auckland, by M.A. McNeilage, R.A. Beatson, and E.A. MacRae. AA01_01 × AA04_01; crossed 1987 by M.A. McNeilage; tested as C3C3; selected 1998. USPP 14,212; 7 Oct. 2003. **Fruit:** infructescences generally 3 fruit; small, length 34.8 mm, greater diameter 21.6 mm, lesser diameter 19.6 mm, 11.9 g; oblong-ovoid; shoulders round; stylar end slightly pointed, protruding; cross section circular-elliptical; skin edible, glossy green (RHS 137-141B), becoming dull when ripe; smooth, hairs absent; flesh green (RHS 137A-141B); core medium; yellow-green to green (RHS 150D-157B); sweet; aromatic; matures late February to early March in Te Puke, New Zealand. **Vine:** tetraploid; vigor strong; precocious; budbreak late August, early September; blooms early November.

Hortgem Wha. Female, green-skinned, green-fleshed *A. arguta*. **Origin:** Horticulture and Food Research Institute of New Zealand, Auckland, by M.A. McNeilage, R.A. Beatson, and E.A. MacRae. AA05_01 × AA13_01; crossed 1987 by M.A. McNeilage; tested as K2E5; selected 1998 by M.A. McNeilage, R.A. Beatson, and E.A. MacRae. USPP 14,320; 25 Nov. 2003. **Fruit:** infructescences generally 3 fruit; small, length 32 mm, greater diameter 23.3 mm, lesser

diameter 19.7 mm, 8.5 g; oblong; shoulders square; styler end slightly pointed protruding; cross section elliptical; skin edible, glossy green (RHS 141A-143A) becoming dull when ripe; smooth; hairs absent; flesh green (RHS 139B-141B); core yellow-green (RHS 154D) to green-white (RHS 157C); sweet, 17 °Brix at eating ripeness; aromatic; stores 5 weeks at 0 °C; matures late February to early March in Te Puke, New Zealand. **Vine:** tetraploid; vigor strong; precocious; budbreak early, mid-September; flowers early-mid-November.

AU Golden Sunshine. See Jinyang.

AU Golden Tiger. Male, *A. chinensis* var. *chinensis*. **Origin:** Auburn University, Auburn, AL, by W.A. Dozier, Jr., B.S. Wilkins, J. Pitts, C.J. Hansen, and J.D. Spiers. From seed of AU Golden Dragon O.P., sown 1998. USPP 22,140; 13 Sept. 2011. **Vine:** hexaploid; vigor strong; budbreak late March; blooms late April to early May in central Alabama, before Matua; selected as pollenizer for AU Golden Sunshine.

Takaka Green. Female, green-skinned, green-fleshed *A. arguta*. **Origin:** unknown, possibly introduction, 1955, from Hillier Nursery, England, of unspecified origin. **Fruit:** small, 11 g; shape short cylindrical, some distinctly apple-shaped; shoulders square; stylar end round; cross section elliptical; skin edible, glossy green becoming dull when ripe; smooth, hairs absent; flesh green; sweet, aromatic; core white; matures late February to early March in Te Puke, New Zealand. **Vine:** vigor strong.

AU Gulf Coast Gold. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Auburn University, Auburn, AL, by W.A. Dozier, Jr., J.A. Pitts, and J.D. Spiers. Bud mutation of AU Golden Sunshine grown at Fairhope, AL, selected 1999. USPP 29,587; 14 Aug. 2018. **Fruit:** size medium, length 71.5 mm, greater diameter 48.3 mm, lesser diameter 45.1 mm, 96.8 g; long cylindrical; shoulders round; stylar end round to slightly pointed; cross section circular-elliptical; skin grey-brown (RHS 99B); pubescence lanulose, adherence strong; flesh yellow-green (RHS 153C); core greyish-yellow (RHS 160C); sweet; dry matter high, 21.2%; stores 4 months at 1 °C; matures late September in Fairhope, AL. **Vine:** diploid; vigor strong; chilling requirement low; budbreak late March to early April; blooms late April.

B52. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand by D.A. Skelton. B361 × A28; selected 2001. USPP 25,348; 17 Mar. 2015. **Fruit:** medium-large, length 75 mm, diameter 51 mm, 121 g; wide-oblong; shoulders square, truncate; stylar end flat, slightly indented; cross section circular; skin yellow-green (RHS 152C), lenticels inconspicuous; pubescence downy, easily lost; skin adherence to flesh weak; flesh yellow, outer pericarp pale yellow (RHS 2D), inner pericarp darker yellow (RHS 2A), core yellow (RHS 2A); matures midseason in North Waikato, New Zealand. **Vine:** diploid; vigor moderate; budbreak midseason, flowers midseason.

CM 2018 (Green Angel™). Female, green-fleshed *A. chinensis* var. *deliciosa*. **Origin:** Miretti Vivai, Saluzzo, Italy. Hayward sport selected by D. Miretti in 2017, introd. 2017. EU PBR 2017-0037; 6 Jan. 2017. **Fruit:** similar to Hayward, 100 g; flesh brilliant green even after long storage; dry matter higher, 16-18%; 14-15 °Brix at eating ripeness. **Vine:** growth weak, plant smaller than Hayward; canopy smaller; watershoots not formed; branches shorter with internodes closer; trunk diameter smaller; resistance to *Psa (Pseudomonas syringae* pv. *actinidiae)* greater.

Cristal. Female, creamy (lighter) green-fleshed *A. chinensis* var. *deliciosa*. **Origin:** Curico, Chile, by G.P. Espinosa Rodriguez, Los Cristales. Mutation of Hayward?; selected 2010. USPP applied for. **Fruit:** very large, length 70-75 mm, greater diameter 60 mm, lesser diameter 50 mm, 180 g; elongated ovoid; shoulders square; stylar end slightly indented; cross section elliptical; skin light brown; lenticels abundant, inconspicuous; pubescence medium hirsute, dark brown, easily lost; flesh creamy (lighter) green; sweeter, less acid than Hayward; seeds few; core elliptical, greenish white; ripens late in Curico. **Vine:** vigor strong; more flowers than Hayward; budbreak late; blooms late.

CharmTM. See Zesy003.

Dorì. See AC1536.

E11. Female, pale yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand by D.A. Skelton. A55 × B17; selected 2001. USPP 25,347; 17 Mar. 2015. **Fruit:** large, length 75 mm, diameter 60 mm, 140 g; oblate; shoulders square; stylar end weakly protruding, blunt; cross section circular-elliptical; skin yellow-green (RHS 152C); lenticels inconspicuous; pubescence very soft, downy.

KIWIFRUIT

A. Ross Ferguson, The New Zealand Institute for Plant & Food Research, Auckland, New Zealand

51-1785. Female, yellow-fleshed, *Actinidia chinensis* var. *chinensis*. **Origin:** Horticulture and Food Research Institute of New Zealand, Te Puke, by R.G. Lowe. Jinfeng (79-3) × CK40_02; crossed 1994; selected 1998. USPP 17,774; 29 May 2007. **Fruit:** size medium, length 66 mm, greater diameter 61 mm, lesser diameter 58 mm, 99 g; globose; shoulders square; stylar end round; cross section circular; skin pale mid-brown; lenticles conspicuous, raised; pubescence sparse, short, soft, easily removed; flesh bright golden yellow; core very small; sweet, 13.8 °Brix at eating ripeness; vitamin C 133 mg/100 g fresh weight; stores 5 months at 0 °C; matures late May in Te Puke. **Vine:** tetraploid; vigor medium; budbreak mid-September, blooms mid-late November.

AC1536 (Dori). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** University of Udine, Italy, and University of Bologna, Italy, by R. Testolin. A0172 × A0134.16; crossed 2000; selected by G. Costa, R. Testolin, and G. Cipriani 2003; introd. 2014. USPP 27,060; 16 Aug. 2016. **Fruit:** size medium, length 72 mm, diameter 52 mm, 105 g; long oblong; shoulders square; stylar end flat, indented; skin yellow-brown at harvest; lenticels minute; pubescence fine, downy, only moderately adherent; flesh yellow-green (RHS 3C); core elliptical, near white; sweet, 16 °Brix at eating ripeness; dry matter ~18%; stores >3 months at 2 °C; matures first 2 weeks September, 1 month before Hayward, in Bologna. **Vine:** tetraploid; vigor weak to medium; winter cold tolerant, down to -19 °C; budbreak late March; blooms mid-late May.

AU Author. Male, *A. chinensis* var. *deliciosa*. **Origin:** Auburn University, Auburn, AL, by W.A. Dozier, Jr., F.M. Woods, C.J. Hansen, J. Pitts, R.C. Ebel, G.A. Fitzgerald, and J.P. Fitzgerald. Probably from Hayward O.P. seed. USPP 20,994; 11 May 2010. **Vine:** hexaploid; vigor strong; blooms later than Matua at Clanton, AL, where used as pollinizer for AU Fitzgerald and Hayward.

AU Fitzgerald. Female, dark green-fleshed *A. chinensis* var. *deliciosa*. **Origin:** Auburn University, Auburn, AL, by W.A. Dozier, Jr., F.M. Woods, C.J. Hansen, J. Pitts, R.C. Ebel, G.M. Fitzgerald, and J.P. Fitzgerald. Probably from Hayward O.P. seed. USPP 21,005; 25 May 2010. **Fruit:** size small, length 64.3 mm, diameter 43.7 mm, 60.2 g; long cylindrical-ovate; shoulders round; styler end round, flat; cross section circular; skin brown, pubescence hirsute, brown; flesh dark green (RHS 147B); core pale green (RHS 147D); matures mid-October in Clanton, AL. **Vine:** hexaploid, vigor medium; floriferous, chilling requirement lower than Hayward; bud-break late March; blooms late April to early May.

easily removed; skin adherence to flesh weak; outer pericarp pale yellow (RHS 2D); inner pericarp green-yellow (RHS 1A); core elliptical, yellow-white (RHS 158D); stores >3 months at 2 °C; ripens midseason in north Waikato, New Zealand. **Vine:** diploid; vigor moderate; budbreak early season; blooms early season.

EnzaGold™. See Skelton A19.

G3. See Zesy002.

Gold3. See Zesy002.

G9. See Zesy003.

Gold9. See Zesy003.

Golden Dragon. See Jinnong.

G14. See Zesh004.

Green11. See Zes007.

Green14. See Zesh004.

Green Angel™. See CM 2018.

HFR18. Female, yellow-fleshed, red-centered *A. chinensis* var. *chinensis*. **Origin:** Deyang Professional Academy of Kiwi Fruit, Shifang, Sichuan, China, by G.Y. Dong. Hongyang × SF0612M; crossed 2000; selected 2009. PVR CNA20130213.4; 1 May 2016. USPP 28,753; 12 Dec. 2017. **Fruit:** small-medium, length 57 mm, greater diameter 45 mm, lesser diameter 41 mm, 80 g; ovoid; shoulders round; stylar end slightly depressed; cross section elliptical; skin rough, green-brown (RHS 131D); lenticels inconspicuous; pubescence almost absent; outer pericarp yellow-green (RHS 1B), often with greener tinge near skin, locules bright red (RHS 40A); sweet, 17.1 °Brix at eating ripeness; vitamin C 184 mg/100 g fresh weight; stores 3 months in cold storage; matures early to mid-September in Shifang. **Vine:** diploid; vigor very strong; budbreak mid-February; blooms mid-April.

HFY01. Female, dark yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Sichuan Hua Sheng Agriculture Co., Shifang, Sichuan, China, by M.Z. Li. JXFX-CK-04136 O.P.; crossed 2004; selected 2010. USPP 30,549; 4 June 2019. **Fruit:** small-medium, length 55 mm, greater diameter 49 mm, lesser diameter 47 mm, 85 g; shape broad ovoid; shoulders round; stylar end weakly depressed with very small beak; cross section elliptical; skin tan brown (RHS 164B); pubescence absent; lenticels inconspicuous; flesh deep yellow (RHS 17A); sweet, 17.5 °Brix at eating ripeness; core triangular, cream (RHS 155A); stores up to 6 months at 0 °C; matures late October in Shifang. **Vine:** tetraploid; vigor very strong; budbreak mid-February; blooms late April; resistance to PsA strong.

Hort22D. Female, yellow-fleshed, red-centered *A. chinensis* var. *chinensis*. **Origin:** New Zealand Institute for Plant & Food Research, Te Puke, by R.G. Lowe and C.H. Cheng. CK51_06 × CK51_11; crossed by R.G. Lowe 1996; selected as 52.13.22D by C.H. Cheng. USPP 20,893; 30 Mar. 2010. **Fruit:** size small-medium, length 51.6 mm, maximum width 49 mm, 69.2 g; oblong; stylar end slightly protruding, blunt; cross section circular-elliptical; skin delicate, easily damaged, protection from wind and rain required during early fruit growth; green (RHS 146B) to brown (RHS 165B), depending on exposure; lenticels inconspicuous, numerous, white-orange (RHS 159C); pubescence downy, very short, readily lost; outer pericarp yellow-green (RHS 149B) to yellow (RHS 11B) at maturity; inner pericarp consistently bright red (RHS 45B), in locules; core elliptical, white (RHS 158D), core cavity frequent at stylar end; very

sweet, 16.8 °Brix at eating ripeness; vitamin C 198 mg/100 g fresh weight; stores 2-3 months in cold storage; matures late March to early April in Te Puke. **Vine:** diploid; vigor low to medium, very floriferous, thinning required, fruit drop ~20% of fruit set in last month before harvest; budbreak late August; blooms mid-late October.

Jinnong (AU Golden Dragon). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Fruit and Tea Institute, Hubei Academy of Agricultural Sciences, China. Parentage unknown, selected from seedlings from O.P. fruit of plants growing in Fang County, Hubei. Emihoutao No. 2, PVR as Jinnong; CNA20060461.9; 1 May 2008; patented as AU Golden Dragon by W.A. Dozier, Jr., B.S. Wilkins, J. Pitts, C.J. Hansen, F.M. Woods, J.D. Spiers, Q.H. Chen, Z.Q. Qin, Y.C. Jiang, X. Gu, and A.C. Xu. USPP 22,191; 11 Oct. 2011. **Fruit:** size medium, length 61.6 mm, greater diameter 54.8 mm, lesser width 47.6 mm, 88.2 g; shape wide ovoid-elliptical; shoulders round-flat; stylar end slightly protruding; cross section circular-elliptical; skin brown (RHS 199A); pubescence tomentose, hairs easily removed; outer pericarp yellow-green (RHS 152C-152D); inner pericarp yellow-green (RHS 148A); core greyed-yellow (RHS 160C); flesh sweet; dry matter 18%; vitamin C 97 mg/100 g fresh weight; ripens very early, mid-late August, ~50 d before Hort16A. **Vine:** diploid; vigor strong; chilling requirement low; budbreak mid-March; blooms late March to early April.

Jinyang (AU Golden Sunshine). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Institute of Fruit and Tea, Hubei Academy of Agricultural Sciences, China from seedlings; parentage unknown, from O.P. fruit of plants growing in Chongyang County, Hubei. Emihoutao No 3, PVR as Jinyang; CNA20060460.0; 1 May 2008; patented as AU Golden Sunshine by W.A. Dozier, Jr., B.S. Wilkins, J. Pitts, C.J. Hansen, F.M. Woods, J.D. Spiers, Q.H. Chen, Z.Q. Qin, Y.C. Jiang, X. Gu, and A.C. Xu. USPP 22,159; 27 Sep. 2011. **Fruit:** size medium, length 66.8 mm, greater width 48.4 mm, lesser width 44.7 mm, 90.4 g; cylindrical; shoulders round-flat; stylar end round, slightly indented; cross section circular; skin brown (RHS 199A); pubescence tomentose, easily removed; outer pericarp yellow-green (RHS 152C-152D); inner pericarp yellow-green (RHS 148A); core greyed-yellow (RHS 160C); sweet; dry matter 18%; vitamin C 94.4 mg/100 g fresh weight; matures early-mid-September, ~30 d before Hort16A in central Alabama. **Vine:** diploid; vigor strong; chilling requirement low; blooms late April, 18 d after Hort16A.

K1 89. Female, green-fleshed *A. chinensis* var. *deliciosa*. **Origin:** unspecified, selected by P.G. Rivoira, Verzuolo, Cuneo, Italy. USPP 8,497; 14 Dec. 1993. **Fruit:** large (young plants), length 67 mm, greater diameter 58.1 mm, lesser diameter 54.8 mm, 136 g; shape wide cylindrical; stylar end flat, indented, hollow; cross section circular-elliptical; skin brownish-red (RHS 176D-176B), affected by exposure; pubescence, short, silky, long hairs typical of var. *deliciosa* absent; flesh light green; core medium; sweet, less acid than Hayward; stores 2-3 months in controlled atmosphere; ripens mid-October, 15-20 d before Hayward, in Cuneo. **Vine:** vigor medium, less than Hayward; fruit bud internodes closer than in Hayward; more floriferous; blooms late May, 10 d before Hayward.

KZ02. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Rangiriri, New Zealand, by D.A. Skelton. A87 × A20; crossed 1992; selected 1995. USPP 27,350; 8 Nov. 2016. **Fruit:** size medium, length 76 mm, diameter 43 mm, 110 g; oblong; shoulders square; stylar end slightly protruding, blunt; cross section circular; skin grey-yellow (RHS 162D); lenticels inconspicuous if present; pubescence downy, easily removed; flesh bright yellow (RHS 4A); core white (RHS 155A); sweet, 18.5 °Brix at eating ripeness; stores >3 months at 2 °C; matures late April in Rangiriri. **Vine:** diploid; vigor moderate; precocious; floriferous, thinning probably required; budbreak late August; blooms mid-late October.

KZ03. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Rangiriri, New Zealand, by D.A. Skelton. 91 × 370a; crossed 1992; selected 2008. USPP 31,402; 28 Jan. 2020. **Fruit:** large, length 70 mm, diameter 53 mm, 160 g; oblong; shoulders truncate; stylar end slightly protruding, blunt; cross section circular; skin brown-green (RHS 152B); lenticels absent; pubescence downy, easily removed; skin adherence to flesh at maturity weak; flesh bright clear yellow (RHS 5); core yellow-white (RHS 4B); sweet, 18 °Brix at eating ripeness, stores >3 months at 2 °C; matures mid-late April in Rangiriri. **Vine:** diploid; vigor medium; precocious; floriferous; budbreak medium to late; blooms mid-late October.

KiwiKiss Gold. See Y374.

S600. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Rangiriri, New Zealand, by D.A. Skelton. A124 × RY; selected 2000. USPP 20,727; 9 Feb. 2010. **Fruit:** size medium, length 59 mm, diameter 51 mm, 105 g; shape wide oblong; shoulders strongly squared; stylar end slightly indented, slightly protruding, blunt; cross section circular; skin gray-orange (RHS 165D); lenticels absent; pubescence very soft, downy, easily removed; flesh light yellow (RHS 1C); 15.8–16 °Brix at eating ripeness; stores >3 months at 2 °C; matures late April, 2–3 weeks before Hort16A in Rangiriri. **Vine:** diploid; vigor moderately low; floriferous; budbreak early September; blooms mid-October.

Skelton A16. Female, dark yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Waiuku, New Zealand, by D.A. Skelton. A124 × ALC13; crossed 1994; selected 1999. USPP 20,250; 1 Sept. 2009. **Fruit:** small, length 60 mm, diameter 48 mm; squat ovoid; shoulders round; stylar end slightly indented to slightly protruding; cross section circular; skin grey-brown (RHS 199C); pubescence downy; flesh dark yellow (RHS 2B); sweet, 17.5 °Brix at eating ripeness; ripens early April, 2–4 weeks before Hort16A in Rangiriri, New Zealand. **Vine:** budbreak early September; blooms mid-late October.

Skelton A19 (EnzaGold™). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A124 × RY; crossed 1994; selected 1999; introd. by 2010. USPP 20,671; 26 Jan. 2010. **Fruit:** size medium, length 70 mm, width 46 mm. 95–105 g; obovoid; shoulders round at stalk end, stylar end protruding, blunt; cross section circular; skin yellow-brown (RHS 199B); pubescence sparse, downy; flesh yellow (RHS 3B); sweet, 16.5 °Brix at eating ripeness, aftertaste tangy; matures early April, ~2–4 weeks before Hort16A at Rangiriri, New Zealand. **Vine:** budbreak early September; blooms early October.

Skelton X78. Female, greenish yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A124 × RY; crossed 1994; selected 2000. USPP 20,699; 2 Feb. 2010. **Fruit:** size medium, length 75 mm, width 46 mm, 67–93 g; ovoid; shoulders round; stylar end beak slightly protruding, blunt; cross section circular; skin yellow-brown (RHS 199B); pubescence downy; flesh greenish yellow (RHS 5C), 15.8 °Brix at eating ripeness; matures late April, several weeks before Hort16A in Rangiriri, New Zealand. **Vine:** budbreak mid-August; blooms early-mid-October.

SunGold™. See Zesy002.

Sweet Green™. See Zesh004.

Tomua. Female, green-fleshed *A. chinensis* var. *deliciosa*. **Origin:** Horticulture and Food Research Institute of New Zealand, Te Puke, by R.G. Lowe and H.D. Marsh. Hayward × DA02_03; crossed 1983; selected 1990. USPP 11,065; 21 Sept. 1999. **Fruit:** size medium, smaller than Hayward, length 73.9 mm, greater diameter 51.56 mm, smaller diameter 44.9 mm; ovoid; shoulders round; stylar end round with slight raised beak; cross section elliptical; skin reddish brown; pubescence bristly, easily removed, skin then somewhat shiny; flesh light green; 13.5–15.1 °Brix at eating ripeness; core greenish white; storage life ~half that of Hayward, considered limiting commer-

cially; matures early April in Te Puke, 4–5 weeks before Hayward. **Vine:** hexaploid; vigor medium; budbreak late August to early September; blooms late September.

W45. Female, yellowish green-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. R55 × CMW85; selected 2001. USPP 20,758; 16 Feb. 2010. **Fruit:** size medium-large, length 65 mm, width 57 mm, 124 g; shape broad ovoid; shoulders square; stylar end slightly blunt; cross section circular-elliptical; skin yellow-green (RHS 144A); lenticels absent; pubescence downy, easily removed; pericarp yellow-green (RHS 145B); 16.5 °Brix at eating ripeness; stores >3 months at 2 °C; matures mid-April in Rangiriri, New Zealand. **Vine:** vigor moderate; budbreak mid-August; blooms mid-October.

W47. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Rangiriri, New Zealand, by D.A. Skelton. R5 × RY; selected 2001. USPP 22,777; 12 June 2012. **Fruit:** size medium, length 76 mm, diameter 64 mm, 105 g; ovoid; shoulders square; stylar end slightly blunt, protruding; cross section circular; skin yellow-green (RHS 153B); lenticels minute, yellow-green (RHS 153A); pubescence, downy, adherence moderate; flesh yellow (RHS 3C); sweet, 18 °Brix at eating ripeness; stores >3 months at 2 °C; matures early May in Rangiriri. **Vine:** diploid, vigor moderate; budbreak late August; blooms mid-October.

X60. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A124 × RY; selected 1999. USPP 20,728; 9 Feb. 2010. **Fruit:** size small-medium, length 58 mm, diameter 47 mm, 91 g; shape wide-oblong; shoulders square; stylar end blunt protruding; cross section wide elliptical; skin grey-orange (RHS 165D); lenticels absent; pubescence downy, easily removed; pericarp yellow, outer pericarp yellow-green (RHS 1D), inner pericarp yellow-green (RHS 3D); core elliptical, white (RHS 155B); sweet, 16–17 °Brix at eating ripeness; stores >3 months at 2 °C; matures late March in Rangiriri. **Vine:** diploid; vigor moderate; budbreak early September; blooms mid-late October.

X264. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A50 × A28; selected 2001. USPP 25,331; 10 Mar. 2015. **Fruit:** size medium, length 62 mm, diameter 50 mm, 97 g; oblong; shoulders square, truncate; stylar end weakly blunt protruding; cross section circular-elliptical; skin yellow-green (RHS 152C); lenticels absent; pubescence downy, easily removed; skin adherence to flesh weak; flesh yellow; stores >3 months at 2 °C; matures early, 2–4 weeks before Hort16A in north Waikato, New Zealand. **Vine:** diploid, vigor medium.

Y118. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. R5 × RY; selected 1999. USPP 20,956; 27 Apr. 2010. **Fruit:** size medium-large, length 70 mm, diameter 50 mm, 110 g; shape wide oblong-ovoid; shoulders square; stylar end slightly blunt protruding; cross section elliptical; skin yellow-green (RHS 148A); lenticels absent; pubescence downy, easily removed; flesh yellow; outer pericarp yellow-green (RHS 3D), inner pericarp yellow-green (RHS 2C); core yellow-white (RHS 158D); stores >3 months at 2 °C; matures late March in Rangiriri, New Zealand, ~6 weeks before Hort16A. **Vine:** diploid, vigor moderately high; floriferous; budbreak early September; blooms mid-October.

Y356. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Rangiriri, New Zealand, by D.A. Skelton. R5 × RY; crossed 2004, selected before 2007. USPP 25,127; 2 Dec. 2014. **Fruit:** size medium-large, length 75 mm, diameter 53 mm, 110–115 g; shape long ovoid; shoulders broad; stylar end weakly protruding; cross section circular; skin yellow-green (RHS 152B); lenticels dense, conspicuous, grey-orange (RHS 164A); pubescence absent at maturity; outer pericarp yellow (RHS 11A); inner pericarp yellow-green (RHS 11B); core yellow (RHS 4C); sweet, 16–17 °Brix at eating

ripeness; matures ~2 weeks before Hort16A in Rangiriri. **Vine:** diploid; vigor strong; budbreak early September.

Y368. Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A124 × RY; selected 1999. USPP 20,721; 2 Feb. 2010. **Fruit:** medium-large, length 67 mm, diameter 59 mm, 110 g; shape wide-oblong; shoulders square; stylar end slightly blunt protruding; cross section circular; skin grey-brown (RHS 199C), lenticels absent; pubescence downy, easily removed; flesh yellow; outer pericarp yellow (RHS 3B); inner pericarp yellow (RHS 3A); core elliptical, white (RHS 155A); stores >3 months at 2 °C; matures early, mid-March in Rangiriri, New Zealand. **Vine:** diploid; vigor moderately high; budbreak early September; blooms mid-October.

Y374 (KiwiKiss®). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A17 × R4; crossed 1999. USPP 21,174; 27 July 2010. **Fruit:** size large, length 70 mm, diameter 65 mm, 129 g; obovoid; shoulders round; stylar end round; beak small; skin yellowish green (RHS 146C); lenticels absent; pubescence very sparse; flesh medium yellow (RHS 4C); core white (RHS 155C); sweet, 16 °Brix at eating ripeness; matures early March in Rangiriri, New Zealand. **Vine:** vigor medium; budbreak early September; blooms early-mid October.

Yang's Golden Red No. 1. Female, pale yellow-fleshed, red-centered *A. chinensis* var. *chinensis*. **Origin:** Yangzhou, Jiangsu, China, by S.M. Yang, X.Q. Jiang, Y. Lv, and J. Yang. Hongyang × Male No. 13; selected 2004, Chinese PVR CNA20110642.7; 1 Nov. 2014. USPP 28,580; 31 Oct. 2017. **Fruit:** size medium, length 48–55 mm, diameter 39–45 mm, 90–94 g; shape long cylindrical; shoulders square; stylar end indented, concave; cross section circular-elliptical; skin yellow-green (RHS 152C); pubescence sparse; lenticels sparse, yellow-green (RHS 152C); outer pericarp green becoming yellow-green (RHS 152C); inner pericarp red in locules (RHS 43C); core white (RHS 155C); sweet, 17–20 °Brix at eating ripeness; stores 5 months at 1 °C; matures with Hongyang in Yangzhou. **Vine:** tetraploid; vigor medium; budbreak mid-March; blooms late April.

Yang's Golden Red No. 50. Female, pale yellow-fleshed, red-centered *A. chinensis* var. *chinensis*. **Origin:** Yangzhou, Jiangsu, China, by S.M. Yang, X.Q. Jiang, Y. Lv, and J. Yang. Hongyang × Male No. 13; selected 2004; Chinese PVR CNA20120001.1; 9 Jan. 2009. USPP 26,450; 8 Mar. 2016. **Fruit:** size medium large, length 60–69 mm, diameter 55–75 mm, 104–112 g; cylindrical; shoulders square; stylar end slightly blunt protruding; cross section circular; skin yellow-green (RHS 152C); pubescence sparse; lenticels sparse; outer pericarp yellow-green (RHS 152C); inner pericarp green-yellow (RHS 1D); locules red (RHS 43C); core white (RHS 155C); sweet, 18–21 °Brix at eating ripeness; stores 5 months at 1 °C; matures 4 weeks after Hongyang, 2 weeks before Hort16A in Yangzhou. **Vine:** tetraploid; vigor medium; budbreak mid-March; blooms late April.

Z487. Female, yellow green-fleshed *A. chinensis* var. *chinensis*. **Origin:** Huntly, New Zealand, by D.A. Skelton. A124 × RY; selected 1999. USPP 20,347; 22 Sept. 2009. **Fruit:** medium large, length 65 mm, diameter 55 mm, 100.9 g; shape broad oblong; shoulders square; stylar end slightly blunt protruding; cross section circular-elliptical; skin grey-orange (RHS 165D); pubescence downy, easily removed; flesh yellow-green; outer pericarp yellow-green (RHS 154C); inner pericarp yellow-green (RHS 1D); core elliptical, white (RHS 158D); sweet, >16 °Brix at eating ripeness; stores >3 months at 2 °C; matures very early, late February, ~10 weeks before Hort16A in Rangiriri, New Zealand. **Vine:** diploid; budbreak late August; blooms mid-late October.

Zespri® Charm™. See Zesy003.

Zespri® SunGold™. See Zesy002.

Zespri® Sweet Green™. See Zesy003.

Zes007 (Green11). Female, greenish yellow-fleshed *A. chinensis* var. *deliciosa*. **Origin:** New Zealand Institute for Plant & Food Research, Te Puke, by H.D. Marsh and E. Popowski. T99.40-02-10c × T92.40-08-14e; crossed by H.D. Marsh 2002; selected by E. Popowski 2007; tested as T03.52-19-12f. USPP 31,006; 5 Nov. 2019. **Fruit:** large, length 65.8 mm, diameter 58.2 mm, 128 g; obovate; stylar end flat; skin grey-brown (RHS 199A), adherence to flesh weak; pubescence dense, hirsute, medium brown, similar to Hayward, easily lost; outer pericarp greenish-yellow (RHS 145A); inner pericarp locules yellow-green to medium green; core oblate, yellow-green (RHS 154D); sweet, 15.4 °Brix at eating ripeness, with tropical flavor; matures mid-May in Te Puke. **Vine:** hexaploid; vigor low-medium; floriferous; budbreak midseason; blooms mid-November.

Zesh004 (Green14; fruit sold as Zespri® Sweet Green™). Female, green-fleshed at harvest, changing to yellowish green-fleshed, *A. chinensis* var. *deliciosa* × *A. chinensis* var. *chinensis*. **Origin:** New Zealand Institute for Plant & Food Research, Te Puke, by A.G. Seal. 40-10-14e.92, hexaploid, × CK71_06, diploid; crossed 2000; selected 2005; tested as 16-01-03h.02; test marketed 2008; introd. 2010. USPP 22,276; 29 Nov. 2011. **Fruit:** size moderate-large, length 65.4 mm, greater diameter 56.2 mm, lesser diameter 49.2 mm, 116 g when thinned to 35 fruit m⁻² canopy; long obovoid; shoulders round; stylar end flat with slight indentation; cross section elliptical; skin green-brown (RHS 191A) to reddish brown (RHS 166A), depending on exposure; pubescence moderately dense, short, soft, light brown; lenticels numerous, conspicuous, light orange-white (RHS 164B); outer pericarp green (RHS 146C), becoming yellow green (RHS 154A), if fruit are held at 20 °C after harvest or are allowed to ripen on the vine; inner pericarp light green (RHS 146B); core elliptical yellowish-white (RHS 154D); very sweet, with sub-tropical notes, ~20.3 °Brix at eating ripeness; vitamin C 149 mg/100 g fresh weight; stores 3–4 months in cold storage; matures late March to early April in Te Puke. **Vine:** tetraploid; vigor medium when young, but lower after reaching flowering maturity; flower number low to medium in absence of dormancy breakers; budbreak early September; blooms mid-late November; less susceptible to bacterial canker of kiwifruit (Psa).

Zesy002 (G3 or Gold3; fruit sold as Zespri® SunGold™). Female, yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** New Zealand Institute for Plant & Food Research, Te Puke, by R.G. Lowe. 51-18-15i.97 × 51-18-20j.97; crossed 2000; selected 2005 by R.G. Lowe, K. Hoeata, T. Paterson, and B. Hofstee; tested as 13-15-14g.02; introd. 2010. USPP 22,355; 20 Dec. 2011. **Fruit:** large, length 73.4 mm, greater diameter 54.8 mm, lesser diameter 51.1 mm, 136 g when thinned to 46 fruit m⁻² canopy; ovoid; shoulders round; stylar end flat, slightly indented; cross section circular to mostly elliptical; skin yellow-green (RHS 148B) to dark brown (RHS 200D), depending on exposure; pubescence very short, soft, light brown, easily shed; lenticels numerous, conspicuous, light orange-white (RHS 164C); flesh light yellow (RHS 8D), at maturity sometimes with a greenish ring (RHS 143C or 143D) just under the skin; core yellowish white (RHS 9D or 8D); very sweet, ~17.4 °Brix at eating ripeness; aftertaste tangy; vitamin C 117 mg/100 g fresh weight; stores 3–6 months at 1 °C; matures early April in Te Puke. **Vine:** tetraploid; vigor medium-strong; very floriferous, thinning required to maintain fruit size; high yields in absence of application of dormancy breakers; budburst early September; blooms late October to early November; less susceptible to bacterial canker of kiwifruit (Psa).

Zesy003 (G9 or Gold9; fruit sold as Zespri® Charm™). Female, light yellow-fleshed *A. chinensis* var. *chinensis*. **Origin:** New Zealand Institute for Plant & Food Research, Te Puke, by R.G. Lowe. Kuimi 79-1-1 × 30-03-05c.94; crossed 1995; selected 2005 by

R.G. Lowe, T. Paterson, and B. Hofstee; tested as 51-17-29b.97; test marketed 2008; introd. 2010. USPP 22,292; 6 Dec. 2011. **Fruit:** size moderate-large, length 67.4 mm, greater diameter 55.8 mm, lesser diameter 51.6 mm, 118 g when thinned to ~60 fruit m⁻² canopy; ovoid; shoulders round or square; stylar end slightly indented around slight protrusion; cross section circular-elliptical; skin greenish brown (RHS 199A) to yellowish brown (RHS 148A) to dark brown (RHS 200D), depending on exposure; pubescence soft, sparse brown hairs; lenticels numerous, conspicuous, light orange-brown (RHS 164B); flesh light yellow (RHS 10D); core yellowish white (RHS 11D); very sweet, 17.7 °Brix at eating ripeness; vitamin C 118 mg/100 g fresh weight; stores 6-7 months but tends to shrivel; matures late April in Te Puke. **Vine:** tetraploid; vigor medium; very floriferous and thinning required to maintain fruit size; produces high yields in absence of application of dormancy breakers; budbreak late August; blooms mid-late October; less susceptible to bacterial canker of kiwifruit (Psa).

MANGO

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201230Thom. Red-skinned, adapted to Southern California. **Origin:** Camarillo, CA, by T. Thompson. Parents unknown; planted 1997; selected 2009. USPP 27,080; 23 Aug. 2016. **Fruit:** length 130 mm, width 60 mm, 340-454 g; elongated; cross-section oval; abaxial shoulder sloped; adaxial shoulder rounded blunt; stalk cavity slightly recessed; mature fruit skin smooth and glossy, thickness ~1 mm, adhering strongly to flesh; red (RHS 53C-53D) covering 80-90% of fruit, also orange-red (RHS 33B); flesh orange (RHS 25A); soft; juicy, with very little fiber; matures late October to early November; shelf life 2-3 weeks at 10 °C. **Tree:** vigorous, with strong support branches; 17-year-old tree ~3 m tall, ~2 m wide in Camarillo; trunk bark rough at base, greyed-green (RHS 198C), becoming mainly smooth at upper trunk; leaves oblanceolate; reliably produces good crop under coastal Southern California conditions; very resistant to fungal diseases, including powdery mildew (*Oidium mangiferae*); tolerant to ~ -2.2 °C / -1.1 °C.

301215Thom. Gold-skinned with red blush, adapted to Southern California. **Origin:** Camarillo, CA, by T. Thompson. Parents unknown; planted 1997; selected 2009. USPP 28,396; 19 Sept. 2017. **Fruit:** length 160 mm, width 80 mm, 454-567 g; elongated; stalk cavity slightly recessed; mature skin smooth, glossy, thickness ~1 mm, strongly adherent to flesh; ground color yellow-orange (RHS 23A-B); blush red (RHS 42A), covering 80-90% of surface of fruits grown in full sun; lenticels sparse, diameter ~1 mm, orange-red (RHS 30D); flesh orange (RHS 25A); soft; juicy; with very little fiber; matures late October to early November; shelf life 2-3 weeks at 10 °C. **Tree:** vigorous, with strong support branches, 18-year-old tree ~3 m tall, ~2 m wide in Camarillo; trunk bark rough at base, greyed-green (RHS 198A-C), gradually becoming mainly smooth at upper trunk; leaves oblanceolate; reliably produces good crop under coastal Southern California conditions; very resistant to fungal diseases, including powdery mildew; tolerant to ~ -2.2 °C / -1.1 °C.

302216Thom. Gold-skinned, adapted to Southern California. **Origin:** Camarillo, CA, by T. Thompson. Parents unknown; planted 1994; selected 2008. USPP 28,438; 26 Sept. 2017. **Fruit:** length 150 mm, width 50 mm, 397-510 g; somewhat heart-shaped; cross-section round; stem cavity nearly flat; mature skin smooth, glossy, thickness ~1 mm, strongly adherent to flesh; ground color yellow (RHS 13B-C), mottling orange (RHS 26B); blush orange-red (N34C); lenticels sparse, diameter ~1 mm, orange-red (RHS 30D); flesh orange (RHS 25A); soft; juicy, with very little fiber; shelf life 2-3 weeks at 10 °C. **Tree:** vigorous, with strong support branches, 20-year-old tree ~5 m tall, ~4 m wide in Camarillo; trunk bark rough at base, greyed-green (RHS 198A-C), gradually becoming mainly smooth at upper trunk; leaves oblanceolate; reliably

produces good crop under coastal Southern California conditions; very resistant to fungal diseases, including powdery mildew; tolerant to ~ -2.2 °C.

FP2. Reddish fruit on a yellow ground color ripening in August, resistant to anthracnose. **Origin:** Chiayi, Taiwan, by M.-S. Chang. Limb sport of FP1; discovered 2000; grafted 2006. USPP 21,631; 18 Jan. 2011. **Fruit:** length 157 mm, breadth 87 mm, 995.6 g; shape long oval; shoulders ventral and dorsal round, apex round; skin reddish (RHS 169B) overcolor on a yellow (RHS 163C) ground color, 0.9-1.1 mm thick, smooth, easily separating; flesh orange yellow (RHS 163B); texture firm, juicy, with low fiber; flavor good, some fruits have a turpentine aroma when fully ripe, sugar content high, 16 °Brix, TA low, 0.12%; stone small, length 143 mm, width 42 mm, 43.6 g; seed small, white, monoembryonic; ripens August in Taiwan; resistant to anthracnose (*Colletotrichum gloeosporioides*), powdery mildew and bruising; fruit drops in a protective bag ~3 d after maturity, can be held without any handling requirements for ~20 d. **Tree:** vigor medium; growth habit tall, oval; bark smooth, leaves large, oval-lanceolate; blooms early, in December, with full bloom in February.

Leopold. Brightly colored chance seedling with aroma, flavor and texture similar to Bombay Green, but better keeping qualities. **Origin:** North Miami Beach, FL, by W.J. Gabay. Naturally occurring chance seedling. USPP 19,152; 26 Aug. 2008. **Fruit:** height 89-114 mm; width 63-89 mm, 369-510 g; roundish oblique; shoulder rounded, stalk insertion square; apex obtuse; skin smooth, thin, and tough; immature skin green (RHS 133D); mature skin ground color orange (RHS 25A), blush red-purple (RHS 60A); flesh deep orange (RHS 26A); texture firm, melting, juicy and fiberless; flavor rich, aromatic, and sweet, slightly spicy; stone small, flat, freestone, seed monoembryonic; can be harvested green or mature, matures July-August; stores well, 30 d under controlled conditions, resistant to bruising, somewhat resistant to anthracnose. **Tree:** vigor medium; growth habit spreading; canopy broadly pyramidal; bark very rough; 3 years to first bloom; blooms March; productive, 62 t/ha; moderately alternate bearing; disease susceptibility low.

NMBP-1201. Matures early to midseason with soft red to dark red blush over yellow ground color, flavor like Kensington Pride. **Origin:** Commonwealth Scientific and Industrial Research Organisation, Mareeba, Queensland, Australia, by I.S.E. Bally. Irwin × Kensington Pride; crossed 1995 in Darwin, Northern Territory; planted 1996 at Southedge Research Station, Mareeba. USPP 30,977; 29 Oct. 2019. **Fruit:** length short to medium, width medium to broad, thickness 82 mm; 245-530 g, average 361 g; ovate/round with slight beak and broad elliptic cross section; stalk cavity absent or shallow; neck absent; shoulders ventral rounded upward, dorsal rounded downward; mature skin green with red (RHS 60A) blush, lenticels sparse; ripe skin smooth, thin to medium, adherence to flesh medium; ground color yellow, blush soft red to dark red over 50% of skin when grown in sun, fruit inside canopy do not blush, lenticels medium size and density; firmness soft to medium; flesh yellow-orange (RHS 17A); texture fine to medium, fiber low to medium; flavor sweet like Kensington Pride with slight tang, no turpentine taste; seed polyembryonic; fruit development period 3-3.5 months; matures early to midseason. **Tree:** vigor medium to high, height 4-6 m in 8-10-year-old trees under standard annual pruning; growth habit spreading; canopy compact, medium to dense; bark medium rough, leaf blade base acute, apex attenuate; blooms medium to late, mid-July to late September in Mareeba, yield medium to heavy, commonly alternate bearing.

NMBP-1243. Matures very early to early with strong red/pink blush over pale yellow ground color, flavor like Kensington Pride. **Origin:** Commonwealth Scientific and Industrial Research Organisation, Mareeba, Queensland, Australia, by I.S.E. Bally. Irwin × Kensington Pride; crossed 1995 in Darwin, Northern Territory; planted 1997 at Southedge Research Station, Mareeba. USPP 30,814; 20 Aug. 2019. **Fruit:** length short to medium, width medium, 319-799 g, average 507 g; ovate and deeper than it is wide, with a small sharp beak that

flattens out at full maturity; stem end flat or slightly depressed; stalk cavity shallow; neck absent; mature skin thin to medium, 0.81 mm; ground color yellow-green (RHS 144A), blush red-purple (60B) over up to 80% of skin when exposed to sun, only a weak blush is present when fully shaded; bloom conspicuous; ripe skin ground color yellow-orange (RHS 21B), blush red (RHS 47A), lenticels medium in size and density, light yellow, causing rough surface in mature fruit; flesh yellow-orange (RHS 21A), soft, juiciness medium, texture fine to medium; flavor similar to Kensington Pride, no turpentine taste; seed monoembryonic; fruit development period 2.5-3.5 months, matures very early to early, 2-4 weeks before Kensington Pride. **Tree:** vigor medium, height 4-6 m in 8-10-year-old trees under standard annual pruning; growth habit spreading; canopy open; bark not striated, medium rough; intensity of anthocyanin coloration of young leaves medium to strong; leaf base obtuse, apex acute; blossoms mid-July to late September in Mareeba; yield medium to heavy, consistent.

NMBP-4069. Early to midseason, good cropper with soft pink to red blush over a pale yellow ground color, flavor like Kensington Pride. **Origin:** Commonwealth Scientific and Industrial Research Organisation, Mareeba, Queensland, Australia, by I.S.E. Bally. Van Dyke × Kensington Pride; crossed 1994 in Northern Territory; planted 1996 at Southedge Research Station, Mareeba. USPP 30,813; 20 Aug. 2019. **Fruit:** length 98 mm, width 95 mm, depth 86 mm, 325-500 g, average 378 g; ovate and round with a slight beak; stalk cavity shallow; neck absent, shoulders dorsal and ventral rounded outward; skin medium to thick, adherence to flesh weak to medium; mature skin ground color yellow-green (RHS 151A), blush red (RHS 44A) over 50% of skin when grown in sun, fruit inside canopy do not blush, bloom inconspicuous; lenticels medium in size and density, yellow; ripe skin predominantly yellow and red, ground color yellow-orange (RHS 22B), blush red (RHS 44A); flesh yellow-orange (RHS 23A), soft, moderately juicy; texture medium, pulp fiber very low; flavor sweet, rich, like Kensington Pride with a slight tang, no turpentine taste; seed monoembryonic; matures early to midseason. **Tree:** vigor medium to high; growth habit spreading; canopy compact, medium to dense; bark not striated, medium rough; leaves elliptic with obtuse base, apex variable; bloom timing variable, typically mid-July to late September in Mareeba; yield medium to heavy, tends to alternate bear.

Noa. Late-ripening with attractive shape and color, excellent internal quality, low fiber. **Origin:** Ministry of Agriculture and Rural Development, Bet Dagan, Israel, by U. Lavi, E. Tomer, D. Saada, and Y. Cohen. Shelly O.P. 1995 at Volcani Center, Bet Dagan; selected 2001. USPP 25,297; 24 Feb. 2015. **Fruit:** length 130-140 mm, width 90-100 mm, thickness 80-90 mm, 500-600 g; shape broad elliptic; stalk cavity absent or shallow; neck absent; shoulders ventral rounded upwards, dorsal rounded downwards; mature skin smooth, green (RHS 137C) and red (RHS 184B-C); lenticels pin-head-sized, medium density, rounded, very light green (RHS 138C-D); ripe skin orange (RHS 180B) and red, thickness 3 mm, adherence to flesh strong; flesh orange (RHS 21B), firm, moderately juicy, low in fiber, no turpentine flavor, flavor excellent; seed reniform, monoembryonic; matures late, 20 Aug. to 20 Sept. **Tree:** vigor very strong, height ~4 m at 4 years; growth habit semi-upright; canopy cylindrical, bark cracked, light brownish gray (RHS 199C); leaves ovate; blooms spring.

R10/8. Small tree producing early-ripening, bright yellow fruit with red blush. **Origin:** Katherine, Northern Territory, Australia, by K. Rayner. Irwin × Kensington Pride (most likely pollen parent); grafted 2001; planted 2002. USPP 27,896; 18 Apr. 2017. **Fruit:** length 115 mm, diameter 85 mm, 350-430 g; stalk cavity shallow; apex rounded; beak present; shoulder rising then rounded outward; immature skin green (RHS 141C) with red (RHS 166A) blush where exposed to direct sunlight; mature skin thin, tough, bright yellow (RHS 14B) with red (RHS 44A) blush; flesh yellow (RHS 14A); coarse; very firm and juicy, somewhat fibrous; 14 °Brix; aroma mild;

seed polyembryonic; for fresh market; matures early, variable, 1-20 Oct. 2016; stores ~12 d at ambient temperatures, susceptibility to bruising slight. **Tree:** vigor low, height small to medium; growth habit spreading; trunk bark moderately rough, mottled brown (RHS 165A); leaves lanceolate; bearing heavy, regular.

RA/17. Early-maturing, attractive fruit with excellent flavor and long shelf life. **Origin:** Katherine, Northern Territory, Australia, by K. Rayner. Irwin × R2E2; crossed 1996; grafted 2006. USPP 27,866; 11 Apr. 2017. **Fruit:** size medium, length 120 mm, diameter 90 mm, 375-560 g; apex obtuse; stalk cavity shallow; beak absent; shoulder rounded outwards, sloping abruptly; skin tough, thick; immature skin green (RHS 131D) with red (RHS 39D) blush in direct sunlight; mature skin ground color orange (RHS 24A), blush red (RHS 41A); flesh orange (RHS 24A); very firm; juicy; texture fine, with no fiber; flavor excellent, 14-17 °Brix; aroma mild and pleasant; seed monoembryonic; for fresh market; matures early, 22 Oct. to 20 Nov. 2016; stores 4 weeks in home refrigerator. **Tree:** vigorous, height up to 7.5 m, spread up to 6 m; growth habit narrow upright; canopy open; trunk bark rough, gray-brown (RHS 199C); leaves oblanceolate; productivity good to very good, bearing regular.

TFE 02. Mid-late season, productive, red-skinned, fiber-free. **Origin:** Malelane, Mpumalanga, South Africa, by R. Elphink. Haden O.P. USPP 19,978; 12 May 2009. **Fruit:** length 109 mm, diameter 88 mm, 350-465 g; elliptic; neck not prominent; depth of stalk cavity shallow; skin smooth, medium to thick; mature skin ground color green to yellow-green (RHS 137C-147B), blush grayed red (RHS 181A); ripe skin ground color yellow (RHS 163A), blush red to red-maroon (RHS 180A-180B); flesh yellow-orange (RHS 22A); firm; texture fine, not fibrous; 15.3-19.5 °Brix, acidity low, turpentine flavor absent; seed reniform; matures mid-late season, 2-3 weeks after Kent. **Tree:** vigorous; growth habit upright and spreading; blooms June-August in South Africa; productivity good.

Tropica. High-quality mango well suited to shipping. **Origin:** Clanwilliam, Western Cape, South Africa, by F.A. van den Heever. Chance seedling, parentage unknown, believed to be Heidi × Sensation. USPP 30,757; 30 July 2019. **Fruit:** length 121 mm, diameter 91 mm, 250-450 g; apex flattened; shoulders ventral rounded upward, dorsal rounded downward; stalk cavity absent; beak small-medium, rounded; skin smooth, tough, thick, 1.3-2.2 mm, with good resistance to sunburn, lenticels medium dense; immature skin green (RHS 135C), blush red-purple (RHS 60B) on fruit in direct sunlight; mature skin yellow-orange to orange (RHS 17C-N25D), blush orange-red (RHS N30A); flesh yellow-orange (RHS 20A); texture fine, smooth, not fibrous; aroma tropical; flavor sweet with acid balance, like pineapple, 14 °Brix and higher, no turpentine flavor; for fresh market; matures mid-late season, just before Keitt, 2nd-4th week March in Western Cape; susceptibility to bruising, wind, and disease low. **Tree:** vigor strong, height medium to large, 3 m at 4 years; growth habit erect to slightly spreading; bark smooth to medium, grey-brown (RHS 199B-199C); leaves lanceolate; blooms August-October, 2 years to first flowering; bearing heavy, regular.

NECTARINE

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Andes Nec-2. Slow softening, yellow-fleshed clingstone with long postharvest life. **Origin:** University of Chile, Viveros Asociados Chile, Santiago, by R. Infante. Flavortop × A67-03. USPP 29,727; 9 Oct. 2018. **Fruit:** large, 190-240 g; round; stripped solid red blush covering 60% of surface; firm; acidic; sweet, 13.4-16.1 °Brix; ripens 30-40 d after Flavortop, end of Feb. in Chile; postharvest life up to 50 d at 0 °C; resistant to chilling injury. **Tree:** size medium; vigor weak to medium; highly productive; flowers medium, showy, self-fertile; leaf glands reniform.

Andes Nec-4. Slow softening, white-fleshed, sweet, melting, clingstone with long postharvest life. **Origin:** University of Chile, Viveros Asociados Chile, Santiago, by R. Infante and R. Arturo. 6B-170 × 78-R-121. USPP 29,705; 25 Sept. 2018. **Fruit:** size medium; round; red blush covering 90-100% of surface; symmetrical; firm; juicy; sweet, 17.5-18 °Brix; ripens with Fairhaven, 10-15 Jan. in southern hemisphere. **Tree:** size medium; vigor medium; growth habit semi-upright; productivity high; flowers large, showy, self-fertile; leaf glands reniform.

August Time. Yellow-fleshed, melting, clingstone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. 34P572 × Candy Princess. USPP 30,211; 19 Feb. 2019. **Fruit:** large, 295 g; globose to slightly elongated; uniform; strong red blush covering 100% of surface; firm; crisp; acidic with traditional nectarine flavor, 15 °Brix; kernel bitter; ripens 30 d after Candy Princess, 12-22 Aug. in San Joaquin Valley, California. **Tree:** medium to large; vigorous; hardy; productive; regular bearing; flowers showy, self-fertile; chilling requirement 600 h; leaf glands medium, globose.

Burnectthirtytwo. Yellow-fleshed, clingstone. **Origin:** Burchell Nursery, Oakdale, CA, by T.J. Gerdt and J.K. Slaughter. J10.064 O.P.; tested as N53.082. USPP 29,318; 29 May 2018. **Fruit:** large; firm; uniform; flavor and eating quality very good, good balance between acid and sugar, 11-13.5 °Brix; ripens 12-19 July in San Joaquin Valley, California. **Tree:** large; vigorous; productive; flowers showy, self-fertile; chilling requirement 650 h; leaf glands small, reniform.

Burnectthirtythree. Yellow-fleshed, firm-melting, clingstone. **Origin:** Wawona Packing, Cutler, CA, by T.J. Gerdt and J.K. Slaughter. J10.067 O.P.; tested as N53.015. USPP 30,540; 28 May 2019. **Fruit:** medium-large, 225 g; globose; uniform; red blush covers 75-95% of surface; firm; crunchy; acidic; flavor and eating qualities very good, taste balanced with sweetness and acidity, 11.5-15.5 °Brix; ripens 30 July to 12 Aug. in San Joaquin Valley, California. **Tree:** medium to medium-large; moderately vigorous; growth habit upright; moderately dense; productive; flowers large, showy, self-fertile; chilling requirement 650 h; leaf glands small, reniform.

Burnectthirtyfour. Late ripening, yellow-fleshed, melting, clingstone. **Origin:** Wawona Packing, Cutler, CA, by J.K. Slaughter and T.J. Gerdt. Burnectseven × E499.006; tested as M17.023. USPP 31,405; 28 Jan. 2020. **Fruit:** large, 225 g; globose; uniform; red blush covers 75-95% of surface; skin glossy; firm; crunchy; taste balanced with sweetness and acidity, 11-13.5 °Brix; ripens 10-21 Sept. in San Joaquin Valley, California. **Tree:** medium to medium-large; moderately vigorous; growth habit upright; moderately dense; productive; flowers large, showy, self-fertile; chilling requirement 600 h; leaf glands small, reniform.

Cakebella. Flat, white-fleshed, melting, semi-clingstone. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Cakedelice × Nectarboom. USPP 29,884; 27 Nov. 2018. **Fruit:** medium to large, 160 g; round and flattened; uniform; purple red blush covers 95% of red surface; pistil cavity closed; very firm; very dense; crunchy; juicy; semi-sweet, 15.7 °Brix; ripens 1-9 July in Pyrénées-Orientales Dept., France. **Tree:** size medium; vigor medium to strong; growth habit cylindrical; dense; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium, reniform.

Cakelam. Flat, white-fleshed, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Nectarboom × Cakedelice. USPP 29,934; 4 Dec. 2018. **Fruit:** medium, 170-195 g; flat; purple red blush covers 95% of red background; pistil cavity closed; very firm; very dense; crunchy; juicy; aromatic, semi-sweet, 12-13 °Brix; ripens 2-10 Aug. in Pyrénées-Orientales Dept., France. **Tree:** large; medium vigor;

growth habit cylindrical; dense; flowers medium, showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium, reniform.

Cakemoon. Flat, white-fleshed, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Cakedelice × Nectarperf. USPP 29,885; 27 Nov. 2018. **Fruit:** medium, 150-175 g; round, flattened; uniform; purple red blush covers 85-90% of red background; pistil cavity closed; very firm; very dense; crunchy; juicy; aromatic, semi-sweet, 14.5-17.5 °Brix; ripens 16 Aug. to 8 Sept. in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium to strong; growth habit cylindrical; productivity good to very good; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium, round.

Cakesnow. Flat, white-fleshed, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Nectarrelie × Cakedelice. USPP 29,886; 27 Nov. 2018. **Fruit:** medium to large, 125-150 g; round and flattened; uniform; luminous purple red blush covers 95% of a red background; pistil cavity well closed; crunchy; firm; aromatic, semi-sweet, 14-16 °Brix; ripens 11-24 July in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; growth habit cylindrical; dense; productivity good to very good, regular; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium, reniform.

Cakestar. Slowly ripening, flat, white-fleshed, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Cakedelice × Nectarperf. USPP 29,933; 4 Dec. 2018. **Fruit:** medium-large, 115-165 g; round, flattened; luminous purple red blush covers 100% of surface; very firm; very dense; crunchy; juicy; aromatic, semi-sweet, 15-16 °Brix; ripens 4-18 July in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; growth habit cylindrical; productivity good to very good; flowers medium-large, showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium to large, reniform.

Effie. Firm, white-fleshed, non-melting, clingstone. **Origin:** University of Arkansas, Fayetteville, by M. Worthington and J.R. Clark. Ark. 720 × Ark.747; crossed 2004; selected 2008; tested as Ark. 805. USPP 31,192; 10 Dec. 2019. **Fruit:** size medium, 143 g; round; bright red blush covers 84% of surface; firm; crisp; juicy; moderately aromatic, sweet, 13.9-16.1 °Brix; ripens 2 weeks after Bradley, 16 July in Clarksville, AR. **Tree:** large; vigorous; growth habit upright to semi-spreading; productive; flowers medium-large, showy, self-fertile; chilling requirement 350-1200 h; leaf glands small, reniform; resistant to bacterial spot.

NJF20. Early ripening, low-acid, flat, yellow-fleshed, melting, clingstone. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda. L5-225-01250 × Y153-69. USPP 30,124; 22 Jan. 2019. **Fruit:** size medium, 83 g; oblate, flattened; red purple blush over yellow-orange ground color; tendency to crack medium to high if lightly cropped; firm; sweet, 16 °Brix, low-acid; ripens 30 June to 9 July in Cream Ridge, NJ. **Tree:** large; vigorous; growth habit spreading; productivity medium; flowers medium, non-showy; leaf glands reniform.

NJN102. Yellow-orange-fleshed, melting, semi-freestone. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda and A.M. Voordeckers. Fantasia × Eastern Glo. USPP 30,125; 22 Jan. 2019. **Fruit:** medium-large, 152 g; nearly round; glossy with attractive bright orange-red ground color; firm; juicy; sweet, 12.2 °Brix, moderately acidic; ripens 21-31 July in Cream Ridge, NJ. **Tree:** size medium; vigorous; rounded; productivity excellent; flowers large, showy, self-fertile; leaf glands reniform.

NJN103. White-fleshed, melting, semi-freestone. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda and A.M. Voordeckers. Fantasia × NJN100. USPP 30,123; 22 Jan. 2019.

Fruit: large, 172 g; nearly round; glossy red over yellow-orange ground color; firm; juicy; sweet, 11.6% °Brix, moderately acidic; ripens 21-31 July in Cream Ridge, NJ. **Tree:** size medium; vigorous; growth habit spreading; productivity moderate; flowers large, showy, self-fertile; leaf glands reniform.

Nsred15268. Red-fleshed, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Nectarperf O.P. USPP 31,607; 31 Mar. 2020. **Fruit:** medium-large, 170 g; round; uniform; dark purple red blush covers 100% of red background; very firm; very dense; crunchy; juicy; aromatic, semi-sweet, 15.8 °Brix; flesh color dark red, uniform; ripens slowly, 16-23 July in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; growth habit cylindrical; productivity good, regular; flowers medium-large, showy, self-fertile; chilling requirement 700-1200 h; leaf glands medium, round.

Nsred15270. Red-fleshed, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Nectarperf O.P. USPP 31,504; 3 Mar. 2020. **Fruit:** medium-large, 168 g; round; uniform; dark purple red blush covers 100% of purple-red background; very firm; very dense; crunchy; juicy; aromatic, sugary, 12.9 °Brix; flesh color dark red, uniform; ripens slowly, 24 July to 4 Aug. in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; growth habit cylindrical; productivity good, regular; flowers medium, showy, self-fertile; chilling requirement 700-1200 h; leaf glands medium, round.

Pearlicious XVIII. Low-acid, white-fleshed, clingstone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. 10G523 × 26P994. USPP 31,108; 26 Nov. 2019. **Fruit:** size medium, 241 g; oblate; uniform; dark red blush over a pale greenish yellow ground color; flesh white with vivid red streaking near stone; firm; crisp; juicy; low-acid, very sweet, 20 °Brix; ripens 21-30 Aug. in San Joaquin Valley, California. **Tree:** large; vigorous; growth habit spreading, dense; productive; regular bearing; flowers small, showy, self-fertile; chilling requirement 550 h; leaf glands medium, globose.

Pearlicious XX. Late, low-acid, white-fleshed, melting, clingstone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. 52P564 × 37P398. USPP 30,145; 29 Jan. 2019. **Fruit:** medium, 201 g; globose to round; uniform; strong red blush over a pale greenish yellow background; firm; juicy; low-acid, sweet, 18-20 °Brix; ripens 25 Sept. to 3 Oct. in San Joaquin Valley, California. **Tree:** size medium; vigor moderate; hardy; productive; regular; flowers large, showy, self-fertile; chilling requirement 650 h; leaf glands medium, globose.

Red Bright II. Yellow-fleshed clingstone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. 5P452 × Kay Diamond VII. USPP 29,127; 20 Mar. 2018. **Fruit:** large, 252 g; globose to slightly oblong; uniform; very deep red blush over a moderate red background; firm; crisp; acidic, 14 °Brix; ripens 10-20 June in San Joaquin Valley, California. **Tree:** large; vigorous; growth habit spreading; dense; hardy; flowers showy, self-fertile; chilling requirement 525 h; leaf glands medium, globose.

Smooth Delight Three. Early ripening, low-acid, white-fleshed, melting, clingstone. **Origin:** Texas A&M University, College Station, by D.H. Byrne and N. Anderson. TX4C188LWN self; tested as TX3B323LWN. USPP 30,122; 22 Jan. 2019. **Fruit:** medium-large to large; uniform; red-purple blush covers 80-90% of surface; attractive; low-acid, very sweet, 10-15 °Brix; ripens late May to early June in Fairfield, TX. **Tree:** size medium; vigorous; growth habit semi-spreading; productive; flowers large, showy, self-fertile; chilling requirement 500 h; leaf glands reniform.

Spring Blaze. Low-chill, yellow-fleshed, clingstone. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G.

Zaiger. 396LN413 × 10ZP602. USPP 30,539; 28 May 2019. **Fruit:** medium to large, 161.3 g; globose; blush dark red; firm; meaty; taste balanced, 12.2 °Brix; ripens 28 Apr. to 8 May in Modesto. **Tree:** vigorous; growth habit upright; regular and productive; flowers large, showy, self-fertile; chilling requirement 200 h; leaf glands medium, reniform.

Summer Sugarine. Low-acid, yellow-fleshed, clingstone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. Giant Pearl × Grand Bright. USPP 31,608; 31 Mar. 2020. **Fruit:** large, 332 g; globose to oblong; uniform; blush deep red; firm; crisp; sweet, 15-16 °Brix; ripens 21-30 July in San Joaquin Valley, California. **Tree:** large; vigorous; growth habit spreading; dense; productive; flowers small, non-showy, self-fertile; chilling requirement 550 h; leaf glands globose.

Sunectwentsix. Early ripening, white-fleshed, slow-softening, non-melting, clingstone. **Origin:** Sun World International, Bakersfield, CA, by T. Bacon. NE521 × bulk pollen of: NE1156W, NE1195W, NE1207W, NE1211W. USPP 30,878; 10 Sept. 2019. **Fruit:** size medium, 192 g; round; symmetric; dark red blush covering 99% of surface; firm; juicy; low-acid, sweet, 16 °Brix; ripens 5-14 June in San Joaquin Valley, California. **Tree:** large; vigorous; growth habit semi-upright; very productive; flowers showy, self-fertile; chilling requirement 300 h; leaf glands reniform.

Wanectone. White-fleshed, non-melting, freestone with excellent keeping quality. **Origin:** Wawona Packing, Cutler, CA, by J.K. Slaughter and K.M. Roberts. N21.066 × unpatented nectarine. USPP 31,427; 4 Feb. 2020. **Fruit:** medium large, 257 g; globose; uniform; red blush covers 85-95% of surface; firm, crunchy, dense; juicy; sweet, balanced, 14-19.5 °Brix; ripens 20-29 June in San Joaquin Valley, California. **Tree:** medium to medium-large; vigor moderate; upright; productive; chilling requirement 500 h; leaf glands small, reniform.

PAWPAW

Kirk W. Pomper, Sheri B. Crabtree and Jeremiah D. Lowe,
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KSU 7-5 (KSU-Benson™). Medium-round, fragrant, early-ripening, with smooth, custard-textured flesh. **Origin:** Kentucky State University, Frankfort, by K.W. Pomper, S.B. Crabtree, and J.D. Lowe. Levfiv O.P. growing at the Harold R. Benson Research and Demonstration Farm, Frankfort, KY; selected 2000; tested as KSU 7-5; introd. 2016. **Fruit:** 174-390 g; fleshy; shape unique round; flavor mango-banana-like, sweet, 18.6 °Brix; texture medium-firm, creamy, smooth; flesh orange; fruit quality and quantity excellent; percent seed 6.4% by weight; ripens late August to early September in Kentucky, ~5 d before Sunflower. **Plant:** propagated by chip budding on actively growing rootstock and bark inlay grafting; moderately vigorous; high yielding, 15-32 kg/tree; fruit thinning can increase fruit size.

KSU 4-1 (KSU-Chappell™). Large, fragrant, midseason, with creamy-textured flesh. **Origin:** Kentucky State University, Frankfort, by K.W. Pomper, S.B. Crabtree, and J.D. Lowe. Parentage unknown; selected 2001 from mixed open-pollinated seed collected from pawpaw regional variety trial trees growing at the Harold R. Benson Research and Demonstration Farm, Frankfort, KY; tested as KSU 4-1; introd. 2018. **Fruit:** 224-436 g; fleshy; low percent seed, 5.8% by weight; flavor mild banana-pineapple with floral notes, sweet, 26.2 °Brix; texture medium-firm, creamy, smooth; flesh yellow-orange; fruit quality and quantity excellent; ripens early, mid-September in Kentucky, ~2 d after Sunflower. **Plant:** propagated by chip budding on actively growing rootstock and bark inlay

grafting; vigorous; high yielding, 25-35 kg/tree; fruit thinning can increase fruit size.

KSU-Benson™. See KSU 7-5.

KSU-Chappell™. See KSU 4-1.

PEACH

Nicole Shertzer and Ksenija Gasic, Dept. of Plant and Environmental Sciences, Clemson University, Clemson, SC

April Zee. Yellow-fleshed, firm, clingstone. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 390LU304 × 53ZH1029. USPP 30,012; 25 Dec. 2018. **Fruit:** large, 178.9 g; globose; skin red; texture firm, meaty, crisp; flavor good, 9.5 °Brix; ripens 25 Apr. to 5 May in Modesto. **Tree:** vigorous; growth habit upright; regular and productive; flowers large, showy; chilling requirement 200 h; eglandular.

Burpeachfortyone. White-fleshed, low-acid, firm-melting, clingstone. **Origin:** Burchell Nursery, Oakdale, CA, by T.J. Gerdt and J.K. Slaughter. N21.090 O.P.; tested as Q57.058. USPP 29,128; 20 Mar. 2018. **Fruit:** large, 208 g; uniform; red blush covering 65-85% of pale white-yellow ground color; firm, crunchy, juicy and dense; flavor and eating quality very good, sweet, 12-14.5 °Brix, low-acid; ripens 5-10 May in San Joaquin Valley, California. **Tree:** large; moderately vigorous; productive; growth habit upright; vase shape; flowers medium-large, showy, self-fertile; chilling requirement 350 h; leaf glands average, reniform.

Crimson Joy. Yellow-fleshed, melting, freestone. **Origin:** ARS-USDA, Byron, GA, by C. Chen and W.R. Okie. BY96P3423 O.P. USPP 31,194; 10 Dec. 2019. **Fruit:** large, 175-215 g; uniform; round; purple red blush covers 85-95% of surface; flesh yellow with some redness around pit; firm, juicy; taste balanced, 10.2-11.9 °Brix; ripens with Harvester, early to mid June in Byron. **Tree:** large; vigor moderate; growth habit semi-spreading; productive; bearing regular; flowers showy, self-fertile; chilling requirement 700 h; leaf glands reniform; resistance to bacterial spot moderate to high.

Crispova. Orange-yellow, melting, semi-clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Sweetember O.P.; tested as 8C.01.277.14 PJ and ASF1444. USPP 30,732; 23 July 2019. **Fruit:** large, 190-220 g; uniform; round; purple red blush covers 95% of orange red background; very firm; very dense; crunchy; very juicy; red pigmentation, star-shaped in stone cavity; eating quality high, 11.5-14.4 °Brix; shelf life very long; slow ripening; ripens medium to late, harvested 2-27 Aug. in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; dense; productivity good to very good, regular; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands round, small.

Crispreve. Low-chill, orange-yellow-fleshed, semi-sweet, melting, clingstone with very long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. Nectarflora × ASF PJ BZ0104. USPP 29,551; 31 July 2018. **Fruit:** medium to large, 135-160 g; round to slightly flattened; uniform; purple-red blush covers 75% of orange-red background; very firm; very dense; crunchy; very juicy; semi-sweet; ripens slowly 28 June to 16 July in Pyrénées-Orientales Dept., France. **Tree:** large; vigorous; very productive; growth habit upright; flowers medium, showy, self-fertile; chilling requirement between 350-1200 h; leaf glands small, globose.

Fire Zest One. Yellow-fleshed, non-melting, clingstone. **Origin:** Texas A&M University, College Station, by D.H. Byrne and N. Anderson. TX2B1 × Spring Baby; tested as TX3A296. USPP 29,823; 13 Nov. 2018. **Fruit:** medium-large, 125 g; shape truncated

with unequal halves; high percentage of purple red blush on orange-red background; very firm; quality excellent; sweet, slightly acidic, 9-14 °Brix; ripens with Victor, 7-12 d before TexKing, early May in Fairfield, TX. **Tree:** highly vigorous; density medium to high; productive; growth habit semi-spreading; flowers showy, self-fertile; chilling requirement 500-550 h; leaf glands globose.

Flatbuzz. White-fleshed, flat, melting, semi-clingstone with long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. ASF 1199 O.P.; tested as 07.37.85.13 PBPL and ASF13104. USPP 30,731; 23 July 2019. **Fruit:** medium-large, 100-110 g; shape round and flattened with few bumps; purple red blush covers 85-95% of orange red background; very firm; dense; crunchy; melting; juicy; aromatic, semi-sweet, 16.6-17.2 °Brix; ripens slowly 22 June to 8 July in Pyrénées-Orientales Dept., France. **Tree:** large; vigor medium; dense; uniform; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium to large, reniform; tolerant to brown rot (*Monilinia spp.*); moderately sensitive to powdery mildew (*Phodosphaera leucotricha*); very sensitive to blight (*Puccinia spp.*).

Flatcandy. White-fleshed, flat, melting, semi-clingstone with long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. ASF0621 × Flatreine; tested as 4N.14E.161.13PBPL or ASF1491. USPP 30,759; 30 July 2019. **Fruit:** medium, 80-110 g; round and flattened; purple red blush covers 80-100% of surface; very firm; very dense; crunchy; melting; juicy; aromatic, semi-sweet, 9.5 to 11.0 °Brix; shelf life very long; ripens over 8-9 d, 16-28 June in Pyrénées-Orientales Dept., France. **Tree:** large; dense; vigor medium; productivity good to very good; flowers large, showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium to large, reniform.

Flatwo. Early-season, white-fleshed, flat, melting, semi-clingstone with long shelf life. **Origin:** Argo Selection Fruits, Elne, France, by A. Maillard and L. Maillard. ASF 0621 × Flatreine. USPP 29,635; 4 Sept. 2018. **Fruit:** medium-large, 75 g; round and flattened; purple red blush covering 75% of marbled orange red ground; very firm; very dense; crunchy; melting; juicy; very aromatic, semi-sweet, 9-12 °Brix; grouped maturity within 5-10 d; ripens 1-22 June in Pyrénées-Orientales Dept., France. **Tree:** large; vigorous; very productive; semi-flared; dense; flowers showy, self-fertile; chilling requirement 350-1200 h; leaf glands medium to large, reniform.

July Princess. Yellow-fleshed, acidic freestone suitable for long-distance shipping. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. 43P318 × Snow Princess. USPP 28,996; 27 Feb. 2018. **Fruit:** size medium, 232 g; globose with slight bulging along the suture; uniform; deep red blush; firm; crisp; moderately acidic, sweet, 15-16 °Brix; ripens 7-13 July in San Joaquin Valley, California. **Tree:** large; vigorous; growth habit spreading; productive; dense; flowers showy, self-fertile; chilling requirement 500 h; leaf glands globose when young, medium, reniform with age.

Liberty Joy. Yellow-fleshed, melting, freestone. **Origin:** ARS-USDA, Byron, GA, by C. Chen and W.R. Okie. BY99P1405 × BY02P3862. USPP 31,109; 29 Nov. 2019. **Fruit:** large, 159-251 g; uniform; round; purple red blush covers 90% of surface; flesh yellow with some redness around pit; firm; juicy; taste balanced, 7.6-14.2 °Brix; ripens with Redglobe, 5-10 July in Byron. **Tree:** large; vigor moderate; growth habit semi-spreading; productive; bearing regular; flowers large, showy, self-fertile; chilling requirement 650 h; leaf glands reniform; resistance to bacterial spot high.

Mia Snow. White-fleshed, low-acid, freestone. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 378LU435 × 56B484. USPP 30,262; 5 Mar. 2019. **Fruit:** large, 322 g; globose; skin red, attractive; firm; flavor and eating quality very good, sweet, low-acid, 13.4 °Brix; ripens 9-19 Aug. in Modesto. **Tree:** large; vigorous; growth habit upright; regular and

productive; flowers large, showy, self-fertile; chilling requirement 800 h; leaf glands small, reniform.

NJ357. Yellow-orange-fleshed, low-acid, melting, freestone. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda and A.M. Voordeckers. H15-20-90258 × Summerprince. USPP 29,989; 18 Dec. 2018. **Fruit:** large, 220 g; nearly round; red blushed; firm; juicy; sweet, low-acid, 11.7 °Brix; may develop inking after storage; ripens 25 July to 6 Aug. in Cream Ridge, NJ. **Tree:** vigorous; growth habit spreading; productivity excellent; flowers large, showy; leaf glands reniform.

NJ358. Late-season, aromatic, yellow-orange-fleshed, melting, freestone. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda and A.M. Voordeckers. Flameprince × G47-99-84258. USPP 29,962; 11 Dec. 2018. **Fruit:** large, 262 g; round; red blush over yellow-orange ground color; sweet, moderately acidic; eating quality very good; ripens 24 Aug. to 6 Sept. in Cream Ridge, NJ. **Tree:** vigorous; growth habit spreading; productivity excellent; flowers large, showy; leaf glands reniform; moderately tolerant to bacterial spot.

NJ359. Yellow-orange-fleshed, freestone, melting flesh. **Origin:** Rutgers University, New Brunswick, NJ, by J.C. Goffreda and A.M. Voordeckers. Flameprince × NJ260. USPP 29,961; 11 Dec. 2018. **Fruit:** large, 274 g; nearly round, may have unequal halves; red blush and red-purple mottle over bright yellow-orange ground color; firm; aromatic, moderately acidic, sweet, 13.5 °Brix; eating quality good to very good; ripens 28 Aug. to 8 Sept. in Cream Ridge, NJ. **Tree:** vigorous; growth habit spreading; productivity very good; flowers small, non-showy; leaf glands reniform; moderately tolerant to bacterial spot.

Pearl Princess II. White-fleshed, low-acid, melting, freestone. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. Snow Princess × May Princess; crossed 2007; selected 2012. USPP 31,080; 19 Nov. 2019. **Fruit:** size medium, 244 g; globose; uniform; deep red blush over a strong pink ground color; flesh yellowish-white with strong red flecking near skin; firm; crisp, sweet, 13 °Brix; ripens 14-23 June in San Joaquin Valley, California. **Tree:** large; vigorous; spreading; dense; bearing regular; flowers large, showy, self-fertile; chilling requirement 525 h; leaf glands globose.

Rich Joy. Yellow-fleshed, melting freestone with long shelf life. **Origin:** ARS-USDA, Byron, GA, by C. Chen and W.R. Okie. Flameprince × BY87P0943. USPP 31,081; 19 Nov. 2019. **Fruit:** large, 150-210 g; uniform; round with slightly prominent suture; purple red blush covers 80-95% of surface; flesh yellow with some redness around pit; firm; crisp; slow melting; juicy; taste balanced, 8.6-13.7 °Brix; ripens 1 week after Julyprince, 5-10 July in Byron. **Tree:** large; vigor moderate; growth habit semi-spreading; dense; productive; bearing regular; flowers large, showy, self-fertile; chilling requirement 850 h; leaf glands reniform; resistance to bacterial spot high.

Sauzee Spring. White-fleshed, flat, sweet, low-acid clingstone with good storage and shipping quality. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 186LT97 × Sauzee Queen. USPP 31,009; 5 Nov. 2019. **Fruit:** medium, 90.6 g; shape peento; firm; moderate juice; flavor mild, sweet, low-acid, 11.6 °Brix; shipping and keeping quality good; ripens 15-25 May in Modesto. **Tree:** large; vigorous; growth habit upright; productive; density medium; flowers showy, self-fertile; chilling requirement 550 h; leaf glands small, reniform.

Snow Belle. Early ripening, white-fleshed clingstone with good storage and shipping quality. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. Snow Fox O.P. USPP 29,352; 5 June 2019. **Fruit:** large, 258.4 g; globose; skin red; firm; texture meaty, crisp; flavor and eating quality very good, balanced, 10 °Brix; storage and shipping qualities good; ripens 9-19 May in Modesto. **Tree:** vigorous; growth habit upright; productive; flowers large, showy, self-fertile; chilling requirement 300 h; leaf glands reniform.

Snow Eden. White-fleshed, low-acid clingstone. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 60ZM590 × 43ZN430. USPP 29,401; 19 June 2018. **Fruit:** medium-large, 161.9 g; globose; skin dark red; firm; eating quality good; sweet, low-acid, 14 °Brix; ripens 16-26 May in Modesto. **Tree:** large; vigorous; growth habit upright; productive; flowers large, showy, self-fertile; chilling requirement 550 h; leaf glands large, reniform.

Summer Glory. Yellow-fleshed clingstone with good storage and shipping quality. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 358LN360 × Sweet Henry; selected 2013. USPP 31,193; 10 Dec. 2019. **Fruit:** large, 286 g; globose; skin dark red; flesh firm, meaty; eating quality good, taste balanced, 13 °Brix; ripens 2-12 July in Modesto. **Tree:** large; vigorous; growth habit upright; productive; flowers large, showy, self-fertile; chilling requirement 650 h; leaf glands small, reniform.

Summer Perfection. Yellow-fleshed clingstone with good storage and shipping quality. **Origin:** Zaiger's Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 36LW277 × Sweet Henry; selected 2013. USPP 31,038; 12 Nov. 2019. **Fruit:** large, 319.3 g; globose; skin dark red; flesh firm, meaty, crisp; eating quality good, taste balanced, 10.9 °Brix; ripens 8-18 Aug. in Modesto. **Tree:** large; vigorous; growth habit upright; productive; flowers large, showy, self-fertile; chilling requirement 750 h; leaf glands medium, reniform.

Supechtwentythree. Early ripening, yellow-fleshed, non-melting, clingstone. **Origin:** Sun World International, Bakersfield, CA, by T. Bacon. PE226 × Supechseventeen. USPP 30,952; 22 Oct. 2019. **Fruit:** large, 185 g; medium red to dark red blush covers 90% of surface; firm; sweet, 12 °Brix, acidity medium, Brix/acid ratio 17; ripens 3-13 May in Wasco, CA. **Tree:** size medium; vigorous; very productive; flowers showy, self-fertile; chilling requirement 200-300 h; leaf glands reniform.

Supechtwentytwo. Early ripening, yellow-fleshed, non-melting, clingstone. **Origin:** Sun World International, Bakersfield, CA, by T. Bacon. Supechsixteen × PE345. USPP 30,979; 29 Oct. 2019. **Fruit:** large, 180 g; 95% red blush over yellow-orange ground color; firm; juice moderate; sweet, 13 °Brix; ripens with Snow Angel, 2-11 May in Wasco, CA. **Tree:** size medium; vigorous; growth habit semi-upright; very productive; flowers non-showy, self-fertile; leaf glands reniform; chilling requirement 200 h.

Vilmos. Very good yellow-fleshed, non-melting, clingstone, canning type. **Origin:** University of California, Davis, by T.M. Gradziel and M.A. Thorpe. Loadel × F10E6-27. USPP 29,623; 28 Aug. 2018. **Fruit:** medium to large; slightly angular to round; uniform; red blush covers 20-50% of surface; taste balanced, 11.5 °Brix; ripens 19-31 July in Davis. **Tree:** size medium; vigor medium; growth habit upright; spreading; productive; flowers medium, non-showy, self-fertile; chilling requirement 500-900 h; leaf glands small to medium, globose; tolerant to flower blight and fruit brown rot.

PEAR

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HW624. Red-blushed yellow fruit with tolerance to fire blight and pear psylla. **Origin:** Agriculture and Agri-Food Canada, Ottawa, Canada, by D.M. Hunter. Harrow Sweet × NY10353; crossed 1988; selected 1995; tested as H8806-1, 2000. Canadian PBR 4402; 6 Sept. 2012. USPP 28,336; 29 Aug. 2017. **Fruit:** medium-large, length 8.7 cm, width 6.9 cm, ~159.5 g; straight-sided pyriform, slightly asymmetric; dark red with yellow ground color, no russet; flesh medium-firm; texture very fine, medium-juicy; 11.8-13.5 °Brix; ripens mid-late season, 2

weeks after Bartlett; fresh market. **Tree:** vigor medium-strong; branching strong; growth habit spreading-drooping; yield heavy, consistent; blooms early; chilling requirement 800-1000 h, winter hardy; highly tolerant to fire blight (*Erwinia amylovora*) and pear psylla (*Cacopsylla pyricola*); not graft-compatible with quince rootstocks.

Misty Rose[®]. See NC4.

Naoussa. Flavorful green pyriform pear with tolerance to fire blight, scab, and psylla. **Origin:** Institute of Plant Breeding and Phyto-genetic Resources, Naoussa, Greece, by T. Sotiropoulos, N. Koutinas, and A. Giannakoula. Kristali × Coscia. **Fruit:** medium-large, length 8.6 cm, diameter 7.1 cm, 162 g; pyriform; green or yellow-green; flesh firmness 4.6 kg/cm², juicy, stone cells low; ripens with Kalliopi and Coscia; fresh market; stores ~3 months at 1 °C. **Tree:** vigor medium; growth habit upright; crops heavily, thin to avoid biennial bearing; blooms with Highland and Comice; relatively tolerant to fire blight, some resistance to scab (*Venturia pirina*) and psylla; graft-compatible with quince.

NC4 (Misty Rose[®]). Attractive red-purple fruit. **Origin:** J.R. Breach, Staplehurst, Great Britain. Concorde × Red Williams; crossed 2007, selected 2008. USPP 30,446; 30 Apr. 2019. **Fruit:** medium-large, length 9.8 cm, width 7.1 cm, 213 g; pyriform, elongated, side profile concave; purple with orange-red ground color, russet medium; flesh firm; texture smooth, juicy; 12.5 °Brix; ripens 3 weeks after Conference; fresh market. **Tree:** vigor weak; branching half-spur; growth habit fastigiate; crops medium-heavy; blooms with Conference.

Noiabriskaia (Xenia[®]). Firm green fruit with low susceptibility to scab and fruit tree canker. **Origin:** Van Rijn-de Bruyn, Uden, the Netherlands, selected by P. van Rijn. Triomphe de Vienne × Krier; crossed 1968, selected 2001; introd. 2008. BOPI 12/1995, Moldova. **Fruit:** large, 250-300 g; globose; yellow-green, russet moderate; flesh very firm, can soften; texture crunchy, stone cells low; juicy, non-dripping; ~12 °Brix; ripens 2 weeks after Conference; fresh market; stores ~3 months at 1 °C. **Tree:** vigor medium; growth habit horizontal to upright; crops early, heavy, biennial bearing low; blooms 3-5 d before Conference; susceptibility low for pear scab, very low for fruit tree canker (*Nectria galligena*).

Peggy. Yellow-green Asian type with long storability. **Origin:** Stark Bro's Nurseries & Orchards, Louisiana, MO, by D. Keithly. Danbae mutation; discovered 2008, Yakima, WA. USPP 29,880; 27 Nov. 2018. **Fruit:** medium-large, length 8.3-8.9 cm, diameter 8.3-8.9 cm, ~255-340 g; globose, slight turbinate; yellow-green, russet present; flesh crisp, very juicy; flavor sweet, refreshing; stone cells average near core; ripens 30 d before Danbae; stores at 0 °C until May. **Tree:** vigorous; branching medium; growth habit upright to upright-spreading; yield regular, productive; blooms early.

PremP003. Large, globose, good quality, yellow-green fruit. **Origin:** Prevar, Hastings, New Zealand, by A.G. White. Max Red Bartlett × Snowflake; crossed 1989; selected 1996. USPP 28,853; 9 Jan. 2018. **Fruit:** large, length 10 cm, diameter 8.9 cm; globose; yellow-green; flesh crisp, juicy; ripens mid-September in Parker, WA, 3 weeks after PremP027; fresh market. **Tree:** vigor medium; branching medium; growth habit upright; blooms mid-April in Parker.

PremP027. Attractive yellow-green globose fruit with long shelf life. **Origin:** Prevar, Hastings, New Zealand, by A.G. White. Max Red Bartlett × Snowflake; crossed 1989; selected 1996. USPP 28,874; 16 Jan. 2018. **Fruit:** large, length 15 cm, diameter 9.6 cm; yellow-green; globose; flesh very crisp, very juicy; ripens mid-August in Parker, WA, 2-3 weeks before Snowflake; fresh market; storage 3 months regular atmosphere. **Tree:** vigor medium; branching medium; growth habit upright; blooms mid-April in Parker.

Rode Doyenné van Doorn (Sweet Sensation[®]). Attractive, sweet, yellow-green with red blush. **Origin:** S.K. Broertges, J.H. Van Doorn. Doyenne du Comice mutation, discovered 1992, Wijdenes,

the Netherlands, introd. 2010. Canadian PBR 5715; 5 May 2018. USPP application abandoned. **Fruit:** large, ovate pyriform; yellow-green, red-striped; flesh soft; texture smooth; very juicy; sweet; ripens late season; fresh market. **Tree:** vigor strong; branching medium; growth habit upright; blooms late.

Sweet Sensation[®]. See Rode Doyenné van Doorn.

Xenia[®]. See Noiabriskaia.

PERSIMMON

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Doc's Delight. Nonstringent *Diospyros kaki*, sport of Fuyu ripening 10-14 d earlier. **Origin:** Wasco, CA, by A.W. Carlson. Tree sport of Fuyu, discovered 1996. USPP 16,822; 18 July 2006. **Fruit:** uniform and large for Asian persimmon, axial diameter 72-76 mm; diameter transverse in suture plane 51-52 mm; diameter transverse and at right angles to suture plane 73-78 mm; globular with flat apex; two sutures at right angles to each other; skin thickness average, glabrous, adheres lightly to flesh; ground color wood rose sorghum brown (Maerz and Paul P1.6 B9), absent on shoulder; blush coral bell (Maerz and Paul P1.3 H10); flesh coral bell (Maerz and Paul P1.3 H10); firm at commercial maturity; flavor mild, with no apparent astringency, sweet, 16 °Brix; eating quality similar to Fuyu; seeds none; for fresh market; ripens 10-14 d before Fuyu, first week of October in southern San Joaquin Valley, California. **Tree:** size medium, height on trellis 2.4-3 m, width 2.4-3 m; vigor good; productivity good; bearing regular.

JN5. American persimmon (*Diospyros virginiana*) with vigorous, rapid growth, upright columnar and weeping habit, and light orange fruits. **Origin:** Belvidere, TN, by R. Jackson and C. Jackson. Unidentified selection of *D. virginiana* × unknown selection of *D. virginiana*, discovered in controlled nursery environment 2007. USPP 25,689; 14 July 2015. **Fruit:** length 26-39 mm, diameter 25-38 mm, globose; immature skin light green (RHS 195C); mature skin light orange (RHS 24B), smooth; seed length ~20 mm, diameter ~13 mm, black (RHS 202A). **Tree:** deciduous; vigorous, rapid grower; growth habit upright columnar and weeping, freely branching; density medium; leaves large; blooms May-June in Oklahoma; garden performance good; tolerates wind, rain, and temperatures -29 °C to 43 °C.

Nuevo Rojo Brillante. Pollination-variant astringent *Diospyros kaki* with high parthenocarpic productivity, bearing large, highly colored fruit. **Origin:** Parlier, CA, by C.H. Crisosto. Spontaneous mutation of Rojo Brillante, observed in tree propagated from cuttings imported from Spain in 2005. USPP 20,729; 9 Feb. 2010. **Fruit:** uniform and large for Asian persimmon, diameter 61 mm, 240-300 g; shape very broad ovate; apex obtuse, with weak to moderate grooving; skin thickness average, glabrous, adheres tightly to flesh; tendency to crack not observed; color at maturity fully orange, after ripening bright red orange; flesh yellow-orange, without brown spots; astringent similar to Hachiya; flavor excellent after astringency removal treatment, very sweet; ripens ~3rd week November in southern San Joaquin Valley, California; when pollinated produces seeds and brown areas around seeds; for drying and fresh market only after astringency removal treatment; ready to eat 1-2 d after astringency removal; storage ~7-9 weeks at 10 °C and 90% relative humidity. **Tree:** medium to large; vigor high; productivity very high; bearing regular; cold hardy USDA Zones 8-10.

PINEAPPLE

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Tainung No. 23. Orange yellow medium fruit. **Origin:** Chiayi Agricultural Experiment Station, Chiayi, Taiwan, Taiwan

Agricultural Research Institute, by C.S. Kuan & C.H. Tang. Tainung 19 × Tainung 21; crossed 1994; selected 2006; tested as C83-5-4; introd. 2017; Taiwan PVR A02313; 11 June 2018. **Fruit:** size medium, 1.4 kg with crown; oblong; orange yellow; skin thin; blossom cup medium; flesh yellow; soft; core large; TSS 18.2%; titratable acidity 0.7%; low in fiber. **Plant:** growth habit dwarf, semi-upright; plant height 52 cm; leaf edge smooth with spiny tips.

PLUM AND INTERSPECIFIC HYBRIDS

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Plum

Plumcandy XIV. Purplish-black, melting, clingstone Japanese plum with excellent shipping and keeping quality. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. Plumsweet VIII × pollen mix. USPP 30,184; 12 Feb. 2019. **Fruit:** very large, 239 g; oblate; uniform; skin purplish black with heavy, small, yellow freckling; flesh color pale greenish-yellow; firm; crisp; meaty; juicy; very sweet, 18–21 °Brix; ripens 5–25 Sept. in San Joaquin Valley, California. **Tree:** size medium; vigorous; growth habit spreading; dense; very productive; flowers white, self-incompatible; requires cross-pollination by mid- to late-season plum or interspecific, such as Plumsweet XV interspecific tree; blooms 17 Feb. to 1 March; leaf glands medium, globose.

Plumsweet XXI. Dark red, melting, clingstone Japanese plum. **Origin:** B Q Genetics, Le Grand, CA, by L.G. Bradford and J.M. Quisenberry. Plumred X × pollen mix. USPP 30,210; 19 Feb. 2019. **Fruit:** size medium, 150 g; ovate; uniform; skin dark purplish red; flesh dark red; firm; crisp; juicy; very sweet, 22 °Brix; ripens 25 Sept. to 25 Oct. in San Joaquin Valley, California. **Tree:** small; vigor medium; very productive; flowers white, self-incompatible; requires cross-pollination by mid- to late-season apricot, interspecific or plum, such as Plumred VII; blooms 20 Feb. to 1 March; leaf glands medium, globose.

Polaris. ‘Rose-water’ flavored, non-melting, semi-freestone Japanese plum with orange-pink flesh. **Origin:** Stargrow Cultivar Development, Stellenbosch, South Africa, by J. Fourie. Parentage unknown; selected 2009. USPP 29,777; 30 Oct. 2018. **Fruit:** large, 110 g; round; symmetrical; skin violet blue overcolor covering large area of yellow-green to yellow-orange surface; flesh firm; crisp; juicy; sweet, 18–20 °Brix, rose-water flavored; ripens 10 d after Fortune, 18–25 Jan. in Clanwilliam, Western Cape. **Tree:** size medium; vigor medium; growth habit upright; productivity good; bearing regular; flowers white, self-incompatible; requires cross-pollination; blooms 5–16 Sept. in Paarl/Stellenbosch; leaf glands medium, reniform.

Suplumfiftyfour. Very large, juicy clingstone Japanese plum with black skin and yellow flesh. **Origin:** Sun World International, Bakersfield, CA, by T.A. Bacon. Suplumthirtyfive × bulk plum pollen; tested as PL608YB. USPP 29,766; 23 Oct. 2018. **Fruit:** very large, 215 g; round; slightly asymmetrical; skin dark black covering whole surface; flesh yellow-orange; firm; juicy; flavor mildly sweet, 17 °Brix, Brix:acid ratio 49; ripens 37 d after Suplumthirtyfive, 23 July to 2 Aug. in Wasco, CA. **Tree:** size medium; vigor medium; growth habit semi-upright; very productive; bearing regular; needs thinning; flowers white, self-incompatible; requires cross-pollination; blooms 22–26 Feb. in Wasco; chilling requirement 550 h; leaf glands globose.

Suplumfiftyone. Firm, semi-freestone Japanese plum with dark purple-black skin and dark red flesh. **Origin:** Sun World International, Bakersfield, CA, by T.A. Bacon. PL888RB × pollen mix; tested as PL1617RB. USPP 29,846; 20 Nov. 2018. **Fruit:** large, 170 g; round; flavor sweet-mild, 18 °Brix; aroma slight, fruity; good for fresh market and shipping; ripens 43 d after Black Splendor, 24 July

to 3 Aug. in Wasco, CA. **Tree:** size medium; vigor medium; very productive; bearing regular; needs thinning; flowers white, self-incompatible; requires cross-pollination; blooms 22–26 Feb. in Wasco; chilling requirement 550 h; leaf glands globose.

Suplumfiftythree. Firm, freestone, fresh market Japanese plum with black skin and red flesh. **Origin:** Sun World International, Bakersfield, CA, by T.A. Bacon. PL761RB × PL674RZ; tested as PL1687RB. USPP 29,789; 6 Nov. 2018. **Fruit:** large, 140 g; round; symmetric or slightly asymmetric; skin dark greyed-purple becoming black covering whole surface; flesh firm, crisp; juice medium; flavor mildly sweet, 17 °Brix, Brix:acid ratio 34; aroma slight, fruity; good for fresh market and shipping; ripens 7 d after Black Splendor, 18–21 June in Wasco, CA. **Tree:** size medium; vigor medium; growth habit semi-upright; very productive; bearing regular; needs thinning; flowers white, self-incompatible; requires cross-pollination; blooms 22–26 Feb. in Wasco; chilling requirement 550 h; mostly eglandular, rarely one globose leaf gland.

Suplumfiftytwo. Fresh market, firm, semi-freestone Japanese plum with dark red flesh. **Origin:** Sun World International, Bakersfield, CA, by T.A. Bacon. PL608YB × PL374RR; tested as PL1748RB. USPP 29,776; 30 Oct. 2018. **Fruit:** large, 180 g; round; symmetric or slightly asymmetric; skin dark greyed-purple becoming black covering whole surface; flesh dark red; firm; juicy; flavor mildly sweet, 17 °Brix, Brix:acid ratio 34; aroma slight, fruity; good for fresh market and shipping; ripens with Black Splendor, 13–23 June in Wasco, CA. **Tree:** size medium; vigor medium; growth habit spreading; very productive; bearing regular; needs thinning; flowers white, self-incompatible; requires cross-pollination; blooms 19–23 Feb. in Wasco; chilling requirement 450 h; leaf glands globose.

Interspecific

Flora’s Flavor. Large, yellow-fleshed, clingstone, with an attractive dark purple skin. **Origin:** Zaiger’s Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. Flavorich × 147LB395; selected 1994. USPP 29,400; 19 June 2018. **Fruit:** large, 150.5 g; globose; skin red; flesh firm; eating quality very good, handling and shipping ability good; texture firm, juicy; good balance between acid and sugar; 20 °Brix; ripens 27 d after Flavorich, 30 Aug. to 9 Sept. in Modesto. **Tree:** large; vigorous; growth habit upright; bearing regular and productive; flowers medium, white, self-incompatible; requires cross-pollination; blooms 28 Feb. to 9 Mar.; chilling requirement 850 h; leaf glands medium-large, globose.

Flavor Mist. Large, yellow-fleshed, clingstone, with attractive dark purple skin. **Origin:** Zaiger’s Genetics, Modesto, CA, by G.N. Zaiger, L.M. Gardner, and G.G. Zaiger. 340LU282 × 121LT36; selected 2008; USPP 29,366; 12 June 2018. **Fruit:** large, 176.1 g; globose; skin red; flesh firm; eating quality very good, handling and shipping ability good; texture firm, juicy; good balance between acid and sugar, 18.5 °Brix; ripens 3–13 July in Modesto. **Tree:** large; vigorous; growth habit upright; productive; flowers medium, white, self-incompatible; requires cross-pollination; blooms 8–18 Feb.; chilling requirement 800 h; leaf glands small, globose.

POMEGRANATE

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Al-Sirin-Nar. Medium to large, pinkish red with sweet-tart arils and hard seeds; good for juicing. **Origin:** former Soviet Union, conserved at Kara-Kala Experimental Station, Turkmenistan; introduced from

Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala to USDA-ARS and provided to National Clonal Germplasm Repository, Davis, CA by M.W. Hotchkiss, 1997. Parentage unknown. **Fruit:** medium to large, 349 g, hundred aril weight 52.6 g; round, often with angular edges where locules meet, slightly oblate; rind soft, bright pinkish-red to red; calyx relatively long, large, fleshy, and pronounced; arils medium-large, round, solid red; seeds large, hard, initially crunchy, then chewy; flavor sweet-tart, 16.9-17.3 °Brix, TA 1.10-1.16% citric acid, with mild astringency; good for juice due to hard seededness and flavor; ripens October in Davis. **Tree:** growth habit vigorous and upright; flowers showy, large and red; believed to be resistant to fruit sunburn in Georgia, USA.

Huaibeiruanzi 3. Medium-size, semi-soft seeded, sweet, yellow. **Origin:** well-known commercial cultivar from Anhui Province, China. Parentage unknown. **Fruit:** size medium, 267 g; nearly round; yellow; sweet, 15.0 °Brix, TA 0.62% citric acid; arils white, juicy, with semi-soft seeds; hundred-aril weight 63.5-70.0 g; ripens end of September in Anhui.

Huaiyuanmanaozi. Medium-size, semi-hard seeded, sweet, yellow-green. **Origin:** Anhui Province, China. Parentage unknown. **Fruit:** size medium, 340 g; yellow-green with red blush on sunny side; very juicy; sweet, 17.2 °Brix, TA 0.58% citric acid; vitamin C 13.4 mg/100 g fresh weight; arils pink with large, semi-hard seeds; hundred-aril weight 76.8 g; ripens late September to early October in Anhui; stores well.

Huaiyuanyushizi. Medium-size, semi-soft seeded, sweet, green-yellow. **Origin:** local cultivar from Anhui Province, China; well-known throughout China. Parentage unknown. **Fruit:** size medium, 240 g, green-yellow with red blush on sunny side; arils bright yellow-amber with red rays and large, semi-soft seeds; very juicy and sweet, 16.5 °Brix, TA 0.34% citric acid; vitamin C 12.9 mg/100 g fresh weight; ripens end of September in Anhui; fruit has excellent split resistance but is susceptible to sunburn.

Huilqipiruanzi. Large, semi-hard seeded, sweet, yellow-green. **Origin:** Sichuan Province, China. Parentage unknown. **Fruit:** large, 480 g; nearly round; yellow-green with a slight red blush; arils sweet, 15.3 °Brix, TA 0.43% citric acid, pink, with semi-hard seeds; ripens end of August to September in Sichuan. **Tree:** resistance to diseases good; planted widely in warm regions of China.

Jianshuihongmanao. Medium to large, hard seeded, sweet-sour, red. **Origin:** Yunnan Province, China. Parentage unknown. **Fruit:** medium to large, 318-572 g, round, red with crimson red arils, hard seeds; sweet-sour, 12.5-15.5 °Brix; juice content 34.3-58.3% with applications for fresh fruit and juice processing. Matures end of August into September in Yunnan. **Tree:** small; cold tolerance poor; cultivated in warm regions in China.

Jianshuihongzhenzhu. Medium to large, semi-soft seeded, sweet-sour, crimson red. **Origin:** commercial cultivar from Yunnan Province, China. Parentage unknown. **Fruit:** medium to large, 7.4 cm long, diameter 8.4 cm, 326-574 g; nearly round; crimson red; arils red or pinkish-red with semi-soft seeds; sweet-sour, 14.0-16.0 °Brix; used for juice or fresh eating; ripens end of August into September in Yunnan. **Tree:** cold tolerance poor; cultivated in warm regions in China.

Jinghuayushizi. Medium to large, hard seeded, sweet, yellow-green with red blush, split-resistant. **Origin:** Anhui Province, China. Bud sport of Yushizi. **Fruit:** medium to large, 380g; yellow-green with red blush on sunny side; arils large, bright yellow, juicy with hard seeds; sweet, 14.0 °Brix; hundred-aril weight 90.1 g; ripens in mid-to-late October in Anhui; splitting resistance excellent; postharvest shelf life long.

Lintongsanbaitian. Medium-size, semi-soft seeded, sweet, yellow to milky white. **Origin:** Shanxi Province, China; named for the color

of the flower, peel, and arils. Parentage unknown. **Fruit:** size medium, 300 g; sweet, 16.0 °Brix; yellow to milky white; arils with semi-soft seeds; ripens late September in Shanxi; fruit split occurs frequently from late rains.

Linxuan 1. Medium to large, semi-soft seeded, sweet, yellow-orange. **Origin:** Shanxi Province, China. Parentage unknown. **Fruit:** medium to large, 334 g; round; yellow-orange with a slight pink blush; arils red, juicy, with semi-soft seeds; sweet, 16 °Brix; hundred-aril weight 48-52 g; ripens late September in Shanxi; fruit split occurs frequently from rains during maturity.

Linyijiangshiliu. Small to medium-size, semi-soft seeded, sweet-sour, bright red. **Origin:** Shanxi Province, China. Local cultivar, parentage unknown. **Fruit:** small to medium, 250 g; bright red; arils crimson red, with semi-soft seeds; sweet-sour, 17 °Brix; ripens late October in Shanxi. **Tree:** vigorous; small; tolerance to drought, diseases, and nutrient-poor soils excellent.

Myatadzy. Medium-size, soft seeded, sweet, bright red. **Origin:** Kara-Kala Experimental Station, Turkmenistan; donated in 1999 by W.R. Feldman to the USDA-ARS National Clonal Germplasm Repository, Davis, CA. Parentage unknown. **Fruit:** size medium, 363 g; red to dark red with tendency to russet or display external blemishes, occasional faint striping and russetting and pinkish maturity ring around the relatively small, ornate calyx; arils red to dark red, medium-size, with soft seeds; hundred-aril weight 37.1 g; flavor mild, with Asian pear and nutty undertones; sweet with elusive tartness, 15.2-17.13 °Brix, TA 0.31-0.32% citric acid; ripens October in Davis, CA. **Tree:** tall; growth habit upright.

Sainingmeng. Large, sour, red. **Origin:** Xinjiang Province, China, where it is planted in the Hetian and Kashi regions. Parentage unknown. **Fruit:** large, 400 g; red; arils bright red, juicy, sour, 18 °Brix, TA 3.26% citric acid; used for juice, wine, and fresh eating; ripens late October in Xinjiang. **Tree:** cold tolerance and disease resistance good.

Sakerdze. Medium to large, hard seeded, sweet-tart, pinkish red to red. **Origin:** former Soviet Union, conserved at Kara-Kala Experimental Station, Turkmenistan. Parentage unknown; introduced from Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala to USDA-ARS National Clonal Germplasm Repository, Davis, CA in 1997 by M.W. Hotchkiss. **Fruit:** medium to large, 866 g, round; rind pinkish red to red, thin, spongy and soft; calyx thick, pronounced and rigid; arils solid red and large, with large, hard, bony seeds, hundred-aril weight 49.1 g; sweet-tart, reminiscent of cherry with moderate astringency, 15.9-16.5 °Brix, TA 0.91-1.09% citric acid; good for juice; ripens October in Davis. **Tree:** low-growing; growth habit spreading shrub; precocity and yield high.

Sogdiana. Medium to large, soft seeded, sweet, red with yellow and pink to pinkish red striping, speckling or splotching. **Origin:** former Soviet Union, conserved at Kara-Kala Experimental Station, Turkmenistan. Parentage unknown; introduced from Turkmenistan Experimental Station of Plant Genetic Resources, Garrygala to USDA-ARS National Clonal Germplasm Repository, Davis, CA in 1999 by M.W. Hotchkiss. **Fruit:** medium to large, 610 g; relatively oblate with angled lobes, often symmetrical; skin red with yellow and pinkish red to pink striping, speckling or splotching; pinkish maturity ring, sometimes elevated, may form around the small, pointy-lobed calyx; arils solid red and large, with large soft seeds, hundred-aril weight 41.0 g; taste refreshing, sweet and fruity with mild tartness and astringency; aftertaste slight nutty, 16.8-17.6 °Brix, TA 0.29-0.36% citric acid; ripens October in Davis. **Tree:** growth habit low-growing, spread-out shrub; basal growth vigorous.

Taihanghong. Large, hard seeded, sour-sweet, red. **Origin:** Hebei Province, China. Parentage unknown. **Fruit:** large, 425 g; oblate;

red; arils pinkish red, with hard seeds; sour-sweet, 13.8 °Brix; hundred-aril weight 39.5 g. Matures early September in Hebei; fruit split occurs frequently from rains during maturity. **Tree:** very small, 1.5 m tall; better as an ornamental or for fresh eating than for juice.

Taishanhong. Medium to large, semi-soft seeded, sweet, bright red. **Origin:** Shandong Province, China. Well-known cultivar, parentage unknown. **Fruit:** medium to large, >500 g; bright red; arils crimson red and juicy, with semi-soft seeds; sweet, 17 °Brix, sugar content 14.9%, TA 0.28% citric acid; vitamin C 5.26 mg/100 g fresh weight; ripens late September to early October in Shandong. **Tree:** drought tolerant; disease resistant; cold tolerance poor.

Tunisiruanzi. Large, soft seeded, sweet, bright red. **Origin:** introduced from Tunisia to China, where it is widely planted. Parentage unknown. **Fruit:** large, >400 g; bright red; arils ruby red, juicy, with soft seeds; sweet, 15 °Brix, TA 0.29 citric acid; vitamin C 1.87 mg/100 g fresh weight ripens late August. **Tree:** drought and disease tolerant; cold tolerance poor.

Yain. Large, slightly flattened, shiny, medium-red fruit with soft seeds that ripens midseason. **Origin:** Zamari Nurseries, Yesod Hama'Ala, North Galilee, Israel, by Y. Zamari and N. Zamiri. Naturally occurring whole plant mutation from a cultivated area of Yesod Hama'Ala. USPP 30,915; 1 Oct. 2019. **Fruit:** large, slightly flattened, length 85-95 mm, maximum diameter 100-120 mm; calyx length 25-30 mm, diameter 24-28 mm, cylindrical; medium red (RHS 42A), smooth, leathery; arils bicolored, upper part very dark red (RHS 45A, lower part opaque, milky); seeds soft; ripens late August to mid-September. **Tree:** vigorous, height 3 m, spread 3 m; growth habit upright, spherical, semi-erect branch angles; flowers 2nd week March to end of April.

Yichengqingpimayatian. Large, sweet, yellow-green with reddish blush. **Origin:** Shandong Province, China. Local cultivar, parentage unknown. **Fruit:** large, 500 g; yellow-green with reddish blush; arils pinkish, juicy; sweet, 17 °Brix; ripens September in Shandong; stores well. **Tree:** vigorous; small, up to 5 m tall; drought tolerance and disease resistance good; cold tolerance poor.

Zhengzhuhong. Medium to large, hard seeded, sweet, yellow-green with slight red blush. **Origin:** Anhui Province, China. Local cultivar, parentage unknown. **Fruit:** medium to large, but can be highly variable, 380-1335 g; nearly round; yellow-green with slight red blush on the sunny side; arils pink, juicy, with hard seeds; sweet, 16 °Brix; ripens late September and early October in Anhui. **Tree:** small.

Zimei. Large, very soft seeded, sweet-sour, crimson red. **Origin:** Originated from Israel to Sichuan Province, China, where it is grown. Parentage unknown. **Fruit:** large, 587 g; nearly round; crimson red; arils purplish-red, with very soft seeds; sweet-sour, 17.9 °Brix, sugar content 13.8%, TA 0.939% citric acid; for fresh eating and juicing. **Tree:** cold tolerance poor.

RASPBERRY

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WSU 2166 (Cascade Premier). Early-season floricanefruiting red raspberry for processing. **Origin:** Washington State University, Puyallup, by P.P. Moore and W. Hoashi-Erhardt. WSU 1447 × WSU 0697; crossed 2007; selected 2010; tested as WSU 2166;

introd. 2018. USPP 30,980; 29 Oct. 2019. **Fruit:** large; long; bright red; flavor tart; easily removed from receptacle; good cohesion; recommended for machine harvesting for processing; adapted for fresh use; ripens early, with Willamette. **Plant:** vigorous; susceptible to the North American aphid (*Amphorophora agathonica*) vector of the raspberry mosaic virus complex; susceptible to Raspberry bushy dwarf virus (RBDV); good field tolerance to root rot (*Phytophthora fragariae* var. *rubi*).

Cascade Premier. See WSU 2166

STRAWBERRY

Kim S. Lewers, USDA-ARS, Genetic Improvement of Fruits and Vegetables Laboratory, Beltsville, MD

Allegro. Short-day cultivar adapted to greenhouse production in the Netherlands. **Origin:** Fresh Forward Holding, Eck en Wiel, the Netherlands, by E.J. Meulenbroek. E2003-097 × E2006-492; crossed 2008; selected 2010. USPP 29,964; 11 Dec. 2018. **Fruit:** mid-sized, 18 g, 2-5 cm long × 2-3.5 cm wide; uniform ovoid; moderately glossy, vivid reddish orange (RHS 34A); flesh vivid reddish orange (RHS 33B); firm; flavor good, pleasantly aromatic; calyx small, surface, reflexed; achenes at surface; ripens early; storage long. **Plant:** vigor moderate to high; stolons abundant, 90 per plant; yield moderate, >420g/plant; growth habit compact, upright; flowers below canopy; moderately resistant to phytophthora crown rot (*Phytophthora cactorum*).

Blossomberry. Short-day cultivar adapted to greenhouse production in the Netherlands. **Origin:** Beekers Berries Breeding, Breda, the Netherlands, by J.A.P. de Jongh. BBBPO 02 × 14-132; crossed 2015; selected 2016, Eetten-Leur, the Netherlands. USPP 31,082; 19 Nov. 2019. **Fruit:** mid-sized, 10-20 g, 3.5 cm long × 3.5 cm wide; conic; glossy white to pale yellow (RHS 158A, RHS 161D) with peach-pink blush (RHS 35A, RHS 34B, RHS 42D), and reddish-orange (RHS 34A) achenes; flesh white (RHS NN155A) and reddish-orange (RHS 34A); very firm; flavor sweet and slightly acidic; calyx mid-sized, surface, spreading to reflexed; achenes inset; ripens moderately early; storage 1 week. **Plant:** vigor moderate; yield modest, 330 g/plant; growth habit semi-upright, open; tolerant of wind and rain.

Emilia. Short-day cultivar, remontant in cool environments, adapted to coastal central California. **Origin:** Lassen Canyon Nursery, Redding, CA, by J.H. Bagdasarian. 1D12 × Sweet Ann; crossed 2009; selected 2011, Watsonville, CA; tested as 22K45. USPP 30,427; 23 Apr. 2019. **Fruit:** very large, 29 g, 5.8 cm long × 4.2 cm wide; variable, sometimes irregular, long conic to wedge; glossy, light red (Pantone 179C); flesh red (Pantone 1655U); firm; flavor sweet, 10.9% SSC; calyx mid-sized, raised, reflexed; achenes at surface; moderately early. **Plant:** vigor high; yield very high, 1,626 g/plant; growth habit upright, dense; flowers slightly below canopy; moderately tolerant to charcoal rot and Verticillium wilt.

Florida Brilliance. Short-day, partially remontant cultivar adapted to Florida's winter production. **Origin:** University of Florida, Wimauma, by V.M. Whitaker. FL 11.31-14 × FL 10-153; selected 2013-2014 winter, Balm, FL; tested as FL 13.26-134. USPP 30,564; 25 Apr. 2019. **Fruit:** large, 20.2-20.7 g, 4.5-5.5 cm long × 3.5-4.5 cm wide; slightly variable, conic to cordate; glossy, uniform medium red (LAB a* 34.7); flesh medium red (LAB a* 22.7); very firm; flavor balanced, 8.5% SSC; calyx large, surface to slightly inset; achenes inset; ripens early. **Plant:** vigor moderate, stolons abundant, 20-40 per plant; yield high; growth habit semi-upright, somewhat compact, medium density; flowers at or below canopy, fruiting trusses prostrate; resistant to rain, powdery mildew (*Spaerotheca macularis*), anthracnose fruit rot (*Colletotrichum acutatum*) and charcoal rot; moderately susceptible to Botrytis fruit rot (*Botrytis cinerea*).

Inspire. Short-day cultivar adapted to the central coast of California. **Origin:** Berry Genetics, Freedom, CA, by S.D. Nelson, M.D. Nelson, L.W. Stoeckle, and D.S. Nelson. BG-1975 × Primori; crossed 2009; selected 2011, Ventura County, CA. USPP 29,794; 6 Nov. 2018. **Fruit:** mid-sized, 26 g, 4.7 cm long × 3.7 cm wide; uniform conic; very glossy vivid reddish orange (RHS 34B); flesh variable strong reddish orange (RHS 34C) with deep yellowish pink core (RHS 39B); firm to very firm; flavor excellent, 8.3% SSC; calyx large, inset, spreading to reflexed; achenes at surface; ripens midseason. **Plant:** vigor moderate, stolons adequate, 5-6 per plant; yield high, 866 g/plant; growth habit upright, medium density; flowers above canopy, fruiting trusses prostrate; moderately resistant to powdery mildew and bacterial angular leafspot (*Xanthomonas fragariae*); moderately susceptible to Botrytis fruit rot and two-spotted spider mite (*Tetranychus urticae*); susceptible to Fusarium wilt (*Fusarium oxysporum*) and anthracnose crown rot (*C. fragariae*).

Keepsake. Short-day cultivar adapted to the Mid-Atlantic United States and surrounding regions. **Origin:** USDA-ARS, Beltsville, MD, by K.S. Lewers and J.M. Enns. B1031 × B1181; crossed 2005; selected 2007, Beltsville, MD; tested as B1806. USPP 30,578; 18 Jun. 2019. **Fruit:** medium to large, 13.8 g, 4.6 cm long × 4.0 cm wide; conic to oblate; moderately glossy, vivid red to strong red (RHS 44A, RHS 45A, RHS 46A); flesh orange-red (RHS 33A) and white (RHS 155D); firm, fine-textured; juicy; flavor excellent, sweet and aromatic, 9.0% SSC (6.6-10.5%), pH 3.8 (3.3-3.8); calyx large, slightly inset, reflexed to spreading; achenes at surface; ripens midseason; stores very well, 29% degraded fruits at 1 week, 10% decayed at 2 weeks. **Plant:** vigor moderate, stolons adequate, 10 per plant; yield medium high, 570 g/plant; growth habit upright globose, open, medium density; flowers slightly below canopy, fruiting trusses prostrate; resistant to rain and anthracnose fruit rot.

Liz. Short-day cultivar adapted to the southern United States (excluding Florida). **Origin:** North Carolina State University, Raleigh, by G.E. Fernandez, J. Pattison, and J.R. Ballington. NCH 08-07 O.P.; seeds collected 2009; selected 2010; tested as NCS 10-038; introd. 2018. USPP applied for. **Fruit:** moderately large, 20.1 g; uniform conic to slight blocky; red; flesh medium red with white core; flavor mild, 7% SSC, pH 3.7; calyx mid-sized, surface to inset, spreading to reflexed; achenes inset; ripens midseason. **Plant:** vigor moderate, stolons abundant; yield high, 838 g/plant; flowers at or below canopy, fruiting trusses prostrate.

Opera. Short-day cultivar adapted to greenhouse production in the Netherlands. **Origin:** Fresh Forward Holding, Eck en Wiel, the Netherlands, by E.J. Meulenbroek. E1998-142 × unnumbered selection; crossed 2004; selected 2006, Elst, Gelderland, the Netherlands. USPP 29,441; 16 Nov. 2017. **Fruit:** large, 26.5 g, 2-4 cm long × 3-6 cm wide; slightly variable, broadly rounded to conic; glossy, moderate red (RHS 181A); flesh vivid red (RHS 45A); firm; flavor pleasantly aromatic and balanced; calyx large, at surface to slightly raised, reflexed; achenes at surface; ripens early; long storing, 10 d at 7 °C. **Plant:** vigor moderate to high; yield, moderate, over 470 g/plant; growth habit compact, semi-upright; flowers at canopy; moderately resistant to Verticillium wilt and Phytophthora crown rot.

Preakness. Dayneutral cultivar adapted to the central coast of California. **Origin:** Sweet Darling Sales, Aptos, CA, by J. Larse. 106734 × 108296; selected at Watsonville, CA; tested as 108965. USPP 29,966, 11 Dec. 2018. **Fruit:** large, 26.3 g, 5.2 cm long × 4.7 cm wide; conic to globose conic; glossy, vivid red (RHS 45A); flesh vivid red (RHS 44A) with strong yellowish pink core (RHS 37A); moderately firm; flavor acceptable, 6% SSC, pH 3.42; calyx small, inset, spreading to slightly reflexed; achenes inset; ripens mid-April to mid-September. **Plant:** vigor moderate, stolons sparse, 3 per plant; yield high, 943 g/plant; growth habit semi-upright, round to oblate, open; flowers at or above canopy; moderately tolerant of powdery mildew.

Redstart. Dayneutral cultivar adapted to the northern United States and southern Canada. **Origin:** Michigan State University, East

Lansing, by J. Hancock. Honeoye × Chandler; crossed 2006; selected 2007, Benton Harbor, MI; tested as MSU 67. USPP 30,491; 14 May 2019. **Fruit:** mid-sized, 13.2 g, 3.8 cm long × 3.4 cm wide; conic to long conic; vivid red (RHS 45A); flesh vivid red (RHS 45A); moderately firm; flavor acceptable to good, 8.2% SSC; calyx small, surface; achenes at surface. **Plant:** vigor high, stolons adequate, 4-6 per plant; yield good; growth habit upright; flowers above canopy.

Renewal. Short-day cultivar adapted to the central coast of California. **Origin:** Berry Genetics, Freedom, CA, by S.D. Nelson, M.D. Nelson, and L.W. Stoeckle. BG-633 × BG-219.068; crossed 2006; selected 2008, Ventura County, CA. USPP 29,795; 6 Nov. 2018. **Fruit:** mid-sized, 25.9 g, 4.4 cm long × 3.7 cm wide; uniform conic; glossy vivid red (RHS 45B); flesh variable vivid red (RHS 45C) with strong red core (RHS 39A); very firm; flavor good, 7.7% SSC; calyx large, inset, spreading; achenes at surface; ripens midseason. **Plant:** vigor moderate, stolons adequate, 5-6 per plant; yield high, 804 g/plant; growth habit semi-upright, sparse to medium density; flowers at or above canopy, fruiting trusses prostrate; moderately resistant to Fusarium wilt; moderately susceptible to powdery mildew, Botrytis fruit rot, and two-spotted spider mite; susceptible to bacterial angular leafspot and anthracnose crown rot.

Rocco. Short-day cultivar adapted to the southern United States (excluding Florida). **Origin:** North Carolina State University, Raleigh, by G.E. Fernandez, J. Pattison, and J.R. Ballington. NCH 05-73P O.P.; seeds collected 2009; selected 2010; tested as NCS 10-156; introd. 2018; USPP applied for. **Fruit:** mid-sized, 17.4 g; uniform long conic; red; flesh red with white core; flavor very good, 8% SSC, pH 3.8; calyx mid-sized, surface, spreading; achenes raised to inset; ripens very early. **Plant:** vigor moderate, stolons plentiful; yield medium high, 532 g/plant; flowers at or below canopy, fruiting trusses prostrate.

Sangria. Short-day cultivar, partially remontant in cool environments, adapted to coastal central California. **Origin:** Lassen Canyon Nursery, Redding, CA, by J.H. Bagdasarian. EF64 × Sweet Ann; crossed 2009; selected 2011, Watsonville, CA; tested as 10K52. USPP 30,426; 23 Apr. 2019. **Fruit:** large, 24 g, 4.9 cm long × 3.9 cm wide; long conic to wedge; moderately glossy, light medium red (Pantone 200 C); flesh light medium red (Pantone 032U); moderately firm; flavor sweet, 9.5% SSC; calyx large, surface, reflexed; achenes inset; ripens fairly early. **Plant:** vigor moderate; yield very high, 1,507 g/plant; growth habit semi-upright, semi-open; flowers slightly below canopy; moderately tolerant to charcoal rot and Verticillium wilt.

Strawberry Festival. Short-day cultivar adapted to Florida's winter production. **Origin:** University of Florida, Wimauma, by C.K. Chandler. Rosa Linda × Oso Grande; selected 1995-1996 winter, Dover, FL; tested as FL 95-41. USPP 14,739; 27 Apr. 2004. **Fruit:** large, 17.6 g; variable, wedge-shaped to conic; glossy, deep red (Pantone 188); flesh bright red (Pantone 179); very firm; moderately juicy; flavor good, 7.4% SSC, 0.79% TA; calyx large, surface, reflexed to spreading; achenes at surface; ripens early. **Plant:** vigor high, stolons numerous; yield high, 700 g/plant; growth habit upright; flowers at or below canopy, fruiting trusses prostrate; susceptible to Botrytis fruit rot, anthracnose fruit rot and anthracnose crown rot (*C. gloeosporioides*), powdery mildew, and angular leaf spot.

Vaulter. Dayneutral cultivar adapted to the central coast of California. **Origin:** Sweet Darling Sales, Aptos, CA, by J. Larse. 108171 × 108299; selected at Watsonville, CA; tested as 109261. USPP 29,965; 11 Dec. 2018. **Fruit:** very large, 30.5 g, 5 cm long × 4.5 cm wide; uniform conic to globose conic; very glossy, vivid red (RHS 44A); flesh vivid red (RHS 44A) with strong red core (RHS 41B); firm; flavor acceptable, 7.5% SS, pH 3.32; calyx small, surface to inset, spreading to slightly reflexed; achenes at surface to inset; ripens March-October. **Plant:** vigor moderate to high, stolons adequate, 6

per plant, but none during fruiting; yield high, 744 g/plant; growth habit upright, open; flowers above canopy, fruiting trusses prostrate.

Wasatch. Dayneutral cultivar adapted to the northern U.S. and southern Canada. **Origin:** Michigan State University, East Lansing, by J. Hancock. Seascape × MSU 38; crossed 2008; selected 2009, Benton Harbor, MI; tested as MSU 68. USPP 30,492; 6 Sept. 2018. **Fruit:** mid-sized, 9.5 g, 3.2 cm long × 3.6 cm wide; conic; vivid red (RHS 45A); flesh vivid reddish orange (RHS 34A); moderately firm; flavor good, 10.2% SS, 1.04% TA; calyx small, surface; achenes at surface. **Plant:** vigor high; yield medium high, 604 g/plant; flowers above canopy.

ADDENDA AND REVISIONS

ALMOND

Kester. USPP 27,367; 15 Nov. 2016 (List 48).

AVOCADO

Harvest. Origin: University of California, Riverside. Misstated as University of California, Davis (List 43).

BLACKBERRY

APF-205T. USPP 31,690; 21 Apr. 2020 (List 49).
Columbia Sunrise. USPP 29,367; 12 June 2019 (List 49).
Eclipse. USPP 30,448; 20 Dec. 2018 (List 49).
Galaxy. USPP 30,062; 8 Jan. 2019 (List 49).
Hall's Beauty. USPP 30,063; 4 Oct. 2017 (List 49).
Von. USPP 27,299; 25 Oct. 2016 (List 48).

BLUE HONEYSUCKLE

Hoka (Yezberry Sugar Pie®). Canadian PBR 6135; 20 Feb. 2020.
Kaido (Yezberry Honey Bunch®). Canadian PBR 6136; 20 Feb. 2020.
Kapu (Yezberry® Solo™). Canadian PBR 6137; 20 Feb. 2020.
Kuchi (Yezberry® Maxie™). Canadian PBR 6138; 20 Feb. 2020.

BLUEBERRY

C03-038. USPP 26,765; 31 May 2016 (List 48).
C03-158. USPP 26,917; 12 July 2016 (List 48).
C04-014. USPP 26,971; 26 July 2016 (List 48).
C04-051. USPP 26,288; 5 Jan. 2016 (List 48).
C05-178. USPP 26,764; 31 May 2016 (List 48).
C95-12. Now called Kimba (List 48).
C97-390. Now called Mayra (List 48).
C99-42. Now called Kirra (List 48).
DrisBlueEleven. USPP 26,537; 29 Mar. 2016 (List 48).
DrisBlueNine. USPP 26,287; 5 Jan. 2016 (List 48).
DrisBlueTen. USPP 26,643; 26 Apr. 2016 (List 48).
DrisBlueThirteen. USPP 26,451; 8 Mar. 2016 (List 48).
DrisBlueTwelve. USPP 26,748; 24 May 2016 (List 48).
EB 8-01. Now called Oz Lucia (List 48).
EB 8-17. Now called Oz Julia (List 48).
EB 8-42. Now called Oz Julieta (List 48).
EB 8-50. Now called Oz Monica (List 49).
EB 9-12. Now called Oz Bonita™ (List 49).
EB 9-2. Now called Oz Magica™ (List 49).
Echo. USPP 29,787; 6 Nov. 2018 (List 49).
FCM12-038. USPP 29,436; 3 July 2018 (List 49).
FCM12-045 (AtlasBlue™). USPP 29,468; 10 July 2018 (List 49).
FCM12-131 (JupiterBlue™). USPP 29,125; 20 Mar. 2018 (List 49).
FF03-015 (ChristinaBlue™). USPP 29,986; 18 Dec. 2018 (List 49).
FL98-325 (IndigoCrisp™). USPP 26,523; 22 Mar. 2016 (List 48).
Gumbo. USPP 29,879; 27 Nov. 2018 (List 49).
Heintooga. USPP 28,790; 26 Dec. 2017 (List 48).

Pinnacle. USPP 26,899; 5 July 2016 (List 48).
Ridley 1104. Now called Starlight (List 48).
Ridley 1812 (Twilight). Australian PBR 2010/216; 12 Apr. 2011; described as USPP applied for in List 49, but never patented in US.
Ridley 3402. USPP 26,972; 26 July 2016 (List 48).
Ridley 4408 (Masena). USPP 29,470; 10 July 2018 (List 49).
Ridley 4514. USPP 27,163; 20 Sept. 2016 (List 48).
Ridley 4609 (Radiance). USPP 29,469; 10 July 2018 (List 49).
TH-921 (Miss Alice Mae™). USPP 27,292; 25 Oct. 2016 (List 48).
TH-948 (Miss Lilly™). USPP 27,323; 1 Nov. 2016 (List 48).
VacBri1 (Cabernet Splash™). USPP 30,087; 15 Jan. 2019 (List 49).

CITRUS

914 (UF 914). USPP 26,177; 1 Dec. 2015 (List 47).
Avana Tardivo di Ciaculli. Misspelled as Avana Tardivo di Ciacalli (List 47).
B9-65. USPP 29,144; 13 Sept. 2016 (List 48).
DaisySL. USPP 22,096; 30 Aug. 2011 (List 45).
FairchildLS. USPP 22,649; 17 Apr. 2012 (date was omitted in List 47).
KinnowLS. USPP 23,743; 16 July 2013 (date was omitted in List 47).
Mandared® (Red Nules®). Patented as Top Mandarin Seedless, USPP 18,568; 11 Mar. 2008; Mandared and Red Nules are US registered trademarks (List 45).
N13-32. USPP 27,145; 13 Sept. 2016 (List 48).
N2-28 (Summer Gold). Not patented (described as "USPP applied for" in List 48).
N40W-6-3 (Seedless Snack). USPP 29,091; 13 Mar. 2018 (List 48).
OLL-4. USPP 27,829; 4 Apr. 2017 (List 48).
OLL-8. USPP 26,087; 17 Nov. 2015 (List 47).
US Early Pride. USPP 23,724; 9 July 2013 (List 45).

CITRUS ROOTSTOCK

Furr. Tested as C-57, not C-574, as described in List 45.

GRAPE

Compassion. USPP 31,526; 10 Mar. 2020 (List 49).
Enchantment. SPP 30,513; 21 May 2019 (List 49).
Opportunity. USPP 30,425; 23 April 2019. (List 49).

MANGO

Coconut Cream (C-20). USPP 22,989; 28 Aug. 2012 (List 47).

NECTARINE.

Smooth Texan One. USPP 28,171; 11 July 2017 (List 48; patent numbers and dates for this and next four cultivars erroneously listed as peaches in the List 49 Addenda.).
Smooth Texan Three. USPP 28,078; 6 June 2017 (List 48).
Smooth Texan Two. USPP 28,360; 5 Sept. 2017 (List 48).
Smooth Zest One. USPP 28,202; 18 July 2017 (List 48).
Smooth Zest Two. USPP 28,435; 26 Sept. 2017 (List 48).
Sunecttwentythree. Misspelled as Sunnecttwentythree (List 49).

PEACH

White Zest One. USPP abandoned (List 48).

PEAR

PremP009. USPP 30,552; 4 June 2019 (List 49).

STRAWBERRY

Archer. USPP 30,213; 19 Feb. 2019 (List 49).
Camila. USPP 30,326; 2 Apr. 2019 (List 48).
Florida Beauty. USPP 30,385; 16 Apr. 2019 (List 49).
Marys Peak USPP 29,370; 12 June 2018 (List 49).