‘Rich Joy’ Peach

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The southeastern U.S. peach industry’s shipping market demands large, high-blushed, yellow-fleshed, normal-acidity, slow-melting, freestone peaches. The U.S. Department of Agriculture, Agricultural Research Service (USDA-ARS) peach breeding program at Byron, GA, one of a few programs left that is actively developing new cultivars for the southeastern climate, released the “-prince” series cultivars under W.R. Okie during 1980–2009 to cover the main production season (Okie, 1998; Okie and Layne, 2008a, 2008b). As a continuation of this effort, ‘Rich Joy’ (tested as BY92P2710) is released, which produces attractive, large, very firm fruit ripening ≈ 1 week after ‘Julyprince’ and ≈ 2 weeks before ‘Flameprince’, which can fill the harvest gap between the two cultivars. It has performed well in Georgia and South Carolina and is suggested for trial wherever the “-prince” cultivars are grown.

Origin

‘Rich Joy’ resulted from the cross of ‘Flameprince’ and BY87P0943 in 1992 (Fig. 1). BY87P0943 is an open-pollinated seedling of ‘Blazeprince’. The original seedling tree of ‘Rich Joy’ was designated as 92-2710g when planted at the Southeastern Fruit and Tree Nut Research Laboratory at Byron in 1992. For subsequent testing, the selection was designated BY92P2710.

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Description

Trees of ‘Rich Joy’ are vigorous and productive. Leaf glands are reniform. Blossoms have large, showy pink petals and are self-fertile. Trees bloom slightly after ‘Flameprince’, requiring ≈ 850 h of chilling below 7 °C (45 °F) to break the bud dormancy in a climate similar to that at Byron. Trees have not been extensively tested in northern climates, but the original seedling was one of the few peaches to crop well at Byron after the devastating late spring freeze of 1996. No virus symptoms have been observed on ‘Rich Joy’ trees at Byron, GA.

Performance

Performance in Byron, GA was evaluated yearly based on the selected original seedling, as well as on multiple nonreplicated grafted trees in test blocks (‘Guardian’ as rootstock) (Table 1). Performance in South Carolina was evaluated at Musser Farm of Clemson University (data available at <http://www.clemsonpeach.org>). Appropriate pesticide sprays were applied on the schedule recommended by the Georgia extension service and farm management team, primarily to manage pests and fungal diseases on fruit or control weeds. No bactericides were used on any test trees or at any locations to maximize bacterial spot expression. ‘Rich Joy’ crops reliably, sizes well, and ripens in early to mid-July at Byron, ≈ 1 week after ‘Julyprince’ and 2 weeks before ‘Flameprince’. The fruit is very large, 7 to 8 cm in diameter when adequately thinned, and usually round with a slightly prominent suture (an identifiable characteristic). Fruit is firm and softens slowly on the tree, allowing it to be picked over a relatively longer period compared with other typical melting cultivars. At Byron, the

fruit develops a yellow ground color early but can be left firm on the tree several days to increase in size and red blush color. At maturity, the surface is $\approx 90\%$ bright red with an attractive yellow ground color and little pubescence. The more extensive red blush of ‘Rich Joy’ fruit (Fig. 2) makes it preferable to older ‘Cresthaven’ and ‘Early Augustprince’ (Table 1), which are in the same harvest window between ‘Julyprince’ and ‘Flameprince’. The flesh is yellow with some red in the pit cavity, especially if allowed to hang on the tree for an extended period. The freestone fruit develops excellent melting texture and rich flavor as it ripens. Trees appear to be highly resistant to bacterial spot disease based on little visualized symptoms on fruit and leaves throughout the evaluation years. It is worth noting that in 2017, ‘Rich Joy’ produced no fruit due to extremely insufficient chill, as was the case with all other high-chill peaches (Chen and Beckman, 2019). In 2015, the cultivar yielded a partial crop after a severe spring frost that caused varying degrees of crop loss in many peaches (Chen et al., 2016).

Availability

The cultivar is tested and maintained in the orchard at the USDA-ARS Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA. Request for the cultivar should be addressed to USDA-ARS, Office of Technology Transfer, 5601 Sunnyside Avenue, Room 4-1192, Beltsville, MD 20705-5131. Prospective licensees can also contact the same office at this e-mail: license@usda.gov.

Literature Cited

- Chen, C. and T.G. Beckman. 2019. Effect of a late spring application of hydrogen cyanamide on high-chill peaches. *Agronomy* 9:726.
- Chen, C., W.R. Okie, and T.G. Beckman. 2016. Peach fruit set and buttoning after spring frost. *HortScience* 51:816–821.
- Okie, W.R. 1998. Handbook of peach and nectarine varieties: Performance in the Southeastern United States and index of names. U.S. Dept. Agr. Handbook No. 714. 1-808.
- Okie, W.R. and D.R. Layne. 2008a. ‘Early Augustprince’ and ‘Augustprince’ peaches. *HortScience* 43:1600–1602.
- Okie, W.R. and D.R. Layne. 2008b. ‘Scarletprince’ and ‘Julyprince’ peaches. *HortScience* 43:1603–1605.

Fig. 1. Pedigree of ‘Rich Joy’ peach. OP = open pollinated seedling.

Table 1. Evaluation data of ‘Rich Joy’, ‘Cresthaven’, and ‘Early Augustprince’ at Byron, GA.^z

Cultivars	CR (h)	CH received	Date	Adj (d)	Set (0–9)	Blush (0–9)	Firmness (0–9)	Size (mm)
Rich Joy	850	986	24 July 2007	2	7	8	8	71
		871	31 July 2008	2	7	8	8	74
		948	31 July 2009	–5	7	8	7	74
		1,249	26 July 2010	3	7	8	8	71
		1,129	20 July 2014	7	7	7	7	73
		1,031	23 July 2015	5	3	8	8	73
		744	15 July 2016	7	8	7	8	69
		964	12 July 2018	7	6	7	8	74
		846	17 July 2019	2	8	8	8	77
		928.8	22 July	3.3	6.0	7.7	7.8	72.9
Cresthaven	950		20 July 2007	–2	3	6	7	74
			31 July 2008	–4	5	6	7	76
			27 July 2009	0	5	6	6	74
			3 Aug. 2010	–3	7	6	7	69
			5 Aug. 2014	–3	7	5	6	79
			23 July 2015	4	2	5	6	81
			15 July 2016	5	7	6	6	69
			23 July 2018	1	3	6	6	73
			17 July 2019	7	6	4	8	65
			24 July	0.5	4.5	5.6	6.6	73.3
Early Augustprince	825		24 July 2007	–3	3	7	7	76
			31 July 2008	3	7	7	7	74
			31 July 2009	0	7	6	7	74
			30 July 2010	1	7	7	7	74
			23 July 2014	7	7	5	7	73
			23 July 2015	5	3	5	8	70
			5 Aug. 2016	–6	3	5	6	71
			12 July 2018	7	4	4	8	74
			1 Aug. 2019	–2	2	6	6	75
			26 July	1.3	4.3	5.8	7.0	73.4

^zThe chill requirement (CR) was estimated by the bloom date compared with chill standard cultivars of known chill hours (CH). CH each year were the accumulated hours below 7.2 °C (≈ 45 °F) from 1 Oct. (Winter) to 15 Feb. (Spring) using the calculator at <http://www.georgiaweather.net>. Trees were grafted on ‘Guardian’ rootstock and evaluated yearly. Adjusted days of biological maturity (plus – underripe and minus – overripe), rating (0–9) of set, blush and firmness (none to highest: 6–8, presumably commercially desirable), measurement of size (equatorial circumference in millimeters), and averages were presented. Only recent 9-year data are listed due to space restraints. No evaluation data were collected due to retirement during 2011–13 and record low CH (520) in 2017. In 2017, high-chill peach cultivars delayed budbreak by ≈ 1 month, yielding few flowers and no fruit (Chen and Beckman, 2019). On 29 Mar. 2015, a severe frost caused substantial crop loss (Chen et al., 2016). The CH in 2011–13 were 1389, 785, and 725, respectively.

Fig. 2. Typical ripe ‘Rich Joy’ fruit on a tree at Byron, GA, on 14 July 2016 (A) and harvested on 20 July 2016 (B) showing the size, shape, exterior, flesh, and pit in different views: suture side, back side, longitudinal halves without and with the pit (top left to right), stem end, blossom end, latitudinal halves without and with the pit (bottom left to right). Fruit are freshly harvested from an orchard at Byron, GA, without washing or other treatment. Each square on a Scor-Pal board is equivalent to 1 × 1 cm. Both photos were taken outdoors under the natural sunlight.