

Fire Zest One, an Early Ripening, Non-melting Flesh, Medium Chill Peach

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The ‘Fire Zest One’ peach is being released by Texas A&M AgriLife for trial to provide a very firm, well sized, early-ripening peach with attractive yellow flesh for the medium chill zone. This peach ripens in late April to mid-May in the medium chill zone of Texas and similar mild winter zones from California to northern Florida and Georgia.

Origin and Development

The ‘Fire Zest One’ peach [*Prunus persica* (Batsch) L.] originated in the Stone Fruit Breeding Program of the Department of Horticultural Sciences at Texas A&M University located in College Station, TX, USA. In 2002, a cross was made between an early-ripening, intensely blushed, yellow flesh selection TX2B1 and the early ripening, non-melting, yellow flesh peach ‘Spring Baby’ (Okie 1998). TX2B1 is a selection from a population of seedlings created by crossing ‘TropicBeauty’ (Rouse and Sherman 1989), a low chill, yellow-fleshed peach and ‘Springgold’ (Savage and Prince 1972), an early-ripening peach used in the southeastern United States. ‘Spring Baby’, a release from the USDA Stone Fruit Breeding Program in Parlier, CA, USA, was developed by crossing two selections (P51-2 and P51-103), which were both selected from an open pollinated population from ‘Springcrest’ (Savage and Prince 1972). Among the seedlings of the 2002 cross a selection named TX3A296 was selected in 2005 from the high-density seedling selection block in College Station, TX, USA, for its early maturity, good productivity, yellow-orange ground color, round shape, intense red overcolor, and excellent firmness. TX3A296 was propagated asexually by budding and has been evaluated in Texas and California.

Description

‘Fire Zest One’, propagated on Nemared rootstock, was grown in three locations: two medium chill sites (College Station and Fairfield, TX, USA) and a high chill location (Fowler, CA, USA). College Station, TX (lat.

30°37' N, long. 96°22' W, 94 m elevation), Fairfield, TX (lat. 31°44' N, long. 96°10' W, 134 m elevation), and the Fowler, CA site (lat. 36°38' N, long. 119°42' W, 92 m elevation) have a chilling accumulation that is generally above 550, 700, and 850 chill hours, respectively, as estimated with the mean monthly temperature of the coldest month (Byrne and Bacon 1992; Sharpe 1970; Weinberger 1956) (Table 1).

In the medium chill sites (College Station and Fairfield, TX, USA), this peach bloomed 6 to 7 d after the medium chill peach ‘TexKing’ (Byrne and Bacon 2004a), with the peach ‘Royal Zest One’ (Byrne and Anderson 2014) and 5 to 10 d before ‘June Gold’ (Okie 1998). Thus, based on its blooming behavior, the estimated chilling requirement is ~600 chilling hours. ‘Fire Zest One’ is productive in medium-chill regions where trees of ‘June Gold’, ‘Harvester’, ‘Royal Zest One’, ‘Royal Zest Two’, ‘Royal Zest Three’, and ‘Royal Zest Four’ (Byrne and Anderson 2014) are produced commercially. This early ripening, clingstone, non-melting flesh peach cultivar ripens 65 to 70 d after full bloom and ripens 10 to 13 d before ‘TexKing’ (Byrne and Bacon 2004a), and 5 to 8 d before ‘Royal Zest One’ in the medium chill zone of Texas (Table 2).

This cultivar bears peaches of a good to excellent quality, size and attractiveness for an early ripening peach when properly managed and thinned. ‘Fire Zest One’ has medium acidity (varies between 5.7 and 8.0 meq/mL), and its mean soluble solids is 10 to 11 °Brix. Its quality as measured by total soluble solids and flavor rating are equal to that of other early ripening commercial cultivars (Table 2) such as ‘TexKing’, ‘Royal Zest

One’, and ‘Royal Zest Two’ when picked mature.

The fruit has very firm non-melting flesh, which are firmer and store longer than melting flesh cultivars such as ‘TexKing’, ‘June Gold’, ‘Royal Zest One’, and ‘Royal Zest Two’. In addition, the flesh does not brown readily, nor has it shown a tendency to develop split or shattered pits during the final stage of fruit swelling.

This new peach has an excellent yellow-orange ground color medium length pubescence, and an attractive red blush over 70% to 90% of its surface. ‘Fire Zest One’ generally is more attractive with a higher percentage of red blush and brighter orange yellow ground color than ‘Royal Zest One’, ‘TexKing’, and ‘June Gold’ (Table 2; Figs. 1 and 2).

The trees are vigorous with a semispreading growth habit similar to ‘TexPrince’ (Byrne and Bacon 2004b), ‘TexKing’, and ‘TexRoyal’ (Byrne and Bacon 1991). No observations have been made on resistance for either peach rust (*Tranzschelia discolor*) or bacterial leaf spot [*Xanthomonas arboricola* pv. *pruni* (E. F. Smith) Dye]. This peach has moderately large leaves that are lanceolate with acuminate apices, and crenate margins.

Flowers are showy with a diameter between 39 and 46 mm and petal length of 20 to 22 mm. The five petals are light pink when young becoming darker near the petal claw. The sepals are brownish red with gray. The medium yellow with brown anthers are on filaments (15–17 mm length), which are equal to or slightly more extended than the pistil (16–19 mm including ovary). The filaments are white when young and darken to medium pink with advanced maturity. The pollen is yellow and abundant. The tree is self-fertile.

The stones are of medium size with dimensions of 26 to 31 mm in length, 19 to 26 mm in width, and 15 to 19 mm in thickness. The dry-stone surface is a light brown color.

Availability

This peach is patented (PP 29,823, 13 Nov 2018) and can be propagated under license. Requests for budwood should be directed

Table 1. Chilling conditions at two Texas (College Station and Fairfield) and one California (Fowler) evaluation sites.

Location	December temp (°C)		January temp (°C)		Chilling accumulation ¹		Common commercial cultivars
	Mean	Range	Mean	Range	Mean	Range	
College Station	11.5	7.3–14.2	11.4	8.1–14.1	700	400–1088	TexKing, TexRoyal, June Gold
Fairfield	9.4	5.6–12.8	8.4	6.6–12.9	961	656–1322	Regal, June Gold, Harvester, Sentinel
Fowler	8.8	7.2–10.5	8.8	6.5–11.8	999	832–1114	O’Henry, Elegant Lady

¹ Chilling estimated with the mean monthly temperatures of the two coldest months using the equation $\text{Chilling} = 2079 - (123.8 \times \text{Dec/Jan mean monthly temperature in } ^\circ\text{C})$ (Byrne and Bacon 1992; Sharpe 1970; Weinberger 1956). Fowler and Fairfield used Fresno and Tyler data respectively. Texas sites used data from 2000 to 2019 and California site used data from 2000 to 2014.

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Table 2. Fruiting characteristics of 'Fire Zest One' at College Station, TX, USA; Fowler, CA, USA; and Fairfield, TX, USA.

Name	Full bloom ⁱ	FDP (d) ⁱ	Ripe date ⁱ	Wt (g)	Firm. ⁱⁱ	Blush ⁱⁱ	Shape ⁱⁱ	Tip ⁱⁱ	Ground color ⁱⁱ	Appear. ⁱⁱ	Soluble solids (%)	Taste ⁱⁱ
College Station, TX, USA (2010–18)												
Flordaking	19 Feb c	73 cd	2 May d	96	5.7 c	4.0 c	5.6 b	5.4 cd	6.5 ab	5.5 cd	11.2	6.1
Fire Zest One	27 Feb b	66 d	4 May d	98	7.8 a	8.3 a	7.2 a	7.2 a	7.1 a	7.5 a	10.9	6.4
Royal Zest One	27 Feb abc	71 cd	10 May cd	109	7.0 ab	7.8 a	6.7 ab	6.5 abc	6.3 b	6.8 ab	12.0	6.5
TexKing	21 Feb c	82 bc	14 May c	117	6.5 b	5.2 bc	6.1 b	6.0 bc	6.7 ab	6.0 bc	11.8	6.4
Royal Zest Two	21 Feb c	87 ab	17 May bc	98	7.1 b	8.4 a	7.5 a	7.5 a	7.0 ab	7.8 a	11.4	6.8
June Gold	9 Mar a	75 c	26 May ab	121	6.5 bc	4.3 c	4.3 c	4.2 d	6.6 ab	4.9 d	10.9	6.2
Significance ⁱⁱⁱ	***	***	***	NS	***	***	***	***	**	***	NS	NS
Fowler, CA, USA (2009–13)												
Fire Zest One	21 Feb	85 c	17 May d	120 b	7.9 a	8.3 a	7.8 ab	7.9 ab	7.3 ab	8.0 a	11.0	6.2
Flordaking	22 Feb	82 c	24 May d	176 a	6.5 b	3.0 d	7.3 bc	7.3 bc	6.0 c	4.9 d	11.4	6.0
Royal Zest One	17 Feb	97 bc	25 May d	167 a	6.5 b	6.2 bc	7.4 bc	7.5 bc	6.8 bc	6.9 abc	13.8	6.3
Royal Zest Two	20 Feb	105 ab	5 Jun bc	186 a	6.9 b	8.8 a	7.9 ab	8.2 a	6.9 abc	8.0 a	12.1	6.3
TexKing	14 Feb	113 ab	5 Jun c	192 a	6.6 b	5.0 c	7.0 c	7.3 c	6.7 bc	6.2 bc	11.5	6.1
June Gold	—	—	7 Jun bc	172 ab	6.7 b	3.8 cd	7.0 bc	7.0 c	7.0 c	5.5 cd	12.0	6.3
Royal Zest Four	19 Feb	116 a	14 Jun ab	162 ab	7.4 ab	8.2 a	7.4 bc	7.8 abc	6.7 bc	7.9 a	13.0	6.4
Significance ⁱⁱⁱ	NS	**	***	***	***	***	***	***	***	***	NS	NS
Fairfield, TX, USA (2009–18)												
Fire Zest One	26 Feb abc	69 e	4 May c	104 c	7.8 ab	8.1 a	7.2 abc	7.4 ab	7.1 a	7.8 a	10.1 bc	6.0 bc
Royal Zest One	27 Feb abc	73 e	12 May c	122 bc	7.2 c	6.4 b	6.9 c	6.8 b	6.6 bc	6.7 b	9.7 c	6.0 bc
TexKing	19 Feb c	86 cd	17 May bc	143 ab	6.8 cd	5.0 bc	6.3 bcd	6.3 bc	6.0 c	6.0 bc	11.0 abc	6.0 abc
June Gold	3 Mar ab	77 de	23 May b	137 ab	6.6 d	3.3 c	5.2 d	5.0 c	6.4 c	5.0 c	9.2 c	5.9 c
Royal Zest Two	24 Feb bc	91 bc	24 May b	128 b	7.5 bc	8.1 a	7.6 ab	7.8 a	7.0 ab	7.8 a	11.2 ab	6.4 ab
Royal Zest Four	1 Mar ab	99 a	8 Jun a	132 b	7.4 bc	8.5 a	7.1 abc	7.4 ab	7.0 ab	7.9 a	12.1 a	6.6 a
Royal Zest Three	4 Mar a	96 ab	7 Jun a	141 ab	7.1 c	7.8 a	6.9 c	7.1 ab	7.0 ab	7.6 a	12.1 a	6.4 ab
Golden Zest	4 Mar a	105 a	15 Jun a	160 a	8.1 a	3.0 c	7.7 a	7.7 a	7.2 a	6.8 b	12.8 a	6.8 a
Significance ⁱⁱⁱ	***	***	***	*	***	***	***	***	*	*	*	*

ⁱ Full bloom = 60% to 80% flowers open; FDP = fruit development period, number of days from full bloom to ripe; Ripe date = date when 20% fruit is firm ripe stage.

ⁱⁱ Appear. = appearance; Firm. = firmness. Rating scale 0–9; 0–4 = unacceptable, 5 = marginal, 6 = good, 7 = very good, 8–9 = excellent for commercial use.

ⁱⁱⁱ Analysis done by location. Differences among the mean values of full bloom, ripe date, FDP, weight, and soluble solids were evaluated with a Tukey honestly significant difference test, whereas the mean values of the rating data (size, firmness, blush, shape, tip, appearance, ground color and taste) were evaluated with the Kruskal-Wallis test. NS = not significant, * = 0.05, ** = 0.01, and *** = 0.001 significance probability.



Fig. 1. 'Fire Zest One' fruit on a tree in the research plots in Clovis, CA, USA, showing the high external coloration and the round symmetrical shape of the fruit.



Fig. 2. 'Fire Zest One' peach grown in the medium chill zone in Fairfield, TX, USA, showing high productivity, high color and excellent attractiveness.

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