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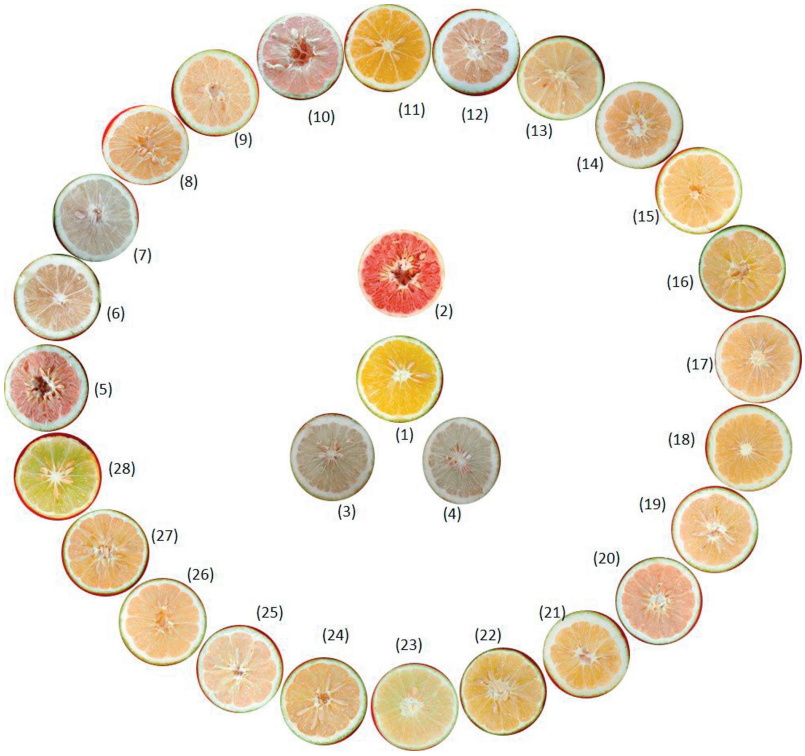

Fig. S1. Transverse section of 24 pummelo × sweet orange hybrid fruits and their four parents. Parents:(1)=sweet orange cv. Mosambi, (2)=PS-2 (pummelo red), (3)=PS-5 (pummelo white), (4)=PS-10 (pummelo white), hybrids: (5)=SCSH 3-10, (6)=SCSH 3-14, (7)=SCSH 3-15, (8)=SCSH 5-5, (9)=SCSH 7-12, (10)=SCSH 9-2, (11)=SCSH 9-10, (12)=SCSH 9-20, (13)=SCSH 11-15, (14)=SCSH 11-19, (15)=SCSH 13-4, (16)=SCSH 13-13, (17)=SCSH 13-14, (18)=SCSH 13-17, (19)=SCSH 15-2, (20)=SCSH 15-3, (21)=SCSH 15-18, (22)=SCSH 15-19, (23)=SCSH 17-9, (24)=SCSH 19-2, (25)=SCSH 19-6, (26)=SCSH 19-8, (27)=SCSH 21-10, (28)=CRH 20-11

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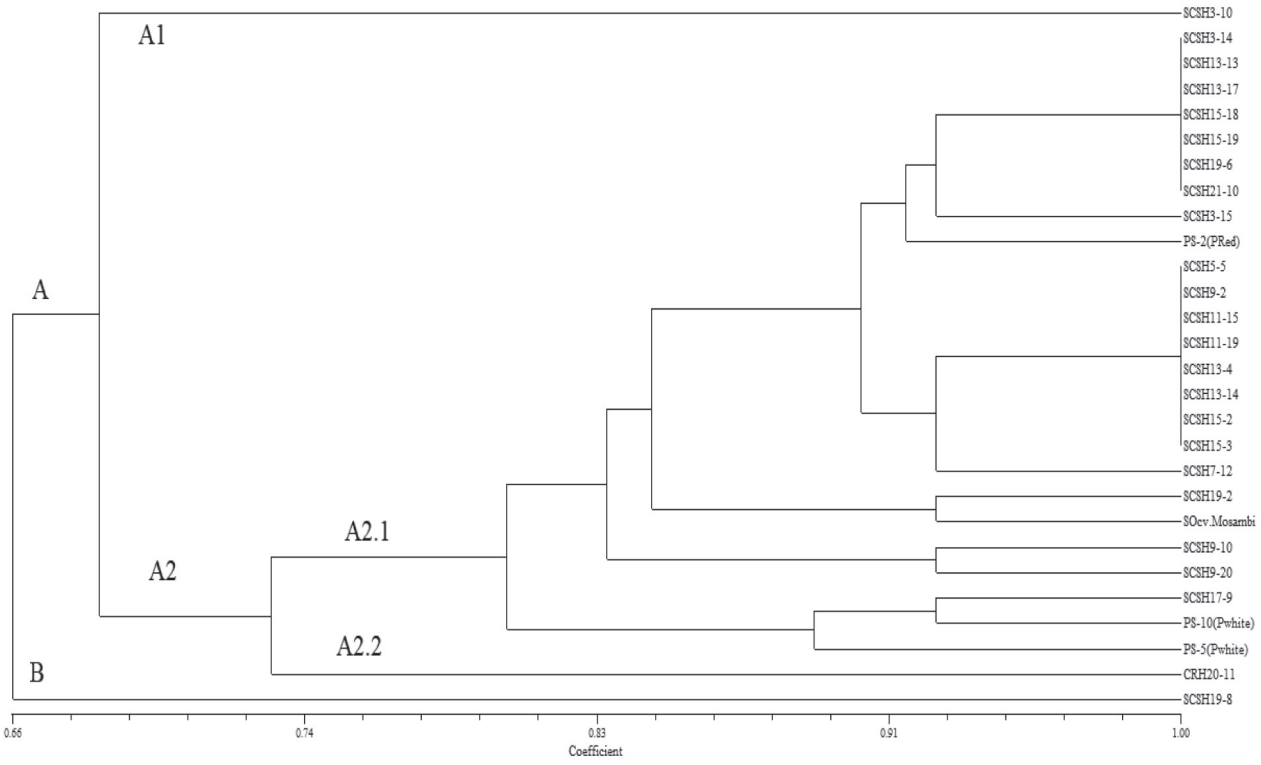

Fig S2. Genetic tree based on acidity-specific markers of 24 citrus fruit hybrids and their four parents

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Table S1. The pummelo × sweet orange hybrids and parents evaluated in the present study

Hybrid	Parent	Planting year
SCSH 3-10	Red pummelo × sweet orange cv. Mosambi	2016
SCSH 3-14		2015
SCSH 3-15		2016
SCSH 5-5		2016
SCSH 9-2		2012
SCSH 9-20		2016
SCSH 13-13		2016
CRH 20-11		2015
SCSH 13-14		2016
SCSH 11-15	White pummelo × sweet orange cv. Mosambi	2013
SCSH 11-19		2012
SCSH 13-4		2013
SCSH 7-12		2013
SCSH 9-10		2012
SCSH 13-17		2012
SCSH 15-2		2012
SCSH 15-3		2014
SCSH 15-18		2014
SCSH 15-19		2012
SCSH 17-9		2014
SCSH 19-2		2012
SCSH 19-6		2014
SCSH 19-8		2014
SCSH 21-10		2012
Parentage		
Sweet orange cv. Mosambi	♂	2003
PS-2 (pummelo red)	♀	2003
PS-5 (pummelo white)	♀	2003
PS-10 (pummelo white)	♀	2003

Table S2. The physicochemical traits of citrus fruit hybrids (pummelo × sweet orange) and their parents

Hybrid	*V*(juice)/ mL	JR/%	pH	TSS/%	TA/%	TSS/TA	*w*(AA)/ (mg/100 g)	TPC as *w*(GAE)/ (mg/100 g)	TFC as *w*(QE)/ (mg/100 g)	DPPH as *b*(Trolox)/ (μmol/g)	*w*(TS)/%	*w*(RS)/%	*w*(NRS)/%
SCSH 3-10	(199.7±10.8)^{b}	(25.1±2.3)^{kl}	(4.00±0.03)^{d}	(8.7±0.6)^{cde}	(1.37±0.07)^{ghijk}	(6.5±0.6)^{defg}	(45.9±3.2)^{defghi}	(40.8±3.2)^{m}	(38.0±3.7)^{efghij}	(3.9±0.2)^{bcd}	(4.82±0.02)^{c}	(1.75±0.03)^{k}	(2.92±0.05)^{ab}
SCSH 3-14	(153.0±1.7)^{c}	(39.8±1.2)^{bcdef}	(3.94±0.02)^{d}	(9.0±0.0)^{cd}	(1.6±0.3)^{cdefgh}	(5.9±0.4)^{efghij}	(43.2±0.8)^{hi}	(70.0±3.1)^{hij}	(45.3±3.4)^{bcdefg}	(5.4±0.1)^{a}	(3.60±0.04)^{gh}	(2.11±0.07)^{hi}	(1.42±0.09)^{i}
SCSH 3-15	(101.7±2.9)^{fgh}	(41.7±2.0)^{abc}	(3.72±0.02)^{ghij}	(9.0±0.0)^{cd}	(1.7±0.2)^{bcdef}	(5.3±0.4)^{ghijkl}	(42.3±2.2)^{hi}	(51.0±1.8)^{lm}	(52.0±4.9)^{abcd}	(5.5±0.3)^{a}	(3.89±0.04)^{f}	(1.96±0.01)^{i}	(1.84±0.06)^{g}
SCSH 5-5	(232±14)^{a}	(42.7±3.5)^{abc}	(3.83±0.01)^{e}	(8.3±0.6)^{de}	(1.79±0.02)^{abcde}	(4.7±0.4)^{jkl}	(42.0±1.2)^{hi}	(48.2±3.8)^{m}	(24.0±2.0)^{kl}	(3.6±0.4)^{cd}	(3.94±0.08)^{f}	(2.31±0.02)^{efg}	(1.55±0.09)^{hi}
SCSH 7-12	(130.0±5.0)^{cde}	(40.0±2.8)^{bcde}	(3.57±0.04)^{kl}	(7.3±0.5)^{f}	(1.0±0.2)^{l}	(7.4±0.4)^{cd}	(42.7±1.0)^{hi}	(64.5±4.8)^{ij}	(28.3±2.6)^{kl}	(4.5±0.7)^{b}	(2.72±0.04)^{l}	(2.2±0.1)^{fgh}	(0.48±0.03)^{l}
SCSH 9-2	(76.7±2.9)^{ijk}	(33.7±2.2)^{fghi}	(3.76±0.07)^{efgh}	(9.3±0.6)^{bc}	(1.35±0.07)^{ghijk}	(6.9±0.1)^{cdef}	(40.8±0.0)^{hi}	(87.0±7.2)^{de}	(38.0±2.2)^{efghij}	(5.6±0.2)^{a}	(4.2±0.1)^{de}	(2.22±0.03)^{fgh}	(1.9±0.2)^{g}
SCSH 9-10	(198.3±18.9)^{b}	(37.7±3.2)^{cdefg}	(3.73±0.04)^{fghi}	(8.3±0.6)^{de}	(1.4±0.1)^{fghij}	(5.8±0.5)^{fghij}	(43.5±4.1)^{ghi}	(63.7±5.7)^{ijk}	(26.3±1.8)^{jkl}	(4.4±0.1)^{b}	(3.5±0.1)^{hi}	(2.56±0.02)^{c}	(0.89±0.04)^{k}
SCSH 9-20	(130.0±10.0)^{cde}	(29.1±3.2)^{hijk}	(3.8±0.1)^{ef}	(8.0±0.0)^{ef}	(1.64±0.03)^{bcdefg}	(4.9±0.1)^{hijkl}	(50.1±4.7)^{bcdef}	(70.3±4.3)^{ghij}	(30.3±2.1)^{hijkl}	(3.6±0.1)^{cd}	(4.0±0.1)^{ef}	(2.4±0.2)^{de}	(1.5±0.1)^{hi}
SCSH 11-15	(56.7±4.6)^{k}	(42.4±3.8)^{abc}	(3.7±0.2)^{ij}	(11.3±0.6)^{a}	(2.1±0.1)^{a}	(5.4±0.5)^{ghijk}	(54.7±0.9)^{ab}	(85.0±6.8)^{def}	(59.3±5.8)^{a}	(4.4±0.2)^{b}	(2.10±0.01)^{m}	(1.7±0.0)^{k}	(0.4±0.0)^{l}
SCSH 11-19	(83.3±7.6)^{hij}	(42.7±3.8)^{abc}	(3.54±0.05)^{l}	(9.0±0.0)^{cd}	(1.83±0.04)^{abcd}	(4.9±0.1)^{hijkl}	(40.0±3.2)^{i}	(79.7±6.5)^{efgh}	(54.7±5.6)^{abc}	(4.3±0.1)^{b}	(4.34±0.05)^{d}	(2.30±0.01)^{efg}	(1.9±0.1)^{fg}
SCSH 13-4	(151.7±14.9)^{c}	(37.3±2.4)^{cdefg}	(3.68±0.04)^{hij}	(8.0±0.0)^{ef}	(1.9±0.4)^{ab}	(4.23±1.04)^{kl}	(45.87±2.01)^{defghi}	(82.9±5.3)^{ef}	(35.0±2.6)^{fghijkl}	(2.8±0.1)^{fghi}	(3.4±0.2)^{hij}	(1.95±0.05)^{ij}	(1.4±0.1)^{ij}
SCSH 13-13	(93.3±8.4)^{fghi}	(33.1±1.2)^{ghi}	(3.44±0.04)^{m}	(8.0±0.0)^{ef}	(1.8±0.5)^{abcd}	(4.6±0.1)^{jkl}	(43.5±2.4)^{ghi}	(107.3±9.7)^{bc}	(34.0±3.4)^{fghijkl}	(4.4±0.4)^{b}	(3.23±0.02)^{jk}	(2.20±0.03)^{gh}	(0.98±0.01)^{k}
SCSH 13-14	(86.0±8.5)^{hij}	(45.6±2.9)^{ab}	(3.76±0.03)^{efgh}	(10.0±0.0)^{b}	(1.0±0.2)^{kl}	(9.6±0.7)^{a}	(47.3±2.3)^{cdefgh}	(69.6±6.4)^{hij}	(33.3±3.3)^{fghijkl}	(5.6±0.5)^{a}	(5.8±0.2)^{a}	(2.42±0.03)^{cde}	(3.2±0.2)^{a}
SCSH 13-17	(111.7±2.9)^{efg}	(34.2±0.6)^{efghi}	(3.75±0.03)^{fgh}	(10.0±0.0)^{b}	(1.16±0.07)^{jkl}	(8.6±0.5)ab	(44.8±3.5)^{defghi}	(74.3±3.4) $^{f ghi}$	(33.7±3.2)^{fghijkl}	(3.3±0.2)^{defg}	(5.3±0.2)^{b}	(2.4±0.1)^{def}	(2.8±0.1)^{b}
SCSH 15-2	(90.0±8.2)^{ghij}	(40.5±6.5)^{bcd}	(3.76±0.01)^{efgh}	(8.0±0.0)^{ef}	(1.33±0.03)^{ghijkl}	(6.0±0.6)^{efghi}	(44.3±1.7)^{efghi}	(81.4±5.0)^{efgh}	(33.3±3.3)^{fghijkl}	(2.8±0.2)^{fghi}	(3.78±0.1)^{fg}	(1.69±0.01)^{k}	(1.9±0.1)^{fg}
SCSH 15-3	(198.3±19.7)^{b}	(34.5±3.3)^{defgh}	(3.5±0.0)^{l}	(8.0±0.0)^{ef}	(1.5±0.2)^{efghij}	(5.6±0.8)^{ghij}	(50.0±3.6)^{bcdefg}	(75.9±6.6)^{efghi}	(30.0±1.7)^{ijkl}	(3.5±0.1)^{cde}	(3.89±0.01)^{f}	(2.5±0.1)^{cd}	(1.3±0.1)^{ij}
SCSH 15-18	(135.0±5.0)^{cde}	(28.3±1.8)^{ijk}	(3.45±0.04)^{m}	(8.0±0.0)^{ef}	(1.4±0.4)^{fghij}	(5.8±0.8)^{efghij}	(53.9±4.6)^{abc}	(82.6±5.3)^{efg}	(23.7±2.7)^{l}	(3.6±0.1)^{cde}	(4.4±0.3)^{d}	(2.37±0.02)^{def}	(1.9±0.1)^{g}
SCSH 15-19	(201.0±9.6)^{b}	(43.9±1.8)^{ab}	(3.79±0.03)^{efg}	(8.0±0.0)^{ef}	(1.9±0.4)^{ab}	(4.3±0.8)^{kl}	(42.13±4.02)^{hi}	(76.0±6.9)^{efghi}	(24.3±2.8)^{kl}	(3.4±0.2)^{def}	(4.4±0.2)^{d}	(2.1±0.2)^{hi}	(2.2±0.1)^{ef}
SCSH 17-9	(103.3±11.5)^{cde}	(26.7±2.3)^{jkl}	(3.75±0.04)^{fgh}	(8.0±0.0)^{ef}	(1.3±0.1)^{ghijkl}	(6.0±0.5)^{efgh}	(58.1±4.6)^{a}	(51.4±4.3)^{jklm}	(37.8±3.6)^{efghij}	(2.0±0.1)^{jk}	(3.6±0.1)^{gh}	(2.2±0.1)^{fgh}	(1.3±0.1)^{ij}
SCSH 19-2	(136.7±13.2)^{cd}	(29.2±1.4)^{hijk}	(3.55±0.03)^{l}	(9.3±1.2)^{bc}	(1.89±0.02)^{abc}	(4.9±0.6)^{hijkl}	(55.5±4.7)^{ab}	(61.8±5.4)^{jkl}	(32.0±3.1)^{ghijkl}	(2.2±0.4)^{ijk}	(3.1±0.1)^{k}	(2.45±0.05)^{cde}	(0.59±0.01)^{l}
SCSH 19-6	(103.33±9.07)^{fgh}	(36.6±2.8)^{cdefg}	(3.72±0.01)^{ghi}	(8.7±0.6)^{cde}	(1.22±0.05)^{ijkl}	(7.1±0.6)^{cde}	(44.4±2.2)^{efghi}	(74.3±6.9)^{fghi}	(29.3±2.4)^{jkl}	(2.6±0.1)^{hij}	(4.8±0.3)^{c}	(2.2±0.1)^{fgh}	(2.5±0.2)^{cd}
SCSH 19-8	(130.0±12.0)^{cde}	(29.8±3.1)^{hijk}	(3.64±0.03)^{jk}	(7.3±0.6)^{f}	(1.5±0.2)^{defghi}	(4.8±0.5)^{ijkl}	(50.7±3.6)^{bcde}	(82.9±3.6)^{ef}	(42.7±0.6)^{cdefgh}	(2.5±0.2)^{hijk}	(3.31±0.02)^{ijk}	(2.14±0.01)^{h}	(1.12±0.01)^{jk}
SCSH 21-10	(130.0±5.0)^{cde}	(31.6±1.2)^{ghij}	(3.55±0.03)^{l}	(8.0±0.0)^{ef}	(1.9±0.1)^{ab}	(4.1±0.1)^{l}	(51.3±4.4)^{bcd}	(75.4±6.9)^{efghi}	(41.3±4.1)^{defghi}	(2.9±0.1)^{efgh}	(3.9±0.1)^{ef}	(2.14±0.01)^{h}	(1.8±0.1)^{gh}
CRH 20-11	(85.0±5.0)^{hij}	(44.7±3.8)^{ab}	(3.68±0.04)^{hij}	(10.0±0)^{b}	(1.3±0.1)^{hijkl}	(7.8±0.6)^{bc}	(53.60±3.02)^{abc}	(84.7±6.6)^{def}	(44.3±1.2)^{bcdefg}	(2.0±0.2)^{jk}	(3.8±0.2)^{fg}	(2.8±0.1)^{b}	(1.02±0.01)^{k}
Parentage													
Mosambi	(133.3±7.6)^{cde}	(47.0±1.2)^{a}	(4.73±0.03)^{a}	(11.0±1.0)^{a}	(1.5±0.1)^{efghij}	(7.6±0.8)^{bcd}	(58.4±0.8)^{a}	(116.7±7.6)^{b}	(36.5±3.5)^{fghijk}	(1.8±0.2)^{k}	(4.4±0.3)^{d}	(2.9±0.2)^{a}	(1.4±0.1)^{i}
PS-2	(115.0±10.0)^{def}	(26.6±2.0)^{jkl}	(4.24±0.04)^{b}	(9.0±1.0)^{cd}	(1.5±0.1)^{defghi}	(5.9±0.2)^{efghi}	(42.0±0.7)^{hi}	(168.2±14.1)^{a}	(49.5±4.3)^{abcde}	(4.1±0.9)^{bc}	(3.9±0.1)^{f}	(1.33±0.04)^{l}	(2.50±0.04)^{cd}
PS-5	(116.7±10.2)^{def}	(20.7±1.5)^{lm}	(3.93±0.03)^{d}	(8.7±1.2)^{cde}	(1.5±0.1)^{efghij}	(5.9±0.2)^{efghi}	(41.3±1.2)^{hi}	(102.3±5.5)^{c}	(50.8±2.9)^{abcd}	(2.5±0.2)^{hij}	(5.0±0.4)^{c}	(2.2±0.1)^{gh}	(2.7±0.4)^{bc}
PS-10	(65.7±2.1)^{jk}	(15.3±0.2)^{m}	(4.08±0.02)^{c}	(8.0±0.0)^{ef}	(1.01±0.01)^{l}	(7.9±0.1)^{bc}	(44.0±1.6)^{fghi}	(96.8±8.7)^{cd}	(56.3±4.7)^{ab}	(2.6±0.3)^{ghij}	(4.2±0.1)^{de}	(1.80±0.02)^{jk}	(2.3±0.1)^{de}
LSD (p≤0.05)	24.75	6.20	0.07	0.95	0.33	1.25	6.61	12.41	12.60	0.68	0.25	0.15	0.25

The results are presented as mean value±standard deviation (*N*=3). Mean values with different letters in superscript in the same column are statistically different (p≤0.05). JR=juice recovery, TSS=total soluble solids, TA=titratable acidity, AA=ascorbic acid, TPC=total phenolic content, TFC=total flavonoid content, DPPH=total antioxidants, TS=total sugars, RS=reducing sugars, NRS=non-reducing sugars

Supplementary materials for: R. KUMAR *et al.*: Molecular Characterization of a New Pummelo Hybrid with Acidity Specific Markers (https://doi.org/10.17113/ftb.62.01.24.8349)

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Table S3. Details of acidity specific markers showed 87.5 % polymorphism

Marker ID	Forward/reverse primer	F t_m/°C	R t_m/°C	t_a/°C	Expected product size/bp	Observed product size/bp	Polymorphism
NRCH1	AACCTATGTCCCCCATGTGC TGCACCATTTTCTTTGGCCG	59.3	57.3	55	183	nd	Not amplified
NRCH2	AAGGGCTAAGGTTGGTGTGG CCCGTTTACATTGTCCTTCACC	59.3	60.3	55	148	100–120	Polymorphic
NRCH3	CGCAGCTGTAAACGATGACC CAGAGTCGGACTGATCCTGC	59.3	61.4	55	107	100–120	Polymorphic
NRCH4	AAGGGCTAAGGTTGGTGTGG CCCGTTTACATTGTCCTTCACC	59.3	60.3	55	148	100–120	Polymorphic
NRCH5	AACCTATGTCCCCCATGTGC CAGAGTCGGACTGATCCTGC	59.3	61.4	55	126	130–150	Polymorphic
NRCH6	AAGGGCTAAGGTTGGTGTGG CCCGTTTACATTGTCCTTCACC	59.3	60.3	55	148	150–190	Polymorphic
NRCH7	CGCAGCTGTAAACGATGACC CAGAGTCGGACTGATCCTGC	59.3	61.4	55	107	100–130	Polymorphic
NRCH8	AAGGGCTAAGGTTGGTGTGG CCCGTTTACATTGTCCTTCACC	59.3	60.3	55	148	110–190	Polymorphic

F=forward primer, R=reverse primer, t_m and t_a=melting and annealing temperatures, nd=not determined

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Table S4. Grouping of citrus fruit hybrids based on acidity-specific markers (three cross combinations)

Parent	Genotype	TA/%
PS-2 (pummelo red) × sweet orange cv. Mosambi	SCSH 3-14	1.56
	SCSH 3-15	1.72
	SCSH 5-5	1.79
	SCSH 9-20	1.64
	SCSH 3-10	1.37
	SCSH 9-2	1.35
	SCSH 13-14	1.07
	CRH 20-11	1.28
PS-5 (pummelo white) × sweet orange cv. Mosambi	SCSH 11-15	2.11
	SCSH 11-19	1.83
	SCSH 13-4	1.96
	SCSH 13-13	1.81
	SCSH 15-19	1.92
	SCSH 19-2	1.89
	SCSH 21-10	1.96
PS-10 (pummelo white) × sweet orange cv. Mosambi	SCSH 19-8	1.55
	SCSH 7-12	1.00
	SCSH 9-10	1.45
	SCSH 13-17	1.16
	SCSH 15-2	1.33
	SCSH 15-3	1.46
	SCSH 15-18	1.45
	SCSH 17-9	1.33
	SCSH 19-6	1.22

TA=titratable acidity