

Supplementary Material

Figure S1. Chromatogram obtained from walnut (a) kernel and (b) oil volatile analysis.

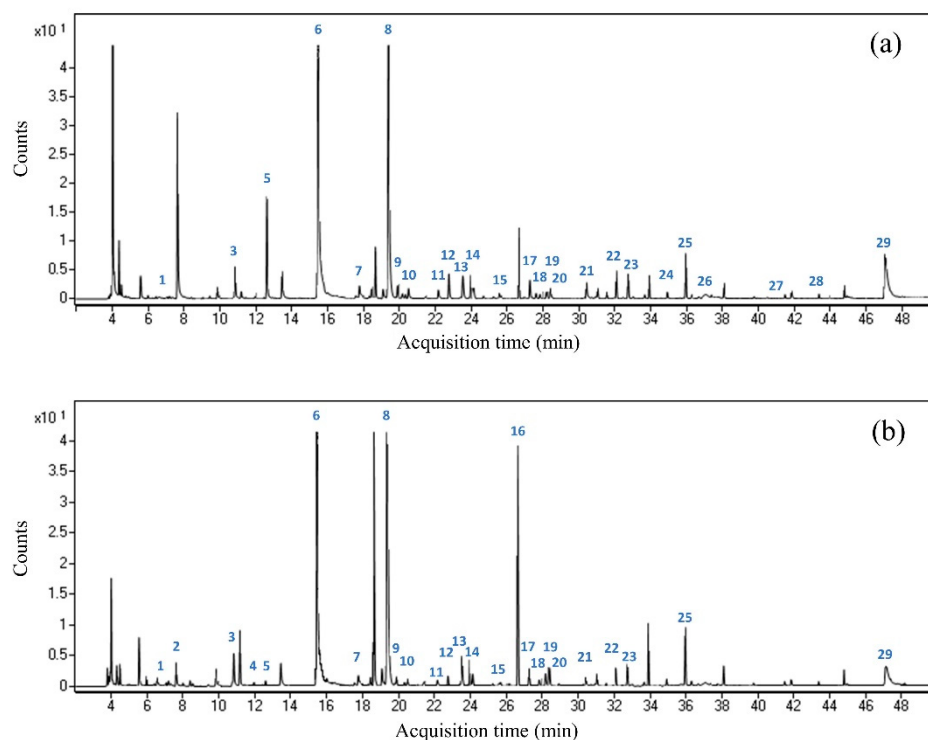


Table S1. Identified volatile compounds and retention times (Rt).

#	Rt (min)	Volatile compound
1	7.1	2-methylpropanal
2	7.6	Ethyl acetate
3	10.8	Pentanal
4	12.4	3-carene
5	12.6	1-penten-3-one
6	15.4	Hexanal
7	17.9	(<i>E</i>)-2-pentenal
8	19.4	1-penten-3-ol
9	19.9	2-heptanone
10	20.5	Heptanal
11	22.2	2-hexenal
12	22.7	2-pentyl-furan
13	23.5	1-pentanol
14	23.9	3-octanone
15	25.6	Octanal
16	26.6	1-octen-3-one
17	26.9	(<i>Z</i>)-2-penten-1-ol
18	27.3	(<i>E</i>)-2-heptenal
19	27.8	6-methyl-5-hepten-2-one
20	28.4	1-hexanol
21	30.4	Nonanal
22	32.1	(<i>E</i>)-2-octenal
23	32.7	1-octen-3-ol
24	34.9	(<i>E,E</i>)-2,4-heptadienal
25	36.3	Benzaldehyde
26	37.4	1-octanol
27	41	(<i>E</i>)-2-decenal
28	43.2	(<i>E,E</i>)-2,4-nonadienal
29	47.2	Hexanoic acid

Table S2. Selected fatty acids (% of total fatty acids detected) in the oil extracted from Chandler and Howard extracted at eleven time points for 28 weeks storage time.

Cultivar	Storage(weeks)	C16:0	C16:1	C17:0	C17:1	C18:0	C18:1	C18:2	C18:3	C22:0	C22:1
Chandler	0	5.1 ±0.80	5.8 ±0.10	0.1 ±0.00	0.1 ±0.00	2.1 ±0.31	14.6 ±0.18	57.3 ±0.65	14.6 ±0.16	0.1 ±0.01	0.2 ±0.00
	1	5.0 ±0.33	5.6 ±0.02	0.1 ±0.01	0.1 ±0.00	2.2 ±0.00	14.0 ±0.46	58.2 ±0.09	14.6 ±0.05	0.1 ±0.00	0.2 ±0.00
	2	4.3 ±0.01	5.6 ±0.00	0.1 ±0.00	0.1 ±0.00	2.2 ±0.00	14.7 ±0.01	58.1 ±0.05	14.6 ±0.02	0.1 ±0.00	0.2 ±0.00
	3	3.9 ±0.31	5.6 ±0.01	0.1 ±0.00	0.1 ±0.00	2.2 ±0.00	14.8 ±0.07	58.4 ±0.18	14.6 ±0.06	0.1 ±0.00	0.2 ±0.00
	4	4.6 ±0.38	6.2 ±0.08	0.1 ±0.00	0.1 ±0.01	2.2 ±0.48	14.7 ±0.18	57.4 ±0.47	14.4 ±0.12	0.1 ±0.00	0.2 ±0.00
	8	3.8 ±0.18	5.8 ±0.02	0.1 ±0.00	0.1 ±0.01	2.0 ±0.43	14.8 ±0.07	58.5 ±0.41	14.7 ±0.12	0.1 ±0.00	0.2 ±0.00
	12	3.5 ±0.42	5.7 ±0.03	0.1 ±0.00	0.1 ±0.02	2.3 ±0.02	14.9 ±0.06	58.5 ±0.33	14.7 ±0.10	0.1 ±0.00	0.2 ±0.00
	16	5.6 ±1.66	5.5 ±0.12	0.1 ±0.00	0.1 ±0.01	2.2 ±0.05	14.6 ±0.26	57.2 ±0.97	14.4 ±0.26	0.1 ±0.00	0.2 ±0.00
	20	4.2 ±1.10	5.8 ±0.01	0.1 ±0.00	0.1 ±0.00	2.0 ±0.38	15.2 ±0.13	57.6 ±0.47	14.8 ±0.08	0.1 ±0.01	0.2 ±0.00
	24	4.7 ±0.22	5.6 ±0.01	0.1 ±0.00	0.1 ±0.01	2.2 ±0.00	14.7 ±0.10	58.1 ±0.17	14.4 ±0.04	0.1 ±0.00	0.2 ±0.00
	28	3.8 ±0.05	5.8 ±0.00	0.1 ±0.00	0.1 ±0.01	2.4 ±0.00	14.9 ±0.01	58.0 ±0.05	14.7 ±0.01	0.1 ±0.00	0.2 ±0.00
Howard	0	7.9 ±0.90	6.0 ±0.14	0.1 ±0.01	0.1 ±0.00	2.2 ±0.05	12.3 ±0.75	57.6 ±0.33	13.7 ±0.29	0.1 ±0.00	0.2 ±0.00
	1	3.6 ±0.10	6.2 ±0.03	0.1 ±0.00	0.1 ±0.00	2.3 ±0.01	13.9 ±0.01	59.1 ±0.10	14.6 ±0.02	0.1 ±0.00	0.2 ±0.00
	2	3.7 ±0.21	6.3 ±0.01	0.1 ±0.00	0.1 ±0.01	2.3 ±0.00	13.8 ±0.04	58.9 ±0.12	14.6 ±0.04	0.1 ±0.00	0.2 ±0.00
	3	2.0 ±0.35	6.5 ±0.09	0.1 ±0.00	0.1 ±0.01	2.1 ±0.40	13.9 ±0.09	60.1 ±0.43	15.0 ±0.13	0.1 ±0.00	0.2 ±0.00
	4	8.1 ±0.26	6.2 ±0.06	0.1 ±0.00	0.1 ±0.00	2.3 ±0.02	12.8 ±0.18	56.4 ±0.20	13.8 ±0.2	0.1 ±0.00	0.2 ±0.00
	8	5.0 ±0.08	6.4 ±0.06	0.1 ±0.00	0.1 ±0.00	2.3 ±0.04	13.6 ±0.16	57.9 ±0.10	14.4 ±0.05	0.1 ±0.00	0.2 ±0.00
	12	5.9 ±0.23	6.3 ±0.02	0.1 ±0.00	0.1 ±0.00	2.3 ±0.01	13.2 ±0.03	57.6 ±0.14	14.2 ±0.03	0.1 ±0.00	0.2 ±0.00
	16	3.6 ±0.14	6.0 ±0.05	0.1 ±0.01	0.1 ±0.00	2.5 ±0.01	14.1 ±0.06	59.5 ±0.21	14.0 ±0.06	0.1 ±0.00	0.2 ±0.00
	20	4.4 ±0.19	6.0 ±0.00	0.1 ±0.00	0.1 ±0.01	2.5 ±0.01	14.0 ±0.05	58.8 ±0.13	13.9 ±0.03	0.1 ±0.00	0.2 ±0.00
	24	3.6 ±0.17	6.0 ±0.01	0.1 ±0.00	0.1 ±0.00	2.5 ±0.00	14.4 ±0.02	59.1 ±0.11	14.1 ±0.03	0.1 ±0.00	0.2 ±0.00
	28	2.7 ±0.64	6.2 ±0.02	0.1 ±0.02	0.1 ±0.01	2.5 ±0.00	14.1 ±0.38	59.8 ±0.26	14.2 ±0.06	0.1 ±0.00	0.2 ±0.00
Chandler		4.4 ±0.81	5.7 ±0.18b	0.1 ±0.00b	0.1 ±0.01	2.2 ±0.21b	14.7 ±0.3a	57.9 ±0.55b	14.6 ±0.16a	0.1 ±0.01	0.2 ±0.00a
Howard		4.6 ±1.96	6.2 ±0.19a	0.1 ±0.01a	0.1 ±0.01	2.3 ±0.17a	13.6 ±0.63b	58.6 ±1.1a	14.2 ±0.4b	0.1 ±0.00	0.2 ±0.01b

Palmitic (C16:0), palmitoleic (C16:1), (17:0), stearic (C18:0), oleic (C18:1), linoleic (C18:2), linolenic (C18:3), (C22:0) and (C22:1) fatty acid average ± standard deviation. Letters denote significant differences between cultivars ($P < 0.05$) on the last two rows.

Table S3. Kernel volatile compounds (mean $\pm$ standard deviation; n from Chandler at 11 sampling times during 28 weeks of storage.

Cultivar	Chandler										
Storage (weeks)	0	1	2	3	4	8	12	16	20	24	28
2-methylpropanal	4.916 $\pm$ 1.289	4.877 $\pm$ 0.335	5.868 $\pm$ 0.489	6.762 $\pm$ 1.153	6.621 $\pm$ 1.609	18.13 $\pm$ 0.887	30.51 $\pm$ 0.424	54.85 $\pm$ 1.914	74.24 $\pm$ 6.225	104.2 $\pm$ 6.080	82.88 $\pm$ 7.112
Ethyl acetate	n.d	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pentanal	14.52 $\pm$ 6.296	13.37 $\pm$ 1.237	14.01 $\pm$ 0.705	19.22 $\pm$ 1.220	11.20 $\pm$ 2.145	109.4 $\pm$ 7.327	140.2 $\pm$ 12.31	276.5 $\pm$ 50.51	626.1 $\pm$ 12.85	610.3 $\pm$ 20.47	639.2 $\pm$ 59.588
3-carene	n.d	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
1-penten-3-one	5.100 $\pm$ 2.226	4.466 $\pm$ 1.234	7.091 $\pm$ 1.117	6.910 $\pm$ 0.483	3.995 $\pm$ 0.664	18.71 $\pm$ 2.016	22.36 $\pm$ 1.051	30.73 $\pm$ 3.578	57.05 $\pm$ 3.420	49.74 $\pm$ 1.596	67.59 $\pm$ 4.128
Hexanal	312.7 $\pm$ 43.74	344.6 $\pm$ 24.99	437.4 $\pm$ 46.82	475.2 $\pm$ 17.00	239.9 $\pm$ 160.8	1915 $\pm$ 119.7	2475 $\pm$ 88.05	5014 $\pm$ 724.5	13124 $\pm$ 378.6	12412 $\pm$ 404.2	13518 $\pm$ 1139
(<i>E</i>)-2-pentenal	48.08 $\pm$ 9.268	34.64 $\pm$ 6.701	36.2 $\pm$ 26.443	33.03 $\pm$ 26.32	41.07 $\pm$ 11.19	31.63 $\pm$ 1.056	52.15 $\pm$ 1.102	73.53 $\pm$ 7.446	136.8 $\pm$ 12.37	123.6 $\pm$ 4.430	130.6 $\pm$ 10.10
1-penten-3-ol	2497 $\pm$ 36.95	2291 $\pm$ 313.5	2779 $\pm$ 433.2	2558 $\pm$ 261.9	2647 $\pm$ 196.5	226.4 $\pm$ 3.893	322.3 $\pm$ 4.004	467.0 $\pm$ 27.43	703.8 $\pm$ 64.51	616.0 $\pm$ 50.51	576.1 $\pm$ 94.79
2-heptanone	92.65 $\pm$ 63.491	100.2 $\pm$ 20.40	118.2 $\pm$ 30.56	91.77 $\pm$ 14.95	88.55 $\pm$ 10.33	65.58 $\pm$ 10.47	22.58 $\pm$ 0.892	51.61 $\pm$ 7.608	144.6 $\pm$ 7.417	129.3 $\pm$ 13.69	194.6 $\pm$ 15.28
Heptanal	10.74 $\pm$ 2.307	10.24 $\pm$ 1.012	11.52 $\pm$ 1.522	9.375 $\pm$ 0.456	10.19 $\pm$ 2.59	20.11 $\pm$ 0.521	24.16 $\pm$ 0.496	45.63 $\pm$ 4.607	151.4 $\pm$ 5.062	106.5 $\pm$ 4.21	152.4 $\pm$ 17.87
2-hexenal	3.234 $\pm$ 0.835	3.191 $\pm$ 0.305	7.481 $\pm$ 0.569	5.145 $\pm$ 0.442	1.820 $\pm$ 0.688	11.19 $\pm$ 0.409	17.49 $\pm$ 0.619	44.37 $\pm$ 4.458	121.3 $\pm$ 4.344	115.1 $\pm$ 2.481	102.6 $\pm$ 8.173
2-pentyl-furan	40.28 $\pm$ 7.280	48.93 $\pm$ 11.27	305.5 $\pm$ 24.93	33.06 $\pm$ 2.933	37.92 $\pm$ 13.99	54.90 $\pm$ 0.952	67.67 $\pm$ 0.853	140.5 $\pm$ 9.365	993.1 $\pm$ 41.11	409.6 $\pm$ 10.07	582.0 $\pm$ 63.14
1-pentanol	30.02 $\pm$ 10.18	28.75 $\pm$ 1.687	28.09 $\pm$ 2.815	30.747 $\pm$ 2.34	30.58 $\pm$ 7.915	104.8 $\pm$ 4.276	147.2 $\pm$ 16.64	405.6 $\pm$ 62.52	1035 $\pm$ 40.26	1084 $\pm$ 59.16	1132 $\pm$ 111.7
3-octanone	1.646 $\pm$ 0.438	1.424 $\pm$ 0.230	1.692 $\pm$ 0.123	2.005 $\pm$ 0.156	3.442 $\pm$ 1.160	4.256 $\pm$ 0.066	4.763 $\pm$ 0.185	8.502 $\pm$ 0.197	22.06 $\pm$ 0.167	16.82 $\pm$ 0.176	24.21 $\pm$ 1.408
Octanal	4.546 $\pm$ 1.200	4.523 $\pm$ 0.310	6.356 $\pm$ 1.516	3.261 $\pm$ 0.198	4.071 $\pm$ 1.185	5.426 $\pm$ 0.334	7.884 $\pm$ 1.462	13.94 $\pm$ 3.378	63.15 $\pm$ 0.626	45.74 $\pm$ 5.626	71.52 $\pm$ 13.38
1-octen-3-one	n.d	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(<i>Z</i>)-2-penten-1-ol	1.792 $\pm$ 0.608	1.704 $\pm$ 0.160	2.330 $\pm$ 0.295	3.059 $\pm$ 0.403	1.791 $\pm$ 0.273	10.18 $\pm$ 0.367	15.37 $\pm$ 0.242	31.72 $\pm$ 2.478	58.21 $\pm$ 3.123	50.93 $\pm$ 1.920	60.81 $\pm$ 7.43
(<i>E</i>)-2-heptenal	8.420 $\pm$ 1.264	9.516 $\pm$ 0.597	15.17 $\pm$ 2.128	17.28 $\pm$ 0.986	8.314 $\pm$ 1.924	44.52 $\pm$ 1.529	74.34 $\pm$ 2.394	121.3 $\pm$ 6.866	290.3 $\pm$ 7.285	244.8 $\pm$ 1.095	333.5 $\pm$ 35.27
6-methyl-5-hepten-2-one	13.27 $\pm$ 1.594	13.24 $\pm$ 1.469	17.24 $\pm$ 3.233	17.36 $\pm$ 0.852	15.56 $\pm$ 2.626	14.75 $\pm$ 0.241	15.73 $\pm$ 1.123	30.79 $\pm$ 1.737	49.84 $\pm$ 2.337	41.70 $\pm$ 2.537	42.96 $\pm$ 3.200
1-hexanol	38.85 $\pm$ 5.932	49.06 $\pm$ 3.396	35.45 $\pm$ 2.425	48.71 $\pm$ 3.033	79.39 $\pm$ 24.49	64.76 $\pm$ 0.528	99.11 $\pm$ 0.634	218.9 $\pm$ 6.990	432.9 $\pm$ 21.96	408.4 $\pm$ 11.88	537.3 $\pm$ 47.46
Nonanal	13.04 $\pm$ 1.627	13.94 $\pm$ 1.493	16.45 $\pm$ 2.823	10.75 $\pm$ 0.368	15.99 $\pm$ 5.518	15.87 $\pm$ 1.080	20.50 $\pm$ 0.935	31.91 $\pm$ 2.440	96.36 $\pm$ 3.923	58.32 $\pm$ 4.058	73.92 $\pm$ 8.621
(<i>E</i>)-2-octenal	5.635 $\pm$ 1.684	5.535 $\pm$ 0.567	3.093 $\pm$ 0.511	3.468 $\pm$ 0.393	3.459 $\pm$ 1.804	12.25 $\pm$ 0.926	14.90 $\pm$ 0.985	59.04 $\pm$ 6.865	233.4 $\pm$ 1.739	215.1 $\pm$ 8.391	313.8 $\pm$ 52.10
1-octen-3-ol	8.340 $\pm$ 1.220	10.05 $\pm$ 0.915	19.72 $\pm$ 1.569	23.63 $\pm$ 1.836	15.58 $\pm$ 6.063	56.00 $\pm$ 2.298	104.6 $\pm$ 0.877	214.9 $\pm$ 15.88	553.5 $\pm$ 12.92	480.3 $\pm$ 8.17	602.9 $\pm$ 123.2
(<i>E,E</i>)-2,4-heptadienal	7.927 $\pm$ 1.855	8.099 $\pm$ 1.281	10.53 $\pm$ 3.044	13.42 $\pm$ 1.608	7.867 $\pm$ 1.336	41.08 $\pm$ 4.592	67.14 $\pm$ 2.086	133.2 $\pm$ 5.506	227.8 $\pm$ 14.69	208.8 $\pm$ 7.402	199.1 $\pm$ 31.93
Benzaldehyde	32.48 $\pm$ 23.26	19.72 $\pm$ 0.912	22.95 $\pm$ 2.079	15.10 $\pm$ 0.945	19.03 $\pm$ 3.418	22.13 $\pm$ 1.445	25.49 $\pm$ 0.638	35.63 $\pm$ 0.622	75.56 $\pm$ 6.391	44.57 $\pm$ 1.618	59.85 $\pm$ 22.46
1-octanol	3.176 $\pm$ 0.268	3.525 $\pm$ 0.430	4.918 $\pm$ 0.527	2.693 $\pm$ 0.079	4.507 $\pm$ 1.709	2.956 $\pm$ 0.533	3.935 $\pm$ 1.648	8.057 $\pm$ 2.378	27.62 $\pm$ 4.600	30.65 $\pm$ 3.996	31.48 $\pm$ 9.784
(<i>E</i>)-2-decenal	0.153 $\pm$ 0.070	0.190 $\pm$ 0.079	0.154 $\pm$ 0.075	0.258 $\pm$ 0.216	0.088 $\pm$ 0.065	0.740 $\pm$ 0.381	2.231 $\pm$ 0.107	3.724 $\pm$ 2.811	2.195 $\pm$ 0.147	2.242 $\pm$ 0.363	4.461 $\pm$ 1.469
(<i>E,E</i>)-2,4-nonadienal	0.508 $\pm$ 0.069	0.528 $\pm$ 0.022	0.443 $\pm$ 0.122	0.635 $\pm$ 0.024	0.437 $\pm$ 0.245	1.792 $\pm$ 0.089	3.130 $\pm$ 0.144	8.766 $\pm$ 0.692	24.84 $\pm$ 1.536	29.72 $\pm$ 1.381	35.73 $\pm$ 8.829
Hexanoic acid	0.555 $\pm$ 0.516	0.312 $\pm$ 0.041	0.206 $\pm$ 0.179	0.244 $\pm$ 0.026	0.143 $\pm$ 0.077	1.223 $\pm$ 0.649	0.887 $\pm$ 0.561	10.45 $\pm$ 1.016	33.63 $\pm$ 4.168	35.10 $\pm$ 8.167	10.07 $\pm$ 0.378
Σ VOCs	3200 $\pm$ 47.59	3027 $\pm$ 371.2	3907 $\pm$ 512.3	3431 $\pm$ 311.5	3299 $\pm$ 45.57	2875 $\pm$ 120.2	3782 $\pm$ 108.9	7536 $\pm$ 939.5	19360 $\pm$ 591.5	17675 $\pm$ 458.5	19581 $\pm$ 1758
Alcohols	2577 $\pm$ 31.42	2381 $\pm$ 316.0	2864 $\pm$ 439.4	2664 $\pm$ 268.8	2774 $\pm$ 176.3	462.2 $\pm$ 2.200	688.6 $\pm$ 13.29	1338 $\pm$ 104.1	2783 $\pm$ 121.1	2640 $\pm$ 123.0	2910 $\pm$ 367.7
Aldehydes	453.8 $\pm$ 103.3	452.6 $\pm$ 33.88	564.1 $\pm$ 47.56	597.0 $\pm$ 27.61	350.5 $\pm$ 161.0	2225 $\pm$ 120.7	2925 $\pm$ 97.28	5868 $\pm$ 817.2	15146 $\pm$ 432.8	14245 $\pm$ 418.4	15618 $\pm$ 1343

Ketones	112.6±60.04	119.3±22.69	144.2±34.66	118.0±16.13	111.5±10.65	103.3±12.58	65.44±1.170	121.6±12.61	273.5±10.41	237.6±15.22	329.4±17.69
Furans	40.28±7.280	48.93±11.27	305.5±24.93	33.06±2.933	37.92±13.99	54.90±0.952	67.67±0.853	140.5±9.365	993.1±41.11	409.6±10.07	582.1±63.14
Acids	0.555±0.516	0.312±0.041	0.206±0.179	0.244±0.026	0.143±0.077	1.223±0.649	0.887±0.561	10.44±1.016	33.64±4.168	35.10±8.167	10.07±0.378

Values of volatile compounds expressed in µg of internal standard per kg of sample. (n.d.) not detected.

Table S4. Kernel volatile compounds (mean $\pm$ standard deviation; n=3) from Howard at 11 sampling times during 28 weeks of storage.

Cultivar	Howard										
Storage (weeks)	0	1	2	3	4	8	12	16	20	24	28
2-methylpropanal	6.007 $\pm$ 0.925	5.264 $\pm$ 0.611	12.49 $\pm$ 0.831	9.324 $\pm$ 1.208	26.80 $\pm$ 0.486	50.39 $\pm$ 11.95	85.59 $\pm$ 5.771	118.8 $\pm$ 4.439	188.6 $\pm$ 17.29	266.6 $\pm$ 17.50	245.7 $\pm$ 23.24
Ethyl acetate	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Pentanal	19.93 $\pm$ 3.358	17.05 $\pm$ 0.791	197.7 $\pm$ 11.42	207.86 $\pm$ 6.24	596.6 $\pm$ 35.63	865.6 $\pm$ 204.7	1077 $\pm$ 22.56	1285 $\pm$ 52.27	2027 $\pm$ 110.4	2459 $\pm$ 43.30	2921 $\pm$ 129.1
3-carene	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
1-penten-3-one	4.915 $\pm$ 0.218	3.335 $\pm$ 1.140	19.49 $\pm$ 0.979	29.37 $\pm$ 2.810	73.62 $\pm$ 1.527	90.49 $\pm$ 18.78	129.4 $\pm$ 6.214	150.6 $\pm$ 4.118	175.5 $\pm$ 10.36	316.4 $\pm$ 2.193	321.5 $\pm$ 36.06
Hexanal	425.3 $\pm$ 78.11	391.7 $\pm$ 42.13	4722 $\pm$ 322.9	3905 $\pm$ 394.6	11423 $\pm$ 1021	16805 $\pm$ 3813	31156 $\pm$ 990	28363 $\pm$ 1655	55793 $\pm$ 2640	52525 $\pm$ 340	61470 $\pm$ 2170
(E)-2-pentenal	22.72 $\pm$ 1.592	19.71 $\pm$ 2.866	27.85 $\pm$ 1.241	27.85 $\pm$ 1.289	100.2 $\pm$ 8.182	194.9 $\pm$ 54.38	153.6 $\pm$ 4.553	528.7 $\pm$ 16.06	494.2 $\pm$ 23.67	1128 $\pm$ 18.52	1309 $\pm$ 67.01
1-penten-3-ol	2376 $\pm$ 132.0	2304 $\pm$ 111.7	236.5 $\pm$ 6.888	311.8 $\pm$ 9.928	692.9 $\pm$ 23.78	1035 $\pm$ 247.1	1387 $\pm$ 56.07	1443 $\pm$ 65.132	2687 $\pm$ 140.5	2552 $\pm$ 70.08	2809 $\pm$ 151.2
2-heptanone	25.23 $\pm$ 2.535	19.45 $\pm$ 1.874	38.38 $\pm$ 4.306	33.08 $\pm$ 2.537	85.53 $\pm$ 6.295	132.4 $\pm$ 35.68	391.5 $\pm$ 26.19	334.7 $\pm$ 40.69	1303 $\pm$ 57.06	1115 $\pm$ 33.88	1650 $\pm$ 66.54
Heptanal	11.84 $\pm$ 0.317	10.29 $\pm$ 0.454	35.07 $\pm$ 0.820	27.38 $\pm$ 4.161	84.14 $\pm$ 9.979	148.3 $\pm$ 43.53	373.2 $\pm$ 39.66	379.6 $\pm$ 48.97	1253 $\pm$ 44.64	992.5 $\pm$ 26.12	1331 $\pm$ 60.34
2-hexenal	1.192 $\pm$ 0.338	1.243 $\pm$ 0.959	27.42 $\pm$ 1.322	21.53 $\pm$ 0.772	68.19 $\pm$ 6.981	113.9 $\pm$ 29.78	223.7 $\pm$ 13.81	261.7 $\pm$ 20.45	559.1 $\pm$ 16.90	625.2 $\pm$ 15.32	732.3 $\pm$ 33.78
2-pentyfuran	124.6 $\pm$ 15.90	100.6 $\pm$ 8.531	382.1 $\pm$ 6.727	98.55 $\pm$ 13.47	352.2 $\pm$ 32.31	498.7 $\pm$ 154.5	1474 $\pm$ 141.1	1669 $\pm$ 265.8	6628 $\pm$ 324.1	4792 $\pm$ 180.40	7164 $\pm$ 668.3
1-pentanol	101.2 $\pm$ 9.653	89.35 $\pm$ 6.398	409.5 $\pm$ 30.60	436.4 $\pm$ 24.91	15154 $\pm$ 98.59	2202 $\pm$ 514.1	3564 $\pm$ 112.4	3672 $\pm$ 171.3	6152 $\pm$ 286.2	5456 $\pm$ 19.14	6013 $\pm$ 197.0
3-octanone	5.686 $\pm$ 0.692	5.368 $\pm$ 0.599	8.603 $\pm$ 0.462	8.101 $\pm$ 0.373	21.00 $\pm$ 1.763	27.31 $\pm$ 6.700	69.21 $\pm$ 7.040	62.61 $\pm$ 5.726	223.2 $\pm$ 10.76	165.4 $\pm$ 10.98	208.4 $\pm$ 22.57
Octanal	4.821 $\pm$ 0.266	3.007 $\pm$ 0.067	10.622 $\pm$ 0.75	6.349 $\pm$ 1.502	22.04 $\pm$ 2.470	42.09 $\pm$ 14.38	154.9 $\pm$ 19.84	144.0 $\pm$ 17.65	713.0 $\pm$ 31.97	513.8 $\pm$ 12.26	756.4 $\pm$ 58.24
1-octen-3-one	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(Z)-2-penten-1-ol	1.142 $\pm$ 0.427	1.014 $\pm$ 0.373	15.31 $\pm$ 0.255	19.54 $\pm$ 0.836	59.85 $\pm$ 5.636	109.3 $\pm$ 26.67	196.1 $\pm$ 15.00	187.4 $\pm$ 11.99	431.9 $\pm$ 12.86	390.9 $\pm$ 8.115	337.3 $\pm$ 17.60
(E)-2-heptenal	4.370 $\pm$ 1.462	2.337 $\pm$ 0.231	68.36 $\pm$ 2.450	78.44 $\pm$ 10.15	261.5 $\pm$ 24.18	375.2 $\pm$ 90.77	810.6 $\pm$ 72.39	975.8 $\pm$ 114.6	2437 $\pm$ 99.73	2327 $\pm$ 85.89	3238 $\pm$ 246.7
6-methyl-5-hepten-2-one	18.77 $\pm$ 0.543	18.006 $\pm$ 1.89	18.04 $\pm$ 0.612	15.02 $\pm$ 2.013	21.88 $\pm$ 2.347	30.33 $\pm$ 6.677	32.08 $\pm$ 1.446	66.09 $\pm$ 3.416	125.0 $\pm$ 3.733	77.24 $\pm$ 0.210	64.91 $\pm$ 9.665
1-hexanol	512.7 $\pm$ 20.49	490.4 $\pm$ 17.85	152.9 $\pm$ 0.675	126.4 $\pm$ 15.37	292.4 $\pm$ 43.43	409.7 $\pm$ 103.9	691.8 $\pm$ 24.08	2412 $\pm$ 264.2	4717 $\pm$ 374.5	1402 $\pm$ 16.32	1872 $\pm$ 99.71
Nonanal	17.07 $\pm$ 1.134	13.60 $\pm$ 0.595	19.91 $\pm$ 0.190	17.53 $\pm$ 4.765	29.11 $\pm$ 3.482	49.62 $\pm$ 15.05	151.6 $\pm$ 17.27	144.6 $\pm$ 19.48	615.1 $\pm$ 51.13	426.8 $\pm$ 23.89	576.3 $\pm$ 76.93
(E)-2-octenal	4.781 $\pm$ 2.261	2.046 $\pm$ 0.304	53.67 $\pm$ 5.801	46.52 $\pm$ 10.00	267.5 $\pm$ 27.22	381.9 $\pm$ 97.56	917.8 $\pm$ 103.6	1124 $\pm$ 215.8	3256 $\pm$ 198.0	2712 $\pm$ 155.9	3874 $\pm$ 409.8
1-octen-3-ol	29.90 $\pm$ 4.407	23.20 $\pm$ 1.706	115.7 $\pm$ 8.169	106.5 $\pm$ 22.37	429.1 $\pm$ 36.95	657.3 $\pm$ 156.3	1656 $\pm$ 186.2	1647 $\pm$ 221.1	4819 $\pm$ 221.7	3861 $\pm$ 112.1	5555 $\pm$ 447.8
(E,E)-2,4-heptadienal	4.700 $\pm$ 0.600	3.414 $\pm$ 0.179	25.33 $\pm$ 1.204	28.99 $\pm$ 9.498	89.88 $\pm$ 13.19	164.4 $\pm$ 37.20	430.2 $\pm$ 44.63	424.5 $\pm$ 21.06	1014 $\pm$ 23.33	985.6 $\pm$ 4.034	1294 $\pm$ 107.9
Benzaldehyde	18.40 $\pm$ 3.197	12.40 $\pm$ 0.906	25.59 $\pm$ 3.591	14.73 $\pm$ 2.808	21.24 $\pm$ 3.465	31.45 $\pm$ 6.780	48.66 $\pm$ 0.865	61.67 $\pm$ 5.322	172.7 $\pm$ 6.869	121.9 $\pm$ 5.284	124.3 $\pm$ 15.58
1-octanol	5.766 $\pm$ 0.801	3.766 $\pm$ 0.268	8.302 $\pm$ 2.870	4.187 $\pm$ 1.694	19.93 $\pm$ 4.244	50.41 $\pm$ 13.35	119.4 $\pm$ 15.32	82.60 $\pm$ 18.47	409.0 $\pm$ 44.60	316.7 $\pm$ 68.76	510.8 $\pm$ 61.08
(E)-2-decenal	0.279 $\pm$ 0.098	0.173 $\pm$ 0.154	0.406 $\pm$ 0.070	0.216 $\pm$ 0.034	1.504 $\pm$ 0.324	4.233 $\pm$ 2.161	15.71 $\pm$ 3.552	10.47 $\pm$ 1.495	52.86 $\pm$ 8.471	45.44 $\pm$ 4.075	60.54 $\pm$ 11.44
(E,E)-2,4-nonadienal	1.540 $\pm$ 1.158	0.633 $\pm$ 0.171	2.993 $\pm$ 0.471	2.596 $\pm$ 0.542	15.17 $\pm$ 1.964	31.30 $\pm$ 11.85	113.2 $\pm$ 23.07	80.99 $\pm$ 10.74	343.0 $\pm$ 48.76	313.5 $\pm$ 28.22	418.8 $\pm$ 55.70
Hexanoic acid	0.440 $\pm$ 0.219	3.508 $\pm$ 1.063	3.786 $\pm$ 1.344	0.784 $\pm$ 0.883	8.649 $\pm$ 3.637	21.57 $\pm$ 10.26	144.2 $\pm$ 72.59	84.47 $\pm$ 20.84	763.3 $\pm$ 105.1	690.6 $\pm$ 89.61	857.3 $\pm$ 113.8
Σ VOCs	3749 $\pm$ 28.82	3545 $\pm$ 160.1	6638 $\pm$ 395.0	5585 $\pm$ 520.0	16580 $\pm$ 1395	24525 $\pm$ 5625	45570 $\pm$ 1869	45719 $\pm$ 3078	97358 $\pm$ 4436	86584 $\pm$ 446.7	105723 $\pm$ 5022
Alcohols	3021 $\pm$ 99.54	2908 $\pm$ 133.4	930.1 $\pm$ 42.79	1001 $\pm$ 65.19	2989 $\pm$ 202.2	4414 $\pm$ 1026	7496 $\pm$ 368.0	9364 $\pm$ 627.9	18807 $\pm$ 868.3	13664 $\pm$ 47.41	16589 $\pm$ 830.0
Aldehydes	522.7 $\pm$ 86.45	469.7 $\pm$ 38.55	5200 $\pm$ 342.9	4377 $\pm$ 434.5	12969 $\pm$ 1148	19192 $\pm$ 4379	35535 $\pm$ 1313	33751 $\pm$ 2170	68353 $\pm$ 3115	64964 $\pm$ 24.29	77751 $\pm$ 3302
Ketones	54.60 $\pm$ 3.978	46.16 $\pm$ 5.188	84.53 $\pm$ 3.246	85.57 $\pm$ 4.848	202.1 $\pm$ 10.19	280.5 $\pm$ 66.94	622.3 $\pm$ 37.38	614.1 $\pm$ 51.38	1827 $\pm$ 81.23	1674 $\pm$ 47.26	2245 $\pm$ 111.0
Furans	124.6 $\pm$ 15.90	100.63 $\pm$ 8.531	382.1 $\pm$ 6.727	98.55 $\pm$ 13.47	352.2 $\pm$ 32.31	498.7 $\pm$ 154.5	1474 $\pm$ 141.0	1669 $\pm$ 265.8	6628 $\pm$ 324.1	4792 $\pm$ 180.4	7164 $\pm$ 668.3
Acids	0.440 $\pm$ 0.219	3.508 $\pm$ 1.063	3.786 $\pm$ 1.344	0.784 $\pm$ 0.883	8.649 $\pm$ 3.637	21.57 $\pm$ 10.26	144.2 $\pm$ 72.59	84.47 $\pm$ 20.84	763.3 $\pm$ 105.1	690.6 $\pm$ 89.61	857.3 $\pm$ 113.8

Values of volatile compounds expressed in μ g of internal standard per kg of sample. (n.d.) not detected.

Table S5. Oil volatile compounds (mean $\pm$ standard deviation; n=3) from Chandler at 11 sampling times during 28 weeks of storage.

Cultivar	Chandler										
Storage (weeks)	0	1	2	3	4	8	12	16	20	24	28
2-methylpropanal	3.746 $\pm$ 0.521	3.131 $\pm$ 0.347	3.627 $\pm$ 0.770	8.574 $\pm$ 1.411	3.914 $\pm$ 1.383	45.14 $\pm$ 56.62	5.996 $\pm$ 1.169	9.573 $\pm$ 0.823	22.01 $\pm$ 0.961	36.79 $\pm$ 1.837	58.76 $\pm$ 13.38
Ethyl Acetate	573.7 $\pm$ 54.81	81.79 $\pm$ 1.920	52.55 $\pm$ 8.018	81.21 $\pm$ 0.084	298.5 $\pm$ 12.02	45.313 $\pm$ 1.15	151.3 $\pm$ 10.11	146.8 $\pm$ 14.72	95.77 $\pm$ 7.760	35.09 $\pm$ 0.770	73.86 $\pm$ 36.31
Pentanal	11.39 $\pm$ 1.109	11.81 $\pm$ 0.621	21.17 $\pm$ 2.767	56.06 $\pm$ 2.954	16.62 $\pm$ 0.110	37.42 $\pm$ 2.884	30.22 $\pm$ 0.702	56.73 $\pm$ 9.390	180.2 $\pm$ 19.17	274.8 $\pm$ 9.535	520.6 $\pm$ 112.5
3-Carene	11.66 $\pm$ 1.032	8.234 $\pm$ 0.107	8.175 $\pm$ 0.877	7.896 $\pm$ 0.208	5.962 $\pm$ 0.102	7.329 $\pm$ 0.609	5.785 $\pm$ 0.445	3.604 $\pm$ 0.620	4.697 $\pm$ 0.510	5.159 $\pm$ 0.058	3.723 $\pm$ 0.879
1-Penten-3-one	4.863 $\pm$ 0.974	4.784 $\pm$ 0.230	11.33 $\pm$ 2.969	17.56 $\pm$ 0.006	10.92 $\pm$ 0.472	11.908 $\pm$ 1.79	17.80 $\pm$ 1.480	19.95 $\pm$ 2.701	27.45 $\pm$ 1.155	33.931 $\pm$ 2.08	45.13 $\pm$ 10.69
Hexanal	214.1 $\pm$ 16.47	374.1 $\pm$ 10.08	514.6 $\pm$ 64.81	874.38 $\pm$ 23.9	300.9 $\pm$ 9.580	761.6 $\pm$ 23.00	566.6 $\pm$ 22.74	1044 $\pm$ 137.7	3564.3 $\pm$ 2.02	4615 $\pm$ 37.48	10480 $\pm$ 2322
(E)-2-Pentenal	18.38 $\pm$ 2.912	14.93 $\pm$ 0.514	18.44 $\pm$ 2.237	6.240 $\pm$ 0.281	7.370 $\pm$ 8.111	11.78 $\pm$ 10.27	13.42 $\pm$ 0.870	10.23 $\pm$ 1.384	30.81 $\pm$ 0.806	48.52 $\pm$ 2.441	137.6 $\pm$ 29.03
1-Penten-3-ol	920.2 $\pm$ 62.21	1055 $\pm$ 11.51	521.1 $\pm$ 54.10	99.10 $\pm$ 3.025	65.01 $\pm$ 6.682	117.5 $\pm$ 3.966	174.3 $\pm$ 13.52	192.7 $\pm$ 17.56	351.8 $\pm$ 10.48	446.9 $\pm$ 13.45	479.3 $\pm$ 117.8
2-Heptanone	9.940 $\pm$ 1.393	13.68 $\pm$ 1.859	14.77 $\pm$ 1.243	13.65 $\pm$ 0.093	11.59 $\pm$ 0.762	13.01 $\pm$ 1.056	9.020 $\pm$ 1.242	15.65 $\pm$ 1.844	38.17 $\pm$ 2.999	54.60 $\pm$ 1.133	158.2 $\pm$ 31.99
Heptanal	3.904 $\pm$ 0.303	5.058 $\pm$ 0.308	5.382 $\pm$ 0.769	7.880 $\pm$ 0.364	2.984 $\pm$ 0.304	12.51 $\pm$ 0.829	6.816 $\pm$ 0.531	9.843 $\pm$ 1.785	30.15 $\pm$ 1.655	35.91 $\pm$ 1.747	153.8 $\pm$ 35.08
2-Hexenal	0.311 $\pm$ 0.160	3.456 $\pm$ 0.212	1.494 $\pm$ 0.140	3.252 $\pm$ 0.239	1.224 $\pm$ 0.221	6.205 $\pm$ 0.054	4.454 $\pm$ 0.065	7.253 $\pm$ 0.736	24.25 $\pm$ 1.166	28.00 $\pm$ 0.177	90.15 $\pm$ 18.92
2-pentyl-Furan	10.62 $\pm$ 0.927	15.37 $\pm$ 0.477	13.04 $\pm$ 1.606	24.05 $\pm$ 0.581	8.401 $\pm$ 0.751	45.16 $\pm$ 0.182	34.87 $\pm$ 1.763	50.73 $\pm$ 5.169	115.8 $\pm$ 0.182	149.2 $\pm$ 1.432	956.9 $\pm$ 220.1
1-Pentanol	12.95 $\pm$ 5.305	15.55 $\pm$ 0.671	21.47 $\pm$ 3.617	86.42 $\pm$ 3.209	16.31 $\pm$ 1.817	60.88 $\pm$ 1.532	45.62 $\pm$ 3.708	82.84 $\pm$ 11.70	257.4 $\pm$ 4.285	316.299 $\pm$ 1.8	584.9 $\pm$ 126.2
3-Octanone	0.455 $\pm$ 0.117	1.105 $\pm$ 0.160	1.745 $\pm$ 0.257	2.884 $\pm$ 0.160	1.378 $\pm$ 0.135	3.866 $\pm$ 0.070	3.979 $\pm$ 0.123	4.913 $\pm$ 0.655	7.387 $\pm$ 1.030	9.107 $\pm$ 0.564	14.42 $\pm$ 3.582
Octanal	2.842 $\pm$ 1.458	2.126 $\pm$ 0.008	1.329 $\pm$ 0.778	2.812 $\pm$ 0.008	1.075 $\pm$ 0.048	4.391 $\pm$ 0.170	2.211 $\pm$ 0.086	2.778 $\pm$ 0.232	9.145 $\pm$ 2.952	13.58 $\pm$ 0.462	62.33 $\pm$ 15.18
1-octen-3-one	4909 $\pm$ 845.3	5182 $\pm$ 820.8	4148 $\pm$ 721.1	4252 $\pm$ 1115	2672 $\pm$ 598.8	5026 $\pm$ 258.1	4401 $\pm$ 93.53	3110 $\pm$ 511.9	5427 $\pm$ 96.33	3666 $\pm$ 1371	5091 $\pm$ 1692
(Z)-2-Penten-1-ol	0.697 $\pm$ 0.159	1.376 $\pm$ 0.321	1.646 $\pm$ 0.305	3.108 $\pm$ 0.063	1.741 $\pm$ 0.144	6.932 $\pm$ 0.023	6.854 $\pm$ 0.347	9.201 $\pm$ 1.544	18.37 $\pm$ 1.356	25.04 $\pm$ 0.008	46.60 $\pm$ 10.92
(E)-2-Heptenal	2.203 $\pm$ 0.381	5.696 $\pm$ 0.150	8.778 $\pm$ 1.443	17.43 $\pm$ 0.633	9.973 $\pm$ 1.120	23.05 $\pm$ 1.234	24.564 $\pm$ 1.41	28.322 $\pm$ 3.38	75.02 $\pm$ 2.101	102.5 $\pm$ 1.139	240.1 $\pm$ 50.48
6-methyl-5-Hepten-2-one	4.524 $\pm$ 0.347	5.653 $\pm$ 0.219	4.856 $\pm$ 0.897	8.211 $\pm$ 0.914	4.569 $\pm$ 0.521	14.32 $\pm$ 0.558	13.12 $\pm$ 0.809	17.65 $\pm$ 1.904	20.31 $\pm$ 1.968	18.74 $\pm$ 0.605	32.17 $\pm$ 7.549
1-Hexanol	11.36 $\pm$ 2.121	15.71 $\pm$ 0.099	21.26 $\pm$ 2.398	20.38 $\pm$ 0.618	12.99 $\pm$ 1.175	67.61 $\pm$ 2.195	37.23 $\pm$ 2.147	72.07 $\pm$ 9.528	74.72 $\pm$ 8.804	98.98 $\pm$ 1.400	250.1 $\pm$ 54.24
Nonanal	7.220 $\pm$ 3.133	7.500 $\pm$ 0.874	6.290 $\pm$ 1.254	6.340 $\pm$ 0.158	3.301 $\pm$ 0.404	11.55 $\pm$ 0.178	7.430 $\pm$ 0.886	6.920 $\pm$ 0.949	14.44 $\pm$ 0.709	17.40 $\pm$ 0.363	89.94 $\pm$ 19.81
(E)-2-Octenal	0.902 $\pm$ 0.059	1.623 $\pm$ 0.111	2.238 $\pm$ 0.068	6.845 $\pm$ 0.005	1.372 $\pm$ 0.094	5.844 $\pm$ 0.247	3.565 $\pm$ 0.044	7.889 $\pm$ 1.219	40.12 $\pm$ 3.189	71.12 $\pm$ 0.638	203.7 $\pm$ 44.77
1-Octen-3-ol	5.200 $\pm$ 0.118	8.920 $\pm$ 0.088	12.89 $\pm$ 1.345	22.20 $\pm$ 0.567	11.20 $\pm$ 1.240	40.17 $\pm$ 0.302	36.71 $\pm$ 2.451	55.45 $\pm$ 7.691	128.6 $\pm$ 6.827	191.2 $\pm$ 3.528	421.1 $\pm$ 95.41
(E,E)-2,4-Heptadienal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Benzaldehyde	13.281 $\pm$ 3.192	11.54 $\pm$ 0.430	11.203 $\pm$ 1.05	11.714 $\pm$ 0.16	7.476 $\pm$ 0.628	18.86 $\pm$ 0.304	14.51 $\pm$ 0.602	14.115 $\pm$ 2.29	23.29 $\pm$ 5.145	20.92 $\pm$ 0.569	49.33 $\pm$ 11.77
1-Octanol	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(E)-2-Decenal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(E,E)-2,4-Nonadienal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Hexanoic acid	14.169 $\pm$ 7.273	19.62 $\pm$ 0.994	27.23 $\pm$ 6.285	62.98 $\pm$ 12.06	12.10 $\pm$ 1.590	45.97 $\pm$ 4.067	33.12 $\pm$ 2.687	77.36 $\pm$ 15.47	357.95 $\pm$ 41.78	965.5 $\pm$ 66.42	2074 $\pm$ 579.4
Σ VOCs	6769 $\pm$ 823.25	6871 $\pm$ 172.9	5455 $\pm$ 1166	5704 $\pm$ 638.4	3489 $\pm$ 346.4	6444 $\pm$ 23.81	5651 $\pm$ 761.3	5058 $\pm$ 44.07	10940 $\pm$ 1471	11282 $\pm$ 5000	22320 $\pm$ 276.4
Alcohols	950.4 $\pm$ 69.68	1097 $\pm$ 10.71	578.3 $\pm$ 646.4	231.2 $\pm$ 7.360	107.2 $\pm$ 10.97	293.1 $\pm$ 7.410	300.7 $\pm$ 22.17	412.2 $\pm$ 48.04	830.9 $\pm$ 10.79	1078 $\pm$ 13.77	1782 $\pm$ 402.3
Aldehydes	265.0 $\pm$ 16.60	429.5 $\pm$ 9.590	583.4 $\pm$ 75.04	989.8 $\pm$ 29.61	348.8 $\pm$ 13.74	919.5 $\pm$ 71.19	665.3 $\pm$ 28.29	1183 $\pm$ 155.9	3990 $\pm$ 5.540	5244 $\pm$ 48.59	12038 $\pm$ 2657
Ketones	4929 $\pm$ 847.4	5208 $\pm$ 823.0	4181 $\pm$ 726.5	4295 $\pm$ 1116	2700 $\pm$ 599.5	5069 $\pm$ 261.49	4445 $\pm$ 89.88	3169 $\pm$ 519.1	5521 $\pm$ 89.17	3783 $\pm$ 1372	5341 $\pm$ 1722
Terpenes	10.62 $\pm$ 0.927	15.37 $\pm$ 0.477	13.04 $\pm$ 1.606	24.05 $\pm$ 0.581	8.401 $\pm$ 0.751	45.16 $\pm$ 0.182	34.87 $\pm$ 1.763	50.73 $\pm$ 5.169	115.8 $\pm$ 0.182	149.2 $\pm$ 1.432	956.9 $\pm$ 220.1
Furans	14.00 $\pm$ 7.300	20.00 $\pm$ 0.990	26.90 $\pm$ 6.300	63.01 $\pm$ 12.10	12.01 $\pm$ 1.600	46.00 $\pm$ 4.100	33.00 $\pm$ 2.700	77.00 $\pm$ 15.50	358.0 $\pm$ 41.80	966.0 $\pm$ 66.40	2075 $\pm$ 579.4
Esters	3.746 $\pm$ 0.521	3.131 $\pm$ 0.347	3.627 $\pm$ 0.770	8.574 $\pm$ 1.411	3.914 $\pm$ 1.383	45.14 $\pm$ 56.62	5.996 $\pm$ 1.169	9.573 $\pm$ 0.823	22.01 $\pm$ 0.961	36.79 $\pm$ 1.837	58.76 $\pm$ 13.38
Acid	573.7 $\pm$ 54.81	81.79 $\pm$ 1.920	52.55 $\pm$ 8.018	81.21 $\pm$ 0.084	298.5 $\pm$ 12.02	45.313 $\pm$ 1.15	151.3 $\pm$ 10.11	146.8 $\pm$ 14.72	95.77 $\pm$ 7.760	35.09 $\pm$ 0.770	73.86 $\pm$ 36.31

Values of volatile compounds expressed in μ g of internal standard per kg of sample. (n.d.) not detected.

Table S6. Oil volatile compounds (mean $\pm$ standard deviation; n=3) from Howard at 11 sampling times during 28 weeks of storage.

Cultivar	Howard										
Storage (weeks)	0	1	2	3	4	8	12	16	20	24	28
2-methylpropanal	1.711 $\pm$ 0.122	4.671 $\pm$ 0.035	12.30 $\pm$ 0.108	12.42 $\pm$ 0.964	38.88 $\pm$ 2.526	44.22 $\pm$ 2.400	62.85 $\pm$ 15.14	73.61 $\pm$ 4.588	148.1 $\pm$ 2.813	170.6 $\pm$ 0.903	173.5 $\pm$ 5.615
Ethyl Acetate	98.86 $\pm$ 7.834	43.11 $\pm$ 0.059	36.858 $\pm$ 0.09	27.23 $\pm$ 5.203	11.45 $\pm$ 0.025	79.74 $\pm$ 1.593	11.13 $\pm$ 0.203	9.342 $\pm$ 0.440	89.12 $\pm$ 2.032	2.225 $\pm$ 0.344	21.67 $\pm$ 2.686
Pentanal	11.74 $\pm$ 1.411	37.47 $\pm$ 0.728	102.9 $\pm$ 3.646	117.1 $\pm$ 0.014	402.2 $\pm$ 3.643	496.0 $\pm$ 3.759	681.4 $\pm$ 169.6	854.9 $\pm$ 20.91	1190 $\pm$ 0.545	1290 $\pm$ 19.98	1547 $\pm$ 17.85
3-Carene	13.06 $\pm$ 1.651	8.568 $\pm$ 0.736	8.425 $\pm$ 0.469	7.605 $\pm$ 0.650	9.618 $\pm$ 0.680	4.987 $\pm$ 0.029	9.063 $\pm$ 0.374	8.022 $\pm$ 1.269	4.149 $\pm$ 0.030	4.914 $\pm$ 0.509	4.628 $\pm$ 0.136
1-Penten-3-one	3.972 $\pm$ 0.054	8.430 $\pm$ 0.128	19.03 $\pm$ 0.884	17.83 $\pm$ 3.668	42.23 $\pm$ 0.824	53.71 $\pm$ 1.696	69.57 $\pm$ 16.87	81.46 $\pm$ 7.567	120.5 $\pm$ 9.733	153.8 $\pm$ 4.291	160.1 $\pm$ 7.129
Hexanal	334.5 $\pm$ 26.29	653.8 $\pm$ 20.21	1831 $\pm$ 28.58	2300 $\pm$ 324.2	7196 $\pm$ 159.3	9283 $\pm$ 80.46	13502 $\pm$ 3728	17948 $\pm$ 341.8	23155 $\pm$ 98.90	24873 $\pm$ 42.79	31777 $\pm$ 528.9
(E)-2-Pentenal	14.09 $\pm$ 3.080	9.090 $\pm$ 8.722	11.27 $\pm$ 0.391	13.96 $\pm$ 0.909	64.50 $\pm$ 15.74	82.85 $\pm$ 28.91	182.6 $\pm$ 72.44	251.0 $\pm$ 9.697	370.2 $\pm$ 13.74	414.6 $\pm$ 6.081	571.6 $\pm$ 25.63
1-Penten-3-ol	1097 $\pm$ 129.0	54.20 $\pm$ 1.206	125.3 $\pm$ 2.848	185.3 $\pm$ 16.15	566.8 $\pm$ 5.926	652.5 $\pm$ 10.46	876.6 $\pm$ 185.4	1105 $\pm$ 5.095	1301 $\pm$ 0.211	1559 $\pm$ 14.50	1886 $\pm$ 26.75
2-Heptanone	13.98 $\pm$ 0.950	7.120 $\pm$ 0.715	13.77 $\pm$ 0.238	13.87 $\pm$ 3.185	52.13 $\pm$ 1.680	112.2 $\pm$ 5.120	126.6 $\pm$ 46.38	170.1 $\pm$ 1.333	394.9 $\pm$ 0.906	471.0 $\pm$ 0.845	743.4 $\pm$ 8.990
Heptanal	9.283 $\pm$ 2.312	5.193 $\pm$ 0.218	11.64 $\pm$ 0.266	11.30 $\pm$ 2.456	50.43 $\pm$ 0.673	95.04 $\pm$ 0.153	141.3 $\pm$ 58.08	188.7 $\pm$ 0.031	351.4 $\pm$ 1.580	401.2 $\pm$ 1.238	613.4 $\pm$ 7.854
2-Hexenal	1.863 $\pm$ 0.241	2.285 $\pm$ 0.104	6.774 $\pm$ 0.145	7.755 $\pm$ 0.910	38.94 $\pm$ 2.004	47.65 $\pm$ 2.248	92.58 $\pm$ 33.69	120.9 $\pm$ 2.926	176.4 $\pm$ 1.427	200.3 $\pm$ 5.015	300.3 $\pm$ 3.928
2-pentyl-Furan	32.30 $\pm$ 3.204	16.31 $\pm$ 1.343	33.51 $\pm$ 0.437	32.88 $\pm$ 1.910	221.9 $\pm$ 3.436	386.2 $\pm$ 22.38	649.5 $\pm$ 253.9	943.6 $\pm$ 13.95	1235 $\pm$ 14.95	1693 $\pm$ 13.50	3023 $\pm$ 81.219
1-Pentanol	52.40 $\pm$ 5.714	41.45 $\pm$ 1.298	119.5 $\pm$ 0.773	192.1 $\pm$ 12.43	720.6 $\pm$ 0.555	869.9 $\pm$ 5.578	1304 $\pm$ 349.5	1701 $\pm$ 22.98	1850 $\pm$ 12.02	2024 $\pm$ 13.77	2460 $\pm$ 42.951
3-Octanone	2.854 $\pm$ 0.337	2.259 $\pm$ 0.081	3.890 $\pm$ 0.024	4.086 $\pm$ 0.688	14.01 $\pm$ 0.075	23.37 $\pm$ 1.016	23.23 $\pm$ 5.640	28.97 $\pm$ 0.490	60.62 $\pm$ 1.238	72.31 $\pm$ 1.984	95.47 $\pm$ 6.031
Octanal	4.142 $\pm$ 0.558	1.412 $\pm$ 0.329	2.825 $\pm$ 0.581	2.352 $\pm$ 0.365	15.25 $\pm$ 0.665	34.31 $\pm$ 0.441	42.71 $\pm$ 16.49	59.87 $\pm$ 2.211	148.7 $\pm$ 0.094	183.1 $\pm$ 4.216	263.0 $\pm$ 20.46
1-octen-3-one	3748 $\pm$ 479.3	3818 $\pm$ 883.8	3313 $\pm$ 848.5	4473 $\pm$ 1146	4816 $\pm$ 1105	2365 $\pm$ 3168	5942 $\pm$ 858.5	6574 $\pm$ 201.4	8171 $\pm$ 49.41	4289 $\pm$ 2425	3622 $\pm$ 5429
(Z)-2-Penten-1-ol	2.603 $\pm$ 0.256	2.120 $\pm$ 0.230	6.352 $\pm$ 0.946	9.393 $\pm$ 0.445	43.71 $\pm$ 0.911	58.19 $\pm$ 1.082	93.49 $\pm$ 31.58	120.9 $\pm$ 0.535	166.6 $\pm$ 1.466	198.6 $\pm$ 8.738	225.5 $\pm$ 20.41
(E)-2-Heptenal	4.497 $\pm$ 0.257	7.895 $\pm$ 0.107	22.66 $\pm$ 1.305	28.21 $\pm$ 0.641	143.6 $\pm$ 3.207	191.9 $\pm$ 6.871	342.4 $\pm$ 118.5	478.3 $\pm$ 6.708	713.6 $\pm$ 0.190	863.5 $\pm$ 12.89	1264 $\pm$ 41.31
6-methyl-5-Hepten-2-one	4.888 $\pm$ 0.928	4.185 $\pm$ 0.071	4.402 $\pm$ 0.351	5.414 $\pm$ 0.298	10.36 $\pm$ 0.088	13.57 $\pm$ 0.479	18.42 $\pm$ 0.681	23.05 $\pm$ 0.863	36.73 $\pm$ 0.459	32.52 $\pm$ 0.095	38.66 $\pm$ 8.022
1-Hexanol	100.6 $\pm$ 9.405	22.29 $\pm$ 0.365	29.649 $\pm$ 1.97	35.13 $\pm$ 1.759	93.50 $\pm$ 3.09	168.9 $\pm$ 11.42	285.0 $\pm$ 5.725	376.6 $\pm$ 10.43	273.2 $\pm$ 7.774	304.1 $\pm$ 0.964	659.7 $\pm$ 39.09
Nonanal	9.040 $\pm$ 2.480	4.470 $\pm$ 0.884	7.200 $\pm$ 0.467	5.140 $\pm$ 0.125	16.47 $\pm$ 2.185	31.72 $\pm$ 1.406	43.18 $\pm$ 15.93	59.63 $\pm$ 3.461	120.8 $\pm$ 1.763	140.7 $\pm$ 4.045	181.2 $\pm$ 31.77
(E)-2-Octenal	4.690 $\pm$ 0.700	2.727 $\pm$ 0.336	11.41 $\pm$ 0.447	14.93 $\pm$ 0.755	138.8 $\pm$ 3.605	203.6 $\pm$ 14.69	340.3 $\pm$ 118.1	482.67 $\pm$ 11.95	760.8 $\pm$ 2.605	936.2 $\pm$ 11.77	1391 $\pm$ 73.36
1-Octen-3-ol	14.27 $\pm$ 1.794	11.82 $\pm$ 0.151	31.16 $\pm$ 0.904	39.04 $\pm$ 1.057	223.5 $\pm$ 6.146	365.7 $\pm$ 22.66	534.8 $\pm$ 184.5	748.1 $\pm$ 16.236	1176 $\pm$ 10.39	1437 $\pm$ 15.66	2138 $\pm$ 101.4
(E,E)-2,4-Heptadienal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Benzaldehyde	13.97 $\pm$ 1.28	6.778 $\pm$ 0.422	9.145 $\pm$ 0.354	8.012 $\pm$ 0.336	17.541 $\pm$ 2.04	25.35 $\pm$ 2.049	36.76 $\pm$ 1.777	21.04 $\pm$ 1.639	57.81 $\pm$ 3.366	55.26 $\pm$ 0.767	62.68 $\pm$ 8.454
1-Octanol	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(E)-2-Decenal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
(E,E)-2,4-Nonadienal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Hexanoic acid	47.68 $\pm$ 3.425	28.04 $\pm$ 2.434	88.35 $\pm$ 2.035	147.0 $\pm$ 9.081	1303 $\pm$ 4.060	3123 $\pm$ 294.5	6019 $\pm$ 287.1	2092 $\pm$ 150.8	11621 $\pm$ 392.4	14786 $\pm$ 28.81	23182 $\pm$ 865.6
Σ VOCs	5643 $\pm$ 864.9	4804 $\pm$ 830.3	5864 $\pm$ 1487	7711 $\pm$ 910.5	16252 $\pm$ 2684	18815 $\pm$ 6232	31433 $\pm$ 97.67	34524 $\pm$ 185.9	53699 $\pm$ 5468	56559 $\pm$ 5131	76409 $\pm$ 0.110
Alcohols	1267 $\pm$ 146.1	131.9 $\pm$ 0.110	312.1 $\pm$ 1.750	461.0 $\pm$ 27.44	1648.1 $\pm$ 4.78	2115 $\pm$ 28.12	3094 $\pm$ 746.1	4053 $\pm$ 23.16	4768.7 $\pm$ 28.52	5523 $\pm$ 53.64	7371 $\pm$ 188.8
Aldehydes	395.6 $\pm$ 37.21	729.1 $\pm$ 13.30	2020 $\pm$ 22.41	2513 $\pm$ 318.8	8105 $\pm$ 192.2	10510 $\pm$ 140.4	15431 $\pm$ 4345	20518 $\pm$ 404.3	27137.2 $\pm$ 122.18	29474 $\pm$ 3.09	38082 $\pm$ 552.2
Ketones	3773 $\pm$ 477.2	3840 $\pm$ 883.2	3355 $\pm$ 847.8	4514 $\pm$ 1139	4934 $\pm$ 1108	2568 $\pm$ 3170	6180 $\pm$ 920.5	6878 $\pm$ 192.9	8784.23 $\pm$ 39.553	5018 $\pm$ 2426	4660 $\pm$ 5416
Terpenes	32.30 $\pm$ 3.204	16.31 $\pm$ 1.343	33.51 $\pm$ 0.437	32.88 $\pm$ 1.910	221.9 $\pm$ 3.436	386.2 $\pm$ 22.38	649.5 $\pm$ 253.9	943.6 $\pm$ 13.95	1235.69 $\pm$ 14.959	1693 $\pm$ 13.50	3023 $\pm$ 81.21
Furans	48.00 $\pm$ 3.400	28.00 $\pm$ 2.400	88.00 $\pm$ 2.00	147.0 $\pm$ 9.100	1303 $\pm$ 4.100	3124 $\pm$ 294.6	6020 $\pm$ 287.2	2093 $\pm$ 150.9	11622 $\pm$ 392.5	14787 $\pm$ 28.80	23182 $\pm$ 865.7
Esters	1.711 $\pm$ 0.122	4.671 $\pm$ 0.035	12.30 $\pm$ 0.108	12.42 $\pm$ 0.964	38.88 $\pm$ 2.526	44.22 $\pm$ 2.400	62.85 $\pm$ 15.14	73.61 $\pm$ 4.588	148.1 $\pm$ 2.813	170.6 $\pm$ 0.903	173.5 $\pm$ 5.615
Acid	98.86 $\pm$ 7.834	43.11 $\pm$ 0.059	36.858 $\pm$ 0.09	27.23 $\pm$ 5.203	11.45 $\pm$ 0.025	79.74 $\pm$ 1.593	11.13 $\pm$ 0.203	9.342 $\pm$ 0.440	89.12 $\pm$ 2.032	2.225 $\pm$ 0.344	21.67 $\pm$ 2.686

Values of volatile compounds expressed in μ g of internal standard per kg of sample. (n.d.) not detected.