

Supplementary Material

Predicting post-storage quality of 'Staccato' sweet cherries: A comprehensive study integrating soil properties, pre-harvest leaf and fruitlet nutrients, and at-harvest fruit nutrients and quality

Supplementary Table S1. Descriptive statistics of soil properties in the thirty studied Staccato sweet cherry orchards in Okanagan Valley, Canada.

Soil properties	Mean	Standard deviation	Median	Minimum	Maximum
pH	6.27	0.62	6.27	5.10	7.50
CEC (meq/100 g soil)	13.7	4.02	11.7	8.71	23.0
OM (%)	3.15	1.28	2.70	1.40	7.47
C (%)	2.05	0.98	1.74	0.94	5.10
N (%)	0.17	0.08	0.15	0.08	0.44
NO ₃ (ppm)	23.5	16.7	17.7	2.33	66.3
ENR (ppm)	43.6	13.0	39.0	26.0	87.7
P (ppm)	41.6	12.5	40.7	24.3	76.3
K (ppm)	265	103	268	122	607
Ca (ppm)	1783	759	1443	613	3277
Mg (ppm)	244	135	206	112	694
S (ppm)	15.6	7.60	12.7	7.04	33.3
Fe (ppm)	73.4	15.9	72.3	42.0	115.3
Mn (ppm)	35.9	12.9	34.0	16.7	55.0
Zn (ppm)	33.7	12.9	31.7	9.32	55.4
Cu (ppm)	5.25	4.47	3.90	0.57	17.5
B (ppm)	0.47	0.26	0.37	0.10	1.23
Na (ppm)	17.4	7.26	16.0	5.32	41.7
Al (ppm)	597	120	593	377	794

CEC: cation exchange capacity, OM: organic matter, ENR: estimated N release.

Supplementary Table S2. Descriptive statistics of leaf nutrient concentrations in the thirty studied Staccato sweet cherry orchards in Okanagan Valley, Canada.

Leaf properties	Mean	Standard deviation	Median	Minimum	Maximum
N (%)	2.67	0.38	2.69	1.83	3.61
P (%)	0.25	0.08	0.23	0.12	0.53
K (%)	2.25	0.43	2.29	1.10	3.19
Ca (%)	1.84	0.68	1.69	0.73	2.98
Mg (%)	0.54	0.26	0.47	0.20	1.74
Fe (ppm)	73.3	37.2	60.9	31.0	198
Mn (ppm)	75.0	71.0	57.5	21.0	421
Zn (ppm)	56.4	69.7	32.6	10.6	442
Cu (ppm)	8.18	1.97	7.92	2.37	14.4
B (ppm)	128.	64.9	115	52.8	360

Supplementary Table S3. Descriptive statistics of fruitlets collected four weeks before harvest including nutrient concentrations and dry matter in the thirty studied Staccato sweet cherry orchards in Okanagan Valley, Canada.

Fruitlet properties	Mean	Standard deviation	Median	Minimum	Maximum
DM (%)	16.8	2.05	16.7	13.1	23.8
N (mg/100 g FW)	171	49	170	56	292
P (mg/100 g FW)	22.3	3.67	22.3	12.8	31.8
K (mg/100 g FW)	219	27	214	143	288
Ca (mg/100 g FW)	15.3	3.83	15.0	9.30	24.6
Mg (mg/100 g FW)	11.1	1.58	11.1	6.62	14.8
Fe (mg/100 g FW)	0.24	0.06	0.25	0.13	0.36
Mn (mg/100 g FW)	0.09	0.03	0.09	0.04	0.22
Zn (mg/100 g FW)	0.14	0.08	0.12	0.06	0.58
Cu (mg/100 g FW)	0.08	0.02	0.08	0.03	0.12
B (mg/100 g FW)	0.69	0.28	0.62	0.33	1.38

DM: dry matter

Supplementary Table S4. Descriptive statistics of at-harvest fruit nutrient content, quality, and disorders in the thirty studied Staccato sweet cherry orchards in Okanagan Valley, Canada. Fruit color is not shown in this table due to its categorical nature.

At-harvest fruit properties	Mean	Standard deviation	Median	Minimum	Maximum
N (mg/100 g FW)	175	45	176	59	310
P (mg/100 g FW)	23.4	4.33	23.9	13.3	31.3
K (mg/100 g FW)	232	24.8	229	185	300
Ca (mg/100 g FW)	12.9	2.33	12.8	7.06	20.7
Mg (mg/100 g FW)	10.3	1.55	10.3	7.19	14.1
Fe (mg/100 g FW)	0.24	0.06	0.24	0.13	0.43
Mn (mg/100 g FW)	0.08	0.03	0.07	0.04	0.22
Zn (mg/100 g FW)	0.11	0.05	0.10	0.05	0.37
Cu (mg/100 g FW)	0.11	0.03	0.10	0.03	0.26
B (mg/100 g FW)	0.80	0.40	0.68	0.32	1.98
DM (%)	20.5	2.20	19.9	17.1	29.5
MW (g)	9.36	2.56	9.40	6.2	25.3
Firmness (g/mm ²)	448	68	450	282	590
SSC (%)	18.5	1.94	17.9	14.6	24.1
pH	3.73	0.17	3.74	2.89	4.03
TA (g/L)	1.29	0.27	1.23	0.88	1.91
Slip skin (%)	4.94	9.47	0	0	45.0
SB (%)	13.7	19.0	3.33	0	66.7
Pitting (%)	10.0	10.6	8.33	0	63.3
Pebbling (%)	4.38	6.87	1.67	0	38.3
Russet (%)	5.48	8.91	1.67	0	46.7

DM: dry matter, MW: mean cherry weight, SS: soluble solids content, TA: titratable acidity, SB: Stem browning.

Supplementary Table S5. The statistical variables of fruit post-storage properties measured in the study blocks. Fruit color is not shown in this table due to its categorical nature.

Fruit post-storage properties	Mean	Standard deviation	Median	Minimum	Maximum
DM (%)	22.8	4.64	21.8	14.8	34.1
MW (g)	9.74	1.96	10.0	5.30	16.2
Firmness (g/mm ²)	502	57.4	504	358	652
SSC (%)	18.2	1.78	17.9	15.0	24.2
pH	3.64	0.36	3.62	2.74	4.27
TA (g/L)	1.05	0.26	1.00	0.65	2.00
TA/SSC (g/L)	0.06	0.01	0.06	0.04	0.10
Slip skin (%)	9.88	15.2	3.33	0	63.3
SB (%)	46.0	26.1	45.0	2.00	96.7
Pitting (%)	24.8	18.6	20.0	3.00	91.7
Pebbling (%)	18.1	19.7	10.0	0	88.0
Russet (%)	5.47	7.05	3.00	0	30.0

DM: dry matter, MW: mean cherry weight, SS: soluble solids content, TA: titratable acidity, SB: Stem browning.