



Supplement of

A novel analytical approach for the simultaneous measurement of nitrate and dissolved organic carbon in soil water

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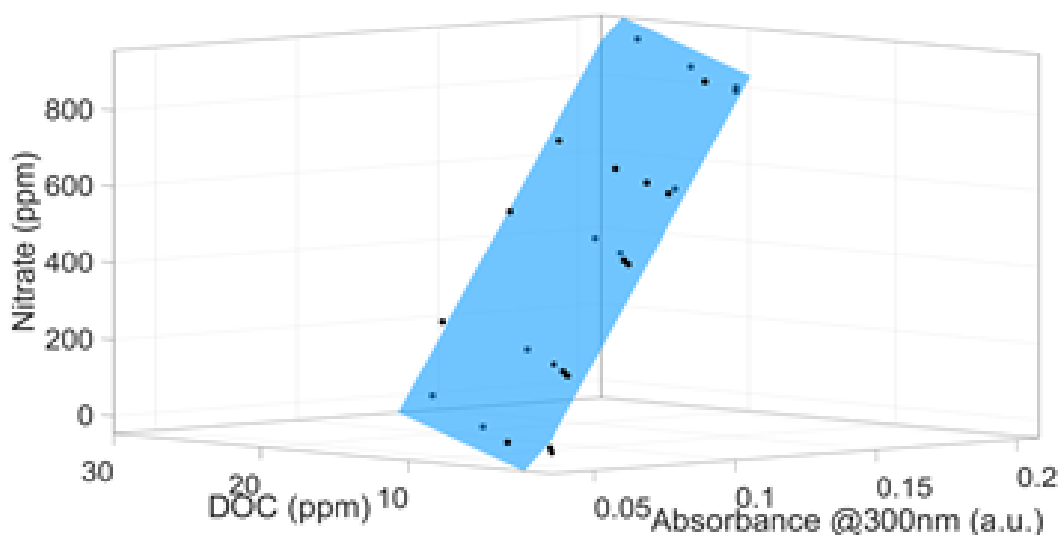
Section S1: Selected agricultural sites

The open crop field and citrus orchard sites are located next to the village of Nir Galim in Israel (34°41'13" E long; 31°49'42" N Lat). Over the past 10 years, the crop field has been used for rainfed winter cereal and summer watermelon cultivation, fertilized mainly with dairy slurry manure. In 2015, the field was converted to irrigated jojoba cultivation. The citrus orchard is irrigated during the summer, in addition to the rainfall during the winter. Further information on these sites may be found at Turkeltaub et al., (2014). The additional study sites were two greenhouses used for rotating vegetable crops. One site practiced an organic regime that is based on the application of organic compost as the main fertilizer, while the other applied conventional fertigation methods. A detailed description of the VMS at each site was previously presented in Dahan et al., (2014); Turkeltaub et al., (2014, 2015a, 2016). Additional samples were taken from an open field located next to Kibbutz Afek (32°50'14.7"N 35°07'28.6"E).

Section S2: Chemical and spectral analyses of porewater samples

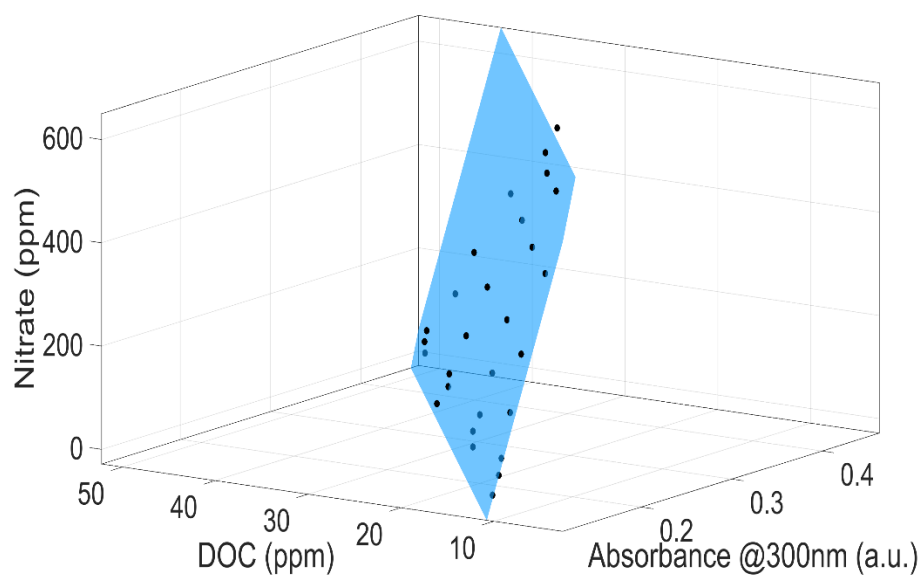
Open field, inland: Database was obtained by analyzing water samples extracted from the soil, and was then used to form the nitrate calibration equation.

Concentration (mg/L)			Concentration (mg/L)		
DOC	Nitrate	Absorption at 300 nm (a.u.)	DOC	Nitrate	Absorption at 300 nm (a.u.)
28.65	5.42	0.1409	3.58	0.68	0.0515
28.09	83.74±5	0.1415	3.51	79.1±5	0.056
27.29	195.64±12	0.1614	3.41	191.12±12	0.0768
26.78	266.74±16	0.1763	3.35	262.32±16	0.0948
26.05	368.56±22	0.2001	3.26	364.25±22	0.1158
14.33	2.71	0.0841	1.79	0.34	0.0427
14.04	81.09±5	0.0982	1.76	78.76±5	0.0483
13.64	193.06±12	0.1202	1.71	190.8±12	0.0694
13.39	264.21±16	0.1261	1.67	262±16	0.0837
13.02	366.1±22	0.151	1.63	363.94±22	0.1074
7.16	1.35	0.0552			
7.02	79.76±5	0.071			
6.82	191.77±12	0.0934			
6.69	262.95±16	0.102			
6.51	364.87±22	0.1219			



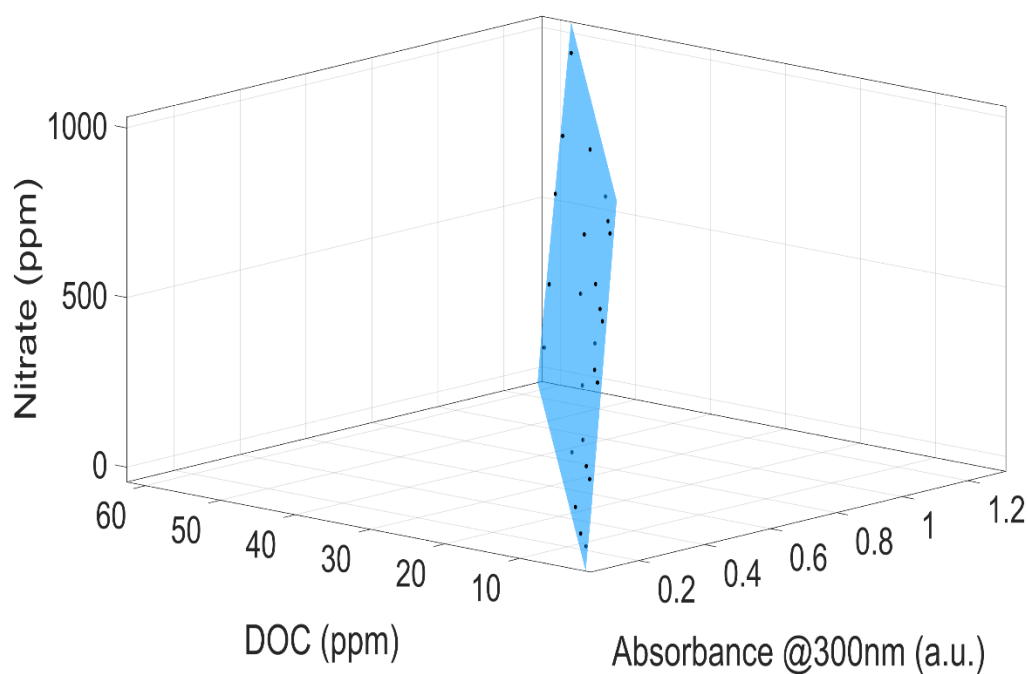
Organic greenhouse: Database was obtained by analyzing water samples extracted from the soil, and was then used to form the nitrate calibration equation.

Concentration (mg/L)			Concentration (mg/L)		
DOC	Nitrate	Absorption at 300 nm (a.u.)	DOC	Nitrate	Absorption at 300 nm (a.u.)
12.50	2.63	0.14	36.06	46.03±3	0.33
12.02	40.99±2	0.14	34.72	81.37±5	0.32
11.57	76.5±5	0.14	31.25	173.23±11	0.30
10.42	168.85±10	0.14	26.79	291.34±18	0.28
8.93	287.59±17	0.13	20.83	448.82±27	0.26
6.94	445.9±27	0.14	14.42	618.41±38	0.22
4.81	616.39±37	0.13	50±0.1	10.5±1	0.45
25.00	5.25	0.24	48.08±0.1	48.56±3	0.43
24.04	43.51±3	0.23	46.3±0.1	83.8±5	0.41
23.15	78.94±5	0.23	41.67	175.42±11	0.40
20.83	171.04±10	0.22	35.71	293.21±18	0.36
17.86	289.46±18	0.21	27.78	450.28±27	0.31
13.89	447.36±27	0.20	19.23	619.42±38	0.28
9.62	617.4±37	0.17			
37.50	7.88	0.33			



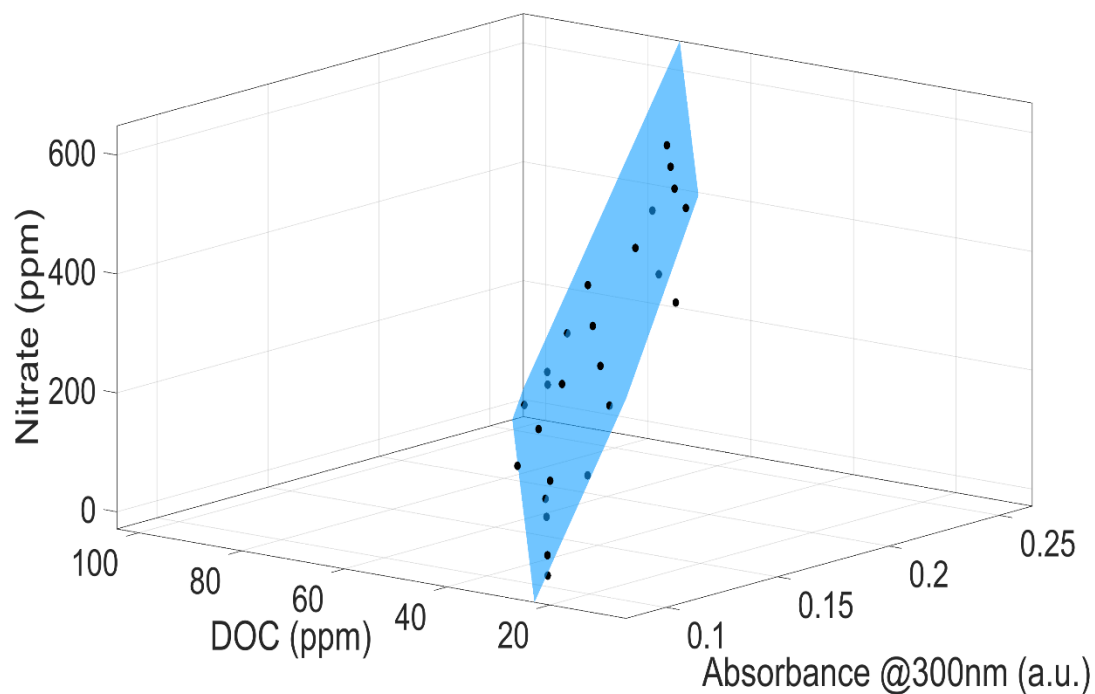
Open crop field, coastal: Database was obtained by analyzing water samples extracted from the soil, and was then used to form the nitrate calibration equation.

Concentration (mg/L)			Concentration (mg/L)		
DOC	Nitrate	Absorption at 300 nm (a.u.)	DOC	Nitrate	Absorption at 300 nm (a.u.)
59.7±0.1	81.7±5	1.26	7.46	10.21±1	0.18
58.5±0.1	276.18±17	1.25	7.32	206.09±13	0.20
56.9±0.1	554±34	1.23	7.11	485.92±30	0.22
55.8±0.1	730.56±44	1.23	6.97	663.75±40	0.23
54.3±0.1	983.36±60	1.22	6.78	918.38±56	0.25
29.9	40.85±2	0.66	3.73	5.11	0.11
29.3	236.13±14	0.68	3.66	201.08±12	0.12
28.4	515.1±31	0.66	3.55	481.05±29	0.14
27.9	692.38±42	0.66	3.49	658.98±40	0.16
27.1	946.23±57	0.66	3.39	913.73±55	0.18
14.9	20.43±1	0.34			
14.6	216.1±13	0.35			
14.2	495.64±30	0.38			
14.0	673.29±41	0.37			
13.6	927.66±56	0.40			



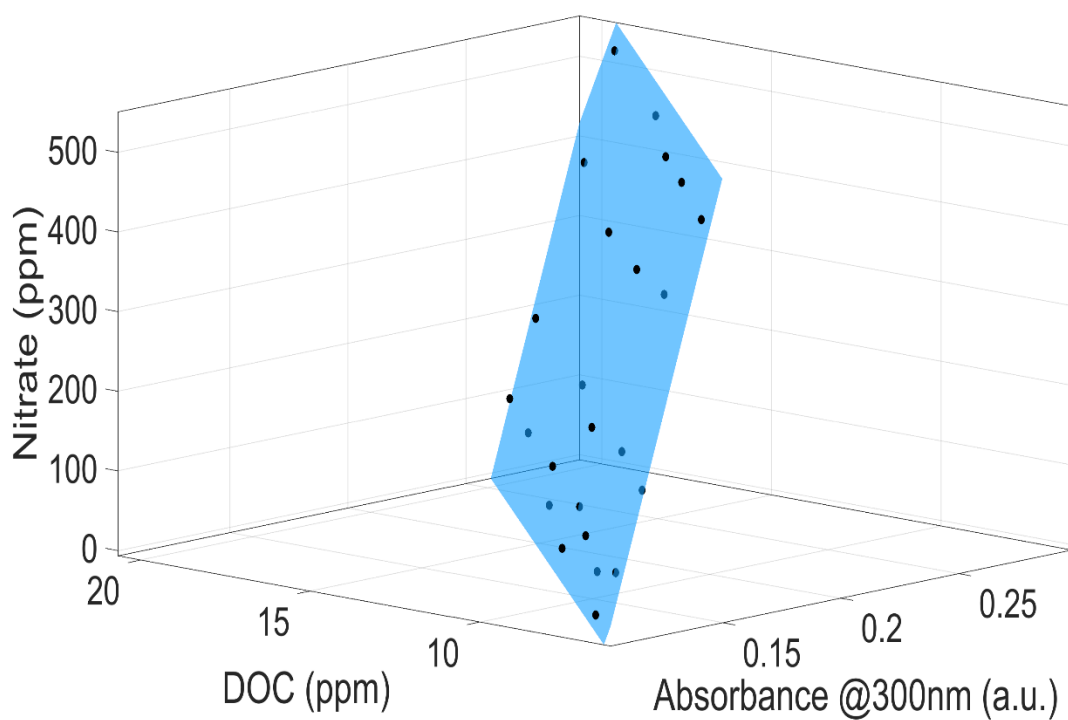
Citrus orchard: Database obtained by analyzing water samples extracted from the soil, and was then used to form the nitrate calibration equation.

Concentration (mg/L)			Concentration (mg/L)		
DOC	Nitrate	Absorption at 300 nm (a.u.)	DOC	Nitrate	Absorption at 300 nm (a.u.)
24.95	2.02	0.09	83.17±0.1	173.39±11	0.24
49.9±0.1	4.04	0.15	17.82	287.16±17	0.10
74.85±0.1	6.05	0.19	35.64	288.6±18	0.14
99.8±0.1	8.07	0.26	53.46±0.1	290.04±18	0.18
23.99	40.4±2	0.09	71.29±0.1	291.48±18	0.22
47.98±0.1	42.34±3	0.14	13.86	445.57±27	0.12
71.97±0.1	44.28±3	0.28	27.72	446.69±27	0.15
95.96±0.1	46.22±3	0.26	41.58	447.81±27	0.17
23.1	75.94±5	0.11	55.44±0.1	448.93±27	0.21
46.2±0.1	77.81±5	0.14	9.6	616.16±37	0.12
69.31±0.1	79.68±5	0.19	19.19	616.94±37	0.14
92.41±0.1	81.55±5	0.25	28.79	617.71±38	0.16
20.79	168.35±10	0.10	38.38	618.49±38	0.18
41.58	170.03±10	0.18			
62.38±0.1	171.71±10	0.19			



Humus and soil mixture extract: Database was obtained by analyzing water samples extracted from the soil, and was then used to form the nitrate calibration equation.

Concentration (mg/L)			Concentration (mg/L)		
DOC	Nitrate	Absorption at 300 nm (a.u.)	DOC	Nitrate	Absorption at 300 nm (a.u.)
7.2	18.53±1	0.1115	14.9	88.16±5	0.2039
7.1	68.19±4	0.1185	14.7	185.82±11	0.2137
7	166.04±10	0.1283	14.4	375.46±23	0.2205
6.8	493.84±30	0.1505	14.2	512.96±31	0.2375
10	25.74±2	0.1524	20	51.47±3	0.2669
9.9	75.36±5	0.1461	19.9	100.97±6	0.2577
9.8	173.14±11	0.16	19.7	198.49±12	0.2657
9.6	363.03±22	0.175	19.3	387.9±24	0.2805
9.5	500.7±30	0.181	19	525.21±32	0.2892
12	30.88±2	0.1663			
11.9	80.48±5	0.1722			
11.8	178.21±11	0.176			
11.6	368±22	0.1921			
11.4	505.6±31	0.2015			
15	38.6±2	0.2039			



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