



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 846



General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (105°C) material. Moisture is reported in the material as received.

Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation, the ISE samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This ISE sample 846 of Calcareous soil, from Spain, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2020	4	2
2017	2	2



Consensus Values ISE 846



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	28.1	1.17	4.2	35	28.0	0.730	0.246	0.878
As	mg/kg	9.59	1.48	15.4	28	9.59	0.767	0.348	3.63
Ba	mg/kg	202	19.5	9.6	33	201	12.0	4.24	2.10
Br	mg/kg	8.42	0.828	9.8	14	8.35	0.450	0.276	3.28
Ca	g/kg	101	3.73	3.7	38	101	2.10	0.756	0.749
Cd	mg/kg	0.136	0.019	13.8	12	0.138	0.012	0.007	4.99
Co	mg/kg	4.85	0.877	18.1	26	4.90	0.670	0.215	4.43
Cu	mg/kg	20.3	2.84	14.0	37	20.2	2.00	0.584	2.88
Fe	g/kg	12.4	0.611	4.9	41	12.5	0.322	0.119	0.959
Ga	mg/kg	7.97	1.62	20.3	22	8.00	1.00	0.432	5.41
K	mg/kg	9769	560	5.7	39	9800	310	112	1.15
Mg	mg/kg	4544	337	7.4	37	4575	175	69.3	1.53
Mn	mg/kg	238	24.7	10.4	41	234	14.0	4.82	2.03
Mo	mg/kg	0.405	0.059	14.6	11	0.422	0.055	0.022	5.50
Na	mg/kg	3429	237	6.9	30	3434	143	54.2	1.58
Ni	mg/kg	11.2	2.16	19.3	33	11.2	1.20	0.470	4.20
P	mg/kg	339	51.0	15.1	34	343	31.0	10.9	3.23
Pb	mg/kg	12.1	1.81	14.9	36	12.1	1.00	0.376	3.10
Rb	mg/kg	50.8	2.54	5.0	25	50.8	1.30	0.634	1.25
Si	g/kg	291	7.62	2.6	29	289	4.00	1.77	0.607
Sr	mg/kg	236	16.5	7.0	29	237	8.50	3.83	1.63
Y	mg/kg	17.7	2.05	11.6	19	17.7	1.03	0.588	3.31
Zn	mg/kg	28.6	3.54	12.4	37	29.0	2.30	0.727	2.54
Zr	mg/kg	302	23.3	7.7	20	306	15.5	6.52	2.16
C-elementary	g/kg	35.6	1.20	3.4	54	35.7	0.735	0.203	0.571
V	mg/kg	32.0	5.82	18.2	34	32.8	3.15	1.25	3.90
Ti	mg/kg	2928	195	6.7	36	2895	135	40.7	1.39
N - elementary	g/kg	0.469	0.114	24.3	86	0.470	0.070	0.015	3.28
Ce	mg/kg	45.9	5.87	12.8	19	45.0	3.00	1.68	3.66
La	mg/kg	22.0	2.52	11.4	18	21.9	1.40	0.742	3.37
Nb	mg/kg	8.71	1.30	14.9	14	8.80	0.500	0.434	4.98
Nd	mg/kg	18.6	1.73	9.3	12	18.6	0.700	0.623	3.36
Th	mg/kg	7.78	1.31	16.9	12	7.79	0.737	0.473	6.08
Hg	µg/kg	13.3	2.08	15.6	20	13.2	1.25	0.581	4.36



Consensus Values ISE 846



Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	8.24	0.929	11.3	39	8.29	0.586	0.186	2.26
Ba	mg/kg	80.5	6.67	8.3	24	81.0	3.17	1.70	2.11
Ca	g/kg	100.0	9.34	9.3	33	99.5	4.71	2.03	2.03
Co	mg/kg	3.85	0.372	9.7	39	3.83	0.198	0.074	1.94
Cr	mg/kg	12.1	2.51	20.7	46	12.0	1.15	0.462	3.82
Cu	mg/kg	18.5	2.21	12.0	54	18.6	1.50	0.377	2.04
Fe	g/kg	11.1	1.39	12.4	31	11.0	1.00	0.312	2.79
Mg	mg/kg	3863	345	8.9	32	3850	204	76.3	1.97
Mn	mg/kg	217	17.0	7.8	33	218	11.5	3.71	1.71
N	g/kg	0.473	0.101	21.4	55	0.475	0.060	0.017	3.61
Ni	mg/kg	9.14	0.917	10.0	44	9.11	0.558	0.173	1.89
P	mg/kg	297	30.4	10.3	36	297	16.7	6.34	2.14
Pb	mg/kg	8.80	1.53	17.4	45	8.89	0.910	0.286	3.24
S	mg/kg	213	19.4	9.1	25	214	9.00	4.85	2.28
Zn	mg/kg	25.3	3.01	11.9	50	25.4	1.95	0.532	2.11
V	mg/kg	13.9	3.13	22.5	27	13.7	2.22	0.754	5.41
Be	mg/kg	0.715	0.100	14.0	18	0.729	0.063	0.029	4.11

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	8.99	1.76	19.5	38	8.98	1.17	0.356	3.96
As	mg/kg	8.22	0.607	7.4	37	8.33	0.520	0.125	1.52
Ba	mg/kg	83.2	9.56	11.5	20	83.7	5.74	2.67	3.21
Be	mg/kg	0.769	0.125	16.2	11	0.800	0.091	0.047	6.11
Ca	g/kg	99.9	10.0	10.0	34	98.3	6.95	2.15	2.15
Cd	mg/kg	0.134	0.023	17.4	35	0.138	0.012	0.005	3.68
Co	mg/kg	3.85	0.466	12.1	42	3.90	0.285	0.090	2.33
Cr	mg/kg	12.3	2.19	17.8	50	12.4	1.23	0.387	3.15
Cu	mg/kg	18.6	2.00	10.8	52	18.6	1.42	0.347	1.87
Fe	g/kg	10.7	0.990	9.3	38	10.8	0.680	0.201	1.88
K	mg/kg	2418	519	21.5	36	2444	288	108	4.47
Li	mg/kg	12.4	1.95	15.7	10	12.4	1.05	0.773	6.22
Mg	mg/kg	3801	445	11.7	37	3801	305	91.5	2.41
Mn	mg/kg	215	18.3	8.5	44	216	12.8	3.45	1.60
Na	mg/kg	124	27.5	22.2	27	123	17.0	6.62	5.34
Ni	mg/kg	9.13	1.27	13.9	52	9.06	0.845	0.220	2.40
P	mg/kg	288	39.8	13.8	30	284	23.8	9.09	3.15



Consensus Values ISE 846



Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Pb	mg/kg	8.87	1.76	19.8	50	8.85	1.09	0.311	3.51
S	mg/kg	206	42.0	20.4	25	207	22.0	10.5	5.10
Sb	mg/kg	0.619	0.078	12.6	9	0.629	0.044	0.032	5.23
Sr	mg/kg	210	24.0	11.4	14	211	16.5	8.01	3.81
V	mg/kg	14.1	2.45	17.4	22	14.0	1.35	0.653	4.63
Zn	mg/kg	24.6	2.05	8.3	52	24.5	1.17	0.356	1.45

(cont.)

Method: Extraction with boiling 2M HNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.135	0.020	14.9	24	0.136	0.012	0.005	3.81
Co	mg/kg	3.03	0.338	11.2	24	3.01	0.245	0.086	2.85
Cr	mg/kg	5.89	0.688	11.7	25	5.87	0.485	0.172	2.92
Cu	mg/kg	17.1	1.25	7.3	28	17.3	0.800	0.295	1.72
Ni	mg/kg	6.91	0.997	14.4	28	6.99	0.729	0.235	3.40
Pb	mg/kg	6.84	1.32	19.3	28	6.75	0.858	0.313	4.57
Zn	mg/kg	17.8	2.17	12.2	27	17.9	1.38	0.523	2.95

Method: Extraction with 0.1M NaNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	µg/kg	49.2	5.86	11.9	8	48.0	2.45	2.59	5.26

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	mg/kg	51.4	4.19	8.2	15	51.6	1.90	1.35	2.63
Mg	mg/kg	47.1	7.64	16.2	13	45.8	4.60	2.65	5.62
N - NO ₃ (as N)	mg/kg	4.62	0.384	8.3	18	4.69	0.198	0.113	2.45
Na	mg/kg	8.53	0.573	6.7	10	8.56	0.320	0.226	2.66

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H ₂ O	...	8.50	0.338	4.0	192	8.47	0.230	0.030	0.359
pH - KCl	...	8.11	0.298	3.7	73	8.09	0.210	0.044	0.537
pH - CaCl ₂	...	7.85	0.162	2.1	62	7.82	0.110	0.026	0.328
Fraction < 2 µm	%	16.3	4.99	30.6	54	17.5	3.42	0.849	5.21
TIC=Tot.Inorg C(as CaCO ₃)	%	25.1	1.68	6.7	56	25.1	0.998	0.280	1.11
EC-SC (ISO 11265)	mS/m	12.7	2.67	21.0	75	12.6	1.73	0.385	3.03
Fraction < 63 µm	%	53.3	11.2	20.9	30	54.2	6.71	2.55	4.77



Consensus Values ISE 846



Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fraction > 63 µm	%	44.8	8.58	19.2	28	44.0	4.76	2.03	4.52
Org.matter (L.O.I.)	%	2.54	1.00	39.6	71	2.62	0.580	0.149	5.88
TC=Total C (org.+inorg.)	g/kg	35.7	1.26	3.5	70	35.5	0.815	0.188	0.526
TOC=Total Org. C	g/kg	5.08	1.32	26.0	74	5.04	0.815	0.192	3.78
C - org others (W&B a.o.)	g/kg	4.79	1.26	26.4	96	4.84	0.675	0.161	3.36

(cont.)

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	0.738	0.186	25.3	76	0.755	0.125	0.027	3.62

Method: Pot. CEC using 1M NH4-acetate at pH=7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	5.16	2.02	39.0	66	5.63	1.31	0.310	6.01
K	cmol+/kg	0.278	0.043	15.7	112	0.280	0.025	0.005	1.85
Mg	cmol+/kg	0.749	0.214	28.6	108	0.770	0.130	0.026	3.44
Ca	cmol+/kg	29.3	12.7	43.2	101	30.8	9.00	1.58	5.37

Method: Pot. CEC using 1M NH4Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
K	cmol+/kg	0.276	0.026	9.5	8	0.280	0.013	0.012	4.19
Ca	cmol+/kg	16.0	1.02	6.3	8	16.1	0.430	0.450	2.80

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	7.23	1.26	17.4	17	7.26	0.680	0.381	5.27
K	cmol+/kg	0.310	0.031	10.1	12	0.301	0.020	0.011	3.64
Ca	cmol+/kg	8.03	0.984	12.3	12	8.04	0.480	0.355	4.43
Mg	cmol+/kg	0.475	0.052	11.0	12	0.480	0.025	0.019	3.96

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	mg/kg	34476	5779	16.8	44	34681	3798	1089	3.16
Cu	mg/kg	4.56	0.817	17.9	40	4.61	0.666	0.162	3.54
Fe	mg/kg	31.6	6.95	22.0	40	31.6	3.88	1.37	4.35
K	mg/kg	110	14.2	12.9	44	112	10.1	2.68	2.43
Mg	mg/kg	270	37.1	13.7	44	270	28.0	7.00	2.59
Mn	mg/kg	28.1	4.62	16.4	41	28.3	3.26	0.902	3.21



Consensus Values ISE 846

Method: Mehlich-3									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Zn	mg/kg	1.10	0.301	27.3	33	1.15	0.160	0.065	5.95
Method: Extraction with 0.01M CaCl ₂ - 0.005M DTPA 1:10 (w/v)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	mg/kg	4.37	0.533	12.2	27	4.47	0.320	0.128	2.93
Method: Extraction with 1M KCl 1:10 (w/v)									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NO ₃ (as N)	mg/kg	5.05	0.786	15.5	25	5.12	0.520	0.196	3.89
Method: Phosphorus and related analysis									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Olsen (as P)	mg/kg	14.8	3.47	23.5	79	15.0	2.30	0.488	3.30
Al - Ox	mg/kg	294	30.5	10.4	9	299	18.4	12.7	4.33
P - Ox	mg/kg	130	13.3	10.3	9	133	5.40	5.55	4.28
P - AL (as P)	mg/kg	63.3	8.60	13.6	20	63.8	4.96	2.40	3.80
Method: UK Soil Methods									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	13.2	2.40	18.2	23	13.2	1.20	0.626	4.74
K - NH ₄ NO ₃ (1/5)	mg/l	110	14.1	12.8	25	109	8.15	3.52	3.21
Mg - NH ₄ NO ₃ (1/5)	mg/l	62.2	7.95	12.8	25	61.7	5.04	1.99	3.19
pH - H ₂ O (2/5)	...	8.52	0.167	2.0	25	8.50	0.120	0.042	0.489



Indicative Values ISE 846



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cr	mg/kg	24.0	8.47	35.3	32	25.0	4.28	1.87	7.81
I	mg/kg	4.39	0.292	6.7	5	4.30	0.100	0.163	3.72
Li	mg/kg	24.1	5.02	20.8	8	23.8	2.27	2.22	9.21
S	mg/kg	194	96.8	49.8	24	210	50.2	24.7	12.7
Sn	mg/kg	2.22	0.557	25.1	16	2.26	0.285	0.174	7.84
Sb	mg/kg	1.06	0.306	28.8	9	1.08	0.150	0.127	12.0
Be	mg/kg	1.09	0.255	23.4	7	1.10	0.180	0.120	11.1
Tl	mg/kg	0.339	0.025	7.3	5	0.340	0.014	0.014	4.06
Sc	mg/kg	8.83	6.99	79.1	8	9.15	4.00	3.09	35.0
U	mg/kg	2.14	0.255	11.9	7	2.09	0.110	0.120	5.63
Cs	mg/kg	3.66	0.541	14.8	7	3.80	0.300	0.255	6.97
W	mg/kg	2.27	0.985	43.5	4	3.00	0.155	0.616	27.2

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	9.48	4.06	42.8	22	8.93	2.58	1.08	11.4
B	mg/kg	10.5	7.97	75.8	14	11.8	3.85	2.66	25.3
Cd	mg/kg	0.141	0.040	28.3	31	0.147	0.021	0.009	6.35
K	mg/kg	2472	1340	54.2	31	2286	884	301	12.2
Li	mg/kg	12.3	0.412	3.3	4	12.3	0.243	0.257	2.09
Mo	mg/kg	0.298	0.129	43.4	17	0.340	0.080	0.039	13.2
Na	mg/kg	179	91.9	51.3	25	195	78.6	23.0	12.8
Se	mg/kg	0.986	1.34	135.8	9	1.59	1.48	0.558	56.6
Sn	mg/kg	0.889	0.487	54.8	9	1.03	0.430	0.203	22.8
Sr	mg/kg	215	44.5	20.7	7	207	25.0	21.0	9.78
Sb	mg/kg	0.601	0.168	28.1	10	0.619	0.089	0.067	11.1
Tl	mg/kg	0.169	0.024	14.1	4	0.164	0.012	0.015	8.84
Ti	mg/kg	78.8	12.5	15.8	4	76.9	6.13	7.81	9.91
Hg	µg/kg	11.4	5.15	45.1	9	13.6	3.10	2.15	18.8

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	9.22	4.25	46.2	14	9.07	2.07	1.42	15.4
Hg	µg/kg	23.2	32.7	141.1	10	29.2	18.7	12.9	55.8
Mo	mg/kg	0.327	0.129	39.6	21	0.332	0.082	0.035	10.8
Se	mg/kg	0.167	0.192	115.0	11	0.230	0.145	0.072	43.3
Sn	mg/kg	0.833	0.032	3.8	6	0.829	0.014	0.016	1.93



Indicative Values ISE 846



Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ti	mg/kg	97.2	39.2	40.3	14	94.0	26.1	13.1	13.5
Tl	mg/kg	0.080	0.039	48.4	7	0.080	0.020	0.018	22.9
U	mg/kg	0.872	0.144	16.5	4	0.871	0.099	0.090	10.3

(cont.)

Method: Extraction with boiling 2M HNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Hg	µg/kg	11.9	2.59	21.8	17	12.5	1.70	0.785	6.61
Tl	mg/kg	0.044	0.010	22.2	7	0.046	0.005	0.005	10.5

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	µg/kg	190	24.1	12.7	6	190	18.4	12.3	6.47
Cu	µg/kg	41.8	9.02	21.6	6	41.1	5.98	4.60	11.0
Mn	mg/kg	0.340	0.148	43.4	4	0.345	0.080	0.092	27.1
N - NH ₄ (as N)	mg/kg	1.14	0.423	37.0	16	1.21	0.305	0.132	11.6
P	mg/kg	0.166	0.082	49.5	10	0.180	0.045	0.032	19.6

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fraction < 16 µm	%	33.2	10.3	31.0	16	32.5	7.12	3.21	9.67
Active Lime (as CaCO ₃)	%	10.8	2.53	23.4	17	11.0	2.00	0.768	7.10

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B - Hot water	mg/kg	0.532	0.238	44.8	19	0.600	0.170	0.068	12.8
delta 13C	‰ V-PDB	-8.59	0.418	4.9	7	-8.47	0.470	0.198	2.30
delta 15N	‰ Air	6.04	2.10	34.7	5	5.83	1.33	1.17	19.4

Method: Fluoride (Swiss standard procedure)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	289	22.9	7.9	5	292	13.0	12.8	4.42

Method: Pot. CEC using 1M NH₄-acetate at pH=7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.065	0.039	60.3	81	0.070	0.023	0.005	8.38



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Method: Pot. CEC using 1M or 0.1M BaCl₂-TEA at pH=8.1 (ISO 13536 OR BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	7.50	2.23	29.7	6	7.65	1.40	1.14	15.1
K	cmol+/kg	0.353	0.171	48.6	4	0.354	0.132	0.107	30.4
Mg	cmol+/kg	0.547	0.063	11.4	4	0.545	0.029	0.039	7.15
Ca	cmol+/kg	13.4	4.45	33.2	4	13.5	2.18	2.78	20.7

Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.046	0.016	34.4	8	0.051	0.011	0.007	15.2
Mg	cmol+/kg	0.528	0.121	22.9	8	0.550	0.046	0.053	10.1

Method: Act. CEC using 0.1M BaCl₂ (UNEP-UN/EC 91065A)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	9.94	1.94	19.5	6	9.65	0.769	0.992	9.97
Na	cmol+/kg	0.043	0.013	29.3	6	0.043	0.006	0.006	15.0
K	cmol+/kg	0.300	0.029	9.6	6	0.299	0.024	0.015	4.92
Ca	cmol+/kg	9.03	1.26	14.0	6	8.78	0.648	0.645	7.15
Mg	cmol+/kg	0.489	0.059	12.1	6	0.475	0.024	0.030	6.16

Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Na	cmol+/kg	0.044	0.011	25.2	11	0.040	0.006	0.004	9.51

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	0.546	0.154	28.2	19	0.588	0.088	0.044	8.09
Na	mg/kg	19.0	7.40	38.9	29	19.5	4.49	1.72	9.02
P	mg/kg	3.27	3.49	106.7	32	4.11	2.54	0.771	23.6
Al	mg/kg	9.24	8.40	90.9	17	10.0	6.00	2.55	27.6

Method: Extraction with 0.01M CaCl₂ - 0.005M DTPA 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fe	mg/kg	8.92	3.22	36.1	26	9.16	1.88	0.789	8.85
Mn	mg/kg	7.44	2.05	27.5	26	7.80	1.29	0.502	6.75
Zn	mg/kg	0.589	0.212	35.9	27	0.580	0.140	0.051	8.64



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Method: Extraction with 1M KCl 1:10 (w/v)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NH ₄ (as N)	mg/kg	2.51	1.95	77.9	21	2.98	1.48	0.533	21.2

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	0.581	0.669	115.1	45	0.810	0.509	0.125	21.4
Fe - Ox	mg/kg	168	56.2	33.5	8	188	24.6	24.9	14.8
P - w (as P)	mg/l soil	2.85	2.56	89.8	9	2.90	1.54	1.07	37.4