



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 878

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.

Please note: Most WEPAL-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most determinand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) in clay soils (ISE).

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 878 of Sandy 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
2025	3	2
2025	1	4



Consensus Values ISE 878



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	17.8	0.639	3.6	33	17.9	0.347	0.139	0.780
As	mg/kg	9.66	1.15	11.9	29	9.90	0.600	0.266	2.75
Ba	mg/kg	109	13.3	12.3	29	109	8.30	3.10	2.85
Br	mg/kg	42.4	3.60	8.5	18	42.8	2.25	1.06	2.50
Ca	g/kg	159	9.00	5.6	34	159	5.20	1.93	1.21
Cr	mg/kg	32.7	4.45	13.6	35	32.6	2.30	0.940	2.88
Cu	mg/kg	12.8	2.80	21.9	32	12.9	1.90	0.618	4.84
Fe	g/kg	9.91	0.847	8.5	40	10.0	0.454	0.167	1.69
K	mg/kg	6826	710	10.4	40	6918	357	140	2.05
Mg	mg/kg	17180	1383	8.1	35	16954	958	292	1.70
Mn	mg/kg	241	26.6	11.0	38	236	17.9	5.40	2.24
Na	mg/kg	961	153	15.9	28	970	76.0	36.1	3.76
Ni	mg/kg	13.1	3.81	29.1	34	12.8	2.66	0.817	6.24
P	mg/kg	714	75.7	10.6	31	723	44.9	17.0	2.38
Rb	mg/kg	33.7	2.47	7.3	20	33.6	1.00	0.691	2.05
S	mg/kg	1549	394	25.4	33	1553	193	85.6	5.53
Si	g/kg	178	14.7	8.3	29	176	9.19	3.42	1.92
Sr	mg/kg	192	11.5	6.0	28	192	6.39	2.71	1.42
Y	mg/kg	9.07	1.69	18.6	15	9.35	0.945	0.544	6.00
Zn	mg/kg	39.3	5.47	13.9	38	39.0	3.53	1.11	2.82
Zr	mg/kg	66.4	10.9	16.4	21	65.1	7.95	2.96	4.46
C-elementary	g/kg	99.0	3.98	4.0	77	98.9	2.53	0.567	0.573
V	mg/kg	29.1	6.44	22.1	31	29.0	3.80	1.45	4.96
Ti	mg/kg	1098	125	11.4	29	1108	88.9	29.1	2.65
N - elementary	g/kg	3.23	0.250	7.8	111	3.23	0.150	0.030	0.920
U	mg/kg	2.11	0.334	15.9	11	2.10	0.170	0.126	5.98
Hg	µg/kg	46.4	5.26	11.3	32	46.5	3.27	1.16	2.51

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	9.27	0.720	7.8	35	9.30	0.440	0.152	1.64
Ba	mg/kg	47.1	5.98	12.7	20	47.8	3.56	1.67	3.55
Ca	g/kg	163	21.9	13.4	31	162	13.1	4.91	3.00
Cd	mg/kg	0.194	0.047	24.0	34	0.210	0.030	0.010	5.14
Co	mg/kg	2.83	0.404	14.3	31	2.89	0.265	0.091	3.21
Cr	mg/kg	24.7	3.68	14.9	43	24.9	2.49	0.702	2.85
Cu	mg/kg	11.7	1.74	14.9	49	11.7	1.21	0.311	2.66



Consensus Values ISE 878



Method: Acid extractable (So-called totals)

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fe	g/kg	9.20	0.707	7.7	28	9.01	0.497	0.167	1.82
K	mg/kg	2971	837	28.2	35	3042	627	177	5.95
Mg	mg/kg	16511	1731	10.5	32	16276	1162	383	2.32
Mn	mg/kg	216	26.7	12.3	34	214	18.5	5.72	2.64
Mo	mg/kg	1.47	0.268	18.3	24	1.54	0.150	0.068	4.66
N	g/kg	3.06	0.383	12.5	51	3.03	0.230	0.067	2.19
Na	mg/kg	507	78.8	15.5	27	507	54.2	19.0	3.74
Ni	mg/kg	11.0	1.57	14.3	39	11.1	1.10	0.313	2.86
P	mg/kg	669	96.2	14.4	46	662	67.3	17.7	2.65
Pb	mg/kg	19.5	6.37	32.6	44	19.8	4.47	1.20	6.15
S	mg/kg	1678	170	10.1	28	1670	107	40.1	2.39
Se	mg/kg	0.810	0.116	14.3	10	0.824	0.073	0.046	5.65
Sr	mg/kg	189	20.3	10.8	12	188	10.8	7.33	3.88
Zn	mg/kg	34.3	4.32	12.6	48	34.6	2.69	0.779	2.27
V	mg/kg	21.9	3.52	16.1	25	22.8	2.55	0.881	4.02
Hg	µg/kg	49.9	9.89	19.8	20	50.6	6.59	2.76	5.54

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	10.2	2.07	20.3	37	10.3	1.36	0.425	4.18
As	mg/kg	9.25	0.959	10.4	49	9.29	0.550	0.171	1.85
Ba	mg/kg	49.8	5.94	11.9	16	49.1	3.68	1.86	3.73
Be	mg/kg	0.489	0.076	15.6	13	0.485	0.050	0.026	5.39
Ca	g/kg	159	13.3	8.4	34	156	7.70	2.85	1.79
Cd	mg/kg	0.207	0.041	19.7	52	0.208	0.025	0.007	3.42
Co	mg/kg	2.94	0.449	15.2	40	3.00	0.260	0.089	3.01
Cr	mg/kg	24.6	3.48	14.1	62	24.6	1.97	0.552	2.24
Cu	mg/kg	12.4	1.86	15.0	61	12.3	1.34	0.297	2.40
Fe	g/kg	8.84	1.04	11.7	43	8.73	0.650	0.198	2.24
K	mg/kg	2921	640	21.9	37	2920	370	132	4.50
Mg	mg/kg	16596	1522	9.2	38	16720	869	309	1.86
Mn	mg/kg	215	29.3	13.6	48	217	19.0	5.29	2.46
Mo	mg/kg	1.52	0.207	13.6	33	1.53	0.150	0.045	2.96
Na	mg/kg	500	56.5	11.3	28	509	33.6	13.3	2.67
Ni	mg/kg	11.3	1.63	14.4	64	11.3	0.875	0.254	2.25
P	mg/kg	669	87.2	13.0	36	667	55.5	18.2	2.72
Pb	mg/kg	18.7	4.17	22.3	62	19.0	2.51	0.662	3.54



Consensus Values ISE 878



Method: Aqua Regia (ISO 11466)									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
S	mg/kg	1739	163	9.4	32	1724	113	36.0	2.07
Sb	mg/kg	0.322	0.044	13.7	11	0.329	0.030	0.017	5.17
Se	mg/kg	0.759	0.140	18.5	16	0.763	0.076	0.044	5.78
Sr	mg/kg	186	21.7	11.6	9	184	12.4	9.04	4.85
V	mg/kg	21.9	2.61	11.9	29	22.0	1.64	0.606	2.76
Zn	mg/kg	35.9	4.40	12.2	60	35.5	2.55	0.710	1.97

Method: Extraction with boiling 2M HNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.213	0.032	14.8	33	0.214	0.019	0.007	3.22
Co	mg/kg	2.37	0.293	12.4	33	2.39	0.210	0.064	2.69
Cr	mg/kg	11.8	1.99	16.8	38	12.0	1.35	0.403	3.41
Cu	mg/kg	10.8	1.51	13.9	38	10.8	0.815	0.306	2.83
Hg	µg/kg	46.2	7.39	16.0	29	47.3	5.37	1.72	3.71
Mo	mg/kg	0.305	0.071	23.2	29	0.300	0.035	0.016	5.37
Ni	mg/kg	6.37	1.03	16.2	37	6.39	0.470	0.212	3.32
Pb	mg/kg	20.8	4.19	20.1	38	20.8	2.89	0.849	4.09
Tl	mg/kg	0.063	0.007	10.7	11	0.060	0.004	0.003	4.03
Zn	mg/kg	32.0	4.40	13.8	38	32.0	2.95	0.893	2.79

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	µg/kg	463	68.7	14.9	9	470	42.0	28.6	6.19
Cu	µg/kg	80.1	8.09	10.1	10	80.1	4.70	3.20	3.99
K	mg/kg	223	14.0	6.3	16	222	7.38	4.37	1.96
Mg	mg/kg	356	15.4	4.3	13	351	11.5	5.35	1.50
Mn	mg/kg	1.12	0.114	10.2	9	1.10	0.100	0.048	4.27
N - NH ₄ (as N)	mg/kg	11.3	0.767	6.8	17	11.4	0.470	0.232	2.05
N - NO ₃ (as N)	mg/kg	22.8	1.19	5.2	17	22.7	0.594	0.360	1.58
Na	mg/kg	278	16.7	6.0	14	281	12.0	5.57	2.00

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH - H ₂ O	...	7.83	0.211	2.7	186	7.82	0.145	0.019	0.247
pH - KCl	...	7.66	0.186	2.4	90	7.66	0.125	0.025	0.321
pH - CaCl ₂	...	7.54	0.209	2.8	55	7.54	0.160	0.035	0.468
TIC=Tot.Inorg C(as CaCO ₃)	%	41.9	6.11	14.6	75	41.2	4.41	0.882	2.11

Method: Soil characteristics									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
EC-SC (ISO 11265)	mS/m	85.2	10.5	12.3	75	85.2	5.51	1.51	1.78
Fraction < 63 µm	%	41.9	7.01	16.7	39	41.1	4.44	1.40	3.35
Fraction > 63 µm	%	58.8	5.42	9.2	34	58.9	3.30	1.16	1.98
Org.matter (L.O.I.)	%	9.40	1.03	11.0	82	9.41	0.633	0.143	1.52
TC=Total C (org.+inorg.)	g/kg	97.4	5.11	5.2	86	97.0	2.61	0.689	0.707
TOC=Total Org. C	g/kg	45.4	6.28	13.8	104	45.8	3.55	0.770	1.70
C - org others (W&B a.o.)	g/kg	42.8	6.81	15.9	88	42.2	4.33	0.907	2.12

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Moisture-content	%	2.81	0.424	15.1	99	2.80	0.270	0.053	1.89
delta 13C	‰ V-PDB	-14.6	0.727	5.0	9	-14.4	0.240	0.303	2.07
delta 15N	‰ Air	4.36	0.264	6.0	9	4.42	0.142	0.110	2.52

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	17.7	5.22	29.5	57	18.6	3.08	0.864	4.88
Na	cmol+/kg	1.24	0.242	19.5	82	1.24	0.144	0.033	2.70
K	cmol+/kg	1.000	0.142	14.2	97	1.00	0.072	0.018	1.80
Mg	cmol+/kg	4.82	0.757	15.7	96	4.75	0.467	0.097	2.00
Ca	cmol+/kg	37.0	11.1	29.8	89	36.9	7.22	1.46	3.95

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	28.5	3.27	11.5	17	28.5	2.12	0.991	3.47
Na	cmol+/kg	1.34	0.158	11.7	14	1.36	0.101	0.053	3.92
K	cmol+/kg	0.916	0.109	11.9	16	0.905	0.063	0.034	3.73
Mg	cmol+/kg	4.64	0.552	11.9	18	4.58	0.388	0.163	3.51

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	2.18	0.489	22.4	26	2.18	0.225	0.120	5.49
Ca	mg/kg	19717	3207	16.3	37	19188	2368	659	3.34
Cu	mg/kg	2.06	0.518	25.1	39	2.14	0.250	0.104	5.02
Fe	mg/kg	263	66.2	25.2	46	263	47.1	12.2	4.64
K	mg/kg	405	41.7	10.3	40	401	25.9	8.25	2.03
Mg	mg/kg	801	66.7	8.3	39	796	41.3	13.4	1.67



Consensus Values ISE 878

Method: Mehlich-3									(cont.)
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mn	mg/kg	45.1	6.01	13.3	47	45.4	3.53	1.10	2.43
Na	mg/kg	304	53.3	17.6	29	305	31.9	12.4	4.07
P	mg/kg	60.7	12.4	20.5	54	60.1	7.44	2.12	3.49
Zn	mg/kg	10.4	1.68	16.2	47	10.1	1.10	0.306	2.96

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	1.38	0.278	20.2	30	1.41	0.154	0.064	4.60
Fe	mg/kg	85.6	20.9	24.4	33	81.5	11.1	4.54	5.31
Mn	mg/kg	15.3	2.66	17.3	30	15.7	1.90	0.606	3.95
Zn	mg/kg	6.93	1.08	15.6	31	6.98	0.630	0.243	3.50

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	16.1	3.41	21.2	25	15.9	1.50	0.853	5.29
N - NO ₃ (as N)	mg/kg	21.5	3.87	18.0	27	21.7	2.33	0.932	4.32

Method: Phosphorus and related analysis									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Olsen (as P)	mg/kg	50.3	9.38	18.6	63	51.8	6.75	1.48	2.94
P - AL (as P)	mg/kg	101	20.8	20.5	21	103	12.4	5.67	5.59

Method: UK Soil Methods									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P – NaHCO ₃ (1/20)	mg/l	54.1	6.87	12.7	24	53.7	4.50	1.75	3.24
K - NH ₄ NO ₃ (1/5)	mg/l	462	47.7	10.3	29	471	33.0	11.1	2.40
Mg - NH ₄ NO ₃ (1/5)	mg/l	479	70.6	14.7	27	493	51.0	17.0	3.54
pH - H ₂ O (2/5)	...	7.86	0.114	1.4	28	7.85	0.060	0.027	0.342

Method: PEP-Ammoniumacetate-EDTA extraction									
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AAE10-Ca	mg/kg	76731	11013	14.4	10	75257	6512	4353	5.67
AAE10-Mg	mg/kg	1589	103	6.5	10	1590	71.1	40.8	2.57
AAE10-K	mg/kg	409	39.4	9.6	10	409	29.5	15.6	3.81
AAE10-P	mg/kg	64.8	5.79	8.9	9	64.3	3.40	2.41	3.72



Consensus Values ISE 878

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pH-H ₂ O	...	7.61	0.066	0.9	11	7.60	0.070	0.025	0.329

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Schluff (silt)	%	19.5	0.596	3.1	8	19.6	0.290	0.263	1.35
C-org	%	3.64	0.273	7.5	9	3.73	0.154	0.114	3.13
Humus	%	6.28	0.374	6.0	8	6.42	0.140	0.165	2.63
TOC_400	%	3.35	0.219	6.5	8	3.36	0.135	0.097	2.89



Indicative Values ISE 878



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cd	mg/kg	0.185	0.071	38.5	13	0.190	0.054	0.025	13.4
Co	mg/kg	3.63	0.932	25.7	23	3.60	0.630	0.243	6.70
Ga	mg/kg	5.16	2.03	39.3	21	5.10	1.36	0.553	10.7
I	mg/kg	6.16	1.11	18.0	4	6.19	0.515	0.694	11.3
Mo	mg/kg	1.68	0.378	22.5	13	1.72	0.203	0.131	7.79
Pb	mg/kg	26.7	7.92	29.7	31	27.3	5.00	1.78	6.66
Sn	mg/kg	2.74	0.502	18.3	12	2.90	0.360	0.181	6.62
Sb	mg/kg	0.805	0.425	52.8	6	0.786	0.300	0.217	26.9
Be	mg/kg	0.836	0.132	15.8	4	0.845	0.075	0.082	9.86
Tl	mg/kg	0.565	0.448	79.3	8	0.450	0.215	0.198	35.0
Ce	mg/kg	25.8	7.78	30.1	15	27.2	5.80	2.51	9.72
La	mg/kg	12.3	4.97	40.5	16	12.4	3.37	1.55	12.7
Nb	mg/kg	3.76	0.938	24.9	12	3.96	0.569	0.338	9.00
Nd	mg/kg	11.0	5.77	52.2	11	10.9	3.10	2.17	19.7
Sc	mg/kg	2.51	2.47	98.4	8	3.72	1.06	1.09	43.5
Th	mg/kg	3.53	1.35	38.3	12	3.64	0.600	0.488	13.8
Cs	mg/kg	3.66	2.96	80.7	8	3.58	1.72	1.31	35.7
W	mg/kg	0.912	0.429	47.0	6	0.961	0.191	0.219	24.0
Yb	mg/kg	0.869	0.167	19.2	5	0.840	0.107	0.093	10.7
Sm	mg/kg	1.76	0.971	55.3	8	1.79	0.679	0.429	24.4
Dy	mg/kg	1.51	0.636	42.2	4	1.63	0.318	0.398	26.4

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	10.9	2.88	26.5	24	10.9	1.97	0.735	6.75
B	mg/kg	16.2	6.85	42.4	18	17.8	5.27	2.02	12.5
Li	mg/kg	10.4	4.20	40.3	10	10.2	2.66	1.66	15.9
Sn	mg/kg	1.41	0.319	22.7	11	1.39	0.220	0.120	8.54
Y	mg/kg	5.61	1.83	32.5	4	6.19	0.965	1.14	20.3
Sb	mg/kg	0.432	0.161	37.2	6	0.478	0.092	0.082	19.0
Be	mg/kg	0.503	0.098	19.4	13	0.516	0.032	0.034	6.72
Tl	mg/kg	0.181	0.053	29.1	7	0.170	0.038	0.025	13.7
Ti	mg/kg	81.4	35.0	43.1	9	96.3	23.1	14.6	17.9
Ce	mg/kg	15.9	0.873	5.5	4	15.7	0.460	0.546	3.44
La	mg/kg	7.78	1.02	13.1	4	7.77	0.460	0.636	8.16
U	mg/kg	1.48	0.075	5.1	5	1.50	0.050	0.042	2.83



Indicative Values ISE 878

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	83.1	49.1	59.0	6	79.5	25.5	25.0	30.1
B	mg/kg	16.3	4.94	30.3	13	17.3	2.63	1.71	10.5
Hg	µg/kg	53.6	16.1	30.1	25	56.7	10.3	4.03	7.52
Li	mg/kg	9.76	2.39	24.5	7	10.2	1.20	1.13	11.6
Rb	mg/kg	16.4	5.00	30.4	4	17.5	2.65	3.12	19.0
Sn	mg/kg	1.46	0.278	19.0	7	1.49	0.188	0.131	9.00
Ti	mg/kg	99.7	25.9	26.0	11	100	17.0	9.77	9.79
Tl	mg/kg	0.119	0.027	22.4	10	0.120	0.020	0.011	8.86
U	mg/kg	1.51	0.241	16.0	9	1.51	0.170	0.100	6.66
Y	mg/kg	4.88	0.310	6.4	4	4.95	0.165	0.194	3.97

Method: Extraction with 0.1M NaNO₃

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cu	µg/kg	81.2	16.5	20.3	11	83.1	10.4	6.21	7.65

Method: Extraction with 0.01M CaCl₂ 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P	mg/kg	1.02	0.331	32.3	15	1.07	0.180	0.107	10.4
SO ₄	mg/kg	754	387	51.4	8	771	285	171	22.7

Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Fraction < 2 µm	%	12.3	5.36	43.6	59	13.0	3.60	0.872	7.10
Fraction < 16 µm	%	27.0	8.65	32.0	23	27.0	6.92	2.25	8.34
Active Lime (as CaCO ₃)	%	8.13	2.70	33.2	13	8.17	1.34	0.936	11.5

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B - Hot water	mg/kg	1.67	0.804	48.2	23	1.74	0.583	0.210	12.6

Method: Fluoride (Swiss standard procedure)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
F - Total	mg/kg	310	27.8	9.0	6	310	25.3	14.2	4.58



Indicative Values ISE 878

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	33.3	2.47	7.4	4	33.2	1.15	1.54	4.63

Method: Act. CEC using 0.01M BaCl₂ (ISO 11260)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CEC	cmol+/kg	31.1	2.12	6.8	4	31.3	0.955	1.33	4.26
Na	cmol+/kg	1.21	0.156	12.9	5	1.21	0.095	0.087	7.23
K	cmol+/kg	1.02	0.192	18.8	5	1.05	0.129	0.107	10.5
Mg	cmol+/kg	4.92	0.767	15.6	5	4.70	0.498	0.429	8.72
Ca	cmol+/kg	32.7	7.96	24.3	4	32.7	4.42	4.97	15.2

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	26.1	6.61	25.3	18	26.2	3.40	1.95	7.46
Mn	cmol+/kg	0.009	0.002	25.2	4	0.010	0	0.001	15.7

Method: Mehlich-3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	39.2	13.7	34.9	24	40.2	8.40	3.49	8.90
Cd	mg/kg	0.068	0.011	15.8	4	0.068	0.007	0.007	9.85
Cr	mg/kg	0.247	0.105	42.4	4	0.255	0.056	0.065	26.5
Co	mg/kg	0.256	0.093	36.3	8	0.255	0.070	0.041	16.1

Method: Water soluble 1:10 (w/v) (EN-12457-4)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
N - NO ₃ (as N)	mg/kg	19.8	1.88	9.5	4	20.2	1.00	1.17	5.93

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
P - Bray (as P)	mg/kg	6.66	5.36	80.4	44	6.79	3.98	1.01	15.1
Al - Ox	mg/kg	875	141	16.2	5	841	83.6	79.1	9.04
Fe - Ox	mg/kg	1919	340	17.7	4	1928	205	212	11.1
K - AL (as K)	mg/kg	399	47.8	12.0	5	392	32.2	26.7	6.70

Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mn	mg/kg	132	43.8	33.1	5	138	26.0	24.5	18.5
Na	mg/kg	337	48.9	14.5	4	352	26.0	30.6	9.07

Indicative Values ISE 878

Method: Extraction with dilute nitric acid (0.43 Mol/l) ISO 17586

(cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	g/kg	104	54.8	52.8	4	110	24.7	34.3	33.0

Method: PEP-Water extraction

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
H2O10-Mg	mg/kg	108	3.50	3.2	7	107	1.87	1.66	1.53
H2O10-K	mg/kg	161	6.24	3.9	7	159	3.60	2.95	1.83
H2O10-P	mg/kg	2.67	0.479	18.0	7	2.57	0.230	0.226	8.49

Method: PEP-Test measurements

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
CO2-K	K-test	16.5	1.52	9.2	7	16.6	0.900	0.718	4.36
CO2-P	P-test	15.2	0.916	6.0	7	15.3	0.550	0.433	2.86
CC-Mg	Mg-test	39.5	2.88	7.3	7	38.8	1.59	1.36	3.45
CaCO3	%	41.2	2.13	5.2	7	41.5	1.50	1.00	2.44
pH-CC	...	7.33	0.110	1.5	4	7.33	0.050	0.069	0.941

Method: PEP-Physical parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ton (clay)	%	15.6	2.57	16.4	8	16.2	1.13	1.14	7.26
Sand	%	56.7	1.52	2.7	7	57.1	0.943	0.720	1.27
ROC_600	%	1.26	0.159	12.6	4	1.22	0.085	0.099	7.89
TIC_900B	%	6.13	0.487	7.9	4	5.98	0.258	0.304	4.96

Method: PEP-Cation Exchange Capacity

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ca	cmol+/kg	26.1	6.42	24.6	4	25.6	3.15	4.01	15.4
Mg	cmol+/kg	4.74	0.219	4.6	4	4.74	0.165	0.137	2.89
Na	cmol+/kg	1.11	0.239	21.6	4	1.12	0.108	0.149	13.5
K	cmol+/kg	0.961	0.280	29.2	4	0.965	0.128	0.175	18.2
H	cmol+/kg	0.801	0.412	51.5	4	0.835	0.194	0.258	32.2
KAK	cmol+/kg	33.5	6.73	20.1	4	33.0	3.25	4.21	12.6
S-Wert	cmol+/kg	32.7	6.13	18.7	4	32.4	3.49	3.83	11.7
BAS	%	97.3	0.570	0.6	4	97.4	0.300	0.356	0.366