



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Soil-Analytical Exchange

REFERENCE MATERIAL

ISE sample 871



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 mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (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 871 of Clay Soil uit de ringen (1990) from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 3 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
2023	4	4
2021	3	2
2017	4	3



Consensus Values ISE 871



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Al	g/kg	58.6	2.62	4.5	48	58.1	1.85	0.47	57.8	-	59.3
As	mg/kg	23.9	1.57	6.6	44	23.8	1.07	0.30	23.4	-	24.4
Ba	mg/kg	433	25.3	5.9	46	432	17.5	4.7	426	-	441
Br	mg/kg	7.19	0.812	11.3	22	7.05	0.555	0.216	6.83	-	7.55
Ca	g/kg	3.88	0.140	3.6	48	3.90	0.100	0.025	3.84	-	3.92
Cd	mg/kg	0.560	0.0663	11.8	19	0.580	0.0500	0.0190	0.528	-	0.592
Co	mg/kg	11.1	1.23	11.1	41	11.2	0.88	0.24	10.74	-	11.52
Cr	mg/kg	86.0	6.38	7.4	53	85.3	4.30	1.10	84.3	-	87.8
Cu	mg/kg	86.4	6.65	7.7	50	85.5	4.65	1.18	84.5	-	88.2
Fe	g/kg	30.0	0.85	2.8	55	30.0	0.60	0.14	29.79	-	30.25
Ga	mg/kg	14.5	1.76	12.1	30	14.2	1.17	0.40	13.9	-	15.2
K	mg/kg	17600	950	5.4	59	17600	670	150	17387	-	17880
Mg	mg/kg	5900	460	7.8	50	5850	319	81	5767	-	6028
Mn	mg/kg	495	33.1	6.7	54	497	23.4	5.6	486	-	504
Na	mg/kg	4810	274	5.7	44	4820	190	52	4729	-	4895
Ni	mg/kg	34.1	3.18	9.3	49	33.7	2.20	0.57	33.2	-	35.1
P	mg/kg	1290	107	8.3	48	1280	77	19	1258	-	1320
Pb	mg/kg	99.3	8.86	8.9	48	98.4	5.83	1.60	96.7	-	101.9
Rb	mg/kg	94.9	2.85	3.0	36	94.8	1.95	0.59	94.0	-	95.9
S	mg/kg	368	90.9	24.7	43	355	65.0	17.3	340	-	396
Si	g/kg	332	9.3	2.8	41	332	6.8	1.8	329.5	-	335.4
Sn	mg/kg	6.70	1.627	24.3	23	6.87	1.170	0.424	6.00	-	7.40
Sr	mg/kg	73.6	4.31	5.9	40	73.6	2.95	0.85	72.3	-	75.0
Y	mg/kg	24.0	0.90	3.7	33	23.6	0.64	0.20	23.66	-	24.30
Zn	mg/kg	127	7.4	5.8	55	126	5.1	1.2	124.8	-	128.8
Zr	mg/kg	192	12.9	6.7	30	191	8.9	2.9	187	-	197
C - elementary	g/kg	21.2	0.72	3.4	86	21.2	0.50	0.10	21.04	-	21.35
Sb	mg/kg	1.60	0.331	20.7	21	1.64	0.237	0.090	1.45	-	1.75
V	mg/kg	88.7	4.96	5.6	48	87.7	3.41	0.89	87.2	-	90.1
Ti	mg/kg	3660	185	5.1	48	3640	129	33	3611	-	3719
N - elementary	g/kg	2.24	0.116	5.2	143	2.22	0.080	0.012	2.22	-	2.26
Ce	mg/kg	63.3	5.27	8.3	30	62.7	3.60	1.20	61.4	-	65.3
La	mg/kg	31.1	3.06	9.9	28	31.4	2.05	0.72	29.9	-	32.3
Nb	mg/kg	13.7	1.11	8.1	24	13.8	0.77	0.28	13.2	-	14.2
Nd	mg/kg	27.5	1.71	6.2	21	27.0	1.19	0.47	26.7	-	28.3
Sc	mg/kg	10.3	1.12	10.9	17	10.5	0.79	0.34	9.69	-	10.8
Th	mg/kg	9.63	1.268	13.2	25	9.78	0.880	0.317	9.10	-	10.1



Consensus Values ISE 871



(cont.)

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Hg	µg/kg	515	45.4	8.8	40	517	32.3	9.0	501	-	530

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	mg/kg	22.0	1.79	8.2	62	21.7	1.27	0.28	21.5	-	22.4
Ba	mg/kg	200	17.1	8.6	37	200	11.6	3.5	194	-	206
Ca	g/kg	3.07	0.338	11.0	38	3.03	0.233	0.069	2.95	-	3.18
Cd	mg/kg	0.544	0.0443	8.1	64	0.547	0.0319	0.0069	0.533	-	0.555
Co	mg/kg	9.90	0.998	10.1	64	9.96	0.695	0.156	9.65	-	10.15
Cr	mg/kg	50.3	8.03	16.0	71	50.7	5.47	1.19	48.4	-	52.2
Cu	mg/kg	82.8	4.67	5.6	77	82.9	3.15	0.67	81.8	-	83.9
Fe	g/kg	27.7	3.02	10.9	41	27.3	2.10	0.59	26.7	-	28.6
Mg	mg/kg	4600	732	15.9	38	4610	498	148	4359	-	4840
Mn	mg/kg	466	35.6	7.6	46	467	24.0	6.6	456	-	477
Mo	mg/kg	0.850	0.1630	19.2	35	0.872	0.1117	0.0344	0.794	-	0.906
N	g/kg	2.14	0.171	8.0	79	2.12	0.120	0.024	2.10	-	2.18
Ni	mg/kg	30.2	2.19	7.2	72	30.2	1.46	0.32	29.7	-	30.8
P	mg/kg	1210	104	8.7	52	1190	73	18	1177	-	1235
Pb	mg/kg	90.6	8.11	9.0	70	91.2	5.52	1.21	88.6	-	92.5
S	mg/kg	379	38.3	10.1	34	378	26.7	8.2	366	-	392
Sn	mg/kg	4.30	0.889	20.7	35	4.19	0.623	0.188	3.99	-	4.60
Zn	mg/kg	118	10.2	8.6	75	119	7.1	1.5	116.1	-	120.9
V	mg/kg	54.5	9.12	16.7	42	55.4	6.36	1.76	51.7	-	57.4
Sb	mg/kg	1.05	0.173	16.4	28	1.08	0.122	0.041	0.988	-	1.12
Be	mg/kg	1.32	0.191	14.5	33	1.32	0.133	0.042	1.25	-	1.39
Hg	µg/kg	522	59.9	11.5	38	516	41.1	12.1	502	-	542

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Al	g/kg	25.5	3.58	14.1	55	25.5	2.49	0.60	24.5	-	26.4
As	mg/kg	21.8	1.52	7.0	55	21.5	1.04	0.26	21.4	-	22.2
Ba	mg/kg	209	19.5	9.3	23	212	13.2	5.1	200	-	217
Be	mg/kg	1.39	0.145	10.4	23	1.40	0.100	0.038	1.33	-	1.46
Ca	g/kg	3.03	0.219	7.2	56	3.03	0.155	0.037	2.97	-	3.09
Cd	mg/kg	0.551	0.0584	10.6	68	0.561	0.0405	0.0088	0.537	-	0.566
Co	mg/kg	9.89	0.719	7.3	55	9.95	0.490	0.121	9.69	-	10.08
Cr	mg/kg	49.4	4.75	9.6	75	49.2	3.20	0.69	48.3	-	50.5



Consensus Values ISE 871



Method: Aqua Regia (ISO 11466) (cont.)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cu	mg/kg	84.2	6.55	7.8	75	83.3	4.46	0.94	82.7	-	85.8
Fe	g/kg	27.4	1.72	6.3	61	27.2	1.23	0.28	27.0	-	27.9
Hg	µg/kg	532	56.2	10.6	36	528	42.4	11.7	513	-	551
K	mg/kg	4120	833	20.2	54	4030	606	142	3889	-	4344
Mg	mg/kg	4640	374	8.1	60	4630	261	60	4542	-	4736
Mn	mg/kg	469	24.1	5.1	60	471	17.1	3.9	463	-	475
Mo	mg/kg	0.867	0.1795	20.7	36	0.856	0.1250	0.0374	0.806	-	0.928
Na	mg/kg	120	28.1	23.4	45	121	19.2	5.2	112	-	129
Ni	mg/kg	30.0	2.54	8.5	73	30.1	1.79	0.37	29.4	-	30.6
P	mg/kg	1180	85	7.2	52	1170	57	15	1157	-	1205
Pb	mg/kg	91.4	8.20	9.0	77	91.5	5.52	1.17	89.5	-	93.3
S	mg/kg	375	21.5	5.7	39	375	14.0	4.3	369	-	382
Sb	mg/kg	0.971	0.2375	24.5	17	1.030	0.1590	0.0720	0.850	-	1.09
Sr	mg/kg	21.3	2.23	10.5	17	21.3	1.50	0.68	20.2	-	22.5
V	mg/kg	54.8	6.88	12.6	29	54.6	4.74	1.60	52.2	-	57.4
Zn	mg/kg	121	6.6	5.5	77	120	4.5	0.9	119.2	-	122.2

Method: Extraction with boiling 2M HNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cd	mg/kg	0.577	0.0523	9.1	42	0.585	0.0370	0.0101	0.561	-	0.593
Co	mg/kg	8.76	0.635	7.2	41	8.67	0.447	0.124	8.56	-	8.96
Cr	mg/kg	29.8	2.10	7.1	47	29.5	1.47	0.38	29.2	-	30.4
Cu	mg/kg	84.3	5.05	6.0	47	83.6	3.43	0.92	82.8	-	85.8
Hg	µg/kg	490	44.4	9.1	36	488	31.2	9.2	475	-	505
Mo	mg/kg	0.229	0.0522	22.9	23	0.242	0.0360	0.0136	0.206	-	0.251
Ni	mg/kg	22.2	2.06	9.2	47	22.0	1.45	0.37	21.6	-	22.8
Pb	mg/kg	95.8	9.63	10.1	46	95.8	6.60	1.77	92.9	-	98.6
Zn	mg/kg	103	6.8	6.6	47	102	4.7	1.2	100.6	-	104.6

Method: Extraction with 0.01M CaCl2 1:10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
K	mg/kg	121	4.7	3.9	19	120	3.5	1.4	118.4	-	122.9
N - NH4 (as N)	mg/kg	47.7	5.94	12.4	21	47.1	4.20	1.62	45.0	-	50.4
N - NO3 (as N)	mg/kg	14.1	1.27	9.0	22	13.9	0.92	0.34	13.5	-	14.7



Consensus Values ISE 871



Method: Soil characteristics

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
pH - H2O	...	5.16	0.160	3.1	272	5.17	0.110	0.012	5.14	- 5.18
pH - KCl	...	4.22	0.094	2.2	112	4.23	0.065	0.011	4.20	- 4.24
pH - CaCl2	...	4.68	0.102	2.2	85	4.68	0.070	0.014	4.65	- 4.70
Fraction < 2 µm	%	29.3	4.57	15.6	87	28.9	3.13	0.61	28.4	- 30.3
EC-SC (ISO 11265)	mS/m	15.0	1.83	12.2	117	15.0	1.28	0.21	14.62	- 15.29
Fraction < 63 µm	%	68.6	2.68	3.9	59	68.6	2.00	0.44	67.9	- 69.3
Fraction > 63 µm	%	31.3	1.74	5.6	53	31.3	1.24	0.30	30.8	- 31.8
Org.matter (L.O.I.)	%	5.94	0.589	9.9	105	5.86	0.420	0.072	5.82	- 6.05
Fraction < 16 µm	%	57.8	6.43	11.1	27	57.7	4.38	1.55	55.2	- 60.3
TC=Total C (org.+inorg.)	g/kg	21.1	1.02	4.9	111	21.0	0.70	0.12	20.89	- 21.27
TOC=Total Org. C	g/kg	19.9	1.39	7.0	131	20.0	0.99	0.15	19.70	- 20.18
C - org others (W&B a.o.)	g/kg	17.6	2.40	13.7	139	17.5	1.69	0.25	17.2	- 18.0

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Moisture-content	%	2.31	0.307	13.3	120	2.29	0.210	0.035	2.25	- 2.36

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
CEC	cmol+/kg	18.6	3.65	19.6	101	18.2	2.53	0.45	17.9	- 19.3
K	cmol+/kg	0.671	0.0910	13.6	156	0.670	0.0637	0.0091	0.656	- 0.685
Mg	cmol+/kg	1.28	0.151	11.8	150	1.30	0.103	0.015	1.26	- 1.31
Ca	cmol+/kg	10.8	1.34	12.3	147	10.9	0.94	0.14	10.60	- 11.04

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Na	cmol+/kg	0.111	0.0149	13.4	16	0.110	0.0100	0.0046	0.103	- 0.119
K	cmol+/kg	0.727	0.0490	6.7	17	0.720	0.0350	0.0149	0.702	- 0.752
Mg	cmol+/kg	1.37	0.084	6.1	17	1.35	0.059	0.025	1.33	- 1.41
Ca	cmol+/kg	11.5	0.95	8.2	17	11.4	0.68	0.29	11.0	- 12.0

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
CEC	cmol+/kg	15.1	1.09	7.2	27	15.2	0.75	0.26	14.7	- 15.5
Na	cmol+/kg	0.104	0.0078	7.5	19	0.106	0.0060	0.0022	0.100	- 0.108
K	cmol+/kg	0.761	0.0883	11.6	22	0.765	0.0616	0.0235	0.722	- 0.800
Ca	cmol+/kg	11.4	0.62	5.4	22	11.5	0.43	0.17	11.17	- 11.72



Consensus Values ISE 871



Method: Act. CEC using cobaltihexamine (AFNOR NFX 31 130)										(cont.)	
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Mg	cmol+/kg	1.42	0.089	6.3	22	1.43	0.062	0.024	1.38	-	1.46

Method: Mehlich-3											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Ca	mg/kg	2250	150	6.7	53	2250	104	26	2205	-	2287
Cu	mg/kg	16.3	2.75	16.8	53	16.3	1.89	0.47	15.6	-	17.1
Fe	mg/kg	565	56.5	10.0	55	561	40.0	9.5	549	-	580
K	mg/kg	269	16.1	6.0	55	269	11.2	2.7	265	-	273
Mg	mg/kg	170	12.4	7.3	54	171	8.4	2.1	166.2	-	173.0
Mn	mg/kg	92.9	8.07	8.7	55	92.6	5.60	1.36	90.8	-	95.1
Na	mg/kg	24.5	2.98	12.1	37	24.3	2.05	0.61	23.6	-	25.5
P	mg/kg	196	17.0	8.7	65	195	12.0	2.6	192	-	201
Zn	mg/kg	13.8	1.88	13.7	56	13.6	1.32	0.31	13.3	-	14.3
Al	mg/kg	1040	101	9.6	31	1030	66	23	1007	-	1081

Method: Extraction with 0.01M CaCl2 - 0.005M DTPA 1:10 (w/v)											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cu	mg/kg	30.3	5.51	18.2	52	30.8	3.83	0.96	28.7	-	31.8
Mn	mg/kg	74.1	7.40	10.0	53	74.4	5.29	1.27	72.1	-	76.1
Zn	mg/kg	10.6	2.45	23.1	51	10.8	1.70	0.43	9.92	-	11.3

Method: Extraction with 1M KCl 1:10 (w/v)											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
N - NH4 (as N)	mg/kg	83.1	8.29	10.0	33	83.4	5.51	1.80	80.1	-	86.0
N - NO3 (as N)	mg/kg	13.2	1.80	13.6	37	13.4	1.23	0.37	12.6	-	13.8

Method: Phosphorus and related analysis											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
P - Olsen (as P)	mg/kg	97.6	16.43	16.8	112	97.0	11.15	1.94	94.6	-	100.7
P - AL (as P)	mg/kg	190	10.7	5.6	27	190	7.5	2.6	186	-	194

Method: UK Soil Methods											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
P - NaHCO3 (1/20)	mg/l	99.2	13.71	13.8	36	97.9	9.46	2.86	94.5	-	104
K - NH4NO3 (1/5)	mg/l	272	20.7	7.6	39	274	14.0	4.1	265	-	279
Mg - NH4NO3 (1/5)	mg/l	164	15.8	9.7	39	164	10.8	3.2	159	-	169
pH - H2O (2/5)	...	5.18	0.121	2.3	40	5.18	0.080	0.024	5.14	-	5.22



Indicative Values ISE 871



Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Li	mg/kg	47.4	6.02	12.7	9	47.5	4.00	2.51	42.9	-	52.0
Mo	mg/kg	1.12	0.270	24.2	15	1.12	0.195	0.087	0.969	-	1.27
Be	mg/kg	1.83	0.215	11.7	13	1.85	0.150	0.075	1.70	-	1.96
Tl	mg/kg	0.702	0.2194	31.3	14	0.726	0.1500	0.0733	0.576	-	0.828
U	mg/kg	2.99	0.344	11.5	15	2.97	0.250	0.111	2.80	-	3.18
Cs	mg/kg	7.88	1.375	17.5	14	7.92	0.950	0.459	7.09	-	8.66
W	mg/kg	2.67	1.255	47.0	10	2.40	0.835	0.496	1.79	-	3.56

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Al	g/kg	29.2	7.91	27.1	33	29.1	5.38	1.72	26.4	-	32.0
K	mg/kg	4040	1629	40.3	39	4100	1180	326	3510	-	4570
Li	mg/kg	36.5	1.74	4.8	11	36.7	1.30	0.66	35.3	-	37.6
Na	mg/kg	156	70.1	44.8	30	154	48.5	16.0	130	-	182
Sr	mg/kg	22.4	7.15	31.9	8	21.7	4.65	3.16	16.6	-	28.3
Ag	mg/kg	0.163	0.0190	11.7	8	0.173	0.0152	0.0084	0.147	-	0.178

Method: Aqua Regia (ISO 11466)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
B	mg/kg	16.4	5.62	34.3	25	17.4	3.72	1.41	14.1	-	18.7
Li	mg/kg	35.2	8.43	24.0	14	35.6	5.85	2.82	30.3	-	40.0
Se	mg/kg	0.485	0.1258	26.0	14	0.514	0.0900	0.0420	0.413	-	0.557
Sn	mg/kg	4.33	0.470	10.9	14	4.38	0.315	0.157	4.06	-	4.60
Ti	mg/kg	242	66.6	27.5	17	247	48.0	20.2	208	-	277
Tl	mg/kg	0.366	0.0549	15.0	12	0.352	0.0370	0.0198	0.332	-	0.401
U	mg/kg	1.29	0.114	8.8	10	1.31	0.080	0.045	1.21	-	1.37

Method: Extraction with boiling 2M HNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Tl	mg/kg	0.0873	0.0086	9.8	12	0.0855	0.0060	0.0031	0.0819	-	0.0926

Method: Extraction with 0.1M NaNO3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cd	µg/kg	29.0	2.66	9.2	14	28.9	1.91	0.89	27.5	-	30.5
Cu	µg/kg	645	40.1	6.2	14	635	27.9	13.4	622	-	668
Ni	µg/kg	402	35.7	8.9	14	401	26.2	11.9	382	-	423
Pb	µg/kg	42.8	3.55	8.3	12	42.9	2.25	1.28	40.6	-	45.0



Indicative Values ISE 871



Method: Extraction with 0.1M NaNO3										(cont.)	
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Zn	µg/kg	1810	165	9.2	14	1770	117	55	1710	-	1900

Method: Extraction with 0.01M CaCl2 1:10											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cu	µg/kg	1110	44	4.0	8	1100	32	20	1070	-	1143
Fe	mg/kg	3.29	1.281	38.9	9	3.60	0.880	0.534	2.33	-	4.26
Mg	mg/kg	116	10.2	8.8	14	116	6.6	3.4	110	-	122
Mn	mg/kg	47.4	0.84	1.8	8	47.6	0.65	0.37	46.7	-	48.0
Na	mg/kg	21.5	1.41	6.5	14	21.6	0.99	0.47	20.7	-	22.3
P	mg/kg	1.95	0.234	12.0	15	1.96	0.161	0.076	1.82	-	2.08
Zn	µg/kg	4400	231	5.3	9	4370	170	96	4225	-	4574

Method: Other determinations											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
B - Hot water	mg/kg	0.478	0.1581	33.1	29	0.500	0.1100	0.0367	0.418	-	0.538
delta 13C	‰ V-PDB	-26.8	0.17	0.6	9	-26.8	0.11	0.07	-26.98	-	-26.72
delta 15N	‰ Air	6.07	0.181	3.0	9	6.07	0.120	0.075	5.93	-	6.21

Method: Fluoride (Swiss standard procedure)											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
F - Total	mg/kg	476	110.8	23.3	9	450	76.0	46.2	393	-	560

Method: Pot. CEC using 1M NH4-acetate at pH=7											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Na	cmol+/kg	0.108	0.0298	27.7	124	0.110	0.0200	0.0033	0.102	-	0.113

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	95 % confidence limits		
CEC	cmol+/kg	26.7	1.66	6.2	8	26.6	1.20	0.73	25.4	-	28.1

Method: Pot. CEC using 1M NH4Cl (BZE)											
Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
CEC	cmol+/kg	15.4	0.93	6.1	8	15.3	0.60	0.41	14.6	-	16.1
Al	cmol+/kg	0.656	0.2332	35.6	12	0.705	0.1585	0.0842	0.509	-	0.803
Mn	cmol+/kg	0.340	0.0309	9.1	13	0.331	0.0220	0.0107	0.322	-	0.359
Fe	cmol+/kg	0.0375	0.0126	33.6	11	0.0370	0.0080	0.0048	0.0292	-	0.0459



Indicative Values ISE 871

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Al	cmol+/kg	0.490	0.0943	19.3	10	0.496	0.0600	0.0373	0.423	-	0.556
Fe	cmol+/kg	0.0330	0.0148	44.9	8	0.0317	0.0108	0.0065	0.0209	-	0.0450
Mn	cmol+/kg	0.263	0.0208	7.9	8	0.259	0.0145	0.0092	0.246	-	0.280

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Fe	mg/kg	383	113.7	29.7	51	376	75.3	19.9	351	-	415

Method: Phosphorus and related analysis

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
P - Bray (as P)	mg/kg	127	56.4	44.3	83	123	38.7	7.7	115	-	140
Al - Ox	mg/kg	1470	163	11.0	10	1500	122	64	1360	-	1590
Fe - Ox	mg/kg	7670	687	9.0	10	7670	488	271	7180	-	8150
P - Ox	mg/kg	917	50.4	5.5	10	920	34.5	19.9	882	-	953
P - w (as P)	mg/l soil	24.9	4.07	16.4	9	26.1	2.85	1.70	21.8	-	27.9



Informative Values ISE 871



Method: Real totals

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
B	mg/kg	43.1	8.59	3		
F	mg/kg	888	95.0	3		
I	mg/kg	3.22	0.720	5		
Se	mg/kg	1.08	0.350	6	3.00	7
Ag	mg/kg	-	-	0	2.00	5
Bi	mg/kg	0.550	0.2600	6	3.000	7
Ge	mg/kg	1.07	0.315	4	3.00	5

Method: Acid extractable (So-called totals)

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
B	mg/kg	16.6	7.00	20		
Se	mg/kg	0.530	0.3000	19	2.000	15
Y	mg/kg	12.4	0.85	4		
Zr	mg/kg	10.9	3.00	4		
Tl	mg/kg	0.447	0.0830	7	1.000	13
Ti	mg/kg	200	104.0	12		
Ce	mg/kg	39.6	2.00	3		
La	mg/kg	18.0	1.42	5		
Sc	mg/kg	5.33	0.410	3		
Te	mg/kg	-	-	0	2.00	14

Method: Aqua Regia (ISO 11466)

Element	Unit	Median	MAD	N
Ag	µg/kg	164	6.7	6
Bi	mg/kg	0.310	0.0080	6
Ce	mg/kg	40.6	0.80	3
La	mg/kg	18.5	1.20	5
Nd	mg/kg	19.4	1.00	3
Th	mg/kg	2.93	0.260	4

Method: Extraction with 0.01M CaCl2 1:10

Element	Unit	Median	MAD	N
B	µg/kg	104	19.2	6
Co	µg/kg	350	8.7	5



Informative Values ISE 871



Method: Extraction with 0.01M CaCl₂ 1:10 (cont.)

Element	Unit	Median	MAD	N
N total soluble	mg/kg	88.2	2.40	5
SO ₄	mg/kg	118	17.2	6

Method: Soil characteristics

Element	Unit	Median	MAD	N
TIC=Tot.Inorg C(as CaCO ₃)	%	0.480	0.3911	40
Active Lime (as CaCO ₃)	%	0.245	0.0800	4

Results smaller than (<)

Median of <	N
0.500	26

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

Element	Unit	Median	MAD	N
Al	cmol+/kg	0.0765	0.0480	6

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

Element	Unit	Median	MAD	N
Na	cmol+/kg	0.150	0.0280	5
K	cmol+/kg	0.688	0.1220	5
Mg	cmol+/kg	1.07	0.120	5
Ca	cmol+/kg	10.4	1.10	5

Method: Pot. CEC using 1M NH₄Cl (BZE)

Element	Unit	Median	MAD	N
H	cmol+/kg	0.0650	0.0210	5

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

Element	Unit	Median	MAD	N
CEC	cmol+/kg	15.1	1.85	6
Na	cmol+/kg	0.120	0.0200	5
K	cmol+/kg	0.920	0.0400	5
Mg	cmol+/kg	1.40	0.100	5
Ca	cmol+/kg	14.0	1.83	5
Al	cmol+/kg	0.765	0.0550	3

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

Element	Unit	Median	MAD	N
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Informative Values ISE 871



CEC cmol+/kg 14.6 0.92 5

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

Element	Unit	Median	MAD	N
Na	cmol+/kg	0.108	0.0113	6
K	cmol+/kg	0.649	0.0467	7
Ca	cmol+/kg	11.6	0.53	7
Mg	cmol+/kg	1.42	0.022	7
Al	cmol+/kg	0.404	0.0391	6
Fe	cmol+/kg	0.0506	0.0027	5
Mn	cmol+/kg	0.300	0.0093	6

(cont.)

Method: Mehlich-3

Element	Unit	Median	MAD	N
B	mg/kg	0.230	0.0920	24
As	mg/kg	0.591	0.2150	3
Cd	mg/kg	0.285	0.1220	4
Cr	mg/kg	0.717	0.2250	4
Pb	mg/kg	4.05	1.005	5
Co	mg/kg	1.03	0.081	3

Results smaller than (<)

Median of <	N
0.750	8

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

Element	Unit	Median	MAD	N
N - NO ₃ (as N)	mg/kg	14.7	1.55	5

Method: Water soluble 1:10 (w/v) (Neth standard VPR C85-06)

Element	Unit	Median	MAD	N
SO ₄	mg/kg	73.1	29.97	5

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

Element	Unit	Median	MAD	N
K	mg/kg	300	23.1	3
Mg	mg/kg	229	20.7	3
P	mg/kg	356	71.1	3
Ca	g/kg	2.51	0.131	3