WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Manure and Refuse Sample Exchange Program

REFERENCE MATERIAL

MARSEP sample 292

WAGENINGEN
UNIVERSITY & RESEARCH

marsep

Certificate of Analysis MARSEP 292

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-NH_4 (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 MARSEP samples are dried at 40°C and milled to pass a 0.5 mm sieve.

This MARSEP sample 292 of Compost, from Switzerland, is prepared for the WEPAL proficiency programs. The sample has been used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table:

Year	Round	Number
2025	3	3

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Consensus Values MARSEP 292

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	6.61	0.911	13.8	12	6.63	0.550	0.329	4.97
Ca	g/kg	47.9	3.55	7.4	25	47.5	1.96	0.887	1.85
Cd	mg/kg	0.315	0.040	12.6	22	0.319	0.022	0.011	3.36
Co	mg/kg	5.37	0.748	13.9	19	5.46	0.477	0.215	3.99
Cr	mg/kg	54.7	11.3	20.7	24	54.2	8.47	2.90	5.29
Cu	mg/kg	42.1	3.76	8.9	28	41.9	2.78	0.888	2.11
Fe	g/kg	13.1	1.35	10.3	19	12.8	0.840	0.386	2.95
Hg	µg/kg	87.5	16.6	19.0	22	86.4	8.48	4.43	5.06
K	g/kg	12.7	1.87	14.7	27	12.8	1.25	0.450	3.53
Mg	g/kg	7.45	0.658	8.8	26	7.44	0.411	0.161	2.16
Mn	mg/kg	477	28.4	5.9	19	474	13.4	8.14	1.71
Mo	mg/kg	3.85	0.553	14.4	17	4.06	0.480	0.168	4.35
Ni	mg/kg	27.1	3.65	13.4	24	27.3	2.49	0.931	3.43
N	g/kg	17.5	0.741	4.2	29	17.6	0.490	0.172	0.981
P	g/kg	2.98	0.273	9.2	32	3.00	0.178	0.060	2.03
Pb	mg/kg	30.0	4.72	15.7	25	30.0	2.63	1.18	3.93
Zn	mg/kg	130	15.3	11.8	28	129	8.70	3.62	2.80
TC =totalC (org+inorg)	g/kg	209	7.73	3.7	11	209	3.00	2.91	1.40

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
loss-on-ignition	%	37.3	0.987	2.6	25	37.4	0.545	0.247	0.661
dry weight	%	95.0	0.747	0.8	16	95.1	0.495	0.233	0.246

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Indicative Values MARSEP 292

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	8.69	2.70	31.1	11	8.60	1.79	1.02	11.7
B	mg/kg	25.4	6.75	26.6	11	25.7	3.59	2.54	10.0
Ba	mg/kg	88.9	17.0	19.1	5	91.4	9.80	9.48	10.7
Be	µg/kg	423	78.0	18.4	4	428	36.2	48.8	11.5
Na	g/kg	0.432	0.108	25.0	15	0.450	0.080	0.035	8.08
Sn	mg/kg	9.25	1.05	11.3	4	9.31	0.637	0.654	7.07
V	mg/kg	25.9	8.29	32.0	8	26.3	6.26	3.66	14.1
S	mg/kg	2040	566	27.7	14	1986	255	189	9.26
TOC =total org.C	g/kg	190	21.6	11.4	4	191	15.5	13.5	7.09
OC = org.C	g/kg	201	14.0	7.0	4	200	6.30	8.73	4.35

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	43.6	12.1	27.8	4	43.5	6.95	7.58	17.4
residue-on-ignition	%	62.4	3.13	5.0	4	61.7	1.66	1.95	3.13