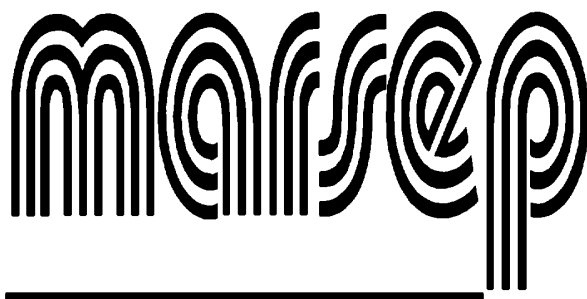




**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Manure and Refuse Sample Exchange Program

REFERENCE MATERIAL

MARSEP sample 266

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

This MARSEP sample 266 of Compost, from Switzerland, is prepared for the WEPAL proficiency programs. The sample has been used in 6 periods (or rounds). Only results from the last 5 periods are used. This way, the consensus values reflect the latest 'state of the art' analytical techniques used by the laboratories. The results on which the values in this report are based were taken from the periods given in the following table:

Year	Round	Number
2026	1	1
2021	1	3
2018	3	1
2016	2	4
2013	2	1

Consensus Values MARSEP 266

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	g/kg	4.81	1.44	29.9	60	4.73	1.03	0.232	4.83
As	mg/kg	2.97	0.385	12.9	56	2.97	0.245	0.064	2.16
B	mg/kg	18.4	4.10	22.3	50	18.9	2.92	0.725	3.94
Ba	mg/kg	61.4	9.22	15.0	30	61.5	6.50	2.10	3.43
Be	µg/kg	239	37.4	15.6	19	240	29.0	10.7	4.49
Ca	g/kg	125	8.71	7.0	129	125	5.51	0.958	0.766
Cd	mg/kg	0.178	0.031	17.4	115	0.180	0.018	0.004	2.03
Co	mg/kg	2.78	0.318	11.5	113	2.75	0.190	0.037	1.35
Cr	mg/kg	71.5	17.4	24.4	133	73.0	12.8	1.89	2.64
Cu	mg/kg	28.5	2.57	9.0	145	28.8	1.69	0.267	0.934
Fe	g/kg	8.16	0.708	8.7	101	8.19	0.473	0.088	1.08
Hg	µg/kg	53.4	9.30	17.4	99	54.0	5.80	1.17	2.19
K	g/kg	7.85	0.820	10.4	143	7.85	0.550	0.086	1.09
Li	mg/kg	8.45	1.39	16.5	12	8.33	0.855	0.503	5.95
Mg	g/kg	6.73	0.459	6.8	137	6.71	0.300	0.049	0.728
Mn	mg/kg	305	23.3	7.6	91	306	15.1	3.05	1.00
Mo	mg/kg	3.96	0.525	13.3	103	3.95	0.350	0.065	1.63
Na	g/kg	1.53	0.142	9.3	66	1.53	0.073	0.022	1.43
Ni	mg/kg	21.3	2.45	11.5	130	21.3	1.64	0.269	1.26
N	g/kg	11.8	0.754	6.4	131	11.8	0.502	0.082	0.698
P	g/kg	2.56	0.168	6.6	146	2.56	0.100	0.017	0.680
Pb	mg/kg	18.9	2.33	12.3	131	19.0	1.40	0.254	1.34
Sb	µg/kg	509	87.2	17.1	22	509	56.0	23.2	4.57
Sr	mg/kg	150	10.2	6.8	19	150	8.30	2.92	1.94
V	mg/kg	11.2	2.34	20.9	46	11.2	1.15	0.431	3.85
Zn	mg/kg	76.2	7.47	9.8	143	76.2	4.80	0.781	1.02
S	mg/kg	1951	275	14.1	54	1944	181	46.8	2.40
TC =totalC (org+inorg)	g/kg	240	11.9	4.9	31	240	8.65	2.66	1.11

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	57.8	8.14	14.1	30	58.4	4.55	1.86	3.21
loss-on-ignition	%	38.9	1.58	4.1	115	38.8	1.10	0.184	0.473
dry weight	%	95.9	0.397	0.4	21	95.9	0.230	0.108	0.113

Indicative Values MARSEP 266

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	108	44.7	41.4	9	124	27.5	18.6	17.2
Bi	µg/kg	99.9	38.3	38.4	6	102	30.8	19.6	19.6
Ga	µg/kg	1461	95.9	6.6	4	1486	51.3	59.9	4.10
Se	µg/kg	211	148	70.1	21	207	109	40.3	19.1
Sn	mg/kg	3.02	1.35	44.7	21	3.30	0.920	0.368	12.2
Ti	mg/kg	140	68.7	49.2	14	139	40.9	22.9	16.4
Tl	µg/kg	56.1	23.8	42.5	12	55.8	11.8	8.59	15.3
U	mg/kg	0.407	0.036	8.8	7	0.410	0.020	0.017	4.17
TOC =total org.C	g/kg	200	12.8	6.4	7	203	7.52	6.04	3.02
OC = org.C	g/kg	205	19.5	9.5	5	201	12.4	10.9	5.31

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
residue-on-ignition	%	61.8	0.740	1.2	6	61.8	0.450	0.378	0.611