WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Manure and Refuse Sample Exchange Program

REFERENCE MATERIAL

MARSEP sample 283

WAGENINGEN
UNIVERSITY & RESEARCH

marsep

Certificate of Analysis MARSEP 283

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

This MARSEP sample 283 of Compost, from Switzerland, 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
2021	4	1
2018	4	1

Consensus Values MARSEP 283

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	4.47	0.571	12.8	20	4.41	0.310	0.160	3.57
B	mg/kg	27.8	5.12	18.4	14	27.4	3.14	1.71	6.15
Ba	mg/kg	87.6	8.54	9.7	9	86.0	4.80	3.56	4.06
Ca	g/kg	52.5	3.13	6.0	43	52.6	2.03	0.596	1.14
Cd	mg/kg	0.343	0.030	8.7	40	0.343	0.019	0.006	1.71
Co	mg/kg	3.79	0.261	6.9	36	3.80	0.163	0.054	1.43
Cr	mg/kg	43.2	8.51	19.7	42	42.7	5.17	1.64	3.80
Cu	mg/kg	48.5	3.30	6.8	45	48.5	2.20	0.616	1.27
Fe	g/kg	13.0	1.01	7.8	30	12.9	0.722	0.230	1.77
Hg	µg/kg	119	18.4	15.4	36	118	11.5	3.82	3.21
K	g/kg	13.9	1.40	10.1	47	13.9	0.990	0.255	1.83
Mg	g/kg	6.62	0.465	7.0	45	6.63	0.300	0.087	1.31
Mn	mg/kg	379	26.9	7.1	30	379	13.7	6.14	1.62
Mo	mg/kg	3.05	0.276	9.1	35	3.07	0.147	0.058	1.92
Na	g/kg	0.897	0.108	12.0	21	0.897	0.073	0.029	3.27
Ni	mg/kg	22.3	1.66	7.4	42	22.3	0.935	0.319	1.44
N	g/kg	19.0	1.03	5.4	43	19.0	0.600	0.196	1.03
P	g/kg	3.41	0.203	5.9	50	3.40	0.130	0.036	1.05
Pb	mg/kg	36.2	2.64	7.3	42	36.6	1.60	0.509	1.41
Zn	mg/kg	143	9.14	6.4	45	143	6.00	1.70	1.19
S	mg/kg	2401	302	12.6	19	2373	183	86.7	3.61
TC =totalC (org+inorg)	g/kg	277	13.3	4.8	11	278	7.70	5.01	1.81

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	37.8	5.41	14.3	11	37.7	1.70	2.04	5.40
loss-on-ignition	%	47.3	1.30	2.8	41	47.3	0.890	0.254	0.538
dry weight	%	94.9	0.797	0.8	10	94.7	0.465	0.315	0.332

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Indicative Values MARSEP 283

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	171	36.8	21.5	5	177	22.0	20.6	12.0
Al	g/kg	5.96	1.55	26.0	19	5.97	1.08	0.444	7.45
Be	µg/kg	322	13.0	4.0	6	322	7.19	6.61	2.05
Li	mg/kg	8.05	1.86	23.1	5	7.84	0.840	1.04	12.9
Sb	µg/kg	623	101	16.3	6	622	70.9	51.7	8.30
Se	µg/kg	174	20.6	11.9	6	180	12.5	10.5	6.07
Sn	mg/kg	3.36	0.906	26.9	8	3.48	0.571	0.400	11.9
Sr	mg/kg	105	10.3	9.8	5	105	7.00	5.76	5.49
Ti	mg/kg	102	26.6	26.2	4	102	12.0	16.6	16.4
V	mg/kg	13.1	3.29	25.1	13	13.2	1.75	1.14	8.69

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
residu-on-ignition	%	51.7	2.15	4.2	4	51.8	1.00	1.34	2.60