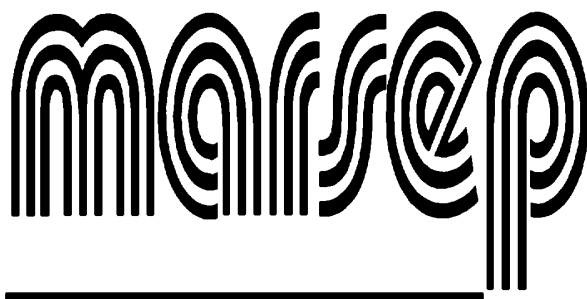




**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Manure and Refuse Sample Exchange Program

REFERENCE MATERIAL

MARSEP sample 285

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 285 of Compost, from Switzerland, is prepared for the WEPAL proficiency programs. The sample has been used in 4 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
2024	2	3
2023	3	1
2020	4	1
2018	1	2

Consensus Values MARSEP 285

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Ag	µg/kg	172	18.0	10.4	8	174	12.1	7.95	4.61
Al	g/kg	9.01	2.17	24.1	47	9.06	1.39	0.396	4.40
As	mg/kg	5.80	0.413	7.1	41	5.86	0.268	0.081	1.39
B	mg/kg	26.7	5.68	21.3	35	27.4	4.55	1.20	4.50
Ba	mg/kg	78.9	8.00	10.1	20	80.3	5.42	2.23	2.83
Be	µg/kg	434	22.0	5.1	16	433	17.0	6.88	1.58
Ca	g/kg	50.8	3.27	6.4	93	51.0	1.90	0.424	0.834
Cd	mg/kg	0.336	0.043	12.9	84	0.340	0.026	0.006	1.76
Co	mg/kg	5.20	0.457	8.8	77	5.22	0.300	0.065	1.25
Cr	mg/kg	60.5	12.5	20.6	88	60.1	8.95	1.66	2.75
Cu	mg/kg	43.3	2.53	5.8	98	43.3	1.56	0.320	0.739
Fe	g/kg	12.1	1.05	8.7	71	12.1	0.642	0.156	1.29
Hg	µg/kg	108	19.3	17.8	76	105	13.4	2.76	2.55
K	g/kg	9.26	1.36	14.7	106	9.25	0.935	0.165	1.78
Mg	g/kg	7.42	0.484	6.5	99	7.42	0.300	0.061	0.820
Mn	mg/kg	462	27.7	6.0	67	459	17.4	4.24	0.916
Mo	mg/kg	3.12	0.360	11.5	72	3.15	0.212	0.053	1.70
Na	g/kg	0.273	0.083	30.2	52	0.282	0.053	0.014	5.24
Ni	mg/kg	26.9	2.06	7.7	87	26.8	1.37	0.276	1.03
N	g/kg	14.4	0.610	4.2	94	14.4	0.400	0.079	0.547
P	g/kg	2.25	0.163	7.3	108	2.26	0.090	0.020	0.873
Pb	mg/kg	33.1	2.63	8.0	88	33.2	1.53	0.351	1.06
Sr	mg/kg	112	5.17	4.6	10	112	2.87	2.04	1.82
V	mg/kg	19.9	4.93	24.8	29	20.2	3.24	1.14	5.76
Zn	mg/kg	129	9.52	7.4	97	130	6.00	1.21	0.934
S	mg/kg	1622	188	11.6	42	1601	111	36.4	2.24
TC =totalC (org+inorg)	g/kg	230	8.82	3.8	30	231	4.65	2.01	0.874

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
AOX	mg/kg	33.8	6.42	19.0	18	34.3	3.70	1.89	5.60
loss-on-ignition	%	40.6	0.894	2.2	80	40.8	0.600	0.125	0.307
residu-on-ignition	%	59.3	0.751	1.3	10	59.4	0.395	0.297	0.500
dry weight	%	94.3	0.637	0.7	31	94.2	0.430	0.143	0.152

Indicative Values MARSEP 285

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Li	mg/kg	12.5	3.11	24.9	6	12.0	1.60	1.58	12.7
S - SO4 (as S)	mg/kg	1595	119	7.5	5	1613	90.9	66.8	4.19
Sb	µg/kg	682	155	22.7	15	710	113	50.0	7.34
Se	µg/kg	241	110	45.6	15	284	70.9	35.5	14.7
Sn	mg/kg	3.32	0.869	26.2	16	3.56	0.417	0.272	8.18
Ti	mg/kg	140	68.8	49.1	6	154	42.0	35.1	25.1
Tl	µg/kg	85.1	51.2	60.1	10	115	23.0	20.2	23.8
U	mg/kg	0.652	0.115	17.6	4	0.678	0.061	0.072	11.0
TOC =total org.C	g/kg	216	11.8	5.5	6	219	6.32	6.04	2.79
OC = org.C	g/kg	213	23.7	11.1	5	217	21.0	13.3	6.23