



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 227



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 IPE samples are dried at 70°C and milled to pass a 0.5 mm sieve.

This IPE sample 227 of Tangel / Ulvaceae, from Netherlands, 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
2015	4	1



Consensus Values IPE 227

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	49.7	5.28	10.6	63	49.4	3.40	0.831	1.67
Cu	mg/kg	11.4	1.47	12.9	90	11.5	1.14	0.194	1.70
Fe	mg/kg	71.7	14.1	19.7	85	72.1	7.60	1.91	2.67
Mn	mg/kg	12.2	1.73	14.2	87	12.3	1.00	0.231	1.90
Zn	mg/kg	8.15	1.56	19.2	90	8.12	0.919	0.206	2.52
Cd	µg/kg	24.4	5.64	23.2	26	24.9	4.04	1.38	5.68
Co	µg/kg	286	31.6	11.1	23	284	14.2	8.24	2.88
Ni	µg/kg	944	206	21.9	20	957	114	57.7	6.11
V	µg/kg	151	9.25	6.1	11	151	4.67	3.48	2.31
Sr	mg/kg	70.6	11.1	15.8	10	69.6	5.38	4.40	6.23
Ca	g/kg	7.28	0.859	11.8	95	7.26	0.566	0.110	1.51
Cl (as Cl)	g/kg	17.8	2.18	12.2	18	18.2	1.25	0.642	3.60
K	g/kg	26.8	2.42	9.0	99	27.0	1.60	0.305	1.14
Mg	g/kg	29.3	4.06	13.9	95	29.2	2.50	0.521	1.78
N - Kjeldahl (as N)	g/kg	19.7	1.32	6.7	60	19.8	0.910	0.212	1.08
Na	mg/kg	12878	1420	11.0	57	12858	1018	235	1.83
P (as P)	g/kg	2.08	0.200	9.6	100	2.10	0.124	0.025	1.20
S (as S)	g/kg	58.0	9.73	16.8	51	57.1	5.40	1.70	2.94

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	328	12.8	3.9	32	330	9.57	2.82	0.860
N - elementary	g/kg	21.0	1.25	6.0	51	21.2	0.790	0.219	1.04

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total ash	g/kg	215	26.1	12.2	9	216	13.0	10.9	5.07



Indicative Values IPE 227

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	µg/kg	642	138	21.4	18	639	61.2	40.5	6.32
Cr	µg/kg	420	158	37.6	20	416	104	44.2	10.5
Hg	µg/kg	2.17	1.15	52.8	7	2.22	0.640	0.542	24.9
I	µg/kg	16905	10460	61.9	5	20600	5720	5847	34.6
Li	µg/kg	224	107	47.8	6	233	57.3	54.7	24.4
Mo	µg/kg	73.8	26.6	36.1	19	78.8	12.8	7.64	10.4
Pb	µg/kg	112	29.5	26.3	23	115	17.6	7.68	6.86
Se	µg/kg	55.3	83.1	150.3	12	59.0	43.7	30.0	54.2
Ba	mg/kg	0.971	0.237	24.4	8	1.03	0.137	0.105	10.8
Sb	µg/kg	20.0	8.92	44.6	6	20.9	5.34	4.55	22.8
Ti	mg/kg	0.604	0.177	29.3	5	0.611	0.109	0.099	16.4
Rb	µg/kg	9402	985	10.5	4	9507	494	616	6.55
N - NO3 (as N)	mg/kg	331	51.3	15.5	8	341	24.2	22.7	6.85

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	14.4	6.70	46.5	12	16.8	4.75	2.42	16.8

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	10.3	2.88	27.9	15	10.5	1.51	0.928	9.00

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-17.7	0.396	2.2	4	-17.7	0.180	0.248	1.40

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	69.2	6.67	9.6	5	68.4	2.85	3.73	5.38
ADF-ash-free	g/kg	164	13.3	8.1	4	165	7.68	8.33	5.07
NDF-ash-free	g/kg	286	25.8	9.0	4	287	12.5	16.1	5.64