



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 151



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 151 of Grass / Poaceae, 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
2001	3	4



Consensus Values IPE 151

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	13.8	2.05	14.8	89	14.0	1.20	0.271	1.96
Cu	mg/kg	9.46	1.20	12.7	128	9.61	0.785	0.132	1.40
Fe	mg/kg	1206	181	15.0	122	1201	114	20.5	1.70
Mn	mg/kg	92.2	8.07	8.8	132	92.1	4.95	0.878	0.952
Zn	mg/kg	31.5	2.85	9.1	132	31.6	1.90	0.311	0.987
As	µg/kg	789	95.8	12.1	22	796	55.9	25.5	3.24
Cd	µg/kg	120	19.0	15.7	42	121	11.0	3.66	3.03
Co	µg/kg	623	98.9	15.9	32	616	66.5	21.9	3.51
Hg	µg/kg	8.57	1.31	15.3	26	8.75	0.875	0.321	3.75
Mo	µg/kg	2419	297	12.3	31	2371	162	66.7	2.76
Ni	µg/kg	3366	572	17.0	46	3410	351	105	3.13
Pb	µg/kg	898	216	24.0	41	890	120	42.1	4.69
Ba	mg/kg	22.7	4.10	18.1	16	23.2	2.40	1.28	5.65
Sr	mg/kg	22.9	1.78	7.8	13	23.5	1.80	0.616	2.69
Ca	g/kg	8.81	0.581	6.6	131	8.82	0.361	0.063	0.721
Cl (as Cl)	g/kg	4.61	0.690	15.0	29	4.57	0.425	0.160	3.47
K	g/kg	22.7	1.55	6.9	130	22.7	0.987	0.170	0.751
Mg	g/kg	3.54	0.258	7.3	131	3.55	0.170	0.028	0.796
N - Kjeldahl (as N)	g/kg	21.7	1.26	5.8	77	21.7	0.827	0.180	0.830
Na	mg/kg	272	78.2	28.8	84	279	43.7	10.7	3.93
P (as P)	g/kg	3.97	0.199	5.0	127	3.95	0.139	0.022	0.555
S (as S)	g/kg	2.05	0.158	7.7	71	2.06	0.103	0.023	1.14

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	429	19.7	4.6	19	427	12.0	5.66	1.32
N - elementary	g/kg	22.4	0.978	4.4	45	22.4	0.686	0.182	0.813

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	723	209	28.8	34	769	180	44.7	6.18



Indicative Values IPE 151

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Cr	µg/kg	4182	1501	35.9	41	4270	1000	293	7.01
Li	µg/kg	1220	445	36.5	5	1335	272	249	20.4
Se	µg/kg	53.5	9.89	18.5	12	55.1	5.50	3.57	6.67
Sb	µg/kg	31.2	6.70	21.5	7	31.6	3.80	3.16	10.1
V	µg/kg	2200	808	36.7	13	2215	421	280	12.7
Be	µg/kg	22.9	10.3	45.1	8	23.3	5.75	4.57	19.9
N - NO3 (as N)	mg/kg	165	46.4	28.1	12	161	21.7	16.7	10.1
SO4 (as SO4)	g/kg	2.71	0.927	34.2	6	2.77	0.538	0.473	17.5

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	1301	853	65.6	7	1420	480	403	31.0

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	240	0.950	0.4	4	240	0.500	0.594	0.248
Total ash	g/kg	106	4.82	4.5	6	106	3.25	2.46	2.32