



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 200



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 200 of Maize (shoots) / Zea mays, from Austria, 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
2010	2	2



Consensus Values IPE 200

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	6.79	1.24	18.2	71	6.76	0.740	0.183	2.70
Cu	mg/kg	2.60	0.457	17.5	96	2.61	0.295	0.058	2.24
Fe	mg/kg	86.4	11.6	13.4	104	86.6	6.45	1.42	1.64
Mn	mg/kg	15.2	1.60	10.6	102	15.2	1.00	0.199	1.31
Zn	mg/kg	15.9	1.41	8.9	104	16.0	0.865	0.173	1.09
Cd	µg/kg	39.0	6.10	15.6	21	38.6	3.56	1.67	4.26
Mo	µg/kg	157	28.0	17.9	21	160	18.0	7.64	4.88
Ba	mg/kg	2.49	0.298	12.0	12	2.48	0.210	0.107	4.32
Sr	mg/kg	13.5	0.806	6.0	15	13.7	0.500	0.260	1.92
Ca	g/kg	3.55	0.268	7.6	112	3.58	0.170	0.032	0.893
Cl (as Cl)	g/kg	2.21	0.222	10.1	26	2.20	0.150	0.054	2.47
K	g/kg	10.7	0.750	7.0	111	10.7	0.500	0.089	0.832
Mg	g/kg	2.17	0.149	6.9	111	2.18	0.100	0.018	0.816
N - Kjeldahl (as N)	g/kg	6.37	0.569	8.9	72	6.40	0.318	0.084	1.32
P (as P)	g/kg	1.14	0.084	7.3	113	1.14	0.050	0.010	0.864
S (as S)	g/kg	0.721	0.077	10.7	66	0.726	0.045	0.012	1.65

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	444	14.0	3.1	39	444	8.35	2.80	0.630
N - elementary	g/kg	6.85	0.710	10.4	58	6.84	0.440	0.117	1.70

Method: Other determinations

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
delta 13C	‰ V-PDB	-11.9	0.164	1.4	11	-11.9	0.100	0.062	0.520
delta 15N	‰ Air	7179	331	4.6	12	7237	234	119	1.66

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Total ash	g/kg	43.8	2.61	6.0	13	44.0	1.00	0.903	2.06



Indicative Values IPE 200

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	µg/kg	77.0	41.3	53.7	12	81.4	23.6	14.9	19.4
Co	µg/kg	38.9	18.8	48.3	20	45.8	12.4	5.26	13.5
Cr	µg/kg	392	210	53.5	21	372	112	57.3	14.6
Hg	µg/kg	3.30	0.746	22.6	6	3.31	0.315	0.381	11.5
Ni	µg/kg	209	105	50.3	17	187	49.0	31.8	15.3
Pb	µg/kg	292	77.3	26.5	28	285	37.5	18.3	6.26
Se	µg/kg	16.1	11.9	74.2	9	17.0	7.00	4.97	30.9
V	µg/kg	142	53.2	37.3	8	152	26.0	23.5	16.5
Rb	µg/kg	1988	44.1	2.2	7	1990	20.0	20.8	1.05
Na	mg/kg	26.0	21.9	84.3	57	28.3	15.7	3.63	14.0

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	82.1	26.5	32.2	12	81.0	18.7	9.56	11.6

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	66.0	24.0	36.3	21	61.0	14.4	6.54	9.90

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	268	18.4	6.9	6	268	7.89	9.38	3.50