



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Plant-Analytical Exchange

REFERENCE MATERIAL

IPE sample 152



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 152 of Alfalfa/ Medicago sativum, 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
2004	4	1



Consensus Values IPE 152

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
B	mg/kg	40.7	4.12	10.1	95	40.7	2.40	0.528	1.30
Cu	mg/kg	10.6	1.04	9.8	134	10.6	0.595	0.112	1.06
Fe	mg/kg	553	48.9	8.8	128	554	28.5	5.41	0.978
Mn	mg/kg	27.5	2.52	9.2	137	27.7	1.50	0.269	0.979
Zn	mg/kg	58.9	3.93	6.7	135	59.2	2.40	0.423	0.718
As	µg/kg	254	32.2	12.7	27	258	20.0	7.74	3.04
Cd	µg/kg	68.3	9.20	13.5	45	70.0	5.00	1.71	2.51
Co	µg/kg	205	33.9	16.6	24	200	23.0	8.64	4.22
Cr	µg/kg	2009	219	10.9	47	2002	158	40.0	1.99
Hg	µg/kg	8.06	1.77	22.0	24	8.13	1.06	0.452	5.61
Mo	µg/kg	3135	270	8.6	33	3125	165	58.9	1.88
Ni	µg/kg	1285	183	14.2	50	1285	118	32.3	2.52
Pb	µg/kg	8212	812	9.9	60	8267	569	131	1.59
Ba	mg/kg	7.18	0.871	12.1	13	7.32	0.540	0.302	4.20
V	µg/kg	2055	252	12.2	11	2080	160	94.8	4.61
Sr	mg/kg	47.3	2.23	4.7	13	47.1	0.870	0.775	1.64
Ca	g/kg	14.8	1.08	7.3	139	14.7	0.721	0.115	0.778
Cl (as Cl)	g/kg	5.14	0.406	7.9	31	5.10	0.248	0.091	1.78
K	g/kg	35.2	1.89	5.4	143	35.2	1.09	0.198	0.562
Mg	g/kg	1.90	0.122	6.4	141	1.90	0.075	0.013	0.675
N - Kjeldahl (as N)	g/kg	29.6	1.27	4.3	97	29.6	0.729	0.161	0.545
N - NO ₃ (as N)	mg/kg	338	50.1	14.8	16	340	22.4	15.7	4.63
Na	mg/kg	280	57.8	20.6	89	283	38.9	7.66	2.74
P (as P)	g/kg	3.27	0.151	4.6	140	3.28	0.093	0.016	0.488
S (as S)	g/kg	4.16	0.391	9.4	72	4.17	0.244	0.058	1.38

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
C - elementary	g/kg	442	17.9	4.0	23	442	10.5	4.65	1.05
N - elementary	g/kg	30.8	1.45	4.7	53	30.8	0.883	0.249	0.809

Method: Acid extractable (So-called totals)

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	462	86.1	18.7	37	469	67.0	17.7	3.83



Indicative Values IPE 152

Method: Inorganic Chemical Composition

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Li	µg/kg	826	127	15.4	5	800	74.0	70.9	8.58
Se	µg/kg	32.6	10.6	32.4	12	33.1	6.75	3.81	11.7
Be	µg/kg	21.2	2.11	9.9	7	21.2	1.20	0.997	4.70
SO4 (as SO4)	g/kg	6.47	0.306	4.7	4	6.55	0.163	0.191	2.95

Method: Real totals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Al	mg/kg	721	159	22.0	5	702	83.0	88.8	12.3

Method: Nutritional values

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Crude fibre	g/kg	317	24.6	7.8	4	323	12.1	15.4	4.85
Total ash	g/kg	125	2.77	2.2	7	125	1.00	1.31	1.04