WAGENINGEN EVALUATING PROGRAMS FOR
ANALYTICAL LABORATORIES

PROF. TESTING
RvA R 002

International Biomass Exchange Program

BiMEP

Annual Report 2011

WAGENINGEN UNIVERSITY
ENVIRONMENTAL SCIENCES

Dear WEPAL participants,

In the annual report of 2011 no changes were made in comparison to the previous annual report. All analytical data from the 2011 samples, previously published in the four quarterly reports, were used to prepare this annual report. Some data have been corrected after the publication of the periodic reports. Corrections are only made in the following situations:
. samples are 'interchanged'
. wrong forms are used (e.g. 'Real Totals' instead of 'so called totals')
. systematic errors in calculations (e.g. wrong units)
. transcription-errors caused by WEPAL
In all other cases, we can not accept changes and corrections after publication of the periodic reports.

We hope that your participation in the WEPAL programmes is a useful instrument in your internal quality control. Please pass on our information to like institutes which may be interested to participate in our PT schemes.

The latest information about the WEPAL is available on our website: www.wepal.nl

Yours sincerely,

Bram Eijgenraam
Manager WEPAL

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Contents

General Information On Wepal

Quality control of analytical procedures for soils, plants, sediments, manure, compost and sludges is of the utmost importance to produce reliable and reproducible analytical data. For this purpose first, second and third line quality control measures are taken in analytical laboratories. For first line control certified reference materials (CRM's) are preferred. For second line control internal reference samples are often used and for third line control participation in laboratory-evaluating exchange programs (or ringtests) is recommended and usually obligatory for accredited laboratories.
WEPAL organizes four laboratory-evaluating programs for plants, soils, sediments, compost, manure and sludges and biomass. These programs are:

IPE = International Plant-analytical Exchange
ISE = International Soil-analytical Exchange
SETOC = International Sediment Exchange for Tests on Organic Contaminants
MARSEP = International Manure and Refuse Sample Exchange Program
BIMEP = International Biomass Exchange Program

The Department Soil Quality - of Wageningen University in the Netherlands started already in 1956 with the organization of a worldwide laboratory-evaluating analysis program for the determination of the inorganic chemical composition of dry plant materials. Since then, four other laboratory-evaluating programs have been started and at this moment more than 400 laboratories all over the world participate in one or more of these programs. Details of the different programs are given in Table 1 and in Houba et al.(1996).
The participating laboratories receive 4 different dry samples every period and the results must be reported before the start of the next period. The results are compiled in quarterly reports immediately after a period has finished. Participating laboratories can report results for as many parameters as they wish. Throughout the year the participants receive at least 12 different plant, soil, sediment, or manure, compost and sludge samples per program. This means a large matrix variation among the distributed samples, which for the participating laboratories is an extra advantage for internal method evaluation.

Table 1 *Details of the Wageningen Evaluating Programs for Analytical Laboratories (WEPAL).*

Program	Start	Members	Countries	Material	Pretreatment	Storage	Portion
IPE	1956	243	70	Plant, as in practice	dried at 70 ^{o}C milled	at -20 ^{o}C	20 g
ISE	1988	305	60	Soil, as in practice	dried at 40 ^{o}C milled	laboratory conditions; in the dark	100 g
SETOC	1990	77	25	Soil, sediment, as in practice	dried at 40 ^{o}C milled	laboratory conditions; in the dark	150 g
MARSEP	1994	48	13	Compost, manure, sludges, as in practice	dried at 40 ^{o}C milled	laboratory conditions; in the dark	20 g
BIMEP	2007	17	7	Biomass	dried at 70 ^{o}C milled	laboratory conditions; in the dark	40 g

Sample preparation
All samples are dried at 70 ^{o}C (IPE, BIMEP) or 40 ^{o}C (ISE, SETOC, MARSEP) and milled to pass a sieve of 0.5 mm. To ensure homogeneous and equivalent samples WEPAL has been using automatic sample dividers for dried, milled materials since the end of 1995. One sample divider can divide amounts of about 60 kg of soil or sediment, or 6 kg of plant, manure, compost or sludge, etc., automatically into uniform units, with weights varying from 20-150 grams (depending on the type of sample). Functioning of this instrument has been described earlier (Houba, 1993). A larger sample divider was installed in 1996. This divider can be used for subdivision of 500 kg dried and milled soil or sediment, into a maximum of 24 buckets. The quality of the sample dividing process is checked by performing homogeneity tests on each sample.

Reports
The results are reported in quarterly reports. For statistical calculations of laboratory-evaluating ring tests robust statistics are preferred. In that case strange values (or outliers) have less influence on the estimated central value (location) and the spread of this value (scale).

New statistics: normal distribution approximation (NDA)

Interlaboratory studies like the WEPAL proficiency testing ringtests frequently give rise to datasets that have complex distributions including excessive tailing and multiple modes. Consequently, sophisticated statistical methods are required to obtain meaningful assessments. The strategy that was used until now makes use of an outlier test followed by straightforward statistics. Problem with this strategy is that removal of outliers causes an underestimation of variance of the dataset. Therefore a methodology is needed that does not rely on arbitrary outlier removal or subjective manual interpretations. Ideally the new methodology must provide the characteristics of the highest mode of the dataset.

A new model is chosen to calculate population characteristics (mean and standard deviation) from experimental datasets (Cofino 2000). The model uses an estimate for the probability density function (pdf) of the measurement process and calculates a best fit based on all observed values. The implementation of the model that is used does not require uncertainty estimates for all data points. Instead it uses a normal distribution approximation (NDA) for the pdf of the individual data points. In essence, the pdf's of the individual datapoints are superposed on each other to create a continuous pdf representing the entire distribution (all datapoints).

With the mathematical model coefficients can be obtained by looking for the combination of data points that has the highest probability in the basis set. This maximization amounts to the identification of the first mode of the dataset. The coefficients can be used to calculate the weighted mean and standard deviation. Subsequent calculations give additional modes of the distribution and for each mode the expectation value (mean), the standard deviation and a percentage indicating the fraction of observations encompassed. In this report only mean and standard deviation for the first mode (combination with the highest probability in the dataset) are given.

Table 2. The model summarised

- Each observation is attributed an ' Observation measurement function' (OMF, φ_i)
- An OMF is defined as the square root of the probability density function appropriate for the observation. If normal distributions are used: $\varphi_i=\sqrt{N(\mu_i,\sigma_i^2)}$
- The set of φ_i 's constitutes a basic set in which the population measurement function Ψ is constructed: $\Psi_i=\sum c_{ik}\,\varphi_k$
- The coefficients are obtained by finding the combination which renders highest probability density (maximise $\int\Psi^2 dx$, x being concentration). Mathematically this amounts to solving the eigenvector-eigenvalue equation $Sc=\lambda c$, S_{ij} being an overlap integral defined as $\int \varphi_i \varphi_j dx$, $0 \leq S_{ij} \leq 1$
- Mean and standard deviation of Ψ_i are calculated from the first and second moment of the probability density function Ψ_i^2

$$\overline{m}_i = \frac{\int x \Psi_i^2 dx}{\int \Psi_i^2 dx},$$

$$s_i^2 = \frac{\int x^2 \Psi_i^2 dx}{\int \Psi_i^2 dx} - \overline{m}_i^2$$

- When the NDA approximation is used the variance calculated by the model represents the sum of the estimates for the within-laboratory and between-laboratory variances, i.e.

$$s_i^2 = s_{between\ \ labs,i}^2 + s_{within\ \ labs,i}^2$$

The model is tested on simulated data sets and datasets of several interlaboratory studies. It is demonstrated that the model is robust and insensitive to outliers. It can cope with asymmetric, strongly tailing and multimodal distributions. Publications describing the procedure in more detail and results of the tests are in preparation.

With the NDA model mean and standard deviation are calculated using all reported data when at least 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

Median and MAD

For each determinand a median value and a median of absolute deviations (MAD) are calculated using all reported data except the reported '<' values. Deviating results like stragglers and outliers are not removed. The median is the middle observation of the sorted observations. In the case of an even number of observations it is the mean of the two middle observations. Using the median instead of mean, extreme data have less influence. MAD is the median of the absolute values of the observations minus their median.

Z-score
For all analytical data a Z-score is calculated according to the formula:

$$\text{Z- score} = \frac{\text{X-} \ X_{mean}}{S_d}$$

in which:

X = the reported value
X_{mean} = the mean of all values calculated with the NDA model
S_d = standard deviation calculated with the NDA model

Accreditation

The Wageningen Evaluating Programmes for Analytical Laboratories organisation is accredited for the organisation of Interlaboratory Studies by the Dutch Accreditation Council RvA since April 26, 2000. The accreditation is based on the ILAC-requirements (Guidelines for the requirements for the competence of providers of proficiency testing schemes, ILAC-G13: 2007). In the following table the scope is given for all WEPAL programs.

Table 3 Scope of the WEPAL programs. (Determinands in bold are in the scope of the accreditation)

IPE Group	**Determinand**
Inorganic Chemical Composition	Ag, **As**, **B**, **Ba**, Be, Bi, Br, **Ca**, **Cd**, **Cl**, **Co**, **Cr**, Cs, **Cu**, F, **Fe**, Ga, **Hg**, I, **K**, Li, **Mg**, **Mn**, **Mo**, **N - Kjeldahl**, N - NH_4 (as N), **N - NO_3**, **Na**, **Ni**, **P**, **Pb**, Pd, Pt, Rb, Rh, **S**, Sb, **Se**, Sn, SO_4, **Sr**, Ti, **V**, **Zn**
Real totals	**Al**, **C - elementary**, **N - elementary**, Si
Acid extractable (So-called totals)	**Al**, Si
Other determinations	**delta ^{13}C, delta ^{15}N**
Nutritional values	ADF-ash-containing, ADF-ash-free, Crude fibre, NDF-ash-containing, NDF-ash-free, Polysaccharides (starch), TDF, TDF-non-soluble, TDF-soluble, **Total ash**, Total Disaccharides, Total fat, Total monosaccharides

ISE Group	**Determinand**
Real totals	Ag, **Al**, **As**, B, **Ba**, Be, Bi, **Br**, **C - elementary**, **Ca**, **Cd**, **Ce**, **Co**, **Cr**, Cs, **Cu**, F, **Fe**, **Ga**, Ge, **Hg**, I, **K**, **La**, **Li**, **Mg**, **Mn**, **Mo**, **N - elementary**, **Na**, **Nb**, Nd, **Ni**, **P**, **Pb**, Pd, Pt, **Rb**, Rh, **S**, **Sb**, **Sc**, Se, **Si**, **Sn**, **Sr**, Te, **Th**, **Ti**, Tl, **U**, **V**, W, **Y**, **Zn**, **Zr**
Acid extractable (So-called totals)	Ag, **Al**, **As**, **B**, **Ba**, **Be**, Bi, Br, **Ca**, **Cd**, Ce, **Co**, **Cr**, **Cu**, F, **Fe**, Ga, **Hg**, I, **K**, La, **Li**, **Mg**, **Mn**, **Mo**, **N**, **Na**, Nb, Nd, **Ni**, **P**, **Pb**, Pt, Rb, **S**, **Sb**, Sc, **Se**, Si, **Sn**, **Sr**, Te, Th, **Ti**, **Tl**, U, **V**, Y, **Zn**, Zr
Aqua Regia (ISO 11466)	Ag, **Al**, **As**, **B**, **Ba**, **Be**, Bi, Br, **Ca**, **Cd**, Ce, **Co**, **Cr**, **Cu**, F, **Fe**, Ga, **Hg**, I, **K**, La, Li, **Mg**, **Mn**, **Mo**, N, **Na**, Nb, Nd, **Ni**, **P**, **Pb**, Pt, Rb, **S**, **Sb**, Sc, **Se**, Si, Sn, **Sr**, Te, Th, **Ti**, Tl, U, **V**, Y, **Zn**, Zr
Extraction with boiling 2M HNO_3	**Cd**, **Co**, **Cr**, **Cu**, **Hg**, **Mo**, **Ni**, **Pb**, Tl, **Zn**
Extraction with 0.1M $NaNO_3$	**Cd, Cu, Ni, Pb, Zn**
Extraction with 0.01M $CaCl_2$ 1:10	Al, B, Cd, CN, Co, Cr, Cu, Fe, **K**, **Mg**, Mn, **N - NH_4**, **N - NO_3**, N total soluble, Na, Ni, P, Pb, SO_4, Zn
Soil characteristics	**C - org others (W&B a.o.)**, **EC-SC (ISO 11265)**, **Fraction < 16 µm**, **Fraction < 2 µm**, **Fraction < 63 µm**, **Fraction > 63 µm**, **Org.matter (L.O.I.)**, **pH - $CaCl_2$**, **pH - H_2O**, **pH - KCl**, **TC=Total C (org.+inorg.)**, **TIC=Tot.Inorg C($CaCO_3$)**, **TOC=Total Org. C**
Other determinations	B - Hot water, CN - Free, CN - Total, delta ^{13}C, delta ^{15}N, K - HCl, Mg - NaCl, **Moisture-content**

ISE Group	Determinand
Fluoride (Swiss standard procedure)	F - Total
Digestion with conc. HNO_3 + conc. HCl + H_2O_2 (UNEP-UN/EC 91075A)	Al, As, B, Ba, Be, Br, Ca, Cd, Co, Cr, Cu, F, Fe, Ga, Hg, I, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sb, Se, Si, Sn, Sr, Tl, V, Y, Zn, Zr
Pot. CEC using 1M NH_4-acetate at pH=7	Al, **Ca**, **CEC**, **K**, **Mg**, **Na**
Pot. CEC using 1M or 0.1M $BaCl_2$-TEA at pH=8.1 (ISO 13536 OR BZE)	Al, Ca, **CEC**, K, Mg, Na
Pot. CEC using 1M NH_4Cl (BZE)	Al, Ca, CEC, Fe, H, K, Mg, Mn, Na
Act. CEC using 0.01M $BaCl_2$ (ISO 11260)	Al, Ca, CEC, Fe, H, K, Mg, Mn, Na
Act. CEC using 0.1M $BaCl_2$ (UNEP-UN/EC 91065A)	Al, **Ca**, CEC, Fe, H, K, Mg, Mn, Na
Act. CEC using cobaltihexamine (AFNOR NFX 31 130)	Al, Ca, CEC, Fe, H, K, Mg, Mn, Na
Mehlich-3	Al, As, **B**, **Ca**, Cd, Cr, **Cu**, **Fe**, **K**, **Mg**, **Mn**, **Na**, **P**, Pb, **Zn**
Extraction with Ca-lactate (VDLUFA)	K, P
Extraction with double lactate (VDLUFA)	**K**, **P**
Water soluble 1:10 (w/v) (EN-12457-4)	Br, Cl, F, N - NO_3
Extraction with 0.01M $CaCl_2$ + 0.005M DTPA 1:10 (w/v)	**Cu, Fe, Mn, Zn**
Extraction with 1M KCl 1:10 (w/v)	N - NH_4, N - NO_3
Phosphorus and related analysis	Al - Ox, Fe - Ox, P - Ox, P - AL, **P - Bray**, **P - Olsen**, Pw
Extraction with 1M HCl (Polish standard)	**B**, **Cu**, **Fe**, **Mn**, **Zn**
Water soluble 1:10 (w/v) (NL VPR C85-06)	Br, Cl, F, SO_4
UK Soil Methods	**K - NH_4NO_3 (1/5), Mg - NH_4NO_3 (1/5), P – $NaHCO_3$ (1/20), pH - H_2O (2/5)**

SETOC Group	Determinand
Polycyclic aromatic hydrocarbons	**acenaphtene**, **acenaphtylene**, **anthracene**, **benz(a)anthracene**, **benzo(a)pyrene**, **benzo(b)fluoranthene**, **benzo(ghi)perylene**, **benzo(k)fluoranthene**, **chrysene**, **dibenz(ah)anthracene**, **fluoranthene**, **fluorene**, **indeno(1,2,3-cd)pyrene**, **naphtalene**, **phenanthrene**, **pyrene**
Polychlorobiphenyls	**PCB 028**, PCB 031, **PCB 052**, PCB 077, PCB 081, **PCB 101**, **PCB 105**, PCB 114, **PCB 118**, PCB 123, PCB 126, **PCB 128**, **PCB 138**, PCB 149, **PCB 153**, PCB 156, PCB 157, PCB 167, PCB 169, **PCB 180**, PCB 189
Organochlorine pesticides	1,2,3 trichlorobenzene, 1,2,3,4 tetrachlorobenzene, 1,2,3,5 tetrachlorobenzene, 1,2,4 trichlorobenzene, 1,2,4,5 tetrachlorobenzene, 1,3,5 trichlorobenzene, aldrin, alpha-endosulfan, alpha-HCH, beta-endosulfan, beta-HCH, chlordane, cis-chlordane, delta-HCH, dieldrin, endosulfan, endosulfan sulfate, endrin, gamma-HCH, heptachlor, heptachlor epoxide, **hexachlorobenzene**, **hexachlorobutadiene**, isodrin, **o,p`-DDD**, **o,p`-DDE**, **o,p`-DDT**, **p,p`-DDD**, **p,p`-DDE**, **p,p`-DDT**, **pentachlorobenzene**, pentachlorophenol, Sum tetrachlorobenzenes, Sum trichlorobenzenes, telodrin, toxaphene, trans-chlord
Other parameters	AOX, CN - Free, **CN - Total**, **EOX**, Inorganic carbon, **Mineral oil, GC**, **Mineral oil, IR**, **Organic carbon**, **Particles < 2 µm**, Particles < 63 µm, Particles > 63 µm

SETOC Group	Determinand
Metals (aqua regia)	**As**, **Ba**, **Cd**, **Co**, **Cr**, **Cu**, **Hg**, Mo, **Ni**, **Pb**, **Zn**
Dibenzo-P Dioxin	1,2,3,4,6,7,8 Cl_7DD, 1,2,3,4,7,8 Cl_6DD, 1,2,3,6,7,8 Cl_6DD, 1,2,3,7,8 Cl_5DD, 1,2,3,7,8,9 Cl_6DD, 2,3,7,8 Cl_4DD, Cl_8DD
Dibenzofuran	1,2,3,4,6,7,8 Cl_7DF, 1,2,3,4,7,8 Cl_6DF, 1,2,3,4,7,8,9 Cl_7DF, 1,2,3,6,7,8 Cl_6DF, 1,2,3,7,8 Cl_5DF, 1,2,3,7,8,9 Cl_6DF, 2,3,4,6,7,8 Cl_6DF, 2,3,4,7,8 Cl_5DF, 2,3,7,8 Cl_4DF, Cl_8DF
Brominated Flame Retarders	BDE 028, BDE 047, BDE 066, BDE 085, BDE 099, BDE 100, BDE 153, BDE 154, BDE 183, BDE 209
Experimental	DEHP, Tributyl Tin (TBT)

MARSEP Group	Determinand
Real totals	Ag, Al, As, B, Ba, Be, Bi, Br, C, Ca, Cd, Co, Cr, Cu, F, Fe, Ga, Hg, I, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Se, Si, Sn, Sr, Ti, Tl, V, Zn
Acid extractable (So-called totals)	Ag, **Al**, **As**, B, Ba, Be, Bi, Br, C, **Ca**, **Cd**, Cl, **Co**, **Cr**, **Cu**, F, **Fe**, Ga, **Hg**, I, **K**, Li, **Mg**, **Mn**, **Mo**, **N**, N - NH4 (as N), N - NO3 (as N), **Na**, **Ni**, **P**, **Pb**, S, S - SO_4, Sb, Se, Si, Sn, Sr, Ti, Tl, V, **Zn**
Other determinations	**AOX**, **loss-on-ignition**

BIMEP Group	Determinand
General Analysis	**ash, calorific value, moisture**, Volatile Matter
Elementary Analysis	**Carbon (C), Cl, Hydrogen (H), Nitrogen (N), S**
Water Soluble Elements	Cl, K, Na
Major Elements	Al, Ca, Fe, K, Mg, Na, P, Si
Minor Elements	As, Ba, Be, Cd, Co, Cr, **Cu**, F, Hg, **Mn**, Mo, Ni, Pb, Sb, Se, Sn, Te, Ti, Tl, V, **Zn**

The selection of determinands included in the scope of accreditation is based on information about the homogeneity and stability of the samples. This information is available when sufficient participants have reported results for a determinand in the past 3 years. Determinands which are not reported regularly in sufficient numbers to have a statistical evaluation are not (yet) included in the scope of the accreditation.

Subcontracting
Some aspects of the proficiency testing scheme may from time to time be subcontracted. When subcontracting occurs it is placed with a competent subcontractor. WEPAL is responsible to the scheme participants for the subcontractor's work.

Confidentiality of results
The confidentiality of the results is extremely important in the Wepal programs. The participants may opt for a code name that indicates their laboratory, or one that ensures their anonymity. In the reports, only the code names will be mentioned.
When an accrediting body or a regulatory authority requires the proficiency test results to be provided by Wepal the participants shall be notified and asked for permission

Complaints and or remarks
The reports of WEPAL are assembled with the utmost care. Please contact us on info.wepal@wur.nl if you feel that the reports are not at a satisfactory standard or if you encountered errors in your results. Also feel free to contact us if you have any other complaints, remarks and or suggestions.

Homogeneity of the distributed samples
WEPAL has developed special equipment for production of representative sub samples (Houba, 1993) from a bulk material. The proper functioning of this equipment is tested regularly by homogeneity testing in the

final sub samples. To perform this testing samples are collected at regular intervals during the preparation of the sub samples with a minimum of 10 samples. The collected samples are analysed in duplicate measurements under repeatability conditions. A selection of (critical) parameters is chosen for the tests:

Table 4 *Parameters for homogeneity tests (in 2011).*

SETOC	Wet digestion Aqua Regia digestion	Determination of C Determination of Cd, Cu, Pb, Zn
MARSEP	Wet digestion	Determination of N, P, Zn
IPE	Wet digestion	Determination of N, P, Zn
BIMEP	Wet digestion	Determination of N, P, Zn
ISE	Wet digestion Aqua Regia digestion	Determination of C Determination of Cd, Cu, Pb, Zn

Calculation

The data are evaluated according to the advised protocol for homogeneity described in ISO/REMCO N 280 (August 1993). In Appendix II of the document a recommended procedure for testing a material for sufficient homogeneity is described. With the data a one-way analysis of variance is performed without exclusion of outliers to calculate s_s^2 (estimate of sampling variance) and s_a^2 (estimate of analytical variance).
The value for s_s/σ is calculated in which σ is the target value for the standard deviation for the proficiency test at analyte concentration x_{mean}. This value should be less than 0.3 for sufficient homogeneity.

The problem is the choice of the target value for the standard deviation at analyte concentration.
In our case we have chosen as target values the values given by the relation between the standard deviation and concentration as reported in our year reports for the different programmes in WEPAL (see also Houba, et al., 1986). For some of the tested element concentrations, these relations are rather good. In case these relations are not yet clear target values are chosen arbitrarily.

Table 5: Results of homogeneity tests of WEPAL samples that were used during the year 2011

Sample	Element	Unit	Mean	Ss	Sa	sigma	Ss/sigma
404	N	g/kg	43	0.028	0.36	0.92	0.01
	P	g/kg	33	-	0.44	1.2	-
	Zn	mg/kg	889	-	42	42	-
412	N - elementary	g/kg	7.6	0.096	0.071	0.61	0.10
	P (as P)	g/kg	1.3	0.018	0.0092	0.087	0.13
	Zn	mg/kg	41	-	2.6	2.4	-
422	N - elementary	g/kg	0.68	0.081	0.070	0.31	0.85
	P (as P)	g/kg	0.043	0.0028	0.0034	0.014	0.23
	Zn	mg/kg	9.4	-	1.5	1.0	-
439	N	g/kg	13	0.28	0.32	0.46	0.52
	P	g/kg	2.8	0.047	0.073	0.13	0.27
	Zn	mg/kg	143	-	8.0	8.0	-
442	N - elementary	g/kg	7.2	-	0.16	0.60	-
	P (as P)	g/kg	0.71	-	0.012	0.064	-
	Zn	mg/kg	29	0.25	0.83	2.1	0.12
443	N	g/kg	18	-	0.61	0.55	-
	P	g/kg	3.1	-	0.097	0.15	-
	Zn	mg/kg	203	1.7	5.8	11	0.16
444	N	g/kg	44	0.33	0.66	1.0	0.32
	P	g/kg	31	0.11	0.46	1.1	0.09
	Zn	mg/kg	703	14	29	32	0.44

Review of results

Before distribution of the periodic reports to the participants, a final check is made based on the results found by the participants. This check is made for all reported parameters. The Coefficient of Variances and concentrations found in the periodic reports are compared with the patterns as found in the previous 5 years. The expected pattern is a high CV at a low concentration and a gradually decreasing CV at higher concentrations till a more or less constant level of CV-values is reached (Houba et al., 1986). Deviations from this expected pattern are mentioned in the periodic reports. This might be an indication of inhomogeneity of the material for the analyte.

Uncertainty of the assigned value
The aim of this proficiency testing scheme is to establish comparability among laboratories. Results for measurands in this scheme are dependent on the methods which are used. It is not feasible to establish metrological traceability of the assigned value. Assigned values are therefore based on consensus values.
In this proficiency test the robust standard deviation is used as standard deviation for proficiency assessment. The uncertainty in the assigned value is calculated as :

$\mathbf{u_x = s / \sqrt{N}}$

s = robust standard deviation
N = number of results

The uncertainty in the assigned value may influence the evaluation of the results (calculated Z-scores). This influence is considered to be negligible if the following conditions is met:

$\mathbf{u_x \leq 0.3 * \sigma_{pt}}$

u_x = uncertainty in the assigned value
σ_{pt} = standard deviation for proficiency assessment (= s)

Because σ_{pt} = s this evaluation reverts to :

$s / \sqrt{N} \leq 0.3 * s$ or $\mathbf{\sqrt{N} \geq 3}$

The influence of uncertainty on the evaluation of the results is therefore dependent on the number of results. Above 10 results of uncertainty on the assigned value is negligible. From 8 to 10 results uncertainty of the consensus value is larger than 0.3 σ_{pt} and therefore may influence the evaluation of the results. Below 8 results no consensus value is given.

Sections Of The Annual Report

Section A: analytical results per element
In this section all analytical results are compiled according to parameter. The first two columns: mean and sd (standard deviation) are calculated with the NDA statistical method with all lab results: N (without results reported as 'smaller than'). Median and MAD are given for comparison. With a normal (Gaussian) distribution Mean and median should be roughly the same. Theoretically sd = 1.483 * MAD (for a Gaussian distribution). In both cases deviations may indicate a non normal distribution. Usually this is caused by analytical differences or 'difficult' samples. The number of Z-scores > 3 also gives an indication of analytical problems. The number of results reported as 'smaller than' is given in the column: N of <. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is smaller than median and mean of the indicative values. This may be caused by a too opmistic (too low) value for the detection limit reported by a majority of participating laboratories which report '<'-values.

Section B: results per sample
In this section all reported values are grouped according to samples. For each of the samples and for each element are calculated with the new NDA statistical method with all lab results, not excluding the analytical results which were marked as an outlier (* and **). Mean and standard deviation are not calculated when less then 8 results are reported. With the values for mean, standard deviation and N the 95 % confidence limits is calculated when at least 10 results are reported and the coefficient of variation is less than 25 %.

In the next part of this section, graphs are presented relating the coefficient of variation (CV) of the determination with the concentration of elements in the analysed materials. For most reported elements two pictures are presented. In the left graph data from the last 5 years (2007-2011) are shown. If less than 16 results were available results of the last 10 years are shown. In these figures each dot represents a mean value for at least 8 different laboratories who analyzed the sample for this analyte. The pattern gives an idea of the present status of the analytical capabilities (Houba et al. 1986). At low concentration levels the coefficient of variation normally increases with decreasing concentration but at elevated concentrations a

constant level of the coefficient of variation is reached. The lowest level that the coefficient of variation can reach depends on the complexity of the determination of the element under study.
The same data are presented in the right graph. In this graph the log(sd) versus log(mean) are presented. This will give a better distribution along the X- and Y-axes and also a linear relationship between X and Y (after Horwitz et al 1980). The linear regression is calculated with the confidence limits (95 %). These are also shown in the graph. This regression is also used in the VC graph (left) to give a best fit curve.

Section C: Median and MAD for the repeated sample
One sample is repeated each quarterly period (see Materials Analysed). For each of the participating laboratories (only indicated by their Laboratory number) the median and MAD of their data on this sample have been calculated. A high relative MAD is a sign of poor quality control. To facilitate comparison of these individual medians with the overall median and MAD , these values are also given. Such a comparison may indicate the existence of systematic errors.
In the second part of this section, variation between laboratories is visualized in Gauss plots. In these plots, a Gaussian distribution is represented by a straight line, a deviation from that distribution is reflected by a nearly straight line. On the vertical axis the ordered observations, $x_{(i)}$, with i ranked from low to high, are plotted, and on the horizontal axis (the probability scale) a function of the relative frequency of values of maximum $x_{(i)}$ is plotted. The median values of the repeat (or standard) sample are plotted for each laboratory.
In such a plot the curvature of the line indicates lack of fit with respect to the Gaussian distribution. Curving downwards to the left and upwards to the right indicates longer-than-Gaussian tails of the practical distribution. In the presented Gauss plots the overall median is indicated by a horizontal straight line.

Section D: number of asterisks and smaller than results per laboratory
In this section the number of results which were reported by each laboratory are shown. Results reported as smaller than ("<") and the number of outliers (* and **) are given in the next columns.. An average Z-score is also calculated. Although big positive and negative Z-scores may compensate each other this usually gives insight in systematic deviations. Average Z-scores greater than 99.9 (absolute) are trimmed to 99.9 (indicated with #). Original Z-scores were calculated with NDA mean and standard deviation.

Method Indicating Code (MIC)

In order to evaluate the analytical results for each reported determinand, a Method Indicating Code (MIC) is used in the other WEPAL programs. Details of the analytical procedures used by the individual participants are indicated by four characters, added at the end of each row with results. With this information all participants can compare the results of their analytical procedures more specifically with the results of other participants. This could be a further valuable tool in judgement of the individual results.The BIMEP program is still in development therefore the MIC codes are not available yet.

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Materials Analyzed

Table 6 *Materials analyzed*

Sample	**Type**	**Country**
404	Sewage Sludge	Netherlands
405	Wheat (straw)	Netherlands
411	Sugerbeet	Netherlands
412	Reed	Netherlands
422	**Woodpellets**	**Finland**
424	Compost	Grobbendonk / Belgium
438	Conifers	Bennekom / Netherlands
439	Compost	Switzerland
440	Rosa (plant) / Rosa l.	Netherlands
441	Potato (tuber) / Solanum tuberosom	Wageningen / Netherlands
442	Chinese Silver Grass / Miscanthus sp.	Nergena
443	Compost	Switzerland
444	Sewage Sludge	Switzerland

Sample in bold is repeated sample

Abbreviations

Table 7 *Used abbreviations*

Where	Abbreviation	Explanation
General Information	CV	coefficient of variation
General Information	MIC	method indicating code
General Information	MAD	median absolute deviation
General Information	Sd	standard deviation
General Information	<	a value smaller than
General Information	*	straggler
General Information	**	outlier
Section A, B	-	less than 8 values, no calculation was possible
Section A, B, C	N	number of reported results
Section A	N stat	number of results after removal of outliers and stragglers
Section B	Stat iter	number of statistical iterations (1, 2 or 3)
Section C, D	-	no calculation was possible
Section D	#	average Z-score greater than 99.9 (trimmed)

SECTION A

SECTION A - General Analysis

Ash (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	393.4	8.5	11	391.0	6.0	1	-	-
405	77.67	2.56	11	76.80	1.90	1	-	-
411	56.26	3.01	15	55.85	2.20	-	-	-
412	303.7	10.0	15	301.9	7.1	2	-	-
422	3.085	1.115	49	3.250	0.750	3	-	-
424	99.88	6.81	15	101.00	4.76	-	-	-
438	48.66	2.84	11	47.70	2.00	1	-	-
439	668.5	12.0	12	669.5	8.2	-	-	-
440	33.38	0.76	12	33.25	0.55	2	-	-
441	48.13	6.77	12	49.00	4.97	1	-	-
442	52.19	3.02	12	52.50	1.90	-	-	-
443	579.4	22.5	12	582.8	15.5	-	-	-
444	413.7	7.3	12	413.0	5.2	1	-	-

Calorific Value (gross) (MJ/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	14.17	0.13	11	14.19	0.09	-	-	-
405	17.97	0.29	11	17.93	0.20	-	-	-
411	17.34	0.18	13	17.36	0.12	-	-	-
412	13.12	0.54	14	13.18	0.40	-	-	-
422	20.31	0.34	48	20.31	0.23	2	-	-
424	19.16	0.32	14	19.12	0.22	-	-	-
438	21.93	0.38	11	21.84	0.26	-	-	-
439	6.375	0.127	12	6.389	0.088	1	-	-
440	19.04	0.27	12	18.95	0.19	1	-	-
441	17.08	0.22	12	17.04	0.16	1	-	-
442	19.01	0.13	11	19.00	0.10	3	-	-
443	8.838	0.155	10	8.805	0.101	-	-	-
444	13.43	0.21	11	13.41	0.15	2	-	-

Moisture (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	80.49	5.52	11	79.50	3.82	-	-	-
405	87.16	0.49	11	87.10	0.40	5	-	-
411	77.43	3.55	15	77.50	2.25	-	-	-
412	50.90	5.34	15	51.79	3.79	-	-	-
422	76.33	2.66	50	75.95	1.85	4	-	-
424	142.6	5.1	15	141.7	3.7	2	-	-
438	91.28	13.45	11	91.60	9.50	-	-	-
439	37.77	5.61	12	38.74	3.95	1	-	-
440	75.26	4.01	12	76.10	2.71	1	-	-
441	88.74	5.71	12	88.30	4.10	1	-	-
442	75.82	3.94	12	75.10	2.85	1	-	-
443	51.96	5.17	12	51.18	3.52	-	-	-
444	97.26	7.15	12	95.16	4.65	-	-	-

Volatile Matter (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	562.5	6.4	10	564.3	4.0	1	-	-
405	733.9	9.4	10	737.2	6.9	1	-	-
411	775.0	12.3	10	777.6	9.1	2	-	-
412	576.0	32.8	10	577.4	23.8	-	-	-
422	849.4	9.8	39	852.8	6.8	6	-	-
424	664.0	14.4	10	667.3	10.5	2	-	-
438	753.1	11.2	10	755.1	8.0	1	-	-
439	327.9	12.3	10	328.1	8.3	-	-	-
440	759.1	11.5	10	761.1	8.1	1	-	-
441	797.1	13.2	10	798.4	8.7	1	-	-
442	781.4	13.4	9	781.0	10.0	2	-	-
443	366.6	19.8	9	369.0	14.0	1	-	-
444	570.1	6.9	9	570.4	4.6	1	-	-

SECTION A - Elementary Analysis

Carbon (C) (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	325.2	4.4	11	324.0	3.0	1	-	-
405	454.2	4.7	11	454.9	3.3	-	-	-
411	440.4	5.8	15	443.0	4.2	3	-	-
412	335.0	12.4	15	333.0	9.0	1	-	-
422	508.0	7.7	49	508.0	5.2	2	-	-
424	504.7	6.2	15	503.5	4.5	2	-	-
438	526.5	9.9	11	528.7	6.7	-	-	-
439	198.0	11.6	12	197.0	7.5	-	-	-
440	483.2	9.0	12	483.4	6.0	-	-	-
441	433.8	5.1	12	434.1	3.4	1	-	-
442	476.5	5.5	11	475.5	3.9	1	-	-
443	250.7	6.7	11	249.7	4.4	-	-	-
444	316.9	6.1	11	317.0	3.9	-	-	-

Cl (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	0.9466	0.0995	9	0.9391	0.0691	-	-	-
405	5.530	0.190	9	5.482	0.148	2	-	-
411	0.1983	0.0901	11	0.1920	0.0611	1	-	-
412	7.165	0.404	11	7.294	0.284	2	-	-
422	0.0901	0.0520	31	0.1000	0.0380	2	7	0.100
424	0.7593	0.0684	11	0.7520	0.0480	1	-	-
438	4.441	0.180	9	4.403	0.139	2	-	-
439	1.371	0.663	9	1.366	0.466	-	-	-
440	0.3281	0.0667	9	0.3230	0.0431	-	-	-
441	0.9055	0.1091	9	0.8890	0.0750	-	-	-
442	0.9098	0.0685	9	0.9000	0.0500	1	-	-
443	1.128	0.530	9	1.036	0.374	-	-	-
444	0.5568	0.0548	9	0.5600	0.0400	-	-	-

Hydrogen (H) (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	46.39	1.42	10	46.66	0.94	1	-	-
405	55.67	1.55	10	55.78	1.05	1	-	-
411	57.40	2.04	13	57.50	1.50	-	-	-
412	43.61	3.22	13	43.34	2.14	-	-	-
422	62.49	1.76	44	62.59	1.21	2	-	-
424	51.23	2.69	13	50.98	1.92	1	-	-
438	64.31	2.10	10	64.96	1.45	1	-	-
439	20.07	2.23	11	20.30	1.56	-	-	-
440	58.17	1.60	11	58.06	1.06	-	-	-
441	59.41	3.29	11	59.50	2.10	-	-	-
442	59.25	1.39	10	59.52	1.00	-	-	-
443	25.88	1.21	10	25.77	0.76	-	-	-
444	44.98	1.16	10	45.39	0.80	-	-	-

Nitrogen (N) (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	45.25	0.56	10	45.25	0.37	-	-	-
405	4.690	0.509	10	4.754	0.354	-	-	-
411	16.20	0.77	15	16.03	0.56	2	-	-
412	8.233	0.673	15	8.150	0.471	1	-	-
422	0.9020	0.5991	40	0.9650	0.4100	-	4	-
424	11.65	1.28	15	11.30	0.93	-	-	-
438	15.17	0.37	10	15.22	0.27	1	-	-
439	14.34	0.74	11	14.20	0.50	-	-	-
440	13.43	0.89	11	13.10	0.60	-	-	-
441	14.23	0.74	11	14.30	0.50	-	-	-
442	7.556	0.571	11	7.650	0.420	-	-	-
443	19.54	0.64	11	19.50	0.44	-	-	-
444	48.07	0.50	11	47.86	0.34	2	-	-

SECTION A - Elementary Analysis

S (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	14.20	1.52	10	13.95	1.12	1	-	-
405	1.641	0.420	10	1.786	0.326	2	-	-
411	1.703	0.200	11	1.730	0.130	1	-	-
412	2.288	0.355	11	2.300	0.255	-	-	-
422	0.0781	0.0614	25	0.1000	0.0480	1	12	0.100
424	2.947	0.336	11	2.881	0.219	-	-	-
438	1.380	0.146	10	1.410	0.110	2	-	-
439	1.828	0.419	10	1.846	0.260	-	-	-
440	0.7787	0.1205	10	0.7780	0.0915	2	-	-
441	1.166	0.309	10	1.170	0.221	1	-	-
442	0.8449	0.2043	10	0.9000	0.1450	1	-	-
443	2.161	0.573	10	2.160	0.402	-	-	-
444	8.112	1.074	10	8.270	0.770	-	-	-

SECTION A - Water Soluble Elements

Cl (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	3	0.8800	0.0460	-	-	-
405	-	-	3	5.370	0.190	-	-	-
411	-	-	2	0.2193	0.0493	-	-	-
412	-	-	2	7.121	0.010	-	-	-
422	0.0746	0.0531	11	0.0713	0.0363	-	-	-
424	-	-	2	0.5909	0.1392	-	-	-
438	-	-	3	4.370	0.216	-	-	-
439	-	-	3	0.2500	0.0380	-	-	-
440	-	-	3	0.2700	0.0751	-	-	-
441	-	-	3	0.6700	0.1734	-	-	-
442	-	-	3	0.9274	0.1326	-	-	-
443	-	-	3	0.8130	0.3230	-	-	-
444	-	-	3	0.4897	0.0703	-	-	-

K (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	1	0.1970	-	-	-	-
405	-	-	1	2.320	-	-	-	-
411	-	-	2	5.984	0.667	-	-	-
412	-	-	2	9.845	0.975	-	-	-
422	-	-	6	0.3497	0.0540	-	-	-
424	-	-	2	3.670	2.050	-	-	-
438	-	-	1	1.430	-	-	-	-
439	-	-	1	4.420	-	-	-	-
440	-	-	1	7.310	-	-	-	-
441	-	-	1	15.48	-	-	-	-
442	-	-	2	3.115	0.205	-	-	-
443	-	-	2	8.855	1.735	-	-	-
444	-	-	2	1.118	0.187	-	-	-

Na (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	1	0.1460	-	-	-	-
405	-	-	1	0.0170	-	-	-	-
411	-	-	2	0.5752	0.0562	-	-	-
412	-	-	2	1.762	0.122	-	-	-
422	-	-	6	0.1134	0.0442	-	-	-
424	-	-	2	0.4468	0.0648	-	-	-
438	-	-	1	0.0190	-	-	-	-
439	-	-	1	6.680	-	-	-	-
440	-	-	1	10.29	-	-	-	-
441	-	-	1	6.630	-	-	-	-
442	-	-	2	0.1381	0.0349	-	-	-
443	-	-	2	1055	1054	-	-	-
444	-	-	2	0.6660	0.1040	-	-	-

SECTION A - Major Elements

Al (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	25.60	1.40	-	-	-
405	-	-	5	0.1100	0.0140	-	-	-
411	-	-	5	0.6730	0.0830	-	-	-
412	-	-	5	13.80	6.27	-	-	-
422	0.0545	0.0356	19	0.0500	0.0260	-	1	-
424	-	-	5	1.400	0.644	-	-	-
438	-	-	4	0.2050	0.0050	-	-	-
439	-	-	5	19.00	1.31	-	-	-
440	-	-	5	0.0930	0.0130	-	-	-
441	-	-	5	0.0500	0.0100	-	-	-
442	-	-	6	0.5150	0.0800	-	-	-
443	-	-	6	17.70	3.45	-	-	-
444	-	-	6	17.50	1.80	-	-	-

Ca (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	40.30	2.90	-	-	-
405	-	-	5	3.300	0.100	-	-	-
411	-	-	5	5.600	0.620	-	-	-
412	-	-	5	6.390	1.290	-	-	-
422	0.7761	0.2176	21	0.7500	0.1500	-	-	-
424	-	-	5	24.30	2.00	-	-	-
438	-	-	4	10.40	0.75	-	-	-
439	-	-	5	77.17	5.86	-	-	-
440	-	-	5	5.000	0.260	-	-	-
441	-	-	5	0.3000	-	-	-	-
442	-	-	6	3.000	0.145	-	-	-
443	-	-	6	55.30	2.74	-	-	-
444	-	-	6	56.90	4.16	-	-	-

Fe (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	51.30	2.50	-	-	-
405	-	-	5	0.1400	0.0370	-	-	-
411	-	-	5	0.5000	0.1300	-	-	-
412	-	-	5	7.500	2.010	-	-	-
422	0.0601	0.0339	18	0.0595	0.0235	-	1	-
424	-	-	5	1.100	0.210	-	-	-
438	-	-	4	0.2200	0.0150	-	-	-
439	-	-	5	11.38	0.78	-	-	-
440	-	-	5	0.1000	0.0400	-	-	-
441	-	-	4	0.0450	0.0060	-	-	-
442	-	-	6	0.3600	0.0230	-	-	-
443	-	-	6	12.22	1.10	-	-	-
444	-	-	6	43.35	3.13	-	-	-

K (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	2.660	0.220	-	-	-
405	-	-	5	16.30	1.39	-	-	-
411	-	-	5	8.500	6.287	-	-	-
412	-	-	5	16.40	3.73	-	-	-
422	0.3767	0.0611	21	0.3760	0.0410	-	-	-
424	-	-	5	2.130	0.330	-	-	-
438	-	-	4	10.30	0.98	-	-	-
439	-	-	5	16.00	0.60	-	-	-
440	-	-	5	7.900	0.340	-	-	-
441	-	-	5	18.61	0.71	-	-	-
442	-	-	6	3.380	0.305	-	-	-
443	-	-	6	17.10	0.88	-	-	-
444	-	-	6	3.600	0.365	-	-	-

SECTION A - Major Elements

Mg (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	3.870	0.130	-	-	-
405	-	-	5	0.4690	0.0310	-	-	-
411	-	-	5	1.900	0.390	-	-	-
412	-	-	5	2.200	0.510	-	-	-
422	0.1878	0.0311	21	0.1980	0.0200	-	-	-
424	-	-	5	7.370	0.970	-	-	-
438	-	-	4	1.330	0.055	-	-	-
439	-	-	5	11.60	0.30	-	-	-
440	-	-	5	1.332	0.032	-	-	-
441	-	-	5	0.8600	0.0730	-	-	-
442	-	-	6	0.8550	0.0460	-	-	-
443	-	-	6	8.395	0.500	-	-	-
444	-	-	6	6.225	0.825	-	-	-

Na (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	1.490	0.090	-	-	-
405	-	-	5	0.1300	0.0400	-	-	-
411	-	-	5	0.9000	0.0600	-	-	-
412	-	-	5	3.400	0.805	-	-	-
422	0.1014	0.0431	21	0.1000	0.0300	-	-	-
424	-	-	5	0.6400	0.0540	-	-	-
438	-	-	4	0.1700	0.0350	-	-	-
439	-	-	5	4.600	0.130	-	-	-
440	-	-	5	0.1220	0.0220	-	-	-
441	-	-	5	0.1000	0.0300	-	-	-
442	-	-	6	0.1920	0.0295	-	-	-
443	-	-	6	2.445	1.055	-	-	-
444	-	-	6	1.430	0.165	-	-	-

P (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	32.30	0.70	-	-	-
405	-	-	5	0.9700	0.1300	-	-	-
411	-	-	5	0.9000	0.1050	-	-	-
412	-	-	5	1.220	0.070	-	-	-
422	0.0546	0.0102	20	0.0565	0.0065	-	-	-
424	-	-	5	0.7000	0.0640	-	-	-
438	-	-	4	1.485	0.075	-	-	-
439	-	-	5	2.720	0.190	-	-	-
440	-	-	5	2.000	0.030	-	-	-
441	-	-	5	2.250	0.089	-	-	-
442	-	-	6	0.7515	0.0370	-	-	-
443	-	-	6	3.460	0.325	-	-	-
444	-	-	6	30.40	2.25	-	-	-

Si (g/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	4	34.03	6.88	-	-	-
405	-	-	4	20.53	1.65	-	-	-
411	-	-	4	7.356	4.555	-	-	-
412	-	-	4	92.34	22.96	-	-	-
422	0.1534	0.0558	16	0.1700	0.0400	-	3	-
424	-	-	4	8.300	3.720	-	-	-
438	-	-	2	1.030	0.370	-	-	-
439	-	-	5	125.2	51.3	-	-	-
440	-	-	4	0.7270	0.1270	-	1	-
441	-	-	4	0.2275	0.0250	-	1	-
442	-	-	5	8.200	4.890	-	1	-
443	-	-	5	105.7	47.0	-	1	-
444	-	-	5	37.34	8.14	-	1	-

SECTION A - Minor Elements

As (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	10.70	0.30	-	1	-
405	-	-	4	0.4590	0.1655	-	2	-
411	-	-	3	0.9000	0.1800	-	4	-
412	-	-	6	3.050	0.320	-	1	-
422	-	-	7	0.8000	0.5530	-	17	0.400
424	-	-	5	1.160	0.374	-	2	-
438	-	-	4	0.4900	0.1505	-	2	-
439	-	-	4	5.705	0.930	-	2	-
440	-	-	4	0.4575	0.0500	-	2	-
441	-	-	1	0.2410	-	-	4	-
442	-	-	4	0.5655	0.1870	-	3	-
443	-	-	6	5.740	0.868	-	1	-
444	-	-	5	5.300	0.610	-	2	-

Ba (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	315.2	52.5	-	-	-
405	-	-	6	36.65	8.40	-	-	-
411	-	-	6	13.43	1.44	-	-	-
412	-	-	6	51.31	6.44	-	-	-
422	5.020	0.709	22	5.300	0.550	-	1	-
424	-	-	6	9.840	2.740	-	-	-
438	-	-	6	15.40	0.90	-	-	-
439	-	-	6	96.20	11.08	-	-	-
440	-	-	6	5.145	1.210	-	-	-
441	-	-	1	7.711	-	-	4	-
442	-	-	7	19.00	1.47	-	-	-
443	-	-	7	139.0	17.0	-	-	-
444	-	-	7	417.0	9.0	-	-	-

Be (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	3	0.3000	0.1000	-	1	-
405	-	-	1	0.1000	-	-	3	-
411	-	-	-	-	-	-	4	-
412	-	-	4	0.3300	0.0750	-	-	-
422	-	-	-	-	-	-	14	0.200
424	-	-	-	-	-	-	4	-
438	-	-	1	0.1000	-	-	3	-
439	-	-	3	0.5600	0.1400	-	1	-
440	-	-	-	-	-	-	4	-
441	-	-	-	-	-	-	4	-
442	-	-	-	-	-	-	4	-
443	-	-	2	0.6070	0.1930	-	2	-
444	-	-	1	0.3000	-	-	3	-

Cd (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	1.880	0.445	-	-	-
405	-	-	5	0.3350	0.0350	-	1	-
411	-	-	5	0.4220	0.0130	-	2	-
412	-	-	4	0.3650	0.1845	-	3	-
422	0.0868	0.0350	13	0.1020	0.0250	-	11	0.200
424	-	-	6	0.2345	0.0220	-	1	-
438	-	-	5	0.6330	0.0500	-	1	-
439	-	-	5	0.3520	0.0520	-	1	-
440	-	-	3	0.1490	0.0560	-	3	-
441	-	-	2	0.0850	0.0040	-	3	-
442	-	-	3	0.1100	0.0050	-	4	-
443	-	-	5	0.4140	0.1080	-	2	-
444	-	-	7	1.400	0.200	-	-	-

SECTION A - Minor Elements

Co (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	5.750	0.870	-	-	-
405	-	-	2	0.3050	0.2950	-	4	-
411	-	-	3	0.1300	0.0300	-	3	-
412	-	-	6	2.610	0.220	-	-	-
422	-	-	6	1.450	0.400	-	17	0.300
424	-	-	4	0.6150	0.3000	-	2	-
438	-	-	6	1.320	0.110	-	-	-
439	-	-	6	5.325	0.409	-	-	-
440	-	-	2	1.050	0.550	-	4	-
441	-	-	-	-	-	-	5	1.00
442	-	-	1	2.700	-	-	6	0.850
443	-	-	7	5.080	0.680	-	-	-
444	-	-	7	6.770	1.160	-	-	-

Cr (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	45.43	6.07	-	-	-
405	-	-	4	1.210	0.410	-	2	-
411	-	-	5	3.790	1.110	-	2	-
412	-	-	7	17.00	1.20	-	-	-
422	1.451	1.110	11	1.100	0.800	-	10	5.00
424	-	-	6	3.585	0.760	-	1	-
438	-	-	4	1.085	0.485	-	2	-
439	-	-	6	84.10	12.65	-	-	-
440	-	-	2	1.883	0.218	-	3	-
441	-	-	2	1.624	0.576	-	3	-
442	-	-	3	3.300	1.770	-	4	-
443	-	-	7	91.80	21.20	-	-	-
444	-	-	7	78.88	4.88	-	-	-

Cu (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	368.7	34.3	-	-	-
405	-	-	3	3.000	0.150	-	2	-
411	-	-	7	11.36	0.74	-	-	-
412	-	-	7	10.79	1.29	-	-	-
422	1.417	0.712	10	1.412	0.500	-	10	5.00
424	-	-	7	13.69	0.96	-	-	-
438	-	-	3	4.400	0.050	-	2	-
439	-	-	6	39.45	3.68	-	-	-
440	-	-	3	3.444	0.106	-	2	-
441	-	-	4	7.410	0.315	-	1	-
442	-	-	5	4.420	0.680	-	2	-
443	-	-	7	51.00	4.23	-	-	-
444	-	-	7	262.1	17.1	-	-	-

F (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	4	203.5	66.1	-	1	-
405	-	-	3	19.00	7.00	-	2	-
411	-	-	2	9.400	2.600	-	2	-
412	-	-	4	77.05	12.75	-	-	-
422	-	-	5	17.00	3.00	-	12	5.00
424	-	-	3	23.30	2.50	-	1	-
438	-	-	3	19.00	11.10	-	2	-
439	-	-	3	153.5	51.5	-	2	-
440	-	-	2	32.04	22.34	-	3	-
441	-	-	2	14.43	6.83	-	3	-
442	-	-	3	8.200	8.179	-	1	-
443	-	-	4	96.93	96.90	-	-	-
444	-	-	4	105.1	105.0	-	-	-

SECTION A - Minor Elements

Hg (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	1.520	0.140	-	1	-
405	-	-	2	0.7225	0.6975	-	3	-
411	-	-	1	0.0170	-	-	5	0.0200
412	-	-	4	0.0385	0.0016	-	2	-
422	-	-	7	0.0110	0.0080	-	14	0.0350
424	-	-	4	0.0365	0.0045	-	3	-
438	-	-	3	0.0340	0.0120	-	2	-
439	-	-	4	0.2300	0.0450	-	1	-
440	-	-	1	0.0110	-	-	4	-
441	-	-	2	3.206	3.195	-	4	-
442	-	-	3	0.0220	0.0070	-	2	-
443	-	-	4	0.1225	0.0375	-	1	-
444	-	-	6	1.114	0.271	-	-	-

Mn (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	487.0	77.0	-	-	-
405	-	-	6	26.86	3.85	-	-	-
411	-	-	7	56.40	1.30	-	-	-
412	-	-	7	126.7	7.1	-	-	-
422	78.72	12.52	24	77.22	7.90	-	-	-
424	-	-	7	53.60	4.40	-	-	-
438	-	-	6	416.2	31.1	-	-	-
439	-	-	6	443.2	28.7	-	-	-
440	-	-	6	39.15	2.03	-	-	-
441	-	-	5	5.810	0.590	-	-	-
442	-	-	7	71.00	2.00	-	-	-
443	-	-	7	424.6	29.6	-	-	-
444	-	-	7	376.0	36.0	-	-	-

Mo (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	6.315	0.800	-	-	-
405	-	-	3	1.0000	0.7000	-	3	-
411	-	-	3	0.5000	0.3000	-	3	-
412	-	-	6	1.480	0.270	-	-	-
422	0.4339	0.5526	10	0.3500	0.3200	-	13	0.500
424	-	-	5	13.78	0.42	-	1	-
438	-	-	3	0.5000	0.4000	-	3	-
439	-	-	5	3.220	0.435	-	1	-
440	-	-	2	0.8500	0.5500	-	4	-
441	-	-	2	0.5000	0.1000	-	3	-
442	-	-	4	1.300	0.172	-	3	-
443	-	-	6	3.795	0.600	-	1	-
444	-	-	7	5.700	0.180	-	-	-

Ni (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	35.75	2.93	-	-	-
405	-	-	4	0.4500	0.1500	-	2	-
411	-	-	5	1.300	0.310	-	2	-
412	-	-	7	9.020	0.570	-	-	-
422	0.6040	0.2923	16	0.6425	0.1875	-	8	3.00
424	-	-	5	1.630	0.270	-	2	-
438	-	-	6	4.240	0.575	-	-	-
439	-	-	6	20.91	1.51	-	-	-
440	-	-	3	0.7000	0.1460	-	3	-
441	-	-	2	0.4630	0.1370	-	3	-
442	-	-	3	0.6840	0.1840	-	4	-
443	-	-	7	25.20	3.70	-	-	-
444	-	-	7	37.30	4.70	-	-	-

SECTION A - Minor Elements

Pb (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	153.6	5.3	-	-	-
405	-	-	5	8.200	0.220	-	1	-
411	-	-	4	1.365	0.410	-	2	-
412	-	-	7	9.560	1.210	-	-	-
422	0.3957	0.4344	13	0.4000	0.3000	-	7	5.00
424	-	-	7	15.50	3.40	-	-	-
438	-	-	6	11.26	1.00	-	-	-
439	-	-	6	33.72	3.45	-	-	-
440	-	-	4	1.613	0.313	-	1	-
441	-	-	4	0.6910	0.3600	-	1	-
442	-	-	5	2.740	0.260	-	2	-
443	-	-	7	59.40	3.00	-	-	-
444	-	-	7	52.80	7.80	-	-	-

Sb (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	3.300	0.500	-	1	-
405	-	-	-	-	-	-	5	1.00
411	-	-	1	3.300	-	-	4	-
412	-	-	3	7.340	3.060	-	2	-
422	-	-	3	0.3000	0.2900	-	17	1.00
424	-	-	3	0.7000	0.3000	-	3	-
438	-	-	2	0.4000	0.3000	-	3	-
439	-	-	3	1.500	0.161	-	2	-
440	-	-	2	0.2550	0.0450	-	4	-
441	-	-	2	180.2	180.0	-	4	-
442	-	-	1	0.2000	-	-	6	1.50
443	-	-	4	2.055	0.450	-	2	-
444	-	-	4	3.770	0.800	-	2	-

Se (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	4	1.930	0.370	-	2	-
405	-	-	1	0.2000	-	-	4	-
411	-	-	2	0.3750	0.2750	-	3	-
412	-	-	4	0.9750	0.1800	-	2	-
422	-	-	2	0.5000	0.2000	-	17	1.00
424	-	-	3	0.9000	0.2600	-	3	-
438	-	-	1	0.5530	-	-	4	-
439	-	-	2	0.2500	0.0500	-	4	-
440	-	-	-	-	-	-	5	1.00
441	-	-	1	0.0600	-	-	4	-
442	-	-	2	3.300	3.200	-	5	1.00
443	-	-	2	0.7000	0.3000	-	5	1.00
444	-	-	4	1.500	0.536	-	3	-

Sn (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	31.73	2.70	-	-	-
405	-	-	2	0.6500	0.4500	-	4	-
411	-	-	1	1.500	-	-	5	0.300
412	-	-	5	1.0000	0.5000	-	1	-
422	-	-	7	0.9000	0.4000	-	15	0.300
424	-	-	2	1.250	0.950	-	4	-
438	-	-	4	0.5000	0.2850	-	2	-
439	-	-	5	2.990	0.210	-	1	-
440	-	-	1	1.300	-	-	5	1.00
441	-	-	-	-	-	-	5	1.00
442	-	-	2	0.7000	0.4000	-	4	-
443	-	-	6	4.975	1.975	-	-	-
444	-	-	6	31.10	2.65	-	-	-

SECTION A - Minor Elements

Te (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	1	1.170	-	-	3	-
405	-	-	1	0.2000	-	-	3	-
411	-	-	-	-	-	-	4	-
412	-	-	-	-	-	-	4	-
422	-	-	-	-	-	-	14	0.750
424	-	-	-	-	-	-	4	-
438	-	-	1	0.0200	-	-	3	-
439	-	-	-	-	-	-	4	-
440	-	-	-	-	-	-	4	-
441	-	-	1	23780	-	-	4	-
442	-	-	1	1.080	-	-	3	-
443	-	-	-	-	-	-	4	-
444	-	-	-	-	-	-	4	-

Ti (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	5	1570	230	-	-	-
405	-	-	4	8.080	4.900	-	-	-
411	-	-	5	80.00	58.87	-	-	-
412	-	-	5	717.0	559.0	-	-	-
422	3.288	0.940	12	3.300	0.580	-	2	-
424	-	-	5	104.0	50.0	-	-	-
438	-	-	4	12.16	7.05	-	-	-
439	-	-	5	401.0	189.4	-	-	-
440	-	-	4	3.410	1.437	-	-	-
441	-	-	4	1.805	0.440	-	-	-
442	-	-	4	28.55	13.45	-	-	-
443	-	-	5	1300	48	-	-	-
444	-	-	5	1404	196	-	-	-

Tl (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	1	1.170	-	-	4	-
405	-	-	1	0.2000	-	-	4	-
411	-	-	-	-	-	-	5	1.00
412	-	-	2	1.145	0.945	-	3	-
422	-	-	1	1.040	-	-	17	1.00
424	-	-	-	-	-	-	5	1.00
438	-	-	1	0.2000	-	-	4	-
439	-	-	1	0.2000	-	-	4	-
440	-	-	-	-	-	-	5	1.00
441	-	-	1	4.400	-	-	5	1.00
442	-	-	-	-	-	-	5	1.00
443	-	-	1	0.3000	-	-	4	-
444	-	-	-	-	-	-	5	1.00

V (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	14.85	1.00	-	-	-
405	-	-	3	0.8000	0.3000	-	3	-
411	-	-	4	0.5200	0.1200	-	2	-
412	-	-	6	12.45	2.42	-	-	-
422	0.2378	0.2510	8	0.2500	0.1850	-	13	1.00
424	-	-	5	2.200	0.600	-	1	-
438	-	-	3	0.2000	0.1600	-	3	-
439	-	-	6	26.40	4.55	-	-	-
440	-	-	1	0.6000	-	-	4	-
441	-	-	2	0.3700	0.2300	-	3	-
442	-	-	2	1.350	0.050	-	4	-
443	-	-	6	24.40	4.54	-	-	-
444	-	-	6	10.50	1.51	-	-	-

SECTION A - Minor Elements

Zn (mg/kg)

Sample	Mean	Sd	N	Median	MAD	Zscore > 5	N of <	Median of <
404	-	-	6	1095	63	-	-	-
405	-	-	5	12.30	4.20	-	1	-
411	-	-	7	37.50	0.50	-	-	-
412	-	-	7	43.00	1.00	-	-	-
422	10.80	3.58	20	9.95	2.50	-	4	-
424	-	-	7	38.80	6.20	-	-	-
438	-	-	6	325.9	20.1	-	-	-
439	-	-	6	145.5	7.0	-	-	-
440	-	-	5	47.30	2.13	-	1	-
441	-	-	4	21.62	2.03	-	1	-
442	-	-	6	27.75	4.75	-	1	-
443	-	-	7	198.0	18.0	-	-	-
444	-	-	7	609.9	14.1	-	-	-

SECTION B

SECTION B - General Analysis

Sample : 404 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	393.4	8.5	11	391.0	6.0	387.7 - 399.1
Calorific Value (gross)	MJ/kg	14.17	0.13	11	14.19	0.09	14.09 - 14.26
Moisture	g/kg	80.49	5.52	11	79.50	3.82	76.83 - 84.15
Volatile Matter	g/kg	562.5	6.4	10	564.3	4.0	557.9 - 567.0

Sample : 405 Wheat (straw)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	77.67	2.56	11	76.80	1.90	75.97 - 79.37
Calorific Value (gross)	MJ/kg	17.97	0.29	11	17.93	0.20	17.77 - 18.16
Moisture	g/kg	87.16	0.49	11	87.10	0.40	86.84 - 87.49
Volatile Matter	g/kg	733.9	9.4	10	737.2	6.9	727.2 - 740.5

Sample : 411 Sugerbeet

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	56.26	3.01	15	55.85	2.20	54.60 - 57.92
Calorific Value (gross)	MJ/kg	17.34	0.18	13	17.36	0.12	17.23 - 17.45
Moisture	g/kg	77.43	3.55	15	77.50	2.25	75.48 - 79.39
Volatile Matter	g/kg	775.0	12.3	10	777.6	9.1	766.3 - 783.7

Sample : 412 Reed

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	303.7	10.0	15	301.9	7.1	298.3 - 309.2
Calorific Value (gross)	MJ/kg	13.12	0.54	14	13.18	0.40	12.82 - 13.43
Moisture	g/kg	50.90	5.34	15	51.79	3.79	47.96 - 53.84
Volatile Matter	g/kg	576.0	32.8	10	577.4	23.8	552.9 - 599.0

Sample : 422 Woodpellets

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	3.085	1.115	49	3.250	0.750	
Calorific Value (gross)	MJ/kg	20.31	0.34	48	20.31	0.23	20.21 - 20.41
Moisture	g/kg	76.33	2.66	50	75.95	1.85	75.57 - 77.08
Volatile Matter	g/kg	849.4	9.8	39	852.8	6.8	846.2 - 852.6

Sample : 424 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	99.88	6.81	15	101.00	4.76	96.13 - 103.63
Calorific Value (gross)	MJ/kg	19.16	0.32	14	19.12	0.22	18.98 - 19.34
Moisture	g/kg	142.6	5.1	15	141.7	3.7	139.8 - 145.4
Volatile Matter	g/kg	664.0	14.4	10	667.3	10.5	653.9 - 674.1

Sample : 438 Conifers

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	48.66	2.84	11	47.70	2.00	46.78 - 50.55
Calorific Value (gross)	MJ/kg	21.93	0.38	11	21.84	0.26	21.68 - 22.18
Moisture	g/kg	91.28	13.45	11	91.60	9.50	82.36 - 100.21
Volatile Matter	g/kg	753.1	11.2	10	755.1	8.0	745.2 - 761.0

Sample : 439 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	668.5	12.0	12	669.5	8.2	661.0 - 676.0
Calorific Value (gross)	MJ/kg	6.375	0.127	12	6.389	0.088	6.295 - 6.455
Moisture	g/kg	37.77	5.61	12	38.74	3.95	34.24 - 41.29
Volatile Matter	g/kg	327.9	12.3	10	328.1	8.3	319.2 - 336.6

Sample : 440 Rosa (plant) / Rosa l.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	33.38	0.76	12	33.25	0.55	32.90 - 33.85
Calorific Value (gross)	MJ/kg	19.04	0.27	12	18.95	0.19	18.87 - 19.20
Moisture	g/kg	75.26	4.01	12	76.10	2.71	72.74 - 77.79
Volatile Matter	g/kg	759.1	11.5	10	761.1	8.1	751.0 - 767.2

Sample : 441 Potato (tuber) / Solanum tuberosom

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	48.13	6.77	12	49.00	4.97	43.87 - 52.39
Calorific Value (gross)	MJ/kg	17.08	0.22	12	17.04	0.16	16.95 - 17.22
Moisture	g/kg	88.74	5.71	12	88.30	4.10	85.15 - 92.33
Volatile Matter	g/kg	797.1	13.2	10	798.4	8.7	787.8 - 806.4

SECTION B - General Analysis

Sample : 442 Chinese Silver Grass / Miscanthus sp.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	52.19	3.02	12	52.50	1.90	50.29 - 54.09
Calorific Value (gross)	MJ/kg	19.01	0.13	11	19.00	0.10	18.92 - 19.09
Moisture	g/kg	75.82	3.94	12	75.10	2.85	73.34 - 78.30
Volatile Matter	g/kg	781.4	13.4	9	781.0	10.0	

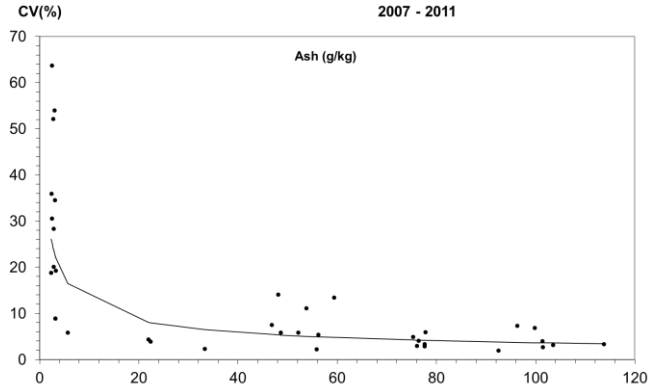
Sample : 443 Compost

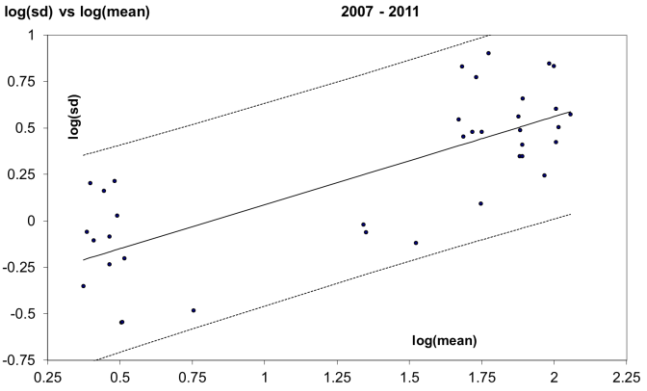
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	579.4	22.5	12	582.8	15.5	565.3 - 593.6
Calorific Value (gross)	MJ/kg	8.838	0.155	10	8.805	0.101	8.729 - 8.947
Moisture	g/kg	51.96	5.17	12	51.18	3.52	48.71 - 55.21
Volatile Matter	g/kg	366.6	19.8	9	369.0	14.0	

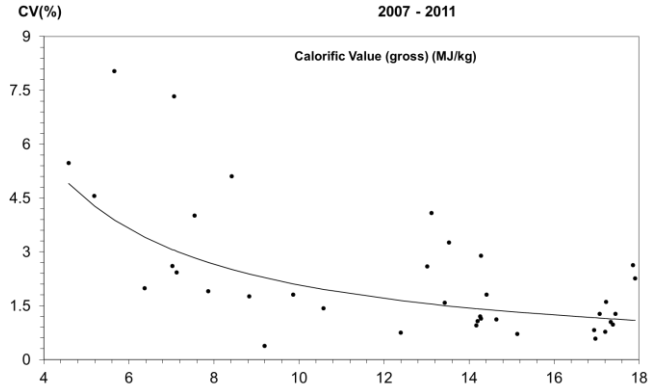
Sample : 444 Sewage Sludge

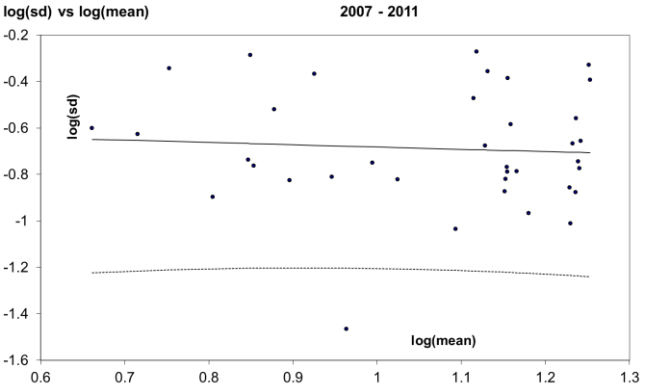
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Ash	g/kg	413.7	7.3	12	413.0	5.2	409.1 - 418.3
Calorific Value (gross)	MJ/kg	13.43	0.21	11	13.41	0.15	13.29 - 13.57
Moisture	g/kg	97.26	7.15	12	95.16	4.65	92.76 - 101.76
Volatile Matter	g/kg	570.1	6.9	9	570.4	4.6	

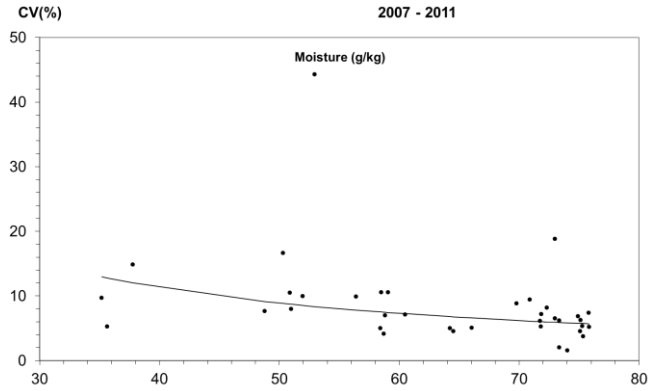
SECTION B - General Analysis

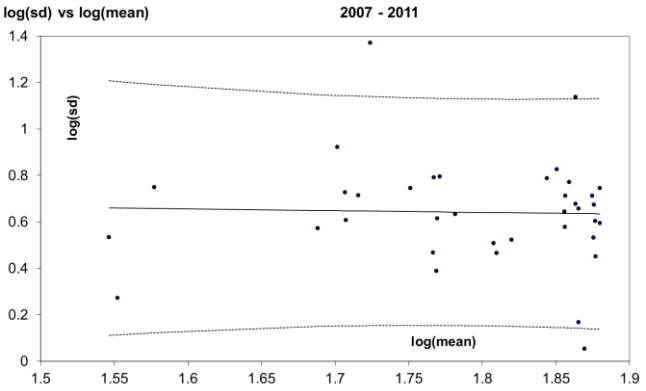


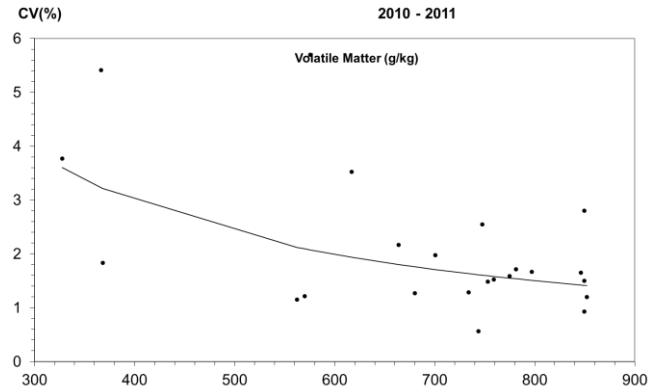


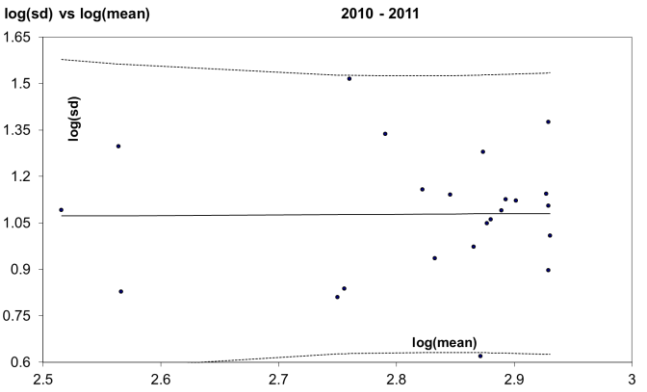












SECTION B - Elementary Analysis

Sample : 404 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	325.2	4.4	11	324.0	3.0	322.3 - 328.1
Cl	g/kg	0.9466	0.0995	9	0.9391	0.0691	
Hydrogen (H)	g/kg	46.39	1.42	10	46.66	0.94	45.39 - 47.40
Nitrogen (N)	g/kg	45.25	0.56	10	45.25	0.37	44.86 - 45.64
S	g/kg	14.20	1.52	10	13.95	1.12	13.13 - 15.28

Sample : 405 Wheat (straw)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	454.2	4.7	11	454.9	3.3	451.1 - 457.3
Cl	g/kg	5.530	0.190	9	5.482	0.148	
Hydrogen (H)	g/kg	55.67	1.55	10	55.78	1.05	54.58 - 56.76
Nitrogen (N)	g/kg	4.690	0.509	10	4.754	0.354	4.331 - 5.048
S	g/kg	1.641	0.420	10	1.786	0.326	

Sample : 411 Sugerbeet

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	440.4	5.8	15	443.0	4.2	437.2 - 443.6
Cl	g/kg	0.1983	0.0901	11	0.1920	0.0611	
Hydrogen (H)	g/kg	57.40	2.04	13	57.50	1.50	56.18 - 58.63
Nitrogen (N)	g/kg	16.20	0.77	15	16.03	0.56	15.78 - 16.63
S	g/kg	1.703	0.200	11	1.730	0.130	1.571 - 1.836

Sample : 412 Reed

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	335.0	12.4	15	333.0	9.0	328.2 - 341.8
Cl	g/kg	7.165	0.404	11	7.294	0.284	6.897 - 7.433
Hydrogen (H)	g/kg	43.61	3.22	13	43.34	2.14	41.68 - 45.54
Nitrogen (N)	g/kg	8.233	0.673	15	8.150	0.471	7.863 - 8.604
S	g/kg	2.288	0.355	11	2.300	0.255	2.052 - 2.524

Sample : 422 Woodpellets

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	508.0	7.7	49	508.0	5.2	505.8 - 510.2
Cl	g/kg	0.09009	0.05205	31	0.10000	0.03800	
Hydrogen (H)	g/kg	62.49	1.76	44	62.59	1.21	61.96 - 63.03
Nitrogen (N)	g/kg	0.9020	0.5991	40	0.9650	0.4100	
S	g/kg	0.07813	0.06142	25	0.10000	0.04800	

Sample : 424 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	504.7	6.2	15	503.5	4.5	501.3 - 508.1
Cl	g/kg	0.7593	0.0684	11	0.7520	0.0480	0.7139 - 0.8047
Hydrogen (H)	g/kg	51.23	2.69	13	50.98	1.92	49.62 - 52.84
Nitrogen (N)	g/kg	11.65	1.28	15	11.30	0.93	10.94 - 12.35
S	g/kg	2.947	0.336	11	2.881	0.219	2.724 - 3.170

Sample : 438 Conifers

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	526.5	9.9	11	528.7	6.7	519.9 - 533.0
Cl	g/kg	4.441	0.180	9	4.403	0.139	
Hydrogen (H)	g/kg	64.31	2.10	10	64.96	1.45	62.84 - 65.79
Nitrogen (N)	g/kg	15.17	0.37	10	15.22	0.27	14.90 - 15.43
S	g/kg	1.380	0.146	10	1.410	0.110	1.277 - 1.482

Sample : 439 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	198.0	11.6	12	197.0	7.5	190.7 - 205.3
Cl	g/kg	1.371	0.663	9	1.366	0.466	
Hydrogen (H)	g/kg	20.07	2.23	11	20.30	1.56	18.58 - 21.55
Nitrogen (N)	g/kg	14.34	0.74	11	14.20	0.50	13.85 - 14.83
S	g/kg	1.828	0.419	10	1.846	0.260	1.532 - 2.123

Sample : 440 Rosa (plant) / Rosa l.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	483.2	9.0	12	483.4	6.0	477.6 - 488.9
Cl	g/kg	0.3281	0.0667	9	0.3230	0.0431	
Hydrogen (H)	g/kg	58.17	1.60	11	58.06	1.06	57.11 - 59.23

SECTION B - Elementary Analysis

Sample : 440 Rosa (plant) / Rosa l. (cont.)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Nitrogen (N)	g/kg	13.43	0.89	11	13.10	0.60	12.84 - 14.02
S	g/kg	0.7787	0.1205	10	0.7780	0.0915	0.6938 - 0.8637

Sample : 441 Potato (tuber) / Solanum tuberosom

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	433.8	5.1	12	434.1	3.4	430.6 - 437.0
Cl	g/kg	0.9055	0.1091	9	0.8890	0.0750	
Hydrogen (H)	g/kg	59.41	3.29	11	59.50	2.10	57.22 - 61.59
Nitrogen (N)	g/kg	14.23	0.74	11	14.30	0.50	13.74 - 14.72
S	g/kg	1.166	0.309	10	1.170	0.221	

Sample : 442 Chinese Silver Grass / Miscanthus sp.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	476.5	5.5	11	475.5	3.9	472.8 - 480.2
Cl	g/kg	0.9098	0.0685	9	0.9000	0.0500	
Hydrogen (H)	g/kg	59.25	1.39	10	59.52	1.00	58.27 - 60.23
Nitrogen (N)	g/kg	7.556	0.571	11	7.650	0.420	7.177 - 7.935
S	g/kg	0.8449	0.2043	10	0.9000	0.1450	0.7010 - 0.9889

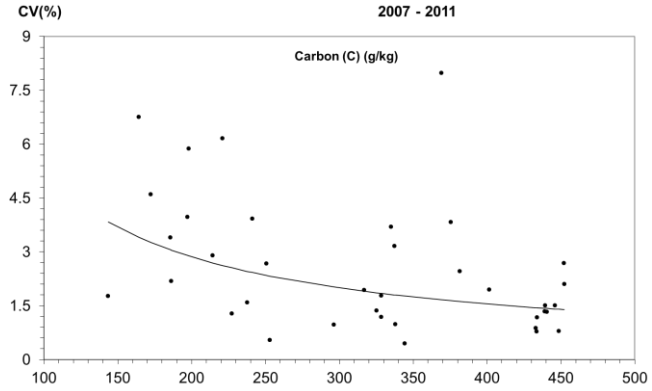
Sample : 443 Compost

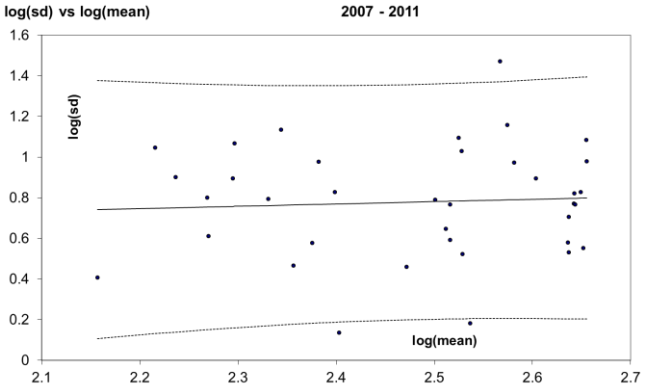
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	250.7	6.7	11	249.7	4.4	246.2 - 255.1
Cl	g/kg	1.128	0.530	9	1.036	0.374	
Hydrogen (H)	g/kg	25.88	1.21	10	25.77	0.76	25.03 - 26.73
Nitrogen (N)	g/kg	19.54	0.64	11	19.50	0.44	19.12 - 19.97
S	g/kg	2.161	0.573	10	2.160	0.402	

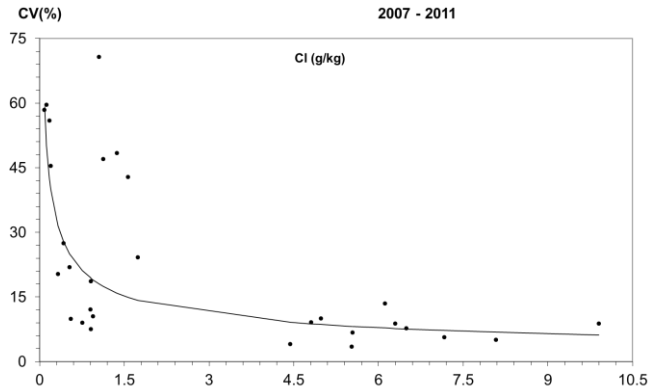
Sample : 444 Sewage Sludge

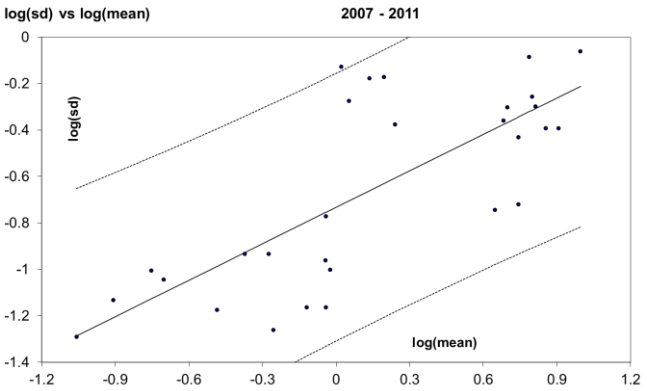
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Carbon (C)	g/kg	316.9	6.1	11	317.0	3.9	312.9 - 321.0
Cl	g/kg	0.5568	0.0548	9	0.5600	0.0400	
Hydrogen (H)	g/kg	44.98	1.16	10	45.39	0.80	44.17 - 45.80
Nitrogen (N)	g/kg	48.07	0.50	11	47.86	0.34	47.73 - 48.40
S	g/kg	8.112	1.074	10	8.270	0.770	7.355 - 8.869

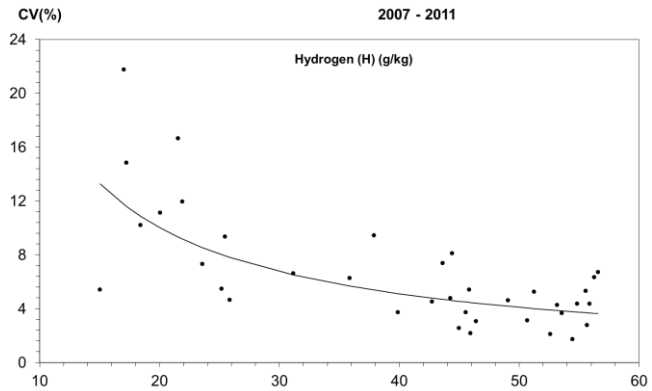
SECTION B - Elementary Analysis

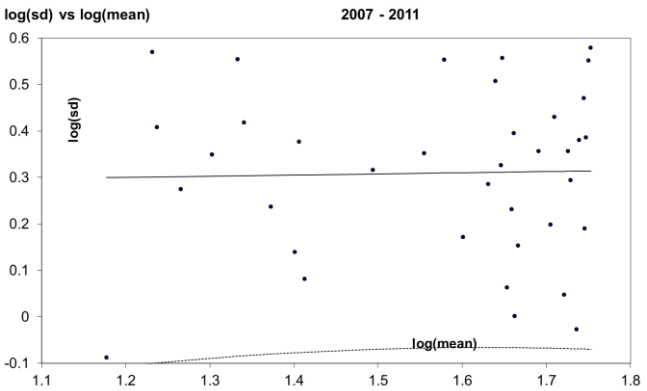


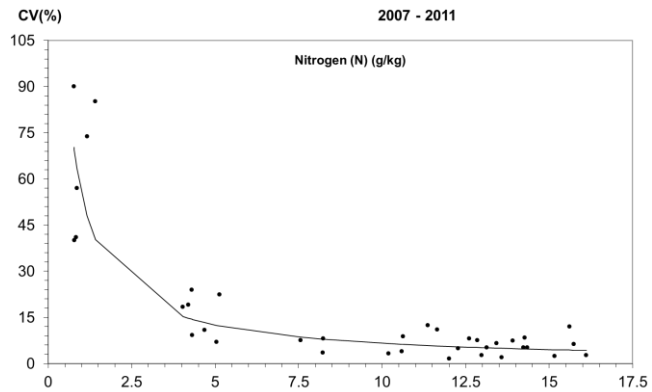


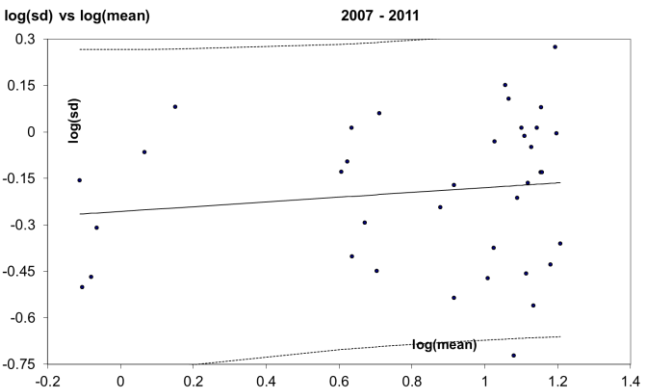




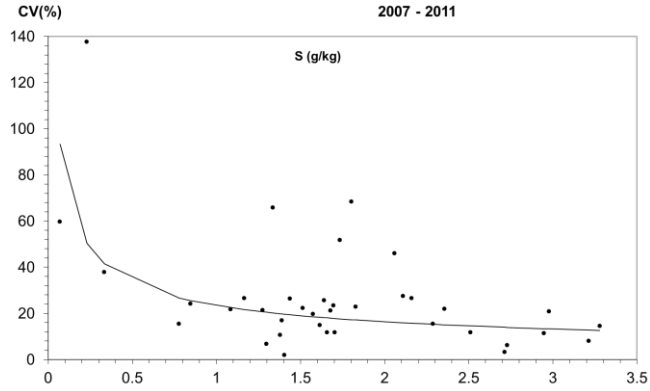


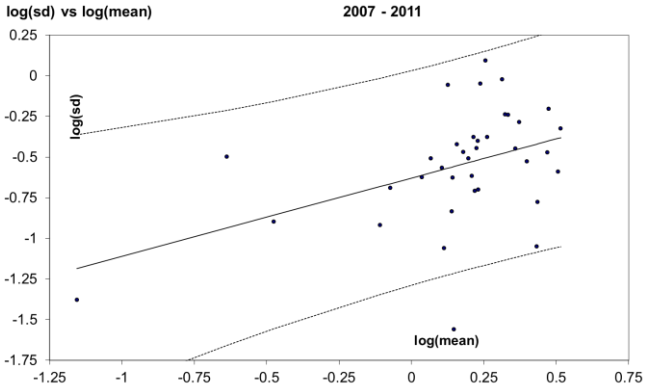






SECTION B - Elementary Analysis





SECTION B - Water Soluble Elements

Sample : 404 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.8800	0.0460	
K	g/kg	-	-	1	0.1970	-	
Na	g/kg	-	-	1	0.1460	-	

Sample : 405 Wheat (straw)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	5.370	0.190	
K	g/kg	-	-	1	2.320	-	
Na	g/kg	-	-	1	0.01700	-	

Sample : 411 Sugerbeet

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	2	0.2193	0.0493	
K	g/kg	-	-	2	5.984	0.667	
Na	g/kg	-	-	2	0.5752	0.0562	

Sample : 412 Reed

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	2	7.121	0.010	
K	g/kg	-	-	2	9.845	0.975	
Na	g/kg	-	-	2	1.762	0.122	

Sample : 422 Woodpellets

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	0.07464	0.05312	11	0.07130	0.03630	
K	g/kg	-	-	6	0.3497	0.0540	
Na	g/kg	-	-	6	0.1134	0.0442	

Sample : 424 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	2	0.5909	0.1392	
K	g/kg	-	-	2	3.670	2.050	
Na	g/kg	-	-	2	0.4468	0.0648	

Sample : 438 Conifers

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	4.370	0.216	
K	g/kg	-	-	1	1.430	-	
Na	g/kg	-	-	1	0.01900	-	

Sample : 439 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.2500	0.0380	
K	g/kg	-	-	1	4.420	-	
Na	g/kg	-	-	1	6.680	-	

Sample : 440 Rosa (plant) / Rosa l.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.2700	0.0751	
K	g/kg	-	-	1	7.310	-	
Na	g/kg	-	-	1	10.29	-	

Sample : 441 Potato (tuber) / Solanum tuberosom

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.6700	0.1734	
K	g/kg	-	-	1	15.48	-	
Na	g/kg	-	-	1	6.630	-	

Sample : 442 Chinese Silver Grass / Miscanthus sp.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.9274	0.1326	
K	g/kg	-	-	2	3.115	0.205	
Na	g/kg	-	-	2	0.1381	0.0349	

SECTION B - Water Soluble Elements

Sample : 443 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.8130	0.3230	
K	g/kg	-	-	2	8.855	1.735	
Na	g/kg	-	-	2	1055	1054	

Sample : 444 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Cl	g/kg	-	-	3	0.4897	0.0703	
K	g/kg	-	-	2	1.118	0.187	
Na	g/kg	-	-	2	0.6660	0.1040	

SECTION B - Major Elements

Sample : 404 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	25.60	1.40	
Ca	g/kg	-	-	5	40.30	2.90	
Fe	g/kg	-	-	5	51.30	2.50	
K	g/kg	-	-	5	2.660	0.220	
Mg	g/kg	-	-	5	3.870	0.130	
Na	g/kg	-	-	5	1.490	0.090	
P	g/kg	-	-	5	32.30	0.70	
Si	g/kg	-	-	4	34.03	6.88	

Sample : 405 Wheat (straw)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	0.1100	0.0140	
Ca	g/kg	-	-	5	3.300	0.100	
Fe	g/kg	-	-	5	0.1400	0.0370	
K	g/kg	-	-	5	16.30	1.39	
Mg	g/kg	-	-	5	0.4690	0.0310	
Na	g/kg	-	-	5	0.1300	0.0400	
P	g/kg	-	-	5	0.9700	0.1300	
Si	g/kg	-	-	4	20.53	1.65	

Sample : 411 Sugerbeet

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	0.6730	0.0830	
Ca	g/kg	-	-	5	5.600	0.620	
Fe	g/kg	-	-	5	0.5000	0.1300	
K	g/kg	-	-	5	8.500	6.287	
Mg	g/kg	-	-	5	1.900	0.390	
Na	g/kg	-	-	5	0.9000	0.0600	
P	g/kg	-	-	5	0.9000	0.1050	
Si	g/kg	-	-	4	7.356	4.555	

Sample : 412 Reed

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	13.80	6.27	
Ca	g/kg	-	-	5	6.390	1.290	
Fe	g/kg	-	-	5	7.500	2.010	
K	g/kg	-	-	5	16.40	3.73	
Mg	g/kg	-	-	5	2.200	0.510	
Na	g/kg	-	-	5	3.400	0.805	
P	g/kg	-	-	5	1.220	0.070	
Si	g/kg	-	-	4	92.34	22.96	

Sample : 422 Woodpellets

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	0.05452	0.03556	19	0.05000	0.02600	
Ca	g/kg	0.7761	0.2176	21	0.7500	0.1500	
Fe	g/kg	0.06007	0.03390	18	0.05950	0.02350	
K	g/kg	0.3767	0.0611	21	0.3760	0.0410	0.3489 - 0.4044
Mg	g/kg	0.1878	0.0311	21	0.1980	0.0200	0.1737 - 0.2019
Na	g/kg	0.1014	0.0431	21	0.1000	0.0300	
P	g/kg	0.05458	0.01019	20	0.05650	0.00650	0.04983 - 0.05933
Si	g/kg	0.1534	0.0558	16	0.1700	0.0400	

Sample : 424 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	1.400	0.644	
Ca	g/kg	-	-	5	24.30	2.00	
Fe	g/kg	-	-	5	1.100	0.210	
K	g/kg	-	-	5	2.130	0.330	
Mg	g/kg	-	-	5	7.370	0.970	
Na	g/kg	-	-	5	0.6400	0.0540	
P	g/kg	-	-	5	0.7000	0.0640	
Si	g/kg	-	-	4	8.300	3.720	

SECTION B - Major Elements

Sample : 438 Conifers

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	4	0.2050	0.0050	
Ca	g/kg	-	-	4	10.40	0.75	
Fe	g/kg	-	-	4	0.2200	0.0150	
K	g/kg	-	-	4	10.30	0.98	
Mg	g/kg	-	-	4	1.330	0.055	
Na	g/kg	-	-	4	0.1700	0.0350	
P	g/kg	-	-	4	1.485	0.075	
Si	g/kg	-	-	2	1.030	0.370	

Sample : 439 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	19.00	1.31	
Ca	g/kg	-	-	5	77.17	5.86	
Fe	g/kg	-	-	5	11.38	0.78	
K	g/kg	-	-	5	16.00	0.60	
Mg	g/kg	-	-	5	11.60	0.30	
Na	g/kg	-	-	5	4.600	0.130	
P	g/kg	-	-	5	2.720	0.190	
Si	g/kg	-	-	5	125.2	51.3	

Sample : 440 Rosa (plant) / Rosa l.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	0.09300	0.01300	
Ca	g/kg	-	-	5	5.000	0.260	
Fe	g/kg	-	-	5	0.1000	0.0400	
K	g/kg	-	-	5	7.900	0.340	
Mg	g/kg	-	-	5	1.332	0.032	
Na	g/kg	-	-	5	0.1220	0.0220	
P	g/kg	-	-	5	2.000	0.030	
Si	g/kg	-	-	4	0.7270	0.1270	

Sample : 441 Potato (tuber) / Solanum tuberosom

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	5	0.05000	0.01000	
Ca	g/kg	-	-	5	0.3000	0	
Fe	g/kg	-	-	4	0.04500	0.00600	
K	g/kg	-	-	5	18.61	0.71	
Mg	g/kg	-	-	5	0.8600	0.0730	
Na	g/kg	-	-	5	0.1000	0.0300	
P	g/kg	-	-	5	2.250	0.089	
Si	g/kg	-	-	4	0.2275	0.0250	

Sample : 442 Chinese Silver Grass / Miscanthus sp.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	6	0.5150	0.0800	
Ca	g/kg	-	-	6	3.000	0.145	
Fe	g/kg	-	-	6	0.3600	0.0230	
K	g/kg	-	-	6	3.380	0.305	
Mg	g/kg	-	-	6	0.8550	0.0460	
Na	g/kg	-	-	6	0.1920	0.0295	
P	g/kg	-	-	6	0.7515	0.0370	
Si	g/kg	-	-	5	8.200	4.890	

Sample : 443 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	6	17.70	3.45	
Ca	g/kg	-	-	6	55.30	2.74	
Fe	g/kg	-	-	6	12.22	1.10	
K	g/kg	-	-	6	17.10	0.88	
Mg	g/kg	-	-	6	8.395	0.500	
Na	g/kg	-	-	6	2.445	1.055	
P	g/kg	-	-	6	3.460	0.325	
Si	g/kg	-	-	5	105.7	47.0	

SECTION B - Major Elements

Sample : 444 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
Al	g/kg	-	-	6	17.50	1.80	
Ca	g/kg	-	-	6	56.90	4.16	
Fe	g/kg	-	-	6	43.35	3.13	
K	g/kg	-	-	6	3.600	0.365	
Mg	g/kg	-	-	6	6.225	0.825	
Na	g/kg	-	-	6	1.430	0.165	
P	g/kg	-	-	6	30.40	2.25	
Si	g/kg	-	-	5	37.34	8.14	

SECTION B - Minor Elements

Sample : 404 Sewage Sludge

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	5	10.70	0.30	
Ba	mg/kg	-	-	6	315.2	52.5	
Be	mg/kg	-	-	3	0.3000	0.1000	
Cd	mg/kg	-	-	6	1.880	0.445	
Co	mg/kg	-	-	6	5.750	0.870	
Cr	mg/kg	-	-	6	45.43	6.07	
Cu	mg/kg	-	-	6	368.7	34.3	
F	mg/kg	-	-	4	203.5	66.1	
Hg	mg/kg	-	-	5	1.520	0.140	
Mn	mg/kg	-	-	6	487.0	77.0	
Mo	mg/kg	-	-	6	6.315	0.800	
Ni	mg/kg	-	-	6	35.75	2.93	
Pb	mg/kg	-	-	6	153.6	5.3	
Sb	mg/kg	-	-	5	3.300	0.500	
Se	mg/kg	-	-	4	1.930	0.370	
Sn	mg/kg	-	-	6	31.73	2.70	
Te	mg/kg	-	-	1	1.170	-	
Ti	mg/kg	-	-	5	1570	230	
Tl	mg/kg	-	-	1	1.170	-	
V	mg/kg	-	-	6	14.85	1.00	
Zn	mg/kg	-	-	6	1095	63	

Sample : 405 Wheat (straw)

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	4	0.4590	0.1655	
Ba	mg/kg	-	-	6	36.65	8.40	
Be	mg/kg	-	-	1	0.1000	-	
Cd	mg/kg	-	-	5	0.3350	0.0350	
Co	mg/kg	-	-	2	0.3050	0.2950	
Cr	mg/kg	-	-	4	1.210	0.410	
Cu	mg/kg	-	-	3	3.000	0.150	
F	mg/kg	-	-	3	19.00	7.00	
Hg	mg/kg	-	-	2	0.7225	0.6975	
Mn	mg/kg	-	-	6	26.86	3.85	
Mo	mg/kg	-	-	3	1.0000	0.7000	
Ni	mg/kg	-	-	4	0.4500	0.1500	
Pb	mg/kg	-	-	5	8.200	0.220	
Se	mg/kg	-	-	1	0.2000	-	
Sn	mg/kg	-	-	2	0.6500	0.4500	
Te	mg/kg	-	-	1	0.2000	-	
Ti	mg/kg	-	-	4	8.080	4.900	
Tl	mg/kg	-	-	1	0.2000	-	
V	mg/kg	-	-	3	0.8000	0.3000	
Zn	mg/kg	-	-	5	12.30	4.20	

Sample : 411 Sugerbeet

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	3	0.9000	0.1800	
Ba	mg/kg	-	-	6	13.43	1.44	
Cd	mg/kg	-	-	5	0.4220	0.0130	
Co	mg/kg	-	-	3	0.1300	0.0300	
Cr	mg/kg	-	-	5	3.790	1.110	
Cu	mg/kg	-	-	7	11.36	0.74	
F	mg/kg	-	-	2	9.400	2.600	
Hg	mg/kg	-	-	1	0.01700	-	
Mn	mg/kg	-	-	7	56.40	1.30	
Mo	mg/kg	-	-	3	0.5000	0.3000	
Ni	mg/kg	-	-	5	1.300	0.310	
Pb	mg/kg	-	-	4	1.365	0.410	
Sb	mg/kg	-	-	1	3.300	-	
Se	mg/kg	-	-	2	0.3750	0.2750	
Sn	mg/kg	-	-	1	1.500	-	
Ti	mg/kg	-	-	5	80.00	58.87	
V	mg/kg	-	-	4	0.5200	0.1200	
Zn	mg/kg	-	-	7	37.50	0.50	

SECTION B - Minor Elements

Sample : 412 Reed

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	6	3.050	0.320	
Ba	mg/kg	-	-	6	51.31	6.44	
Be	mg/kg	-	-	4	0.3300	0.0750	
Cd	mg/kg	-	-	4	0.3650	0.1845	
Co	mg/kg	-	-	6	2.610	0.220	
Cr	mg/kg	-	-	7	17.00	1.20	
Cu	mg/kg	-	-	7	10.79	1.29	
F	mg/kg	-	-	4	77.05	12.75	
Hg	mg/kg	-	-	4	0.03850	0.00160	
Mn	mg/kg	-	-	7	126.7	7.1	
Mo	mg/kg	-	-	6	1.480	0.270	
Ni	mg/kg	-	-	7	9.020	0.570	
Pb	mg/kg	-	-	7	9.560	1.210	
Sb	mg/kg	-	-	3	7.340	3.060	
Se	mg/kg	-	-	4	0.9750	0.1800	
Sn	mg/kg	-	-	5	1.0000	0.5000	
Ti	mg/kg	-	-	5	717.0	559.0	
Tl	mg/kg	-	-	2	1.145	0.945	
V	mg/kg	-	-	6	12.45	2.42	
Zn	mg/kg	-	-	7	43.00	1.00	

Sample : 422 Woodpellets

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	7	0.8000	0.5530	
Ba	mg/kg	5.020	0.709	22	5.300	0.550	4.707 - 5.334
Cd	mg/kg	0.08677	0.03497	13	0.10200	0.02500	
Co	mg/kg	-	-	6	1.450	0.400	
Cr	mg/kg	1.451	1.110	11	1.100	0.800	
Cu	mg/kg	1.417	0.712	10	1.412	0.500	
F	mg/kg	-	-	5	17.00	3.00	
Hg	mg/kg	-	-	7	0.01100	0.00800	
Mn	mg/kg	78.72	12.52	24	77.22	7.90	73.44 - 83.99
Mo	mg/kg	0.4339	0.5526	10	0.3500	0.3200	
Ni	mg/kg	0.6040	0.2923	16	0.6425	0.1875	
Pb	mg/kg	0.3957	0.4344	13	0.4000	0.3000	
Sb	mg/kg	-	-	3	0.3000	0.2900	
Se	mg/kg	-	-	2	0.5000	0.2000	
Sn	mg/kg	-	-	7	0.9000	0.4000	
Ti	mg/kg	3.288	0.940	12	3.300	0.580	
Tl	mg/kg	-	-	1	1.040	-	
V	mg/kg	0.2378	0.2510	8	0.2500	0.1850	
Zn	mg/kg	10.80	3.58	20	9.95	2.50	

Sample : 424 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	5	1.160	0.374	
Ba	mg/kg	-	-	6	9.840	2.740	
Cd	mg/kg	-	-	6	0.2345	0.0220	
Co	mg/kg	-	-	4	0.6150	0.3000	
Cr	mg/kg	-	-	6	3.585	0.760	
Cu	mg/kg	-	-	7	13.69	0.96	
F	mg/kg	-	-	3	23.30	2.50	
Hg	mg/kg	-	-	4	0.03645	0.00450	
Mn	mg/kg	-	-	7	53.60	4.40	
Mo	mg/kg	-	-	5	13.78	0.42	
Ni	mg/kg	-	-	5	1.630	0.270	
Pb	mg/kg	-	-	7	15.50	3.40	
Sb	mg/kg	-	-	3	0.7000	0.3000	
Se	mg/kg	-	-	3	0.9000	0.2600	
Sn	mg/kg	-	-	2	1.250	0.950	
Ti	mg/kg	-	-	5	104.0	50.0	
V	mg/kg	-	-	5	2.200	0.600	
Zn	mg/kg	-	-	7	38.80	6.20	

SECTION B - Minor Elements

Sample : 438 Conifers

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	4	0.4900	0.1505	
Ba	mg/kg	-	-	6	15.40	0.90	
Be	mg/kg	-	-	1	0.1000	-	
Cd	mg/kg	-	-	5	0.6330	0.0500	
Co	mg/kg	-	-	6	1.320	0.110	
Cr	mg/kg	-	-	4	1.085	0.485	
Cu	mg/kg	-	-	3	4.400	0.050	
F	mg/kg	-	-	3	19.00	11.10	
Hg	mg/kg	-	-	3	0.03400	0.01200	
Mn	mg/kg	-	-	6	416.2	31.1	
Mo	mg/kg	-	-	3	0.5000	0.4000	
Ni	mg/kg	-	-	6	4.240	0.575	
Pb	mg/kg	-	-	6	11.26	1.00	
Sb	mg/kg	-	-	2	0.4000	0.3000	
Se	mg/kg	-	-	1	0.5530	-	
Sn	mg/kg	-	-	4	0.5000	0.2850	
Te	mg/kg	-	-	1	0.02000	-	
Ti	mg/kg	-	-	4	12.16	7.05	
Tl	mg/kg	-	-	1	0.2000	-	
V	mg/kg	-	-	3	0.2000	0.1600	
Zn	mg/kg	-	-	6	325.9	20.1	

Sample : 439 Compost

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	4	5.705	0.930	
Ba	mg/kg	-	-	6	96.20	11.08	
Be	mg/kg	-	-	3	0.5600	0.1400	
Cd	mg/kg	-	-	5	0.3520	0.0520	
Co	mg/kg	-	-	6	5.325	0.409	
Cr	mg/kg	-	-	6	84.10	12.65	
Cu	mg/kg	-	-	6	39.45	3.68	
F	mg/kg	-	-	3	153.5	51.5	
Hg	mg/kg	-	-	4	0.2300	0.0450	
Mn	mg/kg	-	-	6	443.2	28.7	
Mo	mg/kg	-	-	5	3.220	0.435	
Ni	mg/kg	-	-	6	20.91	1.51	
Pb	mg/kg	-	-	6	33.72	3.45	
Sb	mg/kg	-	-	3	1.500	0.161	
Se	mg/kg	-	-	2	0.2500	0.0500	
Sn	mg/kg	-	-	5	2.990	0.210	
Ti	mg/kg	-	-	5	401.0	189.4	
Tl	mg/kg	-	-	1	0.2000	-	
V	mg/kg	-	-	6	26.40	4.55	
Zn	mg/kg	-	-	6	145.5	7.0	

Sample : 440 Rosa (plant) / Rosa l.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	4	0.4575	0.0500	
Ba	mg/kg	-	-	6	5.145	1.210	
Cd	mg/kg	-	-	3	0.1490	0.0560	
Co	mg/kg	-	-	2	1.050	0.550	
Cr	mg/kg	-	-	2	1.883	0.218	
Cu	mg/kg	-	-	3	3.444	0.106	
F	mg/kg	-	-	2	32.04	22.34	
Hg	mg/kg	-	-	1	0.01100	-	
Mn	mg/kg	-	-	6	39.15	2.03	
Mo	mg/kg	-	-	2	0.8500	0.5500	
Ni	mg/kg	-	-	3	0.7000	0.1460	
Pb	mg/kg	-	-	4	1.613	0.313	
Sb	mg/kg	-	-	2	0.2550	0.0450	
Sn	mg/kg	-	-	1	1.300	-	
Ti	mg/kg	-	-	4	3.410	1.437	
V	mg/kg	-	-	1	0.6000	-	
Zn	mg/kg	-	-	5	47.30	2.13	

SECTION B - Minor Elements

Sample : 441 Potato (tuber) / Solanum tuberosom

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	1	0.2410	-	
Ba	mg/kg	-	-	1	7.711	-	
Cd	mg/kg	-	-	2	0.08500	0.00400	
Cr	mg/kg	-	-	2	1.624	0.576	
Cu	mg/kg	-	-	4	7.410	0.315	
F	mg/kg	-	-	2	14.43	6.83	
Hg	mg/kg	-	-	2	3.206	3.195	
Mn	mg/kg	-	-	5	5.810	0.590	
Mo	mg/kg	-	-	2	0.5000	0.1000	
Ni	mg/kg	-	-	2	0.4630	0.1370	
Pb	mg/kg	-	-	4	0.6910	0.3600	
Sb	mg/kg	-	-	2	180.2	180.0	
Se	mg/kg	-	-	1	0.06000	-	
Te	mg/kg	-	-	1	23778	-	
Ti	mg/kg	-	-	4	1.805	0.440	
Tl	mg/kg	-	-	1	4.400	-	
V	mg/kg	-	-	2	0.3700	0.2300	
Zn	mg/kg	-	-	4	21.62	2.03	

Sample : 442 Chinese Silver Grass / Miscanthus sp.

Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	4	0.5655	0.1870	
Ba	mg/kg	-	-	7	19.00	1.47	
Cd	mg/kg	-	-	3	0.1100	0.0050	
Co	mg/kg	-	-	1	2.700	-	
Cr	mg/kg	-	-	3	3.300	1.770	
Cu	mg/kg	-	-	5	4.420	0.680	
F	mg/kg	-	-	3	8.200	8.179	
Hg	mg/kg	-	-	3	0.02200	0.00700	
Mn	mg/kg	-	-	7	71.00	2.00	
Mo	mg/kg	-	-	4	1.300	0.172	
Ni	mg/kg	-	-	3	0.6840	0.1840	
Pb	mg/kg	-	-	5	2.740	0.260	
Sb	mg/kg	-	-	1	0.2000	-	
Se	mg/kg	-	-	2	3.300	3.200	
Sn	mg/kg	-	-	2	0.7000	0.4000	
Te	mg/kg	-	-	1	1.080	-	
Ti	mg/kg	-	-	4	28.55	13.45	
V	mg/kg	-	-	2	1.350	0.050	
Zn	mg/kg	-	-	6	27.75	4.75	

Sample : 443 Compost

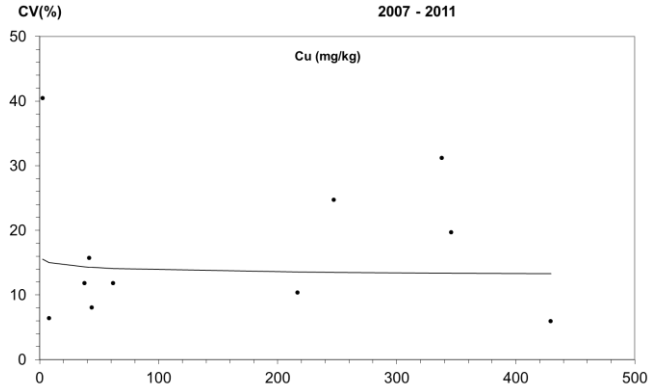
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	6	5.740	0.868	
Ba	mg/kg	-	-	7	139.0	17.0	
Be	mg/kg	-	-	2	0.6070	0.1930	
Cd	mg/kg	-	-	5	0.4140	0.1080	
Co	mg/kg	-	-	7	5.080	0.680	
Cr	mg/kg	-	-	7	91.80	21.20	
Cu	mg/kg	-	-	7	51.00	4.23	
F	mg/kg	-	-	4	96.93	96.90	
Hg	mg/kg	-	-	4	0.1225	0.0375	
Mn	mg/kg	-	-	7	424.6	29.6	
Mo	mg/kg	-	-	6	3.795	0.600	
Ni	mg/kg	-	-	7	25.20	3.70	
Pb	mg/kg	-	-	7	59.40	3.00	
Sb	mg/kg	-	-	4	2.055	0.450	
Se	mg/kg	-	-	2	0.7000	0.3000	
Sn	mg/kg	-	-	6	4.975	1.975	
Ti	mg/kg	-	-	5	1300	48	
Tl	mg/kg	-	-	1	0.3000	-	
V	mg/kg	-	-	6	24.40	4.54	
Zn	mg/kg	-	-	7	198.0	18.0	

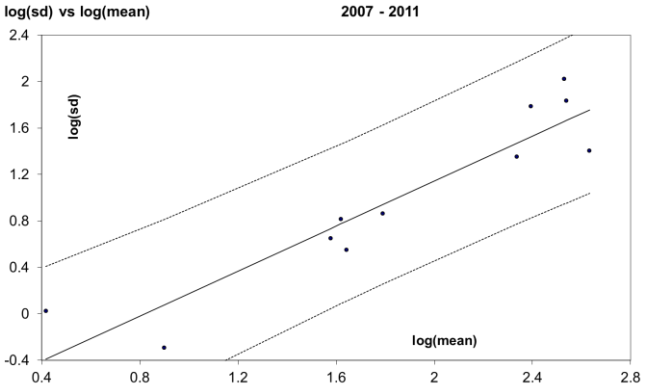
SECTION B - Minor Elements

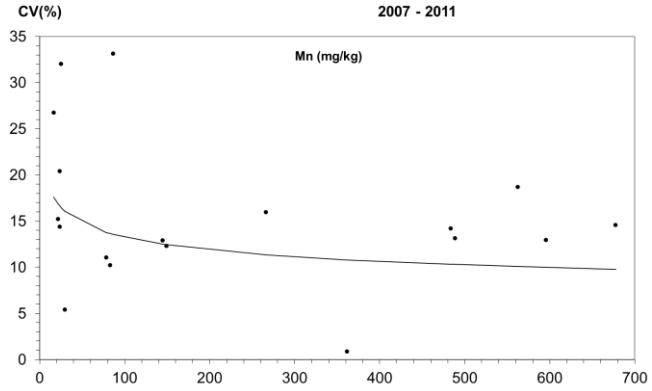
Sample : 444 Sewage Sludge

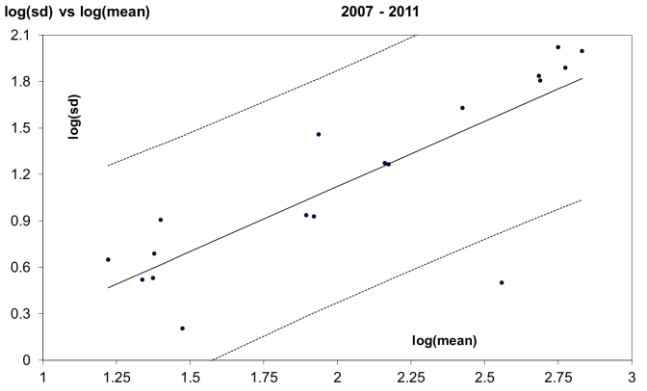
Element	Unit	Mean	Sd	N	Median	MAD	95 % confidence limits
As	mg/kg	-	-	5	5.300	0.610	
Ba	mg/kg	-	-	7	417.0	9.0	
Be	mg/kg	-	-	1	0.3000	-	
Cd	mg/kg	-	-	7	1.400	0.200	
Co	mg/kg	-	-	7	6.770	1.160	
Cr	mg/kg	-	-	7	78.88	4.88	
Cu	mg/kg	-	-	7	262.1	17.1	
F	mg/kg	-	-	4	105.1	105.0	
Hg	mg/kg	-	-	6	1.114	0.271	
Mn	mg/kg	-	-	7	376.0	36.0	
Mo	mg/kg	-	-	7	5.700	0.180	
Ni	mg/kg	-	-	7	37.30	4.70	
Pb	mg/kg	-	-	7	52.80	7.80	
Sb	mg/kg	-	-	4	3.770	0.800	
Se	mg/kg	-	-	4	1.500	0.536	
Sn	mg/kg	-	-	6	31.10	2.65	
Ti	mg/kg	-	-	5	1404	196	
V	mg/kg	-	-	6	10.50	1.51	
Zn	mg/kg	-	-	7	609.9	14.1	

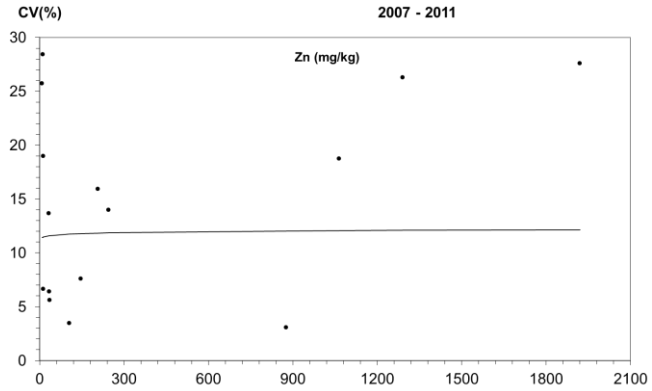
SECTION B - Minor Elements

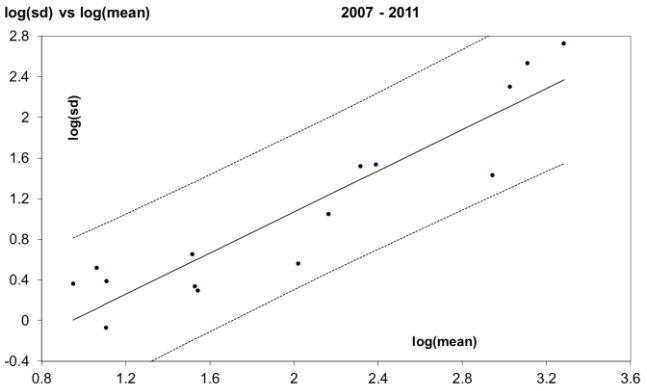












SECTION C

SECTION C - General Analysis

Ash (g/kg)

Labnr	Median	MAD	N	MIC
7	3.60	-	1	
145	3.25	-	1	
460	2.80	0.850	4	
755	2.61	0.580	4	
821	3.05	0.050	4	
900	2.00	0.450	4	
904	4.20	-	1	
916	4.00	0	2	
919	3.15	0.127	3	
968	4.00	-	1	
985	3.00	1.000	4	
1050	5.47	-	1	
1055	3.46	0.515	4	
1057	1.35	0.985	4	
1060	3.30	0.250	4	
1064	3.30	1.150	4	
1065	3.27	-	1	
1080	2.95	1.350	2	
Overall	3.25	0.750	49	

Volatile Matter (g/kg)

Labnr	Median	MAD	N	MIC
460	838	0.5	4	
821	851	1.9	4	
900	850	1.8	4	
916	860	0.5	2	
919	854	0.2	3	
968	996	-	1	
985	841	5.6	4	
1055	857	0.6	4	
1057	880	2.3	2	
1060	997	0.4	4	
1064	841	0.5	4	
1065	997	-	1	
1080	852	0.3	2	
Overall	853	6.8	39	

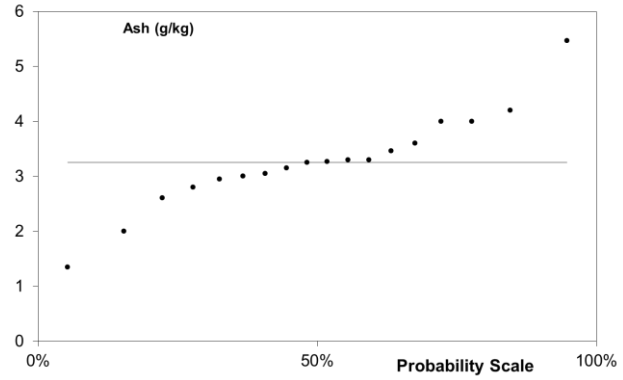
Calorific Value (gross) (MJ/kg)

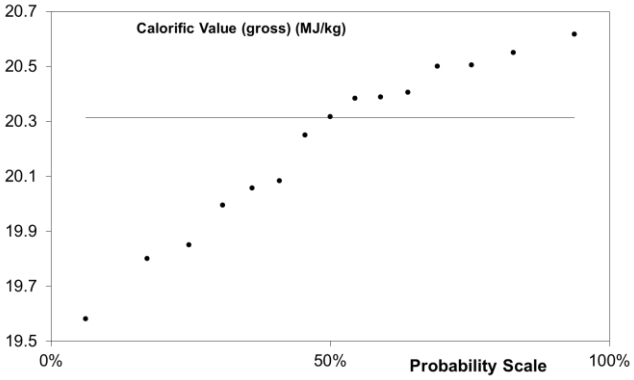
Labnr	Median	MAD	N	MIC
7	20.5	-	1	
145	19.9	0.12	2	
460	20.3	0.10	4	
755	20.4	0.08	4	
821	20.5	0.03	4	
900	20.6	0.07	4	
904	19.8	-	1	
916	20.3	0.03	2	
919	20.1	0.24	2	
985	20.4	0.03	4	
1050	18.8	-	1	
1055	20.1	0.11	4	
1057	19.6	0.14	4	
1060	20.0	0.17	4	
1064	20.6	0.02	4	
1065	17.5	-	1	
1080	20.4	0.31	2	
Overall	20.3	0.23	48	

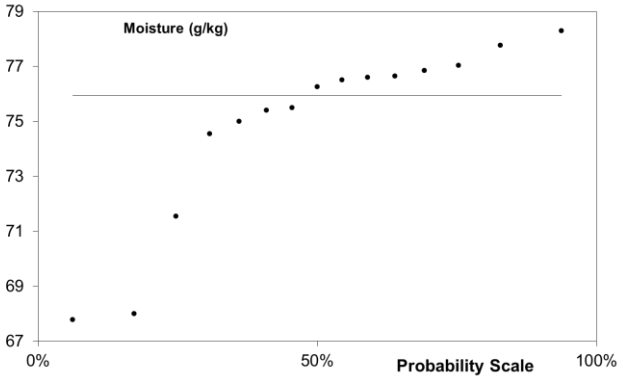
Moisture (g/kg)

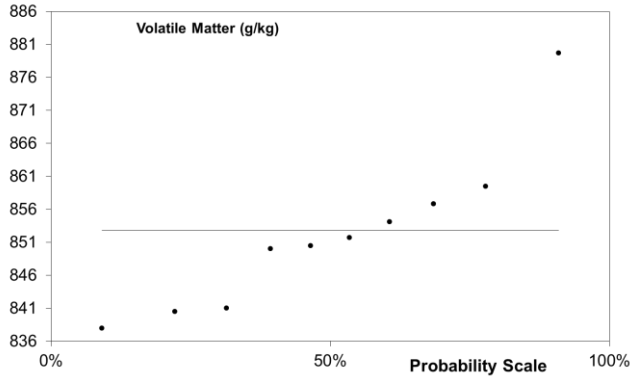
Labnr	Median	MAD	N	MIC
7	75.4	-	1	
145	76.6	0.70	2	
460	75.0	1.55	4	
755	77.0	0.64	4	
821	76.7	1.05	4	
900	78.3	0.90	4	
904	51.8	-	1	
916	76.5	0.50	2	
919	77.8	3.90	4	
968	68.0	-	1	
985	75.5	0.50	4	
1055	71.6	0.28	4	
1057	67.8	2.26	4	
1060	76.9	0.85	4	
1064	76.3	0.60	4	
1065	51.5	-	1	
1080	74.6	2.45	2	
Overall	76.0	1.85	50	

SECTION C - General Analysis









SECTION C - Elementary Analysis

Carbon (C) (g/kg)

Labnr	Median	MAD	N	MIC
7	509	-	1	
145	509	3.1	2	
460	498	2.0	4	
755	509	11.9	4	
821	508	1.1	4	
900	521	1.7	4	
904	497	-	1	
916	507	1.5	2	
919	508	2.9	4	
985	512	3.0	4	
1055	509	6.4	4	
1057	505	0.7	4	
1060	543	9.2	4	
1064	508	0.5	4	
1065	485	-	1	
1080	510	5.7	2	
Overall	508	5.2	49	

Cl (g/kg)

Labnr	Median	MAD	N	MIC
460	0.0595	0.0110	4	
755	0.0885	0.0150	4	
821	0.1000	0.0165	4	
900	0.4700	-	1	
919	0.1235	0.0183	4	
985	0.2000	0.1000	4	
1055	0.4055	0.1425	4	
1060	0.0590	0.0140	3	
1064	0.0400	-	1	
1065	0.0820	-	1	
1080	0.2640	-	1	
Overall	0.1000	0.0380	31	

Hydrogen (H) (g/kg)

Labnr	Median	MAD	N	MIC
145	61.6	1.20	2	
460	65.3	1.35	4	
755	61.9	0.38	4	
821	61.9	0.30	4	
900	63.6	0.30	4	
904	62.7	-	1	
916	61.3	0.05	2	
919	66.2	2.97	4	
985	59.4	0.70	4	
1055	62.2	1.44	4	
1057	61.9	0.14	4	
1064	64.0	0	4	
1065	61.7	-	1	
1080	65.0	2.00	2	
Overall	62.6	1.21	44	

Nitrogen (N) (g/kg)

Labnr	Median	MAD	N	MIC
7	0.760	-	1	
145	0.665	0.3650	2	
460	0.950	0.3950	4	
755	2.595	0.2700	4	
821	1.160	0.1600	4	
900	0.800	0	3	
904	1.570	-	1	
916	1.400	1.1000	2	
919	2.174	-	1	
985	4.200	-	1	
1050	0.670	-	1	

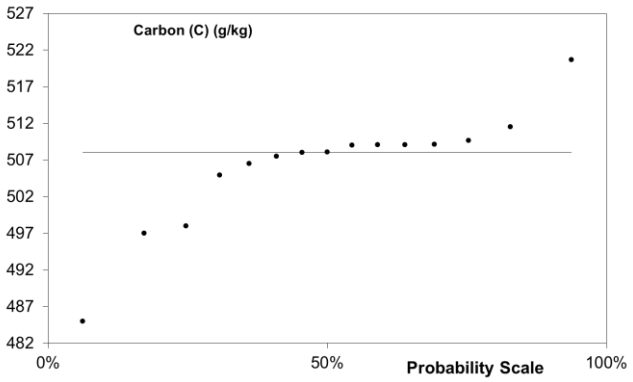
Nitrogen (N) (g/kg) (cont.)

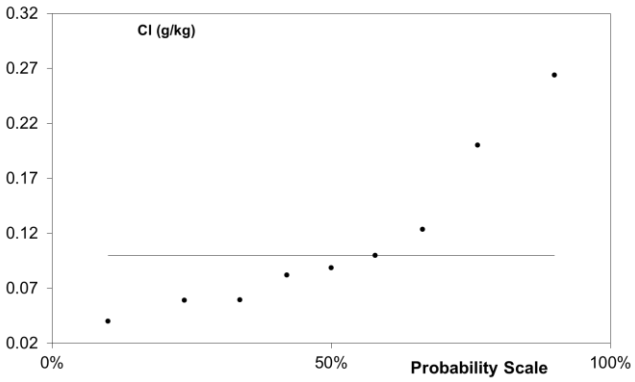
Labnr	Median	MAD	N	MIC
1055	1.017	0.3465	4	
1057	0.475	0.2050	4	
1060	0.809	0.0950	4	
1064	7.100	-	1	
1065	0.650	-	1	
1080	1.950	0.4500	2	
Overall	0.965	0.4100	40	

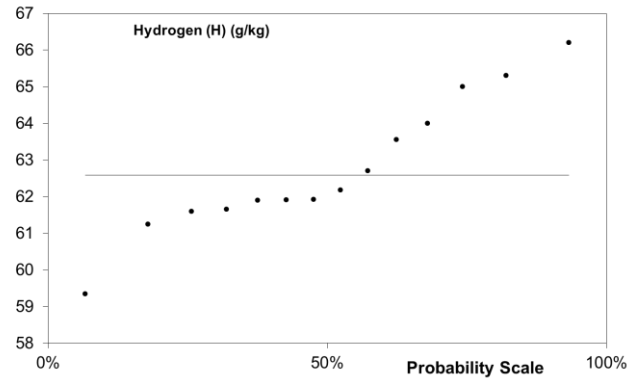
S (g/kg)

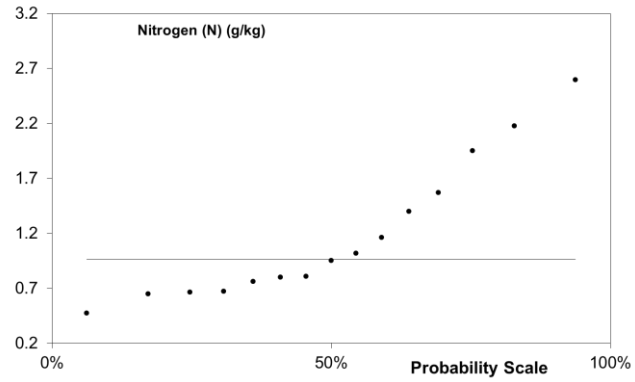
Labnr	Median	MAD	N	MIC
460	0.0710	0.0160	4	
755	0.0600	0.0050	4	
821	0.1000	0	4	
900	0.6550	0.4500	4	
916	0.2500	0.0500	2	
1060	0.0500	0.0010	3	
1064	0.1000	0	3	
1065	0.0240	-	1	
Overall	0.1000	0.0480	25	

SECTION C - Elementary Analysis









SECTION C - Water Soluble Elements

Cl (g/kg)

Labnr	Median	MAD	N	MIC
919	0.0890	0.0222	4	
968	0.3900	-	1	
1055	0.0350	0.0130	3	
1064	0.1200	0.0100	3	
Overall	0.0713	0.0363	11	

K (g/kg)

Labnr	Median	MAD	N	MIC
919	0.376	0.0063	2	
1055	0.302	0.0865	4	
Overall	0.350	0.0540	6	

Na (g/kg)

Labnr	Median	MAD	N	MIC
919	0.143	0.0359	2	
1055	0.105	0.0520	4	
Overall	0.113	0.0442	6	

SECTION C - Major Elements

Al (g/kg)

Labnr	Median	MAD	N	MIC
821	0.0400	0	4	
916	0.0410	0.0010	2	
985	0.1000	0	3	
1055	0.0695	0.0085	4	
1060	0.0505	0.0315	4	
1080	0.0600	0.0300	2	
Overall	0.0500	0.0260	19	

Ca (g/kg)

Labnr	Median	MAD	N	MIC
821	0.700	0.0150	4	
916	0.975	0.1250	2	
968	0.680	-	1	
985	0.800	0.1500	4	
1055	1.172	0.1335	4	
1060	0.766	0.1445	4	
1080	0.535	0.2150	2	
Overall	0.750	0.1500	21	

Fe (g/kg)

Labnr	Median	MAD	N	MIC
821	0.0500	0	4	
916	0.0670	0.0070	2	
985	13.5500	13.4500	2	
1055	0.1065	0.0220	4	
1060	0.0405	0.0075	4	
1080	0.0750	0.0450	2	
Overall	0.0595	0.0235	18	

K (g/kg)

Labnr	Median	MAD	N	MIC
821	0.270	0.0350	4	
916	0.500	0.0505	2	
968	0.380	-	1	
985	0.400	0.0500	4	
1055	0.385	0.0100	4	
1060	0.391	0.0235	4	
1080	0.240	0.1200	2	
Overall	0.376	0.0410	21	

Mg (g/kg)

Labnr	Median	MAD	N	MIC
821	0.165	0.0100	4	
916	0.249	0.0310	2	
968	0.120	-	1	
985	0.200	0	4	
1055	0.199	0.0140	4	
1060	0.179	0.0240	4	
1080	0.140	0.0600	2	
Overall	0.198	0.0200	21	

Na (g/kg)

Labnr	Median	MAD	N	MIC
821	0.0750	0.0050	4	
916	0.0915	0.0045	2	
968	0.120	-	1	
985	0.600	0.5000	4	
1055	0.174	0.0130	4	
1060	0.0910	0.0165	4	
1080	0.110	0.0400	2	
Overall	0.100	0.0300	21	

P (g/kg)

Labnr	Median	MAD	N	MIC
821	0.0500	0	4	
916	0.0710	0.0080	2	
968	0.0240	-	1	
985	0.1000	0	3	
1055	0.0600	0.0015	4	
1060	0.0430	0.0090	4	
1080	0.0450	0.0150	2	
Overall	0.0565	0.0065	20	

Si (g/kg)

Labnr	Median	MAD	N	MIC
821	0.170	0.0100	4	
916	0.108	0.0025	2	
985	0.300	0.1500	4	
1055	0.174	0.0210	2	
1060	0.155	0.0350	2	
1080	0.200	0.1000	2	
Overall	0.170	0.0400	16	

SECTION C - Minor Elements

As (mg/kg)

Labnr	Median	MAD	N	MIC
985	1.500	0.4000	4	
1055	0.247	0.0360	3	
Overall	0.800	0.5530	7	

Ba (mg/kg)

Labnr	Median	MAD	N	MIC
821	4.95	0.150	4	
900	5.25	0.100	4	
916	4.40	0.300	2	
985	8.95	0.400	4	
1055	12.41	1.220	4	
1060	5.06	0.285	4	
Overall	5.30	0.550	22	

Cd (mg/kg)

Labnr	Median	MAD	N	MIC
900	0.0820	0.0030	4	
916	0.0250	0.0050	2	
985	2.3000	0.1500	4	
1055	0.1080	0.0050	3	
Overall	0.1020	0.0250	13	

Co (mg/kg)

Labnr	Median	MAD	N	MIC
916	0.0250	0.005	2	
985	1.65	0.200	4	
Overall	1.45	0.400	6	

Cr (mg/kg)

Labnr	Median	MAD	N	MIC
821	2.25	0.150	4	
916	0.550	0.250	2	
985	0.700	-	1	
1055	1.53	0.660	4	
Overall	1.10	0.800	11	

Cu (mg/kg)

Labnr	Median	MAD	N	MIC
821	1.70	0.450	4	
916	0.650	0.050	2	
1055	1.53	0.319	4	
Overall	1.41	0.500	10	

F (mg/kg)

Labnr	Median	MAD	N	MIC
821	14.5	3.00	4	
916	20.0	-	1	
Overall	17.0	3.00	5	

Hg (mg/kg)

Labnr	Median	MAD	N	MIC
821	0.0095	0.0010	4	
985	0.2000	0.1000	2	
1060	0.2130	-	1	
Overall	0.0110	0.0080	7	

Mn (mg/kg)

Labnr	Median	MAD	N	MIC
821	73.0	0	4	
900	73.4	0.85	4	
916	100.0	7.00	2	
968	74.0	-	1	
985	106.2	5.50	4	
1055	92.5	4.76	4	
1060	71.8	5.05	4	
1065	64.4	-	1	
Overall	77.2	7.90	24	

Mo (mg/kg)

Labnr	Median	MAD	N	MIC
821	0.300	0.0500	4	
916	0.0300	0.0100	2	
985	1.450	0.2000	4	
Overall	0.350	0.3200	10	

Ni (mg/kg)

Labnr	Median	MAD	N	MIC
821	0.650	0.0500	4	
916	0.200	0	2	
985	0.400	0.2500	4	
1055	0.773	0.1400	4	
1060	1.135	0.1250	2	
Overall	0.643	0.1875	16	

Pb (mg/kg)

Labnr	Median	MAD	N	MIC
821	0.700	0.1000	4	
900	0.110	0.0400	4	
916	0.100	0	2	
1055	0.897	0.1130	3	
Overall	0.400	0.3000	13	

Sb (mg/kg)

Labnr	Median	MAD	N	MIC
916	2.255	2.2450	2	
985	0.300	-	1	
Overall	0.300	0.2900	3	

Se (mg/kg)

Labnr	Median	MAD	N	MIC
916	0.300	-	1	
1055	0.700	-	1	
Overall	0.500	0.2000	2	

Sn (mg/kg)

Labnr	Median	MAD	N	MIC
900	0.300	-	1	
916	0.0300	0.0100	2	
985	1.050	0.1000	4	
Overall	0.900	0.4000	7	

Ti (mg/kg)

Labnr	Median	MAD	N	MIC
821	3.30	0.250	4	
916	4.05	0.350	2	
1055	1.82	0.331	2	
1060	2.52	1.325	4	

SECTION C - Minor Elements

Ti (mg/kg) (cont.)

Labnr	Median	MAD	N	MIC
Overall	3.30	0.580	12	

Tl (mg/kg)

Labnr	Median	MAD	N	MIC
1055	1.04	-	1	
Overall	1.04	-	1	

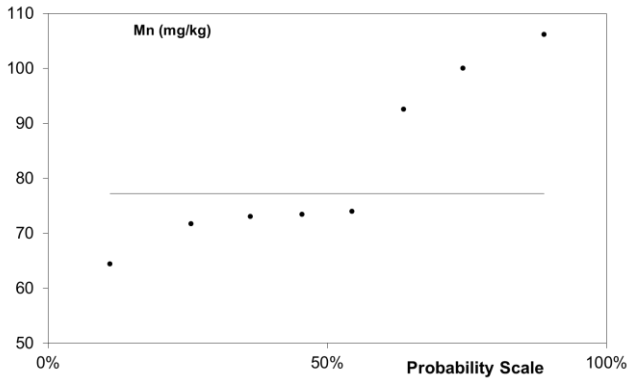
V (mg/kg)

Labnr	Median	MAD	N	MIC
821	0.500	0	3	
916	0.0300	0	2	
985	0.200	0.1000	3	
Overall	0.250	0.1850	8	

Zn (mg/kg)

Labnr	Median	MAD	N	MIC
821	8.30	0.70	4	
900	9.35	0.30	4	
916	2.92	2.89	2	
968	9.90	-	1	
985	14.4	0.90	4	
1055	12.8	0.27	4	
1065	10.9	-	1	
Overall	9.95	2.50	20	

SECTION C - Minor Elements



SECTION D

SECTION D - Outliers and Z-scores per Participant

ATVC (7)		N	<	*/**	Zavg
Ash	(GEN)	4	-	1	0.85
Calorific Value (gross)	(GEN)	4	-	-	0.15
Moisture	(GEN)	4	-	1	-0.76
Carbon (C)	(ELEM)	4	-	-	-0.22
Cl	(ELEM)	4	1	-	0.14
Nitrogen (N)	(ELEM)	4	-	-	-0.45
S	(ELEM)	4	1	-	0.21

IFPO (145)		N	<	*/**	Zavg
Ash	(GEN)	7	-	-	0.23
Calorific Value (gross)	(GEN)	8	-	2	-2.65
Moisture	(GEN)	8	-	3	0.50
Carbon (C)	(ELEM)	8	-	-	-0.15
Hydrogen (H)	(ELEM)	8	-	1	-0.43
Nitrogen (N)	(ELEM)	8	-	-	-0.13

ECN (460)		N	<	*/**	Zavg
Ash	(GEN)	16	-	2	-0.60
Calorific Value (gross)	(GEN)	16	-	1	-0.07
Moisture	(GEN)	16	-	2	0.00
Volatile Matter	(GEN)	16	-	-	-1.01
Carbon (C)	(ELEM)	16	-	4	-1.22
Cl	(ELEM)	16	-	1	0.00
Hydrogen (H)	(ELEM)	16	-	3	1.41
Nitrogen (N)	(ELEM)	16	-	2	0.24
S	(ELEM)	16	-	-	0.06

NGGBUG (755)		N	<	*/**	Zavg
Ash	(GEN)	16	-	2	-0.58
Calorific Value (gross)	(GEN)	16	-	-	0.29
Moisture	(GEN)	16	-	-	0.32
Carbon (C)	(ELEM)	16	-	2	0.30
Cl	(ELEM)	16	-	-	0.10
Hydrogen (H)	(ELEM)	16	-	1	-0.43
Nitrogen (N)	(ELEM)	16	-	6	1.91
S	(ELEM)	16	-	3	6.85

INCOLAB (821)		N	<	*/**	Zavg
Ash	(GEN)	16	-	-	-0.16
Calorific Value (gross)	(GEN)	16	-	-	0.45
Moisture	(GEN)	16	-	-	0.13
Volatile Matter	(GEN)	16	-	-	-0.03
Carbon (C)	(ELEM)	16	-	-	0.01
Cl	(ELEM)	16	-	-	0.10
Hydrogen (H)	(ELEM)	16	-	-	-0.17
Nitrogen (N)	(ELEM)	16	-	-	-0.02
S	(ELEM)	16	-	-	0.19
Al	(MAJOR)	16	-	-	-
Ca	(MAJOR)	16	-	-	-
Fe	(MAJOR)	16	-	-	-
K	(MAJOR)	16	-	-	-
Mg	(MAJOR)	16	-	-	-
Na	(MAJOR)	16	-	-	-
P	(MAJOR)	16	-	-	-
Si	(MAJOR)	16	-	-	-
As	(MINOR)	16	6	-	-
Ba	(MINOR)	16	1	-	-
Be	(MINOR)	16	11	-	-
Cd	(MINOR)	16	7	-	-
Co	(MINOR)	16	8	-	-
Cr	(MINOR)	16	-	-	-
Cu	(MINOR)	16	-	-	-
F	(MINOR)	16	-	-	-
Hg	(MINOR)	16	-	-	-
Mn	(MINOR)	16	-	-	-
Mo	(MINOR)	16	-	-	-
Ni	(MINOR)	16	-	-	-
Pb	(MINOR)	16	-	-	-

INCOLAB (821) (cont.)		N	<	*/**	Zavg
Sb	(MINOR)	16	9	-	-
Se	(MINOR)	16	16	-	-
Sn	(MINOR)	16	8	-	-
Te	(MINOR)	16	16	-	-
Ti	(MINOR)	16	-	-	-
Tl	(MINOR)	16	13	-	-
V	(MINOR)	16	1	-	-
Zn	(MINOR)	16	-	-	-

TLR (900)		N	<	*/**	Zavg
Ash	(GEN)	16	-	-	-0.02
Calorific Value (gross)	(GEN)	16	-	3	1.17
Moisture	(GEN)	16	-	1	1.31
Volatile Matter	(GEN)	16	-	-	-0.41
Carbon (C)	(ELEM)	16	-	4	1.46
Cl	(ELEM)	16	3	4	3.28
Hydrogen (H)	(ELEM)	16	-	-	0.73
Nitrogen (N)	(ELEM)	16	1	-	0.00
S	(ELEM)	16	-	6	1.00
As	(MINOR)	16	5	-	-
Ba	(MINOR)	16	1	-	-
Cd	(MINOR)	16	-	-	-
Co	(MINOR)	16	8	-	-
Cr	(MINOR)	16	11	-	-
Cu	(MINOR)	16	8	-	-
F	(MINOR)	16	6	-	-
Hg	(MINOR)	16	9	-	-
Mn	(MINOR)	16	-	-	-
Mo	(MINOR)	16	9	-	-
Ni	(MINOR)	16	10	-	-
Pb	(MINOR)	16	-	-	-
Sb	(MINOR)	16	15	-	-
Se	(MINOR)	16	13	-	-
Sn	(MINOR)	16	9	-	-
Te	(MINOR)	16	16	-	-
Tl	(MINOR)	16	16	-	-
V	(MINOR)	16	10	-	-
Zn	(MINOR)	16	-	-	-

MICHAEL (904)		N	<	*/**	Zavg
Ash	(GEN)	4	-	2	-7.17
Calorific Value (gross)	(GEN)	3	-	1	-0.82
Moisture	(GEN)	4	-	2	-4.90
Carbon (C)	(ELEM)	4	-	1	-1.06
Hydrogen (H)	(ELEM)	4	-	-	0.26
Nitrogen (N)	(ELEM)	4	-	-	0.58

CSL (916)		N	<	*/**	Zavg
Ash	(GEN)	8	-	1	0.67
Calorific Value (gross)	(GEN)	8	-	-	0.07
Moisture	(GEN)	8	-	-	0.12
Volatile Matter	(GEN)	8	-	-	0.75
Carbon (C)	(ELEM)	8	-	1	-2.78
Cl	(ELEM)	8	2	4	-3.61
Hydrogen (H)	(ELEM)	8	-	-	-0.52
Nitrogen (N)	(ELEM)	8	-	2	0.50
S	(ELEM)	8	-	2	0.41
Al	(MAJOR)	7	-	-	-
Ca	(MAJOR)	7	-	-	-
Fe	(MAJOR)	7	-	-	-
K	(MAJOR)	7	-	-	-
Mg	(MAJOR)	7	-	-	-
Na	(MAJOR)	7	-	-	-
P	(MAJOR)	7	-	-	-
Si	(MAJOR)	7	-	-	-
As	(MINOR)	8	8	-	-
Ba	(MINOR)	8	-	-	-
Be	(MINOR)	8	4	-	-

SECTION D - Outliers and Z-scores per Participant

CSL (916)	(cont.)	N	<	*/**	Zavg
Cd	(MINOR)	8	2	-	-
Co	(MINOR)	8	-	-	-
Cr	(MINOR)	8	-	-	-
Cu	(MINOR)	8	-	-	-
F	(MINOR)	8	3	-	-
Hg	(MINOR)	8	5	-	-
Mn	(MINOR)	8	-	-	-
Mo	(MINOR)	8	-	-	-
Ni	(MINOR)	8	-	-	-
Pb	(MINOR)	8	-	-	-
Sb	(MINOR)	8	1	-	-
Se	(MINOR)	8	2	-	-
Sn	(MINOR)	8	3	-	-
Te	(MINOR)	8	5	-	-
Ti	(MINOR)	8	-	-	-
Tl	(MINOR)	8	5	-	-
V	(MINOR)	8	-	-	-
Zn	(MINOR)	8	-	-	-

LNEG-IP (919)		N	<	*/**	Zavg
Ash	(GEN)	12	-	1	-0.27
Calorific Value (gross)	(GEN)	8	-	1	-0.18
Moisture	(GEN)	16	-	4	0.71
Volatile Matter	(GEN)	12	-	-	0.29
Carbon (C)	(ELEM)	16	-	-	-0.14
Cl	(ELEM)	16	-	1	1.23
Hydrogen (H)	(ELEM)	16	-	8	2.49
Nitrogen (N)	(ELEM)	16	3	-	0.09
S	(ELEM)	12	3	-	0.69
Cl	(WS)	16	-	-	-
K	(WS)	8	-	-	-
Na	(WS)	8	-	-	-
Hg	(MINOR)	4	2	-	-

ZAIR (968)		N	<	*/**	Zavg
Ash	(GEN)	4	-	-	0.65
Moisture	(GEN)	4	-	3	-2.41
Volatile Matter	(GEN)	4	-	4	8.77
Cl	(WS)	4	-	-	-
Al	(MAJOR)	4	1	-	-
Ca	(MAJOR)	4	-	-	-
Fe	(MAJOR)	4	1	-	-
K	(MAJOR)	4	-	-	-
Mg	(MAJOR)	4	-	-	-
Na	(MAJOR)	4	-	-	-
P	(MAJOR)	4	-	-	-
Si	(MAJOR)	4	4	-	-
As	(MINOR)	4	2	-	-
Ba	(MINOR)	4	1	-	-
Cd	(MINOR)	4	2	-	-
Co	(MINOR)	4	2	-	-
Cr	(MINOR)	4	2	-	-
Cu	(MINOR)	4	1	-	-
Mn	(MINOR)	4	-	-	-
Mo	(MINOR)	4	3	-	-
Ni	(MINOR)	4	2	-	-
Pb	(MINOR)	4	2	-	-
Sb	(MINOR)	4	4	-	-
Se	(MINOR)	4	3	-	-
Zn	(MINOR)	4	-	-	-

SECIL (985)		N	<	*/**	Zavg
Ash	(GEN)	16	-	6	-1.00
Calorific Value (gross)	(GEN)	16	-	1	-0.22
Moisture	(GEN)	16	-	-	-0.44
Volatile Matter	(GEN)	16	-	5	1.26
Carbon (C)	(ELEM)	16	-	-	0.30
Cl	(ELEM)	16	-	6	20.74

SECIL (985)	(cont.)	N	<	*/**	Zavg
Hydrogen (H)	(ELEM)	16	-	4	-1.78
Nitrogen (N)	(ELEM)	13	-	1	0.49
S	(ELEM)	12	-	1	1.13
Al	(MAJOR)	15	-	-	-
Ca	(MAJOR)	16	-	-	-
Fe	(MAJOR)	13	-	-	-
K	(MAJOR)	16	-	-	-
Mg	(MAJOR)	16	-	-	-
Na	(MAJOR)	16	-	-	-
P	(MAJOR)	15	-	-	-
Si	(MAJOR)	15	-	-	-
As	(MINOR)	15	-	-	-
Ba	(MINOR)	15	-	-	-
Cd	(MINOR)	15	-	-	-
Co	(MINOR)	15	-	-	-
Cr	(MINOR)	11	-	-	-
Cu	(MINOR)	8	-	-	-
Hg	(MINOR)	6	-	-	-
Mn	(MINOR)	15	-	-	-
Mo	(MINOR)	15	-	-	-
Ni	(MINOR)	15	-	-	-
Pb	(MINOR)	9	-	-	-
Sb	(MINOR)	6	-	-	-
Se	(MINOR)	7	-	-	-
Sn	(MINOR)	15	-	-	-
Te	(MINOR)	1	-	-	-
Ti	(MINOR)	7	-	-	-
Tl	(MINOR)	1	-	-	-
V	(MINOR)	13	-	-	-
Zn	(MINOR)	15	-	-	-

PCL (1050)		N	<	*/**	Zavg
Ash	(GEN)	4	-	1	-0.34
Calorific Value (gross)	(GEN)	4	-	4	-7.52
Nitrogen (N)	(ELEM)	4	-	-	-0.52

DETS (1055)		N	<	*/**	Zavg
Ash	(GEN)	16	-	1	0.37
Calorific Value (gross)	(GEN)	16	-	2	-0.98
Moisture	(GEN)	16	-	6	-2.36
Volatile Matter	(GEN)	16	-	-	0.39
Carbon (C)	(ELEM)	16	-	3	-3.78
Cl	(ELEM)	16	-	6	0.32
Hydrogen (H)	(ELEM)	16	-	6	0.06
Nitrogen (N)	(ELEM)	16	-	3	-0.43
S	(ELEM)	16	4	2	-0.77
Cl	(WS)	12	-	-	-
K	(WS)	16	-	-	-
Na	(WS)	16	-	-	-
Al	(MAJOR)	16	-	-	-
Ca	(MAJOR)	16	-	-	-
Fe	(MAJOR)	16	-	-	-
K	(MAJOR)	16	-	-	-
Mg	(MAJOR)	16	-	-	-
Na	(MAJOR)	16	-	-	-
P	(MAJOR)	16	-	-	-
Si	(MAJOR)	8	-	-	-
As	(MINOR)	16	1	-	-
Ba	(MINOR)	16	-	-	-
Be	(MINOR)	16	12	-	-
Cd	(MINOR)	16	1	-	-
Co	(MINOR)	16	10	-	-
Cr	(MINOR)	16	-	-	-
Cu	(MINOR)	16	-	-	-
F	(MINOR)	12	9	-	-
Hg	(MINOR)	16	14	-	-
Mn	(MINOR)	16	-	-	-
Mo	(MINOR)	16	9	-	-

SECTION D - Outliers and Z-scores per Participant

DETS (1055)	(cont.)	N	<	*/**	Zavg
Ni	(MINOR)	16	-	-	-
Pb	(MINOR)	16	1	-	-
Sb	(MINOR)	16	11	-	-
Se	(MINOR)	16	9	-	-
Sn	(MINOR)	16	11	-	-
Ti	(MINOR)	16	2	-	-
Tl	(MINOR)	16	14	-	-
V	(MINOR)	16	11	-	-
Zn	(MINOR)	16	-	-	-

INTER (1057)		N	<	*/**	Zavg
Ash	(GEN)	16	-	9	-8.37
Calorific Value (gross)	(GEN)	15	-	5	-1.80
Moisture	(GEN)	16	-	5	-3.04
Volatile Matter	(GEN)	8	-	4	2.29
Carbon (C)	(ELEM)	16	-	1	-0.39
Hydrogen (H)	(ELEM)	16	-	-	-0.14
Nitrogen (N)	(ELEM)	16	-	-	-0.40

CELA (1060)		N	<	*/**	Zavg
Ash	(GEN)	16	-	3	-0.40
Calorific Value (gross)	(GEN)	16	-	4	-0.70
Moisture	(GEN)	16	-	2	-0.20
Volatile Matter	(GEN)	16	-	15	11.65
Carbon (C)	(ELEM)	16	-	11	-0.38
Cl	(ELEM)	16	1	-	-0.49
Nitrogen (N)	(ELEM)	16	-	-	0.14
S	(ELEM)	16	1	-	-0.59
Al	(MAJOR)	16	-	-	-
Ca	(MAJOR)	16	-	-	-
Fe	(MAJOR)	16	-	-	-
K	(MAJOR)	16	-	-	-
Mg	(MAJOR)	16	-	-	-
Na	(MAJOR)	16	-	-	-
P	(MAJOR)	16	-	-	-
Si	(MAJOR)	16	4	-	-
As	(MINOR)	16	13	-	-
Ba	(MINOR)	16	1	-	-
Be	(MINOR)	16	14	-	-
Cd	(MINOR)	16	14	-	-
Co	(MINOR)	16	10	-	-
Cr	(MINOR)	16	9	-	-
Cu	(MINOR)	16	9	-	-
F	(MINOR)	16	11	-	-
Hg	(MINOR)	16	10	-	-
Mn	(MINOR)	16	-	-	-
Mo	(MINOR)	16	10	-	-
Ni	(MINOR)	16	6	-	-
Pb	(MINOR)	16	9	-	-
Sb	(MINOR)	16	14	-	-
Se	(MINOR)	16	16	-	-
Sn	(MINOR)	16	11	-	-
Te	(MINOR)	16	15	-	-
Ti	(MINOR)	16	-	-	-
Tl	(MINOR)	16	16	-	-
V	(MINOR)	16	9	-	-
Zn	(MINOR)	16	8	-	-

AMV-lab (1064)		N	<	*/**	Zavg
Ash	(GEN)	16	-	4	40.63
Calorific Value (gross)	(GEN)	16	-	3	-0.61
Moisture	(GEN)	16	-	-	0.14
Volatile Matter	(GEN)	16	-	-	-0.56
Carbon (C)	(ELEM)	16	-	-	0.07
Cl	(ELEM)	4	-	-	-0.68
Hydrogen (H)	(ELEM)	16	-	1	0.25
Nitrogen (N)	(ELEM)	4	-	4	-5.99
S	(ELEM)	16	1	3	4.51

AMV-lab (1064)	(cont.)	N	<	*/**	Zavg
Cl	(WS)	12	-	-	-

202 (1065)		N	<	*/**	Zavg
Ash	(GEN)	4	-	1	-0.29
Calorific Value (gross)	(GEN)	4	-	2	-2.57
Moisture	(GEN)	4	-	3	-5.94
Volatile Matter	(GEN)	4	-	4	12.05
Carbon (C)	(ELEM)	4	-	3	0.09
Cl	(ELEM)	4	-	-	-0.70
Hydrogen (H)	(ELEM)	4	-	-	-0.04
Nitrogen (N)	(ELEM)	4	-	1	-2.98
S	(ELEM)	4	-	1	1.02
As	(MINOR)	4	2	-	-
Cd	(MINOR)	4	2	-	-
Cr	(MINOR)	4	2	-	-
Cu	(MINOR)	4	1	-	-
Mn	(MINOR)	4	-	-	-
Ni	(MINOR)	4	3	-	-
Pb	(MINOR)	4	2	-	-
Zn	(MINOR)	4	-	-	-

KES (1080)		N	<	*/**	Zavg
Ash	(GEN)	8	-	1	-0.53
Calorific Value (gross)	(GEN)	8	-	2	1.64
Moisture	(GEN)	8	-	-	-0.04
Volatile Matter	(GEN)	8	-	-	-0.01
Carbon (C)	(ELEM)	8	-	1	0.76
Cl	(ELEM)	4	-	2	-0.51
Hydrogen (H)	(ELEM)	8	-	3	1.59
Nitrogen (N)	(ELEM)	8	-	3	-1.42
S	(ELEM)	8	2	5	1.05
Al	(MAJOR)	8	-	-	-
Ca	(MAJOR)	8	-	-	-
Fe	(MAJOR)	8	-	-	-
K	(MAJOR)	8	-	-	-
Mg	(MAJOR)	8	-	-	-
Na	(MAJOR)	8	-	-	-
P	(MAJOR)	8	-	-	-
Si	(MAJOR)	8	-	-	-
As	(MINOR)	6	6	-	-
Ba	(MINOR)	6	1	-	-
Be	(MINOR)	6	6	-	-
Cd	(MINOR)	6	4	-	-
Co	(MINOR)	6	3	-	-
Cr	(MINOR)	6	3	-	-
Cu	(MINOR)	6	-	-	-
F	(MINOR)	3	-	-	-
Hg	(MINOR)	6	2	-	-
Mn	(MINOR)	6	-	-	-
Mo	(MINOR)	6	4	-	-
Ni	(MINOR)	6	3	-	-
Pb	(MINOR)	6	-	-	-
Sb	(MINOR)	6	1	-	-
Se	(MINOR)	6	2	-	-
Sn	(MINOR)	6	4	-	-
Te	(MINOR)	6	6	-	-
Ti	(MINOR)	6	-	-	-
Tl	(MINOR)	6	6	-	-
V	(MINOR)	6	2	-	-
Zn	(MINOR)	6	-	-	-

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