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CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION
INTERNATIONAL CO-OPERATIVE PROGRAMME ON ASSESSMENT AND MONITORING OF AIR POLLUTION EFFECTS ON FORESTS
and
EUROPEAN UNION SCHEME
ON THE PROTECTION OF FORESTS AGAINST ATMOSPHERIC POLLUTION

United Nations
Economic Commission
for Europe

European Commission

6th Needle/Leaf Interlaboratory Comparison Test 2003/2004

Bundesamt und Forschungszentrum für Wald – Forest Foliar Co-ordinating Centre
(Austrian Federal Office and Research Centre for Forests)
Seckendorff-Gudent-Weg 8
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Alfred Fürst

Bundesamt und Forschungszentrum für Wald – Forest Foliar Co-ordinating Centre
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A-1131 Wien

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Austrian Federal Office and Research Centre for Forests
Forest Foliar Co-ordinating Centre
Seckendorff-Gudent Weg 8
A-1131 Wien

Phone: +431-87838-1114
Fax: +431-87838-1250

URL: http://www.ffcc.at
e-Mail: alfred.fuerst@bfw.gv.at

Cover photos by Alfred Fürst

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1 INTRODUCTION

The concern about an increased observation of unknown damage to forests in Europe led in the 1980's to the establishment of two European programs for the protection of forests against atmospheric pollution and other stress factors:
The International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP-Forests) and the European Union Scheme on the Protection of Forests against Atmospheric Pollution. In the framework of these two programmes a large-scale 16x16km transnational monitoring network (level I) was established and on this grid annual crown condition surveys have been carried out since 1986/87. In addition to these observations surveys of the forest soil condition and of the chemical content of needles and leaves were carried out in 1995 (Stefan et al. 1997).
For the intensive monitoring programme (Level II) more than 860 permanent observation plots have been established in Europe with the aim of investigating key factors and processes at the ecosystem scale. The foliar survey at Level II is mandatory and the analysis must be carried out at least every two years (1995, 1997, 1999, 2001, 2003).
A high quality and comparable laboratory standard in all countries is indispensable for a European-wide survey of the state of forests. Important steps on this way have been the publication of the "Manual on methods and criteria for harmonised sampling, assessment, monitoring and analysis of the effects of air pollution on forests" (UN-ECE, Hamburg and Prague 1994) and the performance of the first European Foliar- Interlaboratory Comparison Test on two certified standards (BCR 100-*beech leaves* and BCR 101 - *spruce needles*) by 24 laboratories from 21 countries, organised by France in 1993.
The intensive discussion of the forest foliar expert panel in As/Norway 1994 ended with the recommendation of a second test with 4 unknown samples (two spruces, one pine, one oak) during the running level-II monitoring programme. This was organised by Germany in 1995/96 and subsequently discussed by expert panels in Vienna/Austria in 1997. The expert panel in Vienna decided to call for a complete repetition and authorised the Landesumweltamt North-Rhine-Westfalia (LUA) to arrange interlaboratory comparison tests on foliage every two years. The 3rd test (Bartels 1998) with 5 unknown samples and its consequences for the analytical

quality management were intensively discussed in Bonn in 1999 and ended with a revision of Part IV "Sampling and analysis of needles and leaves" of the above mentioned manual (Stefan et al. 2000).

52 Laboratories from 29 European countries took part in the 4th Needle/Leaf Interlaboratory Comparison Test 1999/2000. In comparison with the 3rd test, the results show a distinct improvement of analysis quality of European laboratories working on the issue of forestry analysis (Bartels 2000).

The 5th Interlaboratory Comparison Test was also organized by the LUA (Bartels 2002). In general, the results show good analytical quality in the participating laboratories, but it was very surprising that some laboratories have problems with carbon in foliar samples. The results were discussed by the Expert Panel in Prague/Czech Republic in April 2003. The Panel discussed the difficulties that some laboratories encounter in using new laboratory equipment and the lack of experienced technical staff. Good analytical quality can only be obtained by daily practice and with good quality control. This quality practice must also become a tradition for each laboratory and for each member of the staff.

Because of the good results, the Panel has fixed smaller tolerable limits of ± 15% for zinc and manganese and of ± 20% for copper.

Due to the retirement of Mr. Bartels from the Panel, the Forest Foliar Coordinating Centre (FFCC) indicated its willingness to organise the 6th Interlaboratory Comparison Test and the organisation chart was presented at the meeting. The FFCC developed a web-based interface to an Oracle database to which data input and validation could be made by the participating laboratories via internet. The results of this Interlaboratory Comparison Test were evaluated according to DIN 38402/42.

The Panel proposed the following timetable:

- Information of the participating labs and preparation of the web-page (May 2003)
- Submission of the samples (August 2003)
- Input of the analysis results (October-December 2003)
- Deadline of data input (end of December 2003)
- Evaluation according to DIN 38402/42 (January/February 2004)

The Panel decided to send a questionnaire to participating laboratories to obtain information about the status of their quality control systems. Furthermore, the Panel highlighted the importance of knowing which laboratories will analyse Level II samples 2003.

2 TASK, MATERIAL, PARTICIPANTS AND EVALUATION

2.1 Task

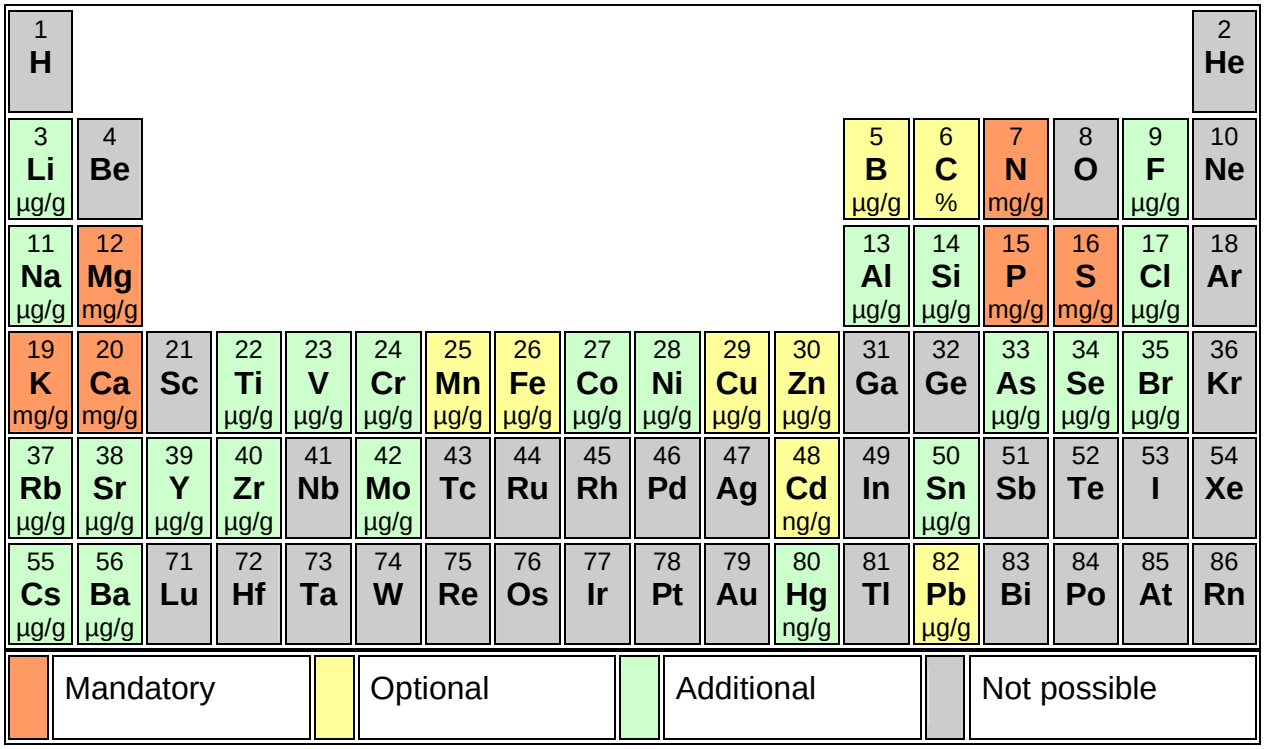
The Foliar Expert Panel proposed the following timetable in Prague (28-29th April 2003):

- Informing the participating labs and preparation of the web-page (6th May 2003)
- Registration of the labs via Internet (till 30th June 2003)
- Submission of the test samples (End of July 2003)
- Input and recheck of the analysis results from the labs (September-December 2003)
- Deadline of data input and recheck (31th of December 2003)
- Evaluation according to DIN 38402/42 (January/February 2004)

For each element four replicates per sample are necessary within this Interlaboratory-Test.

The mandatory parameters S, N, P, K, Ca, Mg must be analysed, optional parameters Zn, Mn, Fe, Cu, Pb, Cd, B and C can be analysed and some additional elements are possible. The units and all possible elements are shown in figure 1.

Figure 1: Elements and units



All samples should be dried at 80°C before analysis (moisture content appr. 5%) and results must be reported as dry matter (105°C).

For a deeper evaluation - all participant laboratories received a questionnaire with purpose to obtain information about the status of their quality control systems and they were asked if they have analysed level II foliar samples in 2003.

2.2 Material

At the end of July the Austrian Federal Office and Research Centre for Forests (BFW) sent four dried and powdered plant samples to 45 European laboratories in 26 countries.

The samples were:

1. Pine needles (Finland)
2. Spruce needles (“Germany”) identical with
   Spruce needles (Slovakia) from the 5th Test (sample 1)
3. Oak leaves (Hungaria)
4. Acer leaves (Austria)

All materials were ground with a Retsch-centrifugal-mill (sieve 0.25 mm, Cr-Ni steel) and homogenised by the LUA-laboratory by shaking over head for 24 hours. Before the samples were sent they were once more homogenized in the BFW-laboratory and were filled in PE-bags. Homogeneity was tested for each of these four samples by analysing the nitrogen and carbon content in eight randomly selected sub samples. No variation was found between the results of these eight samples, and they were therefore considered to be homogeneous.

I have to thank Ulrich Bartels for sample preparation and his support for this interlaboratory comparison test, Hannu Raitio (Parkano/Finland) and Miklos Manninger (Budapest/Hungaria) for sampling and preparing their samples.

2.3 Participants

Table 1 shows the number of countries and laboratories taking part in the six interlaboratory comparison tests.

Table 1: Number of countries and laboratories taking part in the six interlaboratory comparison tests

Interlaboratory Comparison Test	Number of countries	Number of laboratories
1st	21	24
2nd	25	39
3rd	29	51
4th	29	52
5th	29	53
6th	26	46

With a few exceptions, all laboratories analysed in the 6th interlaboratory comparison test the complete list of mandatory elements and most of the optional elements (s. Table 2).

Table 2: Analysed elements from the participant laboratories (level II samples this year…x, no level II samples this year…o):

Labcode	N	S	P	Ca	Mg	K	Zn	Mn	Fe	Cu	Pb	B	Cd	C
01	x	x	x	x	x	x	x	x	x					x
02	o	o	o	o	o	o	o	o	o	o	o	o	o	o
03	x	x	x	x	x	x	x	x	x		o		o	o
04		o	o	o	o	o	o	o		o				
04a	o	o	o	o	o	o	o	o	o	o	o	o	o	o
05	x	x	x	x	x	x	x	x	x	x				
06	x	x	x	x	x	x	x	x	x	x	x	x	x	x
07	x	x	x	x	x	x	x	x	x	x		x		o
08	x	x	x	x	x	x	x	x	x	x	x	x	x	x
09	x	x	x	x	x	x	x	x	x	x	x		x	o
11	x	x	x	x	x	x	x	x	x	x	x	x		x
12	x	x	x	x	x	x		x	x					x
13	x	x	x	x	x	x	o			o	o			x
14														
15	o		o	o	o	o								o
17	x	x	x	x	x	x	x	x	x	x		x		x
18	x	x	x	x	x	x	x	x	x	x				
19	o	o	o	o	o	o								o
20	x	x												
23	x	x	x	x	x	x	x	x	x	x	o	x	o	x
25	o	o	o	o	o	o	o	o	o	o		o	o	o
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	o		o	o	o	o	o	o	o	o				
28	x	x	x	x	x	x	o	o	o	o		o		
29	x	x	x	x	x	x	x	x	x	x	x	x	x	x
30														
33a	o	o	o	o	o	o	o	o	o	o	o		o	
36	o	o	o	o	o	o	o	o	o	o	o	o	o	o
37	x	x	x	x	x	x	x	x	x	x	x	x	x	x
37a		o	o	o	o	o	o	o	o	o				
38	o	o	o	o	o	o	o	o	o	o	o		o	o
39	x	x	x	x	x	x	x	x	x	x	x	x	x	x
40	o	o	o	o	o	o	o	o	o	o	o		o	
42	o	o	o	o	o	o	o	o	o	o	o	o	o	o
43	x	x	x	x	x	x	x	x	x		o	o	o	
44	x	x	x	x	x	x	x	x	x	x	x		x	x
46	o	o	o	o	o	o	o	o	o					o
47	x	x	x	x	x	x		x	x	x	x		x	x
48	x	x	x	x	x	x	x	x	x	x	x	o	x	x
49	o	o	o	o	o	o	o	o	o	o				o
50	x	x	x	x	x	x	x	x	x	x	x	x	o	x
52	o	o	o	o	o	o	o	o	o	o		o		o
56	o	o	o	o	o	o	o	o	o	o	o	o	o	o
60	o	o	o	o	o	o	o	o	o	o	o	o	o	
61	o		x	x	x	x								x
62														

2.4 Data Evaluation

Only results above the detection limits can be used for the evaluation. Results below the detection limit are marked with "<" followed by the detection limit of the laboratory (e.g. <0.1).

The results of the interlaboratory comparison test were evaluated according to DIN 38402/42. Although this is not a modern type of evaluation, it was the only way to organize and evaluate an interlaboratory comparison test within this short timetable. This type of evaluation is easy to do and requires no special computer programme. The computer programme RING 4.0, which was used for the evaluation of the interlaboratory comparison test before, was running on a DOS computer platform, and could not be used any more. But, only by using robust statistics are the results really free of manipulation by the test leader. The differences between these two types of evaluation methods are not very big (Bartels 1996) and as an example the differences between the mean values and the mean standard deviations for the sample 2 from the 5th Interlaboratory Comparison Test are shown in table 3.

Table 3: Comparison of the results between the two interlaboratory comparison test evaluation methods

Element	Robust statistic		DIN 38402/42	
	mean	SI	mean	SI
N (mg/g)	11.73	0.18	11.75	0.17
S (mg/g)	0.84	0.02	0.84	0.02
P (mg/g)	1.39	0.02	1.40	0.02
Ca (mg/g)	2.38	0.05	2.36	0.05
Mg (mg/g)	1.03	0.02	1.02	0.02
K (mg/g)	5.17	0.07	5.11	0.07
Zn (µg/g)	41.79	0.93	42.07	1.05
Mn (µg/g)	318.3	3.72	317.7	3.68
Fe (µg/g)	68.93	2.84	68.79	2.16
Cu (µg/g)	3.41	0.21	3.42	0.16
Pb (µg/g)	0.55	0.11	0.54	0.06
Cd (ng/g)	104.4	21.04	102.1	5.21
B (µg/g)	11.60	0.52	11.65	0.52
C (g/100g)	52.33	0.22	52.12	0.22

The differences in the mean values and in the mean standard deviation are usually very small, only for Cadmium and Lead exists a bigger mean standard deviation. In the detail evaluation of the 5th Interlaboratory Comparison Test it was found that the reason for this is attributable to one laboratory. This laboratory has found values ten times higher than the mean value, also the standard deviation of this single lab is very high. With the DIN 38402/42 method these results were eliminated as outliers and do not influence the test results.

The DIN 38402/42 method identifies three types of outliers. With the Grubbs-test the four replicates from each laboratory can first be checked for outliers (outlier type 1). The next step is to compare the recalculated mean values of each lab with the mean value from all labs as well as with the Grubb-test for outliers (type 2). Finally, the recalculated standard deviation from the laboratories must be compared with the total standard deviation (F-test) to eliminate laboratories with an excessive standard deviation (outlier type 3). Now the outlier free total mean value and the outlier free maximum and minimum mean value of all labs can be calculated. Marked outliers type 1 between the outlier free maximum and minimum mean value are not longer outliers, they can be used for the further evaluation of the interlaboratory comparison test. The last step is to calculate the outlier free statistical values.

With the outlier free mean value for each element/sample and the laboratory mean value the recovery must be calculated and compare with the tolerable limits from table 4. This type of evaluation was fixed in the Foliar Expert Panel Meetings of As (1994) and Vienna (1997).

Table 4: Tolerable limits for the mandatory and optional elements

Element	Tolerable deviation from mean in %	Fixed limits in the Expert Panel-Foliar Meetings
N	90-110	6th Meeting - Bonn 1999
S	80-120	6th Meeting - Bonn 1999
P	85-115	6th Meeting - Bonn 1999
Ca	85-115	6th Meeting - Bonn 1999
Mg	85-115	6th Meeting - Bonn 1999
K	85-115	6th Meeting - Bonn 1999
Zn	85-115	8th Meeting - Prague 2003
Mn	85-115	8th Meeting - Prague 2003
Fe	80-120	6th Meeting - Bonn 1999
Cu	80-120	8th Meeting - Prague 2003
Pb	70-130	6th Meeting - Bonn 1999
Cd	70-130	6th Meeting - Bonn 1999
B	80-120	6th Meeting - Bonn 1999
C	95-105	6th Meeting - Bonn 1999

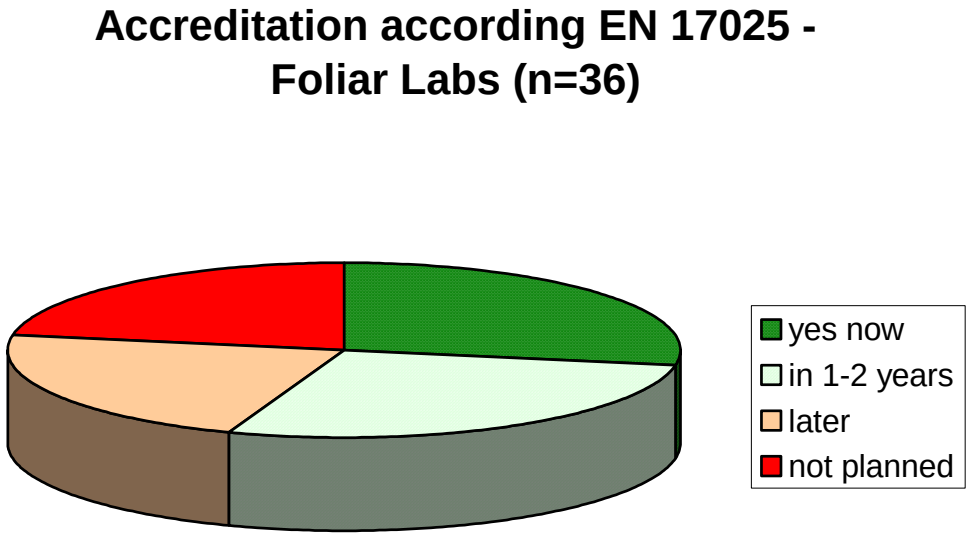
3 RESULTS

3.1 Main results of the questionnaire

All participating laboratories received a questionnaire with purpose to obtain information about the status of their quality control systems and 36 of the 46 laboratories had returned this questionnaire.

The first questions are about accreditation of the laboratories and the summarized results are shown in the figure 2 below.

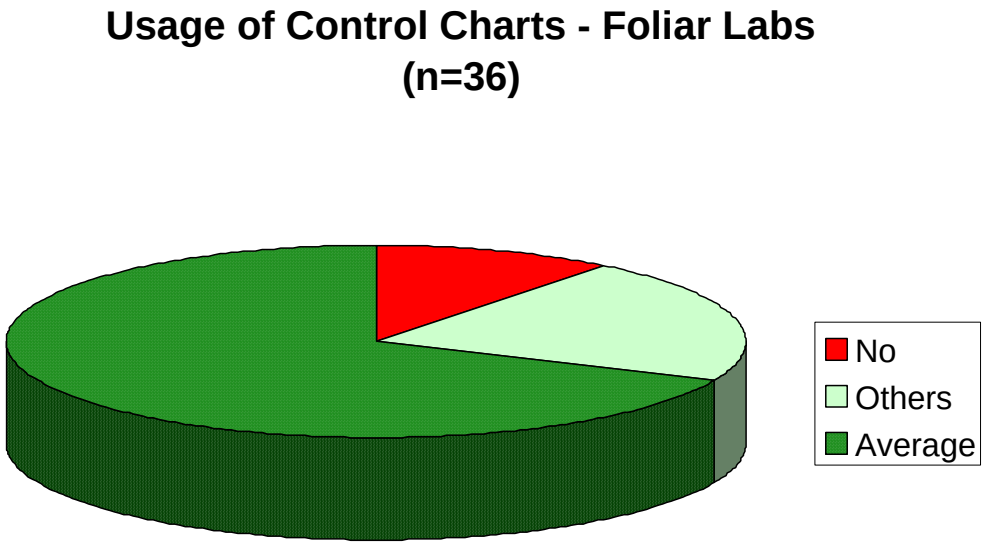
Figure 2: Accreditated foliar laboratories



More than 50% of the laboratories are accredited now or plan an accreditation within 1-2 years.

The next important question was about the usage of control charts for quality control. 90% of the laboratories are using control charts, and most of them are using average control chart (appr. 70%).

Figure 3: Usage of control charts in foliar laboratories



3.2 Results of the 6th Interlaboratory Comparison Test

Table 5 gives an overview as to which laboratories analysed the test samples well and which encountered problems. This evaluation is based on the tolerable limits from Table 4.

Table 5: Results of the 6th Interlaboratory Comparison Test – marked with the limits from table 4 (* = all four samples are analysed well; < = too low; > = too high)

Labcode	N	S	P	Ca	Mg	K	Zn	Mn	Fe	Cu	Pb	B	Cd	C
01	*	*	*	<<<<	<<<<	<>	<<>>	<<<<	>>>>					*
02	*	*	*	*	*	*	*	*	*	*	*	*	*	<<
03	*	*	*	*	*	*	*	*	*		*		<	>>>>
04		*	*	*	*	*	*	*		*				
04a	*	*	>	*	>	*	*	*	*	*	<	*	*	*
05	*	<<<	<>	<	*	<<<<	>>>>	*	>>	*				
06	*	*	*	*	*	*	*	>	>	*	*	*	*	<<
07	*	*	*	*	*	*	*	<	*	*		*		*
08	*	*	*	*	*	*	*	>	>	>	*	<<<	*	*
09	*	*	*	*	*	*	*	*	*	*	*		>	*
11	*	*	*	*	*	*	*	*	*	*	*	*		*
12	*	*	*	*	*	*		*	*					>>>>
13	*	*	*	*	*	*	*			>>>>	>>>			<<<<
14														
15	*		>>>>	<	*	*								*
17	*	*	*	*	*	*	*	*	*	*		*		*
18	*	*	*	*	*	*	>	*	*	*				
19	>>	<	>>>	>>>	>>>>	*								*
20	*	*												
23	*	*	>>	*	*	*	*	<<<<	*	*	>>>>	<<<<	>>>	*
25	*	*	*	*	*	*	<	*	*	*		*	*	>
26	*	>	>>>>	*	*	*	>	*	*	*	*	*	>>	<<
27	*		<<<<	*	*	>>>>	*	>	*	>>>				
28	*	*	*	*	>>	*	*	*	*	*		*		
29	*	*	*	*	*	*	*	*	*	<	<	<	*	*
30														
33a	*	<<<<	<<	*	*	*	*	*	>	<	>		*	
36	*	<<<<	*	*	*	*	>	*	*	*	<	>>>>	*	*
37	*	*	*	*	*	*	*	*	*	*	<	*	*	*
37a		*	*	*	*	*	*	*	*	>				
38	*	*	*	*	*	*	*	*	*	*	<		*	*
39	*	*	*	*	*	*	*	*	*	*	<	*	*	*
40	*	*	*	*	*	<<	>	>	*	*	<<>		>>	
42	*	*	*	*	*	*	*	*	*	<	>	*	*	*
43	*	*	*	*	*	*	<	*	*		*	*	<	
44	*	*	*	*	*	*	*	*	*	*	*		*	*

Labcode	N	S	P	Ca	Mg	K	Zn	Mn	Fe	Cu	Pb	B	Cd	C
46	>>	*	<<<<	<<	*	*	*	>	>					*
47	*	*	*	*	*	*		*	*	*	<>>>		*	*
48	*	*	*	*	*	*	*	*	*	*	<	>>	*	*
49	*	*	*	*	*	*	*	<	>>	*				*
50	*	*	*	*	*	*	*	*	*	*	>	*	*	*
52	*	*	*	*	*	*	*	*	*	*		<		*
56	*	<<<<	*	*	*	*	>>	*	*	*	*	<<	*	*
60	*	>	>	*	*	>	>	*	>	>	<	>>>	*	
61	<		<>	*	*	*								<
62														

The following mean element concentrations were found in the test samples and the percentage of the laboratory results out of tolerance are also given in the following table 6.

Table 6: Mean element concentrations and percentage of non tolerable results

Element	Unit	Sample 1 Pine	Sample 2 Spruce	Sample 3 Oak	Sample 4 Acer
N	mg/g	16,94	12,25	23,51	22,70
	%	2,44	4,88	2,44	2,44
S	mg/g	1,12	1,37	1,69	1,89
	%	7,69	10,00	10,00	15,00
P	mg/g	1,91	1,21	1,55	1,43
	%	21,43	19,05	11,90	16,67
Ca	mg/g	2,64	10,24	7,54	12,82
	%	11,90	4,76	4,76	2,38
Mg	mg/g	0,93	0,76	1,41	2,97
	%	9,52	7,14	4,76	4,76
K	mg/g	5,79	7,10	8,34	6,76
	%	7,14	7,14	7,14	9,52
Zn	µg/g	41,88	54,66	19,33	30,20
	%	10,81	5,41	18,92	10,81
Mn	µg/g	187,23	278,45	976,39	495,86
	%	7,89	21,05	5,26	5,26
Fe	µg/g	38,14	132,51	106,89	136,59
	%	10,81	10,81	5,41	8,11
Cu	µg/g	3,13	5,10	5,82	4,91
	%	16,13	9,09	6,06	9,09
Pb	µg/g	0,23	2,27	0,55	0,61
	%	72,22	12,5	21,74	16,67
Cd	ng/g	74,19	28,85	106,41	86,98
	%	9,52	25,00	4,76	9,52
B	µg/g	5,40	18,23	28,56	13,89
	%	22,22	22,73	18,18	31,82
C	g/100g	51,69	50,09	49,21	50,49
	%	9,38	12,50	25,00	15,63

3.3 Comparison between the 6th Interlaboratory Comparison Test and former tests

Sample 2 of the 6th and sample 1 of the 5th Interlaboratory Comparison Tests were identical (Spruce-Slovakia). For most of the elements the mean values harmonize very well, only for Iron (and Manganese) exists noticeable differences (Table 7).

Table 7: Comparison between the 5th and 6th Interlaboratory Comparison Test

Element (Unit)	5th Interlaboratory Comparison Test (Sample 1) Mean	*N*	6th Interlaboratory Comparison Test (Sample 2) Mean	*N*
Nitrogen (mg/g)	12.53	*47*	12.25	*41*
Sulphur (mg/g)	1.29	*49*	1,37	*40*
Phosphorus (mg/g)	1.28	*49*	1,21	*42*
Calcium (mg/g)	11.25	*49*	10,24	*42*
Magnesium (mg/g)	0.79	*49*	0,76	*42*
Potassium (mg/g)	6.92	*49*	7,10	*42*
Zinc (µg/g)	55.58	*48*	54,66	*37*
Manganese (µg/g)	304.9	*49*	278,5	*38*
Iron (µg/g)	108.2	*47*	132,5	*37*
Copper (µg/g)	4.41	*44*	5,10	*33*
Lead (µg/g)	2.35	*30*	2,27	*24*
Cadmium (ng/g)	34.54	*19*	28,85	*20*
Boron (µg/g)	20.8	*26*	18,23	*22*
Carbon (g/100g)	50.56	*28*	50,09	*32*

The reasons for these differences are unknown. Perhaps the two batches which were send to the 5th (from North Rine Westphalia State Environment Agency) and the 6th Interlaboratory Test (from the Austrian Federal Office and Research Centre for

Forests) were not completely homogenous. But within each ringtest the sample is homogenous and the relative interlaboratory standard deviation of the results is small and comparable (2.21 and 2.09%).

The ringtest is evaluated on the basis of fixed limits (table 4). These tolerable deviations from the mean were updated in Bonn (1999) and Prague (2003) for some elements. The development of tolerable results from the 2nd to the 6th test is shown in table 8.

Table 8: Percentage of non tolerable values

Element	Tolerable deviation from mean (± %)	2nd Labtest 1995/1996		3rd Labtest 1997/1998		4th Labtest 1999/2000		5th Labtest 2001/2002		6th Labtest 2003/2004	
		Non tolerable (%)	N	Non tolerable (%)	N	Non tolerable (%)	N	Non tolerable (%)	N	Non tolerable (%)	N
N	15/10*	**2.7**	*148*	**4.4**	*225*	**6.6**	*196*	**10.1**	*188*	**3.0**	*164*
S	20	**25.8**	*132*	**14.3**	*230*	**9.8**	*184*	**14.2**	*196*	**11.3**	*159*
P	15	**6.8**	*148*	**19.6**	*250*	**7.1**	*196*	**8.2**	*196*	**17.3**	*168*
Ca	15	**9.6**	*156*	**16.3**	*245*	**6.6**	*196*	**8.2**	*196*	**6.5**	*168*
Mg	15	**12.2**	*156*	**16.7**	*245*	**5.1**	*196*	**6.1**	*196*	**6.5**	*168*
K	15	**7.7**	*156*	**20.4**	*250*	**6.6**	*196*	**4.1**	*196*	**7.7**	*168*
Zn	20/15**	**18.9**	*132*	**16.9**	*225*	**12.0**	*183*	**8.3**	*192*	**11,5**	*148*
Mn	20/15**	**3.6**	*139*	**10.9**	*229*	**4.2**	*192*	**1.0**	*196*	**9.9**	*152*
Fe	20	**20.6**	*136*	**23.7**	*224*	**17.9**	*196*	**19.1**	*188*	**8.8**	*148*
Cu	30/20**	**20.7**	*116*	**16.2**	*191*	**20**	*165*	**9.8**	*174*	**9.9**	*131*
Pb	30	**53.0**	*66*	**42.4**	*99*	**32.1**	*78*	**23.9**	*109*	**27.8**	*90*
B	20	**33.9**	*56*	**18.2**	*115*	**18.4**	*103*	**12.5**	*104*	**23.8**	*84*
Cd	30	**48.0**	*25*	**30.0**	*77*	**16.9**	*65*	**21.6**	*88*	**12.0**	*83*
C	10/5*	**32.3**	*99*	**31.1**	*164*	**16.1**	*124*	**13.1**	*107*	**15.6**	*128*

* 2nd and 3rd test / 4th till 6th test ** 2nd till 5th test / 6th test N…number of sent mean results

3.4 Evaluation by element and method

3.4.1 Nitrogen

A very good result, only 3% of non tolerable results can be found. Only two laboratories (19, 46) failed with two samples, both laboratories used element-analysers. They found constant high results in all samples and this suggests a calibration error.

3.4.2 Sulphur

In comparison with the 5th Interlaboratory test the percentage of non tolerable results decreased from 14.2% to 11.3%. Labs 05, 33a, 36 and 56 failed with 3 or 4 samples. Labs 05 and 36 are still using dry ashing methods, which **is not recommended** (Stefan et al. 2000)! Only lab 05 was still analysing Level II samples this year.

3.4.3 Phosphorus

In comparison with the last two Interlaboratory tests the percentage of non tolerable results increased up to 17.3%. Wet digestion methods combined with ICP-determination lead to very good results. Most of the labs with outliers (05, 15, 27, 33a, 61) used dry ashing (not recommended) and/or photometric detection.
Only laboratory 26 with 3 and 4 outliers was sending Level II results this year.

3.4.4 Calcium

It was the best result for calcium in the last five ringtests, with only 6.5% of outliers. Most of the labs used wet digestion combined with ICP, some labs are using the Flame Atomic Absorption determination method. Because of the phosphorous interference, C_2H_2/N_2O flame or a modifier (e.g. La) must be used for the AAS method (Stefan et al. 2000). Laboratories 1 and 19 had 3 or 4 outliers – laboratory 1 is also analysing Level II samples.

3.4.5 Magnesium

The results of the 6th Interlaboratory test are similar to the previous tests, 6.5% of outliers. The best results are obtained by acid digestion with ICP determination. Laboratories 1 and 19 had problems with magnesium, both had only outliers. Laboratory 1 was also analysing Level II samples.

3.4.6 Potassium

The percentage of outliers decreased to 7.7%. Laboratories 5 and 27 failed with all samples. Lab 27 is using the not recommended dry ashing method, and both are using the flame – AAS technique. In this case, matrix adopted standard and blank solutions with the same acid concentrations like the sample solution must be used. Also, the use of an ionisation buffer (CsCl) is recommended in the manual. Laboratory 5 is also analysing this year level II samples.

3.4.7 Zinc

11,5% outliers were found, the tolerable limit was reduced (± 15%) in this ringtest so the results are very good. Laboratories 1 and 5 have only outliers, both are using open acid digestion method and Flame-AAS. Both labs are analysing Level II samples this year too. Because of contamination effects it is better to use acid digestion in closed systems.

3.4.8 Manganese

The tolerable limit was reduced in Prague to ± 15%. An increase of the percentage of outliers could be found. Laboratories 1 and 23 have problems with manganese – they are also analysing level II samples this year.

With the exception of dry ashing methods, all other digestion and determination methods can be used.

3.4.9 Iron

The iron results are really good. The laboratories with outliers found excessive concentrations, which looks like a contamination problem. Only laboratory 1 failed with all samples and this laboratory was analysing level II samples.

3.4.10 Copper

9.9% of outliers were found, but the tolerable limit was reduced (± 20%) in this ringtest so the results are very good. The laboratories with outliers found mostly concentrations which were too high and this looks like a contamination problem. Laboratories 13 and 27 failed with 3 or 4 samples but they do not analyse level II samples this year.

3.4.11 Lead

An increase of non-tolerable results to 27.8% could be found, which resulted from the very low concentration in sample 1 (0.23 mg/kg). Most of the results (>72%) are outside ± 30%. If the concentration of the sample is ten times higher, only 12.5% outliers could be found (sample 2). Laboratories 13, 23, 40 and 47 failed with 3 or 4 samples. Only lab 47 analysed level II samples this year, but reason for the wrong results was a mistake in data input.

For low lead concentrations it is better to use flameless AAS as determination method.

3.4.12 Cadmium

The error rate decreases drastically with the increase of the concentration. Only laboratory 23 had problems and failed with 3 samples – this lab is using an open acid digestion system, so it could be a contamination problem.

3.4.13 Boron

The results are very good, only 12% of outliers were found. Labs 08, 23, 36 and 60 failed with 3 or 4 samples. Labs 08, 23 were also analysing level II samples.
Most of the labs with outliers used open acid digestion or dry ashing. The best results could be achieved with closed acid digestion (quartz or teflon vessels) and ICP determination.

3.4.14 Carbon

15.6% of outliers were found, some laboratories had problems with the calibration of their element-analysers, because they had the same percentage error for all samples. Laboratories 3, 12, 13 failed with all four samples – labs 12 and 13 have analysed level II samples, too. Laboratory 12 has sent the ringtest results in a wrong unit (g/kg instead of g/100g).

4 CONCLUSIONS

The results of the 6th Interlaboratory comparison test show generally a good analytical quality in foliar analysis. Few of the laboratories had to learn from their ringtest results, especially laboratories with outliers type b, c and/or results outside of the tolerable limits. A few of the laboratories must change their methods (e.g. dry ashing!!!). Some laboratories sent also detection limits, but a few of these detection limits were sent in wrong units.

Good equipment is not only necessary for acceptable results, but also a well educated staff is a basis for good results. The use of control charts, reference materials and/or primary standards should be a daily quality routine. Till now approximately 90% of the participating labs are using quality control charts (70% of the labs are using average charts). More than 50% of the laboratories are already accredited or plan the accreditation within 1-2 years.

A trend in the use of analytical methods can be seen:

- For C, N, S element-analysers are becoming more and more important.
- Acid digestion methods in closed systems in combination with ICP methods are very good for the determination of S, P, K, Ca, Mg, Fe, Zn, B, Cu, Pb and Cd.
- Flameless-AAS methods for Cd, Pb and Cu (especially for low concentrations)
- X-ray fluorescence analyses for S, P, Ca, Mg, K, Zn and Mn.

5 LITERATURE

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Method Code – Pretreatment (P)

0 No information

1 No pretreatment

2 Extractions
2.1 Extraction, H2O
2.2 Extraction. HNO3
2.2 Extraction, aqua regia

3 Wet ashings at room pressure (open system)
3.1 Wet ashing, HNO_3
3.2 Wet ashing, HNO_3/HF
3.3 Wet ashing, $HNO_3/HClO_4$
3.4 Wet ashing, $HNO_3/HClO_4$/HF
3.5 Wet ashing HNO_3/H_2O_2
3.6 Wet ashing $HNO_3/HClO_4$ /H_2SO_4
3.7 Wet ashing, $HNO_3/HClO_4/CaCl_2$
3.8 Wet ashing, $HNO_3/HClO_4/H_2O_2$
3.9 Wet ashing, HNO_3,/$HClO_4$/HCl
3.10 Wet ashing, HNO_3 /H_2SO_4
3.11 Wet ashing, aqua regia
3.20 Wet ashing, $HClO_4/H_2O_2$
3.21 Wet ashing, $HClO_4/H_2SO_4$
3.31 Wet ashing, H_2SO_4/H_2O_2
3.32 Wet ashing, H_2SO_4/K_2CrO_7
3.50 Kjeldahl, H_2SO_4/ Se-catalyst
3.51 Kjeldahl, H_2SO_4/Cu-catalyst
3.52 Kjeldahl, H_2SO_4/Ti-Cu-catalyst
3.53 Kjeldahl, H_2SO_4/Hg-catalyst

4 Pressure digestions (closed system)
4.1 Pressure digestion, HNO_3,
4.2 Pressure digestion, HNO_3/HF
4.3 Pressure digestion, $HNO_3/HClO_4$,
4.4 Pressure digestion, $HNO_3/HClO_4$/HF,
4.5 Pressure digestion, HNO_3/H_2O_2,

5 Microwave pressure digestions (closed system)
5.1 Microwave digestion, HNO3,
5.2 Microwave digestion, HNO3/HF
5.3 Microwave digestion, HNO3/HClO4
5.4 Microwave digestion, HNO3/HClO4/HF
5.5 Microwave digestion, HNO3/H2O2,
5.6 Microwave digestion, HNO3/H2O2/HF
5.7 Microwave digestion, HNO3/H2O2/HCl
5.8 Microwave aqua regia

6 Dry ashings
6.1 Dry ashing, dissolution with HNO_3
6.2 Dry ashing, dissolution with $HNO_3/MgNO_3$
6.3 Dry ashing, dissolution with HNO_3/HF
6.4 Dry ashing, dissolution with HNO_3/HCl
6.5 Dry ashing, dissolution with HCl
6.6 Dry ashing, dissolution with HCl/HF
6.7 Dry ashing, dissolution with H_2SO_4

7 Oxygen ashings
7.1 Oxygen ashing, Schöniger
7.2 Oxygen ashing, Wickbold
7.3 Oxygen ashing, calorimetric bomb

9 X-ray-pretreatments and other pretreatments
9.1 Material pressed (Pellet)
9.2 Material melted and formed (tablet)
9.3 Melting (NaOH)

Method Code – Determination (D)

0 No information

1 No detection

10 Elemental-analyzers
11 Kjeldahl-apparatus
11.1 Kjeldahl-apparatus (Tecator)
11.2 Kjeldahl-apparatus (Gerhardt)
11.3 Kjeldahl-apparatus (Büchi)

12 N-Analyzer
12.1 N-Analyzer (Heraeus/Elementar)
12.2 N-Analyzer (Vario)
12.3 N-Analyzer (Leco)

13 C-Analyzer
13.1 C-Analyzer (Leco)

14 S-Analyzer
14.1 S-Analyzer (Leco)

15 C/N-Analyzer
15.1 C/N-Analyzer (Carlo-Erba)
15.2 C/N-Analyzer (Leco)
15.3 C/N-Analyzer (Heraeus)
15.4 C/N-Analyzer (Vario)

16 C/S-Analyzer
16.1 C/S-Analyzer (Leco)

17 C/N/S-Analyzer
17.1 C/N/S-Analyzer (Leco)

18 C/N/H-Analyzer
18.1 C/N/H-Analyzer (Leco)
18.2 C/H/N-Analyzer (Heraeus)

20 Mono-Atom-Spectrometry-Techniques
21 AAS-flame technique
21.1 AAS-flame technique (C2H2/Air)
21.2 AAS-flame technique (C2H2/N2O)

22 AAS-flameless technique

24 AAS-hydride technique

25 AAS-cold vapor technique

26 AFS-hydride-technique

28 AES-Flame photometer

30 Multi-Atom-Spectrometry-techniques
31 ICP-AES without Ultrasonic nebulisation

32 ICP-AES with Ultrasonic nebulisation

35 ICP-MS

40 Physical techniques
41 X-ray-energy dispersive

42 X-ray-wavelength dispersive

45 Neutron activation analysis (NAA)

47 Gamma-spectroscopy

50 UV-VIS-spectrophotometry-techniques

51 Colorimetric N-Determination
51.1 Indophenol-blue-method
51.2 Flow Injection (FIAS) - NH_3-Membrane-diffusion, 566 nm
51.3 Continuous flow method, Indophenol blue

52 Colorimetric S-Determination
52.1 BaCl2-methods (Nephelometry)

53 Colorimetric P-Determination
53.1 Molybdene-blue-method
53.2 Vanadium-Mo-blue-method
53.3 Continuous flow method, Molybdene-blue

54 Colorimetric B-Determination
54.1 Azomethin - H
54.2 Carmine

60 Ion-chromatographic techniques

61.1 Anion-Chromatography w. chemical suppression
61.2 Anion-Chromatography w. electr. suppression

62.1 Kation-Chromatography w. chemical suppression
62.2 Kation-Chromatography w. electr. suppression

70 Electrochemical methods

71 Conductimetry
71.1 Conductometric titration

72 Potentiometry
72.1 pH
72.2 other ion selective elektrodes

73 Potentiometric titrations

74 Stripping potentiometry

75 Voltammetry

76 Polarography

77 Amperometry

78 Electrophoresis

79 Redox potential

80 Classical analytical techniques

81 Gravimetry

82 Titration
82.1 NH_4-back titration
82.2 Thiocyanate-titration
82.3 $FeNH_4SO_4$-Titration
82.4 Barimetric titration
82.5 $AgNO_3$-Titration

90 Other detections

List of laboratories and responsible persons

Austria	AGES GmbH Landwirtschaft Linz Wieningerstraße A-4021 Linz	Josef Mittendorfer
	Bundesamt u. Forschungszentrum f. Wald Pflanzenanalyse Seckendorff-Gudent-Weg 8 A-1131 Wien	Alfred Fürst
Belgium	Inst. of Forestry and Game Management Lab Site Research Gaverstraat 4 B-9500 Geraardsbergen	Bruno de Vos Carine Buysse
	University of Louvain-la-Neuve Unité des eaux et forêts Place Croix du Sud 2, bte 9 B-1348 Louvain-La-Neuve	François Piscaglia
Bulgaria	University of Forestry Ecology and Env. Protection KL.Ohridski 10 BU-1756 Sofia	Ekaterina Pavlova
Croatia	Forest Research Institute Department of Ecology and Siviculture Cvjetno naselje 41 HR-10450 Jastrebarsko	Tamara Jakovljevic
Cyprus	Department of Agriculture Analytical Laboratories Louki Akrita -Av. CY-1412 Nicosia	Panicos Hadjigeorgiou

Czech Republic	Forestry and Game Management Res. Inst. Testing Laboratories (25) Jíloviste - Strnady CZ-15604 Prague	OldŚch PŚbyl
Denmark	Danish Forest and Landscape Res. Inst. Dept.of Forest Ecology Horsholm Kongevej 11 DK-2970 Horsholm	Morten Ingerslev Annemarie Bastrup-Birk
Estonia	Tartu Environmental Research Akadeemia 4 EST-51003 Tartu	Mae Uri
Finland	Finnish Forest Research Institute Parkano Research Station Kaironiementie 54 FIN-39700 Parkano	Kari Honka
France	INRA USRAVE B.P.81 Villenave d'Ornon	Alain Gomez
Germany	LUA Nordrhein-Westfahlen RFA-LUA Wallneyer Str. 6 D-45133 Essen	Gerd Cousen
	Institut Dr. Meyer-Spasche Am Teeberg 5 D-29581 Gerdau	H. Meyer-Spasche
	TU Dresden Inst. f. Bodenkunde und Standortslehre Pienner Str. 19 D-01737 Tharandt	Thomas Klinger

Germany	LUFA Speyer Abt. 3 Referat 2 Obere Langgasse 40 D-67346 Speyer	Klaus Wies
	Landeslabor Schleswig-Holstein Außenstelle Kiel II, Dez.:830 Mercatorstraße 7 D-24106 Kiel	Nack
	Landesforstanstalt Eberswalde Abt. Waldökologie Alfred-Möller-Str. 1 D-16225 Eberswalde	L.Reichelt
	Universität Kiel Ökologie Zentrum Olshausenstrasse 40 D-24098 Kiel	Claus-G. Schimming
	TU - München Lehrgebiet f. Waldernährung u. Wasserhaushalt Am Hochanger 13 D-85354 Freising	Günther Bartonek
	Bayr. LA f. Land- u. Forst-wirtschaft Zentrallabor Am Hochanger 11 D-85354 Freising	Uwe Blum
	FI. für Bergbaufolgelandschaften Analytisches Labor Brauhausweg 2 D-03238 Finsterwalde	Sawinski

Germany	Saxon State Institute of Forestry Dept. Soil Science & Plantnutr. Ref. 31 Bonnewitzer Str. 34 D-01796 Pirna OT Graupa	Frank Symossek
	FVA-Baden-Württemberg Abt. Bodenkunde Wonnhaldestraße 4 D-79100 Freiburg	Gabriele Trefz-Malcher
	Thüringer LA für Landwirtschaft Boden- und Düngemittelunter-suchung Naumburger Str. 98 D-07743 Jena	G.Kießling
	Untersuchungszentrum Münster – LUFA Inorganic Analytic Nevinghoff 40 D-48147 Münster	Anne Werning
	LUFA Rostock Graf-Lippe-Str. 1 D-18059 Rostock	W. Sarich
	HDLGN-LUFA Kassel 3214 Am Versuchsfeld 13 D-34128 Kassel	Rolf Ellinghaus
	Niedersächsische Forstl. Versuchsanstalt Abteilung Umweltanalytik Grätzelstrasse 2 D-37079 Göttingen	Nils König

Greece	Forest Research Institute of Athens Forest Soils Terma Alkmanos 115 28 Athens	P. Michopoulos
Hungaria	Forest Research Insitute Ecological Laboratory Várkerület 30/a H-9601 Sárvár	Gabor Pancel
Ireland	Coillte Teoranta Coillte Research Laboratory Newtownmountkennedy Co.Wicklow	Philip O'Dea
Italy no results	Dept. Environmental Science Applied Ecology P.A.Mattioli 4, Univ. of Siena I-53100 Siena	M.Bianconi & C.Leonzio
no results	University of Siena Dep. of environmental science P.A. Mattioli 4 I-53100 Siena	Bianconi Moira
	Consorzio Agrital Ricerche (DISAFRI) Consorzio Agrital Ricerche Viale dell'Industria, 24 I-00057 Maccarese-Fiumicino-Roma	Magnani Ermenegildo
Latvia	Latvian Hydrometeorological Agency Laboratory Department of LVA Maskavas Str. 165 LV-1019 Riga	I. Lyulko

Norway	Norwegian Forest Research Institute - Chemical Laboratorie Hogskoleveien 12 N-1432 As	Gabriele Remedios
Poland	Forest Research Institute Lab. of Forest Environment Chemistry Sekocin Las PL-05-090 Raszyn	Jozef Wojcik
Romania no results	Forest Research and Management Institute Forestry-Ecology Laboratory Sos.Stefanest,nr.128 RO-72904 Bucharest	Aurelia Surdu
Russia	Water Research and Control Center (WRCC) Laboratory of Spectrometry and Chemistry Komsomola street 9 RUS-195009 Saint-Petersburg	E. L. Proletarskaja
Slovakia	Forest Research Institute Laboratory of Forest Environment T.G.Masaryka 22 SK-96092 Zvolen	Jana Durkovicová
Slovenia	Slovenian Forestry Institute Laboratory for Forest Ecology Vecna pot 2 SL-1000 Ljubljana	Polona Kalan
Spain	INIA - Lab.de Ecosistemas Forestales y Agrobio Apdo.8111 E-28080 Madrid	Rosario González Cascón

Switzerland	Eidg. Forschungsanstalt WSL Zentrallabor Zürcherstrasse 111 CH-8903 Birmensdorf	Daniele Pezzotta
United Kingdom	Forest Research ERB Alice Holt Lodge GU10 4LH Farnham, Surrey	Ernest Ward

List of abbreviation

No.	Number of result ordered by Lab. mean
Lab. Code	Code of the laboratory / Laboratory which are analysing level II samples 2003/2004 are marked with x
P	Code for pre-treatment method (s. method code pre-treatment)
D	Code for determination method (s. method code determination)
Lab. mean	Mean of the results of each laboratory without outliers type 1
n	Number of all results from this laboratories without outliers type 1, 2, 3
N	Number of all results from all laboratories without outliers type 1, 2, 3
Mean	Total mean value from all results without outliers type 1, 2, 3
Si	Standard deviation from each laboratory without outliers type 1
SI	Mean Standard deviation for all laboratories without outliers type 1, 2, 3
Vi	Si*100/Lab. mean
VI	SI*100/Mean
Recovery %	Lab.mean * 100/Mean
a	Outlier type 1
b	Outlier type 2
c	Outlier type 3
*	Not tolerable mean value from one laboratory (see table 4)

ANNEX - Results

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: N **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	61	1	15.3	15,12	16,56	15,44	15,81	4	15,73		0,62	3,94	92,85
2	05x	3.52	11	14,79	16,19	16,21	16,20	4	15,85		0,71	4,45	93,53
3	13x	0	17.1	16,20	16,10	16,20	*15,7a*	3	16,17		0,06	0,36	95,42
4	52	0	0	16,35	*15,39a*	16,24	16,25	3	16,28		0,06	0,37	96,09
5	2	1	15.4	16,20	15,80	16,20	16,40	4	16,15		0,25	1,56	95,32
6	25	6	17	16,10	16,40	16,30	16,30	4	16,28		0,13	0,77	96,06
7	60	1	12.3	16,35	16,22	16,37	16,43	4	16,34		0,09	0,54	96,45
8	36	3.51	11	16,52	16,35	16,30	16,52	4	16,42		0,11	0,70	96,93
9	11x	3.51	11.1	16,37	16,39	16,52	16,56	4	16,46		0,09	0,57	97,15
10	40	1	15.3	16,22	16,62	16,45	16,55	4	16,46		0,17	1,05	97,15
11	18x	3.31	51.3	16,70	16,00	16,80	16,50	4	16,50		0,36	2,16	97,38
12	50x	1	17.1	16,51	16,46	16,70	17,06	4	16,68		0,27	1,63	98,46
13	12x	1	17.1	16,67	16,64	16,70	16,76	4	16,69		0,05	0,31	98,52
14	49	1	15.3	16,79	16,60	16,53	16,98	4	16,73		0,20	1,21	98,71
15	33a	5.1	82	16,83	16,77	16,80	16,60	4	16,75		0,10	0,61	98,86
16	27	3.51	11.1	16,76	16,78	16,81	16,79	4	16,78		0,02	0,13	99,06
17	08x	1	15.2	17,00	16,90	16,80	16,70	4	16,85		0,13	0,77	99,45
18	09x	3.51	11.2	17,10	16,79	16,85	16,80	4	16,89		0,15	0,86	99,66
19	20x	1	15.2	16,90	16,91	16,98	16,87	4	16,92		0,05	0,28	99,83
20	15	1	17	*17,50*	*18,20*	*15,10*	*17,00*	*0*	*16,95*	c	*1,33*	*7,83*	*100,04*
21	06x	1	15.1	17,38	16,57	16,93	16,96	4	16,96		0,33	1,95	100,10
22	39x	1	12.3	17,29	16,52	17,02	17,26	4	17,02		0,36	2,09	100,47
23	04a	1	15.2	17,08	16,76	17,23	17,02	4	17,02		0,20	1,15	100,47
24	42	1	15.2	17,10	17,10	16,90	17,00	4	17,03		0,10	0,56	100,48
25	23x	1	15	16,93	16,60	17,53	17,24	4	17,08		0,40	2,34	100,78
26	43x	1	15.2	17,10	17,10	17,20	17,00	4	17,10		0,08	0,48	100,92
27	07x	1	18.1	17,00	17,40	17,00	17,30	4	17,18		0,21	1,20	101,37
28	29x	3.51	11.1	17,21	17,20	17,18	17,20	4	17,20		0,01	0,07	101,50
29	28x	3.31	51.3	17,05	17,11	17,34	17,38	4	17,22		0,16	0,95	101,63
30	56	1	17	17,41	17,17	17,31	17,26	4	17,29		0,10	0,58	102,03
31	48x	1	15.4	17,61	17,08	17,21	17,26	4	17,29		0,23	1,31	102,05
32	01x	1	17.1	17,50	17,50	17,40	17,00	4	17,35		0,24	1,37	102,40
33	44x	1	12.3	17,60	17,30	17,50	17,30	4	17,43		0,15	0,86	102,84
34	26x	3.31	15	17,13	17,85	17,19	17,55	4	17,43		0,34	1,93	102,87
35	17x	1	17	17,40	17,50	17,50	17,40	4	17,45		0,06	0,33	102,99
36	37x	0	11.1	17,51	17,41	17,51	17,51	4	17,49		0,05	0,29	103,20
37	47x	1	15.4	17,90	18,05	17,88	17,79	4	17,91		0,11	0,60	105,68
38	38	1	15.4	18,00	17,90	17,90	17,90	4	17,93		0,05	0,28	105,79
39	19	1	15.1	18,01	18,10	17,30	18,80	4	18,05		0,61	3,40	106,55
40	03x	1	15.2	18,15	18,20	18,11	17,98	4	18,11		0,09	0,52	106,89
41	46	1	*15*	*20,19*	*19,67*	*18,83*	*18,70*	*0*	*19,35*	b *	*0,71*	*3,66*	*114,19*
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	N	Mean	SI	VI
all labs	154	**16,94**	**0,192**	**1,133**
10	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: N **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	61	1	15.3	*10,06*	*11,04*	*10,86*	*10,67*	*0*	*10,66*	b	*	*0,43*	*4,00*	*87,00*
2	2	1	15.4	11,30	11,40	11,10	11,40	4	11,30			0,14	1,25	92,25
3	52	0	0	11,46	11,34	11,60	11,37	4	11,44			0,12	1,02	93,41
4	11x	3.51	11.1	11,37	11,56	11,62	11,67	4	11,56			0,13	1,14	94,33
5	13x	0	17.1	11,70	11,60	11,70	11,30	4	11,58			0,19	1,64	94,49
6	25	6	17	11,80	11,40	11,60	11,70	4	11,63			0,17	1,47	94,90
7	60	1	12.3	11,68	11,73	11,72	11,69	4	11,71			0,02	0,20	95,56
8	12x	1	17.1	11,85	12,02	12,07	11,97	4	11,98			0,09	0,79	97,78
9	50x	1	17.1	11,96	11,81	11,86	12,28	4	11,98			0,21	1,76	97,78
10	40	1	15.3	11,79	12,14	11,92	12,08	4	11,98			0,16	1,32	97,84
11	20x	1	15.2	11,96	12,09	12,06	11,96	4	12,02			0,07	0,56	98,11
12	18x	3.31	51.3	12,00	12,00	12,10	12,00	4	12,03			0,05	0,42	98,17
13	07x	1	18.1	12,10	11,60	11,80	12,70	4	12,05			0,48	3,98	98,37
14	36	3.51	11	11,97	12,04	12,10	12,22	4	12,08			0,11	0,88	98,64
15	33a	5.1	82	12,09	12,01	12,15	12,09	4	12,09			0,06	0,48	98,66
16	42	1	15.2	12,20	12,10	12,10	12,10	4	12,13			0,05	0,41	98,98
17	05x	3.52	11	12,95	12,18	12,16	12,16	4	12,36			0,39	3,17	100,92
18	26x	3.31	15	12,12	12,28	12,21	12,10	4	12,18			0,08	0,69	99,41
19	08x	1	15.2	12,20	12,10	12,30	12,30	4	12,23			0,10	0,78	99,80
20	28x	3.31	51.3	12,24	12,29	12,20	12,22	4	12,24			0,04	0,32	99,90
21	27	3.51	11.1	12,24	12,22	12,26	12,25	4	12,24			0,01	0,11	99,93
22	49	1	15.3	12,26	12,18	12,34	12,21	4	12,25			0,07	0,57	99,98
23	09x	3.51	11.2	12,26	12,39	12,35	12,09	4	12,27			0,13	1,09	100,19
24	43x	1	15.2	12,30	12,40	12,40	12,30	4	12,35			0,06	0,47	100,82
25	06x	1	15.1	12,43	12,55	12,10	12,36	4	12,36			0,19	1,54	100,90
26	04a	1	15.2	12,24	12,20	12,65	12,36	4	12,36			0,20	1,65	100,92
27	48x	1	15.4	12,33	12,41	12,29	12,43	4	12,37			0,07	0,53	100,94
28	56	1	17	12,46	12,17	12,50	12,38	4	12,38			0,15	1,19	101,05
29	39x	1	12.3	12,41	12,26	12,93	12,06	4	12,42			0,37	3,00	101,35
30	47x	1	15.4	12,55	12,60	12,58	12,43	4	12,54			0,08	0,61	102,37
31	37x	0	11.1	12,53	12,63	12,63	12,53	4	12,58			0,06	0,46	102,70
32	23x	1	15	12,77	12,70	12,12	12,78	4	12,59			0,32	2,52	102,80
33	29x	3.51	11.1	12,61	12,61	12,60	12,61	4	12,61			0,00	0,04	102,92
34	44x	1	12.3	12,70	12,80	12,60	12,60	4	12,68			0,10	0,76	103,47
35	17x	1	17	12,70	12,70	12,70	12,70	4	12,70			0,00	0,00	103,68
36	38	1	15.4	12,60	12,70	12,70	12,80	4	12,70			0,08	0,64	103,68
37	01x	1	17.1	12,70	12,70	12,80	12,80	4	12,75			0,06	0,45	104,09
38	15	1	17	*17,2a*	12,60	13,20	12,80	3	12,87			0,31	2,37	105,04
39	03x	1	15.2	13,16	13,10	12,90	13,03	4	13,05			0,11	0,86	106,52
40	19	1	15.1	12,60	12,90	13,90	13,80	4	13,30			0,65	4,87	108,58
41	46	1	15	*15,04*	*14,63*	*14,47*	*13,49*	*0*	*14,41*	b	*	*0,66*	*4,56*	*117,62*
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	N	Mean	SI	VI
all labs	155	**12,25**	**0,145**	**1,186**
10	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: N **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	13x	0	17.1	21,80	22,10	21,00	21,20	4	21,53		0,51	2,38	91,56
2	11x	3.51	11.1	21,44	21,52	21,65	21,66	4	21,57		0,11	0,49	91,74
3	2	1	15.4	22,80	21,10	21,90	22,10	4	21,98		0,70	3,18	93,47
4	36	3.51	11	21,90	22,00	21,90	22,18	4	22,00		0,13	0,60	93,56
5	15	1	17	21,50	22,60	23,30	21,80	4	22,30		0,81	3,64	94,86
6	52	0	0	22,40	22,16	22,00	22,69	4	22,31		0,30	1,35	94,91
7	60	1	12.3	22,38	22,45	22,21	22,26	4	22,33		0,11	0,49	94,96
8	18x	3.31	51.3	22,60	23,00	22,20	22,60	4	22,60		0,33	1,45	96,13
9	05x	3.52	11	23,36	22,75	22,61	22,40	4	22,78		0,41	1,81	96,90
10	33a	5.1	82	22,79	22,80	22,89	22,95	4	22,86		0,08	0,33	97,23
11	09x	3.51	11.2	22,94	22,79	23,34	22,47	4	22,89		0,36	1,58	97,35
12	12x	1	17.1	22,72	23,07	22,96	23,07	4	22,96		0,17	0,72	97,64
13	26x	3.31	15	23,72	22,54	23,02	22,85	4	23,03		0,50	2,17	97,97
14	61	1	15.3	21,84	23,15	24,02	23,55	4	23,14		0,94	4,05	98,43
15	06x	1	15.1	23,06	22,97	23,45	23,16	4	23,16		0,21	0,90	98,51
16	40	1	15.3	23,64	22,78	23,45	23,22	4	23,27		0,37	1,59	98,99
17	20x	1	15.2	23,29	23,46	23,18	23,36	4	23,32		0,12	0,51	99,21
18	39x	1	12.3	23,76	23,04	23,32	23,20	4	23,33		0,31	1,32	99,24
19	50x	1	17.1	23,92	22,94	23,25	23,34	4	23,36		0,41	1,75	99,38
20	56	1	17	24,33	23,56	23,08	23,64	4	23,65		0,51	2,18	100,61
21	25	6	17	23,80	23,40	23,90	23,60	4	23,68		0,22	0,94	100,71
22	43x	1	15.2	23,50	24,40	23,20	23,60	4	23,68		0,51	2,16	100,71
23	08x	1	15.2	24,20	23,40	23,70	23,50	4	23,70		0,36	1,50	100,81
24	01x	1	17.1	23,50	24,00	24,00	23,40	4	23,73		0,32	1,35	100,92
25	04a	1	15.2	23,94	22,95	24,63	23,48	4	23,75		0,71	3,00	101,02
26	07x	1	18.1	23,70	23,60	23,90	23,90	4	23,78		0,15	0,63	101,13
27	42	1	15.2	23,90	23,90	23,90	23,50	4	23,80		0,20	0,84	101,24
28	44x	1	12.3	24,00	24,40	23,30	24,10	4	23,95		0,47	1,94	101,88
29	49	1	15.3	24,05	24,44	23,69	23,62	4	23,95		0,38	1,57	101,88
30	37x	0	11.1	23,93	24,03	23,83	24,03	4	23,96		0,10	0,40	101,90
31	17x	1	17	23,90	24,60	24,00	23,80	4	24,08		0,36	1,49	102,41
32	27	3.51	11.1	24,07	24,09	24,12	24,10	4	24,10		0,02	0,09	102,49
33	28x	3.31	51.3	24,13	24,02	24,13	24,13	4	24,10		0,05	0,23	102,52
34	48x	1	15.4	23,79	24,27	24,38	24,82	4	24,32		0,42	1,74	103,43
35	29x	3.51	11.1	24,31	24,35	24,49	24,37	4	24,38		0,08	0,32	103,70
36	47x	1	15.4	24,72	22,93	24,58	25,36	4	24,40		1,04	4,24	103,78
37	38	1	15.4	24,70	24,40	24,30	24,40	4	24,45		0,17	0,71	104,00
38	03x	1	15.2	25,20	25,41	25,04	25,14	4	25,20		0,16	0,62	107,18
39	46	1	15	25,90	25,84	24,71	24,49	4	25,24		0,74	2,93	107,34
40	23x	1	15	26,27	25,47	25,14	25,30	4	25,55		0,50	1,96	108,66
41	19	1	15.1	26,40	*29,8a*	26,20	27,00	3	26,53	*	0,42	1,57	112,86
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	N	Mean	SI	VI
all labs	163	**23,51**	**0,360**	**1,530**
10	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: N **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	2	1	15.4	21,30	21,20	21,30	21,10	4	21,23			0,10	0,45	93,48
2	13x	0	17.1	21,00	21,60	20,90	21,80	4	21,33			0,44	2,08	93,92
3	40	1	15.3	21,26	21,31	21,75	21,56	4	21,47			0,23	1,07	94,57
4	11x	3.51	11.1	21,33	21,44	21,51	21,92	4	21,55			0,26	1,20	94,91
5	36	3.51	11	21,62	21,57	21,62	21,95	4	21,69			0,17	0,81	95,53
6	15	1	17	21,90	23,20	20,90	20,80	4	21,70			1,12	5,15	95,58
7	60	1	12.3	21,79	21,81	21,84	21,78	4	21,81			0,03	0,12	96,04
8	52	0	0	21,90	21,96	21,75	21,88	4	21,87			0,09	0,40	96,34
9	06x	1	15.1	22,28	21,99	22,12	22,13	4	22,13			0,12	0,54	97,47
10	05x	3.52	11	22,17	22,26	21,96	22,17	4	22,14			0,13	0,57	97,51
11	25	6	17	22,10	22,30	22,00	22,20	4	22,15			0,13	0,58	97,56
12	61	1	15.3	21,60	22,68	22,34	*26,79a*	3	22,21			0,55	2,49	97,81
13	12x	1	17.1	22,19	22,27	22,45	22,43	4	22,34			0,13	0,56	98,37
14	49	1	15.3	22,54	22,40	22,48	22,33	4	22,44			0,09	0,41	98,82
15	33a	5.1	82	22,54	22,55	22,40	22,44	4	22,48			0,07	0,33	99,02
16	09x	3.51	11.2	22,79	22,71	22,74	22,28	4	22,63			0,24	1,04	99,67
17	08x	1	15.2	22,80	22,70	22,60	22,60	4	22,68			0,10	0,42	99,87
18	43x	1	15.2	22,70	22,80	22,60	22,70	4	22,70			0,08	0,36	99,98
19	42	1	15.2	22,70	22,70	22,70	22,80	4	22,73			0,05	0,22	100,09
20	07x	1	18.1	22,80	22,70	22,50	22,90	4	22,73			0,17	0,75	100,09
21	18x	3.31	51.3	23,00	22,40	22,80	22,70	4	22,73			0,25	1,10	100,09
22	20x	1	15.2	22,69	22,72	22,86	22,82	4	22,77			0,08	0,35	100,30
23	26x	3.31	15	23,55	22,19	22,90	22,75	4	22,85			0,56	2,45	100,63
24	39x	1	12.3	22,81	23,41	22,85	22,33	4	22,85			0,44	1,93	100,64
25	50x	1	17.1	23,67	22,41	22,85	22,63	4	22,89			0,55	2,40	100,82
26	04a	1	15.2	22,91	22,77	22,88	23,01	4	22,89			0,10	0,43	100,83
27	27	3.51	11.1	22,90	22,89	22,90	22,90	4	22,90			0,01	0,03	100,86
28	28x	3.31	51.3	22,92	22,92	23,05	22,90	4	22,95			0,07	0,30	101,07
29	48x	1	15.4	22,99	23,00	23,11	23,01	4	23,03			0,06	0,24	101,42
30	56	1	17	23,09	23,00	23,12	23,07	4	23,07			0,05	0,22	101,61
31	01x	1	17.1	23,00	23,30	22,80	23,30	4	23,10			0,24	1,06	101,74
32	37x	0	11.1	23,16	23,16	23,05	23,26	4	23,16			0,09	0,37	101,99
33	29x	3.51	11.1	23,19	23,19	23,19	23,18	4	23,19			0,00	0,02	102,13
34	44x	1	12.3	23,30	23,20	23,20	23,20	4	23,23			0,05	0,22	102,29
35	17x	1	17	23,40	23,40	23,40	23,30	4	23,38			0,05	0,21	102,95
36	47x	1	15.4	23,68	23,04	23,72	24,01	4	23,61			0,41	1,73	104,00
37	38	1	15.4	23,70	23,70	23,50	23,60	4	23,63			0,10	0,41	104,05
38	03x	1	15.2	24,37	24,33	24,24	24,18	4	24,28			0,09	0,35	106,94
39	23x	1	15	24,82	25,26	24,70	24,35	4	24,78			0,38	1,52	109,15
40	46	1	15	25,46	25,16	24,40	24,25	4	24,82			0,58	2,36	109,31
41	19	1	15.1	*25,50*	*26,50*	*24,20*	*26,50*	*0*	*25,68*	b	*	*1,09*	*4,25*	*113,08*
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	N	Mean	SI	VI
all labs	159	**22,70**	**0,211**	**0,929**
10	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: S **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	6.5	52.1	*<0,02*	*<0,02*	*<0,02*	*<0,02*							
2	56	1	17	*0,16*	*0,15*	*0,12*	*0,12*	*0*	*0,14*	b	*	*0,02*	*16,22*	*12,46*
3	33a	5.1	60	*0,74*	*0,67*	*0,78*	*0,62*	*0*	*0,70*	b	*	*0,07*	*10,16*	*62,97*
4	36	6.5	81	*0,78*	*0,77*	*0,81*	*0,82*	*0*	*0,80*	b	*	*0,02*	*2,99*	*71,26*
5	19	5.6	31	0,97	0,72	1,04	0,94	4	0,92			0,14	15,06	82,24
6	08x	6.3	31	0,99	1,06	1,01	0,97	4	1,01			0,04	3,95	90,24
7	28x	6	61.2	1,01	1,00	1,01	1,01	4	1,01			0,01	0,50	90,31
8	52	4.1	31	1,02	1,00	0,98	1,03	4	1,01			0,02	2,20	90,31
9	39x	5.5	31	1,04	1,00	1,02	1,02	4	1,02			0,01	1,38	91,28
10	25	6	17	1,04	1,04	1,04	1,04	4	1,04			0,00	0,21	93,22
11	12x	5.1	31	1,04	0,96	1,08	1,10	4	1,05			0,06	5,99	93,70
12	07x	5.5	31	1,06	1,04	1,05	1,05	4	1,05			0,01	0,78	94,12
13	43x	4.1	31	1,08	1,07	1,07	1,05	4	1,07			0,01	1,18	95,69
14	47x	4.1	32	1,06	1,06	1,08	1,08	4	1,07			0,01	1,08	95,91
15	49	5.1	31	1,08	1,12	1,05	1,04	4	1,07			0,04	3,35	96,14
16	38	5.5	31	1,09	1,08	1,07	1,07	4	1,08			0,01	0,89	96,59
17	09x	5.5	31	1,06	1,11	1,12	1,06	4	1,09			0,03	2,92	97,46
18	37x	5.5	31	1,09	1,10	1,09	1,08	4	1,09			0,01	0,75	97,71
19	44x	4.1	31	1,10	1,09	1,10	1,07	4	1,09			0,01	1,30	97,71
20	06x	5.2	31	1,10	1,09	1,09	1,09	4	1,09			0,01	0,46	97,93
21	50x	4.1	31	1,11	1,10	1,11	1,11	4	1,11			0,00	0,30	99,37
22	48x	4.1	31	1,12	1,11	1,12	1,10	4	1,11			0,01	0,90	99,84
23	60	3.3	31	1,08	1,14	1,11	1,13	4	1,12			0,03	2,37	99,95
24	2	5.3	31	1,10	1,20	1,10	1,10	4	1,13			0,05	4,44	100,84
25	42	4.1	31	1,13	1,13	1,13	1,13	4	1,13			0,00	0,18	101,31
26	03x	1	14.1	1,12	1,18	1,12	1,12	4	1,14			0,03	2,64	101,74
27	46	5.2	31	1,23	1,15	1,21	1,03	4	1,16			0,09	7,79	103,53
28	26x	5.5	35	1,19	1,16	1,11	1,17	4	1,16			0,03	2,94	103,76
29	4	9.1	41	1,17	1,17	1,16	1,15	4	1,16			0,01	0,93	104,25
30	40	5.7	31	1,18	1,15	1,16	1,16	4	1,16			0,01	1,08	104,36
31	17x	5.5	31	1,16	1,18	1,17	1,18	4	1,17			0,01	0,95	105,10
32	11x	4.1	31	1,16	1,18	1,18	1,18	4	1,18			0,01	0,85	105,33
33	37a	0	42	1,17	1,15	1,19	1,19	4	1,18			0,02	1,63	105,33
34	20x	1	14.1	1,22	1,23	1,14	1,14	4	1,18			0,05	4,00	106,11
35	23x	3.9	31	1,12	1,19	1,20	1,24	4	1,19			0,05	4,20	106,45
36	18x	1	10	1,19	1,19	1,19	1,19	4	1,19			0,00	0,00	106,67
37	04a	9.1	42	1,18	1,20	1,21	1,17	4	1,19			0,02	1,53	106,67
38	29x	3.3	31	1,19	1,20	1,19	1,21	4	1,20			0,01	0,80	107,34
39	13x	0	17.1	1,24	1,23	1,25	1,29	4	1,25			0,03	2,10	112,27
40	01x	1	16.1	1,36	1,31	1,32	1,33	4	1,33			0,02	1,62	119,22
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	N	Mean	SI	VI
all labs	144	**1,12**	**0,025**	**2,249**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: S **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	56	1	17	*0,17*	*0,15*	*0,15*	*0,16*	*0*	*0,16*	b	*	*0,01*	*7,07*	*11,52*
2	05x	6.5	52.1	*0,54*	*0,68*	*0,60*	*0,65*	*0*	*0,62*	b	*	*0,06*	*10,39*	*45,02*
3	33a	5.1	60	*0,85*	*0,94*	*0,90*	*0,92*	*0*	*0,90*	b	*	*0,04*	*4,28*	*65,88*
4	36	6.5	81	*0,91*	*0,97*	*1,08*	*1,00*	*0*	*0,99*	b	*	*0,07*	*7,14*	*72,27*
5	19	5.6	31	*0,85*	*1,47*	*1,52*	*1,01*	*0*	*1,21*	c		*0,33*	*27,49*	*88,51*
6	28x	6	61.2	*1,19a*	1,23	1,23	1,24	3	1,23			0,01	0,47	90,03
7	08x	6.3	31	1,27	1,21	1,21	1,24	4	1,23			0,03	2,33	89,97
8	52	4.1	31	1,29	1,23	1,24	1,26	4	1,26			0,03	2,11	91,62
9	25	6	17	1,27	1,26	1,27	1,26	4	1,27			0,01	0,46	92,35
10	43x	4.1	31	1,28	1,28	1,28	1,30	4	1,29			0,01	0,78	93,81
11	06x	5.2	31	1,30	1,30	1,29	1,29	4	1,30			0,01	0,45	94,54
12	03x	1	14.1	1,30	1,30	1,30	1,28	4	1,30			0,01	0,77	94,54
13	09x	5.5	31	1,29	1,32	1,34	1,28	4	1,31			0,03	2,01	95,38
14	60	3.3	31	1,29	1,34	1,37	1,27	4	1,32			0,05	3,47	96,18
15	37x	5.5	31	1,34	1,32	1,33	1,34	4	1,33			0,01	0,72	97,27
16	38	5.5	31	1,33	1,36	1,33	1,31	4	1,33			0,02	1,55	97,27
17	49	5.1	31	1,31	1,34	1,33	1,36	4	1,34			0,02	1,56	97,46
18	50x	4.1	31	1,33	1,34	1,34	1,36	4	1,34			0,01	0,98	97,80
19	07x	5.5	31	1,34	1,35	1,34	1,34	4	1,34			0,01	0,37	98,00
20	44x	4.1	31	1,37	1,36	1,37	1,31	4	1,35			0,03	2,12	98,73
21	39x	5.5	31	1,34	1,38	1,35	1,35	4	1,36			0,02	1,31	98,93
22	47x	4.1	32	1,37	1,37	1,40	1,38	4	1,38			0,01	1,02	100,74
23	48x	4.1	31	1,39	1,38	1,39	1,38	4	1,38			0,00	0,33	100,91
24	4	9.1	41	1,35	1,36	1,41	1,41	4	1,38			0,03	2,32	100,98
25	37a	0	42	1,37	1,40	1,40	1,39	4	1,39			0,01	1,02	101,47
26	12x	5.1	31	1,41	1,27	1,41	1,48	4	1,39			0,09	6,36	101,53
27	18x	1	10	1,39	1,39	1,39	1,39	4	1,39			0,00	0,00	101,69
28	42	4.1	31	1,41	1,39	1,39	1,39	4	1,39			0,01	0,65	101,73
29	11x	4.1	31	1,40	1,40	1,39	1,40	4	1,40			0,00	0,36	102,02
30	2	5.3	31	1,40	1,40	1,40	1,40	4	1,40			0,00	0,00	102,20
31	13x	0	17.1	1,41	1,42	1,40	1,38	4	1,40			0,02	1,22	102,38
32	04a	9.1	42	1,41	1,41	1,41	1,39	4	1,41			0,01	0,71	102,57
33	20x	1	14.1	1,39	1,40	1,40	1,44	4	1,41			0,02	1,38	102,75
34	17x	5.5	31	1,41	1,42	1,42	1,43	4	1,42			0,01	0,61	103,77
35	46	5.2	31	1,40	1,43	1,47	1,47	4	1,44			0,03	2,36	105,30
36	40	5.7	31	1,43	1,42	1,47	1,46	4	1,44			0,02	1,56	105,40
37	01x	1	16.1	1,47	1,46	1,48	1,46	4	1,47			0,01	0,65	107,13
38	29x	3.3	31	1,49	1,49	1,48	1,50	4	1,49			0,01	0,55	108,77
39	26x	5.5	35	1,51	1,51	1,55	1,49	4	1,52			0,03	1,66	110,60
40	23x	3.9	31	1,55	1,55	1,37	1,65	4	1,53			0,12	7,62	111,69
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	N	Mean	SI	VI
all labs	139	**1,37**	**0,021**	**1,499**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: S **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	56	1	17	*0,18*	*0,18*	*0,18*	*0,20*	*0*	*0,19*	b	*	*0,01*	*4,26*	*10,99*
2	05x	6.5	52.1	*0,20*	*0,166a*	*0,20*	*0,20*	*0*	*0,20*	b	*	*0,00*	*1,46*	*11,77*
3	33a	5.1	60	*0,67*	*0,87*	*0,72*	*0,83*	*0*	*0,77*	b	*	*0,09*	*12,07*	*45,85*
4	36	6.5	81	*1,15*	*1,26*	*1,20*	*1,14*	*0*	*1,19*	b	*	*0,05*	*4,63*	*70,47*
5	08x	6.3	31	1,44	1,47	1,47	1,45	4	1,46			0,01	1,03	86,50
6	19	5.6	31	1,50	1,26	1,77	1,43	4	1,49			0,21	14,24	88,43
7	46	5.2	31	1,46	1,45	1,53	1,57	4	1,50			0,06	3,82	89,17
8	52	4.1	31	1,53	1,48	1,51	1,51	4	1,51			0,02	1,37	89,47
9	28x	6	61.2	1,52	1,50	1,55	1,49	4	1,52			0,03	1,75	89,91
10	39x	5.5	31	1,55	1,58	1,56	1,58	4	1,56			0,01	0,91	92,82
11	37x	5.5	31	1,57	1,59	1,53	1,58	4	1,57			0,03	1,68	93,03
12	06x	5.2	31	1,58	1,58	1,57	1,58	4	1,58			0,00	0,32	93,62
13	60	3.3	31	1,67	1,66	1,60	1,42	4	1,59			0,12	7,30	94,21
14	43x	4.1	31	1,59	1,60	1,59	1,58	4	1,59			0,01	0,51	94,36
15	38	5.5	31	1,61	1,58	1,61	1,58	4	1,60			0,02	1,09	94,66
16	07x	5.5	31	1,61	1,60	1,61	1,60	4	1,61			0,01	0,36	95,25
17	09x	5.5	31	1,60	1,62	1,66	1,63	4	1,63			0,03	1,59	96,53
18	49	5.1	31	1,63	1,58	1,64	1,67	4	1,63			0,04	2,30	96,74
19	50x	4.1	31	1,62	1,64	1,65	1,66	4	1,64			0,01	0,84	97,42
20	48x	4.1	31	1,65	1,65	1,66	1,63	4	1,65			0,01	0,81	97,80
21	03x	1	14.1	1,68	1,64	1,67	1,67	4	1,67			0,02	1,04	98,81
22	13x	0	17.1	1,67	1,67	1,70	1,67	4	1,68			0,02	0,89	99,55
23	12x	5.1	31	1,76	1,67	1,68	1,70	4	1,70			0,04	2,34	100,95
24	11x	4.1	31	1,71	1,69	1,71	1,70	4	1,70			0,01	0,56	101,04
25	44x	4.1	31	1,73	1,73	1,72	1,68	4	1,72			0,02	1,39	101,78
26	20x	1	14.1	1,74	1,74	1,71	1,70	4	1,72			0,02	1,19	102,27
27	4	9.1	41	1,68	1,69	1,76	1,77	4	1,73			0,05	2,71	102,51
28	47x	4.1	32	1,72	1,73	1,78	1,74	4	1,74			0,03	1,51	103,41
29	42	4.1	31	1,77	1,74	1,75	1,72	4	1,74			0,02	1,05	103,46
30	37a	0	42	1,76	1,75	1,75	1,74	4	1,75			0,01	0,47	103,86
31	40	5.7	31	1,76	1,78	1,76	1,74	4	1,76			0,01	0,79	104,45
32	25	6	17	1,82	1,76	1,70	1,77	4	1,76			0,05	2,79	104,60
33	2	5.3	31	1,80	1,80	1,80	1,80	4	1,80			0,00	0,00	106,82
34	17x	5.5	31	1,78	1,81	1,82	1,80	4	1,80			0,02	0,85	106,84
35	04a	9.1	42	1,84	1,81	1,82	1,77	4	1,81			0,03	1,63	107,42
36	29x	3.3	31	1,89	1,89	1,84	1,85	4	1,87			0,03	1,41	110,83
37	23x	3.9	31	1,78	1,88	1,83	2,02	4	1,88			0,10	5,51	111,42
38	01x	1	16.1	1,89	1,87	1,92	1,88	4	1,89			0,02	1,14	112,17
39	26x	5.5	35	1,89	1,96	1,82	1,93	4	1,90			0,06	3,19	112,76
40	18x	1	10	1,87	1,98	1,98	1,94	4	1,94			0,05	2,67	115,16
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	N	Mean	SI	VI
all labs	144	**1,69**	**0,034**	**1,998**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: S **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	56	1	17	*0,20*	*0,21*	*0,21*	*0,22*	*0*	*0,21*	b	*	*0,01*	*2,95*	*11,18*
2	05x	6.5	52.1	*0,77*	*0,86*	*0,80*	*0,85*	*0*	*0,82*	b	*	*0,04*	*5,12*	*43,35*
3	33a	5.1	60	*1,09*	*1,13*	*1,08*	*1,12*	*0*	*1,11*	b	*	*0,02*	*2,15*	*58,39*
4	36	6.5	81	*1,38*	*1,42*	*1,40*	*1,42*	*0*	*1,41*	b	*	*0,02*	*1,36*	*74,25*
5	19	5.6	31	*1,63*	*1,39*	*1,41*	*1,52*	*0*	*1,49*	b	*	*0,11*	*7,45*	*78,61*
6	08x	6.3	31	1,65	1,66	1,74	1,65	4	1,68			0,04	2,60	88,52
7	28x	6	61.2	1,71	1,72	1,73	1,74	4	1,73			0,01	0,75	91,16
8	52	4.1	31	1,74	1,78	1,74	1,74	4	1,75			0,02	1,14	92,48
9	37x	5.5	31	1,76	1,77	1,78	1,78	4	1,77			0,01	0,54	93,67
10	06x	5.2	31	1,76	1,78	1,80	1,78	4	1,78			0,02	0,92	94,06
11	38	5.5	31	1,84	1,79	1,80	1,80	4	1,81			0,02	1,23	95,52
12	39x	5.5	31	1,80	1,81	1,85	1,81	4	1,82			0,02	1,01	96,14
13	09x	5.5	31	1,77	1,85	1,83	1,91	4	1,84			0,06	3,15	97,30
14	50x	4.1	31	1,85	1,83	1,84	1,86	4	1,84			0,01	0,78	97,37
15	25	6	17	1,82	1,84	1,87	1,85	4	1,85			0,02	1,13	97,50
16	48x	4.1	31	1,85	1,83	1,88	1,84	4	1,85			0,02	1,09	97,68
17	07x	5.5	31	1,85	1,87	1,85	1,86	4	1,86			0,01	0,52	98,16
18	49	5.1	31	1,85	1,84	1,89	1,88	4	1,87			0,02	1,28	98,56
19	43x	4.1	31	1,87	1,86	1,88	1,87	4	1,87			0,01	0,44	98,82
20	37a	0	42	1,88	1,90	1,86	1,88	4	1,88			0,02	0,87	99,35
21	03x	1	14.1	1,89	1,87	1,90	1,89	4	1,89			0,01	0,67	99,74
22	44x	4.1	31	1,89	1,94	1,92	1,90	4	1,91			0,02	1,16	101,07
23	13x	0	17.1	1,88	1,87	1,99	1,93	4	1,92			0,06	2,87	101,33
24	04a	9.1	42	1,93	1,92	1,94	1,88	4	1,92			0,03	1,37	101,33
25	42	4.1	31	1,92	1,92	1,92	1,91	4	1,92			0,00	0,25	101,40
26	47x	4.1	32	1,94	1,92	1,92	1,90	4	1,92			0,02	0,85	101,46
27	23x	3.9	31	1,71	1,98	2,08	1,92	4	1,92			0,16	8,13	101,59
28	11x	4.1	31	1,92	1,94	1,94	1,94	4	1,94			0,01	0,52	102,25
29	4	9.1	41	1,94	1,96	1,94	1,94	4	1,95			0,01	0,63	102,84
30	2	5.3	31	2,00	2,00	1,90	1,90	4	1,95			0,06	2,96	103,05
31	17x	5.5	31	1,96	1,96	1,95	1,94	4	1,95			0,01	0,43	103,13
32	40	5.7	31	1,95	1,96	1,99	1,97	4	1,97			0,02	1,03	103,93
33	12x	5.1	31	1,90	1,91	1,96	2,10	4	1,97			0,09	4,73	103,99
34	18x	1	10	2,04	1,94	1,94	1,97	4	1,97			0,05	2,60	104,10
35	20x	1	14.1	2,00	1,96	2,03	1,98	4	1,99			0,03	1,38	105,28
36	01x	1	16.1	1,96	2,05	2,06	2,00	4	2,02			0,05	2,30	106,61
37	46	5.2	31	2,05	2,12	2,11	2,06	4	2,09			0,04	1,68	110,18
38	29x	3.3	31	2,08	2,09	2,10	2,09	4	2,09			0,01	0,39	110,45
39	26x	5.5	35	*2,12*	*2,20*	*2,15*	*2,40*	*0*	*2,22*	b		*0,13*	*5,68*	*117,18*
40	60	3.3	31	*2,69*	*2,96*	*2,81*	*2,84*	*0*	*2,83*	b	*	*0,11*	*3,93*	*149,29*
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	N	Mean	SI	VI
all labs	132	**1,89**	**0,030**	**1,566**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: P **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	27	6.5	50	*0,89*	*0,89*	*0,91*	*0,90*	*0*	*0,90*	b	*	*0,01*	*1,12*	*47,11*
2	05x	6.5	50	*1,04*	*1,00*	*1,10*	*1,14*	*0*	*1,07*	b	*	*0,06*	*5,81*	*56,13*
3	46	5.2	31	1,56	1,46	1,52	1,40	4	1,49		*	0,07	4,71	77,90
4	61x	4.1	53.1	1,63	1,66	1,57	1,48	4	1,59		*	0,08	5,01	83,15
5	33a	5.1	50	1,69	1,70	1,69	1,70	4	1,69			0,01	0,36	88,69
6	12x	5.1	31	1,70	1,69	1,67	1,72	4	1,70			0,02	1,05	88,93
7	01x	3.21	50	1,72	1,72	1,74	1,74	4	1,73			0,01	0,67	90,75
8	36	3.3	53	1,74	1,76	1,77	1,77	4	1,76			0,01	0,80	92,33
9	13x	5.3	53.1	1,78	1,80	1,64	1,78	4	1,75			0,07	4,22	91,80
10	39x	5.5	31	1,84	1,82	1,83	1,85	4	1,83			0,01	0,58	96,25
11	49	5.1	31	1,85	1,81	1,90	1,79	4	1,84			0,05	2,64	96,39
12	52	4.1	31	1,87	1,83	1,82	1,87	4	1,85			0,03	1,42	96,92
13	40	5.7	31	1,86	1,89	1,81	1,86	4	1,85			0,03	1,71	97,22
14	47x	4.1	32	1,86	1,90	1,81	1,86	4	1,86			0,04	1,98	97,44
15	06x	5.2	31	1,88	1,88	1,86	1,87	4	1,87			0,01	0,51	98,23
16	08x	6.3	31	1,84	1,92	1,86	1,91	4	1,88			0,04	2,05	98,75
17	60	3.3	31	1,83	1,92	1,87	1,92	4	1,89			0,04	2,31	98,88
18	43x	4.1	31	1,89	1,89	1,90	1,88	4	1,89			0,01	0,43	99,15
19	03x	3.10	31	1,90	1,96	1,85	1,86	4	1,89			0,05	2,64	99,28
20	25	4.1	31	1,89	1,89	1,96	1,87	4	1,90			0,04	2,07	99,80
21	18x	3.31	31	1,89	1,89	1,96	1,91	4	1,91			0,03	1,73	100,33
22	37x	5.5	31	1,94	1,93	1,93	1,94	4	1,94			0,01	0,30	101,51
23	17x	5.5	31	1,89	1,96	2,04	1,90	4	1,94			0,07	3,43	102,02
24	11x	5.1	31	1,94	1,95	1,95	1,94	4	1,95			0,01	0,30	102,03
25	28x	3.31	53.3	1,95	1,95	1,95	1,95	4	1,95			0,00	0,00	102,29
26	38	5.5	31	1,94	1,96	1,96	1,95	4	1,95			0,01	0,49	102,42
27	44x	5.1	31	1,97	1,96	1,97	1,94	4	1,96			0,01	0,72	102,82
28	50x	4.1	31	1,96	1,99	1,94	1,96	4	1,96			0,02	0,94	102,87
29	42	4.1	31	1,98	1,98	1,98	1,97	4	1,98			0,01	0,29	103,70
30	09x	5.5	31	1,97	2,01	1,98	1,96	4	1,98			0,02	0,99	103,81
31	48x	4.1	31	2,00	2,00	2,01	1,97	4	1,99			0,02	0,86	104,59
32	2	5.3	31	2,00	2,00	2,00	2,00	4	2,00			0,00	0,00	104,92
33	07x	5.5	31	2,00	2,00	2,00	2,01	4	2,00			0,00	0,25	105,05
34	56	5.5	31	2,00	1,99	2,02	2,01	4	2,01			0,01	0,72	105,19
35	29x	3.3	31	2,04	2,06	2,02	2,05	4	2,04			0,02	0,84	107,15
36	37a	0	42	2,10	2,07	2,05	2,07	4	2,07			0,02	0,99	108,72
37	4	9.1	41	2,21	2,22	2,15	2,13	4	2,18			0,04	1,95	114,12
38	23x	3.9	31	2,12	2,21	2,23	2,28	4	2,21		*	0,07	3,02	115,93
39	04a	9.1	42	2,21	2,28	2,33	2,23	4	2,26		*	0,05	2,38	118,69
40	19	5.6	31	*2,95*	*2,42*	*2,85*	*2,98*	*0*	*2,80*	b	*	*0,26*	*9,26*	*146,88*
41	26x	5.5	35	*2,93*	*2,89*	*2,82*	*2,97*	*0*	*2,90*	b	*	*0,06*	*2,20*	*152,26*
42	15	5.1	53	*3,37*	*3,44*	*3,04*	*3,21*	*0*	*3,27*	b	*	*0,18*	*5,46*	*171,28*
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	N	Mean	SI	VI
all labs	148	**1,91**	**0,028**	**1,464**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: P **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	27	6.5	50	*0,57*	*0,57*	*0,58*	*0,57*	*0*	*0,57*	b	*	*0,01*	*1,16*	*47,34*
2	46	5.2	31	*0,94*	*0,92*	*0,98*	*0,98*	*0*	*0,96*	b	*	*0,03*	*3,14*	*78,85*
3	33a	5.1	50	1,05	1,04	1,03	1,05	4	1,04			0,01	0,77	86,22
4	36	3.3	53	1,10	1,09	1,05	1,09	4	1,08			0,02	2,05	89,38
5	01x	3.21	50	1,10	1,10	1,10	1,10	4	1,10			0,00	0,00	90,82
6	12x	5.1	31	1,13	1,11	1,11	1,06	4	1,10			0,03	2,74	90,97
7	13x	5.3	53.1	1,13	1,14	1,14	1,15	4	1,14			0,01	0,72	94,13
8	60	3.3	31	1,14	1,17	1,20	1,10	4	1,15			0,04	3,71	95,16
9	06x	5.2	31	1,16	1,17	1,17	1,17	4	1,17			0,00	0,43	96,40
10	25	4.1	31	1,19	1,19	1,14	1,16	4	1,17			0,02	2,09	96,60
11	40	5.7	31	1,17	1,19	1,17	1,17	4	1,17			0,01	0,81	96,87
12	08x	6.3	31	1,22	1,12	1,18	1,21	4	1,18			0,05	3,93	97,57
13	39x	5.5	31	1,19	1,20	1,20	1,19	4	1,19			0,00	0,32	98,56
14	43x	4.1	31	1,20	1,19	1,19	1,22	4	1,20			0,01	1,18	99,08
15	03x	3.10	31	1,20	1,20	1,19	1,21	4	1,20			0,01	0,68	99,08
16	18x	3.31	31	1,21	1,21	1,20	1,20	4	1,21			0,01	0,48	99,49
17	52	4.1	31	1,23	1,21	1,18	1,23	4	1,21			0,02	1,95	100,11
18	47x	4.1	32	1,17	1,24	1,24	1,23	4	1,22			0,03	2,76	100,73
19	38	5.5	31	1,24	1,22	1,23	1,20	4	1,22			0,02	1,40	100,94
20	49	5.1	31	1,18	1,27	1,21	1,24	4	1,23			0,04	3,16	101,15
21	11x	5.1	31	1,23	1,23	1,23	1,23	4	1,23			0,00	0,00	101,56
22	56	5.5	31	1,23	1,21	1,25	1,23	4	1,23			0,02	1,50	101,64
23	17x	5.5	31	1,23	1,22	1,26	1,22	4	1,23			0,02	1,61	101,76
24	28x	3.31	53.3	1,23	1,25	1,24	1,22	4	1,24			0,01	1,05	101,97
25	50x	4.1	31	1,22	1,23	1,25	1,24	4	1,24			0,01	0,90	101,99
26	48x	4.1	31	1,24	1,22	1,25	1,23	4	1,24			0,01	1,06	102,09
27	37x	5.5	31	1,24	1,25	1,24	1,24	4	1,24			0,00	0,40	102,59
28	44x	5.1	31	1,26	1,27	1,25	1,23	4	1,25			0,02	1,36	103,42
29	09x	5.5	31	1,26	1,26	1,26	1,25	4	1,26			0,01	0,44	103,73
30	4	9.1	41	1,23	1,23	1,28	1,28	4	1,26			0,03	2,21	103,79
31	37a	0	42	1,28	1,29	1,27	1,28	4	1,28			0,01	0,64	105,69
32	42	4.1	31	1,31	1,28	1,29	1,29	4	1,29			0,01	0,93	106,53
33	04a	9.1	42	1,28	1,32	1,30	1,28	4	1,30			0,02	1,48	106,92
34	29x	3.3	31	1,30	1,28	1,29	1,31	4	1,30			0,01	1,00	106,92
35	2	5.3	31	1,30	1,30	1,30	1,30	4	1,30			0,00	0,00	107,34
36	07x	5.5	31	1,31	1,32	1,32	1,32	4	1,32			0,00	0,38	108,78
37	23x	3.9	31	*1,36*	*1,47*	*1,23*	*1,65*	*0*	*1,43*	c	*	*0,18*	*12,46*	*117,86*
38	61x	4.1	53.1	*1,43*	*1,45*	*1,56*	*1,60*	*0*	*1,51*	b	*	*0,08*	*5,49*	*124,68*
39	19	5.6	31	*1,56*	*1,77a*	*1,55*	*1,53*	*0*	*1,55*	b	*	*0,02*	*0,99*	*127,70*
40	05x	6.5	50	*1,41*	*1,98*	*1,48*	*1,86*	*0*	*1,68*	b	*	*0,28*	*16,70*	*138,71*
41	26x	5.5	35	*1,89*	*1,87*	*1,85*	*1,95*	*0*	*1,89*	b	*	*0,04*	*2,29*	*156,05*
42	15	5.1	53	*2,17*	*2,17*	*2,21a*	*2,16*	*0*	*2,17*	b	*	*0,01*	*0,27*	*178,90*
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	N	Mean	SI	VI
all labs	136	**1,21**	**0,016**	**1,286**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: P **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	27	6.5	50	*0,73*	*0,74*	*0,73*	*0,73*	*0*	*0,73*	b	*	*0,01*	*0,93*	*47,15*
2	46	5.2	31	*1,11*	*1,13*	*1,10*	*1,21*	*0*	*1,14*	b	*	*0,05*	*4,39*	*73,17*
3	33a	5.1	50	1,32	1,30	1,31	1,31	4	1,31		*	0,01	0,60	84,20
4	36	3.3	53	1,34	1,36	1,36	1,37	4	1,36			0,01	0,93	87,32
5	60	3.3	31	1,37	1,50	1,41	1,31	4	1,40			0,08	5,71	89,89
6	12x	5.1	31	1,47	1,39	1,46	1,32	4	1,41			0,07	5,00	90,90
7	13x	5.3	53.1	1,44	1,38	1,39	1,45	4	1,42			0,04	2,48	91,01
8	61x	4.1	53.1	1,44	1,61	1,34	1,47	4	1,47			0,11	7,61	94,23
9	25	4.1	31	1,49	1,45	1,50	1,47	4	1,48			0,02	1,50	95,03
10	06x	5.2	31	1,48	1,49	1,47	1,48	4	1,48			0,01	0,55	95,20
11	05x	6.5	50	1,45	1,48	1,55	1,48	4	1,49			0,04	2,85	95,84
12	01x	3.21	50	1,49	1,49	1,49	1,52	4	1,50			0,01	1,00	96,32
13	39x	5.5	31	1,50	1,50	1,51	1,50	4	1,50			0,01	0,49	96,58
14	18x	3.31	31	1,53	1,55	1,47	1,51	4	1,52			0,03	2,25	97,45
15	40	5.7	31	1,55	1,56	1,48	1,49	4	1,52			0,04	2,75	97,74
16	43x	4.1	31	1,52	1,53	1,52	1,52	4	1,52			0,01	0,33	97,93
17	52	4.1	31	1,54	1,50	1,55	1,53	4	1,53			0,02	1,41	98,41
18	08x	6.3	31	1,52	1,56	1,52	1,54	4	1,54			0,02	1,25	98,73
19	49	5.1	31	1,50	1,56	1,55	1,58	4	1,55			0,03	2,20	99,54
20	38	5.5	31	1,55	1,56	1,54	1,54	4	1,55			0,01	0,62	99,54
21	37x	5.5	31	1,55	1,56	1,53	1,56	4	1,55			0,01	0,91	99,70
22	17x	5.5	31	1,54	1,57	1,62	1,52	4	1,56			0,04	2,67	100,53
23	03x	3.10	31	1,57	1,58	1,55	1,61	4	1,58			0,03	1,58	101,47
24	09x	5.5	31	1,60	1,60	1,60	1,59	4	1,60			0,00	0,28	102,62
25	28x	3.31	53.3	1,60	1,60	1,60	1,60	4	1,60			0,00	0,00	102,91
26	47x	4.1	32	1,46	1,64	1,66	1,66	4	1,61			0,10	6,05	103,24
27	4	9.1	41	1,59	1,60	1,61	1,62	4	1,61			0,01	0,77	103,30
28	37a	0	42	1,60	1,62	1,60	1,62	4	1,61			0,01	0,72	103,56
29	50x	4.1	31	1,60	1,63	1,60	1,62	4	1,61			0,01	0,81	103,77
30	19	5.6	31	1,55	1,64	1,64	1,64	4	1,62			0,05	2,78	104,04
31	11x	5.1	31	1,60	1,62	1,62	1,64	4	1,62			0,02	1,01	104,20
32	48x	4.1	31	1,63	1,63	1,62	1,62	4	1,62			0,00	0,28	104,34
33	56	5.5	31	1,62	1,64	1,66	1,63	4	1,64			0,02	1,02	105,28
34	44x	5.1	31	1,66	1,65	1,65	1,61	4	1,64			0,02	1,35	105,65
35	04a	9.1	42	1,65	1,65	1,66	1,64	4	1,65			0,01	0,49	106,13
36	07x	5.5	31	1,66	1,67	1,64	1,67	4	1,66			0,01	0,85	106,77
37	42	4.1	31	1,69	1,67	1,68	1,64	4	1,67			0,02	1,11	107,42
38	29x	3.3	31	1,69	1,68	1,67	1,69	4	1,68			0,01	0,57	108,22
39	2	5.3	31	1,70	*1,80a*	1,70	1,70	3	1,70			0,00	0,00	109,35
40	23x	3.9	31	1,73	1,73	1,79	1,84	4	1,77			0,05	3,00	114,01
41	26x	5.5	35	*2,56*	*2,61*	*2,51*	*2,55*	*0*	*2,56*	b	*	*0,04*	*1,61*	*164,50*
42	15	5.1	53	*2,73*	*2,75*	*2,79*	*2,75*	*0*	*2,76*	b	*	*0,03*	*0,91*	*177,20*
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	N	Mean	SI	VI
all labs	151	**1,55**	**0,026**	**1,702**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: P **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	27	6.5	50	*0,67*	*0,66*	*0,67*	*0,67*	*0*	*0,67*	b	*	*0,00*	*0,47*	*46,65*
2	46	5.2	31	1,15	1,19	1,14	1,20	4	1,17		*	0,03	2,52	81,80
3	33a	5.1	50	1,22	1,19	1,20	1,21	4	1,21		*	0,01	0,95	84,42
4	36	3.3	53	1,24	1,23	1,23	1,22	4	1,23			0,01	0,66	85,99
5	12x	5.1	31	1,25	1,25	1,19	1,28	4	1,24			0,04	3,25	86,76
6	01x	3.21	50	1,33	1,33	1,33	1,30	4	1,32			0,02	1,13	92,46
7	13x	5.3	53.1	1,33	1,35	1,33	1,33	4	1,34			0,01	0,75	93,33
8	37x	5.5	31	1,37	1,35	1,36	1,37	4	1,36			0,01	0,70	95,26
9	06x	5.2	31	1,35	1,37	1,39	1,37	4	1,37			0,02	1,19	95,78
10	38	5.5	31	1,38	1,37	1,38	1,38	4	1,38			0,00	0,36	96,30
11	40	5.7	31	1,39	1,40	1,37	1,38	4	1,39			0,01	0,99	96,83
12	39x	5.5	31	1,39	1,39	1,43	1,39	4	1,40			0,02	1,27	97,84
13	37a	0	42	1,38	1,40	1,40	1,42	4	1,40			0,02	1,17	97,88
14	08x	6.3	31	1,44	1,40	1,38	1,39	4	1,40			0,03	1,88	98,05
15	47x	4.1	32	1,28	1,42	1,47	1,45	4	1,41			0,09	6,11	98,23
16	43x	4.1	31	1,43	1,41	1,43	1,41	4	1,42			0,01	0,81	99,28
17	25	4.1	31	1,45	1,42	1,40	1,42	4	1,42			0,02	1,45	99,45
18	52	4.1	31	1,46	1,44	1,42	1,42	4	1,44			0,02	1,33	100,32
19	18x	3.31	31	1,44	1,42	1,47	1,44	4	1,44			0,02	1,43	100,85
20	03x	3.10	31	1,42	1,47	1,44	1,45	4	1,45			0,02	1,44	101,02
21	28x	3.31	53.3	1,45	1,45	1,45	1,45	4	1,45			0,00	0,00	101,37
22	48x	4.1	31	1,45	1,44	1,46	1,46	4	1,45			0,01	0,78	101,58
23	49	5.1	31	1,45	1,43	1,49	1,45	4	1,46			0,03	1,73	101,72
24	17x	5.5	31	1,48	1,48	1,41	1,47	4	1,46			0,03	2,06	101,95
25	50x	4.1	31	1,48	1,46	1,47	1,45	4	1,46			0,01	0,75	102,28
26	11x	5.1	31	1,47	1,47	1,48	1,47	4	1,47			0,01	0,34	102,95
27	56	5.5	31	1,47	1,46	1,50	1,49	4	1,48			0,02	1,18	103,35
28	09x	5.5	31	1,48	1,48	1,48	1,49	4	1,48			0,00	0,32	103,54
29	04a	9.1	42	1,49	1,48	1,49	1,48	4	1,49			0,01	0,39	103,82
30	44x	5.1	31	1,47	1,51	1,49	1,48	4	1,49			0,02	1,15	103,99
31	42	4.1	31	1,51	1,49	1,49	1,49	4	1,49			0,01	0,50	104,50
32	29x	3.3	31	1,47	1,52	1,50	1,49	4	1,50			0,02	1,39	104,52
33	4	9.1	41	1,51	1,52	1,52	1,52	4	1,52			0,01	0,39	106,09
34	05x	6.5	50	1,52	1,54	1,52	1,54	4	1,53			0,01	0,75	106,97
35	2	5.3	31	1,60	1,60	1,50	1,50	4	1,55			0,06	3,72	108,36
36	07x	5.5	31	1,57	1,58	1,56	1,57	4	1,57			0,01	0,52	109,76
37	23x	3.9	31	1,52	1,58	1,57	1,61	4	1,57			0,04	2,38	109,76
38	61x	4.1	53.1	1,66	1,70	1,37	1,55	4	1,57			0,15	9,40	109,76
39	26x	5.5	35	1,63	1,62	1,72	*2,30a*	3	1,66		*	0,06	3,32	115,82
40	19	5.6	31	*2,16*	*1,98*	*1,82*	*1,69*	*0*	*1,91*	b	*	*0,20*	*10,63*	*133,71*
41	60	3.3	31	*2,16*	*2,33*	*2,23*	*2,22*	*0*	*2,24*	b	*	*0,07*	*3,15*	*156,25*
42	15	5.1	53	*2,49a*	*2,40*	*2,38*	*2,38*	*0*	*2,39*	b	*	*0,01*	*0,48*	*166,86*
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	N	Mean	SI	VI
all labs	151	**1,43**	**0,023**	**1,614**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Ca **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*0,90*	*1,60*	*1,40*	*1,40*	*0*	*1,33*	b	*	*0,30*	*22,54*	*50,18*
2	15	5.1	21.1	*2,24*	*1,76*	*1,76*	*1,98*	*0*	*1,94*	b	*	*0,23*	*11,80*	*73,28*
3	05x	3.3	21.1	*2,02*	*2,03*	*2,2a*	*2,02*	*0*	*2,02*	b	*	*0,00*	*0,25*	*76,50*
4	46	5.2	31	*2,14*	*2,01*	*2,19*	*2,08*	*0*	*2,11*	b	*	*0,08*	*3,69*	*79,72*
5	43x	4.1	31	2,39	2,36	2,36	2,32	4	2,36			0,03	1,22	89,28
6	13x	5.3	21	2,47	2,29	2,32	2,46	4	2,39			0,09	3,91	90,32
7	25	4.1	31	2,41	2,44	2,43	2,48	4	2,44			0,03	1,21	92,40
8	23x	3.9	31	2,45	2,43	2,48	2,47	4	2,46			0,02	0,90	93,07
9	33a	5.1	21	2,51	2,47	2,40	2,48	4	2,47			0,05	1,89	93,35
10	49	5.1	31	2,45	2,49	2,55	2,47	4	2,49			0,04	1,74	94,30
11	06x	5.2	31	2,53	2,53	2,48	2,51	4	2,51			0,02	0,94	95,15
12	07x	5.5	31	2,52	2,51	2,53	2,54	4	2,53			0,01	0,51	95,62
13	61x	4.1	21.2	2,54	2,54	2,49	2,54	4	2,53			0,03	0,99	95,72
14	52	4.1	31	2,53	2,51	2,59	2,55	4	2,55			0,03	1,34	96,38
15	39x	5.5	31	2,54	2,55	2,57	2,55	4	2,55			0,01	0,51	96,51
16	56	5.5	31	2,60	2,63	2,52	2,57	4	2,58			0,04	1,71	97,59
17	40	5.7	31	2,55	2,63	2,57	2,60	4	2,59			0,04	1,44	98,05
18	4	9.1	41	2,60	2,65	2,59	2,63	4	2,62			0,03	1,01	99,12
19	12x	5.1	31	2,62	2,55	2,62	2,68	4	2,62			0,05	2,03	99,12
20	44x	4.1	31	2,63	2,61	2,66	2,64	4	2,64			0,02	0,79	99,79
21	08x	6.3	31	2,61	2,67	2,63	2,70	4	2,65			0,04	1,52	100,45
22	11x	5.1	31	2,64	2,67	2,67	2,67	4	2,66			0,02	0,56	100,83
23	03x	3.10	31	2,65	2,73	2,69	2,59	4	2,67			0,06	2,24	100,92
24	47x	4.1	32	2,64	2,67	2,68	2,69	4	2,67			0,02	0,81	101,11
25	26x	5.5	31	2,74	2,69	2,69	2,58	4	2,68			0,07	2,53	101,30
26	50x	4.1	31	2,75	2,70	2,59	2,66	4	2,68			0,07	2,53	101,30
27	29x	3.3	31	2,70	2,69	2,66	2,66	4	2,68			0,02	0,77	101,40
28	36	3.3	21.1	2,68	2,65	2,70	2,69	4	2,68			0,02	0,81	101,49
29	2	5.3	31	2,70	2,70	2,70	2,70	4	2,70			0,00	0,00	102,25
30	09x	5.5	31	2,70	2,73	2,77	2,63	4	2,71			0,06	2,16	102,47
31	60	3.3	31	2,63	2,75	2,71	2,80	4	2,72			0,07	2,64	103,10
32	48x	4.1	31	2,72	2,71	2,75	2,73	4	2,73			0,02	0,69	103,29
33	42	4.1	31	2,74	2,73	2,72	2,72	4	2,73			0,01	0,46	103,30
34	17x	5.5	31	2,74	2,76	2,79	2,74	4	2,76			0,02	0,72	104,48
35	18x	3.31	31	2,73	2,80	2,79	2,77	4	2,77			0,03	1,12	104,99
36	27	6.5	21.1	2,83	2,77	2,80	2,77	4	2,79			0,03	0,91	105,78
37	37x	5.5	31	2,80	2,81	2,78	2,82	4	2,80			0,02	0,61	106,13
38	38	5.5	31	2,85	2,82	2,80	2,80	4	2,82			0,02	0,84	106,70
39	37a	0	42	2,84	2,80	2,82	2,84	4	2,83			0,02	0,68	106,98
40	28x	3.31	21.1	2,81	2,83	2,85	2,85	4	2,84			0,02	0,68	107,36
41	04a	9.1	42	2,85	2,87	2,88	2,87	4	2,87			0,01	0,44	108,59
42	19	5.6	31	*3,34*	*3,61*	*3,70*	*3,62*	*0*	*3,57*	b	*	*0,16*	*4,40*	*135,10*
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	N	Mean	SI	VI
all labs	148	**2,64**	**0,032**	**1,225**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Ca **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*4,88*	*4,88*	*5,04*	*5,12*	*0*	*4,98*	b	*	*0,12*	*2,41*	*48,62*
2	46	5.2	31	8,92	9,01	8,79	8,87	4	8,90			0,09	1,04	86,86
3	05x	3.3	21.1	8,40	9,10	9,25	9,20	4	8,99			0,40	4,41	87,74
4	25	4.1	31	9,14	9,17	9,19	9,12	4	9,16			0,03	0,34	89,38
5	33a	5.1	21	9,02	9,24	9,18	9,29	4	9,18			0,12	1,28	89,65
6	43x	4.1	31	9,30	9,23	9,12	9,20	4	9,21			0,07	0,81	89,94
7	61x	4.1	21.2	9,30	9,37	9,70	9,18	4	9,39			0,22	2,37	91,65
8	13x	5.3	21	9,27	9,55	9,29	9,68	4	9,45			0,20	2,12	92,23
9	39x	5.5	31	9,71	9,71	9,67	9,56	4	9,66			0,07	0,74	94,31
10	18x	3.31	31	9,46	10,25	9,84	9,85	4	9,85			0,32	3,28	96,16
11	49	5.1	31	10,06	9,89	10,12	10,01	4	10,02			0,10	0,97	97,82
12	44x	4.1	31	9,99	10,00	10,20	9,97	4	10,04			0,11	1,07	98,02
13	06x	5.2	31	10,11	10,08	9,95	10,05	4	10,05			0,07	0,69	98,09
14	40	5.7	31	10,18	10,13	10,12	10,13	4	10,14			0,03	0,27	98,99
15	29x	3.3	31	9,98	10,01	10,40	10,20	4	10,15			0,19	1,92	99,07
16	50x	4.1	31	10,12	10,31	10,09	10,13	4	10,16			0,10	0,98	99,21
17	52	4.1	31	10,28	10,03	10,17	10,21	4	10,17			0,11	1,04	99,31
18	23x	3.9	31	10,43	10,08	9,99	10,50	4	10,25			0,25	2,46	100,07
19	56	5.5	31	10,28	10,35	10,18	10,30	4	10,28			0,07	0,69	100,34
20	03x	3.10	31	10,37	10,35	10,37	10,33	4	10,36			0,02	0,18	101,09
21	47x	4.1	32	10,14	10,37	10,46	10,46	4	10,36			0,15	1,46	101,12
22	12x	5.1	31	10,36	10,12	10,88	10,21	4	10,39			0,34	3,27	101,46
23	08x	6.3	31	10,60	10,20	10,20	10,60	4	10,40			0,23	2,22	101,53
24	48x	4.1	31	10,44	10,32	10,52	10,38	4	10,42			0,09	0,82	101,68
25	37x	5.5	31	10,44	10,46	10,39	10,43	4	10,43			0,03	0,28	101,82
26	17x	5.5	31	10,40	10,38	10,53	10,57	4	10,47			0,09	0,90	102,22
27	11x	5.1	31	10,50	10,40	10,50	10,50	4	10,48			0,05	0,48	102,26
28	36	3.3	21.1	10,29	10,63	10,43	10,55	4	10,48			0,15	1,41	102,26
29	26x	5.5	31	10,50	10,30	10,70	10,50	4	10,50			0,16	1,56	102,51
30	38	5.5	31	10,59	10,54	10,39	10,56	4	10,52			0,09	0,85	102,70
31	09x	5.5	31	10,48	10,76	10,66	10,43	4	10,58			0,15	1,46	103,30
32	07x	5.5	31	10,60	10,60	10,60	10,70	4	10,63			0,05	0,47	103,73
33	04a	9.1	42	10,67	10,70	10,72	10,68	4	10,69			0,02	0,21	104,39
34	42	4.1	31	10,81	10,61	10,81	10,69	4	10,73			0,10	0,91	104,78
35	2	5.3	31	10,80	10,80	10,80	10,90	4	10,83			0,05	0,46	105,68
36	4	9.1	41	10,51	10,70	11,10	11,08	4	10,85			0,29	2,71	105,91
37	28x	3.31	21.1	10,97	10,77	10,89	10,84	4	10,87			0,08	0,77	106,10
38	37a	0	42	10,94	10,98	10,96	10,95	4	10,96			0,02	0,16	106,97
39	60	3.3	31	10,83	11,08	10,90	11,05	4	10,97			0,12	1,09	107,05
40	27	6.5	21.1	11,20	11,15	11,18	11,18	4	11,18			0,02	0,19	109,11
41	15	5.1	21.1	12,10	11,70	10,70	12,00	4	11,63			0,64	5,50	113,49
42	19	5.6	31	*13,02*	*12,68*	*12,55*	*12,48*	*0*	*12,68*	b	*	*0,24*	*1,89*	*123,82*
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	N	Mean	SI	VI
all labs	160	**10,24**	**0,138**	**1,344**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Ca **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*3,72*	*3,72*	*4,08*	*3,88*	*0*	*3,85*	b	*	*0,17*	*4,44*	*51,05*
2	46	5.2	31	6,14	6,43	6,61	6,33	4	6,38		*	0,20	3,08	84,56
3	15	5.1	21.1	6,78	6,33	6,26	6,46	4	6,46			0,23	3,57	85,62
4	43x	4.1	31	6,78	6,89	6,76	6,86	4	6,82			0,06	0,91	90,46
5	13x	5.3	21	6,83	7,14	6,71	7,05	4	6,93			0,20	2,85	91,91
6	05x	3.3	21.1	7,25	7,45	6,10	7,30	4	7,03			0,62	8,86	93,14
7	61x	4.1	21.2	7,13	7,00	7,02	6,99	4	7,04			0,06	0,92	93,27
8	39x	5.5	31	7,05	7,02	7,05	7,04	4	7,04			0,01	0,19	93,30
9	25	4.1	31	7,13	7,10	7,09	7,11	4	7,11			0,02	0,24	94,23
10	4	9.1	41	7,07	7,20	7,21	7,30	4	7,19			0,10	1,32	95,35
11	18x	3.31	31	6,73	7,70	7,39	7,27	4	7,27			0,40	5,56	96,42
12	06x	5.2	31	7,35	7,19	7,35	7,30	4	7,30			0,08	1,03	96,75
13	04a	9.1	42	7,29	7,41	7,31	7,32	4	7,33			0,05	0,72	97,22
14	50x	4.1	31	7,42	7,57	7,48	7,39	4	7,47			0,08	1,06	98,97
15	09x	5.5	31	7,35	7,29	7,68	7,57	4	7,47			0,18	2,44	99,07
16	40	5.7	31	7,49	7,54	7,48	7,40	4	7,48			0,06	0,75	99,15
17	29x	3.3	31	7,63	7,32	7,56	7,49	4	7,50			0,13	1,77	99,44
18	12x	5.1	31	7,56	7,55	7,59	7,34	4	7,51			0,11	1,53	99,57
19	07x	5.5	31	7,53	7,49	7,52	7,60	4	7,54			0,05	0,62	99,90
20	52	4.1	31	7,54	7,56	7,54	7,52	4	7,54			0,02	0,22	99,97
21	33a	5.1	21	7,43	7,57	7,46	7,71	4	7,54			0,13	1,68	100,00
22	44x	4.1	31	7,53	7,77	7,53	7,68	4	7,63			0,12	1,55	101,13
23	49	5.1	31	7,58	7,69	7,66	7,63	4	7,64			0,05	0,61	101,29
24	37x	5.5	31	7,60	7,66	7,64	7,67	4	7,64			0,03	0,41	101,33
25	60	3.3	31	7,94	8,06	7,61	7,21	4	7,71			0,38	4,94	102,16
26	03x	3.10	31	7,96	7,61	7,50	7,79	4	7,72			0,20	2,62	102,29
27	37a	0	42	7,79	7,75	7,77	7,77	4	7,77			0,02	0,21	103,02
28	08x	6.3	31	7,79	7,82	7,69	7,85	4	7,79			0,07	0,89	103,25
29	38	5.5	31	7,83	7,85	7,77	7,72	4	7,79			0,06	0,76	103,32
30	47x	4.1	32	7,66	7,79	7,95	7,87	4	7,82			0,12	1,58	103,65
31	48x	4.1	31	7,77	7,85	7,88	7,87	4	7,84			0,05	0,65	103,95
32	56	5.5	31	7,88	7,88	7,76	7,86	4	7,84			0,06	0,72	103,99
33	17x	5.5	31	7,89	7,88	7,95	7,83	4	7,88			0,05	0,62	104,53
34	36	3.3	21.1	8,00	7,70	8,07	7,93	4	7,93			0,16	2,03	105,07
35	23x	3.9	31	7,80	7,87	7,87	8,29	4	7,96			0,22	2,82	105,50
36	11x	5.1	31	7,93	8,01	8,00	8,04	4	8,00			0,05	0,58	106,00
37	42	4.1	31	7,98	8,05	8,02	7,97	4	8,00			0,04	0,46	106,10
38	26x	5.5	31	7,88	8,05	8,08	8,00	4	8,00			0,09	1,10	106,10
39	28x	3.31	21.1	8,23	8,16	8,23	8,13	4	8,19			0,05	0,62	108,55
40	2	5.3	31	8,40	8,70	8,10	7,80	4	8,25			0,39	4,69	109,38
41	27	6.5	21.1	8,39	8,36	8,39	8,36	4	8,38			0,02	0,19	111,07
42	19	5.6	31	*9,08*	*8,91*	*9,86*	*8,51*	*0*	*9,09*	b	*	*0,57*	*6,23*	*120,52*
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	N	Mean	SI	VI
all labs	160	**7,54**	**0,125**	**1,658**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Ca **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	01x	3.21	21.1	*6,68*	*6,68*	*6,70*	*6,52a*	0	*6,69*	b *	*0,01*	*0,17*	*52,16*
2	46	5.2	31	11,23	11,17	11,51	11,22	4	11,28		0,15	1,36	88,02
3	13x	5.3	21	11,73	12,03	10,99	11,09	4	11,46		0,50	4,38	89,40
4	61x	4.1	21.2	11,57	11,71	11,56	11,70	4	11,64		0,08	0,70	90,77
5	25	4.1	31	11,90	11,60	11,60	11,70	4	11,70		0,14	1,21	91,27
6	39x	5.5	31	11,67	11,83	12,06	11,90	4	11,87		0,16	1,34	92,57
7	04a	9.1	42	12,04	12,01	12,03	11,88	4	11,99		0,07	0,62	93,54
8	05x	3.3	21.1	12,35	11,85	12,05	12,05	4	12,08		0,21	1,71	94,20
9	4	9.1	41	11,99	12,15	12,53	12,53	4	12,30		0,27	2,22	95,97
10	37x	5.5	31	12,32	12,37	12,42	12,39	4	12,38		0,04	0,34	96,54
11	50x	4.1	31	12,35	12,60	12,30	12,50	4	12,44		0,14	1,11	97,03
12	12x	5.1	31	12,79	12,69	11,84	12,96	4	12,57		0,50	3,97	98,06
13	15	5.1	21.1	13,10	12,10	12,70	12,40	4	12,58		0,43	3,40	98,10
14	43x	4.1	31	12,60	12,53	12,67	12,50	4	12,58		0,08	0,60	98,10
15	33a	5.1	21	12,52	12,83	12,35	12,72	4	12,61		0,21	1,69	98,33
16	38	5.5	31	12,81	12,59	12,59	12,59	4	12,65		0,11	0,87	98,65
17	06x	5.2	31	12,42	12,65	12,87	12,65	4	12,65		0,18	1,45	98,67
18	18x	3.31	31	12,64	12,45	12,91	12,67	4	12,67		0,19	1,49	98,82
19	47x	4.1	32	12,68	12,75	12,78	12,57	4	12,70		0,09	0,73	99,04
20	29x	3.3	31	12,70	12,78	12,65	12,75	4	12,72		0,06	0,45	99,23
21	44x	4.1	31	12,50	12,90	12,60	12,90	4	12,73		0,21	1,62	99,27
22	37a	0	42	12,80	12,76	12,70	12,81	4	12,77		0,05	0,39	99,60
23	08x	6.3	31	13,20	12,90	12,80	12,80	4	12,93		0,19	1,46	100,83
24	49	5.1	31	12,85	13,17	12,78	12,95	4	12,94		0,17	1,31	100,93
25	09x	5.5	31	12,63	12,60	13,42	13,22	4	12,97		0,41	3,20	101,18
26	52	4.1	31	12,77	12,88	13,01	13,27	4	12,98		0,22	1,66	101,28
27	48x	4.1	31	13,02	12,96	13,15	13,04	4	13,04		0,08	0,61	101,75
28	03x	3.10	31	13,12	13,38	13,15	12,94	4	13,15		0,18	1,37	102,57
29	56	5.5	31	13,07	13,33	12,90	13,30	4	13,15		0,20	1,54	102,59
30	07x	5.5	31	13,30	13,30	13,20	13,10	4	13,23		0,10	0,72	103,17
31	17x	5.5	31	13,37	13,40	13,00	13,15	4	13,23		0,19	1,43	103,21
32	28x	3.31	21.1	13,24	13,25	13,22	13,22	4	13,23		0,02	0,11	103,23
33	42	4.1	31	13,42	13,28	13,33	13,34	4	13,34		0,06	0,43	104,10
34	36	3.3	21.1	13,16	13,14	13,65	13,48	4	13,36		0,25	1,87	104,21
35	26x	5.5	31	13,30	13,30	13,50	13,40	4	13,38		0,10	0,72	104,34
36	11x	5.1	31	13,40	13,50	13,40	13,40	4	13,43		0,05	0,37	104,73
37	23x	3.9	31	12,92	13,61	13,65	13,80	4	13,50		0,39	2,90	105,28
38	2	5.3	31	13,50	13,60	13,40	13,50	4	13,50		0,08	0,60	105,32
39	40	5.7	31	13,43	13,41	13,64	13,59	4	13,52		0,12	0,85	105,45
40	60	3.3	31	13,56	14,35	13,51	13,81	4	13,81		0,38	2,79	107,72
41	27	6.5	21.1	13,97	13,95	13,95	13,97	4	13,96		0,02	0,11	108,89
42	19	5.6	31	14,49	14,89	14,38	14,72	4	14,62		0,23	1,57	114,05
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	N	Mean	SI	VI
all labs	164	**12,82**	**0,178**	**1,389**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mg **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*0,54*	*0,56*	*0,51*	*0,53*	*0*	*0,54*	b	*	*0,02*	*3,89*	*57,70*
2	05x	3.3	21.1	0,80	0,80	0,85	0,80	4	0,81			0,03	3,08	87,62
3	61x	4.1	21.1	0,81	0,83	0,81	0,83	4	0,82			0,01	1,41	88,43
4	46	5.2	31	0,86	0,83	0,84	0,87	4	0,85			0,02	2,15	91,67
5	27	6.5	21.1	0,85	0,85	0,85	0,85	4	0,85			0,00	0,00	92,02
6	12x	5.1	31	0,88	*0,80a*	0,88	0,87	3	0,87			0,01	0,70	94,04
7	15	5.1	21.1	0,84	0,85	0,84	0,91	4	0,86			0,03	3,91	92,75
8	13x	5.3	21	0,91	0,85	0,81	0,88	4	0,86			0,04	4,95	93,02
9	56	5.5	31	0,90	0,91	0,87	0,86	4	0,89			0,02	2,49	95,60
10	33a	5.1	21	0,89	0,92	0,88	0,91	4	0,90			0,02	2,03	97,06
11	2	5.3	31	0,90	0,90	0,90	0,90	4	0,90			0,00	0,00	97,06
12	43x	4.1	31	0,91	0,90	0,90	0,89	4	0,90			0,01	0,89	97,11
13	39x	5.5	31	0,90	0,90	0,90	0,90	4	0,90			0,00	0,31	97,14
14	4	9.1	41	0,90	0,94	0,89	0,89	4	0,90			0,03	2,82	97,36
15	25	4.1	31	0,91	0,91	0,91	0,91	4	0,91			0,00	0,30	97,90
16	49	5.1	31	0,88	0,92	0,94	0,93	4	0,92			0,03	2,87	98,95
17	40	5.7	31	0,94	0,92	0,91	0,92	4	0,92			0,01	1,53	99,38
18	52	4.1	31	0,92	0,92	0,93	0,93	4	0,93			0,01	0,62	99,76
19	17x	5.5	31	0,91	0,93	0,93	0,95	4	0,93			0,02	1,95	100,19
20	11x	5.1	31	0,93	0,93	0,93	0,93	4	0,93			0,00	0,14	100,24
21	08x	6.3	31	0,91	0,95	0,93	0,95	4	0,93			0,02	2,00	100,81
22	07x	5.5	31	0,95	0,94	0,94	0,94	4	0,94			0,00	0,52	101,46
23	06x	5.2	31	0,95	0,95	0,94	0,94	4	0,94			0,00	0,38	101,70
24	09x	5.5	31	0,98	0,93	0,94	0,95	4	0,95			0,02	2,21	102,56
25	03x	3.10	31	0,95	0,98	0,95	0,93	4	0,95			0,02	2,16	102,72
26	18x	3.31	31	0,95	0,95	0,96	0,96	4	0,96			0,01	0,60	102,99
27	44x	4.1	31	0,96	0,95	0,96	0,95	4	0,96			0,01	0,60	102,99
28	42	4.1	31	0,96	0,96	0,96	0,96	4	0,96			0,00	0,13	103,26
29	26x	5.5	31	0,97	1,01	0,93	0,93	4	0,96			0,04	3,99	103,50
30	50x	4.1	31	0,97	0,96	0,95	0,96	4	0,96			0,01	0,99	103,50
31	37x	5.5	31	0,96	0,96	0,96	0,96	4	0,96			0,00	0,00	103,53
32	47x	4.1	32	0,97	0,95	0,97	0,95	4	0,96			0,01	1,20	103,53
33	48x	4.1	31	0,99	0,98	0,98	0,96	4	0,98			0,01	0,97	105,20
34	38	5.5	31	0,98	0,98	0,98	0,98	4	0,98			0,00	0,00	105,69
35	37a	0	42	0,99	0,98	0,99	0,98	4	0,99			0,01	0,59	106,23
36	29x	4.3	31	0,99	0,98	0,98	0,99	4	0,99			0,01	0,61	106,28
37	36	3.3	21.1	1,00	1,00	0,99	0,99	4	1,00			0,01	0,58	107,31
38	60	3.3	31	0,97	1,01	1,00	1,02	4	1,00			0,02	2,43	107,66
39	23x	3.9	31	0,99	1,04	1,04	1,02	4	1,02			0,02	2,31	110,27
40	04a	9.1	42	*1,09*	*1,10*	*1,11*	*1,09*	*0*	*1,10*	b	*	*0,01*	*0,87*	*118,36*
41	28x	3.31	21.1	*1,15*	*1,15*	*1,15*	*1,16a*	*0*	*1,15*	b	*	*0,00*	*0,00*	*124,02*
42	19	5.6	31	*1,59*	*1,71*	*1,26*	*1,35*	*0*	*1,48*	b	*	*0,21*	*14,10*	*159,34*
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	N	Mean	SI	VI
all labs	151	**0,93**	**0,013**	**1,413**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mg **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*0,44*	*0,40*	*0,47*	*0,45*	*0*	*0,44*	b	*	*0,03*	*6,69*	*57,81*
2	27	6.5	21.1	0,66	0,66	0,66	0,66	4	0,66			0,00	0,00	86,99
3	05x	3.3	21.1	0,65	0,65	0,70	0,65	4	0,66			0,03	3,77	87,05
4	4	9.1	41	0,65	0,65	0,69	0,70	4	0,67			0,03	3,91	87,87
5	61x	4.1	21.1	0,68	0,68	0,68	0,68	4	0,68			0,00	0,00	89,35
6	2	5.3	31	0,70	0,70	0,70	0,70	4	0,70			0,00	0,00	91,97
7	13x	5.3	21	0,70	0,74	0,65	0,74	4	0,71			0,04	6,04	92,96
8	40	5.7	31	0,72	0,72	0,74	0,73	4	0,73			0,01	1,03	95,72
9	46	5.2	31	0,74	0,73	0,73	0,74	4	0,74			0,01	0,79	96,57
10	43x	4.1	31	0,74	0,73	0,73	0,75	4	0,74			0,01	1,29	96,97
11	12x	5.1	31	0,75	0,69	0,78	0,73	4	0,74			0,04	5,17	97,10
12	37a	0	42	0,74	0,75	0,75	0,74	4	0,75			0,01	0,77	97,89
13	56	5.5	31	0,76	0,76	0,74	0,73	4	0,75			0,01	1,91	98,04
14	33a	5.1	21	0,72	0,74	0,76	0,77	4	0,75			0,02	2,97	98,22
15	39x	5.5	31	0,76	0,76	0,75	0,75	4	0,75			0,01	0,69	98,97
16	25	4.1	31	0,74	0,76	0,76	0,76	4	0,76			0,01	1,25	99,33
17	06x	5.2	31	0,76	0,76	0,76	0,76	4	0,76			0,00	0,41	99,79
18	09x	5.5	31	0,76	0,75	0,77	0,78	4	0,77			0,02	2,15	100,61
19	49	5.1	31	0,76	0,75	0,80	0,77	4	0,77			0,02	2,81	101,17
20	11x	5.1	31	0,77	0,77	0,77	0,77	4	0,77			0,00	0,29	101,27
21	07x	5.5	31	0,77	0,77	0,77	0,78	4	0,77			0,00	0,55	101,30
22	52	4.1	31	0,78	0,77	0,77	0,77	4	0,77			0,00	0,65	101,50
23	08x	6.3	31	0,79	0,76	0,76	0,78	4	0,77			0,02	2,01	101,53
24	44x	4.1	31	0,78	0,78	0,77	0,77	4	0,78			0,01	0,74	101,83
25	50x	4.1	31	0,78	0,78	0,78	0,77	4	0,78			0,00	0,12	101,86
26	48x	4.1	31	0,78	0,78	0,78	0,76	4	0,78			0,01	1,04	101,87
27	18x	3.31	31	0,78	0,78	0,78	0,78	4	0,78			0,00	0,00	102,49
28	42	4.1	31	0,78	0,78	0,78	0,78	4	0,78			0,00	0,35	102,65
29	38	5.5	31	0,80	0,78	0,79	0,78	4	0,79			0,01	1,22	103,47
30	03x	3.10	31	0,79	0,79	0,78	0,79	4	0,79			0,00	0,63	103,47
31	15	5.1	21.1	0,78	0,76	0,81	0,81	4	0,79			0,02	3,10	103,80
32	17x	5.5	31	0,80	0,80	0,78	0,80	4	0,79			0,01	1,64	104,33
33	47x	4.1	32	0,79	0,79	0,80	0,81	4	0,80			0,01	1,20	104,79
34	60	3.3	31	0,79	0,82	0,83	0,77	4	0,80			0,03	3,22	105,15
35	29x	4.3	31	0,79	0,80	0,81	0,81	4	0,80			0,01	0,74	105,41
36	37x	5.5	31	0,81	0,81	0,80	0,81	4	0,81			0,01	0,62	106,10
37	26x	5.5	31	0,81	0,80	0,83	0,81	4	0,81			0,01	1,20	106,72
38	23x	3.9	31	0,84	0,88	0,70	0,84	4	0,82			0,08	9,69	107,08
39	04a	9.1	42	0,81	0,83	0,82	0,80	4	0,82			0,01	1,58	107,08
40	36	3.3	21.1	0,84	0,84	0,83	0,83	4	0,84			0,01	0,69	109,71
41	28x	3.31	21.1	*0,98*	*0,98*	*0,99*	*0,99*	*0*	*0,99*	b	*	*0,01*	*0,59*	*129,42*
42	19	5.6	31	*1,43*	*1,39*	*1,28*	*1,12*	*0*	*1,31*	b	*	*0,14*	*10,63*	*171,47*
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	N	Mean	SI	VI
all labs	156	**0,76**	**0,013**	**1,695**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mg **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*0,98*	*0,99*	*0,98*	*0,95*	*0*	*0,98*	b	*	*0,02*	*1,78*	*69,21*
2	27	6.5	21.1	1,22	1,22	1,22	1,22	4	1,22			0,00	0,00	86,46
3	13x	5.3	21	1,31	1,33	1,22	1,26	4	1,28			0,05	3,88	90,86
4	46	5.2	31	1,30	1,31	1,39	1,27	4	1,32			0,05	3,89	93,52
5	12x	5.1	31	1,35	1,31	1,35	1,28	4	1,32			0,03	2,53	93,63
6	61x	4.1	21.1	1,30	1,34	1,36	1,28	4	1,32			0,04	2,77	93,70
7	05x	3.3	21.1	1,30	1,35	1,30	1,35	4	1,33			0,03	2,18	94,06
8	39x	5.5	31	1,32	1,33	1,33	1,33	4	1,33			0,01	0,42	94,29
9	40	5.7	31	1,37	1,34	1,36	1,35	4	1,36			0,01	0,79	96,26
10	25	4.1	31	1,37	1,36	1,36	1,34	4	1,36			0,01	0,93	96,36
11	33a	5.1	21	1,32	1,37	1,36	1,38	4	1,36			0,03	1,94	96,36
12	43x	4.1	31	1,37	1,38	1,37	1,36	4	1,37			0,01	0,52	97,18
13	37a	0	42	1,40	1,36	1,36	1,40	4	1,38			0,02	1,67	97,96
14	56	5.5	31	1,41	1,36	1,40	1,38	4	1,38			0,02	1,57	98,25
15	06x	5.2	31	1,40	1,37	1,40	1,39	4	1,39			0,01	0,89	98,74
16	15	5.1	21.1	1,38	1,36	1,42	1,43	4	1,40			0,03	2,36	99,20
17	49	5.1	31	1,37	1,43	1,41	1,39	4	1,40			0,03	1,84	99,38
18	2	5.3	31	1,40	1,40	1,40	1,40	4	1,40			0,00	0,00	99,38
19	52	4.1	31	1,43	1,38	1,37	1,43	4	1,40			0,03	2,28	99,56
20	4	9.1	41	1,36	1,39	1,46	1,47	4	1,42			0,06	3,94	100,68
21	11x	5.1	31	1,42	1,43	1,42	1,42	4	1,42			0,01	0,35	100,98
22	08x	6.3	31	1,41	1,43	1,41	1,44	4	1,42			0,02	1,05	100,98
23	18x	3.31	31	1,42	1,47	1,39	1,42	4	1,43			0,03	2,33	101,16
24	50x	4.1	31	1,48	1,41	1,41	1,40	4	1,43			0,04	2,49	101,24
25	48x	4.1	31	1,43	1,43	1,44	1,42	4	1,43			0,01	0,78	101,37
26	37x	5.5	31	1,44	1,43	1,44	1,43	4	1,44			0,01	0,40	101,87
27	36	3.3	21.1	1,45	1,47	1,40	1,42	4	1,44			0,03	2,17	101,87
28	60	3.3	31	1,49	1,51	1,43	1,31	4	1,44			0,09	6,22	101,99
29	07x	5.5	31	1,44	1,44	1,44	1,44	4	1,44			0,00	0,00	102,22
30	44x	4.1	31	1,45	1,47	1,42	1,42	4	1,44			0,02	1,70	102,22
31	38	5.5	31	1,44	1,44	1,44	1,44	4	1,44			0,00	0,00	102,22
32	03x	3.10	31	1,44	1,44	1,43	1,45	4	1,44			0,01	0,57	102,22
33	29x	4.3	31	1,46	1,46	1,43	1,45	4	1,45			0,01	0,83	103,00
34	26x	5.5	31	1,48	1,50	1,43	1,44	4	1,46			0,03	2,26	103,82
35	17x	5.5	31	1,50	1,49	1,41	1,50	4	1,47			0,04	3,00	104,62
36	42	4.1	31	1,48	1,48	1,48	1,48	4	1,48			0,01	0,35	105,02
37	04a	9.1	42	1,47	1,49	1,49	1,47	4	1,48			0,01	0,78	105,06
38	09x	5.5	31	1,53	1,46	1,49	1,44	4	1,48			0,04	2,68	105,24
39	23x	3.9	31	1,46	1,45	1,49	1,57	4	1,49			0,05	3,64	105,95
40	47x	4.1	32	1,52	1,45	1,51	1,52	4	1,50			0,03	2,24	106,48
41	28x	3.31	21.1	1,62	1,61	1,62	1,61	4	1,62			0,01	0,36	114,64
42	19	5.6	31	*2,13*	*1,85*	*2,28*	*2,08*	*0*	*2,09*	b	*	*0,18*	*8,55*	*148,01*
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	N	Mean	SI	VI
all labs	160	**1,41**	**0,024**	**1,711**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mg **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*2,24*	*2,22*	*2,13*	*2,14*	*0*	*2,18*	b	*	*0,06*	*2,55*	*73,43*
2	61x	4.1	21.1	2,69	2,63	2,60	2,62	4	2,64			0,04	1,47	88,66
3	27	6.5	21.1	2,68	2,68	2,68	2,68	4	2,68			0,00	0,00	90,23
4	12x	5.1	31	2,75	2,73	2,56	2,79	4	2,71			0,10	3,65	91,07
5	13x	5.3	21	2,79	2,82	2,67	2,62	4	2,73			0,10	3,50	91,69
6	05x	3.3	21.1	2,75	2,70	2,80	2,75	4	2,75			0,04	1,48	92,53
7	25	4.1	31	2,83	2,76	2,79	2,77	4	2,79			0,03	1,11	93,79
8	33a	5.1	21	2,79	2,87	2,72	2,87	4	2,81			0,07	2,57	94,63
9	46	5.2	31	2,82	2,76	2,89	2,90	4	2,84			0,07	2,30	95,64
10	39x	5.5	31	2,82	2,83	2,85	2,87	4	2,84			0,02	0,73	95,66
11	37a	0	42	2,84	2,86	2,86	2,85	4	2,85			0,01	0,34	95,98
12	48x	4.1	31	2,90	2,86	2,94	2,89	4	2,90			0,03	1,19	97,51
13	04a	9.1	42	2,92	2,92	2,89	2,87	4	2,90			0,02	0,84	97,57
14	36	3.3	21.1	2,87	2,91	2,92	2,98	4	2,92			0,05	1,56	98,25
15	56	5.5	31	2,93	2,96	2,91	2,93	4	2,93			0,02	0,79	98,67
16	07x	5.5	31	2,93	2,97	2,94	2,96	4	2,95			0,02	0,62	99,26
17	17x	5.5	31	2,96	2,96	2,94	2,94	4	2,95			0,01	0,34	99,27
18	50x	4.1	31	2,95	2,96	2,98	2,96	4	2,96			0,01	0,50	99,63
19	08x	6.3	31	3,04	2,97	2,93	2,94	4	2,97			0,05	1,67	99,93
20	06x	5.2	31	2,92	3,00	3,04	2,99	4	2,99			0,05	1,57	100,49
21	44x	4.1	31	2,98	3,03	2,97	2,99	4	2,99			0,03	0,88	100,69
22	28x	3.31	21.1	2,99	3,00	3,00	3,00	4	3,00			0,01	0,17	100,85
23	29x	4.3	31	3,02	2,96	3,04	2,99	4	3,00			0,03	1,16	101,00
24	38	5.5	31	3,04	3,01	3,02	2,99	4	3,02			0,02	0,69	101,44
25	37x	5.5	31	3,03	3,01	3,01	3,02	4	3,02			0,01	0,32	101,53
26	49	5.1	31	3,02	2,95	3,10	3,05	4	3,03			0,06	2,07	101,95
27	4	9.1	41	3,03	3,07	3,03	3,01	4	3,04			0,03	0,92	102,17
28	11x	5.1	31	3,05	3,04	3,04	3,03	4	3,04			0,01	0,27	102,28
29	52	4.1	31	3,02	3,03	3,05	3,08	4	3,05			0,03	0,87	102,45
30	40	5.7	31	2,99	3,02	3,13	3,05	4	3,05			0,06	1,90	102,54
31	18x	3.31	31	3,10	3,05	3,11	3,08	4	3,09			0,03	0,86	103,80
32	15	5.1	21.1	3,15	2,99	3,20	3,03	4	3,09			0,10	3,19	104,05
33	26x	5.5	31	3,12	3,10	3,10	3,06	4	3,10			0,03	0,81	104,13
34	03x	3.10	31	3,07	3,13	3,09	3,10	4	3,10			0,03	0,81	104,22
35	43x	4.1	31	3,11	3,09	3,13	3,09	4	3,10			0,02	0,68	104,43
36	47x	4.1	32	3,16	3,10	3,07	3,14	4	3,12			0,04	1,29	104,89
37	42	4.1	31	3,14	3,13	3,13	3,13	4	3,13			0,01	0,20	105,46
38	2	5.3	31	3,20	3,20	3,10	3,10	4	3,15			0,06	1,83	105,98
39	09x	5.5	31	3,22	3,19	3,21	3,07	4	3,17			0,07	2,12	106,71
40	23x	3.9	31	3,01	3,12	3,38	3,36	4	3,22			0,18	5,65	108,26
41	60	3.3	31	3,23	3,41	3,23	3,30	4	3,29			0,08	2,52	110,74
42	19	5.6	31	*4,41*	*4,88*	*4,67*	*4,28*	*0*	*4,56*	b	*	*0,27*	*5,88*	*153,43*
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	N	Mean	SI	VI
all labs	160	**2,97**	**0,041**	**1,390**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: K **Sample: 1 (Pine Needles - Finland)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	*1,05*	*1,06*	*1,09*	*1,05*	*0*	*1,06*	b	*	*0,02*	*1,70*	*18,29*
2	40	5.7	31	*4,51*	*4,52*	*4,56*	*4,56*	*0*	*4,54*	b	*	*0,03*	*0,57*	*78,38*
3	13x	5.3	21	5,08	4,98	5,15	5,03	4	5,06			0,07	1,43	87,40
4	46	5.2	31	4,90	5,03	5,12	5,19	4	5,06			0,13	2,47	87,40
5	19	5.6	31	5,53	5,63	5,22	4,95	4	5,33			0,31	5,79	92,11
6	36	3.3	28	5,35	5,40	5,39	5,35	4	5,37			0,03	0,49	92,80
7	26x	5.5	35	5,60	5,30	5,35	5,53	4	5,45			0,14	2,63	94,05
8	01x	3.21	21.1	5,70	5,40	5,30	5,50	4	5,48			0,17	3,12	94,57
9	39x	5.5	31	5,46	5,40	5,53	5,55	4	5,48			0,07	1,22	94,73
10	33a	5.1	28	5,53	5,57	5,42	5,61	4	5,53			0,08	1,48	95,56
11	52	4.1	31	5,55	5,51	5,59	5,55	4	5,55			0,03	0,59	95,87
12	25	4.1	31	5,48	5,55	5,63	5,60	4	5,57			0,07	1,18	96,12
13	4	9.1	41	5,44	5,57	5,64	5,71	4	5,59			0,11	2,05	96,50
14	17x	5.5	31	5,64	5,63	5,69	5,73	4	5,67			0,05	0,84	97,97
15	06x	5.2	31	5,69	5,75	5,61	5,68	4	5,68			0,06	1,01	98,15
16	61x	4.1	28	5,67	5,67	5,70	5,70	4	5,69			0,02	0,30	98,20
17	23x	3.9	31	5,65	5,70	5,87	5,64	4	5,72			0,11	1,87	98,72
18	43x	4.1	31	5,69	5,69	5,73	5,80	4	5,73			0,05	0,91	98,93
19	47x	4.1	32	5,74	5,80	5,73	5,67	4	5,74			0,05	0,93	99,06
20	29x	3.3	31	5,80	5,74	5,77	5,78	4	5,77			0,03	0,43	99,71
21	18x	3.31	31	5,70	5,80	5,80	5,80	4	5,78			0,05	0,87	99,75
22	28x	3.31	21.1	5,80	5,85	5,83	5,81	4	5,82			0,02	0,38	100,57
23	44x	4.1	31	5,90	5,79	5,87	5,76	4	5,83			0,07	1,13	100,70
24	60	3.3	31	5,80	5,96	5,77	5,87	4	5,85			0,08	1,44	101,05
25	08x	6.3	31	5,72	5,96	5,79	5,95	4	5,86			0,12	2,03	101,13
26	15	5.1	28	5,86	5,91	5,86	5,80	4	5,86			0,05	0,77	101,18
27	2	5.3	31	5,90	6,00	5,80	5,80	4	5,88			0,10	1,63	101,48
28	09x	5.5	31	5,81	5,89	5,91	5,93	4	5,89			0,05	0,89	101,67
29	11x	5.1	31	5,96	5,97	5,91	5,95	4	5,95			0,03	0,44	102,73
30	49	5.1	31	5,96	5,94	5,99	5,97	4	5,97			0,02	0,35	103,03
31	56	5.5	31	6,00	6,01	5,90	5,96	4	5,97			0,05	0,82	103,07
32	07x	5.5	31	6,07	5,99	5,99	5,97	4	6,01			0,04	0,74	103,73
33	37x	5.5	31	6,01	6,05	6,04	6,08	4	6,05			0,03	0,48	104,42
34	50x	4.1	31	6,19	6,00	6,25	6,06	4	6,13			0,12	1,88	105,80
35	48x	4.1	31	6,14	6,11	6,18	6,12	4	6,14			0,03	0,53	106,01
36	03x	3.10	31	6,08	*6,47a*	6,07	6,14	3	6,10			0,04	0,62	105,31
37	42	4.1	31	6,25	6,19	6,21	6,21	4	6,21			0,02	0,39	107,32
38	04a	9.1	42	6,19	6,21	6,31	6,18	4	6,22			0,06	0,96	107,48
39	12x	5.1	31	6,43	6,25	6,28	5,94	4	6,23			0,21	3,31	107,53
40	38	5.5	31	6,34	6,33	6,34	6,32	4	6,33			0,01	0,15	109,38
41	37a	0	42	6,45	6,45	6,30	6,30	4	6,38			0,09	1,36	110,12
42	27	6.5	21.1	*7,49*	*7,47*	*7,52*	*7,49*	*0*	*7,49*	b	*	*0,02*	*0,29*	*129,43*
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	N	Mean	SI	VI
all labs	155	**5,79**	**0,073**	**1,259**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: K **Sample: 2 (Spruce needles - Germany)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	*1,22a*	*1,20*	*1,20*	*1,20*	*0*	*1,20*	b	*	*0,00*	*0,24*	*16,87*
2	01x	3.21	21.1	*4,80*	*5,00*	*4,70*	*4,60*	*0*	*4,78*	b	*	*0,17*	*3,58*	*67,21*
3	13x	5.3	21	6,11	*5,92a*	6,17	6,14	3	6,14			0,03	0,49	86,42
4	40	5.7	31	6,05	5,98	6,22	6,13	4	6,09			0,10	1,67	85,78
5	36	3.3	28	6,50	6,60	6,50	6,55	4	6,54			0,05	0,73	92,02
6	46	5.2	31	6,62	6,68	6,86	6,60	4	6,69			0,12	1,77	94,16
7	25	4.1	31	6,88	6,78	6,62	6,66	4	6,74			0,12	1,75	94,80
8	39x	5.5	31	6,82	6,82	6,79	6,78	4	6,80			0,02	0,32	95,75
9	06x	5.2	31	6,82	6,90	6,87	6,87	4	6,87			0,03	0,48	96,62
10	4	9.1	41	6,58	6,69	7,13	7,10	4	6,87			0,28	4,05	96,74
11	33a	5.1	28	6,87	6,88	6,88	6,94	4	6,89			0,03	0,46	97,01
12	52	4.1	31	6,98	6,91	6,82	6,86	4	6,89			0,07	1,00	97,01
13	15	5.1	28	7,20	6,94	6,71	6,79	4	6,91			0,22	3,12	97,26
14	26x	5.5	35	6,88	6,95	6,93	7,00	4	6,94			0,05	0,72	97,68
15	44x	4.1	31	7,10	7,08	6,89	6,97	4	7,01			0,10	1,40	98,67
16	18x	3.31	31	7,00	7,00	7,10	7,00	4	7,03			0,05	0,71	98,88
17	19	5.6	31	7,33	7,25	6,85	6,71	4	7,04			0,30	4,29	99,02
18	23x	3.9	31	7,18	7,24	7,08	6,67	4	7,04			0,26	3,65	99,12
19	43x	4.1	31	7,07	7,12	7,14	7,17	4	7,13			0,04	0,59	100,28
20	28x	3.31	21.1	7,14	7,13	7,13	7,16	4	7,14			0,01	0,20	100,50
21	17x	5.5	31	7,16	7,19	7,22	7,19	4	7,19			0,03	0,36	101,21
22	60	3.3	31	7,32	7,45	7,16	6,87	4	7,20			0,25	3,47	101,34
23	2	5.3	31	7,30	7,30	7,10	7,10	4	7,20			0,12	1,60	101,34
24	61x	4.1	28	7,36	7,16	7,15	7,14	4	7,20			0,11	1,46	101,38
25	04a	9.1	42	7,23	7,25	7,21	7,21	4	7,23			0,02	0,27	101,69
26	29x	3.3	31	7,20	7,23	7,25	7,22	4	7,23			0,02	0,29	101,69
27	37x	5.5	31	7,19	7,24	7,23	7,25	4	7,23			0,03	0,36	101,73
28	08x	6.3	31	7,41	7,04	7,14	7,35	4	7,24			0,17	2,41	101,83
29	50x	4.1	31	7,22	7,22	7,31	7,28	4	7,26			0,05	0,62	102,15
30	09x	5.5	31	7,27	7,35	7,32	7,23	4	7,29			0,06	0,76	102,64
31	49	5.1	31	7,30	7,25	7,33	7,29	4	7,29			0,03	0,45	102,64
32	56	5.5	31	7,26	7,24	7,32	7,35	4	7,29			0,05	0,70	102,65
33	47x	4.1	32	7,28	7,30	7,47	7,30	4	7,34			0,09	1,21	103,28
34	48x	4.1	31	7,31	7,31	7,45	7,37	4	7,36			0,07	0,89	103,55
35	11x	5.1	31	7,44	7,44	7,42	7,20	4	7,38			0,12	1,59	103,80
36	37a	0	42	7,40	7,36	7,34	7,40	4	7,38			0,03	0,41	103,80
37	42	4.1	31	7,27	7,49	7,38	7,41	4	7,39			0,09	1,28	103,99
38	07x	5.5	31	7,42	7,47	7,42	7,42	4	7,43			0,02	0,34	104,61
39	03x	3.10	31	7,65	7,54	7,53	7,25	4	7,49			0,17	2,28	105,46
40	38	5.5	31	7,67	7,70	7,49	7,49	4	7,59			0,11	1,49	106,79
41	12x	5.1	31	7,76	7,95	8,43	7,50	4	7,91			0,39	4,97	111,31
42	27	6.5	21.1	*8,82*	*8,79*	*8,90*	*8,85*	*0*	*8,84*	b	*	*0,05*	*0,51*	*124,40*
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	N	Mean	SI	VI
all labs	155	**7,10**	**0,100**	**1,407**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: K **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	*1,33*	*1,35*	*1,37*	*1,35*	*0*	*1,35*	b	*	*0,02*	*1,23*	*16,17*
2	40	5.7	31	7,05	7,22	6,94	7,08	4	7,07		*	0,12	1,64	84,86
3	13x	5.3	21	7,26	*7,05a*	7,26	7,23	3	7,25			0,02	0,24	86,98
4	25	4.1	31	7,39	7,40	7,41	7,40	4	7,40			0,01	0,11	88,78
5	36	3.3	28	7,60	7,65	7,65	7,68	4	7,65			0,03	0,43	91,71
6	19	5.6	31	8,26	7,55	8,57	6,22	4	7,65			1,04	13,65	91,77
7	46	5.2	31	7,77	7,78	7,58	7,84	4	7,74			0,11	1,46	92,88
8	4	9.1	41	7,51	7,64	7,98	8,06	4	7,80			0,26	3,36	93,56
9	39x	5.5	31	7,88	7,84	7,89	7,88	4	7,87			0,02	0,28	94,46
10	61x	4.1	28	8,11	7,65	7,99	7,98	4	7,93			0,20	2,49	95,16
11	06x	5.2	31	7,96	7,96	7,89	7,94	4	7,94			0,03	0,42	95,22
12	52	4.1	31	7,97	8,09	8,05	8,16	4	8,07			0,08	0,98	96,78
13	33a	5.1	28	7,94	8,17	8,06	8,34	4	8,13			0,17	2,09	97,50
14	15	5.1	28	8,07	8,30	8,28	8,09	4	8,19			0,12	1,49	98,19
15	18x	3.31	31	8,20	8,50	8,00	8,20	4	8,23			0,21	2,51	98,67
16	60	3.3	31	8,45	8,52	8,08	7,99	4	8,26			0,26	3,20	99,09
17	43x	4.1	31	8,31	8,31	8,31	8,26	4	8,30			0,03	0,30	99,54
18	44x	4.1	31	8,44	8,51	8,28	8,18	4	8,35			0,15	1,80	100,20
19	28x	3.31	21.1	8,36	8,36	8,35	8,39	4	8,37			0,02	0,21	100,35
20	04a	9.1	42	8,38	8,38	8,42	8,28	4	8,37			0,06	0,71	100,35
21	50x	4.1	31	8,33	8,40	8,29	8,50	4	8,38			0,09	1,10	100,53
22	26x	5.5	35	8,75	8,46	8,55	8,20	4	8,49			0,23	2,69	101,85
23	2	5.3	31	8,50	8,70	8,30	8,50	4	8,50			0,16	1,92	101,97
24	29x	3.3	31	8,65	8,36	8,62	8,50	4	8,53			0,13	1,55	102,36
25	47x	4.1	32	8,68	8,41	8,55	8,49	4	8,53			0,11	1,33	102,36
26	17x	5.5	31	8,62	8,64	8,42	8,54	4	8,55			0,10	1,18	102,63
27	23x	3.9	31	8,41	8,62	8,67	8,57	4	8,57			0,11	1,31	102,78
28	37x	5.5	31	8,54	8,62	8,59	8,57	4	8,58			0,03	0,39	102,93
29	08x	6.3	31	8,57	8,65	8,51	8,64	4	8,59			0,07	0,76	103,08
30	01x	3.21	21.1	8,20	8,60	8,80	8,80	4	8,60			0,28	3,29	103,17
31	09x	5.5	31	8,63	8,66	8,71	8,51	4	8,63			0,09	0,99	103,51
32	11x	5.1	31	8,61	8,68	8,61	8,67	4	8,64			0,04	0,44	103,68
33	49	5.1	31	8,70	8,66	8,72	8,73	4	8,70			0,03	0,36	104,40
34	37a	0	42	8,70	8,74	8,76	8,75	4	8,74			0,03	0,30	104,82
35	07x	5.5	31	8,67	8,79	8,75	8,75	4	8,74			0,05	0,58	104,85
36	56	5.5	31	8,92	8,75	8,81	8,77	4	8,81			0,08	0,86	105,71
37	48x	4.1	31	8,86	8,89	8,86	8,89	4	8,88			0,02	0,19	106,47
38	38	5.5	31	8,99	8,87	8,91	8,87	4	8,91			0,06	0,63	106,89
39	42	4.1	31	8,95	8,96	8,92	9,06	4	8,97			0,06	0,66	107,64
40	03x	3.10	31	9,00	8,68	8,67	9,76	4	9,03			0,51	5,67	108,30
41	12x	5.1	31	9,23	9,25	9,24	9,19	4	9,23			0,03	0,30	110,72
42	27	6.5	21.1	*10,15*	*10,23*	*10,29*	*10,18*	*0*	*10,21*	b	*	*0,06*	*0,59*	*122,50*
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	N	Mean	SI	VI
all labs	159	**8,34**	**0,131**	**1,573**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: K **Sample: 4 (Maple leaves - Austria)** Dimension: mg/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	*1,24a*	*1,21*	*1,21*	*1,21*	*0*	*1,21*	b	*	*0,00*	*0,19*	*17,87*
2	19	5.6	31	6,02	5,81	6,31	5,14	4	5,82			0,50	8,55	86,14
3	13x	5.3	21	5,85	5,80	5,95	5,86	4	5,87			0,06	1,06	86,80
4	40	5.7	31	5,99	5,96	6,29	6,20	4	6,11			0,16	2,57	90,42
5	36	3.3	28	6,32	6,25	6,30	6,26	4	6,28			0,03	0,53	92,98
6	26x	5.5	35	6,33	6,24	6,50	6,36	4	6,36			0,11	1,70	94,09
7	25	4.1	31	6,39	6,41	6,31	6,36	4	6,37			0,04	0,68	94,24
8	4	9.1	41	6,28	6,31	6,42	6,47	4	6,37			0,09	1,41	94,25
9	39x	5.5	31	6,33	6,36	6,42	6,45	4	6,39			0,06	0,89	94,58
10	23x	3.9	31	6,46	6,60	6,49	6,28	4	6,46			0,13	2,06	95,57
11	33a	5.1	28	6,47	6,54	6,30	6,52	4	6,46			0,11	1,69	95,57
12	46	5.2	31	6,46	6,54	6,47	6,52	4	6,50			0,04	0,59	96,17
13	06x	5.2	31	6,47	6,58	6,67	6,57	4	6,57			0,08	1,24	97,28
14	43x	4.1	31	6,65	6,61	6,65	6,68	4	6,65			0,03	0,43	98,39
15	52	4.1	31	6,66	6,67	6,70	6,82	4	6,71			0,07	1,10	99,35
16	44x	4.1	31	6,79	6,85	6,75	6,72	4	6,78			0,06	0,83	100,31
17	07x	5.5	31	6,79	6,87	6,74	6,79	4	6,80			0,05	0,79	100,61
18	28x	3.31	21.1	6,83	6,80	6,80	6,80	4	6,81			0,02	0,22	100,75
19	61x	4.1	28	6,73	6,71	7,19	6,71	4	6,84			0,24	3,47	101,16
20	37a	0	42	6,80	6,84	6,86	6,86	4	6,84			0,03	0,41	101,23
21	29x	3.3	31	6,87	6,85	6,94	6,89	4	6,89			0,04	0,56	101,94
22	04a	9.1	42	6,94	6,92	6,96	6,86	4	6,92			0,04	0,62	102,42
23	18x	3.31	31	7,00	6,80	7,00	6,90	4	6,93			0,10	1,38	102,49
24	2	5.3	31	7,00	7,00	6,90	6,80	4	6,93			0,10	1,38	102,49
25	11x	5.1	31	6,96	6,93	6,95	6,91	4	6,94			0,02	0,32	102,68
26	15	5.1	28	6,79	7,10	7,00	6,89	4	6,95			0,13	1,93	102,79
27	08x	6.3	31	7,15	6,93	6,88	6,88	4	6,96			0,13	1,85	103,01
28	37x	5.5	31	6,93	6,98	6,96	7,00	4	6,97			0,03	0,43	103,12
29	47x	4.1	32	7,00	7,08	6,89	6,94	4	6,98			0,08	1,17	103,27
30	17x	5.5	31	7,08	7,08	6,87	6,91	4	6,98			0,11	1,57	103,37
31	09x	5.5	31	7,02	7,02	7,01	6,93	4	6,99			0,04	0,61	103,51
32	48x	4.1	31	7,06	6,96	7,06	7,04	4	7,03			0,05	0,69	104,07
33	56	5.5	31	7,07	7,10	6,97	7,20	4	7,08			0,09	1,32	104,85
34	50x	4.1	31	7,18	7,13	7,05	7,07	4	7,11			0,06	0,83	105,19
35	03x	3.10	31	6,72	7,47	6,84	7,47	4	7,13			0,40	5,63	105,45
36	38	5.5	31	7,20	7,12	7,16	7,08	4	7,14			0,05	0,72	105,68
37	49	5.1	31	7,00	7,40	7,10	7,10	4	7,15			0,17	2,42	105,82
38	42	4.1	31	7,36	7,30	7,33	7,33	4	7,33			0,02	0,33	108,46
39	12x	5.1	31	7,62	7,25	7,10	7,62	4	7,40			0,27	3,60	109,48
40	27	6.5	21.1	*8,69*	*8,66*	*8,72*	*8,69*	*0*	*8,69*	b	*	*0,02*	*0,25*	*128,60*
41	60	3.3	31	*10,27*	*10,86a*	*10,39*	*10,37*	*0*	*10,34*	b	*	*0,06*	*0,62*	*153,09*
42	01x	3.21	21.1	*10,80*	*10,60*	*10,50*	*10,90*	*0*	*10,70*	b	*	*0,18*	*1,71*	*158,36*
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	N	Mean	SI	VI
all labs	152	**6,76**	**0,101**	**1,497**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Zn **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*20,00*	*16,00*	*22,00*	*14,00*	*0*	*18,00*	b	*	*3,65*	*20,29*	*42,98*
2	25	4.1	31	35,70	35,20	35,10	35,90	4	35,48		*	0,39	1,09	84,71
3	43x	4.1	31	38,00	36,00	38,00	36,00	4	37,00			1,15	3,12	88,35
4	27	6.5	21.1	36,80	37,87	36,80	37,33	4	37,20			0,51	1,37	88,83
5	07x	5.5	31	39,60	39,70	39,90	40,00	4	39,80			0,18	0,46	95,04
6	37x	5.5	31	39,40	39,70	39,90	40,50	4	39,88			0,46	1,17	95,22
7	46	5.2	31	40,60	39,20	40,20	39,90	4	39,98			0,59	1,48	95,46
8	33a	5.1	21	41,21	39,51	39,67	39,84	4	40,06			0,78	1,95	95,65
9	49	5.1	31	39,30	39,90	41,40	40,70	4	40,33			0,92	2,28	96,29
10	4	9.1	41	39,50	39,90	41,70	40,70	4	40,45			0,97	2,40	96,59
11	50x	4.1	31	40,22	40,20	41,02	41,13	4	40,64			0,50	1,23	97,05
12	23x	3.9	31	40,16	40,67	40,89	41,13	4	40,71			0,41	1,02	97,22
13	42	4.1	31	40,00	41,00	41,00	41,00	4	40,75			0,50	1,23	97,31
14	17x	5.5	31	40,14	41,28	40,91	41,25	4	40,90			0,53	1,30	97,65
15	52	4.1	31	41,47	42,89	40,31	39,29	4	40,99			1,55	3,78	97,88
16	13	5.3	21	44,60	40,00	40,40	40,70	4	41,43			2,14	5,16	98,92
17	06x	5.2	31	41,80	41,36	41,40	41,52	4	41,52			0,20	0,48	99,14
18	38	5.5	31	41,30	42,20	41,40	42,40	4	41,83			0,56	1,33	99,87
19	39x	5.5	35	41,26	42,89	43,70	41,79	4	42,41			1,10	2,58	101,27
20	18x	3.31	31	42,10	42,70	43,20	42,70	4	42,68			0,45	1,05	101,90
21	08x	6.3	31	42,70	42,70	43,00	42,30	4	42,68			0,29	0,67	101,90
22	03x	3.10	31	42,40	44,00	42,70	41,80	4	42,73			0,93	2,17	102,02
23	09x	5.5	31	43,01	43,15	42,75	42,01	4	42,73			0,51	1,19	102,03
24	11x	5.1	31	43,70	42,20	43,70	42,20	4	42,95			0,87	2,02	102,56
25	29x	3.3	31	42,90	43,60	43,50	43,20	4	43,30			0,32	0,73	103,40
26	48x	4.1	31	43,72	43,29	43,52	43,07	4	43,40			0,28	0,65	103,63
27	56	5.5	31	43,82	46,41	41,36	42,41	4	43,50			2,19	5,03	103,87
28	60	3.3	31	43,40	44,40	43,60	44,00	4	43,85			0,44	1,01	104,71
29	26x	5.5	31	43,00	43,00	44,20	45,40	4	43,90			1,15	2,62	104,83
30	28	4.1	21.1	43,94	44,05	43,96	43,75	4	43,93			0,13	0,29	104,89
31	44x	4.1	32	45,00	41,00	46,00	44,00	4	44,00			2,16	4,91	105,07
32	04a	9.1	42	44,75	44,91	44,46	44,37	4	44,62			0,25	0,56	106,55
33	2	5.3	31	44,00	45,50	44,80	45,40	4	44,93			0,69	1,54	107,28
34	37a	0	42	46,40	46,80	45,60	45,80	4	46,15			0,55	1,19	110,20
35	36	3.3	21.1	47,10	47,20	46,90	47,60	4	47,20			0,29	0,62	112,71
36	40	5.7	31	*45,90*	*66,10*	*55,20*	*52,30*	*0*	*54,88*	b	*	*8,43*	*15,37*	*131,04*
37	05x	3.3	21.1	*60,00*	*60,00*	*60,00*	*60,00*	*0*	*60,00*	b	*	*0,00*	*0,00*	*143,27*
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	N	Mean	SI	VI
all labs	136	**41,88**	**0,733**	**1,751**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Zn **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	25	4.1	31	47,40	47,70	46,60	46,50	4	47,05			0,59	1,26	86,08
2	43x	4.1	31	47,00	47,00	48,00	48,00	4	47,50			0,58	1,22	86,91
3	27	6.5	21.1	52,44	48,73	48,20	49,79	4	49,79			1,89	3,79	91,09
4	37x	5.5	31	50,70	51,90	51,30	52,10	4	51,50			0,63	1,23	94,23
5	23x	3.9	31	53,54	51,71	50,83	50,67	4	51,69			1,32	2,55	94,57
6	13	5.3	21	50,50	51,00	51,50	58,80	4	52,95			3,92	7,41	96,88
7	06x	5.2	31	53,50	52,95	53,41	53,29	4	53,29			0,24	0,45	97,50
8	17x	5.5	31	53,63	53,46	53,22	53,48	4	53,45			0,17	0,32	97,79
9	38	5.5	31	53,80	54,40	53,50	54,30	4	54,00			0,42	0,79	98,80
10	4	9.1	41	52,30	52,70	55,80	55,30	4	54,03			1,78	3,30	98,85
11	39x	5.5	35	54,80	54,39	53,82	53,67	4	54,17			0,52	0,96	99,11
12	26x	5.5	31	57,10	53,90	52,90	53,00	4	54,23			1,97	3,63	99,21
13	60	3.3	31	54,00	55,70	56,00	52,30	4	54,50			1,71	3,14	99,71
14	33a	5.1	21	52,25	57,49	54,13	54,53	4	54,60			2,17	3,97	99,90
15	08x	6.3	31	55,20	53,60	54,90	55,00	4	54,68			0,73	1,33	100,03
16	46	5.2	31	55,10	54,40	55,80	54,00	4	54,83			0,79	1,45	100,31
17	07x	5.5	31	53,80	54,80	57,00	53,80	4	54,85			1,51	2,75	100,35
18	50x	4.1	31	54,70	55,00	55,25	54,45	4	54,85			0,35	0,64	100,35
19	52	4.1	31	57,76	53,30	56,79	53,23	4	55,27			2,35	4,25	101,12
20	49	5.1	31	54,20	56,50	55,20	55,90	4	55,45			0,99	1,78	101,45
21	03x	3.10	31	55,60	54,90	55,00	56,30	4	55,45			0,65	1,16	101,45
22	11x	5.1	31	55,40	55,50	56,00	55,50	4	55,60			0,27	0,49	101,73
23	42	4.1	31	56,00	55,00	56,00	56,00	4	55,75			0,50	0,90	102,00
24	2	5.3	31	56,50	55,10	55,90	55,80	4	55,83			0,57	1,03	102,14
25	09x	5.5	31	56,22	56,39	55,09	55,70	4	55,85			0,59	1,05	102,18
26	18x	3.31	31	55,90	56,20	56,20	56,10	4	56,10			0,14	0,25	102,64
27	29x	3.3	31	56,80	56,40	55,70	55,60	4	56,13			0,57	1,02	102,69
28	56	5.5	31	54,99	54,95	57,05	57,72	4	56,18			1,42	2,53	102,78
29	04a	9.1	42	55,87	56,80	56,22	56,31	4	56,30			0,38	0,68	103,01
30	28	4.1	21.1	56,59	56,25	56,31	56,12	4	56,32			0,20	0,35	103,04
31	40	5.7	31	59,10	57,40	56,50	56,90	4	57,48			1,14	1,99	105,16
32	48x	4.1	31	57,70	57,17	57,53	57,68	4	57,52			0,25	0,43	105,24
33	37a	0	42	58,30	57,60	58,70	58,20	4	58,20			0,45	0,78	106,48
34	44x	4.1	32	59,00	55,00	63,00	57,00	4	58,50			3,42	5,84	107,03
35	36	3.3	21.1	58,50	59,10	59,30	59,60	4	59,13			0,46	0,79	108,18
36	05x	3.3	21.1	*80,00a*	*72,50*	*72,50*	*72,00*	*0*	*72,33*	b	*	*0,29*	*0,40*	*132,34*
37	01x	3.21	21.1	*108,00*	*116,00*	*106,00*	*122,00*	*0*	*113,0*	b	*	*7,39*	*6,54*	*206,75*
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	N	Mean	SI	VI
all labs	140	**54,66**	**1,018**	**1,863**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Zn **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	43x	4.1	31	15,00	15,00	16,00	15,00	4	15,25		*	0,50	3,28	78,89
2	33a	5.1	21	17,32	19,08	16,81	16,41	4	17,41			1,18	6,76	90,03
3	06x	5.2	31	18,04	17,54	17,98	17,85	4	17,85			0,22	1,25	92,35
4	07x	5.5	31	18,10	18,20	18,00	18,60	4	18,23			0,26	1,44	94,28
5	37x	5.5	31	17,90	18,40	18,10	18,50	4	18,23			0,28	1,51	94,28
6	04a	9.1	42	18,30	18,23	18,40	18,74	4	18,42			0,23	1,23	95,27
7	60	3.3	31	19,00	20,10	18,30	16,90	4	18,58			1,34	7,21	96,09
8	39x	5.5	35	18,77	18,62	18,80	18,64	4	18,71			0,09	0,48	96,77
9	17x	5.5	31	18,85	18,85	18,00	19,20	4	18,73			0,51	2,73	96,86
10	08x	6.3	31	18,60	18,80	18,60	18,90	4	18,73			0,15	0,80	96,86
11	42	4.1	31	19,00	19,00	19,00	18,00	4	18,75			0,50	2,67	96,99
12	46	5.2	31	18,30	19,20	18,50	19,30	4	18,83			0,50	2,65	97,38
13	13	5.3	21	17,70	19,90	18,10	19,60	4	18,83			1,09	5,78	97,38
14	4	9.1	41	18,20	18,30	19,20	19,60	4	18,83			0,68	3,64	97,38
15	28	4.1	21.1	19,05	18,53	18,75	19,05	4	18,85			0,25	1,34	97,48
16	23x	3.9	31	17,98	19,20	18,56	20,19	4	18,98			0,95	4,99	98,19
17	38	5.5	31	18,30	19,30	19,10	19,50	4	19,05			0,53	2,76	98,54
18	03x	3.10	31	19,50	19,30	18,80	19,10	4	19,18			0,30	1,56	99,19
19	27	6.5	21.1	20,03	19,49	18,41	18,95	4	19,22			0,70	3,64	99,41
20	50x	4.1	31	19,04	19,53	19,00	19,68	4	19,31			0,34	1,78	99,90
21	29x	3.3	31	18,70	19,80	19,40	19,40	4	19,33			0,46	2,37	99,97
22	11x	5.1	31	19,40	19,50	19,40	19,80	4	19,53			0,19	0,97	101,00
23	09x	5.5	31	19,78	19,30	19,73	20,32	4	19,78			0,42	2,11	102,33
24	49	5.1	31	18,90	21,90	20,30	20,00	4	20,28			1,24	6,11	104,88
25	52	4.1	31	19,15	21,87	20,49	20,01	4	20,38			1,14	5,58	105,42
26	25	4.1	31	21,20	19,80	20,70	20,10	4	20,45			0,62	3,05	105,79
27	44x	4.1	32	22,00	21,00	*33,00a*	19,00	3	20,67			1,53	7,39	106,91
28	40	5.7	31	21,80	19,80	20,20	21,10	4	20,73			0,90	4,34	107,21
29	48x	4.1	31	21,24	20,62	21,12	21,21	4	21,05			0,29	1,38	108,88
30	37a	0	42	22,30	21,70	22,60	21,20	4	21,95			0,62	2,85	113,55
31	2	5.3	31	21,60	22,80	22,50	21,10	4	22,00			0,79	3,58	113,80
32	18x	3.31	31	*31,40*	*18,80*	*17,80*	*22,00*	*0*	*22,50*	c	*	*6,20*	*27,55*	*116,39*
33	26x	5.5	31	20,10	23,40	24,20	23,90	4	22,90		*	1,90	8,28	118,46
34	36	3.3	21.1	*26,10*	*25,10*	*25,90*	*25,40*	*0*	*25,63*	b	*	*0,46*	*1,78*	*132,56*
35	56	5.5	31	*25,59*	*34,77*	*36,09*	*20,79*	*0*	*29,31*	b	*	*7,35*	*25,09*	*151,62*
36	05x	3.3	21.1	*52,50*	*52,50*	*52,50*	*50a*	*0*	*52,50*	b	*	*0,00*	*0,00*	*271,58*
37	01x	3.21	21.1	*66,00*	*50,00*	*54,00*	*52,00*	*0*	*55,50*	b	*	*7,19*	*12,95*	*287,10*
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	N	Mean	SI	VI
all labs	127	**19,33**	**0,646**	**3,344**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Zn **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*18,00*	*20,00*	*20,00*	*24,00*	*0*	*20,50*	b	*	*2,52*	*12,28*	*67,88*
2	43x	4.1	31	27,00	27,00	27,00	27,00	4	27,00			0,00	0,00	89,40
3	37x	5.5	31	27,20	27,70	27,90	28,10	4	27,73			0,39	1,39	91,80
4	06x	5.2	31	28,26	28,44	28,85	28,52	4	28,52			0,25	0,87	94,43
5	38	5.5	31	28,30	29,50	28,50	29,60	4	28,98			0,67	2,31	95,94
6	13	5.3	21	28,80	30,20	28,90	28,10	4	29,00			0,88	3,02	96,03
7	39x	5.5	35	29,70	28,87	29,91	28,41	4	29,22			0,70	2,41	96,76
8	07x	5.5	31	29,20	29,50	29,20	29,40	4	29,33			0,15	0,51	97,10
9	46	5.2	31	29,60	29,20	29,30	29,20	4	29,33			0,19	0,65	97,10
10	25	4.1	31	28,90	29,80	28,70	30,00	4	29,35			0,65	2,20	97,18
11	04a	9.1	42	29,64	29,64	28,91	29,34	4	29,38			0,35	1,18	97,29
12	23x	3.9	31	29,69	29,88	29,27	28,75	4	29,40			0,50	1,71	97,34
13	33a	5.1	21	29,98	31,62	27,98	28,13	4	29,43			1,72	5,85	97,44
14	50x	4.1	31	29,83	29,56	29,24	29,18	4	29,45			0,30	1,03	97,52
15	4	9.1	41	28,60	28,90	30,60	29,90	4	29,50			0,92	3,12	97,68
16	42	4.1	31	30,00	29,00	30,00	29,00	4	29,50			0,58	1,96	97,68
17	17x	5.5	31	29,83	29,90	29,23	29,88	4	29,71			0,32	1,08	98,38
18	52	4.1	31	30,04	30,17	29,06	30,76	4	30,01			0,71	2,35	99,36
19	27	6.5	21.1	30,04	30,57	30,04	30,30	4	30,24			0,26	0,85	100,12
20	29x	3.3	31	29,90	30,40	31,30	30,20	4	30,45			0,60	1,98	100,83
21	03x	3.10	31	30,60	31,10	30,30	30,40	4	30,60			0,36	1,16	101,32
22	09x	5.5	31	30,69	30,56	31,58	31,08	4	30,98			0,46	1,48	102,57
23	40	5.7	31	31,30	31,10	30,80	31,20	4	31,10			0,22	0,69	102,98
24	37a	0	42	31,40	30,80	31,60	30,60	4	31,10			0,48	1,53	102,98
25	18x	3.31	31	31,20	30,70	31,50	31,10	4	31,13			0,33	1,06	103,06
26	2	5.3	31	31,00	31,60	30,70	31,20	4	31,13			0,38	1,21	103,06
27	49	5.1	31	30,60	29,90	33,00	31,10	4	31,15			1,33	4,26	103,14
28	11x	5.1	31	31,40	31,20	31,60	30,90	4	31,28			0,30	0,95	103,56
29	48x	4.1	31	31,36	31,70	31,54	31,36	4	31,49			0,16	0,52	104,27
30	26x	5.5	31	31,90	32,70	31,90	30,20	4	31,68			1,05	3,32	104,88
31	28	4.1	21.1	32,16	31,84	32,42	32,55	4	32,24			0,31	0,97	106,76
32	44x	4.1	32	34,00	33,00	32,00	32,00	4	32,75			0,96	2,92	108,44
33	08x	6.3	31	*32,60*	*41,70*	*29,00*	*29,20*	*0*	*33,13*	c		*5,95*	*17,96*	*109,68*
34	36	3.3	21.1	34,30	34,40	34,50	34,00	4	34,30			0,22	0,63	113,57
35	56	5.5	31	*46,00*	*48,38*	*48,13*	*31,26a*	*0*	*47,50*	b	*	*1,31*	*2,75*	*157,29*
36	60	3.3	31	*47,80*	*49,80*	*46,20*	*46,80*	*0*	*47,65*	b	*	*1,58*	*3,31*	*157,78*
37	05x	3.3	21.1	*77,50*	*95a*	*77,50*	*80,00*	*0*	*78,33*	b	*	*1,44*	*1,84*	*259,38*
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	N	Mean	SI	VI
all labs	128	**30,20**	**0,521**	**1,724**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mn **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*42,00*	*56,00*	*46,00*	*54,00*	*0*	*49,50*	b	*	*6,61*	*13,35*	*26,44*
2	23x	3.9	31	*95,85*	*99,26*	*98,18*	*100,21*	*0*	*98,38*	b	*	*1,88*	*1,91*	*52,54*
3	49	5.1	31	*149,00*	*148,10*	*151,30*	*149,70*	*0*	*149,5*	b	*	*1,35*	*0,90*	*79,86*
4	4	9.1	41	*160a*	165,00	165,00	166,00	3	165,33			0,58	0,35	88,31
5	36	3.3	21.1	166,30	168,30	167,00	168,30	4	167,48			0,99	0,59	89,45
6	07x	5.5	31	168,00	168,00	168,00	168,00	4	168,00			0,00	0,00	89,73
7	33a	5.1	21	175,70	182,50	176,40	172,50	4	176,78			4,18	2,36	94,42
8	08x	6.3	31	183,00	176,00	178,00	181,00	4	179,50			3,11	1,73	95,87
9	06x	5.2	31	180,90	181,70	179,70	180,70	4	180,75			0,82	0,46	96,54
10	52	4.1	31	180,73	179,88	180,89	182,01	4	180,88			0,88	0,48	96,61
11	25	4.1	31	182,00	185,00	182,00	178,00	4	181,75			2,87	1,58	97,07
12	40	5.7	31	180,00	184,00	183,00	182,00	4	182,25			1,71	0,94	97,34
13	46	5.2	31	182,40	183,30	184,30	180,50	4	182,63			1,62	0,88	97,54
14	26x	5.5	31	187,00	191,00	179,00	174,00	4	182,75			7,68	4,20	97,61
15	11x	5.1	31	183,00	184,00	183,00	182,00	4	183,00			0,82	0,45	97,74
16	18x	3.31	31	181,30	184,50	184,50	183,40	4	183,43			1,51	0,82	97,97
17	2	5.3	31	182,00	185,00	183,00	184,00	4	183,50			1,29	0,70	98,01
18	28	4.1	21.1	184,00	181,00	187,00	183,00	4	183,75			2,50	1,36	98,14
19	42	4.1	31	184,00	185,00	184,00	184,00	4	184,25			0,50	0,27	98,41
20	17x	5.5	31	183,10	186,80	186,60	181,90	4	184,60			2,48	1,34	98,60
21	05x	3.3	21.1	180,00	180,00	190,00	190,00	4	185,00			5,77	3,12	98,81
22	37x	5.5	31	184,40	185,60	185,70	184,40	4	185,03			0,72	0,39	98,82
23	12x	5.1	31	189,50	182,30	185,70	185,30	4	185,70			2,95	1,59	99,18
24	56	5.5	31	184,60	182,30	190,70	189,30	4	186,73			3,94	2,11	99,73
25	47x	4.1	32	185,00	186,00	188,00	189,00	4	187,00			1,83	0,98	99,88
26	03x	3.10	31	189,00	193,00	189,00	186,00	4	189,25			2,87	1,52	101,08
27	44x	4.1	31	190,00	190,00	190,00	190,00	4	190,00			0,00	0,00	101,48
28	43x	4.1	31	189,00	189,00	194,00	188,00	4	190,00			2,71	1,43	101,48
29	09x	5.5	31	193,00	190,00	192,00	191,00	4	191,50			1,29	0,67	102,28
30	38	5.5	31	194,00	193,00	194,00	190,00	4	192,75			1,89	0,98	102,95
31	50x	4.1	31	197,00	194,00	193,00	193,00	4	194,25			1,89	0,97	103,75
32	48x	4.1	31	201,30	198,30	199,00	196,50	4	198,78			1,99	1,00	106,17
33	37a	0	42	201,40	199,60	198,80	197,30	4	199,28			1,71	0,86	106,43
34	39x	5.5	31	198,12	199,43	201,03	199,32	4	199,48			1,19	0,60	106,54
35	29x	3.3	31	199,00	200,80	203,10	201,20	4	201,03			1,68	0,84	107,37
36	04a	5.5	31	210,00	204,00	206,00	209,00	4	207,25			2,75	1,33	110,69
37	60	3.3	31	*232a*	208,00	204,00	203,00	3	205,00			2,65	1,29	109,49
38	27	6.5	21.1	213,33	213,33	213,33	213,33	4	213,33			0,00	0,00	113,94
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	N	Mean	SI	VI
all labs	138	**187,23**	**2,039**	**1,089**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mn **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*60,00*	*66,00*	*72,00*	*72,00*	*0*	*67,50*	b	*	*5,74*	*8,51*	*24,24*
2	23x	3.9	31	*140,41*	*146,17*	*129,46*	*143,47*	*0*	*139,9*	b	*	*7,33*	*5,24*	*50,24*
3	07x	5.5	31	230,00	227,00	225,00	228,00	4	227,50		*	2,08	0,92	81,70
4	36	3.3	21.1	242,60	245,60	243,70	245,90	4	244,45			1,57	0,64	87,79
5	25	4.1	31	251,00	260,00	250,00	252,00	4	253,25			4,57	1,81	90,95
6	33a	5.1	21	251,50	241,40	259,80	260,70	4	253,35			8,98	3,54	90,99
7	17x	5.5	31	258,00	256,60	255,90	253,90	4	256,10			1,71	0,67	91,97
8	11x	5.1	31	262,00	256,00	262,00	256,00	4	259,00			3,46	1,34	93,02
9	2	5.3	31	261,00	264,00	260,00	258,00	4	260,75			2,50	0,96	93,64
10	18x	3.31	31	261,90	258,80	263,20	261,30	4	261,30			1,85	0,71	93,84
11	03x	3.10	31	263,00	265,00	262,00	260,00	4	262,50			2,08	0,79	94,27
12	42	4.1	31	262,00	261,00	266,00	262,00	4	262,75			2,22	0,84	94,36
13	38	5.5	31	265,00	266,00	263,00	268,00	4	265,50			2,08	0,78	95,35
14	09x	5.5	31	266,00	274,00	265,00	260,00	4	266,25			5,80	2,18	95,62
15	56	5.5	31	260,60	273,10	276,60	259,60	4	267,48			8,64	3,23	96,06
16	44x	4.1	31	270,00	260,00	270,00	270,00	4	267,50			5,00	1,87	96,07
17	37x	5.5	31	266,40	269,10	267,70	267,20	4	267,60			1,13	0,42	96,10
18	26x	5.5	31	263,00	267,00	275,00	266,00	4	267,75			5,12	1,91	96,16
19	47x	4.1	32	266,00	269,00	272,00	270,00	4	269,25			2,50	0,93	96,70
20	4	9.1	41	269,00	275,00	269,00	270,00	4	270,75			2,87	1,06	97,24
21	52	4.1	31	272,48	270,23	271,56	271,50	4	271,44			0,92	0,34	97,48
22	12x	5.1	31	273,70	268,50	280,00	263,60	4	271,45			7,04	2,59	97,49
23	28	4.1	21.1	270,00	273,00	272,00	271,00	4	271,50			1,29	0,48	97,51
24	05x	3.3	21.1	280,00	270,00	260,00	280,00	4	272,50			9,57	3,51	97,86
25	43x	4.1	31	275,00	283,00	274,00	273,00	4	276,25			4,57	1,66	99,21
26	50x	4.1	31	276,00	277,00	280,00	277,00	4	277,50			1,73	0,62	99,66
27	37a	0	42	280,20	278,40	278,70	281,30	4	279,65			1,35	0,48	100,43
28	48x	4.1	31	283,90	278,80	277,90	281,80	4	280,60			2,76	0,98	100,77
29	39x	5.5	31	283,87	282,91	281,96	280,18	4	282,23			1,57	0,56	101,36
30	29x	3.3	31	289,30	284,50	280,80	285,10	4	284,93			3,48	1,22	102,33
31	49	5.1	31	289,40	291,20	290,70	293,80	4	291,28			1,85	0,63	104,61
32	04a	5.5	31	297,00	295,00	297,00	292,00	4	295,25			2,36	0,80	106,03
33	60	3.3	31	311,00	317,00	310,00	307,00	4	311,25			4,19	1,35	111,78
34	06x	5.2	31	327,40	327,20	331,10	328,60	4	328,58		*	1,79	0,55	118,00
35	27	6.5	21.1	317,79	344,28	317,79	344,28	4	331,04		*	15,29	4,62	118,89
36	46	5.2	31	333,00	336,50	333,10	334,80	4	334,35		*	1,65	0,49	120,08
37	08x	6.3	31	340,00	324,00	332,00	342,00	4	334,50		*	8,23	2,46	120,13
38	40	5.7	31	343,00	352,00	344,00	348,00	4	346,75		*	4,11	1,19	124,53
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	N	Mean	SI	VI
all labs	144	**278,45**	**3,832**	**1,376**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mn **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	23x	3.9	31	*482,76*	*520,81*	*531,72*	*505,77*	*0*	*510,3*	b	*	*21,20*	*4,15*	*52,26*
2	01x	3.21	21.1	*776,00*	*800,00*	*826,00*	*824,00*	*0*	*806,5*	b	*	*23,52*	*2,92*	*82,60*
3	08x	6.3	31	871,00	878,00	851,00	845,00	4	861,3			15,76	1,83	88,21
4	36	3.3	21.1	884,70	866,40	873,00	878,00	4	875,5			7,74	0,88	89,67
5	4	9.1	41	857,00	871,00	898,00	909,00	4	883,8			23,94	2,71	90,51
6	33a	5.1	21	891,40	956,60	934,90	928,40	4	927,8			27,11	2,92	95,03
7	06x	5.2	31	938,00	933,00	952,00	941,00	4	941,0			8,04	0,85	96,38
8	07x	5.5	31	951,00	944,00	938,00	933,00	4	941,5			7,77	0,83	96,43
9	49	5.1	31	944,00	942,90	943,50	940,90	4	942,8			1,36	0,14	96,56
10	27	6.5	21.1	947,37	947,37	947,37	947,37	4	947,4			0,00	0,00	97,03
11	11x	5.1	31	946,00	954,00	950,00	949,00	4	949,8			3,30	0,35	97,27
12	25	4.1	31	955,00	944,00	949,00	958,00	4	951,5			6,24	0,66	97,45
13	37x	5.5	31	953,00	950,30	954,30	951,60	4	952,3			1,73	0,18	97,53
14	17x	5.5	31	949,40	950,40	945,70	968,50	4	953,5			10,20	1,07	97,66
15	43x	4.1	31	957,00	962,00	956,00	947,00	4	955,5			6,24	0,65	97,86
16	52	4.1	31	972,11	949,55	943,53	989,32	4	963,6			21,09	2,19	98,69
17	38	5.5	31	963,00	964,00	968,00	968,00	4	965,8			2,63	0,27	98,91
18	12x	5.1	31	1001,00	973,70	956,70	935,20	4	966,7			27,80	2,88	99,00
19	29x	3.3	31	969,90	974,70	970,20	970,50	4	971,3			2,26	0,23	99,48
20	2	5.3	31	964,00	992,00	965,00	988,00	4	977,3			14,82	1,52	100,09
21	56	5.5	31	977,70	963,60	973,60	1011,00	4	981,5			20,55	2,09	100,52
22	18x	3.31	31	970,90	1015,90	968,70	985,20	4	985,2			21,75	2,21	100,90
23	26x	5.5	31	973,00	1000,00	985,00	986,00	4	986,0			11,05	1,12	100,98
24	50x	4.1	31	987,00	992,00	988,00	979,00	4	986,5			5,45	0,55	101,04
25	46	5.2	31	991,70	990,30	977,00	995,40	4	988,6			8,03	0,81	101,25
26	42	4.1	31	994,00	988,00	994,00	985,00	4	990,3			4,50	0,45	101,42
27	05x	3.3	21.1	940,00	985,00	1040,00	1000,00	4	991,3			41,31	4,17	101,52
28	48x	4.1	31	997,30	1003,00	1008,00	993,70	4	1000,5			6,30	0,63	102,47
29	37a	0	42	990,10	1007,40	1010,30	996,70	4	1001,1			9,39	0,94	102,53
30	09x	5.5	31	1011,00	991,00	1013,00	991,00	4	1001,5			12,15	1,21	102,57
31	44x	4.1	31	1020,00	1010,00	1010,00	970,00	4	1002,5			22,17	2,21	102,67
32	03x	3.10	31	988,00	1022,00	1010,00	996,00	4	1004,0			15,06	1,50	102,83
33	39x	5.5	31	1003,10	1002,40	1009,90	1011,80	4	1006,8			4,75	0,47	103,12
34	47x	4.1	32	1025,00	996,00	990,00	1024,00	4	1008,8			18,36	1,82	103,31
35	60	3.3	31	1064,00	1063,00	1044,00	1022,00	4	1048,3			19,77	1,89	107,36
36	28	4.1	21.1	1055,00	1051,00	1081,00	1062,00	4	1062,3			13,30	1,25	108,79
37	04a	5.5	31	1100,00	1071,00	1072,00	1099,00	4	1085,5			16,18	1,49	111,18
38	40	5.7	31	1084,00	1098,00	1087,00	1096,00	4	1091,3			6,80	0,62	111,76
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	N	Mean	SI	VI
all labs	144	**976,39**	**12,358**	**1,266**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Mn **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	01x	3.21	21.1	*230,00*	*246,00*	*248,00*	*252,00*	*0*	*244,0*	b	*	*9,66*	*3,96*	*49,21*
2	23x	3.9	31	*250,72*	*250,58*	*251,19*	*257,83a*	*0*	*250,8*	b	*	*0,32*	*0,13*	*50,58*
3	07x	5.5	31	431,00	435,00	428,00	432,00	4	431,50			2,89	0,67	87,02
4	37a	0	42	443,20	446,70	441,90	445,80	4	444,40			2,23	0,50	89,62
5	36	3.3	21.1	451,70	459,30	456,40	454,90	4	455,58			3,16	0,69	91,88
6	4	9.1	41	451,00	454,00	463,00	467,00	4	458,75			7,50	1,63	92,52
7	37x	5.5	31	467,80	465,20	466,90	467,90	4	466,95			1,25	0,27	94,17
8	33a	5.1	21	462,60	477,00	452,70	482,70	4	468,75			13,64	2,91	94,53
9	25	4.1	31	475,00	477,00	479,00	472,00	4	475,75			2,99	0,63	95,94
10	38	5.5	31	481,00	482,00	479,00	483,00	4	481,25			1,71	0,35	97,05
11	17x	5.5	31	481,80	485,80	481,40	480,50	4	482,38			2,35	0,49	97,28
12	06x	5.2	31	477,00	486,00	491,00	485,00	4	484,75			5,80	1,20	97,76
13	47x	4.1	32	474,00	494,00	489,00	485,00	4	485,50			8,50	1,75	97,91
14	43x	4.1	31	490,00	485,00	491,00	485,00	4	487,75			3,20	0,66	98,36
15	12x	5.1	31	492,30	493,70	457,60	508,30	4	487,98			21,50	4,41	98,41
16	49	5.1	31	488,80	492,30	489,50	490,10	4	490,18			1,51	0,31	98,85
17	2	5.3	31	497,00	497,00	490,00	493,00	4	494,25			3,40	0,69	99,67
18	42	4.1	31	496,00	493,00	496,00	494,00	4	494,75			1,50	0,30	99,78
19	08x	6.3	31	511,00	498,00	491,00	493,00	4	498,25			9,00	1,81	100,48
20	11x	5.1	31	499,00	497,00	500,00	498,00	4	498,50			1,29	0,26	100,53
21	46	5.2	31	494,20	506,60	496,70	501,30	4	499,70			5,46	1,09	100,77
22	60	3.3	31	514,00	502,00	491,00	496,00	4	500,75			9,91	1,98	100,99
23	56	5.5	31	491,00	487,50	517,40	518,70	4	503,65			16,70	3,32	101,57
24	50x	4.1	31	505,00	504,00	508,00	511,00	4	507,00			3,16	0,62	102,25
25	05x	3.3	21.1	540,00	500,00	495,00	500,00	4	508,75			20,97	4,12	102,60
26	26x	5.5	31	507,00	512,00	507,00	509,00	4	508,75			2,36	0,46	102,60
27	48x	4.1	31	511,10	506,30	509,20	508,80	4	508,85			1,97	0,39	102,62
28	27	6.5	21.1	509,53	509,53	509,53	509,53	4	509,53			0,00	0,00	102,76
29	44x	4.1	31	510,00	510,00	520,00	500,00	4	510,00			8,16	1,60	102,85
30	52	4.1	31	509,02	506,30	512,86	517,52	4	511,43			4,87	0,95	103,14
31	03x	3.10	31	514,00	518,00	514,00	517,00	4	515,75			2,06	0,40	104,01
32	09x	5.5	31	515,00	509,00	520,00	523,00	4	516,75			6,13	1,19	104,21
33	29x	3.3	31	516,50	517,60	520,20	518,10	4	518,10			1,55	0,30	104,48
34	28	4.1	21.1	536,00	524,00	506,00	507,00	4	518,25			14,43	2,78	104,51
35	18x	3.31	31	525,80	513,20	519,60	519,50	4	519,53			5,14	0,99	104,77
36	39x	5.5	31	526,00	530,30	528,30	534,85	4	529,86			3,76	0,71	106,86
37	40	5.7	31	531,00	536,00	556,00	549,00	4	543,00			11,52	2,12	109,51
38	04a	5.5	31	548,00	546,00	547,00	*558,00a*	3	547,00			1,00	0,18	110,31
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	N	Mean	SI	VI
all labs	143	**495,86**	**5,905**	**1,191**
15	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Fe **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	08x	6.3	31	31,20	31,50	29,90	30,80	4	30,85			0,70	2,25	80,88
2	07x	5.5	31	32,80	32,00	32,60	32,40	4	32,45			0,34	1,05	85,07
3	43x	4.1	31	31,00	34,00	34,00	36,00	4	33,75			2,06	6,11	88,48
4	2	5.3	31	34,00	36,20	33,20	33,90	4	34,33			1,30	3,79	89,99
5	06x	5.2	31	35,00	34,58	34,39	34,66	4	34,66			0,25	0,74	90,86
6	09x	5.5	31	35,20	35,40	35,10	34,70	4	35,10			0,29	0,84	92,02
7	52	4.1	31	33,23	36,41	36,67	34,19	4	35,13			1,68	4,79	92,08
8	36	5.5	31	35,80	35,70	34,20	35,50	4	35,30			0,74	2,11	92,54
9	12x	5.1	31	37,00	34,40	36,70	36,80	4	36,23			1,22	3,38	94,97
10	27	6.5	21.1	36,80	37,33	34,67	36,53	4	36,33			1,16	3,19	95,25
11	40	5.7	31	39,40	37,40	35,50	36,10	4	37,10			1,73	4,65	97,26
12	37a	0	42	36,80	37,50	37,10	37,00	4	37,10			0,29	0,79	97,26
13	29x	3.3	31	37,00	37,00	38,00	37,00	4	37,25			0,50	1,34	97,66
14	47x	4.1	32	37,43	37,73	37,65	36,77	4	37,40			0,44	1,16	98,04
15	28	4.1	21.1	37,29	37,04	37,56	38,01	4	37,48			0,42	1,11	98,24
16	18x	3.31	31	35,60	40,70	36,60	37,60	4	37,63			2,21	5,86	98,64
17	39x	5.5	31	38,29	39,04	38,03	38,55	4	38,47			0,43	1,12	100,86
18	56	5.5	31	34,99	39,81	40,82	38,75	4	38,59			2,55	6,60	101,17
19	11x	5.1	31	39,60	37,80	40,10	38,40	4	38,98			1,06	2,72	102,18
20	26x	5.5	31	38,00	38,00	40,00	40,00	4	39,00			1,15	2,96	102,24
21	42	4.1	31	42,00	39,00	38,00	37,00	4	39,00			2,16	5,54	102,24
22	48x	4.1	31	38,81	39,73	39,10	38,66	4	39,08			0,47	1,21	102,44
23	50x	4.1	31	39,48	39,61	38,16	40,00	4	39,31			0,80	2,03	103,06
24	17x	5.5	31	39,04	40,02	39,65	38,59	4	39,33			0,64	1,62	103,09
25	46	5.2	31	40,30	37,00	39,80	42,80	4	39,98			2,38	5,95	104,80
26	44x	4.1	31	40,00	40,00	40,00	40,00	4	40,00			0,00	0,00	104,86
27	03x	3.10	31	41,00	41,00	40,00	39,00	4	40,25			0,96	2,38	105,52
28	37x	5.5	31	39,90	40,60	40,40	40,90	4	40,45			0,42	1,04	106,04
29	25	4.1	31	43,60	39,10	39,00	41,30	4	40,75			2,18	5,34	106,83
30	38	5.5	31	40,50	40,30	41,70	41,90	4	41,10			0,82	1,99	107,75
31	23x	3.9	31	40,28	41,83	42,87	39,91	4	41,22			1,38	3,34	108,07
32	04a	5.5	31	41,40	41,70	41,60	41,00	4	41,43			0,31	0,75	108,60
33	60	3.3	31	45,10	44,70	44,50	45,40	4	44,93			0,40	0,90	117,78
34	33a	5.1	21	46,40	50,60	47,40	43,60	4	47,00		*	2,89	6,15	123,22
35	05x	3.3	21.1	*53,00*	*53,00*	*67,50*	*67,00*	*0*	*60,13*	b	*	*8,23*	*13,69*	*157,62*
36	49	5.1	31	*72,50*	*71,40*	*73,60*	*73,00*	*0*	*72,63*	b	*	*0,93*	*1,28*	*190,39*
37	01x	3.21	21.1	*164,00*	*160,00*	*168,00*	*168,00*	*0*	*165,0*	b	*	*3,83*	*2,32*	*432,57*
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	N	Mean	SI	VI
all labs	136	**38,14**	**1,068**	**2,801**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Fe **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	26x	5.5	31	106,00	107,00	107,00	117,00	4	109,25			5,19	4,75	82,45
2	07x	5.5	31	111,00	115,00	113,00	112,00	4	112,75			1,71	1,51	85,09
3	36	5.5	31	112,60	115,90	111,90	111,50	4	112,98			2,00	1,77	85,26
4	43x	4.1	31	116,00	115,00	114,00	112,00	4	114,25			1,71	1,49	86,22
5	2	5.3	31	118,10	118,90	119,80	111,20	4	117,00			3,93	3,36	88,29
6	09x	5.5	31	122,10	120,40	116,40	116,80	4	118,93			2,78	2,34	89,75
7	25	4.1	31	121,00	117,00	123,00	119,00	4	120,00			2,58	2,15	90,56
8	29x	3.3	31	121,00	124,00	123,00	125,00	4	123,25			1,71	1,39	93,01
9	11x	5.1	31	129,00	122,00	129,00	125,00	4	126,25			3,40	2,70	95,27
10	05x	3.3	21.1	117,00	117,00	*168a*	120,00	3	118,00			1,73	1,47	89,05
11	39x	5.5	31	129,91	130,04	132,65	130,79	4	130,85			1,26	0,97	98,74
12	48x	4.1	31	132,90	128,90	131,20	131,50	4	131,13			1,66	1,26	98,95
13	47x	4.1	32	133,26	129,91	133,26	131,12	4	131,89			1,66	1,26	99,53
14	56	5.5	31	133,30	128,40	132,40	141,50	4	133,90			5,50	4,10	101,05
15	38	5.5	31	133,00	132,00	135,00	136,00	4	134,00			1,83	1,36	101,12
16	28	4.1	21.1	136,70	130,94	132,82	135,82	4	134,07			2,67	1,99	101,18
17	17x	5.5	31	134,20	134,90	135,50	133,10	4	134,43			1,03	0,77	101,44
18	37x	5.5	31	135,00	133,30	135,90	133,80	4	134,50			1,17	0,87	101,50
19	50x	4.1	31	132,80	136,10	135,90	134,20	4	134,75			1,55	1,15	101,69
20	03x	3.10	31	134,00	135,00	136,00	134,00	4	134,75			0,96	0,71	101,69
21	33a	5.1	21	136,30	129,30	140,60	133,90	4	135,03			4,72	3,49	101,90
22	52	4.1	31	133,75	132,18	137,85	138,89	4	135,67			3,21	2,37	102,38
23	18x	3.31	31	139,30	139,40	138,00	138,90	4	138,90			0,64	0,46	104,82
24	44x	4.1	31	140,00	140,00	140,00	140,00	4	140,00			0,00	0,00	105,65
25	42	4.1	31	140,00	139,00	143,00	138,00	4	140,00			2,16	1,54	105,65
26	27	6.5	21.1	138,77	140,36	143,01	140,89	4	140,76			1,75	1,24	106,22
27	40	5.7	31	141,00	140,00	144,00	143,00	4	142,00			1,83	1,29	107,16
28	04a	5.5	31	149,00	141,00	146,00	144,00	4	145,00			3,37	2,32	109,42
29	37a	0	42	148,20	149,10	147,80	148,70	4	148,45			0,57	0,38	112,03
30	23x	3.9	31	155,26	159,09	139,44	143,29	4	149,27			9,39	6,29	112,65
31	49	5.1	31	150,50	148,90	151,20	150,70	4	150,33			0,99	0,66	113,44
32	60	3.3	31	151,80	163,10	158,70	143,60	4	154,30			8,52	5,52	116,44
33	12x	5.1	31	149,30	136,60	152,20	*216,7a*	3	146,03			8,30	5,68	110,20
34	01x	3.21	21.1	*190,00*	*188,00*	*184,00*	*182,00*	*0*	*186,0*	b	*	*3,65*	*1,96*	*140,37*
35	08x	6.3	31	*261,00*	*247,00*	*252,00*	*261,00*	*0*	*255,3*	b	*	*6,95*	*2,72*	*192,62*
36	06x	5.2	31	*253,60*	*257,50*	*261,50*	*257,50*	*0*	*257,5*	b	*	*3,23*	*1,25*	*194,34*
37	46	5.2	31	*271,60*	*264,00*	*263,70*	*267,30*	*0*	*266,7*	b	*	*3,68*	*1,38*	*201,23*
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	N	Mean	SI	VI
all labs	130	**132,51**	**2,772**	**2,092**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Fe **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	07x	5.5	31	89,90	88,90	89,40	91,60	4	89,95			1,17	1,30	84,15
2	36	5.5	31	92,30	93,60	93,40	95,50	4	93,70			1,33	1,42	87,66
3	2	5.3	31	91,90	92,80	97,20	97,40	4	94,83			2,88	3,04	88,71
4	43x	4.1	31	98,00	97,00	94,00	94,00	4	95,75			2,06	2,15	89,58
5	06x	5.2	31	103,80	91,20	93,30	96,08	4	96,10			5,51	5,74	89,90
6	08x	6.3	31	97,10	97,70	99,50	98,90	4	98,30			1,10	1,11	91,96
7	26x	5.5	31	96,60	96,70	93,00	111,00	4	99,33			7,97	8,03	92,92
8	27	6.5	21.1	100,69	100,15	101,77	101,23	4	100,96			0,70	0,69	94,45
9	28	4.1	21.1	108,60	104,79	99,02	95,12	4	101,88			5,99	5,88	95,32
10	09x	5.5	31	104,10	102,10	101,40	101,90	4	102,38			1,19	1,16	95,78
11	49	5.1	31	103,70	105,30	104,90	102,90	4	104,20			1,10	1,06	97,48
12	40	5.7	31	102,00	99,90	108,00	112,00	4	105,48			5,54	5,25	98,68
13	37x	5.5	31	106,00	106,90	106,40	105,80	4	106,28			0,49	0,46	99,42
14	11x	5.1	31	106,00	107,00	106,00	108,00	4	106,75			0,96	0,90	99,87
15	39x	5.5	31	107,04	106,80	106,22	107,00	4	106,77			0,38	0,35	99,88
16	17x	5.5	31	105,50	106,50	108,20	106,90	4	106,78			1,12	1,05	99,89
17	52	4.1	31	109,39	107,64	104,07	108,95	4	107,51			2,41	2,24	100,58
18	18x	3.31	31	108,70	110,30	104,10	107,70	4	107,70			2,63	2,44	100,76
19	60	3.3	31	114,30	111,30	112,30	95,90	4	108,45			8,46	7,80	101,46
20	47x	4.1	32	110,14	106,80	110,56	106,72	4	108,56			2,08	1,92	101,56
21	50x	4.1	31	113,50	109,80	105,20	107,00	4	108,88			3,62	3,32	101,86
22	48x	4.1	31	108,70	108,90	111,00	108,00	4	109,15			1,29	1,18	102,11
23	38	5.5	31	110,00	108,00	110,00	111,00	4	109,75			1,26	1,15	102,68
24	37a	0	42	110,20	110,80	108,90	111,60	4	110,38			1,14	1,03	103,26
25	29x	3.3	31	111,00	113,00	110,00	112,00	4	111,50			1,29	1,16	104,31
26	46	5.2	31	110,50	108,30	115,50	114,40	4	112,18			3,36	2,99	104,94
27	44x	4.1	31	*120a*	110,00	110,00	110,00	3	110,00			0,00	0,00	102,91
28	03x	3.10	31	116,00	114,00	113,00	111,00	4	113,50			2,08	1,83	106,18
29	56	5.5	31	115,40	116,30	113,10	109,50	4	113,58			3,03	2,67	106,25
30	25	4.1	31	118,00	115,00	113,00	114,00	4	115,00			2,16	1,88	107,59
31	12x	5.1	31	118,80	121,40	116,10	104,10	4	115,10			7,65	6,64	107,68
32	33a	5.1	21	117,70	119,00	113,70	114,30	4	116,18			2,58	2,22	108,69
33	04a	5.5	31	120,00	116,00	113,00	118,00	4	116,75			2,99	2,56	109,22
34	42	4.1	31	117,00	117,00	120,00	121,00	4	118,75			2,06	1,74	111,10
35	23x	3.9	31	117,07	118,09	120,06	123,29	4	119,63			2,74	2,29	111,92
36	05x	3.3	21.1	*174,00*	*112,00*	*105,00*	*160,00*	*0*	*137,8*	b	*	*34,37*	*24,95*	*128,87*
37	01x	3.21	21.1	*142,00*	*148,00*	*150,00*	*154,00*	*0*	*148,5*	b	*	*5,00*	*3,37*	*138,93*
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	N	Mean	SI	VI
all labs	139	**106,89**	**2,637**	**2,467**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Fe **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	2	5.3	31	116,70	115,30	111,50	109,50	4	113,25			3,33	2,94	82,91
2	07x	5.5	31	115,00	123,00	114,00	114,00	4	116,50			4,36	3,74	85,29
3	36	5.5	31	115,10	115,80	122,10	118,20	4	117,80			3,16	2,68	86,24
4	26x	5.5	31	121,00	124,00	120,00	116,00	4	120,25			3,30	2,75	88,04
5	40	5.7	31	121,00	118,00	123,00	120,00	4	120,50			2,08	1,73	88,22
6	09x	5.5	31	122,50	122,40	120,00	118,90	4	120,95			1,79	1,48	88,55
7	27	6.5	21.1	126,58	122,29	125,51	124,43	4	124,70			1,83	1,47	91,30
8	25	4.1	31	132,00	125,00	122,00	129,00	4	127,00			4,40	3,46	92,98
9	06x	5.2	31	126,10	126,10	130,40	127,50	4	127,53			2,03	1,59	93,36
10	11x	5.1	31	128,00	127,00	129,00	129,00	4	128,25			0,96	0,75	93,89
11	28	4.1	21.1	140,98	139,94	126,90	114,88	4	130,68			12,33	9,43	95,67
12	08x	6.3	31	137,00	135,00	131,00	129,00	4	133,00			3,65	2,75	97,37
13	37x	5.5	31	132,90	134,50	133,40	132,70	4	133,38			0,81	0,60	97,65
14	48x	4.1	31	135,20	136,30	134,10	135,80	4	135,35			0,95	0,70	99,09
15	33a	5.1	21	130,30	139,20	132,00	140,10	4	135,40			4,97	3,67	99,13
16	17x	5.5	31	136,70	137,20	133,40	138,80	4	136,53			2,27	1,66	99,95
17	29x	3.3	31	138,00	137,00	139,00	136,00	4	137,50			1,29	0,94	100,67
18	47x	4.1	32	138,05	140,26	137,30	135,98	4	137,90			1,79	1,30	100,96
19	39x	5.5	31	135,14	142,17	137,15	137,43	4	137,97			2,98	2,16	101,01
20	38	5.5	31	137,00	138,00	138,00	139,00	4	138,00			0,82	0,59	101,03
21	23x	3.9	31	132,59	141,68	145,83	133,14	4	138,31			6,52	4,71	101,26
22	43x	4.1	31	139,00	138,00	134,00	143,00	4	138,50			3,70	2,67	101,40
23	52	4.1	31	140,74	140,03	139,14	136,99	4	139,23			1,63	1,17	101,93
24	46	5.2	31	146,80	137,60	136,60	141,20	4	140,55			4,61	3,28	102,90
25	50x	4.1	31	144,00	136,80	138,30	144,90	4	141,00			4,05	2,87	103,23
26	56	5.5	31	143,30	146,10	140,30	136,40	4	141,53			4,16	2,94	103,61
27	44x	4.1	31	140,00	150,00	140,00	140,00	4	142,50			5,00	3,51	104,33
28	18x	3.31	31	145,80	141,70	146,00	144,50	4	144,50			1,98	1,37	105,79
29	37a	0	42	145,60	144,20	144,80	143,90	4	144,63			0,75	0,52	105,88
30	12x	5.1	31	136,90	139,40	130,90	*179,7a*	3	135,73			4,37	3,22	99,37
31	42	4.1	31	144,00	144,00	160,00	150,00	4	149,50			7,55	5,05	109,45
32	03x	3.10	31	145,00	143,00	152,00	159,00	4	149,75			7,27	4,86	109,63
33	05x	3.3	21.1	156,00	155,00	155,00	155,00	4	155,25			0,50	0,32	113,66
34	04a	5.5	31	147,00	*189a*	141,00	146,00	3	144,67			3,21	2,22	105,91
35	01x	3.21	21.1	166,00	168,00	172,00	172,00	4	169,50		*	3,00	1,77	124,09
36	49	5.1	31	171,90	170,10	170,80	173,30	4	171,53		*	1,40	0,81	125,58
37	60	3.3	31	*227,00*	*253,00*	*232,00*	*224,00*	*0*	*234,0*	b	*	*13,09*	*5,59*	*171,31*
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	N	Mean	SI	VI
all labs	142	**136,59**	**3,299**	**2,415**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cu **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	06x	5.2	31	<3,6	<,36	<3,6	<3,6	0						
2	05x	3.3	21.1	<2	<2	<2	<2	0						
3	33a	5.1	21	2,45	2,54	2,50	2,39	4	2,47		*	0,06	2,62	78,97
4	29x	3.3	31	2,31	2,44	*3,23a*	2,37	3	2,37		*	0,07	2,74	75,88
5	18x	3.31	31	2,38	2,75	2,66	2,60	4	2,60			0,16	6,07	83,05
6	25	4.1	21	2,50	2,60	2,80	2,70	4	2,65			0,13	4,87	84,72
7	42	4.1	22	*2,2a*	2,80	2,80	2,80	3	2,80			0,00	0,00	89,52
8	39x	5.5	35	2,79	2,75	2,72	2,73	4	2,75			0,03	1,05	87,83
9	23x	3.9	31	2,72	2,80	2,81	2,80	4	2,78			0,04	1,51	88,96
10	52	4.1	31	2,89	3,01	3,03	2,81	4	2,94			0,10	3,54	93,84
11	11x	5.1	22	2,95	3,00	2,93	2,92	4	2,95			0,04	1,21	94,32
12	56	5.5	31	2,84	2,83	3,05	3,10	4	2,95			0,14	4,79	94,45
13	44x	4.1	32	3,10	3,00	2,90	2,90	4	2,98			0,10	3,22	95,12
14	28	4.1	21.1	3,00	3,00	3,00	3,00	4	3,00			0,00	0,00	95,91
15	2	5.3	31	3,20	3,00	2,90	2,90	4	3,00			0,14	4,71	95,91
16	50x	4.1	31	3,21	2,94	2,85	3,08	4	3,02			0,16	5,24	96,55
17	40	5.7	31	3,37	2,99	2,82	2,92	4	3,03			0,24	7,95	96,71
18	38	5.5	31	3,13	3,02	3,11	3,04	4	3,08			0,05	1,73	98,31
19	49	5.1	31	3,00	2,90	3,40	3,10	4	3,10			0,22	6,97	99,11
20	26x	5.5	31	3,22	3,03	3,08	3,12	4	3,11			0,08	2,59	99,51
21	17x	5.5	31	3,04	3,33	3,25	2,85	4	3,11			0,22	6,91	99,57
22	37x	5.5	31	3,06	3,19	3,21	3,13	4	3,15			0,07	2,15	100,63
23	60	3.3	31	3,02	3,24	3,20	3,34	4	3,20			0,13	4,18	102,31
24	48x	4.1	31	3,20	3,22	3,24	3,27	4	3,23			0,03	0,95	103,30
25	47x	4.1	32	3,26	3,29	3,28	3,32	4	3,29			0,02	0,76	105,11
26	09x	5.5	31	3,22	3,55	3,19	3,31	4	3,32			0,16	4,92	106,07
27	36	5.5	31	3,45	3,63	3,12	3,27	4	3,37			0,22	6,56	107,66
28	07x	5.5	31	3,48	3,46	3,49	3,48	4	3,48			0,01	0,36	111,18
29	04a	5.5	22	3,74	3,43	3,78	3,43	4	3,60			0,19	5,32	114,94
30	27	6.5	21.1	3,73	3,73	3,73	3,73	4	3,73			0,00	0,00	119,36
31	4	9.1	41	3,80	3,90	3,70	3,60	4	3,75			0,13	3,44	119,89
32	08x	6.3	31	3,86	3,42	4,27	3,91	4	3,87		*	0,35	9,01	123,57
33	37a	0	42	4,18	4,10	3,95	3,92	4	4,04		*	0,12	3,06	129,08
34	13	5.3	21	*12,70*	*12,30*	*14,40*	*14,90*	*0*	*13,58*	*b*	*	*1,27*	*9,34*	*434,01*
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	N	Mean	SI	VI
all labs	122	**3,13**	**0,110**	**3,522**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cu **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	<2	<2	<2	<2	0						
2	42	4.1	22	3,60	4,10	4,00	4,40	4	4,03		*	0,33	8,21	78,99
3	25	4.1	21	4,30	4,60	4,40	4,40	4	4,43			0,13	2,84	86,84
4	23x	3.9	31	4,92	4,92	4,36	4,11	4	4,58			0,41	8,92	89,83
5	39x	5.5	35	4,72	4,73	4,43	4,48	4	4,59			0,16	3,41	90,04
6	52	4.1	31	4,67	4,79	4,19	4,73	4	4,60			0,27	5,97	90,17
7	33a	5.1	21	4,71	4,56	4,75	4,70	4	4,68			0,08	1,77	91,84
8	29x	3.3	31	4,82	4,72	4,50	4,89	4	4,73			0,17	3,59	92,87
9	50x	4.1	31	4,80	4,82	4,62	4,73	4	4,74			0,09	1,90	93,07
10	11x	5.1	22	4,95	4,83	4,67	4,88	4	4,83			0,12	2,46	94,83
11	09x	5.5	31	4,66	5,00	4,69	5,02	4	4,84			0,19	4,01	95,03
12	49	5.1	31	5,00	4,70	5,70	4,00	4	4,85			0,70	14,53	95,18
13	60	3.3	31	4,95	5,28	4,87	4,48	4	4,90			0,33	6,71	96,06
14	06x	5.2	31	5,08	4,68	4,98	4,91	4	4,91			0,17	3,46	96,40
15	18x	3.31	31	4,48	4,76	5,73	4,99	4	4,99			0,54	10,73	97,92
16	48x	4.1	31	5,20	5,00	4,99	5,05	4	5,06			0,10	1,93	99,25
17	56	5.5	31	4,80	4,81	5,21	5,42	4	5,06			0,30	6,01	99,25
18	26x	5.5	31	5,20	4,99	4,95	5,25	4	5,10			0,15	2,93	100,03
19	2	5.3	31	5,00	5,70	4,80	4,90	4	5,10			0,41	8,00	100,08
20	37x	5.5	31	5,13	5,07	5,20	5,01	4	5,10			0,08	1,60	100,13
21	44x	4.1	32	5,00	4,90	5,80	4,80	4	5,13			0,46	8,92	100,57
22	40	5.7	31	5,24	5,35	5,18	5,21	4	5,25			0,07	1,41	102,93
23	4	9.1	41	5,10	5,00	5,40	5,70	4	5,30			0,32	5,97	104,01
24	38	5.5	31	5,66	5,33	5,31	4,95	4	5,31			0,29	5,46	104,25
25	17x	5.5	31	5,82	5,44	4,94	5,41	4	5,40			0,36	6,69	106,02
26	47x	4.1	32	5,52	5,36	5,58	5,49	4	5,49			0,09	1,69	107,69
27	07x	5.5	31	5,58	5,68	5,68	5,63	4	5,64			0,05	0,85	110,73
28	04a	5.5	22	6,11	5,43	5,40	6,18	4	5,78			0,42	7,31	113,43
29	08x	6.3	31	5,80	6,09	5,63	5,70	4	5,81			0,20	3,49	113,92
30	37a	0	42	5,80	5,90	5,85	5,80	4	5,84			0,05	0,82	114,55
31	36	5.5	31	6,60	5,40	5,30	6,42	4	5,93			0,67	11,38	116,37
32	28	4.1	21.1	6,00	6,00	6,00	6,00	4	6,00			0,00	0,00	117,74
33	27	6.5	21.1	*7,42*	*7,42*	*7,42*	*7,42*	*0*	7,42	b	*	*0,00*	*0,00*	*145,51*
34	13	5.3	21	*13,80*	*15,40*	*13,40*	*15,50*	*0*	*14,53*	b	*	*1,08*	*7,44*	*285,04*
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	N	Mean	SI	VI
all labs	124	**5,10**	**0,249**	**4,887**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cu **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	<2	<2	<2	<2	0						
2	42	4.1	22	4,70	4,70	4,70	*4,6a*	3	4,70			0,00	0,00	80,77
3	60	3.3	31	4,96	5,06	4,56	5,27	4	4,96			0,30	6,00	85,28
4	07x	5.5	31	4,94	5,03	5,10	4,98	4	5,01			0,07	1,38	86,14
5	25	4.1	21	5,10	5,20	4,90	4,90	4	5,03			0,15	2,99	86,35
6	39x	5.5	35	5,16	5,31	5,21	5,26	4	5,23			0,07	1,24	89,91
7	33a	5.1	21	5,47	5,67	5,54	5,18	4	5,47			0,21	3,79	93,91
8	06x	5.2	31	5,54	5,48	5,46	5,49	4	5,49			0,03	0,62	94,39
9	50x	4.1	31	5,52	5,39	5,51	5,68	4	5,53			0,12	2,15	94,94
10	37x	5.5	31	5,60	5,58	5,63	5,65	4	5,62			0,03	0,55	96,49
11	40	5.7	31	5,74	5,61	5,49	5,64	4	5,62			0,10	1,83	96,58
12	29x	3.3	31	5,50	5,63	5,68	5,67	4	5,62			0,08	1,47	96,58
13	23x	3.9	31	5,36	5,83	5,69	6,06	4	5,74			0,29	5,11	98,55
14	11x	5.1	22	5,68	5,75	5,74	5,80	4	5,74			0,05	0,86	98,68
15	18x	3.31	31	6,34	5,95	5,02	5,77	4	5,77			0,55	9,60	99,15
16	2	5.3	31	5,80	5,90	5,70	5,70	4	5,78			0,10	1,66	99,24
17	26x	5.5	31	5,83	5,66	5,81	5,85	4	5,79			0,09	1,50	99,46
18	48x	4.1	31	5,86	5,92	5,84	5,82	4	5,86			0,04	0,71	100,73
19	38	5.5	31	5,90	5,87	5,86	5,88	4	5,88			0,02	0,29	101,00
20	09x	5.5	31	5,88	6,02	5,71	6,01	4	5,91			0,14	2,45	101,47
21	28	4.1	21.1	6,00	6,00	6,00	6,00	4	6,00			0,00	0,00	103,11
22	36	5.5	31	6,03	6,22	5,78	6,00	4	6,01			0,18	3,00	103,24
23	44x	4.1	32	6,20	6,00	6,10	6,00	4	6,08			0,10	1,58	104,40
24	4	9.1	41	6,20	5,20	6,60	6,40	4	6,10			0,62	10,19	104,83
25	08x	6.3	31	6,31	5,98	5,93	6,78	4	6,25			0,39	6,26	107,40
26	52	4.1	31	6,06	6,19	6,02	6,75	4	6,26			0,34	5,40	107,49
27	17x	5.5	31	6,45	6,70	6,15	5,79	4	6,27			0,39	6,21	107,80
28	49	5.1	31	5,50	6,20	7,10	6,50	4	6,33			0,67	10,52	108,69
29	37a	0	42	6,35	6,30	6,30	6,35	4	6,33			0,03	0,46	108,69
30	47x	4.1	32	6,30	6,49	6,34	6,26	4	6,35			0,10	1,58	109,08
31	56	5.5	31	7,11	6,79	6,28	5,85	4	6,51			0,56	8,55	111,84
32	04a	5.5	22	7,56	7,06	6,32	6,76	4	6,93			0,52	7,53	119,00
33	27	6.5	21.1	*8,66*	*9,20a*	*8,66*	*8,66*	*0*	*8,66*	b	*	*0,00*	*0,00*	*148,85*
34	13	5.3	21	*16,00*	*16,80*	*15,10*	*15,60*	*0*	*15,88*	b	*	*0,72*	*4,52*	*272,80*
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	N	Mean	SI	VI
all labs	123	**5,82**	**0,204**	**3,509**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cu **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	05x	3.3	21.1	<2	<2	<2	<2	0						
2	42	4.1	22	4,00	3,90	4,30	3,90	4	4,03			0,19	4,70	81,89
3	39x	5.5	35	4,32	4,32	4,33	4,14	4	4,28			0,09	2,11	86,99
4	25	4.1	21	4,20	4,30	4,50	4,40	4	4,35			0,13	2,97	88,51
5	33a	5.1	21	4,60	4,36	4,29	4,44	4	4,42			0,13	3,01	89,98
6	18x	3.31	31	4,77	4,11	4,41	4,43	4	4,43			0,27	6,09	90,13
7	50x	4.1	31	4,80	5,01	4,44	4,25	4	4,63			0,34	7,42	94,10
8	37x	5.5	31	4,58	4,66	4,72	4,67	4	4,66			0,06	1,24	94,76
9	23x	3.9	31	4,34	4,88	5,04	4,42	4	4,67			0,34	7,34	95,02
10	11x	5.1	22	4,65	4,72	4,68	4,69	4	4,69			0,03	0,62	95,32
11	09x	5.5	31	4,83	4,77	4,78	4,65	4	4,76			0,08	1,60	96,80
12	29x	3.3	31	4,72	4,93	4,71	4,75	4	4,78			0,10	2,16	97,21
13	06x	5.2	31	4,74	4,76	4,96	4,82	4	4,82			0,10	2,06	98,07
14	2	5.3	31	4,90	4,90	4,80	4,80	4	4,85			0,06	1,19	98,68
15	38	5.5	31	4,97	4,81	4,86	4,78	4	4,86			0,08	1,72	98,78
16	48x	4.1	31	4,87	4,71	4,92	4,93	4	4,86			0,10	2,14	98,82
17	40	5.7	31	5,24	5,09	4,73	4,91	4	4,99			0,22	4,43	101,58
18	28	4.1	21.1	5,00	5,00	6,00	5,00	4	5,25			0,50	9,52	106,82
19	17x	5.5	31	5,18	4,67	5,23	4,99	4	5,02			0,25	5,04	102,09
20	26x	5.5	31	5,06	5,06	4,99	4,97	4	5,02			0,05	0,93	102,14
21	4	9.1	41	5,30	5,00	4,90	5,00	4	5,05			0,17	3,43	102,75
22	49	5.1	31	4,20	5,90	4,90	5,20	4	5,05			0,70	13,96	102,75
23	44x	4.1	32	5,10	5,10	5,00	5,20	4	5,10			0,08	1,60	103,77
24	08x	6.3	31	*14,1a*	5,17	5,53	4,88	3	5,19			0,33	6,27	105,67
25	36	5.5	31	5,00	4,91	5,36	5,60	4	5,22			0,32	6,15	106,16
26	52	4.1	31	5,12	5,32	5,16	5,33	4	5,23			0,11	2,07	106,46
27	47x	4.1	32	5,46	5,18	5,13	5,30	4	5,27			0,15	2,79	107,17
28	07x	5.5	31	5,28	5,30	5,28	5,37	4	5,31			0,04	0,80	107,99
29	37a	0	42	5,38	5,32	5,25	5,29	4	5,31			0,05	1,03	108,04
30	56	5.5	31	6,26	5,85	5,06	5,19	4	5,59			0,56	10,10	113,73
31	04a	5.5	22	5,92	6,52	5,37	5,63	4	5,86			0,49	8,43	119,23
32	27	6.5	21.1	*6,97*	*6,97*	*6,97*	*6,97*	*0*	*6,97*	b	*	*0,00*	*0,00*	*141,87*
33	60	3.3	31	*7,06*	*7,15*	*6,93*	*6,83*	*0*	*6,99*	b	*	*0,14*	*2,02*	*142,27*
34	13	5.3	21	*15,00*	*16,40*	*14,40*	*13,90*	*0*	*14,93*	b	*	*1,08*	*7,24*	*303,67*
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	N	Mean	SI	VI
all labs	119	**4,91**	**0,205**	**4,169**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Pb **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	06x	5.2	31	<3	<3	<3	<3							
2	09x	5.5	31	<,5	<,5	<,5	<,5							
3	43	4.1	32	<,5	<,5	<,5	<,5							
4	2	5.3	31	<,4	<,4	<,4	<,4							
5	44x	4.1	32	<,35	<,35	<,35	<,35							
6	08x	6.3	32	<,2	<,2	<,2	<,2							
7	3	5.1	22	<,1	<,1	<,1	<,1							
8	29x	3.3	31	0,08	0,07	0,09	0,08	4	0,08		*	0,01	10,21	35,12
9	37x	5.5	35	0,10	0,09	0,10	0,10	4	0,10		*	0,00	3,99	42,14
10	38	5.5	22	0,10	0,10	0,09	0,10	4	0,10		*	0,00	3,40	42,69
11	60	3.1	22	0,11	0,10	0,10	0,10	4	0,10		*	0,00	4,47	44,89
12	48x	4.1	35	0,12	0,12	0,12	0,12	4	0,12		*	0,00	1,47	53,54
13	39x	5.5	35	0,13	0,12	0,13	0,12	4	0,12		*	0,00	2,58	54,15
14	04a	5.5	22	0,18	0,15	0,13	0,17	4	0,15		*	0,02	14,37	67,93
15	56	5.5	22	0,17	0,16	0,16	0,15	4	0,16			0,01	5,23	70,23
16	42	4.1	22	0,23	0,16	0,19	0,19	4	0,19			0,03	14,92	84,50
17	36	5.5	31	0,19	0,20	0,22	0,17	4	0,20			0,02	10,68	85,60
18	11x	5.1	22	0,20	0,19	0,23	0,21	4	0,21			0,02	8,23	91,09
19	26x	5.5	35	0,21	0,20	0,18	0,27	4	0,22			0,04	17,95	95,04
20	50x	4.1	31	0,30	0,26	0,35	0,34	4	0,31		*	0,04	13,05	135,97
21	33a	5.1	90	0,43	0,43	0,43	0,42	4	0,43		*	0,01	1,17	187,66
22	13	5.3	22	0,40	0,50	0,60	0,60	4	0,53		*	0,10	18,24	230,47
23	40	5.7	31	0,66	0,54	0,69	0,65	4	0,64		*	0,07	10,26	278,97
24	47x	4.1	32	*1,06*	*1,06*	*1,08*	*1,08*	*0*	*1,07*	b	*	*0,01*	*1,08*	*469,71*
25	23	3.9	31	*2,60*	*3,43*	*3,59*	*3,04*	*0*	*3,17*	b	*	*0,44*	*13,96*	*1389,38*
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	N	Mean	SI	VI
all labs	64	**0,23**	**0,023**	**10,077**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Pb **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	06x	5.2	31	<3	<3	<3	<3	0						
2	47x	4.1	32	1,37	1,37	1,40	1,38	4	1,38		*	0,01	1,02	60,71
3	36	5.5	31	1,72	1,57	1,59	1,80	4	1,67			0,11	6,54	73,46
4	40	5.7	31	1,51	1,89	1,91	2,42	4	1,93			0,37	19,33	85,01
5	48x	4.1	35	2,08	2,06	2,07	2,07	4	2,07			0,01	0,35	91,04
6	43	4.1	32	2,20	2,10	1,90	2,10	4	2,08			0,13	6,06	91,28
7	2	5.3	31	2,00	2,10	2,20	2,00	4	2,08			0,10	4,61	91,28
8	33a	5.1	90	2,12	2,11	2,06	2,19	4	2,12			0,05	2,53	93,26
9	38	5.5	22	2,21	2,08	2,02	2,24	4	2,14			0,11	5,00	93,92
10	37x	5.5	35	2,15	2,08	2,19	2,21	4	2,16			0,06	2,66	94,91
11	29x	3.3	31	2,15	2,19	2,20	2,18	4	2,18			0,02	0,99	95,90
12	39x	5.5	35	2,18	2,23	2,15	2,20	4	2,19			0,03	1,48	96,31
13	11x	5.1	22	2,27	2,14	2,25	2,33	4	2,25			0,08	3,53	98,87
14	09x	5.5	31	2,26	2,09	2,41	2,35	4	2,28			0,14	6,12	100,19
15	08x	6.3	32	2,33	2,37	2,23	2,19	4	2,28			0,08	3,69	100,30
16	04a	5.5	22	2,22	2,30	2,40	2,30	4	2,31			0,07	3,20	101,40
17	50x	4.1	31	2,25	2,17	2,40	2,40	4	2,31			0,11	4,97	101,40
18	44x	4.1	32	2,40	2,30	2,60	2,40	4	2,43			0,13	5,19	106,68
19	60	3.1	22	2,40	2,41	2,45	2,47	4	2,43			0,03	1,39	106,89
20	26x	5.5	35	2,60	2,54	2,44	2,22	4	2,45			0,17	6,81	107,78
21	13	5.3	22	2,50	2,70	2,60	3,00	4	2,70			0,22	8,00	118,77
22	56	5.5	22	2,92	3,15	2,82	2,51	4	2,85			0,26	9,21	125,27
23	3	5.1	22	2,76	2,99	2,74	2,91	4	2,85			0,12	4,22	125,37
24	42	4.1	22	3,08	3,18	3,29	3,18	4	3,18		*	0,09	2,70	140,00
25	23	3.9	*31*	*6,84*	*9,57*	*7,27*	*3,91*	*0*	*6,90*	b	*	*2,32*	*33,70*	*303,43*
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	N	Mean	SI	VI
all labs	92	**2,27**	**0,109**	**4,780**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Pb **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	06x	5.2	31	<3	<3	<3	<3	0						
2	43	4.1	32	<,5	<,5	<,5	<,5	0						
3	36	5.5	31	0,34	0,38	0,32	0,39	4	0,36		*	0,03	9,24	65,59
4	40	5.7	31	0,26	0,38	0,45	0,39	4	0,37		*	0,08	21,51	67,88
5	39x	5.5	35	0,41	0,43	0,42	0,45	4	0,43			0,02	3,65	78,80
6	38	5.5	22	0,42	0,46	0,41	0,45	4	0,43			0,02	4,63	79,63
7	37x	5.5	35	0,42	0,46	0,45	0,46	4	0,45			0,02	4,23	82,10
8	48x	4.1	35	0,49	0,48	0,47	0,47	4	0,47			0,01	1,89	87,01
9	29x	3.3	31	0,52	0,48	0,51	0,50	4	0,50			0,02	3,40	92,19
10	04a	5.5	22	0,48	0,51	0,55	0,55	4	0,52			0,03	6,05	95,54
11	08x	6.3	32	0,56	0,42	0,58	0,58	4	0,54			0,08	14,25	98,71
12	60	3.1	22	0,55	0,53	0,57	0,54	4	0,55			0,02	2,93	100,08
13	33a	5.1	90	0,58	0,56	0,57	0,57	4	0,57			0,01	1,43	104,58
14	3	5.1	22	0,54	0,54	0,62	0,58	4	0,57			0,04	6,72	104,58
15	11x	5.1	22	0,63	0,60	0,58	0,60	4	0,60			0,02	3,42	110,54
16	56	5.5	22	0,65	0,68	0,63	0,46	4	0,61			0,10	16,54	111,24
17	50x	4.1	31	0,61	0,61	0,60	0,63	4	0,61			0,02	2,46	112,33
18	26x	5.5	35	0,63	0,70	0,64	0,60	4	0,64			0,04	6,30	117,97
19	42	4.1	22	0,63	0,65	0,65	0,65	4	0,65			0,01	1,55	118,34
20	44x	4.1	32	0,80	0,60	0,60	0,70	4	0,68			0,10	14,18	123,84
21	2	5.3	31	0,60	0,70	0,70	0,70	4	0,68			0,05	7,41	123,84
22	09x	5.5	31	0,62	0,78	0,76	0,57	4	0,68			0,10	15,15	125,22
23	13	5.3	22	*1,00*	*0,70*	*1,00*	*1,10*	*0*	*0,95*	b	*	*0,17*	*18,23*	*174,29*
24	47x	4.1	32	*1,72*	*1,73*	*1,78*	*1,74*	*0*	*1,74*	b	*	*0,03*	*1,51*	*319,69*
25	23	3.9	31	*9,31*	*16,05*	*11,83*	*17,01*	*0*	*13,55*	b	*	*3,61*	*26,66*	*2485,99*
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	N	Mean	SI	VI
all labs	80	**0,55**	**0,040**	**7,334**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Pb **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	06x	5.2	31	<3	<3	<3	<3							
2	40	5.7	31	*0,28*	*0,39*	*0,22*	*0,31*	*0*	*0,30*	b	*	*0,07*	*23,57*	*49,25*
3	39x	5.5	35	0,49	0,49	0,49	0,47	4	0,48			0,01	2,59	79,46
4	2	5.3	31	<,4	0,50	0,50	<,4	2	0,50			0,00	0,00	82,08
5	37x	5.5	35	0,49	0,52	0,53	0,52	4	0,52			0,02	3,36	84,55
6	48x	4.1	35	0,51	0,52	0,52	0,52	4	0,52			0,00	0,81	85,05
7	38	5.5	22	0,50	0,53	0,53	0,51	4	0,52			0,02	3,10	85,45
8	09x	5.5	31	0,58	0,50	0,54	0,58	4	0,55			0,04	6,96	90,29
9	43	4.1	32	0,70	0,50	0,50	0,50	4	0,55			0,10	18,18	90,29
10	36	5.5	31	0,60	0,55	0,55	0,57	4	0,57			0,02	4,16	93,16
11	60	3.1	22	0,58	0,57	0,57	0,59	4	0,58			0,01	1,32	94,72
12	33a	5.1	90	0,58	0,59	0,57	0,60	4	0,59			0,01	2,21	96,04
13	04a	5.5	22	0,59	0,59	0,57	0,63	4	0,59			0,03	4,45	97,56
14	08x	6.3	32	0,59	0,64	0,59	0,61	4	0,61			0,02	3,58	99,36
15	26x	5.5	35	0,66	0,67	0,64	0,62	4	0,65			0,02	3,15	106,50
16	44x	4.1	32	0,60	0,60	0,80	0,60	4	0,65			0,10	15,38	106,71
17	50x	4.1	31	0,66	0,61	0,71	0,67	4	0,66			0,04	5,88	108,80
18	11x	5.1	22	0,67	0,69	0,67	0,65	4	0,67			0,02	2,44	109,99
19	42	4.1	22	0,67	0,65	0,72	0,65	4	0,67			0,03	4,91	110,40
20	29x	3.3	31	0,71	0,70	0,63	0,68	4	0,68			0,04	5,23	111,63
21	3	5.1	22	0,66	0,71	0,64	0,73	4	0,69			0,04	6,14	112,45
22	56	5.5	22	0,72	0,69	0,68	0,71	4	0,70			0,02	2,64	115,19
23	13	5.3	22	0,60	0,60	1,10	0,90	4	0,80		*	0,24	30,62	131,33
24	47x	4.1	32	*1,94*	*1,92*	*1,92*	*1,90*	*0*	*1,92*	b	*	*0,02*	*0,85*	*315,20*
25	23	3.9	31	*11,68*	*21,76*	*21,86*	*9,94*	*0*	*16,31*	b	*	*6,39*	*39,18*	*2677,56*
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	N	Mean	SI	VI
all labs	82	**0,61**	**0,040**	**6,493**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cd **Sample: 1 (Pine Needles - Finland)** Dimension: ng/g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	2	5.3	31	<200	<200	<200	<200	0					
2	06x	5.2	31	<,6	<,6	<,6	<,6	0					
3	44x	4.1	32	<,16	<,16	<,16	<,16	0					
4	43	4.1	32	52,00	*47,00a*	51,00	52,00	3	51,67	*	0,58	1,12	69,64
5	29x	3.3	31	50,00	50,00	60,00	50,00	4	52,50		5,00	9,52	70,77
6	40	5.7	31	47,00	54,00	66,00	62,00	4	57,25		8,46	14,78	77,17
7	09x	5.5	31	68,00	56,00	55,00	60,00	4	59,75		5,91	9,89	80,54
8	37x	5.5	35	64,10	64,80	65,00	64,70	4	64,65		0,39	0,60	87,14
9	38	5.5	22	65,30	63,10	64,20	66,30	4	64,73		1,38	2,13	87,24
10	25	4.1	21	69,60	67,50	68,80	68,00	4	68,48		0,92	1,35	92,30
11	23	3.9	31	53,79	69,93	81,14	80,48	4	71,34		12,77	17,91	96,15
12	3	5.1	22	76,00	67,00	74,00	69,00	4	71,50		4,20	5,88	96,38
13	33a	5.1	90	74,42	72,37	72,88	72,09	4	72,94		1,04	1,43	98,32
14	39x	5.5	35	74,90	74,70	72,40	74,60	4	74,15		1,17	1,58	99,95
15	36	5.5	31	78,00	74,00	72,00	79,00	4	75,75		3,30	4,36	102,11
16	08x	6.3	32	74,60	78,20	78,70	75,70	4	76,80		1,97	2,56	103,52
17	50	4.1	31	85,20	74,50	71,90	78,90	4	77,63		5,82	7,50	104,63
18	48x	4.1	35	79,70	80,00	77,90	79,00	4	79,15		0,93	1,18	106,69
19	60	3.1	22	79,00	79,00	80,00	81,00	4	79,75		0,96	1,20	107,50
20	04a	5.5	22	80,40	85,70	86,70	82,50	4	83,83		2,90	3,46	112,99
21	47x	4.1	32	91,78	85,74	86,73	88,07	4	88,08		2,65	3,00	118,73
22	56	5.5	22	96,60	95,40	93,00	83,30	4	92,08		6,04	6,56	124,11
23	42	4.1	22	93,10	92,10	93,10	91,00	4	92,33		1,00	1,08	124,45
24	26x	5.5	35	108,00	98,00	96,00	90,00	4	98,00	*	7,48	7,64	132,10
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	N	Mean	SI	VI
all labs	83	**74,19**	**3,566**	**4,806**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cd **Sample: 2 (Spruce needles - Germany)** Dimension: ng/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	2	5.3	31	<200	<200	<200	<200	0						
2	43	4.1	32	<20	<20	<20	<20	0						
3	06x	5.2	31	<,6	<,6	<,6	<,6	0						
4	44x	4.1	32	<,16	<,16	<,16	<,16	0						
5	3	5.1	22	23,00	22,00	17,00	18,00	4	20,00		*	2,94	14,72	69,33
6	25	4.1	21	19,10	21,60	20,80	19,80	4	20,33			1,10	5,41	70,46
7	47x	4.1	32	29,03	26,11	27,82	21,82	4	26,20			3,15	12,04	90,81
8	37x	5.5	35	25,90	26,70	26,80	26,50	4	26,48			0,40	1,52	91,78
9	38	5.5	22	25,40	26,50	25,40	28,60	4	26,48			1,51	5,70	91,78
10	56	5.5	22	28,30	27,30	27,10	26,80	4	27,38			0,65	2,37	94,90
11	29x	3.3	31	20,00	30,00	30,00	30,00	4	27,50			5,00	18,18	95,33
12	08x	6.3	32	29,40	25,10	27,30	31,00	4	28,20			2,56	9,09	97,76
13	48x	4.1	35	28,80	27,70	28,20	29,90	4	28,65			0,95	3,31	99,32
14	39x	5.5	35	29,10	28,20	29,90	29,00	4	29,05			0,70	2,39	100,71
15	42	4.1	22	28,70	29,70	31,80	27,60	4	29,45			1,79	6,06	102,09
16	33a	5.1	90	30,72	28,52	29,76	30,74	4	29,94			1,05	3,50	103,78
17	60	3.1	22	31,00	33,00	28,00	31,00	4	30,75			2,06	6,70	106,60
18	04a	5.5	22	30,10	33,30	28,10	33,30	4	31,20			2,56	8,20	108,16
19	36	5.5	31	35,00	31,00	31,00	36,00	4	33,25			2,63	7,91	115,27
20	50	4.1	31	36,60	38,70	31,60	39,90	4	36,70			3,66	9,98	127,23
21	26x	5.5	35	36,60	36,60	43,20	39,00	4	38,85		*	3,11	8,01	134,68
22	23	3.9	31	*57,87*	*96,39*	*95,13*	*52,88*	*0*	*75,57*	b	*	*23,41*	*30,98*	*261,97*
23	40	5.7	31	*71,00*	*85,00*	*91,00*	*88,00*	*0*	*83,75*	b	*	*8,85*	*10,56*	*290,34*
24	09x	5.5	31	*91,00*	*101,00*	*105,00*	*73,00*	*0*	*92,50*	b	*	*14,27*	*15,43*	*320,67*
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	N	Mean	SI	VI
all labs	68	**28,85**	**2,107**	**7,305**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cd **Sample: 3 (Oak leaves - Hungaria)** Dimension: ng/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	2	5.3	31	<200	<200	<200	<200	0						
2	06x	5.2	31	<,6	<,6	<,6	<,6	0						
3	44x	4.1	32	<,16	<,16	<,16	<,16	0						
4	43	4.1	32	85,00	79,00	82,00	83,00	4	82,25			2,50	3,04	77,30
5	29x	3.3	31	80,00	80,00	90,00	90,00	4	85,00			5,77	6,79	79,88
6	38	5.5	22	90,00	94,40	90,00	92,20	4	91,65			2,11	2,30	86,13
7	37x	5.5	35	91,00	91,80	92,20	92,70	4	91,93			0,72	0,78	86,39
8	36	5.5	31	93,00	92,00	95,00	93,00	4	93,25			1,26	1,35	87,63
9	08x	6.3	32	92,80	93,40	103,00	102,00	4	97,80			5,45	5,57	91,91
10	25	4.1	21	90,40	104,30	108,40	90,20	4	98,33			9,42	9,58	92,40
11	39x	5.5	35	101,10	102,10	97,60	99,70	4	100,13			1,95	1,95	94,09
12	3	5.1	22	105,00	96,00	101,00	101,00	4	100,75			3,69	3,66	94,68
13	48x	4.1	35	97,80	103,50	98,10	103,90	4	100,83			3,33	3,30	94,75
14	60	3.1	22	110,00	111,00	112,00	109,00	4	110,50			1,29	1,17	103,84
15	50	4.1	31	109,00	105,00	118,00	117,00	4	112,25			6,29	5,60	105,49
16	47x	4.1	32	110,37	122,91	111,23	108,20	4	113,18			6,61	5,84	106,36
17	04a	5.5	22	110,00	114,00	117,00	115,00	4	114,00			2,94	2,58	107,13
18	33a	5.1	90	117,00	115,10	113,50	120,70	4	116,58			3,10	2,66	109,55
19	26x	5.5	35	112,00	123,00	112,00	121,00	4	117,00			5,83	4,98	109,95
20	42	4.1	22	119,80	119,80	120,00	119,00	4	119,65			0,44	0,37	112,44
21	56	5.5	22	130,30	120,70	123,90	114,60	4	122,38			6,54	5,35	115,00
22	09x	5.5	31	109,00	136,00	131,00	128,00	4	126,00			11,80	9,37	118,41
23	40	5.7	31	105,00	147,00	155,00	132,00	4	134,75			22,01	16,33	126,63
24	23	3.9	31	*204,40*	*352,83*	*292,31*	*188,50*	*0*	*259,5*	b	*	*77,17*	*29,74*	*243,88*
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	N	Mean	SI	VI
all labs	80	**106,41**	**5,152**	**4,842**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: Cd **Sample: 4 (Maple leaves - Austria)** Dimension: ng/g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	2	5.3	31	<200	<200	<200	<200							
2	06x	5.2	31	<,6	<,6	<,6	<,6							
3	44x	4.1	32	<,16	<,16	<,16	<,16							
4	29x	3.3	31	70,00	60,00	70,00	60,00	4	65,00			5,77	8,88	74,73
5	25	4.1	21	74,40	68,80	73,30	70,50	4	71,75			2,56	3,57	82,49
6	08x	6.3	32	78,90	76,30	80,60	78,60	4	78,60			1,77	2,25	90,37
7	38	5.5	22	79,00	80,00	77,90	80,00	4	79,23			1,00	1,26	91,09
8	09x	5.5	31	85,00	80,00	64,00	93,00	4	80,50			12,23	15,20	92,55
9	43	4.1	32	78,00	75,00	94,00	76,00	4	80,75			8,92	11,05	92,84
10	37x	5.5	35	82,30	83,50	81,50	82,80	4	82,53			0,84	1,02	94,88
11	33a	5.1	90	81,92	85,18	88,13	85,40	4	85,16			2,54	2,98	97,91
12	39x	5.5	35	87,40	84,50	86,40	85,40	4	85,93			1,25	1,46	98,79
13	48x	4.1	35	87,80	86,70	85,60	85,40	4	86,38			1,11	1,28	99,31
14	50	4.1	31	87,00	84,50	91,40	94,50	4	89,35			4,46	5,00	102,73
15	47x	4.1	32	97,83	85,80	95,42	85,51	4	91,14			6,41	7,03	104,79
16	3	5.1	22	96,00	86,00	96,00	89,00	4	91,75			5,06	5,51	105,49
17	04a	5.5	22	85,20	94,60	93,60	94,60	4	92,00			4,56	4,95	105,77
18	60	3.1	22	93,00	93,00	93,00	92,00	4	92,75			0,50	0,54	106,64
19	36	5.5	31	102,00	91,00	101,00	93,00	4	96,75			5,56	5,75	111,24
20	56	5.5	22	100,60	100,80	98,80	96,90	4	99,28			1,82	1,83	114,14
21	26x	5.5	35	101,00	96,60	97,40	109,00	4	101,00			5,67	5,61	116,12
22	42	4.1	22	102,00	103,00	103,00	103,00	4	102,75			0,50	0,49	118,13
23	40	5.7	31	*152,00*	*128,00*	*107,00*	*126,00*	*0*	*128,3*	b	*	*18,45*	*14,38*	*147,45*
24	23	3.9	31	*463,46*	*482,49*	*474,68*	*237,23a*	*0*	*473,5*	b	*	*9,57*	*2,02*	*544,44*
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	N	Mean	SI	VI
all labs	76	**86,98**	**3,818**	**4,390**
30	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: B **Sample: 1 (Pine Needles - Finland)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	43	4.1	31	*<6*	*<6*	*<6*	*<6*							
2	56	5.5	31	*<5*	*<5*	*<5*	*<5*							
3	06x	5.2	31	*<3*	*<3*	*<3*	*<3*							
4	08x	6.1	31	*<1*	*<1*	*<1*	*<1*							
5	23x	3.9	31	*12,81a*	2,72	3,74	3,61	3	3,36		*	0,56	16,54	62,18
6	52	4.1	31	3,79	3,98	3,81	3,45	4	3,76		*	0,22	5,91	69,61
7	17x	5.5	31	4,80	4,66	4,39	4,60	4	4,61			0,17	3,66	85,42
8	42	4.1	31	5,10	5,00	5,00	5,00	4	5,03			0,05	1,00	93,09
9	29x	3.3	31	4,55	4,96	5,96	4,78	4	5,06			0,62	12,27	93,78
10	50x	4.1	31	5,26	5,19	5,11	5,29	4	5,21			0,08	1,54	96,56
11	07x	5.5	31	5,31	5,31	5,17	5,11	4	5,23			0,10	1,94	96,80
12	37x	5.5	31	5,33	5,43	5,38	5,38	4	5,38			0,04	0,76	99,67
13	04a	5.5	31	5,49	5,31	5,62	5,50	4	5,48			0,13	2,33	101,52
14	28	6.5	54.1	5,00	6,00	6,00	5,00	4	5,50			0,58	10,50	101,89
15	48	4.1	35	5,64	5,67	5,60	5,65	4	5,64			0,03	0,48	104,46
16	39x	5.5	31	5,86	5,59	5,79	5,71	4	5,74			0,12	2,07	106,32
17	11x	5.1	31	5,85	5,72	5,78	5,75	4	5,78			0,06	0,96	106,98
18	26x	5.5	31	5,80	6,00	5,75	5,95	4	5,88			0,12	2,03	108,84
19	2	5.3	31	5,70	5,90	5,70	6,20	4	5,88			0,24	4,02	108,84
20	25	4.1	31	6,40	6,60	6,31	6,16	4	6,37			0,18	2,89	117,96
21	60	3.3	31	7,30	7,40	7,50	7,30	4	7,38		*	0,10	1,30	136,62
22	36	6.5	54.2	*15,10*	*13,18*	*15,80*	*14,00*	*0*	*14,52*	b	*	*1,16*	*7,99*	*268,99*
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	N	Mean	SI	VI
all labs	67	**5,40**	**0,199**	**3,685**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: B **Sample: 2 (Spruce needles - Germany)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	56	5.5	31	10,06	9,28	11,53	9,68	4	10,14	*	0,98	9,67	55,61
2	23x	3.9	31	16,68	10,58	10,98	13,20	4	12,86	*	2,80	21,74	70,53
3	08x	6.1	31	10,10	14,20	14,10	14,30	4	13,18	*	2,05	15,57	72,26
4	39x	5.5	31	15,84	15,43	15,09	15,20	4	15,39		0,33	2,16	84,41
5	29x	3.3	31	17,16	15,17	15,19	16,85	4	16,09		1,06	6,59	88,26
6	43	4.1	31	16,00	17,00	18,00	15,00	4	16,50		1,29	7,82	90,50
7	06x	5.2	31	17,34	17,53	17,81	17,56	4	17,56		0,19	1,10	96,31
8	52	4.1	31	18,14	18,00	17,50	17,51	4	17,79		0,33	1,86	97,56
9	26x	5.5	31	19,30	19,90	17,20	16,70	4	18,28		1,56	8,55	100,23
10	42	4.1	31	18,30	18,80	18,70	18,80	4	18,65		0,24	1,28	102,29
11	17x	5.5	31	19,88	18,19	19,19	18,46	4	18,93		0,76	4,02	103,83
12	50x	4.1	31	18,93	19,00	19,16	18,83	4	18,98		0,14	0,73	104,10
13	28	6.5	54.1	18,00	18,00	19,00	22,00	4	19,25		1,89	9,83	105,58
14	11x	5.1	31	19,00	19,60	19,10	19,60	4	19,33		0,32	1,66	105,99
15	25	4.1	31	19,30	19,60	19,30	19,10	4	19,33		0,21	1,07	105,99
16	37x	5.5	31	19,30	19,40	19,40	19,50	4	19,40		0,08	0,42	106,40
17	04a	5.5	31	20,20	19,90	20,40	20,40	4	20,23		0,24	1,17	110,93
18	07x	5.5	31	20,80	20,40	20,60	21,00	4	20,70		0,26	1,25	113,53
19	2	5.3	31	20,90	20,90	20,80	20,80	4	20,85		0,06	0,28	114,36
20	48	4.1	35	21,29	21,74	21,47	21,79	4	21,57		0,23	1,09	118,32
21	60	3.3	31	21,80	22,50	22,10	22,50	4	22,23	*	0,34	1,53	121,90
22	36	6.5	54.2	23,10	23,80	24,00	24,70	4	23,90	*	0,66	2,75	131,09
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	N	Mean	SI	VI
all labs	88	**18,23**	**0,728**	**3,995**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: B **Sample: 3 (Oak leaves - Hungaria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	23x	3.9	31	18,63	19,53	24,24	18,40	4	20,20	*	2,74	13,55	70,74
2	08x	6.1	31	22,00	20,20	23,30	18,90	4	21,10	*	1,94	9,20	73,89
3	56	5.5	31	25,63	25,25	19,96	20,75	4	22,90		2,96	12,92	80,18
4	28	6.5	54.1	25,00	25,00	24,00	22,00	4	24,00		1,41	5,89	84,04
5	29x	3.3	31	25,51	24,44	23,27	24,99	4	24,55		0,96	3,91	85,98
6	39x	5.5	31	26,01	25,22	25,77	25,22	4	25,56		0,40	1,56	89,49
7	43	4.1	31	26,00	26,00	29,00	28,00	4	27,25		1,50	5,50	95,42
8	52	4.1	31	27,50	28,07	27,70	27,92	4	27,80		0,25	0,90	97,34
9	06x	5.2	31	28,42	28,36	27,86	28,22	4	28,22		0,25	0,89	98,80
10	17x	5.5	31	29,34	28,66	27,80	28,66	4	28,62		0,63	2,20	100,20
11	25	4.1	31	29,20	28,90	28,50	28,30	4	28,73		0,40	1,40	100,59
12	42	4.1	31	29,00	29,00	29,00	28,50	4	28,88		0,25	0,87	101,11
13	50x	4.1	31	29,25	29,13	28,95	28,60	4	28,98		0,28	0,98	101,49
14	11x	5.1	31	29,30	29,50	29,40	29,50	4	29,43		0,10	0,33	103,04
15	37x	5.5	31	29,40	29,30	29,50	29,50	4	29,43		0,10	0,33	103,04
16	07x	5.5	31	30,00	30,00	30,30	30,10	4	30,10		0,14	0,47	105,40
17	26x	5.5	31	31,50	30,70	31,10	30,10	4	30,85		0,60	1,94	108,03
18	04a	5.5	31	31,70	30,90	31,50	32,00	4	31,53		0,46	1,47	110,39
19	60	3.3	31	31,80	32,60	32,40	32,40	4	32,30		0,35	1,07	113,11
20	2	5.3	31	32,10	33,10	31,70	32,30	4	32,30		0,59	1,82	113,11
21	48	4.1	35	35,19	35,15	34,88	36,15	4	35,34	*	0,56	1,57	123,76
22	36	6.5	54.2	41,00	40,80	39,20	39,90	4	40,23	*	0,83	2,07	140,86
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	N	Mean	SI	VI
all labs	88	**28,56**	**0,804**	**2,817**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: B **Sample: 4 (Maple leaves - Austria)** Dimension: mg/kg

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	56	5.5	31	8,43	7,82	6,12	5,98	4	7,09	*	1,22	17,26	51,04
2	23x	3.9	31	8,24	9,15	6,90	7,99	4	8,07	*	0,93	11,47	58,12
3	29x	3.3	31	9,71	10,91	9,29	10,58	4	10,12	*	0,75	7,42	72,90
4	08x	6.1	31	10,10	10,60	10,00	13,10	4	10,95	*	1,46	13,31	78,86
5	06x	5.2	31	11,72	12,29	11,61	11,87	4	11,87		0,30	2,51	85,50
6	39x	5.5	31	12,10	12,63	12,57	12,19	4	12,37		0,27	2,15	89,11
7	52	4.1	31	12,54	12,55	12,00	12,40	4	12,37		0,26	2,08	89,11
8	28	6.5	54.1	14,00	14,00	12,00	12,00	4	13,00		1,15	8,88	93,62
9	42	4.1	31	14,00	14,00	14,00	13,50	4	13,88		0,25	1,80	99,93
10	17x	5.5	31	13,98	13,92	13,95	13,81	4	13,92		0,07	0,53	100,21
11	50x	4.1	31	14,62	14,18	14,32	14,33	4	14,36		0,18	1,29	103,44
12	25	4.1	31	14,50	14,70	14,30	14,40	4	14,48		0,17	1,18	104,25
13	43	4.1	31	15,00	14,00	13,00	16,00	4	14,50		1,29	8,90	104,43
14	37x	5.5	31	14,60	14,50	14,70	14,60	4	14,60		0,08	0,56	105,15
15	11x	5.1	31	15,10	14,60	14,90	14,60	4	14,80		0,24	1,66	106,59
16	04a	5.5	31	14,40	15,40	15,30	15,50	4	15,15		0,51	3,34	109,11
17	2	5.3	31	15,60	15,60	15,40	15,30	4	15,48		0,15	0,97	111,45
18	07x	5.5	31	15,40	15,70	15,70	15,80	4	15,65		0,17	1,11	112,71
19	26x	5.5	31	16,00	16,30	16,00	18,00	4	16,58		0,96	5,79	119,37
20	48	4.1	35	18,16	17,83	17,10	17,41	4	17,63	*	0,47	2,64	126,93
21	60	3.3	31	18,70	18,70	18,40	17,70	4	18,38	*	0,47	2,57	132,34
22	36	6.5	54.2	20,00	20,40	19,60	21,00	4	20,25	*	0,60	2,95	145,84
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	N	Mean	SI	VI
all labs	88	**13,89**	**0,543**	**3,914**
20	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: C **Sample: 1 (Pine Needles - Finland)** Dimension: g/100g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	13x	0	17.1	*48,5a*	48,70	48,70	48,70	3	48,70	*	0,00	0,00	94,22
2	2	1	15.4	49,00	48,70	49,50	49,30	4	49,13		0,35	0,71	95,05
3	06x	1	15.1	49,25	49,16	49,28	49,23	4	49,23		0,05	0,10	95,25
4	61x	1	15.3	49,25	49,29	49,04	49,36	4	49,24		0,14	0,28	95,26
5	26x	2.1	15	49,60	48,60	49,20	50,10	4	49,38		0,63	1,28	95,53
6	50x	1	17.1	50,55	50,91	50,80	50,63	4	50,72		0,16	0,32	98,14
7	52	0	13.1	50,89	50,74	50,71	50,90	4	50,81		0,10	0,19	98,31
8	17x	1	17	51,10	51,20	51,10	51,10	4	51,13		0,05	0,10	98,91
9	11x	0	13	51,38	50,71	52,84	49,74	4	51,17		1,30	2,55	99,00
10	49	1	15.3	51,48	51,37	51,39	51,47	4	51,43		0,06	0,11	99,50
11	37x	0	10	51,27	51,48	51,48	51,58	4	51,45		0,13	0,25	99,55
12	04a	1	15.2	51,63	50,54	51,73	51,96	4	51,47		0,63	1,23	99,57
13	56	1	17	51,78	51,70	51,44	51,59	4	51,63		0,15	0,29	99,89
14	46	1	15	51,70	51,75	51,70	51,72	4	51,72		0,02	0,05	100,06
15	29x	1	11.1	51,50	51,80	52,00	51,70	4	51,75		0,21	0,40	100,12
16	23x	1	15	51,58	50,27	53,24	52,31	4	51,85		1,25	2,42	100,32
17	48x	1	15.4	52,65	51,76	51,74	51,81	4	51,99		0,44	0,85	100,59
18	39x	1	13.1	51,70	52,30	52,70	51,30	4	52,00		0,62	1,20	100,61
19	08x	1	15.2	52,20	52,30	52,20	51,90	4	52,15		0,17	0,33	100,90
20	42	1	15.2	52,20	52,30	52,30	52,30	4	52,28		0,05	0,10	101,14
21	47x	1	15.4	52,47	52,95	52,03	52,28	4	52,43		0,39	0,74	101,44
22	38	1	15.4	52,50	52,50	52,50	52,40	4	52,48		0,05	0,10	101,53
23	15	1	17	51,70	52,90	52,50	53,00	4	52,53		0,59	1,12	101,62
24	19	1	15.1	52,46	52,76	52,47	52,55	4	52,56		0,14	0,26	101,69
25	7	1	18.1	52,60	52,40	52,70	52,80	4	52,63		0,17	0,32	101,82
26	9	0	13	53,08	52,38	52,53	52,91	4	52,73		0,33	0,62	102,01
27	44x	1	13.1	53,40	52,60	52,80	52,50	4	52,83		0,40	0,76	102,20
28	25	6	17	53,00	53,00	53,30	53,40	4	53,18		0,21	0,39	102,88
29	01x	1	17.1	53,50	53,24	53,19	52,97	4	53,23		0,22	0,41	102,98
30	36	3.32	82.3	53,10	53,72	53,02	53,43	4	53,32		0,32	0,60	103,16
31	3	1	15.2	54,39	54,51	54,42	54,43	4	54,44	*	0,05	0,09	105,32
32	12x	1	17.1	*504,20*	*505,30*	*504,10*	*505,00*	*0*	*504,7*	b *	*0,59*	*0,12*	*976,38*
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	N	Mean	SI	VI
all labs	123	**51,69**	**0,303**	**0,586**
5	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: C **Sample: 2 (Spruce needles - Germany)** Dimension: g/100g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	26x	2.1	15	37,80	41,50	50,80	45,00	4	43,78		*	5,53	12,63	87,37
2	13x	0	17.1	47,40	47,10	47,30	47,30	4	47,28		*	0,13	0,27	94,35
3	06x	1	15.1	48,03	47,76	47,51	47,77	4	47,77			0,21	0,44	95,34
4	2	1	15.4	47,70	48,10	47,50	48,00	4	47,83			0,28	0,58	95,45
5	61x	1	15.3	48,18	48,28	48,19	48,25	4	48,23			0,05	0,10	96,25
6	52	0	13.1	49,80	49,70	49,79	49,62	4	49,73			0,08	0,17	99,25
7	50x	1	17.1	49,88	49,91	50,01	49,67	4	49,87			0,14	0,29	99,53
8	29x	1	11.1	50,20	50,20	49,40	49,80	4	49,90			0,38	0,77	99,59
9	36	3.32	82.3	50,18	50,10	49,93	49,60	4	49,95			0,26	0,51	99,70
10	37x	0	10	49,89	50,00	50,11	50,00	4	50,00			0,09	0,18	99,79
11	56	1	17	50,12	50,07	50,09	50,22	4	50,13			0,07	0,13	100,04
12	48x	1	15.4	50,26	50,34	50,24	49,94	4	50,20			0,18	0,35	100,18
13	49	1	15.3	50,18	50,22	50,18	50,21	4	50,20			0,02	0,04	100,19
14	17x	1	17	50,20	50,30	50,20	50,20	4	50,23			0,05	0,10	100,24
15	47x	1	15.4	50,21	50,87	50,03	50,18	4	50,32			0,37	0,74	100,44
16	38	1	15.4	50,30	50,40	50,30	50,40	4	50,35			0,06	0,11	100,49
17	04a	1	15.2	50,01	50,35	50,84	50,51	4	50,43			0,35	0,68	100,65
18	46	1	15	50,48	50,48	50,42	50,41	4	50,45			0,04	0,07	100,69
19	11x	0	13	48,86	50,56	50,97	51,69	4	50,52			1,20	2,38	100,83
20	42	1	15.2	50,60	50,60	50,60	50,50	4	50,58			0,05	0,10	100,94
21	08x	1	15.2	50,80	50,40	50,80	50,90	4	50,73			0,22	0,44	101,24
22	7	1	18.1	51,00	50,70	50,80	50,90	4	50,85			0,13	0,25	101,49
23	39x	1	13.1	51,40	50,60	51,10	50,60	4	50,93			0,39	0,78	101,64
24	19	1	15.1	50,86	51,15	51,03	51,08	4	51,03			0,12	0,24	101,85
25	25	6	17	51,00	51,20	51,30	51,20	4	51,18			0,13	0,25	102,14
26	15	1	17	51,80	51,10	50,90	51,30	4	51,28			0,39	0,75	102,34
27	23x	1	15	52,18	51,48	49,74	51,86	4	51,32			1,09	2,12	102,42
28	44x	1	13.1	51,40	52,10	51,20	51,20	4	51,48			0,43	0,83	102,74
29	9	0	13	52,15	51,42	51,21	51,47	4	51,56			0,41	0,79	102,91
30	01x	1	17.1	51,95	51,94	51,91	51,84	4	51,91			0,05	0,10	103,61
31	3	1	15.2	53,32	53,37	53,24	53,12	4	53,26		*	0,11	0,20	106,31
32	12x	1	17.1	*493,70*	*494,60*	*494,60*	*494,20*	*0*	*494,3*	b	*	*0,43*	*0,09*	*986,51*
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	N	Mean	SI	VI
all labs	124	**50,10**	**0,419**	**0,836**
5	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: C **Sample: 3 (Oak leaves - Hungaria)** Dimension: g/100g

No.	Lab.	Method code		Replications				n	Lab.mean			Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4					Si	Vi	%
1	26x	2.1	15	*23,10*	*33,40*	*41,50*	*35,30*	*0*	*33,33*	c	*	*7,64*	*22,94*	*67,72*
2	13x	0	17.1	45,50	*45,2a*	45,50	45,50	3	45,50		*	0,00	0,00	92,46
3	06x	1	15.1	46,04	45,82	46,07	45,98	4	45,98		*	0,11	0,24	93,43
4	2	1	15.4	46,80	46,30	46,00	46,00	4	46,28		*	0,38	0,82	94,04
5	61x	1	15.3	46,56	46,85	46,70	46,67	4	46,70		*	0,12	0,26	94,89
6	36	3.32	82.3	47,86	47,62	47,74	47,46	4	47,67			0,17	0,36	96,87
7	52	0	13.1	48,55	48,35	48,33	48,52	4	48,44			0,11	0,23	98,43
8	49	1	15.3	48,73	48,74	48,70	48,64	4	48,70			0,04	0,09	98,97
9	04a	1	15.2	48,74	47,88	49,40	48,81	4	48,71			0,63	1,29	98,98
10	9	0	13	49,39	49,41	49,09	48,34	4	49,06			0,50	1,02	99,69
11	50x	1	17.1	49,24	49,15	49,07	48,92	4	49,10			0,14	0,28	99,77
12	56	1	17	49,14	49,03	49,20	49,18	4	49,14			0,08	0,15	99,86
13	29x	1	11.1	49,70	49,00	48,60	49,40	4	49,18			0,48	0,97	99,93
14	39x	1	13.1	47,90	49,00	50,00	49,90	4	49,20			0,98	1,98	99,98
15	38	1	15.4	49,40	49,30	49,50	49,40	4	49,40			0,08	0,17	100,39
16	37x	0	10	49,57	49,46	49,36	49,36	4	49,44			0,10	0,20	100,47
17	15	1	17	50,20	49,70	49,60	48,40	4	49,48			0,76	1,54	100,54
18	17x	1	17	49,50	49,60	49,50	49,50	4	49,53			0,05	0,10	100,64
19	46	1	15	49,71	49,66	49,59	49,59	4	49,64			0,06	0,12	100,87
20	47x	1	15.4	49,78	48,40	50,27	50,28	4	49,68			0,89	1,78	100,96
21	48x	1	15.4	49,70	49,73	49,71	49,74	4	49,72			0,02	0,04	101,04
22	11x	0	13	49,32	49,44	50,07	50,12	4	49,74			0,42	0,84	101,08
23	19	1	15.1	49,50	49,64	50,35	49,60	4	49,77			0,39	0,78	101,15
24	42	1	15.2	49,90	49,90	49,70	49,80	4	49,83			0,10	0,19	101,25
25	7	1	18.1	50,10	49,80	50,00	50,10	4	50,00			0,14	0,28	101,61
26	08x	1	15.2	50,10	49,80	50,20	50,00	4	50,03			0,17	0,34	101,66
27	01x	1	17.1	50,25	50,16	50,40	50,20	4	50,25			0,11	0,21	102,12
28	44x	1	13.1	50,60	50,60	50,20	50,40	4	50,45			0,19	0,38	102,52
29	23x	1	15	50,87	50,92	50,48	49,73	4	50,50			0,55	1,09	102,62
30	25	6	17	51,40	51,90	51,80	51,60	4	51,68		*	0,22	0,43	105,01
31	3	1	15.2	52,44	52,63	52,67	52,58	4	52,58		*	0,10	0,19	106,85
32	12x	1	17.1	*482,90*	*481,90*	*481,10*	*481,80*	*0*	*481,9*	b	*	*0,74*	*0,15*	*979,36*
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	N	Mean	SI	VI
all labs	119	**49,21**	**0,269**	**0,547**
5	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Element: C **Sample: 4 (Maple leaves - Austria)** Dimension: g/100g

No.	Lab.	Method code		Replications				n	Lab.mean		Lab.standard dev.		Recovery
	Code	P	D	1	2	3	4				Si	Vi	%
1	13x	0	17.1	47,50	*47,3a*	47,50	47,50	3	47,50	*	0,00	0,00	94,09
2	2	1	15.4	47,90	47,70	47,70	47,70	4	47,75	*	0,10	0,21	94,58
3	06x	1	15.1	48,08	47,48	47,91	47,83	4	47,83	*	0,25	0,53	94,73
4	61x	1	15.3	48,57	48,58	48,68	48,04	4	48,47		0,29	0,60	96,00
5	26x	2.1	15	47,40	*36,8a*	50,00	50,10	3	49,17		1,53	3,11	97,39
6	11x	0	13	48,83	50,44	48,68	50,92	4	49,72		1,13	2,27	98,48
7	29x	1	11.1	49,50	50,80	50,60	48,40	4	49,83		1,11	2,23	98,69
8	52	0	13.1	49,84	49,86	49,76	49,85	4	49,83		0,05	0,09	98,70
9	49	1	15.3	50,00	50,00	49,89	49,98	4	49,97		0,05	0,11	98,97
10	04a	1	15.2	50,05	50,21	50,38	50,84	4	50,37		0,34	0,68	99,77
11	37x	0	10	50,53	50,32	50,42	50,32	4	50,40		0,10	0,20	99,83
12	48x	1	15.4	50,52	50,46	50,45	50,34	4	50,44		0,07	0,15	99,91
13	50x	1	17.1	50,62	50,44	50,50	50,34	4	50,48		0,12	0,23	99,98
14	36	3.32	82.3	50,00	50,79	50,66	50,50	4	50,49		0,35	0,69	100,00
15	56	1	17	50,39	50,59	50,52	50,45	4	50,49		0,09	0,17	100,00
16	39x	1	13.1	50,30	50,20	51,00	50,70	4	50,55		0,37	0,73	100,13
17	47x	1	15.4	50,91	49,24	51,15	51,01	4	50,58		0,90	1,77	100,18
18	17x	1	17	50,80	50,70	50,60	50,60	4	50,68		0,10	0,19	100,38
19	42	1	15.2	50,90	50,90	50,90	50,80	4	50,88		0,05	0,10	100,77
20	38	1	15.4	50,90	50,90	50,90	50,90	4	50,90		0,00	0,00	100,82
21	46	1	15	51,04	50,87	50,86	50,85	4	50,91		0,09	0,18	100,83
22	19	1	15.1	50,39	51,11	51,25	50,95	4	50,93		0,38	0,74	100,87
23	7	1	18.1	50,90	51,00	50,90	50,90	4	50,93		0,05	0,10	100,87
24	9	0	13	50,96	50,97	51,03	51,08	4	51,01		0,06	0,11	101,04
25	01x	1	17.1	50,97	50,87	51,38	51,26	4	51,12		0,24	0,47	101,26
26	08x	1	15.2	51,30	51,10	50,90	51,20	4	51,13		0,17	0,33	101,27
27	15	1	17	51,20	51,10	51,20	51,10	4	51,15		0,06	0,11	101,32
28	44x	1	13.1	51,60	51,50	51,40	51,60	4	51,53		0,10	0,19	102,06
29	25	6	17	52,50	52,80	52,50	52,60	4	52,60		0,14	0,27	104,19
30	23x	1	15	52,54	53,17	52,51	52,60	4	52,71		0,31	0,59	104,40
31	3	1	15.2	53,79	53,69	53,69	53,65	4	53,71	*	0,06	0,11	106,38
32	12x	1	17.1	*492,80*	*492,60*	*492,60*	*492,60*	*0*	*492,7*	b *	*0,10*	*0,02*	*975,82*
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	N	Mean	SI	VI
all labs	122	**50,49**	**0,279**	**0,552**
5	% from the mean			

* = non tolerable mean because more than +/-

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	1	56	5.5	31	313,8	310,5	307,6	316,3	312,05	3,800	1,218
			43	4.1	31	331	328	331	329	329,75	1,500	0,455
			25	3.1	31	330	334	329	332	331,25	2,217	0,669
			09	5.5	31	334	333	335	333	333,75	0,957	0,287
			06	5.2	31	336	337,7	333,3	335,7	335,68	1,812	0,540
			52	4.1	31	344,09	337,55	347,38	344,88	343,48	4,192	1,220
			23	3.9	31	339,16	349,96	353,16	344,37	346,66	6,182	1,783
			26	5.5	31	350	341	354	348	348,25	5,439	1,562
			08	6.3	31	342	357	346	357	350,50	7,681	2,191
			04a	9.1	42	337	350	378	341	351,50	18,484	5,259
			48	4.1	31	356,3	353,7	357,1	348,6	353,93	3,835	1,084
			42	4.1	31	369	368	368	365	367,50	1,732	0,471
			50	4.1	31	371	383	366	381	375,25	8,098	2,158
			18	3.31	31	371,5	391,9	365,5	376,3	376,30	11,300	3,003
			47	4.1	32	387	375	370	380	378,00	7,257	1,920
			02	5.3	31	384	381	372	379	379,00	5,099	1,345
			12	5.1	31	391	379	388	401	389,75	9,069	2,327
Al	(µg/g)	2	25	3.1	31	47,1	46,4	48,2	47,6	47,33	0,763	1,613
			09	5.5	31	56,7	54,8	54,7	50,9	54,28	2,431	4,479
			26	5.5	31	58	55	55	55,3	55,83	1,457	2,610
			04a	9.1	42	55	67	65	60	61,75	5,377	8,708
			56	5.5	31	79,01	77,33	81,75	82,55	80,16	2,420	3,019
			02	5.3	31	88	87	83	83	85,25	2,630	3,085
			48	4.1	31	92,05	87,77	91,31	87,66	89,70	2,309	2,575
			52	4.1	31	90,86	90,71	90,22	90,39	90,55	0,292	0,323
			43	4.1	31	93	92	91	91	91,75	0,957	1,044
			42	4.1	31	98	104	105	100	101,75	3,304	3,247
			50	4.1	31	96,9	102	105	104	101,98	3,606	3,536
			23	3.9	31	107,88	107,97	98,98	96,77	102,90	5,872	5,707

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	2	06	5.2	31	108,7	107,8	111	109,1	109,15	1,348	1,235
			47	4.1	32	113	112	111	115	112,75	1,708	1,515
			08	6.3	31	128	119	115	120	120,50	5,447	4,520
			18	3.31	31	112,6	143,6	111	122	122,30	15,006	12,270
			12	5.1	31	129	135	122	124	127,50	5,802	4,551
Al	(µg/g)	3	25	3.1	31	46,2	44,5	45,3	45,8	45,45	0,733	1,612
			26	5.5	31	68	71	71	63	68,25	3,775	5,531
			09	5.5	31	67,2	75,9	73,8	77,4	73,58	4,499	6,115
			02	5.3	31	102	85	95	101	95,75	7,805	8,151
			56	5.5	31	95,33	98,41	95,39	99,25	97,10	2,033	2,094
			48	4.1	31	101,3	103,7	98,56	102,7	101,57	2,232	2,198
			43	4.1	31	102	102	105	111	105,00	4,243	4,041
			06	5.2	31	107,5	107,2	106,1	107	106,95	0,603	0,564
			50	4.1	31	108	109	107	110	108,50	1,291	1,190
			52	4.1	31	108,24	120,14	109,95	114,91	113,31	5,360	4,731
			23	3.9	31	112,8	114,43	117,5	110,53	113,82	2,931	2,576
			04a	9.1	42	116	116	120	115	116,75	2,217	1,899
			42	4.1	31	117	117	117	119	117,50	1,000	0,851
			47	4.1	32	122	121	116	115	118,50	3,512	2,964
			08	6.3	31	120	120	120	121	120,25	0,500	0,416
			18	3.31	31	130,7	121,5	121,6	124,6	124,60	4,314	3,462
			12	5.1	31	147	138	135	131	137,75	6,801	4,937
Al	(µg/g)	4	25	3.1	31	56,9	51,5	53	54,9	54,08	2,341	4,330
			09	5.5	31	55,6	62,9	59,9	60,1	59,63	3,013	5,053
			26	5.5	31	61	59	64	57	60,25	2,986	4,956
			04a	9.1	42	90	93	85	88	89,00	3,367	3,783
			02	5.3	31	99	92	95	85	92,75	5,909	6,371
			56	5.5	31	113,8	113,2	124,7	105,6	114,33	7,859	6,875
			23	3.9	31	121,7	142,24	117,89	124,43	126,57	10,789	8,524

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Al	(µg/g)	4	48	4.1	31	131,1	137,4	137,3	135,4	135,30	2,947	2,178
			43	4.1	31	139	144	133	142	139,50	4,796	3,438
			50	4.1	31	142	134	138	148	140,50	5,972	4,251
			52	4.1	31	140,93	146,56	140,94	140,45	142,22	2,902	2,041
			06	5.2	31	139,4	147,8	155,6	147,6	147,60	6,615	4,482
			42	4.1	31	149	148	148	150	148,75	0,957	0,644
			12	5.1	31	150	150	145	171	154,00	11,576	7,517
			18	3.31	31	166,6	154,6	146,1	155,8	155,78	8,410	5,399
			47	4.1	32	161	161	164	160	161,50	1,732	1,072
			08	6.3	31	163	162	164	160	162,25	1,708	1,053
As	(µg/g)	1	02	5.3	31	<,7	<,7	1	<,7			
			48	4.1	35	0,0195	0,018	0,0219	0,02	0,02	0,002	8,108
			23	3.9	31	0,24	0,26	0,26	0,24	0,25	0,012	4,619
As	(µg/g)	2	23	3.9	31	0,1	0,13	0,06	0,11	0,10	0,029	29,439
			48	4.1	35	0,34	0,359	0,3538	0,3515	0,35	0,008	2,285
			02	5.3	31	1,3	1,3	1,4	1,2	1,30	0,082	6,281
As	(µg/g)	3	48	4.1	35	0,0817	0,0807	0,0848	0,0767	0,08	0,003	4,127
			23	3.9	31	0,15	0,16	0,24	0,1	0,16	0,058	35,662
			02	5.3	31	1,3	1,4	0,9	1,2	1,20	0,216	18,002
As	(µg/g)	4	48	4.1	35	0,0778	0,078	0,0757	0,0742	0,08	0,002	2,371
			23	3.9	31	0,18	0,35	0,35	0,31	0,30	0,081	27,083
			02	5.3	31	0,9	1	<,7	1	0,97	0,058	5,973
Ba	(µg/g)	1	06	5.2	31	<1,8	<1,8	<1,8	<1,8			
			02	5.3	31	0,9	0,9	0,9	0,9	0,90	0,000	0,000
			50	4.1	31	1,42	1,49	1,49	1,39	1,45	0,051	3,494
			48	4.1	35	1,858	1,743	1,849	1,729	1,79	0,068	3,799
Ba	(µg/g)	2	50	4.1	31	65,5	66,1	67,6	64,8	66,00	1,192	1,806
			48	4.1	35	75,82	76,56	77	76,09	76,37	0,521	0,682
			06	5.2	31	77,96	78,21	78,12	78,1	78,10	0,103	0,132

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ba	(µg/g)	2	02	5.3	31	83,2	82,7	82,8	82,1	82,70	0,455	0,550
Ba	(µg/g)	3	50	4.1	31	41,7	43,5	42	42,5	42,43	0,789	1,860
			06	5.2	31	48,69	47,51	48,98	48,39	48,39	0,636	1,314
			48	4.1	35	50,13	49,79	50,62	49,95	50,12	0,360	0,717
			02	5.3	31	52,4	53,4	52,3	53,2	52,83	0,556	1,053
Ba	(µg/g)	4	50	4.1	31	48,8	49,4	49,9	49,3	49,35	0,451	0,914
			48	4.1	35	59,62	59,28	58,72	59,06	59,17	0,378	0,639
			06	5.2	31	57,84	60,05	61,16	59,68	59,68	1,380	2,312
			02	5.3	31	63,2	62,5	62,5	61,2	62,35	0,835	1,339
Cl	(µg/g)	1	03	2.2	82	370	350	350	360	357,50	9,574	2,678
			04a	9.1	42	360	360	370	370	365,00	5,774	1,582
Cl	(µg/g)	2	03	2.2	82	390	390	380	380	385,00	5,774	1,500
			04a	9.1	42	430	420	420	420	422,50	5,000	1,183
Cl	(µg/g)	3	03	2.2	82	430	420	410	420	420,00	8,165	1,944
			04a	9.1	42	510	500	520	490	505,00	12,910	2,556
Cl	(µg/g)	4	04a	9.1	42	1720	1720	1720	1710	1717,50	5,000	0,291
			03	2.2	82	1740	1740	1730	1730	1735,00	5,774	0,333
Co	(µg/g)	1	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,2	<,2	<,2	<,2			
			50	4.1	31	0,108	0,132	0,115	0,106	0,12	0,012	10,251
			47	4.1	32	0,12	0,12	0,11	0,12	0,12	0,005	4,255
			48	4.1	35	0,1235	0,133	0,1245	0,122	0,13	0,005	3,929
			44	4.1	32	0,2	0,1	0,1	0,2	0,15	0,058	38,490
Co	(µg/g)	2	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,2	<,2	<,2	<,2			
			47	4.1	32	0,06	0,05	0,07	0,07	0,06	0,010	15,319
			50	4.1	31	0,06	0,078	0,07	0,068	0,07	0,007	10,715
			48	4.1	35	0,0877	0,0907	0,0894	0,0895	0,09	0,001	1,381
			44	4.1	32	0,2	0,1	0,2	0,2	0,18	0,050	28,571

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Co	(µg/g)	3	50	4.1	31	<,05	<,05	<,05	<5			
			06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,2	<,2	<,2	<,2			
			48	4.1	35	0,0678	0,0693	0,0674	0,0676	0,07	0,001	1,272
			47	4.1	32	0,07	0,08	0,06	0,09	0,08	0,013	17,213
			44	4.1	32	0,1	0,1	0,1	0,1	0,10	0,000	0,000
Co	(µg/g)	4	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,2	<,2	<,2	<,2			
			47	4.1	32	0,1	0,12	0,11	0,1	0,11	0,010	8,906
			50	4.1	31	0,14	0,152	0,141	0,142	0,14	0,006	3,868
			48	4.1	35	0,1511	0,1498	0,1514	0,1509	0,15	0,001	0,463
			44	4.1	32	0,2	0,1	0,2	0,3	0,20	0,082	40,825
Cr	(µg/g)	1	43	4.1	32	<2,5	<2,5	<2,5	<2,5			
			02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			56	5.5	31	<1	<1	<1	<1			
			23	3.9	31	0,3	0,29	0,34	0,3	0,31	0,022	7,211
			09	5.5	31	0,555	0,575	0,524	0,523	0,54	0,025	4,652
			06	5.2	31	0,81	0,72	0,8	0,78	0,78	0,040	5,185
			48	4.1	35	0,7974	0,8092	0,7905	0,7723	0,79	0,015	1,948
			44	4.1	32	0,8	0,9	0,8	0,8	0,83	0,050	6,061
			08	6.3	32	0,849	0,995	0,887	0,828	0,89	0,074	8,350
			50	4.1	31	0,875	0,914	0,9	0,934	0,91	0,025	2,738
			18	3.31	31	0,9	1	0,9	0,9	0,93	0,050	5,405
			47	4.1	32	0,95	0,95	0,97	0,98	0,96	0,015	1,558
Cr	(µg/g)	2	23	3.9	31	2	1,77	1,54	1,25	1,64	0,321	19,557
			02	5.3	31	2	2	1,7	1,5	1,80	0,245	13,608
			09	5.5	31	2,047	1,941	1,822	2,167	1,99	0,147	7,388
			56	5.5	31	3,729	3,887	3,941	4,144	3,93	0,171	4,365
			50	4.1	31	4,06	4,05	4,12	4,16	4,10	0,052	1,266

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Cr	(µg/g)	2	08	6.3	32	4,28	4,32	4,15	4,31	4,27	0,079	1,841
			48	4.1	35	4,14	4,146	4,296	4,602	4,30	0,216	5,037
			43	4.1	32	4,2	4,7	4,3	4,5	4,43	0,222	5,011
			47	4.1	32	5,06	5,01	5	5,02	5,02	0,026	0,524
			44	4.1	32	5,2	5,2	5,5	5,5	5,35	0,173	3,237
			06	5.2	31	6,92	6,74	7,99	7,21	7,22	0,552	7,647
			18	3.31	31	7,8	7,8	7	7,5	7,53	0,377	5,017
Cr	(µg/g)	3	43	4.1	32	<2,5	<2,5	<2,5	<2,5			
			02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			56	5.5	31	<1	<1	<1	<1			
			06	5.2	31	<,6	<,6	<,6	<,6			
			44	4.1	32	0,4	0,3	0,3	<,3	0,33	0,058	17,321
			48	4.1	35	0,2628	0,2676	0,2598	0,2666	0,26	0,004	1,358
			47	4.1	32	0,29	0,27	0,3	0,31	0,29	0,017	5,839
			08	6.3	32	0,346	0,292	0,316	0,354	0,33	0,028	8,714
			50	4.1	31	0,473	0,385	0,359	0,446	0,42	0,053	12,696
			09	5.5	31	0,455	0,547	0,53	0,511	0,51	0,040	7,826
			23	3.9	31	0,59	0,57	0,51	0,47	0,54	0,055	10,295
			18	3.31	31	0,5	0,7	0,5	0,6	0,58	0,096	16,651
Cr	(µg/g)	4	43	4.1	32	<2,5	<2,5	<2,5	<2,5			
			02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			56	5.5	31	1,004	<1	1,133	<1	1,07	0,091	8,537
			09	5.5	31	0,486	0,452	0,512	0,467	0,48	0,026	5,402
			08	6.3	32	0,862	0,869	0,842	0,829	0,85	0,018	2,156
			23	3.9	31	0,62	0,79	0,89	1,14	0,86	0,217	25,280
			06	5.2	31	1,09	1,18	1,05	1,1	1,11	0,054	4,929
			48	4.1	35	1,142	1,19	1,168	1,086	1,15	0,045	3,912
			47	4.1	32	1,16	1,19	1,13	1,13	1,15	0,029	2,492
			44	4.1	32	1,1	1,2	1,1	1,4	1,20	0,141	11,785

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Cr	(µg/g)	4	50	4.1	31	1,24	1,29	1,24	1,39	1,29	0,071	5,481
			18	3.31	31	1,6	1,1	1,4	1,4	1,38	0,206	14,993
F	(µg/g)	1	03	7.1	72.2	6,2	6,4	5,8	5,3	5,93	0,486	8,196
F	(µg/g)	2	03	7.1	72.2	5,7	5,7	5,6	5,7	5,68	0,050	0,881
F	(µg/g)	3	03	7.1	72.2	5	4,6	4,4	4	4,50	0,416	9,252
F	(µg/g)	4	03	7.1	72.2	3,7	3,7	3,7	4	3,78	0,150	3,974
Hg	(ng/g)	1	25	6	90	22,1	21,8	21,3	20,9	21,53	0,532	2,469
Hg	(ng/g)	2	25	6	90	42,4	41,3	42,6	40,9	41,80	0,829	1,982
Hg	(ng/g)	3	25	6	90	20,7	19,8	21	20,5	20,50	0,510	2,487
Hg	(ng/g)	4	25	6	90	77,2	76,5	76	76,9	76,65	0,520	0,678
Li	(µg/g)	1	02	5.3	31	<,4	<,4	<,4	<,4			
Li	(µg/g)	2	02	5.3	31	<,4	<,4	<,4	<,4			
Li	(µg/g)	3	02	5.3	31	<,4	<,4	<,4	<,4			
Li	(µg/g)	4	02	5.3	31	<,4	<,4	<,4	<,4			
Mo	(µg/g)	1	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,4	<,4	<,4	<,4			
			08	6.3	32	<,1	<,1	<,1	<,1			
			48	4.1	35	0,0688	0,069	0,0669	0,066	0,07	0,001	2,163
			23	3.9	31	0,32	0,29	0,3	0,29	0,30	0,014	4,714
Mo	(µg/g)	2	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	0,5	<,4	<,4	<,4			
			48	4.1	35	0,4416	0,4305	0,4405	0,4285	0,44	0,007	1,547
			08	6.3	32	0,637	0,55	0,533	0,592	0,58	0,046	8,045
			23	3.9	31	0,65	0,71	0,52	0,51	0,60	0,098	16,476
Mo	(µg/g)	3	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,4	<,4	<,4	<,4			
			08	6.3	32	<,1	<,1	<,1	<,1			
			48	4.1	35	0,0683	0,0661	0,0659	0,0626	0,07	0,002	3,576
			23	3.9	31	0,27	0,61	0,64	0,24	0,44	0,214	48,709

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Mo	(µg/g)	4	06	5.2	31	<1,2	<1,2	<1,2	<1,2			
			02	5.3	31	<,4	<,4	<,4	<,4			
			08	6.3	32	0,18	0,207	0,154	<,1	0,18	0,027	14,696
			48	4.1	35	0,1536	0,1633	0,1632	0,1666	0,16	0,006	3,470
			23	3.9	31	0,44	1,18	1,1	0,47	0,80	0,397	49,783
Na	(µg/g)	1	06	5.2	31	8,1	9,48	7,25	7,68	8,13	0,966	11,887
			50	4.1	31	9,21	11,04	10,74	10,69	10,42	0,821	7,882
			42	4.1	31	14	10	9	9	10,50	2,380	22,671
			47	4.1	32	11,41	12,02	12,66	12,62	12,18	0,589	4,841
			02	5.3	31	36,9	16,2	16,3	19,4	22,20	9,912	44,648
			27	6.5	21.1	30,3996	36,7995	33,0662	34,1328	33,60	2,649	7,883
			23	3.9	31	35,12	47,07	44,8	37,51	41,13	5,715	13,896
			25	4.1	31	48,7	49,7	48,5	49,2	49,03	0,538	1,097
			08	6.3	31	55,7	46,1	66,3	66,2	58,58	9,690	16,543
			26	5.5	35	66	67,4	56	63	63,10	5,077	8,046
			09	5.5	31	79,4	71,6	91,3	90,7	83,25	9,502	11,414
			05	3.3	21.1	100	100	190	180	142,50	49,244	34,557
Na	(µg/g)	2	50	4.1	31	16,2	15,52	16,74	15,92	16,10	0,513	3,185
			47	4.1	32	18,47	18,9	19,41	19,43	19,05	0,459	2,411
			06	5.2	31	19,48	19,05	19,09	19,21	19,21	0,194	1,010
			42	4.1	31	19	20	20	19	19,50	0,577	2,961
			02	5.3	31	30,3	27,3	31	34,8	30,85	3,084	9,996
			23	3.9	31	42,85	41,34	39,08	34,67	39,49	3,564	9,027
			08	6.3	31	59,7	48,6	60,2	56,9	56,35	5,367	9,524
			25	4.1	31	67,2	63,2	62,9	65,8	64,78	2,076	3,205
			09	5.5	31	80,2	76,6	80,9	79,6	79,33	1,893	2,386
			27	6.5	21.1	111,2282	116,5247	113,3468	114,4061	113,88	2,205	1,936
			26	5.5	35	135	130	115	127	126,75	8,500	6,706
			05	3.3	21.1	220	125	195	200	185,00	41,433	22,396

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Na	(µg/g)	3	50	4.1	31	10,65	10,52	10,53	10,8	10,63	0,131	1,231
			42	4.1	31	12	13	12	12	12,25	0,500	4,082
			47	4.1	32	12,3	12,58	12,26	12,16	12,33	0,180	1,460
			06	5.2	31	12,24	12,61	12,36	12,4	12,40	0,154	1,243
			02	5.3	31	38	17	12,5	14,5	20,50	11,811	57,615
			23	3.9	31	36,83	51,38	50,56	57,15	48,98	8,614	17,588
			25	4.1	31	54,8	56,8	55,7	57,3	56,15	1,121	1,996
			08	6.3	31	55,1	55,9	68,9	56,4	59,08	6,572	11,125
			26	5.5	35	55	63,6	61,4	60	60,00	3,648	6,080
			27	6.5	21.1	76,8722	80,6616	71,4586	76,3308	76,33	3,777	4,948
			09	5.5	31	108,2	66,08	100,4	109,2	95,97	20,311	21,164
			05	3.3	21.1	195	185	170	185	183,75	10,308	5,610
Na	(µg/g)	4	50	4.1	31	7,23	8,63	7,31	7,69	7,72	0,642	8,323
			47	4.1	32	10,19	10,64	10,54	10,43	10,45	0,193	1,851
			42	4.1	31	12	10	10	10	10,50	1,000	9,524
			06	5.2	31	10,37	12,55	10,92	10,65	11,12	0,978	8,791
			02	5.3	31	15,3	14,6	24,2	16	17,53	4,487	25,601
			08	6.3	31	50,1	25,9	24,8	26,9	31,93	12,147	38,048
			23	3.9	31	35,63	44	38,81	43,4	40,46	3,968	9,806
			25	4.1	31	48,7	49,7	48,5	49,2	49,03	0,538	1,097
			26	5.5	35	58,4	60	50,8	56,4	56,40	4,013	7,116
			09	5.5	31	114,6	131,1	101,7	131,2	119,65	14,285	11,939
			27	6.5	21.1	125,5059	130,8694	121,2151	126,5786	126,04	3,966	3,146
			05	3.3	21.1	250	310	310	250	280,00	34,641	12,372
Ni	(µg/g)	1	23	3.9	31	3,66	3,81	3,79	3,76	3,76	0,067	1,773
			02	5.3	31	4,2	4,3	4,2	4,2	4,23	0,050	1,183
			50	4.1	31	4,62	4,69	4,87	5,02	4,80	0,181	3,762
			08	6.3	32	5,33	5,21	5,18	4,99	5,18	0,141	2,719
			48	4.1	35	5,202	5,189	5,185	5,206	5,20	0,010	0,194

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ni	(µg/g)	1	18	3.31	31	5,23	5,44	5,01	5,23	5,23	0,176	3,359
			06	5.2	31	5,36	5,3	5,16	5,27	5,27	0,084	1,590
			56	5.5	31	5,523	5,407	5,332	4,949	5,30	0,249	4,688
			44	4.1	32	5,5	5,3	5,4	5,4	5,40	0,082	1,512
			09	5.5	31	5,33	5,75	5,14	6,02	5,56	0,399	7,172
			47	4.1	32	5,56	5,63	5,62	5,58	5,60	0,033	0,590
Ni	(µg/g)	2	02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			23	3.9	31	1,54	1,4	1,21	0,97	1,28	0,247	19,295
			09	5.5	31	1,07	1,3	1,49	1,33	1,30	0,173	13,340
			56	5.5	31	1,473	1,446	1,59	1,417	1,48	0,076	5,121
			50	4.1	31	1,46	1,55	1,48	1,44	1,48	0,048	3,229
			48	4.1	35	1,591	1,62	1,627	1,618	1,61	0,016	0,980
			18	3.31	31	1,7	1,74	1,76	1,73	1,73	0,025	1,443
			44	4.1	32	1,6	1,7	2	1,7	1,75	0,173	9,897
			47	4.1	32	1,77	1,78	1,73	1,77	1,76	0,022	1,258
			08	6.3	32	1,78	1,87	1,85	1,75	1,81	0,057	3,133
			06	5.2	31	1,85	1,81	2,25	1,83	1,94	0,211	10,885
Ni	(µg/g)	3	02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			56	5.5	31	<1	<1	<1	<1			
			06	5.2	31	<,9	<,9	<,9	<,9			
			09	5.5	31	<,9	<,9	<,9	<,9			
			44	4.1	32	0,4	0,4	0,3	0,4	0,38	0,050	13,333
			08	6.3	32	0,402	0,399	0,347	0,482	0,41	0,056	13,673
			50	4.1	31	0,385	0,415	0,448	0,398	0,41	0,027	6,624
			48	4.1	35	0,4048	0,5059	0,3976	0,4124	0,43	0,051	11,819
			47	4.1	32	0,46	0,38	0,48	0,45	0,44	0,043	9,829
			23	3.9	31	0,52	0,8	0,64	0,85	0,70	0,151	21,506
			18	3.31	31	1,21	0,5	0,7	0,8	0,80	0,299	37,250
Ni	(µg/g)	4	02	5.3	31	<1,1	<1,1	<1,1	<1,1			

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Ni	(µg/g)	4	06	5.2	31	1,12	1,27	1,12	1,17	1,17	0,071	6,044
			08	6.3	32	1,05	1,37	1,23	1,09	1,19	0,145	12,277
			56	5.5	31	1,364	1,113	1,314	1,001	1,20	0,170	14,219
			09	5.5	31	1,21	1,26	1,3	1,18	1,24	0,053	4,295
			47	4.1	32	1,37	1,29	1,3	1,23	1,30	0,057	4,422
			50	4.1	31	1,26	1,37	1,31	1,39	1,33	0,059	4,435
			48	4.1	35	1,379	1,36	1,361	1,34	1,36	0,016	1,172
			18	3.31	31	1,35	1,18	1,62	1,38	1,38	0,181	13,105
			44	4.1	32	1,5	1,5	1,3	1,3	1,40	0,115	8,248
			23	3.9	31	1,43	1,55	1,56	1,13	1,42	0,201	14,149
Rb	(µg/g)	1	48	4.1	35	18,02	18,14	18,07	18,05	18,07	0,051	0,282
Rb	(µg/g)	2	48	4.1	35	1,126	1,101	1,12	1,127	1,12	0,012	1,079
Rb	(µg/g)	3	48	4.1	35	10,99	10,87	10,87	10,88	10,90	0,059	0,537
Rb	(µg/g)	4	48	4.1	35	5,076	5,068	5,029	5,071	5,06	0,022	0,427
Se	(µg/g)	1	02	5.3	31	<2,2	<2,2	<2,2	<2,2			
			48	4.1	35	<1	<1	<1	<1			
			23	3.9	31	1,14	1,27	1,22	1,34	1,24	0,084	6,778
Se	(µg/g)	2	02	5.3	31	<2,2	<2,2	<2,2	<2,2			
			48	4.1	35	<1	<1	<1	<1			
			23	3.9	31	1,28	1,7	0,99	0,67	1,16	0,438	37,741
Se	(µg/g)	3	48	4.1	35	<1	<1	<1	<1			
			02	5.3	31	2,3	<2,2	2,5	<2,2	2,40	0,141	5,893
			23	3.9	31	1,89	3,14	3,07	1,19	2,32	0,948	40,822
Se	(µg/g)	4	02	5.3	31	<2,2	<2,2	<2,2	<2,2			
			48	4.1	35	<1	<1	<1	<1			
			23	3.9	31	1,76	4,58	4,47	1,63	3,11	1,635	52,585
Si	(µg/g)	1	04a	9.1	42	630	690	700	640	665,00	35,119	5,281
Si	(µg/g)	2	04a	9.1	42	5050	5120	5170	5030	5092,50	64,485	1,266
Si	(µg/g)	3	04a	9.1	42	11490	10670	11430	10600	11047,50	477,799	4,325

ICP-Forests 6th needle/leaf interlaboratory test 2003/2004

Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Si	(µg/g)	4	04a	9.1	42	10480	10290	10390	10190	10337,50	125,266	1,212
Sr	(µg/g)	1	48	4.1	35	2,939	2,931	2,916	2,955	2,94	0,016	0,554
			02	5.3	31	3,1	3,1	3	3,1	3,08	0,050	1,626
Sr	(µg/g)	2	48	4.1	35	60,57	60,43	60,42	60,69	60,53	0,128	0,212
			02	5.3	31	68,3	67,6	68,2	67,6	67,93	0,377	0,556
Sr	(µg/g)	3	48	4.1	35	13,66	13,77	13,68	13,75	13,72	0,053	0,388
			02	5.3	31	14,6	14,9	14,5	14,7	14,68	0,171	1,164
Sr	(µg/g)	4	48	4.1	35	58,43	58,16	58,1	57,73	58,11	0,288	0,496
			02	5.3	31	64,7	64,1	63,7	63,3	63,95	0,597	0,934
Ti	(µg/g)	1	02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			18	3.31	31	0,7	0,8	0,6	0,7	0,70	0,082	11,664
			48	4.1	35	1,543	1,542	1,561	1,522	1,54	0,016	1,034
Ti	(µg/g)	2	02	5.3	31	2,6	2,8	2,2	2,2	2,45	0,300	12,245
			48	4.1	35	4,89	4,615	4,757	5,041	4,83	0,182	3,776
			18	3.31	31	8,8	8,7	9,1	8,9	8,88	0,171	1,924
Ti	(µg/g)	3	02	5.3	31	<1,1	<1,1	<1,1	<1,1			
			48	4.1	35	4,668	4,919	4,325	4,857	4,69	0,267	5,692
			18	3.31	31	7,1	6,7	7,6	7,1	7,13	0,369	5,173
Ti	(µg/g)	4	02	5.3	31	1,5	1,4	1,3	1,2	1,35	0,129	9,563
			48	4.1	35	5,825	5,734	5,532	5,58	5,67	0,136	2,394
			18	3.31	31	10,9	12,4	13,2	12,2	12,18	0,954	7,832
V	(µg/g)	1	48	4.1	35	0,0435	0,0457	0,0435	0,0439	0,04	0,001	2,379
			02	5.3	31	0,5	0,6	0,5	0,5	0,53	0,050	9,524
V	(µg/g)	2	48	4.1	35	0,319	0,3074	0,3152	0,3102	0,31	0,005	1,650
			02	5.3	31	0,6	0,6	0,7	0,6	0,63	0,050	8,000
V	(µg/g)	3	48	4.1	35	0,17	0,1741	0,1771	0,1692	0,17	0,004	2,137
			02	5.3	31	<,2	0,4	0,4	0,3	0,37	0,058	15,746
V	(µg/g)	4	02	5.3	31	0,3	<,2	0,3	0,3	0,30	0,000	0,000
			48	4.1	35	0,2697	0,2777	0,2638	0,2652	0,27	0,006	2,327

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Additional parameters

Element	Unit	Sample no.	Lab no.	Methode code		Replicates				Mean	Si	Vi
				P	D	1	2	3	4			
Y	(µg/g)	1	02	5.3	31	<,1	<,1	<,1	<,1			
Y	(µg/g)	2	02	5.3	31	<,1	<,1	<,1	<,1			
Y	(µg/g)	3	02	5.3	31	0,2	0,2	0,2	0,2	0,20	0,000	0,000
Y	(µg/g)	4	02	5.3	31	0,6	0,6	0,6	0,6	0,60	0,000	0,000