



# Needle/Leaf Interlaboratory Comparison Tests and the Status of the Laboratory Qualification within FutMon

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Combined FutMon/ICP Forests Expert Meeting  
Tampere/Finland

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# 11<sup>th</sup> Needle/Leaf Interlaboratory Test 2008-2009

- **Samples**

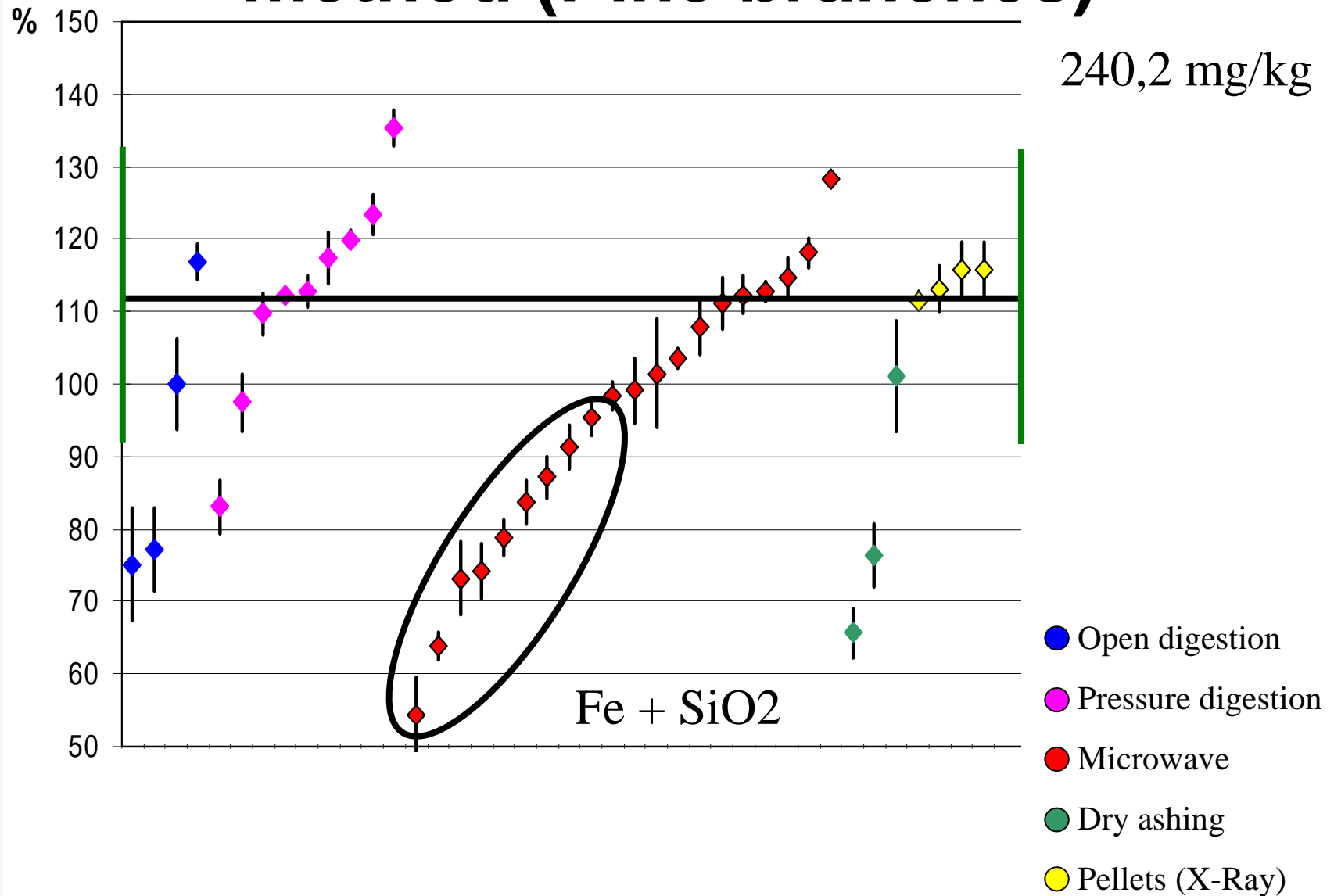
- Litterfall: **Pine branches** (Finland)
- Foliage: **Pine - *Pinus brutia*** (Turkey)
- Foliage: **Maple leaves** (Austria)
- Foliage: **Spruce needles** (Finland)

- **Qualification Reports February 2009**

- **Requalification till October 2009**



# Iron – Influence of the digestion method (Pine branches)



# Feedback from the laboratories - Reasons for wrong results

- New instrument / methodic problem (4 labs)
- Too small sample weight for element-analyzer  
→ „wrong“ instrumentation (2 labs)
- Old instrumentation (2 labs)
- Wrong calibration (4 labs)
- No reason found (3 labs)
- Wrong blanks / contamination (3 labs)
- Submit results in wrong units (5 labs)
- Wrong / no moisture correction (5 labs)



# 12<sup>th</sup> Needle/Leaf Interlaboratory Test 2009-2010

- **Samples**

- Foliage: **Spruce Needles** (Finland)
- Foliage: **Oak Leaves** (France)
- Ground veg.: **Bears garlic** (Switzerland)
- Foliage: **Spruce needles** (Austria)

- **Qualification Reports February 2010**

- **Requalification till 1<sup>st</sup> October 2010**



# 12<sup>th</sup> Test mandatory parameters

Element	Unit	Spruce needles	Oak leaves	<i><b>Bears garlic</b></i>	Spruce needles
N	mg/g	12.82	9.56	<b>49.64</b>	11.85
S	mg/g	0.96	0.89	<b>11.66</b>	0.89
P	mg/g	1.70	0.48	3.80	1.24
Ca	mg/g	2.34	10.30	5.86	12.33
Mg	mg/g	1.23	1.16	2.20	0.77
K	mg/g	5.78	2.92	<b>15.16</b>	6.07

# 12<sup>th</sup> Test mandatory parameters

Element	Wrong results	Spruce needles	Oak leaves	<i>Bears garlic</i>	Spruce needles
N	%	5.66	11.32	<b>7.55</b>	5.66
S	%	12.00	14.00	<b>22.00</b>	18.00
P	%	13.21	15.09	13.21	13.21
Ca	%	12.96	11.11	11.11	3.70
Mg	%	11.11	18.52	18.52	9.26
K	%	5.55	7.41	<b>7.41</b>	3.70



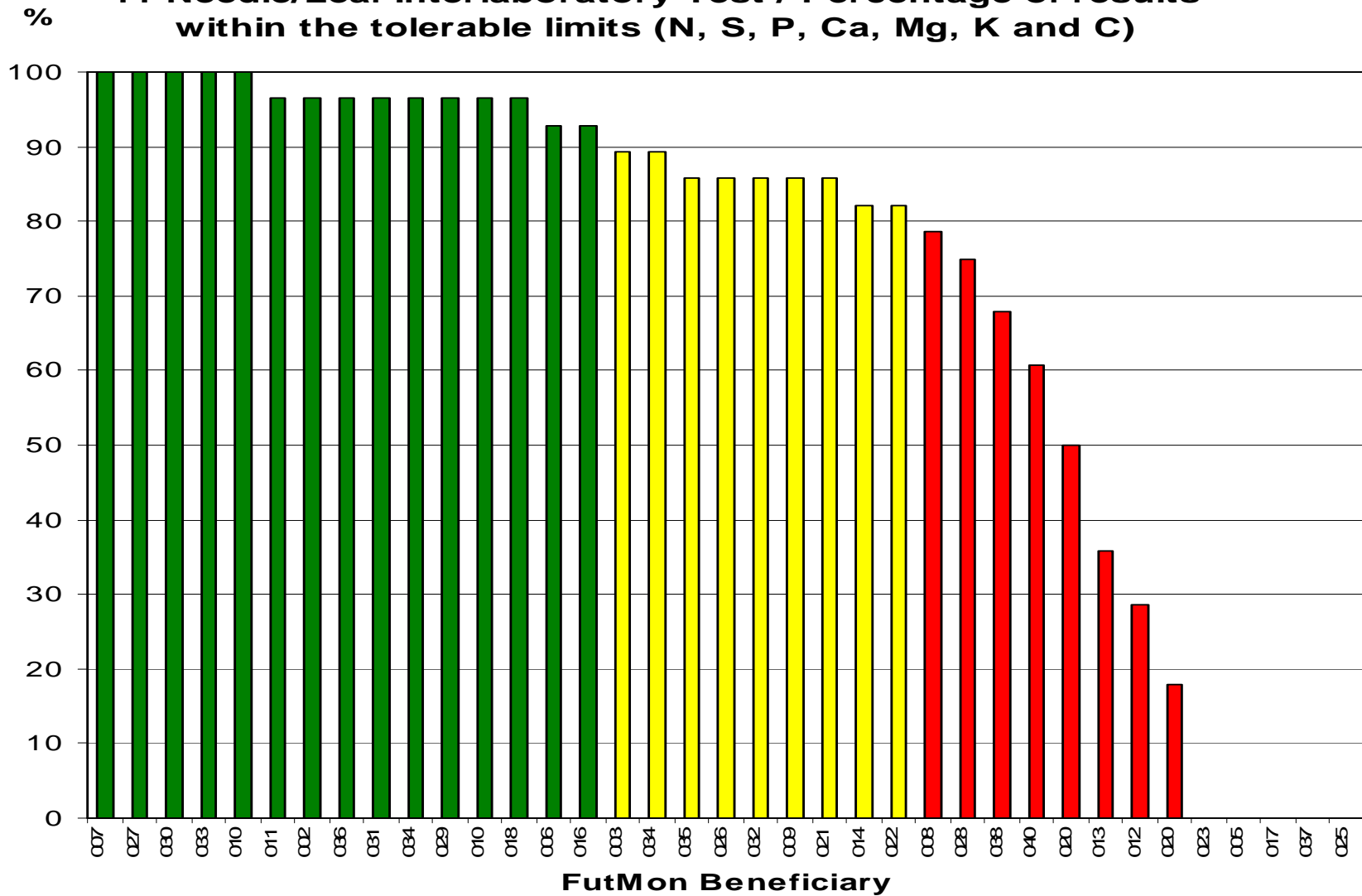
# Ringtest samples are needed!

- **Non-foliage litterfall** (dried, ground & homogenized)
- **Ground vegetation** (dried, if possible ground & homogenized)
- **Foliage samples** (dried, if possible ground & homogenized)
  
- **Minimum 4 kg dry weight**
  
- **Contact: [alfred.fuerst@bfw.gv.at](mailto:alfred.fuerst@bfw.gv.at)**





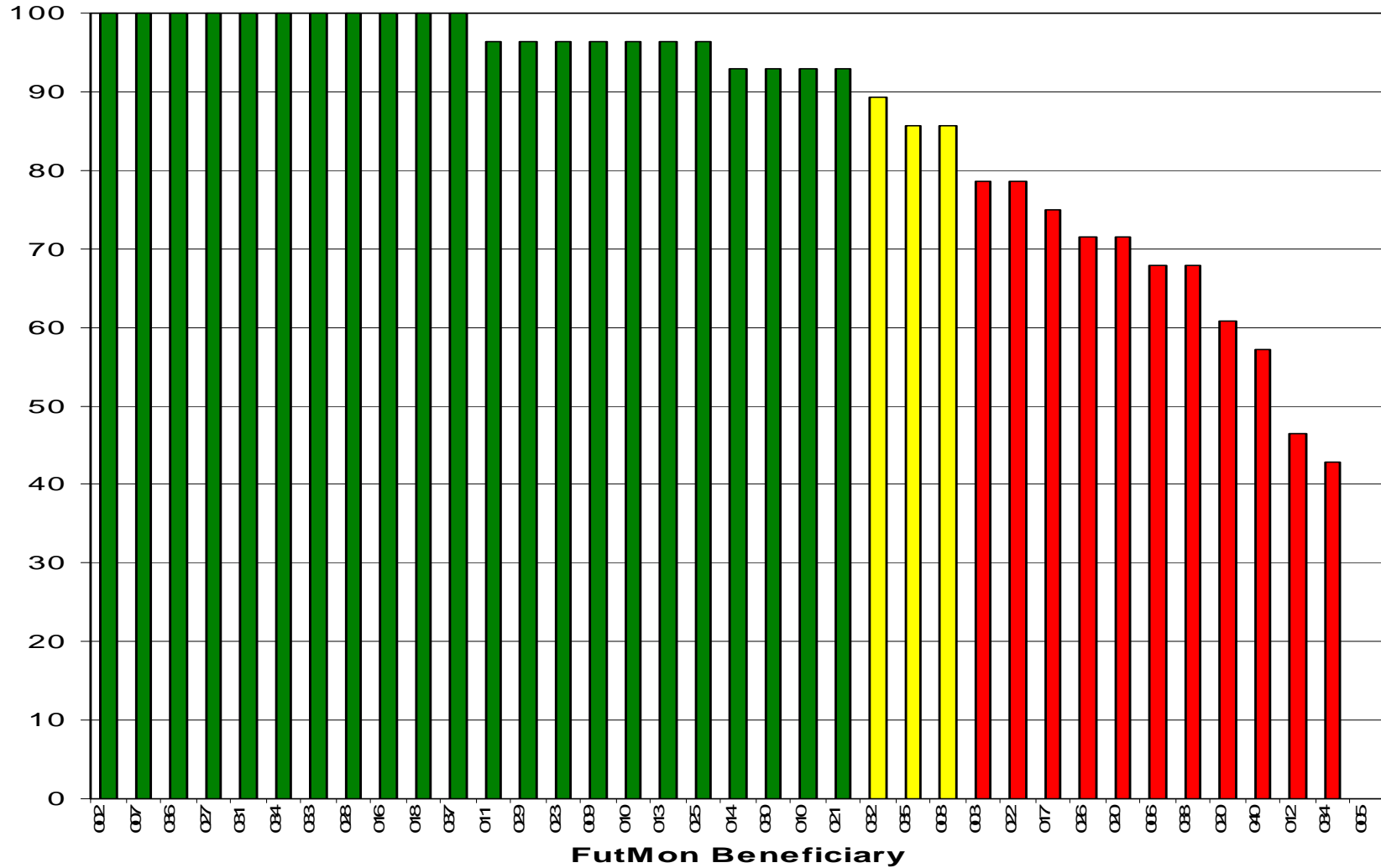
**11 Needle/Leaf Interlaboratory Test / Percentage of results within the tolerable limits (N, S, P, Ca, Mg, K and C)**



**71.4%**



**% 12 Needle/Leaf Interlaboratory Test / Percentage of results within the tolerable limits (N, S, P, Ca, Mg, K and C)**



**84.5%**



# 12th Test / Qualification Status of the FutMon labs

FutMon Beneficiary	Lab-code	Country	N	S	P	Ca	Mg	K	C
003	F03	Belgium/Fl.				>>		<>>	<
005	F29	Bulgaria	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
006	F04	Cyprus	<		<<	<	<<<	<	<
035	A58	Germany		>>>		<			
034	F10	Germany	n.a.	n.a.	n.a.				n.a.
032	F13	Germany					>>>		
012	A43	Greece		n.a.	<		<<<	<<<	n.a.
040	F22	Italy		>>>>	<<<<<	>	>>	<	
038	F24	Latvia			<>	>>>	>>>	<	
017	F30	Netherlands		>>>					n.a.
020	F26	Romania	>	>>	>>				<<<
022	F27	Slovenia		<>>>				<<	
026	A61	United Kingdom	<>>>	n.a.					

- = qualification failed in both tests
- = qualification failed in the 12th Test
- = qualified in the 12th test
- n.a. = not analyzed

# FutMon Beneficiary 012 (Greece – Lab Code A43)

Ringtest Number	N	S	P	Ca	Mg	K	C
8	>		>>>>			>>	n.a.
9					>		n.a.
10	<	n.a.	<	>>>		>>	n.a.
11		n.a.*)	<<	>>>>	<<<	>>>	n.a.*)
12		n.a.*)	<		<<<	<<<	n.a.*)

\*) will be analyzed from another FutMon laboratory in future

# FutMon Beneficiary 040 (Italy – Lab Code F22)

Ringtest Number	N	S	P	Ca	Mg	K	C
8			n.a.	n.a.	n.a.	n.a.	
9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
10			n.a.	<>	<<	<<<	
11	<	>	<<<	<<<	<<<		
12		>>>>	<<<<	>	>>	<	

Participating in the foliage laboratory helping programme 2007

# FutMon Beneficiary 020 (Romania – Lab Code F26)

Ringtest Number	N	S	P	Ca	Mg	K	C
8		<<<<		<<	>>>		n.a.
9	<<<	<<<<	<<<	<<<	<>>	>>>>	n.a.
10		>>	<<	<<<<	>>>	<<<<	n.a.
11	>>>>	>>>>	>>>>	<<<	<<<>	<<>>	n.a.
12	>	>>	>>				<<<

Participate in the QA/QC laboratory helping programme now

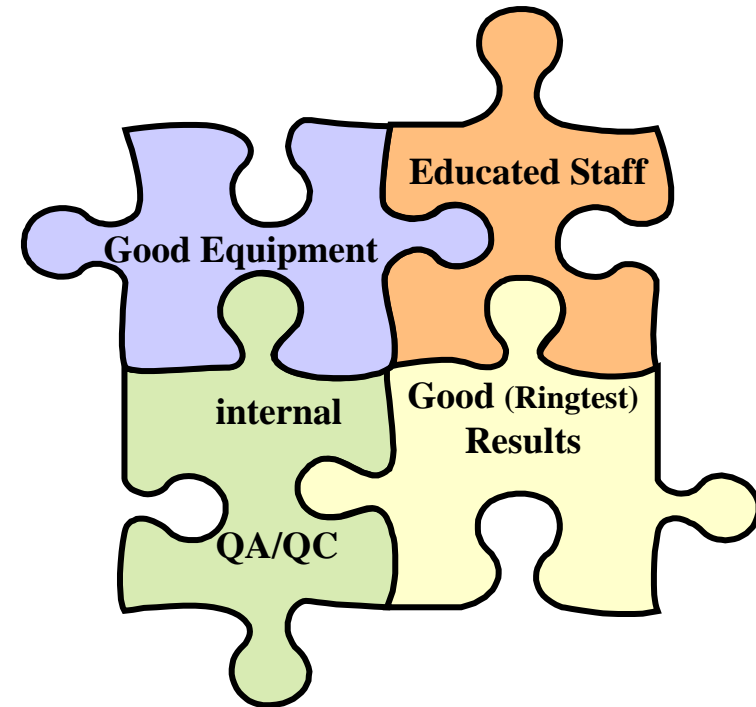


# FutMon Beneficiary 030 (Germany – Lab Code F12)

Ringtest Number	N	S	P	Ca	Mg	K	C
8							
9	>						
10	>						
11							
12	>>						



- **Validated methods**
- **Internal QC system in routine operation**



*“An unexpected poor result in a ringtest points to inadequacy in either the method validation or the internal QC or, most likely, in both.”*

# 12th Needle/Leaf Interlaboratory Test / Qualification

- Qualification Reports submitted in February 2010
- Re-qualification only possible till **1<sup>st</sup> of October 2010**
- ***Laboratory Helping Programme***  
(→ [nils.koenig@nw-fva.de](mailto:nils.koenig@nw-fva.de))



# Thank you for your attention!

