

**QC/QA progress in the
Expert Panel Foliage
(and in the foliage laboratories)
1993-2007**

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BFW – Forest Foliar Coordinating Centre/EP-Foliage

Sampling period for foliage

- **Level I** 1995 - or better from 1987 till 1995 data collection was done by FFCC
- **Level II** every two years (1995, 1997, 1999, 2001, 2003, 2005) data collection was/is done by FIMCII, PCC and/or EC-JRC



Sampling period in the year

- Deciduous species (+ larch): second half of the growing season
 - Evergreen species: dormanic period
- Analytical work will start usually in winter/spring



Interlaboratory test programme I

Every two years in winter, because of the sampling period for level II (Task to LUA/NRW Mr. Bartels):

- 1st Test 1993/1994 (EC/ICP-Forests)
- 2nd Test 1995/1996 (EC/ICP-Forests)
- 3rd Test 1997/1998 (EC/ICP-Forests)
- 4th Test 1999/2000 (EC/ICP-Forests)
- 5th Test 2001/2002 (EC/ICP-Forests)



Interlaboratory test programme II

Every year, because of the sampling period **and** to support the labs too (Task to FFCC/Mr. Fürst):

- **6th Test 2003/2004 (no cofinancing)**
- 7th Test 2004/2005 (FFCC/via Metla)
- **8th Test 2005/2006 (national programme)**
- 9th Test 2006/2007 (FFCC/via Metla)
- 10th Test 2007/2008 (participation fee)



QC/QA actions in EP-Foliage I

- **1st EP- Foliage Meeting** / As 1993: Start of the **Interlaboratory Test Programme**
- **2nd EP- Foliage Meeting** / As – March 1994: **target quality limits** for interlaboratory test results for **mandatory** parameters (N, P, K, Ca, Mg, S) where discussed



Tolerable limits I

Test	mandatory Parameters					
	N	S	P	Ca	Mg	K
2nd	15%	20%	15%	15%	15%	15%
3rd						
4th	10%					
5th						
6th						
7th						
8th						
9th or 10th	7%	15%	10%	10%	10%	10%



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QC/QA actions in EP-Foliage II

- **3rd EP- Foliage Meeting** / Vienna November
 - 1995 quality limits for interlaboratory test results for **mandatory** parameters (N, P, K, Ca, Mg, S) were adopted (*but too late for the level I- foliage survey....*)
- **4th EP- Foliage Meeting** / Vienna February 1997
 - tolerable quality limits for interlaboratory test results for **optional** and **additional** parameters (Na,Zn,Mn,Fe,Cu,Pb,Al,B,Cd,C) were adopted
 - Discussion about “*preferred*” methods for each element



QC/QA actions in EP-Foliage III

- **5th EP- Foliage Meeting** / Vienna October 1998:
 - dry digestion methods are not longer recommended, because of element losses and contamination risks
 - revision of the analytical part in the Manual should be done
- **6th EP-Foliage Meeting** / Bonn December 1999:
 - decrease of tolerable limits for N (10%) and C (5%)
 - mandate for **updating the manual** especially the chemical/analytical part – finished and was updated 05/2000



QC/QA actions in EP-Foliage IV

- **7th EP-Foliage Meeting** / Tampere September 2001:
 - **dropped Na and Al** from the optional parameter list, because of analytical problems
 - clear recommendation for element analyzers and closed digestion with HNO₃/ICP methods **BUT** countries which are unable to follow this recommendation are allowed to use other methods as described in the ICP Forest Manual
- **8th EP-Foliage Meeting** / Prague April 2003:
 - decrease of tolerable limits for Zn and Mn (15%) and Cu (20%)
 - **Task for FFCC to organize future ringtests** (web-interface, faster evaluation, annual repetition)
 - Recommendation to the NFCs (*local* reference sample material used for control charts), first ideas to QC/QA in foliage sampling



Tolerable limits I

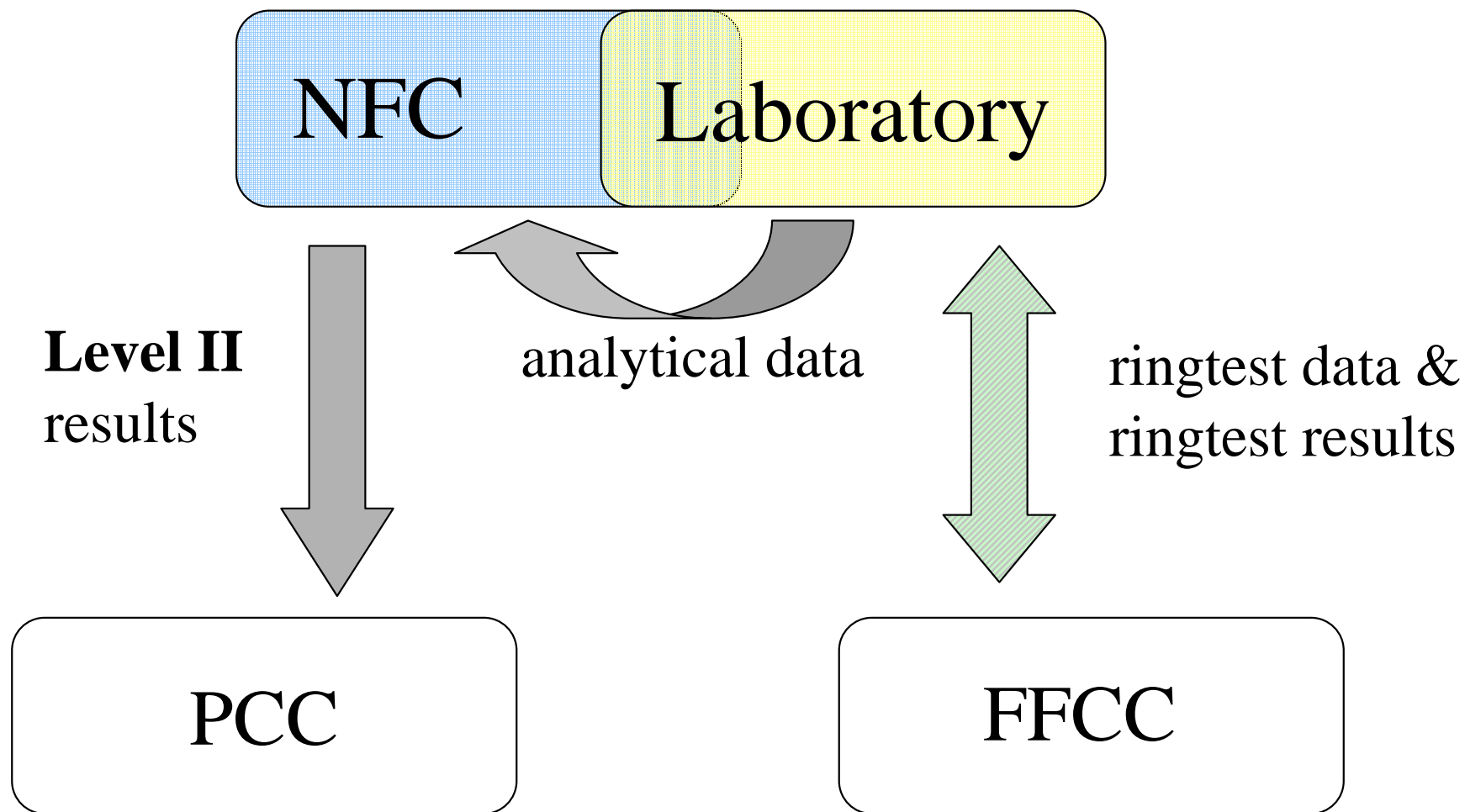
Test	optional Parameters									
	Na	Zn	Mn	Fe	Cu	Pb	Al	B	Cd	C
2nd										
3rd	30%	20%	20%	20%	30%	30%	20%	20%	30%	10%
4th										5%
5th	drop						drop		add	add
6th		15%	15%		20%					



QC/QA actions in EP-Foliage V

- **9th EP-Foliage Meeting** / Dublin June 2005
 - **QC/QA information** of the interlaboratory test programme, will be submitted to **ICP-Forests** (labcode/number of outliers)
 - Updated submission forms for chemical parameters (*.FOM and *.FOO) with laboratory codenumbers
 - **Link between the interlaboratory test programme and the submitted parameters**
 - Task to FFCC to start with a laboratory support programme (training course or direct laboratory visits)
 - **Connections between data quality and trend detection** – “better data quality - save time and money” (Mika Sulkava)



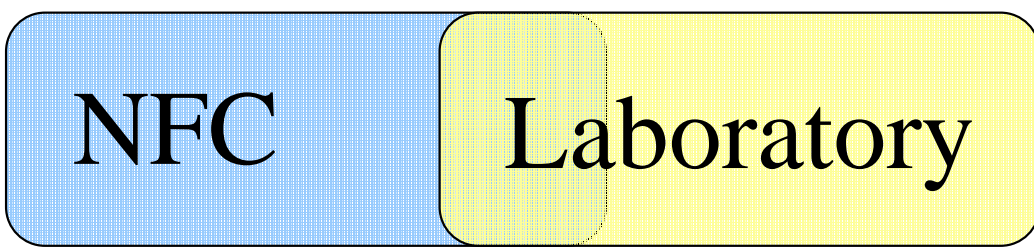


No QC/QA Information

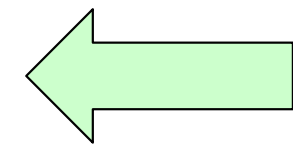
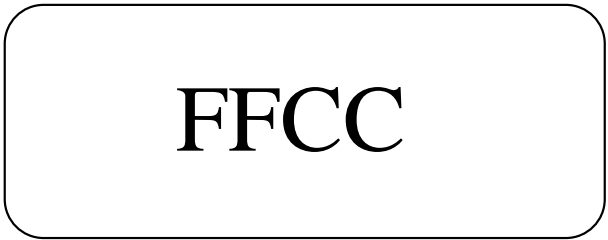
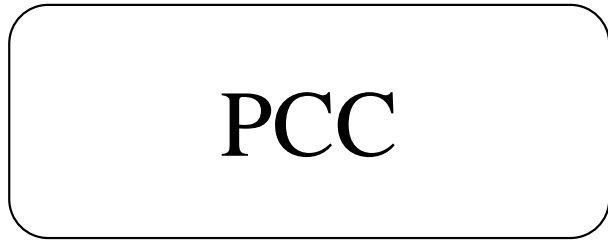
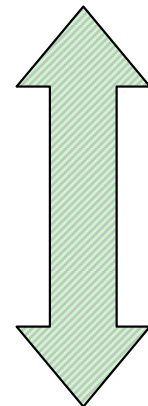
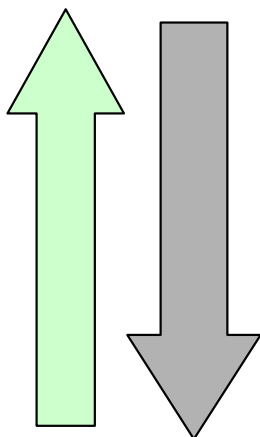


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actions for improvement



Reaction in case of bad data quality



QC/QA Information



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Planned QC/QA actions

- *Task at the 10th EP-Foliage Meeting / Madrid April 2007*
 - *Decrease of tolerable limits for mandatory parameters (N, P, K, Ca, Mg and S)*
 - *FFCC offers Reference samples (spruce and maple) for QC/QC issues*
 - *Financing of the interlaboratory test programme and the lab support*

