

## **Minutes**

### **from Second meeting of Expert Panel on Foliar Analysis in cooperation with the EU Ås, Norway, 8 - 9 March 1994**

31 delegates from 19 ICP countries, PCC-East, PCC-West, and EU were present at the meeting (Annex 1). The manual for foliar analysis was accepted by the Task Force meeting in Budapest 1993, and EU-Regulations are also made for EU-member states. The aim of this 2'nd meeting of the Expert Panel was to continue the preparation of a foliar sampling and analysis on levels 1 and 2 plots.

23 laboratories from 21 countries have participated in a ringtest based on two samples (beech leaves and spruce needles), with certificated values for the content of several elements prepared by BCR. The results from the ringtest was discussed, and recommendations for future ringtests was agreed upon. (See Recommendations 1 and Annex 2).

Foliar sampling on level 1, which is optional, is foreseen by many of the countries by 1995 on approximately 2000 plots, but a number of the countries have not yet reached a decision (See Annex 3).

Discussion and recommendations were also made concerning: the year of sampling, species list, washing of foliage before analysis, practical ways of sampling, denotion of crown condition and symptoms of sampled trees, as well as data submission, storage, validation and evaluation (See Recommendations 2-8 and 10-12, and Annexes 4, 5 and 7).

Common guidelines for deficiency, optimal and excess content of elements in the foliage would be helpful for interpretation of the forecoming results from the foliage analysis. A lot of the delegates contributed with their experiences and/or literature references to this subject. This is stored by the chairman, for evt. further use. It was not possible to reach an agreement of defined levels of elements (See Recommendations 9 and Annex 6).

## **Recommendations**

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**1. Laboratories test.** Foliar analysis should be controlled by including test samples together with the regular samples analysed. The control shall be done in the form of a ringtest with uncertified samples. As a guideline for the quality of laboratory results, values should not deviate more than 10% for N, P, Ca, Mg and K, and not more than 15% for S (See Annex 2).

### **2. Year of sampling.**

2.1. The countries agreed to execute foliar sampling on level 2 in summer 1995 (broadleaves and larix), or the winter 1995/96 (conifers). A reservation was made by Italy.

2.2. The countries participating in foliage survey on level 1, shall submit the analysis results before 30 June 1996. Foliage data which were collected before 1994, but after January 1990 could also be transmitted if the methods as described in the manual have been applied.

**3. Species list.** The panel agreed to the 58 species on the species list for levels 1 and 2 (See Annex 4).

**4. Washing of needles and leaves.** It is recommended that a literature review on the effects of washing on foliar chemical composition is undertaken, prior to needle samples being washed routinely. After discussion in the panel, Finland and Slovakia were asked to investigate the effects of washing before analysis, by means of a literature study.

### **5. Amendments of the manual.**

5.1. re: 2.3 Number of trees to be sampled and analysed (level 1)

The composite sample shall be made by mixing equal quantities of each tree sample after drying.

5.2. re: 2.4 Selection of the sample trees

Replace last indent with: The trees are representative of the sanitary status of the plot.

5.3. re: 3.3.2 Methods of digestion. Dry ashing. B3: Combustion in a Schöniger flask, a closed flask in which plant powder is burnt in O<sub>2</sub> atmosphere and directly dissolved in acidic or alkaline solution.

**6. Practical ways of sampling.** Various methods were presented and discussed. It is recommended that an overview of the sampling methods, actually being used, is added as an annex to the manual (See Annex 5).

### **7. Crown condition assessments**

Crown condition should be assessed for trees used for foliar sampling.

### **8. Symptoms**

It is recommended that symptoms in the foliage of sample trees are recorded in the field, and that guidelines for the symptom description are developed.

### **9. Levels of nutrition.**

Interpretation of the forest foliage data should be done with regard to present knowledge about optimal, deficient and excess concentrations of the elements in the foliage. Further work is needed to improve definitions of these, and achieve common guidelines (See Annex 6).

### **10. Data submission**

It was agreed to use the EU forms for reporting foliar analysis data from level 1 and level 2. Minor amendments have to be made to the forms (See Annex 7).

### **11. Storage, validation and evaluation (level 1)**

It was agreed that a Coordinating Centre for Forest Foliage data (FFCC) need to be installed to store, validate and evaluate the data of the level 1 plots. This centre should keep a common data base on forest foliage data for the EU and the ICP countries. The mandate for the centre should be decided by the Task Force. The chairman will prepare a proposal for this mandate.

### **12. Storage, validation and evaluation (level 2)**

A proposal for the storage , validation and evaluation at national and international level was presented, including a proposal for the protocol. The non EU countries should be included in the system offered by the EU.

## Annexes

from Second meeting of Expert Panel on Foliar Analysis in cooperation with the EU Ås,  
Norway, 8 - 9 March 1994

### Annex 1.

#### Delegates at the meeting:

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