Quality improvement of the laboratories of the ICP Forests program and the FutMon project

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To improve the comparability and evaluability of the European analytical data of the ICP Forests program and the FutMon project by advancing the quality of the laboratories the Working Group QA/QC in Laboratories was installed within the ICP Forests program.

After several years of work the analytical parts of the ICP Forests manual have been totally revised and unqualified methods have been eliminated. A review of possible checks and other helps for quality assurance and control in laboratories has been compiled and published. Meetings of the heads of the labs have been organized to exchange analytical knowledge and discuss analytical problems and solutions. A helping program for laboratories with problematic ring test results has been organized with bilateral visits of the labs and active help. The use of reference methods, different quality checks like control charts or ion balances and the participation in ring tests has become mandatory within the ICP Forests program and the FutMon project.

The most important step to force quality assurance and control was the introduction of regularly ring tests for water, soil and plant samples. In the meantime 6 soil, 4 water and 12 foliar ring tests have been organized within the ICP Forests program and FutMon project. From the results of these ring tests the development of quality in the labs can be seen. In Fig. 1 the results of the water ring test are mapped. The percentage of results out of the tolerable limits has been reduced over 8 years from 20–60% to 5–30%.

The same trend can be seen for the results of the last 4 soil ring tests in Fig. 2: the coefficient of variation (CV in %) for the results of all participants for the shown parameters lowered over 7 years from 15–65% to 10–35%. For the foliar ring tests (Fig. 3) the trend towards better results reached already in 2005 a level of 3–10% results out of the tolerable limits. It is difficult to improve further beyond this level.

The comparability and quality of the soil analyses are inferior to those of water and plant analyses as supported by the soil ring tests. But also the quality of water analyses can still be improved. Therefore regularly ring tests are still important for the improvement of the quality of analyses in the ICP Forests program.

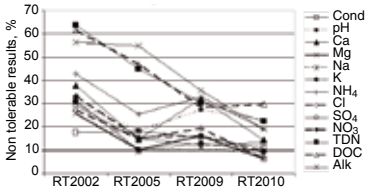

Figure 1. Development of the non tolerable results of the ICP Forests / FutMon water ring tests (RT) 2002–2010 for all evaluated parameters.

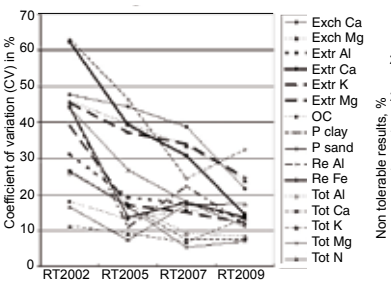

Figure 2. Development of the coefficient of variation (CV, in %) for selected parameters of the ICP Forests/ FutMon soil ring tests (RT) 2002–2009 for all evaluated parameters.

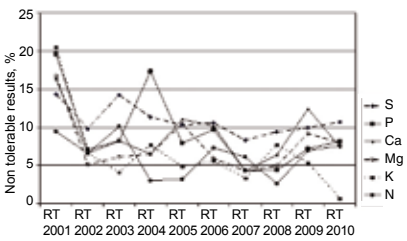

Figure 3. Development of the non tolerable results of the ICP Forests/ FutMon foliar ring tests (RT) 2001–2010.

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