



External Quality Assurance: WEPAL Annual Proficiency Test on Nitrogen-15 and Carbon-13 isotopic abundance in plant materials

Christian Resch (1), Winnie van Vark (2), Roman Gruber (1), Maria Heiling (1), and Gerd Dercon (1)

(1) Soil and Water Management & Crop Nutrition Laboratory, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, International Atomic Energy Agency, Seibersdorf, Austria (ch.resch@iaea.org), (2) WEPAL, Wageningen, The Netherlands

External Quality Assurance: WEPAL Annual Proficiency Test on Nitrogen-15 and Carbon-13 isotopic abundance in plant materials

1 Resch, C., 2 van Vark, W., 1 Gruber, R., Heiling, M., 1 Dercon, G.

1 Soil and Water Management and Crop Nutrition Laboratory (SWMCNL), Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Seibersdorf, Austria

2 WEPAL, Wageningen, The Netherlands

The Wageningen Evaluating Programs for Analytical Laboratories (WEPAL, <http://www.wepal.nl>) is accredited for the organization of Inter-Laboratory Studies by the Dutch Accreditation Council. WEPAL is a world-leading organiser of proficiency testing (PT) programs in the fields plants, soil, sediments and organic waste. They are organising this for over 50 years and currently have over 500 participants in these PT schemes in countries all over the world. A wide variety of samples from the PT programs are also available as reference material. The quarterly proficiency tests cover analytical parameters such as inorganic chemical composition, real totals, acid extractable inorganic composition and stable isotope ratios of nitrogen-15 and carbon-13.

The worldwide comparison of stable nitrogen-15 and carbon-13 isotope measurements provides confidence in the analytical performance of stable isotope laboratories and hence making it an important tool for external quality control.

Since 2008, the Proficiency Test on nitrogen-15 and carbon-13 isotopic abundance in plant materials, organized by the University of Wageningen, the Netherlands, and funded by the SWMCN Laboratory has been implemented yearly.

Every year, one nitrogen-15 -enriched plant test sample, produced at the SWMCN Laboratory, is included in one round of the WEPAL IPE (International Plant-Analytical Exchange) Programme. A special evaluation report for IAEA participants on the analytical performance in stable isotope analysis is issued by the SWMCN Laboratory and sent to the participants together with a certificate of participation additionally to the regular WEPAL evaluation report. The participation fee for one round per year is covered by the IAEA.

Since the start of this annual proficiency test, on average 12 stable isotope laboratories have participated yearly, with minimum 10 and maximum 15 laboratories.

The main lessons learnt from this annual proficiency test on nitrogen-15 and carbon-13 isotopic abundance in plant materials are:

(i) (most of) the results of the IAEA participants are very good comparable; (ii) participants producing poor results improve their performance in the following years; and (iii) basic errors such as mixing up of samples or calculation errors occur regularly.

Through this presentation we aim to increase the visibility of this yearly PT and participation of stable isotope laboratories to assure the quality of nitrogen-15 and carbon-13 stable isotope analysis of plant material across the world. Further information will be provided on the development of stable isotope labelling techniques for producing stable isotope enriched plant test samples.