

Working Group Report - 2018

Working Group on Quality Measurement of Agricultural Products (QMAP)

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SECTION 1 – Details of the membership of the Working Group

1.1 Brief history

In 1996, the 3rd Forum Meeting proposed establishment of a new WG to study rice moisture meters with a coordinator of Australia. In 1997, it was re-established as a WG on Rice Moisture Meters. In 2001, Mr. Issei Akamastu of NMIJ (National Metrology Institute of Japan in AIST) took the chair, then Mr. Hiroshi Kitano (2005-2007) and Dr. Tsuyoshi Matsumoto (after 2007) took over the chair. In 2007, the name of WG was changed as present to cover a wide range of grains. A private company in Japan has supported the chair since its establishment.

This WG has conducted ten training courses on traceability in rice moisture measurement and three workshops on agricultural measurement since 2001. More than 300 participants attended these events. In the recent six years, four large training courses were conducted in

Indonesia (May 2012), Thailand (November 2013), Cambodia (November 2015) and Malaysia (July 2017).

The training courses/workshops until 2009 were supported by the fund of APEC (Asia-Pacific Economic Cooperation). The two training courses in 2012-2013 were supported by the host economies. The courses after 2015 were supported by MEDEA (Metrology: Enabling Developing Economies within Asia) project.

* *'Grains' is used to indicate any target products in general. 'Rice' is used to indicate a narrower target because this WG, which is presently taken responsibility by Japan, has sufficient knowledge/experiences on rice. The WG considers however that WG should target any kinds of grain, which are produced/traded in the APLMF region.*

1.2 Membership

Although there is no explicit membership in this WG, its intended members are the national authorities in legal metrology and/or scientific metrology in the member economies which are producing grains. The members may correspond to the economies which participated in the former training courses, namely, Cambodia, PR China, Chinese Taipei, Indonesia, Rep. Korea, Malaysia, Mongolia, Philippines, Thailand and Vietnam.

SECTION 2 – Key activities of 2017/18

2.1. Training courses on grain / rice moisture measurement

The latest large training course for rice moisture measurement was hosted by NMIM (National Metrology Institute of Malaysia), SIRIM in Malaysia from 17 to 21 July, 2017. Total of 18 trainees plus 8 observers attended this training course from the following ten economies; Bhutan, Cambodia, Indonesia, Malaysia, Mongolia, Myanmar, Nepal, Philippines, Thailand and Vietnam. NMII and Kett Electric Laboratory Co. Ltd. provided four trainers. The training report was provided in the 24th Forum Meeting).

Another small training course for WG on QMAP, was hosted by CBWM (Central Bureau of Weights and Measures) in Thailand from 3 to 6 July 2018. Total 13 trainees plus 13 observers attended this training course from the following four economies; Cambodia, Indonesia, Thailand and Vietnam. CBWM, NMIM (National Metrology Institute of Malaysia), NMII and Kett Electric Laboratory Co. Ltd. provided five trainers. This course was dedicated for transferring of the former chair knowledge and experience to the new chair the new WG members. It composed of following lectures components ; economy report, history/roles of WG, basic understanding of moisture measurement, discussion on future directions and visit to the laboratories in CBWM.

On 23 and 24 October 2018, this WG also had a small meeting at CBWM. WG chair of Thailand, the co-chair of Malaysia, the former chair of Japan, two experts of a manufacture and about 10 local staffs attended this meeting. The participants discussed on; (1) preparation of the large training course in Pattaya in December including confirmation of the schedule, (2) future training courses in 2019-2020 including target samples/properties,

- (3) future directions of WG including transfer to regional levels including ASEAN-ACCSQ and
- (4) WG report for the 25th APLMF Forum Meetings in November..

2.2. APLMF guide document on rice moisture measurement

The WG has provided the second draft of a new *APLMF Guide Document on Rice Moisture Measurement* at the 23rd Forum Meeting. This draft was amended based on the comments from the member economies and then, it was published on the APLMF Website in May 2017. This document aims to provide practical procedures to establish a regional traceability system and calibrate/test grain moisture meters, which are not covered by OIML recommendations or ISO documents. Materials used in the previous training courses on rice moisture measurement are used as the basis of this guide document.

2.3. Contributed to OIML TC 17/SC 1 and TC 17/ SC 8

The WG has been continuously monitoring the activities of OIML TC 17/SC 1 (*humidity*) and TC 17/SC 8 (*instruments for quality analysis of agricultural products*) in regard to the two OIML documents shown below.

(1) TC 17/SC 1 R 59 *Moisture Meters for Cereal Grains and Oilseeds (2016)*:

To revise this recommendation, substantial amount of time of discussion was spent in TC 17/SC 1. A new version of R 59 (2016) was finally published in March 2017 with efforts by the joint secretariat of USA and PR China.

(2) TC 17/SC 8 146 *Protein Measuring Instruments for Cereal Grains and Oilseeds (2016)*:

A long discussion in SC 8 to draft a new recommendation was finished with efforts by the secretariat in Australia. The WG also actively involved in this process by submitting many comments. This recommendation was published as OIML R 146 (2016) in February 2017.

The former WG chair and experts in Japan attended the meetings of TC 17/SC 1 and TC 17/SC 8 and provided many comments from the viewpoint of the Asian economies.

2.4. Cooperation with BIPM and APMP on moisture measurement

The former WG chair exchanged information regarding the grain moisture measurement with the experts in metrology in NMJJ and APMP (Asia-Pacific Metrology Programme). The chairperson realized that grain moisture is one of the common topics of concern for both scientific metrology and legal metrology.

2.5 Transferred the chair for the next generation

The most remarkable key change in 2017 was the transfer of WG chair to another economy. During the training course in Malaysia in July 2017, Dr. Matsumoto announced an intention of stepping down from WG Chair and taking over the WG to another economy.

Transfer of the chair was therefore the top priority of this WG in 2017 for proceeding toward the future. A call for nominations of the chair was sent from the Secretariat to all APLMF member economies in September 2017. At the 24th forum meeting, it was finally agreed that the WG chair was transferred to Thailand (chair) and Malaysia (co-chair).

The former chair, Dr. Tsuyoshi Matsumoto, also expressed that he would support the new chair as a WG member even after taking over. His proposal met the new policy of APLMF President in which each WG should be maintained by a real group of experts (it has been maintained by one person in many cases).

Transfer of the chair was closely related to a transition of the WG activities to the next generation. WG considers that competent trainees should be recruited as the trainers in the future who support the new chair. In the training courses in 2017 and 2018, trainees who participated in many training courses served as trainers. In connection with the transfer of the chair, recruitment of the trainers in the next generation is also encouraged.

SECTION 3 – Future focus - Recommendations

3.1. Transfer of training programs to a regional level (key change 1)

The main concept of APLMF training programs has been “train the trainers” course for a long time. It means that the trainees, who participated in training courses, should become trainers in their home economy; and then, an international training activity should gradually be transferred to a regional program. Considering the well-established contents of this training program developed over a long period of time, it is encouraged to transfer training activities to a regional or national level.

WG encourages competent trainees to plan and conduct regional training courses in each economy as the trainers. In the regional level of South East Asia. The WG already submitted to the chair of WG3 (Working Group on Legal Metrology) the proposal to include QMAP's activities in ACCSQ WG3 (ASEAN Consultative Committee on Standard and Quality, WG3).

3.2. Continue of training courses (to be continued / proposed program)

Regardless the taking over of the chair, many participants in the training courses requested to continue a training program in this field. Many economies have not set up a reliable traceability system on grain moisture measurement and still need practical knowledge on reference method and calibration/usage of moisture meters. It is strongly recommended therefore to continue the training program in this field. The WG should also keep calling for host economies of training course in the future.

An advanced course at a higher level for the trainers in the future is also requested from several economies. Coverage of other kind of grains such as wheat, corn, beans, coffee, etc, evaluation of measurement uncertainty and implementation of inter - comparisons are requested for a long time but they have not been fully realized. To cover such items, WG plans other training courses aiming at a specific target of product other than rice as well as

a longer course for two weeks for the experienced experts. The WG already started seeking host economies for the future training courses in 2019-2020.

The incoming training course for rice moisture measurement will be hosted by CBWM (Central Bureau of Weights and Measures), and be held at EWMC (East West Measure Center) in Pattaya, Thailand during 3-7 December, 2018. The objectives of the course is to 1) provide participants with the knowledge and skills to understand international standards and recommendations, 2) establish traceability by preparing a reference standard using the drying method, and 3) verify rice moisture meters adequately. Participants from the following economies; Bhutan, Cambodia, Indonesia, Kiribati, Laos, Malaysia, Mongolia, Myanmar, Philippines, Thailand and Vietnam, are registered to attend the courses. Trainers and assistant trainers consist of experts from Cambodia, Indonesia, Japan, Malaysia, Thailand, and Vietnam.

3.3. Experts on this topic (for training program on grain moisture)

Among the economies which participated in training courses in the past, the WG recommends individuals from the metrology institutes of Cambodia, Indonesia, Malaysia, Mongolia, Philippines, PR. China, Thailand and Vietnam. Among them, Thailand already established a sound national traceability system and a framework for controlling moisture meters with type evaluation and verification.

3.4. Revision of the APLMF guide document (to be continued)

The WG continues to review and update the present *APLMF Guide Document on Rice Moisture Measurement* to improve the contents and to catch up with recent developments in technology and social systems. The term 'rice' in the title should ideally be replaced with 'grain' to accommodate wider range of products and to make this guide more versatile which will be utilized by all grain-producing economies. WG plans to add additional information about the moisture adjustment method and uncertainty of grain moisture measurement. WG will send an inquiry to the participants of the prior training courses and the incoming training course in December, to seek suggestions and comments about the guide document as well as the targets of future training courses.

3.5. Contribution to OIML TC 17/SC 1 and TC 17/SC 8 (to be continued)

The WG should continue to contribute to OIML TC 17/SC 1 and TC 17/SC 8 even after the new R 59 and R 146 were published. The WG aims to contribute to harmonize between the activities of OIML and APLMF in agricultural measurements.

3.6. Monitoring activities of BIPM and APMP (to be continued)

The WG continues to monitor activities in scientific metrology including BIPM and APMP, regarding the traceability and uncertainty in grain moisture measurements. These organizations recognize the importance of grain moisture measurement as an important application of scientific metrology. And some representatives from NIMT (National Institute of Metrology (Thailand)) are going to participate in the incoming training course for rice moisture measurement in Pattaya as observers.

SECTION 4 – Future focus – emerging issues

4.1. Taking over the assets of WG (resourcing / engagement / risks)

As it is mention in Clause 3, there is a strong need from the member economies for continuing such a training program on grain moisture measurement. This program also has a long history and it may be one of the matured ones organized by APLMF/MEDEA. The WG has sufficient experience and knowledge and maintains many training materials accumulated over the 18 years. One important lesson learned from the experience is continuation or transfer of such a matured program.

We should not finish the current activity and it should be maintained in APLMF or in each economy. The transfer of the WG to a regional level and next generation shall proceed carefully in order not to lose the WG's valuable assets. Management of the new WG with a group of experts could be an effective solution.

4.2. Special remarks on grain moisture measurement (resourcing / risks/proposed solutions)

Training courses on rice moisture measurement have a long history in the events organized by APLMF / MEDEA. This is because grain moisture measurement strongly depends on practical skills in a laboratory which are transferred through a training program continued for a long time. Practical experience using real instruments therefore is a core element to be learned. Until 2005, some training courses lasted even for two weeks to cover necessary practical sessions, while the length of recent training courses are less than a week long. Many participants realized the importance of practical experience and expressed this needs for future improvement, however. The WG considered such a practical component is still necessary and it should be continued.

A set of reference samples of grain is the core item to be prepared for setting up a traceability system as well as conducting a training course. There is a critical difference between a grain sample and another measurement standard used for fundamental physical quantities such as mass. Grain samples inherently do not have either stability or homogeneity, and their characteristics change unpredictably depending on variety, storage condition and time. Fresh samples shall therefore be collected locally where a training course is conducted or a traceability system is established because their quality depends on the place and year of harvest.

The preparation phase of a training course for grain moisture measurement, including procedures for providing reference samples, plays an important role. Such procedures are however conducted by the host staffs without a supervision by the trainers or the WG. The quality of a training course also depends on facility, equipment, tools and materials prepared in the laboratory.

As another important lesson obtained in the experience, the WG and trainers should communicate with the host staffs more closely in the preparation phase. For such a training

course, which closely depends on facility and samples, it would be ideal to have a prior visit to the host institute, if circumstances allow.

4.3. Synergy among the stakeholders (emerging / risks)

An important objective of MEDEA is a synergy between the two fields; scientific metrology (APMP) and legal metrology (APLMF). This WG was not involved in this object however, because grain moisture measurement usually falls outside of the framework of scientific metrology. Instead, WG faced even more complex circumstances; the measurement field of grain moisture was maintained by several ministries of government or another ministry in which metrology was not under their jurisdiction. Such circumstances also varied significantly among the member economies. A synergy among different ministries in the government is another important issue to be remembered when we organize a training course on grain moisture measurement.

4.4. Cooperation with the private sectors (resourcing / engagement)

The support from a private company (manufacturer) is another issue to be noted. If we transfer the WG to another economy and/or set up a regional training program, we are not encouraged continue to rely on the voluntary support from a specific company. As a contradictory factor, however, such a training program essentially connected closely to the facility, equipment, measuring instruments and practical knowledge on the instruments. The organizer, who belongs to a public organization in many cases, still needs support from a private sector for such items. We need to find a good compromise toward the future for continuing such a training program in cooperation with the private sectors. Therefore, this WG should provide even opportunities for all eligible private sectors to participate in the QMAP's training programs.

4.5. IT technologies supporting training course (resourcing / solutions)

In the training courses after 2015, the new IT-system Google Drive realized a paper-less course, in which all electronical materials were shard online. The materials were uploaded at least one week before the course. It gave the participants sufficient time to print them by themselves in advance. Another online system 'Survey Monkey' provided by PTB facilitated collection of feedback comments from the participants. Most of the participants brought their own PCs which enabled usage of such new systems. Such an operation lessened the workload of the host as well as the pressure of trainers for submitting a complete set of documents in advance. We encourage continuing such an operation using IT technologies.