Session V: General Discussion and Synthesis

International Workshop on Soil and Plant Tissue Analysis: Testing Methods, QA/QC, Data interpretation and Application

Sep 12-13, 2018
Taiwan Agricultural Research Institute (TARI), Taichung, Taiwan

Moderator:
Dr. Akira Hasebe
Deputy Director, FFTC
Proposed Agenda of Session V
14:00-15:20

- Introductory remarks
  - What is FFTC?,
  - Two soil related FFTC workshops in 2018,
  - Discussion Points of the WS
- Brief reports from each session
- General Discussion
FFTC Goal and Mission

Goal: Contribute *Higher Incomes and Better Lives for Farmers*

Three major objectives:

#1 *Spearhead* the transfer of mature technologies and information to Farmers

#2 *Promote* the sharing and exchange of agricultural information among countries

#3 *Bridge* the agricultural technology gap between developed and developing countries
FFTC is a unique “Platformer” in the AP region

- As an agricultural information center, FFTC collects agricultural information, technologies and policies.

- To collect those information, FFTC has provided a unique platform system which consists of real (for more than 48 years) and virtual one (for over 6 years).

- Several workshops and seminars organized by FFTC with NARS every year are recognized as real (practical world) platform, on the other hand, FFTC managed websites, such as FFTC-AP net are recognized virtual (cyber space) platform.
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</thead>
<tbody>
<tr>
<td>2017</td>
<td>Protected cultivation of high-value crops under changing climate conditions, MARDI (P07)</td>
<td>Developing Organic agriculture as new business opportunity for SSFs, NIU, YIA (P06)</td>
<td>Roles of cooperatives in response to changes in food consumption trends, NTIFO (P03)</td>
<td>Enhancing farm management efficiency by ICT for young farmers, NARO (P02)</td>
<td>Developing knowledge management in agriculture for SSFs, PCAARRD (P05)</td>
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<td></td>
<td>Climate Smart Agriculture for SSFs in the Asian and Pacific Region, NARO (P08)</td>
<td>Smart beef cattle feeding, NARO (P01)</td>
<td>Soil and plant tissue analysis: testing methods, QA/QC, data interpretation and application, TARI (P03)</td>
<td>Smart use of fertilizers for environmentally friendly agriculture, TDARES (P07)</td>
<td>Boar Samen application, DLP, MARDI (P04)</td>
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<td>2018</td>
<td>Strengthening the prevention strategies and early warning systems of agricultural disasters through ICT, TARI (P08)</td>
<td>Promoting Rice farmer's market through Value-added activities, KU (P02)</td>
<td>Promoting Rice farmer's market through Value-added activities, KU (P02)</td>
<td>Quality assurance and ISTA accreditation for Beginners, NARO, ISTA (P05)</td>
<td>Fostering increased engagement and capacitating the youth on Agri-entrepreneurship, MARDI (P06)</td>
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Two soil related FFTC Workshops in 2018

Soil/Plant Analysis

This workshop mainly focuses on testing methods, QA/QC, proficiency testing, data interpretation.

Diagnosis

Nutrient/Fertilizer Application

The next workshop focuses on smart fertilization technologies.

Soil Information System, Digital soil map, Soil DB,
This Project 04-2018: International Workshop on Soil and Plant Tissue Analysis: Testing Methods, QA/QC, Data Interpretation and Application

- Type of activity: Proficiency test and workshop
- Date and Venue: Sep 11-15, 2018, TARI
- Organizer: TARI & FFTC

BACKGROUND

No Standard Process and Certification Reference Material for Labs

CHALLENGE

Objectives:
- To conduct “Determine of nutrient contents in soil and plant tissue proficiency testing program”
- Exchanging experiences on the soil and plant tissue analysis in the Asia-Pacific region
- To enhance the capability of soil and plant tissue analysis in the Asia-Pacific region

SESSIONS

1. PT program for compare with each other
2. Build up a soil/plant tissue testing standard and operation process

- Testing methods and QA/QC for soil and plant tissue analysis
- Introduction to testing methods, QA/QC, and data interpretation of soil and plant tissue analysis labs.
- Introduction of FFTC 2018 Proficiency testing program of soil and plant tissues
- Application of soil and plant tissue testing for enhancing crop production and land use planning
Next Coming Project 07-2018: International Workshop on *Smart Use of Fertilizers* for Environmentally Friendly Agriculture

- Type of activity: Workshop
- Date and Venue: Oct 29 to Nov 2, 2018, Taichung DARES
- Organizer: FFTC & TDARES (Taichung District Agricultural Research and Extension Station)

**Highlights:**

- One keynote speaker from Chemical Fertilizer Company will present current status of Controlled Release Fertilizer
- Farmers and Extension workers are planned to attend the workshop.

**PROPOSED SESSIONS**

- Keynote Sessions (General Overview, Bio & Organic Fertilizer, Controlled Release Fertilizer)
- Country Report Session
- Technical Report Session
- Wrap-up Discussion Session

“Use Smart, Smart Use” (fertilizer)

1. Smart Use
2. Smart Products
Two soil related FFTC Workshops in 2018

Soil/Plant Analysis

This workshop mainly focuses on testing methods, QA/QC, proficiency testing, data interpretation.

1. Laboski as Key note
2. Lin
13. Kanazawa
3. Chen
12. Syu

Diagnosis


Nutrient/Fertilizer Application

The next workshop focuses on smart fertilization technologies.

5. Audthasit
6. Nilo
7. Phai
8. Liu
9. Kong
10. Norziana
11. Husnain
Soil/Plant (Chemical )Analysis for Farmers

Discussion Items or key words

- Testing methods;
  Laboski; limitations to current soil test methods, using plant analysis to complement soil analysis
  Norziana, Chen; development of standard testing methods, improvements of analysis
  Kong; on-site diagnosis to detect abnormal crop growth
  Husnain; soil sampling
  Audthasit, Nilo, Husnain, Kanazawa; soil test kit, rapid soil test, plant tissue chemical analysis, simple and quick testing methods for available N
  Liu, Lin; awareness of environmental protection
  Lin; extraction methods, conversion equations

- QA/QC; ISO/IEC 17025
  Kong, Phai; accuracy and reliability of soil analysis, soil testing education, soil testing lab certification program
  Chen; international lab accreditation/certification, upgrading of the quality of analysis data, QA/QC guidelines
  Audthasit, Phai, Kong; internal reference material(IRM), internal soil/plant reference sample, cost efficiency, legal status, quality manual
  Nilo; limit of detection, limit of quantitation, precision test, relative standard deviation, relative percent difference, recovery test, accuracy test, certified reference material, control chart
  Norziana; custody processes
Soil/Plant Analysis for Farmers

Discussion Items or key words

- Proficiency testing
  - Audthasit, Nilo; standard operating procedures (SOP's)
  - Nilo, Kong, Syu, Chen; z-score
  - Nilo, Phai; external inter-laboratory proficiency tests, ASPAC, ALP

- Data interpretation; Kong, Hong; soil testing database, updating

- Diagnosis System;
  - Laboski, Kong, Hong, Liu, Takata; fertilizer/nutrient application recommendation/prescription guidelines/system/program/sheet, computerized recommendation, web-based system, smartphone users, on-site diagnosis soil nutrient management
  - Laboski, Husnain, Audthasit; adoption of fertilizer recommendations by farmers, education to convince farmers, soil clinic
  - Laboski, Audthasit, Takata, Liu; crop nutrient removal, crop demand level, organic matter adjustment, on-farm nutrient sources, for new varieties and new crops, optimum fertilizer application, economic return to farmers
  - Husnain, Audthasit; low-cost decision support system (DSS), site specific fertilizer recommendation
Soil/Plant Analysis for Farmers
Discussion Items or key words

- Global needs;
  *Hong*; global soil map for global issues like food production, hunger eradication, climate change, and environmental degradation

*Phai*; globally accepted certifications

- International harmonization;
  *Audthasit, Nilo, Husnain*; Asian Soil Partnership (ASP), South-East Laboratory Network (SEALNET), set up a regional inter-laboratory proficiency program, Global Soil Partnership (GSP) under FAO/UN assembly, Global Soil Laboratory Network (GLOSOLAN), site-specific nutrient management (SSNM), harmonized soil data

- Other Application and Aspects;
  *Kong, Hong, Guo, Takata*; agricultural policies, agricultural land management, certification of environmental-friendly and GAP products, digital soil maps, soil database

*Hong, Guo, Liu*; soil information system, soil survey, available water capacity, soil carbon storage, long-term trends in soil properties,

*Takata, Husnain, Norziana*; soil inventory, soil monitoring project, soil fertility degradation, soil nutrient classification
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<tr>
<th>Country</th>
<th>Operating bodies</th>
<th>Legal status</th>
<th>PT provider</th>
<th>Accreditation</th>
<th>Specific Remarks</th>
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<tbody>
<tr>
<td>INA</td>
<td>Public/Private</td>
<td>SEALNET, ASPAC</td>
<td>ISO/IEC 17025</td>
<td>Soil Lab Established since 1905</td>
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<td>JPN</td>
<td>Private/Public</td>
<td>ALP, ASPAC, SEALNET</td>
<td>ISO/IEC 17025</td>
<td>For environmental protection, environmental soil analysis is supervised by Measurement Act</td>
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<tr>
<td>KOR</td>
<td>Public</td>
<td>KOR-RDA</td>
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<td>Website Huge Database</td>
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<td>MYS</td>
<td>Public/Private</td>
<td>Standards of Malaysia Act, MYS-AgLAM</td>
<td>ISO/IEC 17025</td>
<td>Soil diagnosis not used for fertilizer application except for rice production</td>
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<tr>
<td>PHL</td>
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<td>ALP, ASPAC, SEALNET</td>
<td>ISO/IEC 17025</td>
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<td>THA</td>
<td>Public/Private</td>
<td>THA-DOA, SEALNET</td>
<td>ISO/IEC 17025</td>
<td>Founder of SEALNET in 1995 Free of charge gov. service</td>
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<tr>
<td>TWN</td>
<td>Public</td>
<td>TWN-TARI</td>
<td>ISO/IEC 17025</td>
<td>Free analysis service</td>
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<tr>
<td>VNM</td>
<td>Public</td>
<td>ASPAC</td>
<td>ISO/IEC 17025</td>
<td>Soil/Plant analysis data not used for fertilizer application</td>
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ALP: Agricultural Laboratory Proficiency, ASPAC: Australian Soil and Plant Analysis Council, SEALNET: South-East Soil Laboratory Network
Thank you for your attention!