Smart use of fertilizers to improve crop production and soil conservation

In 2011 the Asian Pacific region as a whole applied 165 kilograms of mineral fertilizers per hectare of agricultural land. This figure is more than twice as much as FAO’s Europe and Central Asia’s region and well above the world average of 120 kilograms (FAOSTAT). New forms of agricultural management such as “Sustainable Intensification of Crop Production” is seeking to minimize the amount of chemical inputs entering the soil. With the ongoing developments in agriculture, the rate of fertilizer application is still growing. Inadequate and/or inefficient fertilization is often a constraint to achieving satisfactory crop yields and is a major contributor to soil degradation. With the rising awareness of food safety and sustainable agriculture, it becomes critical for farmers to be educated on the smart way of using fertilizers: fertilizing using the right timing, appropriate amount and suitable methods.

The five-day intensive training course introduced the extension specialists from the Asian Pacific region the concepts, theories and applications of using fertilizers the smart way. There were keynote and oral presentations, lab practices, field studies and discussions on the best way to apply fertilizers in different types of soils planted to different crops and growing in different agro-climatic conditions.

This year’s International training course on “Smart use of fertilizers to improve crop production and soil conservation” was participated in by 34 extension specialists from 18 countries. It was organized by FFTC and the Asia-Pacific Association of Agricultural Research Institutions (APAARI), and sponsored by TDARES, Council of Agriculture (COA).
Major findings and recommendations:

- Know the right time, the right place, the right crops, the right kinds, and the right amounts of fertilizers to be used;
- Rely on soil tests to evaluate fertility needs and control production costs;
- Do not overfertilize. As a general rule, the smart way of fertilization is to avoid unnecessary use of fertilizers;
- Know your farms’ soil problems. Soil improvement and correct fertilization can help enhance soil fertility and help increase crop production and crop quality;
- Learn to read and follow directions on how to use and apply various types of fertilizers—whether they are chemical or organic or liquid and solid;
- Utilize the internet to learn newly established system for agri-environmental resources management. This includes understanding soil information system, livestock manure information system, agricultural weather, disease and insect connection system, rural agricultural water information system and the environmental value information system;
- Establish a control, mechanism to supervise all agri-environmental related work. This could be done using the cooperative system; and
- Strengthen capacity building to encourage farmers to use ICTs in fertilizer use.

Dr. Te-Chen Kao, Deputy Director of TDARES takes the international trainees on a tour of the station’s experimental fields and explains the various ways of applying fertilizers in different types of soils planted to different crops.

A trainee from Malaysia tries her hands in getting soil samples. This is part of a series of laboratory exercises when trainees are exposed to the various aspects of grapes production.

Mr. Wen-deh Chen, Deputy Minister, Council of Agriculture, Executive Yuan delivers the welcome remarks during the workshop’s opening ceremony.
Smart use of fertilizers to improve crop production and soil conservation

Held in Changhua county, Taiwan 10-16 May, 2015
No. of participating countries: 18 (Cambodia, Indonesia, Korea, Malaysia, Myanmar, Philippines, Taiwan, Thailand, Vietnam, Bangladesh, Bhutan, Fiji, India, Nepal, Pakistan, Japan, Papua New Guinea, Vanuatu)
No. of papers presented: 14
No. of participants: 34 participants from 18 countries
Co-organizer: Taichung District Agricultural research and Extension Station (TDARES) Council of Agriculture (COA)

List of papers

Keynote papers

1. Smart use of fertilizers for increased crop production, environmental sustainability, and soil conservation
   - Jen-Hsuan Chen
2. Application of modern technology in fertilization
   - Ryo Ohtomo
3. Promotion of environmentally-friendly agriculture in Korea
   - Chang-Gil Kim
4. The experience of promoting smart fertilization technology in Taiwan
   - Te-Chen Kao

Resource papers

5. Effects of smart use of fertilizers on rice
   - Chih-Sheng Sheu
6. Effects of smart use of fertilizers on peanuts
   - Ai-Hua Yang
7. Effects of smart use of fertilizers on grapes
   - Wen-Lung Lai
8. Effects of smart use of fertilizers on papaya
   - Ren-Huang Wang
9. Effects of smart use of fertilizers on cabbage
   - Cheng-Hung Hsiao
10. Effects of smart use of fertilizers on tomatoes
    - Jui-Chang Huang
11. The use of ICT technologies on soil conservation in Taiwan
    - Hourng-Yuh Guo
12. Effects of bio-fertilizers on crop improvement
    - Yi-Feng Tsai
13. Effects of liquid fertilizers on rice production
    - Te-Chen Kao
14. Effects of green manure on soil conservation in Taiwan
    - Lee-Ying Cheng

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