Modern Technology for Sustainable Agricultural Systems (MoTSAS)

Pogramme	Annual International Training Courses Thai International Cooperation Programme
Course Title	Modern Technology for Sustainable Agricultural Systems (MoTSAS)
Duration	July 5 – 20, 2016
Closing Date for Application	March 15, 2016
Number of Participants	18-20
Eligible Countries	**Asia:** Afghanistan, Bangladesh, Georgia, Indonesia, Iran, Jordan, Kyrgyzstan, Malaysia, Maldives, Nepal, Oman, Pakistan, Palestine, Philippines, Sri Lanka, Tajikistan, Timor-Leste, Uzbekistan, Yemen, and Thailand **Africa:** Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Lesotho, Libya, Malawi, Mali, Mauritania, Mauritius, Morocco, Namibia, Rwanda, South Sudan, Sudan, Swaziland, Togo, Tunisia, Zambia, Zimbabwe **Pacific:** Cook Island, Fiji, Marshalls Island, Nauru, Palau, Papua New Guinea, Vanuatu, Solomon Island, Tonga, Tuvalu **Member Countries;** FEALAC, OAS and CARICOM

Objectives

The course aim to:

- To introduce fundamental scientific knowledge and skillin modern technology for sustainable agricultural system.
- To provide important elements and principles of modern technology for sustainable agricultural systems with reference to biological control, biotechnology, improving soil fertility, crop modelling, GIS and remote sensing, tropical animal production and nutrition, natural animal and aquaculture production
- To develop necessary skills in practical modern technology for sustainable agricultural systems.

Qualifications

Applicant for this course shold:

- a resident of one of the following the above countries
- should graduate from university and currently involve in agriculture field related to research, lecture/teaching or farmers.
- has basic knowledge in agricultural systems.
- be able to communicate (speaking and writing)in English and he/she should have a basic computer skill (Microsoft Windows & Microsoft Office).

Course Contents

1. Course Outline

- Sustainable development concept and application
- Lecture: Farming system research
- Seed science and technology part I and II
- Important natural enemies to control insect pest in rice
- Mass rearing technique of certain natural enemies
- Basic concepts and applications of crop model for the improvement of crop production; precise integrated crop management
- Introduction and applications of biotechnology in agricutural systems
- Basic concepts of plant diseases
- Applications of GIS and remote sensing in plant diseases
- Organic Bio-fertilizer production
- Microbial fertilizers for soybean and rice production
- Postharvest science and quality management of value-added horticultural products
- Food Safety part I: Risk assessment and GAP standard (Global GAP)
- Food Safety part II: Law &Regulation
- Semi-bio pig production

- Applications of molecular genetic markers for modern livestock production
- Applications of Near-infrared spectroscopy (NIRS) in animal productions
- Appropriate technology in aquaculture
- Group presentation and course evaluation

2. Practices

- Seed science and technology
- Plant biotechnology laboratory
  - Techniques in plant tissue culture and applications
- Biological control for pest management in rice production
  - Sampling technique in rice paddy field
  - Identification of insect pest and their natural enemies in rice
  - Rearing techique of certain natural enemies
- Crop model
  - Software installation (WaNuLCAS model)
  - Understanding input parameters, calibration and validation of crop model based on agroforestry systems
  - Interpretation and discussion on model outputs
  - Application of crop model to special cases related to agricutural production
- GIS and remote sensing
  - Introduction to GIS and remote sensing
  - Application of GIS and remote sensing to special cases related to plant diseases
- A principle laboratory on quality measurement and fruit tasting
- Application of microbial fertilizer
- Semi-bio pig production
  - Techniques essential for raising pigs in semi-bio production system
- Appropriate aquaculture techniques
  - Fish culturing system in lower northern Thailand

3. Study Trips/ Field Trips

- Naresuan University(NU) Campus tour for giving information to participants e.g. textile museum, NU library and the school of Renewable Energy Technology (SERT)
- Study trip to Biological Control Research Center for developing an idea about practical biological control using for sustainable agricultural systems
- Field trip to show participants about organic farming, integrated pest management, biopesticides and using organic fertilizer. All participants will go to Therdthai Farm, Si Samrongdistrict, Sukhothai Province and Kamnan Chul Farm, Phetchabun.
- Visit an organic bio-fertilizer plant at Wang Thong district, Phitsanulok
- Visit a research farm at semi-bio pig production at Bueng Rachanok Research Station, Wang Thong district, Phitsanulok
- Thai native chicken and fighting cock farms at private chicken farm within Phitsanulok province
- Visit a research field at Bueng Rachanok, Phitsanulok for aquaculture production

4. Advance Assignments

1) **Country Report**
   Participantswill be asked to briefly introduce about their country and experience in agricultural systems.About 8-10 minute presentation will be organized for each participant.
2) **Reading Assignment**
   - Toward Sustainable Agricultural Systems in the 21st Century. National Academies Press (2010) 570 pages.
   - WaNuLCAS model manual: avaiable from the website: http://www.worldagroforestry.org/sea/Products/AFModels/wanulcas/download.htm
3) **Project Assignment**
   We invite all participants to bring his/her own experimental data e.g. daily weather, soil physical and chemical data, crop management, crop characteristics, and crop growth analysis. These data will use to test with WaNulCAS model. Participants will develop a skill in designed agricultural systems based on their own data set by using WaNuLCAS model.

5. Expected Results

After successful completion of this training course,the participants are expected to

- Have knowledge, understanding and skills required to manage agricultural production systems in a socially and environmentally responsible manner.
- Have knowledge of, and skills in, decision-making and the evaluation of technology and management techniques used in sustainable agricultural systems.

6. Evaluation

- Participants must strictly attend classes as scheduled.
- Group presentations (6 groups) will be assigned for participants. The criteria will be related to 1) conclusion of concepts gatheringduring lectures and study trips/field trips and 2) how to introduce the modern technology for sustainable agricultural systems to farmers and motivate them to put it into practice. After each group presentation, there will be questions, discussions, and comments by academic members and other participants.

Institution

The course will be conducted by:

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