

Introduction



FFTC'S MECHANISM FOR AGRICULTURAL TECHNOLOGY TRANSFER reflects a strong technological complementation among countries in the Asian and Pacific (ASPAC) region. Through the Center's various activities like seminars, workshops, training courses, field demonstrations, collaborative research and publications, thousands of scientists, researchers, policymakers and extension workers are given not only the chance to share and exchange technological information and innovation in agriculture, but also the opportunity to strengthen technical cooperation among countries in the region. The technology and information collected and disseminated by the Center for almost four decades now have given countless resource-poor farmers and extension workers new opportunities and new solutions to their problems.

In 2007, the Center's technology and information collection and dissemination activities focused on the attainment of the missions under the *FFTC Strategic Plan for 2007-2011*, namely: increased income and improved livelihood of small-scale farmers; improved food safety; enhancement of environment-friendly technology; and sustainable use of natural resources in the ASPAC region. On the first year of the Plan's implementation, the Center's programs and activities addressed current concerns on sustainability of natural resources and environment through ecologically sound agricultural practices, enhancement of rural development, and meeting changing market and consumer preferences through food quality and safety standards amid recent trends in economic development and globalization.

Management of agrochemical residues in foods

In view of the public's enhanced concern on food quality and safety, many countries in Asia are now aware of the need to strengthen agrochemical residue standards permissible in food. Hence, inspection system and development of analytical methods for agrochemical residues have become necessary tools to remove unsafe products from the market. At the same time, several Asian countries are now moving toward a food chain approach by applying regulatory controls at the point where they are most effective, such as the use of Good Agricultural Practice (GAP) to reduce levels of agrochemicals and other contaminants at the production stage.



The international seminar on the management of agrochemical residues in foods was organized in view of the common goal among Asian countries to develop and promote the adoption of a unified and workable protocol for agrochemical-residue analysis and GAP system for small- and medium-scale farmers in the region.

New solutions to soil pollution and distribution, bioavailability and management of heavy metals

Along with industrial expansion, arable lands have been gradually degraded or contaminated with heavy metals and organic pollutants in most Asian countries. In the past two decades, this trend became more evident, significantly aggravating the quality of soils and crops as the concentration of pollutants continue to increase. Consequently, this brings about great risks to human health and food safety and the deterioration of environmental quality.

This international conference was intended to collect reliable data and useful information to develop methodologies to rehabilitate arable lands that have been gradually degraded or contaminated with heavy metals and organic pollutants in most Asian countries, toward the promotion of safe food production and environmental sustainability in the region.

Appropriate use of bio-fertilizers and bio-pesticides for small-scale farmers in Asia

Excessive and inappropriate use of agrochemicals has undeniably resulted in negative and sometimes irreparable effects on the environment and on human health. Hence, bio-agents, such as bio-fertilizers and bio-pesticides are among the alternatives to reduce agrochemical use that countries in the Asian region are exploring toward improved and sustainable crop production without threat to food safety and damage to the environment.

This international workshop was organized to bring together experts from all over the Asian region to share and exchange practical and technical information on the efficacy and safety of using bio-agents in small-scale farms, and to determine the status and prospects of bio-agents as promising strategies for environment-friendly and sustainable crop production.

Enhancing the role of women farmers in the development of rural Asia

A look at recent trends and prospects for developing Asian countries show that the number of women economically active in agriculture is increasing and growing faster than the number of males economically active in this sector. This

phenomenon is dubbed as the "feminization of agriculture," referring to women's increasing participation in the agricultural labor force. Yet, despite the growing importance of the women farmers' role in agriculture, the lack of access to and control over productive resources deprives them of opportunities for their own capacity building and improved quality of life.

This seminar was organized with the overall goal to understand the situation of women farmers in agriculture in order to improve their status and enhance their contribution to rural development. It also aimed to promote the integration of women's concerns in rural development policy agenda, particularly of developing Asian countries.

Development and adoption of traceability system for fish and fish products in Asia

Traceability systems for fish and fish products are deemed necessary as key elements in ensuring quality and safety, and because consumers demand ever more information about the food they eat. However, despite the noticeable development of traceability systems worldwide, some important questions remain open, particularly at the level of international fish trade and how small-scale fish farmers can cope with these rigid procedures and standards.

The main objective of this workshop was to provide a venue for the sharing and exchange of knowledge, information, and practical tools toward the development and adoption of a suitable fish and fish products traceability system in Asia, considering the great complexity of the production and distribution chain, as well as the prevailing characteristics of the fish industry in the region.

Improved duck production of small-scale farmers in Asia

Small-scale duck production substantially contributes to household food security, helps diversify incomes, and serves as a renewable asset in many rural households in developing Asian countries. However, small-scale duck producers are constrained by poor access to appropriate technologies and information, as well as market and support services, which could otherwise translate into improved productivity, increased income, and sustainable duck production systems.

This international seminar was organized primarily with the goal of bringing together duck experts from all over Asia in order to share and exchange practical and technical information in support of small-scale duck producers, as well as to enhance technical cooperation in this area among countries in the region.

Summary of 2007 Work Program

Project Title	Type*	Venue	Co-sponsors	Date
<i>Management of agrochemical residues in foods</i>	SM	Taiwan	APO, TACTRI COA, CPC, BAPHIQ/COA	Oct 01-05
<i>New solutions to soil pollution and distribution, bioavailability and management of heavy metals</i>	CF	Japan	NIAES, ESAFS	Oct 22-26
<i>Appropriate use of bio-fertilizers and bio-pesticides for small-scale farmers in the ASPAC region</i>	WS	Philippines	PCARRD	Nov 19-23
<i>Enhancement of women farmers' role in the development of rural Asia</i>	SM	Korea	RDA	Oct 15-19
<i>Development and adoption of traceability system for fish and fish products in Asia</i>	WS	Indonesia	RCA	Nov 26-30
<i>Improved duck production of small-scale farmers in ASPAC</i>	SM	Vietnam	NIAH	Sept 17-21
<i>Agricultural biotechnology training workshop for Southeast Asian countries</i>	TC	Taiwan	NTU, STPI SEARCA, NSC, COA, AIT	Sept 03-11
<i>Modern corn cultivation technology transfer in Caraga region, Phil. (Y2)</i>	TT	Philippines	NORMISIST DA, MECO COA	Jan - Dec
<i>Establishment of pathogen-free citrus germplasm repository for the improvement of the citrus industry in ASPAC (Y2)</i>	TT	Cambodia Taiwan	NTU RDF	Jan - Dec
<i>A rapid, less-costly and accurate detection of citrus greening (HLB) pathogen in the ASPAC (Y1)</i>	CR	Japan, Taiwan	NIFTS KONARC OPARC	Apr 2007- Mar 2008

*Type of Activity: SM=Seminar; CF=Conference; WS=Workshop; TT=Technology Transfer; TC=Training Course; CR=Collaborative Research

Strengthening the agricultural biotechnology capacity of Southeast Asian countries

The application of powerful tools of modern biotechnology, particularly that involving DNA recombinant technologies, promises substantial improvement in agricultural production and food quality and significant contribution in attaining food security globally. The research and development advances made by Taiwan in agricultural

biotechnology and its subsequent agro-industry applications, provide a fertile ground for learning among countries in Southeast Asia.

This *Agricultural Biotechnology Training Workshop for Southeast Asian Countries* primarily aimed to strengthen the agricultural biotechnology capacity of countries in Southeast Asia and was envisioned to pave the way for the enhancement of their respective biotechnology industry. The training

course was also expected to open doors for future cooperation and partnerships in the development of agricultural biotechnology industry in the region.

Modern corn cultivation technology transfer in Caraga region, Philippines (Year 2)

Corn is the second most important crop in the Philippines, comprising about 70 percent of livestock mixed feeds in the country, and is the preferred main staple food of about 12 million Filipinos. About 60 percent of the Philippines' annual corn production is from Mindanao, and of this island's six main corn production areas, the Caraga region has the lowest average yield production of 1.77 MT/hectare in 2005. This is mainly attributed to low adoption of modern corn production technologies and use of low-yielding traditional/inbred varieties by the farmers.

The overall goal of this three-year technology transfer program is to improve the productivity and achieve sustainable production of quality corn in the Caraga region through the extension of modern cultivation techniques and introduction of hybrid corn varieties, with the technical assistance of scientists from Taiwan.

Establishment of pathogen-free citrus germplasm repository for the improvement of the citrus industry in ASPAC (Year 2)

Citrus HLB and other virus diseases such as citrus tristeza closterovirus (CTV), citrus tatter leaf capillovirus (CTLV) and citrus exocortis viroid (CEVd) have become serious constraints to the growth of the citrus industry in the ASPAC region in recent decades. These systemic diseases can only be effectively controlled by integrated measures of disease management such as: establishment of virus-free citrus cultivar repository, which is of primary importance in preventing prevalence of the diseases; and precise and rapid disease indexing techniques indispensable for the management of pathogen-free (PF) nursery system.

Under this three-year special project, an advanced Taiwanese technology package will be continuously transferred to countries in the region to help rehabilitate their respective citrus industry. The technology package shall include establishment and application of pathogen-free citrus foundation, and disease-indexing technique for controlling serious epidemic of citrus greening (HLB) and other virus diseases.

A rapid, less-costly and accurate detection of citrus greening (HLB) pathogen in the ASPAC region (Year 1)

In recent decades, citrus greening disease or Huanglongbing (HLB) has been causing major

damage and economic losses to the citrus industry in the ASPAC region. Identification of HLB disease infection is extremely difficult because of its similarity to the symptoms of such nutrient deficiencies of Zn and Fe, and its pathogen, *Diaphorina citri*, cannot be cultivated on an artificial culture medium. In addition, no effective agrochemicals to control this disease are yet available. The only countermeasure to cope with HLB infection is to cut down the infected citrus trees. Therefore, early detection is very important to mitigate the damage caused by HLB infection. In view of the urgency and seriousness of this problem, this two-year collaborative research project aims to develop a rapid, less-costly and accurate detection of the HLB pathogen based on the loop-mediated isothermal amplification (LAMP), a newly developed method for DNA amplification in Japan.

FFTC publications and website on Asian agriculture

FFTC is committed to ensure that the dissemination of agricultural information is focused on the right problem, relevant and useful, involving the right users, and not duplicating the information disseminated by other organizations. In 2007, the Center published four issues of its quarterly Newsletter, one annual report, one statistical book, two books based on seminar/workshop proceedings, and nineteen extension and technical bulletins. All these publications were made available free of charge on the Center's website and database, which had more than seven million hits during the year.

New challenges ahead

Traversing into its fourth decade, FFTC is faced with new emerging challenges amid structural changes in global agriculture. Rapid exploitation of natural resources is threatening the sustainability for higher productivity and incomes, free trade has made small-scale farmers' livelihood vulnerable, populations continue to rise, and concerns over food safety and ecologically sound agricultural practices have become greater than ever. In this challenging decade, the Center shall continue to promote sustainable agriculture in the region, integrating the main goals of environmental stewardship, competitiveness through safety and quality of produce, farm profitability, and prosperous farming communities.

Co-sponsors of FFTC Programs in 2007

Japan

Asian Productivity Organization (APO)
 East and Southeast Asia Federation of Soil Science Societies (ESAFS)
 National Institute of Fruit Tree Science (NIFTS)
 National Institute for Agro-Environmental Sciences (NIAES)
 National Agricultural Research Center for Kyushu Okinawa Region (KONARC)
 Okinawa Prefectural Agricultural Research Center (OPARC)



Taiwan ROC

Council of Agriculture (COA)
 Asian Productivity Center (CPC)
 Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ)
 National Taiwan University (NTU)
 Rural Development Foundation (RDF)
 National Institute of Agricultural Chemicals and Toxic Substances Research Institute (TACTRI)

Korea

Rural Development Administration (RDA)
 National Agricultural Cooperative Federation (NACF)

Philippines

Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)
 Department of Agriculture (DA)
 Northern Mindanao State Institute of Science and Technology (NORMISIST)
 Manila Economic and Cultural Office (MECO)
 Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)

Indonesia

Research Center for Aquaculture (RCA)

Vietnam

National Institute of Animal Husbandry (NIAH)