

# Management of agrochemical residues in foods



**THE FOOD SAFETY SYSTEMS IN BOTH DEVELOPED AND DEVELOPING COUNTRIES** in the Asian region face unprecedented challenges arising from the globalization of food trade, shifts in food consumption patterns, and more intensive food production techniques to meet the needs of an ever increasing population and of the changing consumer demands.

International trade in agricultural products has expanded rapidly worldwide, fueled by the growing consumer demand and technological developments in marketing and processing, enabling huge volumes of food products, fresh and processed alike, to be traded among distant countries. While many Asian countries have become major players in international trade, one vital challenge is the proliferation and strengthening of food safety standards and technical regulations, especially in developed countries. For lack of capacity and experience, many developing Asian countries are struggling to comply with the emerging requirements and the high costs of compliance to these standards and regulations, further marginalizing small enterprises and small-scale farmers in the region.

Meanwhile, in some Asian countries where population grows more rapidly than food production, food security remains as important as food safety. High inputs of agrochemicals are still practiced aiming at improving crop yields. As a consequence, persistent residues of these chemicals may contaminate food and disperse in the environment, jeopardizing the health and well-being of the consuming public.

## Agrochemical residue standards in Asia

Reducing dietary exposure to agrochemical residues has become an important goal of policymakers worldwide in response to public health and environmental issues, and for the protection of producers, various food industries, and consumers alike. This results in the imposition of much stricter Sanitary and Phytosanitary (SPS) standards by major importers on food products especially from developing countries. This trend is posing a serious threat for many food exporters in the Asian region, on one hand, but also brings about great opportunities for them to produce high-value food.

As an old Chinese proverb says "we are what we eat". Access to safe and quality food has been a continuous effort since the earliest days of human existence. With 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.

Recently, standards for maximum level of agrochemical residues in foods in many Asian countries have become more rigid as a way of coping with both food safety and trading concerns alike. Hence, inspection system and development of analytical method for agrochemical residues have become necessary as enforcement mechanisms 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 Good Agricultural Practice (GAP) model, to reduce levels of agrochemicals and other contaminants at the production stage.

This 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. In particular, it sought to enhance the capacity of member countries in terms of access to and familiarization with modern technologies, good agricultural practices, and food traceability systems to improve the quality and safety levels of agricultural produce and processed products in their respective country.

Attended by 27 international participants from 11 countries and about 30 guests and local participants, the seminar was sponsored by the Asian Productivity Organization (APO) and the Council of Agriculture



Vegetable products of the Han-Kuan Cooperative in Taiwan ROC, with quality certification and traceability information.

(COA), Taiwan ROC, and organized by FFTC, the Taiwan Agricultural Chemicals & Toxic Substances Research Institute (TACTRI), the China Productivity Center (CPC), and the Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ), COA, Taiwan ROC.

Specifically, the activity aimed to: review regulations and standards of agrochemical residues in foods in the participating Asian countries; exchange relevant analytical technology of agrochemical residues in food products; share information on relevant GAP systems to minimize agrochemical residues in foods; and discuss the possibility of harmonizing regulations and standards, analytical technology, and GAP system especially in the context of small- and medium-scale Asian farmers.

### Harmonizing regulations and standards

Reducing risks in food depends on effective legal, technical, and administrative frameworks. Therefore, governments must have the political will to take the necessary steps to develop, adopt and implement comprehensive national food safety standards based on internationally recommended standards, guidelines and codes of practice (such as CODEX, HACCP, GAP/GMP, ISO 9000) and

founded on scientific principles and risk analysis/assessment. The application of regulatory and non-regulatory measures at appropriate points in the food chain from pre-production to marketing or distribution is necessary so that the food meets such food safety standards.

While aiming for the harmonization of food safety standards in the context of multilateral trading may not be feasible at this time, bilateral negotiations may prove to be a more practical direction for exporting and importing countries in the Asian region, especially in view of the opportunities posed by the ASEAN Free Trade Agreement with its goal of coming up with a comprehensive program of regional tariff reduction and developing common product certification standards in the region.

Agrochemical management should be an important component of every country's food safety program, to include proper registration procedure considering risks to human health and the environment as well as efficacy to target pests, and setting of maximum residue limits (MRLs) as well as inspection and development of analytical method for agrochemical residues.

While MRLs are currently implemented in different Asian countries using various levels and mechanisms, the CODEX system recognized by most countries worldwide is a good reference norm. Vital as it may seem in terms of greatly minimizing trade issues related to agrochemical residues, unifying MRLs among trading countries may not be realistic. Therefore, countries in the region must enhance their efforts to develop their own MRLs based on internationally-accepted standards, but are adapted to their own conditions, needs and requirements (TMDI, ADI, food consumption data, etc.).

Some developing Asian countries are considerably lagging behind in terms of analytical methodology/protocol for MRL setting and residue testing, and lack the facilities/equipment and trained personnel for sophisticated scientific procedures. In view of this, sharing and exchange of information, as well as technical cooperation among developed and developing countries in establishing protocol on MRL setting and proficiency testing/analytical methodology is of vital importance.

### Future prospects and recommendations

Countries in the Asian region must develop their own GAP protocol, based on tested technology packages for competitive commodities, and using international standards as reference norms to attain the basic concepts of sustainable production practices and quality and safety of produce. It is likewise critical to advocate strong government support, political will and legislation in promoting GAP, particularly in terms of standardization/

certification, farmers' education and training, research and development on quality management systems, and funding to develop and maintain traceability systems. Compliance by the farmers must also be ensured through intensified extension and education activities.

In the context of a globalizing economy, there should be domestic policy support in favor of small- and medium-scale farmers. Therefore, in some developing countries, GAP protocols can only be successful if introduced in the context of group farms or production and marketing units. Enabling policy must be present to group small-scale farmers into local production and marketing units, and to provide them with training and support services to enhance their entrepreneurial management capacities; improve access to product and market information; and gain access to technology and credit.

Some future challenges and needs identified during the seminar are as follows: 1) collection of

Participants visited the Han-Kuan Fruit and Vegetable Production Cooperative in central Taiwan, where member and non-member farmers alike are grouped into production units under the supervision and management of the Cooperative.



Production schedules to meet market supply are all planned, organized and coordinated by the Han Kuan Cooperative management, and adherence to GAP, including pesticide/fertilizer use to meet MRL standards, is ensured. At the marketing center, strict quality and safety requirements are adopted in the post-handling and packaging of the produce.



Participants also visited the Lugu Township in Nantou, Taiwan, which is famous for its high mountain Dongding Oolong Tea. The Lugu Farmers Association offers assistance to tea farmers on the safety management of pesticide use and the monitoring of chemical residues in tea products.

GAP and traceability information in other countries; 2) establishment of each country's own GAP and traceability system; 3) infrastructure improvement of analytical equipment; and 4) capacity building of analysts and laboratory workers.

### APO Seminar on Management of Agrochemical Residues in Foods

Held in TACTRI, Taichung, Taiwan ROC,  
October 1-5, 2007

No. of participating countries: 11 (India, Indonesia, Iran, Japan, Korea, Malaysia, Philippines, Sri Lanka, Taiwan ROC, Thailand & Vietnam)

No. of papers presented: 16

No. of participants: 27 international & 30 local participants

Co-sponsors: Asian Productivity Organization (APO), Japan; Council of Agriculture (COA), Taiwan ROC; Taiwan Agricultural Chemicals & Toxic Substances Research Institute (TACTRI), COA, Taiwan ROC; China Productivity Center (CPC), Taiwan ROC; Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ), COA, Taiwan ROC

### List of papers

#### Resource papers

1. Changing regulations for the inspection of food imports to Taiwan responding to consumers' preference  
- Hui-Wen Cheng, Bureau of Food Safety, Department of Health, Taiwan ROC
2. Food regulations on agrochemicals for ensuring the quality and safety of food supply in Japan  
- Shoji Miyagawa, Department of Food Safety, Ministry of Health, Labor and Welfare, Japan
3. Safety management and inspection of agrochemical residues of food in the trade of exported product: A case study of the Taiwan-grown Irwin Mango  
- Chin-Wen Kao, TACTRI/COA, Taiwan ROC
4. Approaches to the problems on pesticide residues in crop and soils in Japan  
- Yasuhiro Yogo, Director, National Institute for Agro-Environmental Sciences, Japan
5. Perspectives on efficient assessment and analysis of agrochemical residue in food in Korea  
- Su-Myeong Hong, International Technical Cooperation Center, RDA, Korea

6. Development of GAP and traceability system for greening the food chain in Taiwan  
- Jong-I Hu, Economics and Planning Department, COA, Taiwan ROC
7. Recent advances in agrochemical residue management in food: Taiwan's experiences and challenges in marketing and trade  
- Sue-Sun Wong, Agroformosa Technology Company Ltd., Taiwan ROC
12. Management of agrochemical residues in food: Korea country report  
- Ju Young Cho, Natural Farming Institute
13. The Philippines' response to the emerging global interest on food safety and quality: a country paper  
- Judith Mae B. Arvesu & Maria Josephine S. Dano, Bureau of Fisheries and Aquatic Resources (BFAR) Region 7; Ma. Celia M. Raquepo; Philippine Coconut Authority

*Country papers*

8. Management and regulatory control of agrochemical residues in food production in Taiwan  
- Shu-Jen Tuan, TACTRI/COA, Taiwan ROC
9. Pesticides: production, use and regulation in India  
- P.G. Shah, Anand Agricultural University; Priyanka Raha, Banaras Hindu University; Kaithamalai Bhuvaneshwari, Tamil Nadu Agricultural University; and Satish Kumar Pandey, Chhattisgarh State Livestock Development Agency, India
10. Indonesia agricultural development  
- Ade Yayah Asqiah, Ministry of Agriculture; and Heri Suprianto, Ministry of Manpower and Transmigration, Indonesia
11. The current status of agrochemical residue management in Iran  
- Nasser Peimani, Ministry of Jihad-e-Agriculture, Iran; and Ramin Nabizadeh, University of Tehran, Iran
14. Management of agrochemical residues in food in Sri Lanka  
- J.M.D.J. Bandara & K.P. Karawita, Department of Agriculture, Sri Lanka
15. Thailand's plant products safety; Thai food's trade balance; Community product standards and chemical residues  
- Wantana Sriratanasak, Ministry of Agriculture and Co-operative; Orawan Kaewprakaisangkul, National Food Institute; Siriluk Malaniyom, Ministry of Industry, Thailand
16. Management of agrochemical residues in food in Vietnam  
- Le Thi Thuy Hang, Quality Assurance and Testing Centre, Vietnam

*For further information, contact:*

*Dr. Te-Yeh Ku, FFTC Technical Consultant*