

## Major Symposia and Seminars

### 1. International Workshop on Development of Database (APASD) for Biological Invasion

The workshop was held from 18 to 22 September 2006 at Taiwan Agricultural Chemicals and Toxic Substances Research Institute (TACTRI), Taichung, Taiwan, Republic of China (ROC), sponsored by Food and Fertilizer Technology Center (FFTC), for the Asian and Pacific Region, National Institute for Agro-Environmental Sciences (NIAES), Japan, Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ), TACTRI, Council of Agriculture, ROC. Countries represented were Cambodia, Japan, Malaysia, the Philippines, Taiwan, Thailand, and Vietnam.

Introductions of invasive alien species (IAS) to the Asia-Pacific region have recently increased along with increases in global trade and human travel. Many plants, animals, and microbes have invaded countries worldwide, causing great economic damage and having biosafety and ecological impacts. Hence, IAS have become an important global concern, and the need to exchange research and monitoring information among countries in order to prevent the spread and damage these species cause has become vital and more urgent than ever.

Toward this end, the Asian-Pacific Alien Species Database (APASD, <http://apasd-niaes.dc.affrc.go.jp/>) was introduced by NIAES at an international seminar held in Tsukuba, Japan, in 2003 as a means of facilitating the accumulation and searching of data on IAS. This database seeks to enable the sharing of recent information on invasive alien species among countries in the Asia Pacific region, and to maximize its value it needs to be op-

erated as a regional network in conjunction with existing international databases on IAS.

Since the introduction of APASD in 2003, aspects of the APASD system have been improved and data input has continued. A follow-up workshop held in Taichung, Taiwan, in 2004, aimed to establish a constructive linkage/cooperation mechanism to further build up the database. This 2006 workshop was designed as a follow-up activity to the previous two seminars; the intention was to update the APASD system to make it more functional and user-friendly. This is in line with FFTC's commitment, in collaboration with NIAES, to continue to support the development of the APASD and to organize related programs such as training workshops to improve the functionality of the system for wider use among countries in the region.

During the 2-day paper presentation and discussion, 15 speakers representing seven countries in Asia presented a total of two keynote speeches, three resource papers, two database demonstrations/practical exercises, six country reports, and two institutional presentations. They shared and exchanged information, knowledge, and experiences on the status of the development of the APASD, and they discussed the critical issues concerning IAS in each country, for the following objectives, to determine the status of development of the APASD toward enhancing the sharing of recent information on IAS among countries in the region; to deliberate on the critical issues concerning alien invasive species, with regional scientists providing data and confirming the species to be inputted to the database; to establish a cooperative mechanism to further solidify the building-up of the database; and to discuss and exchange research and monitoring information on IAS and the updating of the APASD system to make it more functional and user-friendly. (K. Hirai)



Photo taken in front of TACTRI, 2006

## 2. Korea–Japan Joint International Symposium: Nitrogen Behavior and its Effective Management in Agro-Ecosystems

Since FY 2003 NIAES has been running a research project on “Water quality conservation in agro-ecosystems and assessment of risk to the environment”. This project is underpinned by a Memorandum of Understanding forged with the National Institute of Agricultural Science and Technology (NIAST) of the Republic of Korea. On 21 September 2006, the Korea–Japan Joint International Symposium, relevant to the above-mentioned project, was held at the International Technical Cooperation Center of the Rural Development Administration, in Suwon, Korea.

With the ultimate aim of preventing environmental pollution of agro-ecosystems by nitrogen loads attributable to agricultural activity, participants shared information on case studies of technological and political planning in Japan, Korea, China, the United States, and the Netherlands. It was clarified that underground and surface waters are being polluted by the excessive application of nitrogen fertilizers and the disposal of livestock excreta onto agricultural lands. Quantitative evaluation of nutrients that flow out from non-point sources is needed to prepare for their effective management.

Nine speakers gave presentations on the following topics: 1) Keynote lecture: “Status of nitrogen pollution in agro-ecosystems in Korea” (C-H Kim, NIAST, Korea); 2) Keynote lecture: “Nitrogen cycling and environmental conservation agriculture in Japan” (K. Kumazawa, Japan); 3) “Nitrogen management in Korean agriculture” (Y. Lee, NIAST, Korea); 4) “Integrated nutrient management in two cropping systems in China” (F-S Zhang, China Agricultural University, China); 5) “Environmental issues related to nitrogen management practices in the United States” (P. P. Motavalli, University of Missouri, USA); 6) “Nutrient management and water quality protection in EU countries” (O. F. Schoumans, Alterra, the Netherlands); 7) “Prediction of soil nutrient outflow to groundwater by soil water and electrical conductivity sensing” (D-S Oh, NIAST, Korea); 8) “Assessment of nitrogen pollution risk in rivers by using mesh data from agricultural Statistics” (K. Kohyama, NIAES, Japan); and 9) “Influence of land use on nitrogen load to the Saemangeum Basin” (D-B. Lee, NIAST, Korea).

The lectures and the general discussion were summarized as follows:

### 1) Keynote lectures

Dr. Kim explained the current status of non-point sources and the excess amount of nutrients in Korea, systems for the management of water quality, the current status of water quality monitoring, and the reduction in nitrogen and phosphorus loads by such measures as the prevention of soil erosion. Dr. Kumazawa then provided information on an extensive range of subjects, including the current status of nitrate pollution in the groundwater of Japan, research on the sources of nitrate in groundwater, the environmental impact of livestock excreta and other organic wastes, the nitrogen balance in arable lands, and environmentally-friendly agriculture with the cyclical use of nitrogen in Japan.

### 2) General lectures

Dr. Y. Lee explained the history of nutrient management in Korean agriculture and the current status of nutrient management, and then asked “Who has responsibility for the problem of livestock excreta?” Professor Zhang reported that the load on the environment can be mitigated by integrated nutrient management based on the diagnosis of nutritional needs in crops. Professor Motavalli showed how to improve nitrogen management practices related to fertilizers and manure in the grain belt of the United States; he proposed new ways of reducing the influence of these substances on the environment.

Dr. Schoumans explained that the outflow of phosphorus is becoming more important in the Netherlands than is indicated in the “Nitrates Directive” and “Water Framework Directive”, which are common policies in the EU. Dr. Oh showed how to predict the leaching of soil nutrients from the results of soil column experiments, and Dr. Kohyama showed how to evaluate nitrogen pollution risk in rivers from mesh data on agricultural statistics. Finally, Dr. D-B. Lee reported that the nitrogen loads generated by urban living are the main sources of pollution in the Saemangeum Basin.

### 3) General discussion:

At the opening of the general discussion, Dr. Ki-Cheol Eom, Chairman of the general discussion, asked “Who has responsibility for the problem of livestock excreta?” in response to the lecture by Dr. Y. Lee. This question sparked an active discussion on 1) the importance of farm practices, 2) the importance of regional differences in livestock excreta, 3) support measures and stewardship responsibility, 4) the restriction of manure application on the basis of measurements of phosphorus outflow, and 5) the problem of the offensive odors emitted by such materials as barnyard manure. In our country, the problem of livestock excreta is still unsolved despite the enforcement of the so-called “Livestock Excreta Legislation”, and there is a need to evaluate the negative

environmental effects of organic matter application at a catchment scale. (K. Sugahara)

### 3. Third Meeting for the Presentation of NIAES Research Topics

The Third Meeting for the Presentation of NIAES Research Topics, subtitled “Thinking about Agriculture and the Environment”, was held on 28 September 2006 at the Shinjuku Meiji Yasuda Seimei Hall in Tokyo. NIAES became an independent administrative institution in April 2001, and since that time we have been carrying out research activity with continuous 5-year mid-term plans. We held a research presentation meeting twice during the first 5-year plan period, in 2002 and 2004. Because the first 5-year mid-term plan ended in March 2006, we held a third meeting to introduce oral and poster presentations on the research results from this first period. The meeting was attended by a total of 221 participants, including 156 from government agencies, private companies, universities, public agencies and corporations, and 65 from NIAES.

The meeting opened with speeches by Yohei Sato, President of NIAES, and Kenji Takahashi, Director General of the Agriculture, Forestry and Fisheries Research Council, and a special lecture, entitled “Impact of agriculture on the Earth’s environment from the viewpoint of environmental history”, by Hiroyuki Ishi, a Professor at Hokkaido University. The following four research topics from the first plan period, and the directions of research for the second plan period, were then presented in: “Seeking agriculture that fosters rich biota”(Shori Yamamoto, Senior Researcher, Biodiversity Division), “Pesticides in the atmosphere: diffusion and control”(Yasuhiro Yogo, Director of Organochemicals Division),

“Water quality changes caused by increasing food demand in East Asia”(Junko Shindo, Senior Researcher, Carbon and Nutrient Cycles Division), and “How will increased atmospheric CO<sub>2</sub> and global warming affect paddy rice growth and yield?”(Toshihiro Hasegawa, Senior Researcher, Agro-Meteorology Division). Also, Ichiro Taniyama, Director of the Natural Resources Inventory Center, gave a speech entitled “Disseminating information surrounding the agricultural environment”. He talked about the data and resources that the Natural Resources Inventory Center possesses, and their usage.

At the question-and-answer session after these presentations, there were discussions about water management in abandoned paddy fields, the possibility of considering international trade in food for future water quality prediction models, and the level of CO<sub>2</sub> at which rice yield is affected. All topics addressed by lecturers at the meeting dealt with historical time and space and highlighted the importance of these concepts.

Poster presentations on 17 research topics were displayed before the lectures and during the break, and there were active discussions and exchanges of opinions among the researchers and participants.

A questionnaire on this meeting gathered the impressions and opinions of 90 participants. Most of the comments were positive: “Topics were explained intelligibly”, and “It was good that the meeting was held in Tokyo”. In terms of the research topics, lectures, and poster presentations, many participants were interested in global warming and food production; this reflects the social interests of today’s society. However, there were also negative comments such as, “Should pursue broader perspectives (in order to solve environmental problems)” and “Explanations insufficient for the general public”. (T. Imagawa)



Professor Hiroyuki Ishi of Hokkaido University, delivering the special lecture



#### 4. NIAES International Symposium 2006, “Evaluation and Effective Use of Environmental Resources for Sustainable Agriculture in Monsoon Asia—Toward International Research Collaboration”

The NIAES International Symposium, entitled “Evaluation and Effective Use of Environmental Resources for Sustainable Agriculture in Monsoon Asia—Toward International Research Collaboration”, was held on 12 to 14 December 2006 in Epochal Tsukuba, with the support of the Agriculture, Forestry and Fisheries Research Council of the Ministry of Agriculture, Forestry and Fisheries. The symposium aimed to give an overview of various environmental problems in and around agro-ecosystems in the monsoon Asian region and to explore international research collaboration to solve these agro-environmental problems.

On the first day of the symposium, the six invited speakers gave excellent and informative lectures on agro-environmental research in monsoon Asia. The topics were:

- Agro-environmental research and development of consortium in monsoon Asia (Yohei Sato, NIAES, Japan)
- Environment and sustainable agriculture in monsoon Asia (Koji Tanaka, Kyoto University, Japan)
- Rice research for poverty alleviation and environmental sustainability in Asia (Robert S. Zeigler, International Rice Research Institute, Philippines)
- Rice production in Southeast Asia for sustainable agriculture and environment—international collaboration for rice technology development (Shu Fukai, University of Queensland, Australia)
- Impact of nitrogen cycling on global warming in agro-ecosystems of East Asia (Ryusuke Hatano, Hokkaido University, Japan)

- Effect of global warming on invasion of alien plants in Asia (R.M. Kathiresan, Annamalai University, India)

Dr. Yohei Sato, President of NIAES, presented an overview in which he pointed out that Asian countries are blessed with the food production platform of paddy rice agriculture, but that they are facing potential agro-ecosystem collapse because of such events as global warming, urbanization, pollution by hazardous chemicals, and invasion by alien species. He also emphasized the need for an international research network on agro-environmental issues throughout monsoon Asia. Professor Tanaka, Dr. Zeigler, and Professor Fukai over-viewed the issue of international research collaboration on the basis of their abundant experience, and discussed pathways for achieving international research collaboration. Specific agro-environmental issues were highlighted in the lectures that followed. Professor Hatano presented data on the emission of large amounts of nitrogen to the environment through agricultural activities and warned of the effect of this nitrogen on global warming. Professor Kathiresan overviewed the issue of invasion of monsoon Asian countries by alien plant species and suggested how global warming is accelerating this invasion.

On days 2 and 3 of the symposium the following four workshops were held, and the current status of research and future research strategies were discussed.

- Workshop 1: Invasive Alien Plants in Asia: Status and Control

This session was organized by Dr. Y. Fujii of NIAES. Ten speakers invited from Sri Lanka, Thailand, China, Vietnam, and Japan revealed the current status of alien plant invasion and its control. In a general discussion, Professor J. Silander (University of Connecticut, USA) and Professor T. Yahara (Kyushu University, Japan) gave valuable comments.



- Workshop 2: Monsoon Asia Agricultural Greenhouse Gas Emission Studies

This workshop, organized by Dr. K. Yagi of NIAES, was the second workshop for Monsoon Asia Agricultural Greenhouse Gas Emission Studies (MAGE); the first workshop was held in Tsukuba in March 2006 (see Annual Report 2006, pp. 12–13). Eight speakers invited from China, Thailand, India, the Philippines, and Japan reported on the current status of greenhouse gas emissions in agriculture and discussed ways of collaborating to reduce these emissions.

- Workshop 3: Prediction of Rice Production Variation in East and Southeast Asia under Global Warming

This workshop was organized by Dr. H. Toritani of NIAES. Fourteen speakers invited from China, Vietnam, Thailand, and Japan reported on their current achievements, mainly from the viewpoint of how global warming and a rise in CO<sub>2</sub> levels will affect rice production in Asia and how we can predict these effects. In the general discussion, Professor K. Kobayashi (University of Tokyo, Japan) gave critical comments based upon his studies using FACE (free-air CO<sub>2</sub> enrichment).

- Workshop 4: Ecological Risk Assessment of Gene Flow from Genetically Modified (GM) Crops

Eight speakers invited from China, the Philippines, Korea, and Japan gave valuable reports on the ecological risk assessment of GM crops. Some speakers stressed that GM crops are safe, whereas others emphasized the difficulty of evaluating the risks posed by GM crops. The organizer of this workshop, Dr. K. Matsuo, emphasized the need for exchange of information, not only among scientists but also between scientists and the general public.

At the end of the symposium, all participants agreed to adopt the following Symposium Statement (see p.30). (M. Saito)

### 5. Public Seminars on Alien Plants (Third through Sixth)

Four public seminars, including international seminar at Tsukuba City, were held as outreach activities for “Risk Assessment of Invasive Alien Plants and their Control,” a project under the Special Coordination Funds for Promoting Science and Technology - Research and Development Program for Resolving Critical Issues of the Ministry of Education, Culture, Sports, Science and Technology. These four events had a total of 642 participants.

- (1) Third Public Seminar: Held at Okayama University in Okayama City on 5 August 2006. There were 168 participants. Talks were as follows.

- 1) On the purposes of the Invasive Alien Species Act and our National Project
- 2) Botanical gardens and the "Invasive Alien Species Act"
- 3) On *Azolla* problems
- 4) Learning from the aquatic alien plant outbreaks in water systems of southern Okayama Prefecture
- 5) Attempts to develop technologies to control the alien plant weeping lovegrass (*Eragrostis curvula*)
- 6) Alien plants that are strongly allelopathic, and containing toxic substances
- 7) Advantages and problems of alien plants

The seminar concluded with free discussion on the subject “How should we deal with alien plants?” There were opinions and questions from participants, and discussion.

- (2) Fourth Public Seminar: Held in Fukuoka City on 21 October 2006. There were 77 participants. The following presentations were given.

- 1) Developing ways to scientifically assess the risks of alien plants
- 2) What kind of invasive alien plants are currently distributed in Japan?
- 3) Alien plants that cause problems through strong allelopathy and toxicity
- 4) Soils preferred by alien and native plants
- 5) Investigation of the route of invasion by genetic approach, and shutting out further invasions
- 6) Determining species from seeds: Building an alien plant database
- 7) Investigating the impacts on wild plants of the herbicides used to control alien plants
- 8) Developing technologies to control alien plants now spreading throughout Japan

- (3) Fifth Public Seminar: Held at the Tokyo International Forum Hall on 10 December 2006 with the support of the Ministry of Agriculture, Forestry and Fisheries and the Ministry of the Environment. There were 127 participants. The following presentations were given.

- 1) Background and purpose of this research
- 2) What kind of invasive alien plants are currently spreading in Japan?
- 3) Soils preferred by alien and native plants
- 4) Invasive alien plants that cause problems

- through strong allelopathy and toxicity in Japan
- 5) Developing the scientific risks assessments for invasive alien plants
  - 6) Invasive alien plants in tropical Asia: The case of Thailand
  - 7) The impacts of alien plant invasions on the biodiversity of national parks in Vietnam
  - 8) Investigating the invasion routes of alien plants on the genetic level, and shutting out further invasions
  - 9) Determining species from seeds: Building an alien plant database
  - 10) Investigating the impacts on wild plants of the herbicides used to control alien plants
  - 11) Development of technologies for alien plant control for the purpose of recovering plant diversity



Photo 1 Fifth Public Seminar, 10 December 2006, Tokyo

- (4) Sixth Public Seminar (International Seminar): Held at the Tsukuba International Conference Hall (Tsukuba City) on 12 through 15 December 2006. This event was an international workshop with the support of the National Institute for Agro-Environmental Sciences (NIAES). There were 270 participants.

In tandem with the worldwide expansion of freight and passenger traffic, there is a considerable increase in the economic and ecological damage caused by invasive alien plants in the Asia-Pacific region. Presentations were given on the policy measures and situation relating to alien species in Japan, and on the achievements of research in the project “Risk Assessment of Invasive Alien Plants and their Control” at this workshop. To solve these problems, which are shared by Asian countries, we discussed sharing information and setting up an international network. Dr. Yohei Sato, President of NIAES, proposed creating the Monsoon Asia Agro-Environmental Research Consortium (MARCO).

This Sixth Public Seminar invited researchers the five countries that compose the Monsoon Asia program (China, India, Sri Lanka, Thailand, and Vietnam). We discussed on the invasion of alien plants, their damage, and control, which enabled participants to exchange opinions on specific types of weed damage and control methods. Japanese participants sought much information and asked many questions about control and future invasions, and there was enthusiastic debate. (Y. Fujii)



Photo 2 Sixth Public Seminar (International Seminar): 12 through 15 December 2006, Tsukuba