25th Session of
the Asia and Pacific Plant Protection Commission (APPPC)
Beijing, China, 27 ~ 31 August 2007

Country Report
The Republic of Korea

1. Introduction

The Ministry of Agriculture & Forestry (MAF) of Korea, with the rapid increase of public concerns over the safety and quality of agricultural products, has decisively turned a production method from input-oriented one depending highly on use of fertilizers and pesticides as well as mass cropping into the environment-friendly farming. The Ministry also has strengthened the regulatory system for agro-products safety management to provide consumers with a safe food from farm to table by developing and distributing environment-friendly farming techniques which are easy for most of farmers to put in practice.

Also, for the purpose of harmonizing agriculture with the environment and developing sustainable agriculture, the amount of chemical fertilizers and pesticides used will be reduced by 30% to 2005 and 40% to 2010 through the Integrated Nutrient Management(INM) and the Integrated Pest Management(IPM). In addition, the pest control by using natural enemies will be expanded gradually, and the development and distribution of an environment-friendly pesticide such as bio-pesticides will be carried out side by side. By doing so, environmental pollution due to the chemical compound pesticides continues to be reduced.

Meanwhile, NPPO in Korea, the National Plant Quarantine Service (NPQS), in order to execute scientific and transparent phytosanitary measures to resolve bilateral as well as multilateral plant quarantine issues, implements plant quarantine regulation and the system in accordance with the ISPMs. Especially NPQS responds promptly to new demands such as for adoption of a new regulation on LMO movement between countries recently. A new NPQS notification on procedure on agricultural LMO inspection is being prepared for implementation of a new law on LMO movement between countries. NPQS strengthens activities for disclosure of violation to develop effective and efficient implement.

After the Plant Quarantine Act being enacted on Dec 30, 1961, NPQS has made efforts to strengthen border quarantine to prevent introduction of exotic pests and to reinforce the monitoring and control activities at the domestic level. NPQS continues to improve regulation and practice to develop transparent and effective quarantine system.

2. Occurrence, Monitoring and Control of Major Pests

2.1 Occurrence, monitoring and control of rice pests

In 2006, during rice growing season, we had extended monsoon period and more rainy days which caused increase of disease occurrence. But we did not have big natural disaster such as typhoon, the yield of rice was above average. Due to developed low pressure, amount of long distance migrating flying insect such as brown planthoppers, white-backed rice planthoppers and rice leaf rollers folders from China, was increased but the reproduction was low due to frequent rain. The estimated number of pest control measure implementation in rice field is 2 ~ 4. According to the survey of the National Agricultural Products Quality Management Service(NAQS), the total number of the pest control measures implementation for all pests in 2005 was 7.2 times, which was similar to 2004. (refer to Table below)

Table 1) Number of pest control measure implementation (total 2,420 households surveyed by NAQS)

(unit: times)

Ref.	Total	Damages by diseases				Damages by insect pests		
		Subtotal	Blast	Sheath blight	Others	Subtotal	Plant-hoppers	Others
2005 [No.]	7.2	3.6	2.0	1.4	0.2	3.5	1.1	2.4
2004 [No.]	7.1	4.9	2.8	2.0	0.1	5.6	1.9	3.7
Control ratio [%]	68	73	71	70	200	63	58	65

- Actual spray is about 3 times/year with 2~3 pesticides mixture.

2.2 Monitoring of pests

The Rural Development Administration(RDA) monitored and observed the occurrence of major pests which have significant economic effect on domestic crops through numbers of stations and used the results obtained from those stations as data to conduct precise pest control.

- 150 monitoring stations and 690 observing stations for rice pests

In order to provide information on pests occurrence quickly and accurately to farmers and related institutes, 14 experts were convened to have a meeting regarding crop pest monitoring and released relevant information through mass media (TV, newspapers and internet) and agricultural magazine, and sometimes in a form of leaflet.

3. Extension of IPM demonstration projects

3.1. Rice and citrus IPM demonstration projects

The RDA conducted the demonstration projects for rice, apple, and citrus to distribute IPM practice techniques focusing on producing safe agricultural products and conserving agricultural environment.

RDA carried out the IPM demonstration projects for rice targeting in 124 cities and counties at 284 sites (5,027 farmhouses, 2,842ha) and conducted 464 training sessions with 15,846 farmers. As a result, the application frequency of pesticides and application hour in the target area of the demonstration project decreased to 2.1times (1.5 times less than common practice) and to 1.1hr (1.0 hr less than common practice) respectively.

IPM on citrus in 2 cities and counties and 16 sites (21 farmers, 21 ha), the application frequency of pesticides dropped from 10.5 to 7.5times.

3.2. Natural enemy propagation and biological control demonstration projects

Biological control demonstration projects was initiated from UNDP IPM and developed into new Demonstration Project of New Technology of RDA. In 1997, reproduction and distribution of white fly parasite was started in Agricultural Technology Center. From 2000, 23 Agricultural Technology Centers of cities and counties establish facilities to reproduce and distribute of natural enemies. Revision of Plant Protection Act

(2002) and new NPQS notification (2003) made possible to import biological control agents. In 2004~5, a new Project of Distribution of Commercial Natural Enemies and a new Policy Project of Distribution of Natural Enemies to farmers by MAF was launched which replaced the Demonstration Project.

Propagation facilities of natural enemies were installed in 23 cities and counties and provided natural enemies to 892 farmhouses in 308.2 ha. The demonstration project for biological control using natural enemy were carried out in 59 cities and counties and 111 sites.

In 2003 and 2004, training was provided to 1000 officials responsible for extension service on a yearly basis.

4. Plant Quarantine

4.1. Changes in the National Plant Quarantine Service (NPQS)

The National Plant Quarantine Service (NPQS) increased 21 quarantine officials to cope with increased import and export of plants and plant products.

As a result, the organization has changed as follows;

As of July 1st 2007, NPQS operates 449 officers. 1 Headquarter. 5 Regional offices. 2 Post-entry quarantine stations and 22 Branch offices.

4.2 Development and revision of plant quarantine regulation

○ Revision of Plant Protection Enforcement Ordinance

- Enforcement date : 12 May 2006.
- Application case
  . Quarantine premise designation, management of the quarantine premise etc.

○ Revision and New MAF notification

- Revision of 'The plant quarantine import requirement for Canadian *Pinus* spp and *Larix* spp. lumber (27 Dec. 2005.)
- Plant quarantine requirement of fresh potatoes imported form Australia via the state of Victoria
- Import plant quarantine requirement of fresh pumpkin fruit from Tonga (28 March 2006)

- Import plant quarantine requirement of fresh avocado fruit from Mexico (27 March 2006)
- Import plant quarantine requirement of walnut from USA (22 May 2006)
- Import plant quarantine requirement of fresh grape and kiwi fruit from Chile (30 May 2006)
- Import plant quarantine requirement of fresh cherry fruit from New Zealand (27 June 2006)
- Import plant quarantine requirement of fresh sweet orange and lemon fruit from Australia (28 Aug 2006)
- Import plant quarantine requirement of fresh mango fruit of Australia (27 April 2007)
- Import plant quarantine requirement of *Anthrium* spp. plants from Netherlands (27 April 2007)
- Import plant quarantine requirement of fresh cherry fruit from China (1 June 2007)

○ Newly designated 74 quarantine pests were notified to WTO/SPS as follows (28 June 2006, 23 Jan. 2007).

	Group	**Pest (Scientific name)**
1	Fungus	*Phytopthora kernoviae*
2		*Phytopthora alni*
3		*Corticium koleroga*
4		*Pestalotiopsis hartigii*
5		*Pestalotiopsis disseminata*
6		*Phaeosclerotinia nipponica*
7		*Seimatosporium lichenicola*
8		*Cytosphaera mangiferae*
9		*Oidium mangiferae*
10		*Potebniamyces pyri*
11		*Podosphaera pannosa*
12		*Phaeomoniella chlamydospora*
13		*Cochliobolus australiensis*
14		*Cochlioborus hawaiiensis*

15		*Curvularia clavata*
16		*Pseudocochliobolus pallescens*
17		*Pseudocochliobolus pallescens*
18	Virus	Bean common necrosis virus
19		Bean pod mottle virus
20		Tomato infectious chlorosis virus
21		Tomato chlorosis virus
22		Alstroemeria mosaic virus
23		Eggplant mottled dwarf virus
24		Chilli veinal mottle virus
25		Cucurbit yellow stunting disorder virus
26		Cucumber vein yellowing virus
27		Mungbean yellow mosaic India virus
28		Beet necrotic yellow vein virus
29		Tobacco leaf curl virus (=Chilli leaf curl virus)
30	Viroid	Apple fruit crinkle viroid
31	Bacteria	*Xanthomonas campestris pv. mangiferarindicae*
32	Weed	*Alternanthera philoxeroides*
33		*Solanum elaeagnifolium*
34	Insect	*Anastrepha distincta*
35		*Anastrepha pseudoparallela*
36		*Anastrepha striata*
37		*Bactrocera cucumis*
38		*Bactrocera fraunfeldi*
39		*Bactrocera kraussi*
40		*Bactrocera murrayi*
41		*Bactrocera opiliae*
42		*Grapholita prunivorana*

43		*Odontotermes formosanus*
44		*Acheta domesticus*
45		*Cosmophylum pallidulum*
46		*Amblypelta lutescens*
47		*Colgaroides acuminata*
48		*Lepidosaphes chinensis*
49		*Paracoccus marginatus*
50		*Pseudococcus jackbeardsleyi*
51		*Monanus concinnulus*
52		*Ptilinus fuscus*
53		*Rhynchites auratus*
54		*Rhynchites auricapillus*
55		*Rhynchites confragossicollis*
56		*Rhynchites faldermanni*
57		*Rhynchites giganteus*
58		*Anoplolepis gracilipes*
59		*Eurytoma samsonovi*
60		*Hoplocampa danfengensis*
61		*Hoplocampa fulvicornis*
62		*Monomorium destructor*
63		*Quadrastichus erythrinae*
64		*Erosomyia mangiferae*
65		*Duponchelia fovealis*
66		*Pandemis cerasana*
67		*Paysandisia archon*
68		*Atherigona orientalis*
69		*Bactericera cockerelli*
70		*Dysmicoccus grassii(=D. alazon)*

71		*Exallomochlus philippinensis*
72		*Maconellicoccus multipori*
73		*Planococcus bendovi*
74		*Planococcus philippinensis*

4.3. Preparation for implement of a new law on LMO movement between countries

○ NPQS is in charge of boarder control of import LMO for agricultural purpose
- NPQS notification on procedure of LMO inspection methods (in process)
- Development of cooperation system between relevant organizations
- Human resources and equipment for inspection and testing
- Collection of information and development of inspection methods

4.4. Cooperation with international institutes such as WTO/SPS, IPPC/CPM, APPPC and bilateral counterparts

○ Active participation in international meetings related to plant quarantine to present and reflect our own opinions
- Korea has participated in most of WPO/SPS Session including recent 39th session, the 1st and 2nd IPPC/CPM Session, specialists meetings for preparing the APPPC regional standards etc.
- One specialist from NPQS of Korea has been appointed as an Asia representative of the Subsidiary Body on Dispute Settlement (SBDS) in the 7th IPPC/ICPM session.

○ Hosting international training program and meeting on plant quarantine
- Hosting ASEAN plant quarantine expert training program (2006, 2007)
- Hosting IPPC/ISPM draft workshop in APPPC region (2006, 2007)

○ Faithful compliance of the duties such as the duty of notification under the WTO/SPS Agreement
- In 2006, 6 times of notifications have been completed with relation to the revised articles of Plant Quarantine Regulations.
- In the first half of 2007, 6 times of notifications have been completed with relation to the revised articles of Plant Quarantine Regulations.

○ Conducting negotiations on bilateral plant quarantine issues based on the ISPMs and/or scientific evidences

- Requests for the import permission on the prohibited plants and plant products are progressed according to IRA Procedures.

4.5. Strengthening of activities of disclosure of violation of plant quarantine regulation

○ Enhancement of activities of special police for Plant Quarantine

- Training in National Police Agency
- Workshop on special police activities for plant quarantine

○ Enhancement of activities of special police for Plant Quarantine

- Increase the number of honorary watchmen for plant quarantine from 120 watchmen ('06) to 500 in 2007.

4.6. Implementation of ISPMs

When we establish, revise or implement the Plant Protection Act and other regulations or any other directives on phytosanitary measures, our government thoroughly takes into account the harmonization with the international standards and thus has no problem to execute ISPMs.

Also, for better understanding on ISPMs, we included the 『Introduction Course for the International Organizations and Standards related to Plant Quarantine』 into all of the curricula of training programs for plant quarantine officers in the NPQS. Besides, the NPQS distributes the translated Korean-version of ISPMs to every Regional or Branch Office and the related domestic organizations when a new ISPM is officially approved and adopted. The NPQS periodically publishes a book about the ISPMs and distributes it to the related domestic bodies for promoting implementation of those standards too.

4.6. Early detection and prompt response to introduction of exotic pests

○ Installation of monitoring traps intensively on the sites such as airport and seaport, and fields with import planting material: 540 sites

○ Field survey for the growing sites of import plants : 1 ~ 2 times/mon.

○ Designation of farmers as foreign pests monitoring resources: 201 farmers
- Exchange of information on pest occurrence by telephone or visit more than twice a month

○ Establishment of the Cyber Declaration Center for Exotic Pests in NPQS Homepage (www.npqs.go.kr)

4.7. Accessibility to the phytosanitary information on the internet websites

Plant quarantine information can be accessed through the following organizations' websites, and the English version is also available.

- Ministry of Agriculture and Forestry : http://www.maf.go.kr
- Rural Development Administration : http://www.rda.go.kr
- National Plant Quarantine Service : http://www.npqs.go.kr

NPQS established the 『One-Stop Civil Application Settlement System』 and has enabled importers to request the inspection for import plant and plant products and to check the status of inspection through internet since January 2004.

- Time for application of an inspection: 70 min.→ 10min.
- The No. of export & import consignment application via internet in 2004 : 187 thousand articles→ about 2 million dollars cost saved
- Ratio of internet application: (Dec. 2003) 14.3%→ (2004) 75.9%→ (2005.2.) 97.1%

5. Pesticides

RDA strengthens the safety management corresponding to IPMs and promotes the development as well as distribution of low toxic safe environment-friendly pesticides.

5.1. Pesticide registration and regulation

Among the 1,200 chemicals listed in Korea as pesticide, more than 98% is low or common toxic. Hazard concerned chemicals including the high toxic pesticides are specifically regulated through many measures including a restriction standard on handling those materials.

In case of agro-chemicals which are toxic to live organisms in nature, pictorial-warning-mark and cautionary directions should be clearly printed on the label of the container. Especially, nowadays safety standard for Korean ecological indicator fish, loach has been strengthened.

RDA deposited the instrument of ratification to the Rotterdam Convention on the Prior Informed Consent (PIC) Procedures for Certain Hazardous Chemicals and Pesticides in International Trade on Aug. 2003, and improved related regulations or systems. As such, Korea has been fulfilling its duties as a contracting party.

Also, RDA signed the Stockholm Convention on the production, usage and discharge prohibition of residual persistent organic pollutants(POPs) in 2001, ratified in Jan. 2007.

5.2. Development and application of natural enemies and bio-pesticides

5.2.1 Natural enemies

MAF is promoting the natural enemy projects for horticultural crop pests from 2005. Through the effort, MAF intends to implement these projects on 50% domestic greenhouse crop area. Main target crops for the project are strawberry, tomato, and hot pepper. RDA also conducts research on selection of endogenous natural enemies and its application. And RDA conducts UNDP/Environment-Friendly Agriculture Project (2003-2007).

Fifteen species of natural enemies such as *Phytoseiulus persimilis* for two spotted spider mite have been commercialized by domestic private companies.

5.2.2 Bio-pesticides

In order to encourage development and registration of low-toxic, non-residual, and environment-friendly bio-pesticides, RDA enacted and notified the standard for the registration of bio-organism pesticides in 2000. Thereafter, the 『Review Standard for the Registration Test Method of Bio-Pesticide and the Registration Application Document Act』 including the natural extracts and sex pheromone etc. is prepared in 2005, and leads to the development and registration of control bio-pesticides for the pests and weeds.

Currently, 8 source materials and 14 articles products of bio-pesticides using live micro-organisms such as fungi, bacteria, virus, and protozoa are registered and being used. They are as follows;

Paenibacillus polymyxa AC-1 SC, *Streptomyces goshikiensis* WYE 324 SL, *Streptomyces colombiensis* WYE 20 SL, *Bacillus subtilis* GB-0365 SC, *Ampelomyces quisqualis* AQ94013 WP, *Bt.* subsp. *aizawai* GB413 SC, *Bt.* subsp. *aizawai* Nt0423 WP, *Bt.* WP, *Bt. aizawai* SC, *Bt. aizawai* WG, *Bt. kurstaki* SC, *Bt. kurstaki* WG etc.

6. National Plant Protection Organization

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7. Conclusion

The Republic of Korea, considering the rapid increase of domestic as well as international concerns over the environment protection and food safety, steadily pursues sustainable environment- friendly agriculture.

And to establish international standard-harmonized and transparent plant quarantine system, NPQS continues to improve and revises the regulations and practices.

In conclusion, Korea would like to emphasize that the APPPC's role as a place for members not only to discuss smooth implementation of ISPMs but also to exchange information should be strengthened.